

Massachusetts Water Resources Authority



Metropolitan Water Tunnel Program

Environmental Notification Form

March 2021

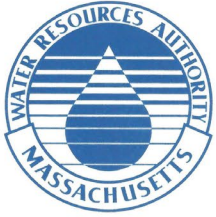
**PRELIMINARY DESIGN,
GEOTECHNICAL INVESTIGATION AND
ENVIRONMENTAL IMPACT REPORT**

MWRA Contract 7159

Revision 0

Prepared by
VHB in association with
CDM Smith and Jacobs

For a larger print version, please contact Gabrielle Marrese at
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MASSACHUSETTS WATER RESOURCES AUTHORITY

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Frederick A. Laskey
Executive Director

To: Reviewers
From: Kathleen Murtagh, Director, Tunnel Redundancy Program
Re: Massachusetts Water Resources Authority Metropolitan Water Tunnel Program
Environmental Notification Form (ENF)

The Massachusetts Water Resources Authority (MWRA, the Authority) filed the Metropolitan Water Tunnel Program ENF with the Massachusetts Environmental Policy Act (MEPA) Office on March 31, 2021 for publication in the April 7, 2021 Environmental Monitor. Through its Metropolitan Water Tunnel Program (the Program), the Authority proposes to construct approximately 14 miles of two new water supply deep rock tunnels that will provide redundancy for MWRA's existing Metropolitan Tunnel System, which includes the City Tunnel (1950), City Tunnel Extension (1963) and Dorchester Tunnel (1976). The Program will also allow the Authority's aging existing water tunnel system to be rehabilitated without interrupting service. The Program is in the preliminary design and environmental review stage. It is anticipated that up to 12 shaft sites will be constructed for deep rock tunnel boring and to connect to the existing surface water distribution system. Final design will begin after preliminary design is complete, with tunnel construction planned to occur from approximately 2026-2027 through 2037. Temporary construction impacts will be associated with the construction of the deep rock tunnels and associated construction shaft sites, and intermediate shaft sites facilitating connections to surface connections.

An electronic copy of the ENF is available on MWRA's website at: <https://www.mwra.com/mwtp/resources.html> and printed copies are available for viewing at the following libraries:

Boston Public Library- Main Branch 700 Boylston Street Boston, MA 02116	Needham Public Library 1139 Highland Ave Needham Heights, MA 02494	Weston Public Library 87 School Street Weston, MA 02493
Belmont Public Library 336 Concord Ave Belmont, MA 02478	The Public Library of Brookline- Brookline Village 361 Washington Street Brookline, MA 02445	Dedham Public Library 43 Church Street Dedham, MA 02026
Newton Free Library 330 Homer Street Newton, MA 02459	Watertown Free Public Library 123 Main Street Watertown, MA 02472	Wellesley Free Library 530 Washington Street Wellesley, MA 02482
Waltham Public Library 735 Main Street Waltham, MA 02451		

The MEPA public comment period closes on April 27, 2021. A virtual site visit may be held during the public comment period and the specific date and time will be posted in the Environmental Monitor. Due to the COVID-19 pandemic, comments may be submitted through MEPA's Public Comment Portal (<https://eeaonline.eea.state.ma.us/EEA/PublicComment/Landing/>) or through emailing MEPA@mass.gov.

Reviewers
March 31, 2021
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If you have any questions regarding this submittal or would like a hard copy, you may contact Gabrielle Marrese at 617-570-5469 or Gabrielle.Marrese@mwra.com

Este ENF (Formulario de notificación medioambiental) contiene información importante sobre un proyecto de construcción propuesto en las comunidades mencionadas. Sírvase hacerlo traducir o hable con alguien que lo comprenda.

Sincerely,

Kathleen Mustog

**Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
Massachusetts Environmental Policy Act (MEPA) Office**

Environmental Notification Form

For Office Use Only EEA#: _____ MEPA Analyst: _____

The information requested on this form must be completed in order to submit a document electronically for review under the Massachusetts Environmental Policy Act, 301 CMR 11.00.

Project Name: Metropolitan Water Tunnel Program		
Street Address: Multiple locations		
Municipality: Waltham, Belmont, Watertown, Weston, Newton, Wellesley, Needham, Brookline, Boston, Dedham	Watershed: Charles, Boston Harbor (Mystic), Boston Harbor (Neponset)	
Universal Transverse Mercator Coordinates: Multiple locations	Latitude: Multiple locations Longitude: Multiple locations	
Estimated commencement date: 2026/2027	Estimated completion date: 2037	
Project Type: Water Supply Tunnel Redundancy	Status of project design: 10% complete	
Proponent: Massachusetts Water Resources Authority		
Street Address: 100 First Avenue		
Municipality: Boston	State: MA	Zip Code: 02129
Name of Contact Person: Gabrielle Marrese		
Firm/Agency: Massachusetts Water Resources Authority	Street Address: 100 First Avenue	
Municipality: Boston	State: MA	Zip Code: 02129
Phone: 617-570-5469	Fax: 617-371-1605	E-mail: gabrielle.marrese@mwra.com
<p>Does this project meet or exceed a mandatory EIR threshold (see 301 CMR 11.03)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If this is an Expanded Environmental Notification Form (ENF) (see 301 CMR 11.05(7)) or a Notice of Project Change (NPC), are you requesting:</p> <p>a Single EIR? (see 301 CMR 11.06(8)) <input type="checkbox"/> Yes <input type="checkbox"/> No a Special Review Procedure? (see 301CMR 11.09) <input type="checkbox"/> Yes <input type="checkbox"/> No a Waiver of mandatory EIR? (see 301 CMR 11.11) <input type="checkbox"/> Yes <input type="checkbox"/> No a Phase I Waiver? (see 301 CMR 11.11) <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Note: Greenhouse Gas Emissions analysis must be included in the Expanded ENF.)</i></p> <p>Which MEPA review threshold(s) does the project meet or exceed (see 301 CMR 11.03)?</p> <p>11.03(4)(a)3. Construction of one or more new water mains ten or more miles in length.</p> <p>Which State Agency Permits will the project require?</p> <p>The Metropolitan Water Tunnel Program (the Program) could potentially require the following State Agency Permits, which will be further evaluated as the design progresses and updated in the Draft Environmental Impact Report (DEIR):</p>		

- Massachusetts Department of Transportation (MassDOT) Highway Access Permits
- Department of Conservation and Recreation (DCR) Access Permits
- Section 401 Water Quality Certificate
- Chapter 91 license (inland waterways only)
- Bureau of Resource Protection Water Supply (BRP WS) Permit 32 – Distribution System Modification under the Massachusetts Drinking Water Regulations
- Surface Water Discharge Permitting
- Ground Water Discharge Permitting
- Soils Management / Hazardous Waste Generation (MCP)
- Article 97 Land Disposition Legislation
- Natural Heritage and Endangered Species Program review
- Water Management Act

Identify any financial assistance or land transfer from an Agency of the Commonwealth, including the Agency name and the amount of funding or land area in acres:

No financial assistance is anticipated for this Program, as it is part of the Massachusetts Water Resources Authority's (MWRA or the Authority) Capital Improvement Plan. Any changes to funding or proposed Agency land transfers will be disclosed in the DEIR.

Summary of Project Size & Environmental Impacts

	Existing	Change	Total
LAND			
Total site acreage (multiple sites)	Up to 11 acres		
New acres of land altered (total for up to 12 sites)		To be determined in DEIR (Site specific)	
Acres of impervious area	To be determined in DEIR (Site specific)	Up to 4 acres	To be determined in DEIR (Site specific)
Square feet of new bordering vegetated wetlands alteration		0 (Anticipate avoiding direct impacts)	
Square feet of new other wetland alteration		0 (Anticipate avoiding direct impacts)	
Acres of new non-water dependent use of tidelands or waterways		0 (Anticipate avoiding direct impacts)	
STRUCTURES			
Gross square footage	0	<ul style="list-style-type: none"> • 25x25 ft connection shaft (up to 6) • 50x50 ft valve chamber and 28 ft diameter top of shaft structure (up to 6 of each) 	Approx. 22,440 square feet
Number of housing units	N/A	N/A	N/A
Maximum height (feet)	0	14 feet	14 feet

TRANSPORTATION			
Vehicle trips per day	To be determined in DEIR (Site specific)	0-8	To be determined in DEIR (Site specific)
Parking spaces	To be determined in DEIR (Site specific)	Approximately 40	To be determined in DEIR (Site specific)
WASTEWATER			
Water Use (Gallons per day)	180 million	0	180 million
Water withdrawal (GPD)	0	0	0
Wastewater generation/treatment (GPD)	0	0	0
Length of water mains (miles)*	100	14.5	114.5
Length of sewer mains (miles)	274	0	274
Has this project been filed with MEPA before? <input type="checkbox"/> Yes (EEA # _____) <input checked="" type="checkbox"/> No			
Has any project on this site been filed with MEPA before? <input type="checkbox"/> Yes (EEA # _____) <input checked="" type="checkbox"/> No			

* Deep tunnel water main

Note: Temporary construction impacts will be associated with the construction of the shaft sites and surface connections, management of material removed from the tunnel and treatment of groundwater inflow.

GENERAL PROJECT INFORMATION – all proponents must fill out this section

PROJECT DESCRIPTION:

Existing Conditions

Describe the existing conditions and land uses on the project site:

The Authority provides wholesale water and wastewater services to over 3.1 million people and over 5,500 industrial users in 61 metropolitan Boston communities. The Quabbin and Wachusett Reservoirs, which are the main water supply sources, are located 65 and 35 miles west of Boston, respectively. Water from the reservoirs is treated at the John J. Carroll Water Treatment Plant in Marlborough before being conveyed to the metropolitan Boston area through a number of existing tunnels and aqueducts.

As part of the MWRA water transmission system, the existing Metropolitan Tunnel System carries approximately 60 percent of the metropolitan Boston area's daily demand through the remaining 19 miles of tunnels. With no redundancy to the Metropolitan Tunnel System, partial system shutdowns cannot take place for planned maintenance of the aged infrastructure or in the event of unplanned emergencies without substantial service disruptions.

See additional details of existing conditions and the Program background in Attachment C: ENF Narrative.

Project Description

Describe the proposed project and its programmatic and physical elements:

NOTE: The project description should summarize both the project's direct and indirect impacts (including construction period impacts) in terms of their magnitude, geographic extent, duration and frequency, and reversibility, as applicable. It should also discuss the infrastructure requirements of the project and the capacity of the municipal and/or regional infrastructure to sustain these requirements into the future.

Through the Metropolitan Water Tunnel Program (the Program), the Authority will construct approximately 14 miles of new water supply deep rock tunnels that will provide redundancy for MWRA's existing Metropolitan Tunnel System, which includes the City Tunnel (1950), City Tunnel Extension (1963) and Dorchester Tunnel (1976). The Program will also allow the Authority's aging existing water tunnel system to be rehabilitated without interrupting service. The Program is in the preliminary design and environmental review stage. It is anticipated that up to 12 shaft sites will be required as part of the deep rock tunnel construction and provide permanent connections to the existing surface water distribution system. Final design will begin after preliminary design is complete, with tunnel construction planned to occur from approximately 2026-2027 through 2037. Temporary construction impacts will be associated with the construction at the shaft sites and for surface connections, management of material removed from the tunnel, and treatment of groundwater inflow.

See additional details of the Program in Attachment C: ENF Narrative.

Alternatives

Describe the on-site project alternatives (and alternative off-site locations, if applicable), considered by the proponent, including at least one feasible alternative that is allowed under current zoning, and the reasons(s) that they were not selected as the preferred alternative:

NOTE: The purpose of the alternatives analysis is to consider what effect changing the parameters and/or siting of a project, or components thereof, will have on the environment, keeping in mind that the objective of the MEPA review process is to avoid or minimize damage to the environment to the greatest extent feasible. Examples of alternative projects include alternative site locations, alternative site uses, and alternative site configurations.

A detailed Alternatives Screening Report is included in Attachment D, which provides a description of each north and south alternative alignment evaluated using a two-tiered screening criteria approach to determine the conceptual tunnel route for the north and south alignments. Twenty-eight alignment alternatives (15 south and 13 north) were screened consistently and objectively against established criteria. Specific tunnel routes and connection points for the north and south alignments will be evaluated in the DEIR.

Tier 1 Screening Criteria addresses the Primary Program goals, and alternatives that do not meet the Primary Program goals were eliminated from further consideration. Some alternatives were eliminated at this tier if they were paired with an alternative that was eliminated for other reasons in the screening process. For example, in the case where a north alternative satisfied Tier 1 criteria but was combined with a south alternative which did not satisfy the criteria, the north alternative was eliminated from further evaluation.

Tier 2 Screening Criteria of the screening process is a high-level preliminary assessment of each alternative in terms of its feasibility, potential impacts and constructability. Alternatives passing through the second tier of evaluation will be further evaluated in the next phase of conceptual design and environmental impact assessment.

Mitigation

Summarize the mitigation measures proposed to offset the impacts of the preferred alternative:

The Program Study Area encompasses approximately 14 miles of deep rock tunnels below the surface of several communities and surface impacts will be limited to approximately 11 acres. The intent of the

shaft site selection process will be to avoid resource areas and sensitive receptors to the greatest extent practicable. Mitigation measures will be appropriately developed and documented in the DEIR for locations where impacts are unavoidable.

Phasing

If the project is proposed to be constructed in phases, please describe each phase:

The Program is comprised of two segments; a north alignment and a south alignment. As the conceptual design proceeds, consideration will be given to phasing and will be documented in the DEIR. Phasing options include boring one deep rock tunnel at a time, or boring both the north and south tunnels simultaneously.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN:

Is the project within or adjacent to an Area of Critical Environmental Concern?

Yes (Specify _____) No

if yes, does the ACEC have an approved Resource Management Plan? ___ Yes ___ No;

If yes, describe how the project complies with this plan.

Will there be stormwater runoff or discharge to the designated ACEC? ___ Yes X No; If yes, describe and assess the potential impacts of such stormwater runoff/discharge to the designated ACEC.

RARE SPECIES:

Does the project site include Estimated and/or Priority Habitat of State-Listed Rare Species? (see http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/priority_habitat/priority_habitat_home.htm)

Yes (Specify PH1194, EH913, PH 1224, PH1230, PH1232, PH1195, PH1213, PH1256, PH1342, PH1377, EH1028, & PH1420 – See Attachment B: Figure 2) No

HISTORICAL /ARCHAEOLOGICAL RESOURCES:

Does the project site include any structure, site or district listed in the State Register of Historic Place or the inventory of Historic and Archaeological Assets of the Commonwealth?

Yes (Specify: Preliminary investigations show that one or more sites could potentially include historic resources. The intent of the shaft site selection process will be to avoid historical and archaeological resource areas to the greatest extent practicable. See Attachment B: Figure 7.) No

If yes, does the project involve any demolition or destruction of any listed or inventoried historic or archaeological resources? Yes (Specify See above) No

WATER RESOURCES:

Is there an Outstanding Resource Water (ORW) on or within a half-mile radius of the project site? X Yes ___ No; if yes, identify the ORW and its location.

Stony Brook Reservation (Public Water Supply Watershed) is located in Weston and Waltham within the Program Study Area.

(NOTE: Outstanding Resource Waters include Class A public water supplies, their tributaries, and bordering wetlands; active and inactive reservoirs approved by MassDEP; certain waters within Areas of Critical Environmental Concern, and certified vernal pools. Outstanding resource waters are listed in the Surface Water Quality Standards, 314 CMR 4.00.)

Are there any impaired water bodies on or within a half-mile radius of the project site? X Yes ___ No; if

yes, identify the water body and pollutant(s) causing the impairment:

- Mother Brook MA73-28 (Color, DDT in Fish Tissue, Dissolved Oxygen, Escherichia Coli, Fecal Coliform, Mercury in Fish Tissue, Odor, PCBs in Fish Tissue, and Total Phosphorous);
- Charles River MA72-07 (DDT in Fish Tissue, Escherichia Coli, Fish Bioassessments, Harmful Algal Blooms, Nutrient/Eutrophication Biological Indicators, PCBs in Fish Tissue, and Total Phosphorous);
- Sawmill Brook MA72-23 (Chloride, Dissolved Oxygen, Escherichia Coli, Organic Enrichment (Sewage) Biological Indicators, and Total Phosphorous);
- Kendrick Street Pond MA72055 (Turbidity);
- South Meadow Brook MA72-24 (Dissolved Oxygen, Escherichia Coli, Total Phosphorous, and Turbidity);
- Rosemary Brook MA72-25 (Dissolved Oxygen and Total Phosphorous);
- Beaver Brook MA72-28 (Algae, Dissolved Oxygen, Escherichia Coli, Organic Enrichment (Sewage) Biological Indicators, Total Phosphorous, Sedimentation/Siltation); and
- Seaverns Brook MA72-44 (Escherichia Coli)

See Attachment B: Figure 3.

Is the project within a medium or high stress basin, as established by the Massachusetts Water Resources Commission? **Yes** ___ No

STORMWATER MANAGEMENT:

Generally describe the project's stormwater impacts and measures that the project will take to comply with the standards found in MassDEP's Stormwater Management Regulations:

Temporary construction impacts will be associated with the construction of the shaft sites and surface connections, management of material removed from the tunnel and treatment of groundwater inflow. Runoff generated from impervious surfaces will be collected and managed in accordance with the Massachusetts Department of Environmental Protection (MassDEP) policy. Creation of new impervious area will be quantified once the shaft site selection process is complete. The shaft site design will incorporate a stormwater management system that includes measures to provide groundwater recharge, attenuate peak flows and provide water quality treatment. Compliance with the 10 Stormwater Management Standards cited in Section 310 CMR 10.05(6)(k) of the Wetlands Protection Act (WPA) Regulations will be appropriately documented in the DEIR. The Program will require a specific Stormwater Pollution Prevention Plan in accordance with the Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Activities.

MASSACHUSETTS CONTINGENCY PLAN:

Has the project site been, or is it currently being, regulated under M.G.L.c.21E or the Massachusetts Contingency Plan? **Yes** ___ No; if yes, please describe the current status of the site (including Release Tracking Number (RTN), cleanup phase, and Response Action Outcome Classification):

Due to the large size of the Program Study Area, preliminary assessment approximates the number of MassDEP disposal sites within the Program Study Area using available MassGIS information. Based on the Tier Classified Oil and Hazardous Materials Sites layer obtained from MassGIS, a total of 28 active Tier Classified disposal sites are located within the Program Study Area. An additional 102 disposal sites associated with AULs are located within the Program Study Area. It should be noted that disposal site information was obtained from MassGIS which is subject to inaccuracies. Attachment B: Figure 6

illustrates MassDEP disposal sites.

Is there an Activity and Use Limitation (AUL) on any portion of the project site? **Yes** **No**;
if yes, describe which portion of the site and how the project will be consistent with the AUL:

Due to the large size of the Program Study Area associated with the Program, the number of AUL areas within the Program Study Area has been approximated. Based on the Hazardous Materials Sites with AULs layer obtained from MassGIS, a total of 102 disposal sites with AULs are located within the Program Study Area. It should be noted that disposal site information was obtained from MassGIS, which is subject to inaccuracies and will be further evaluated in the DEIR.

Are you aware of any Reportable Conditions at the property that have not yet been assigned an RTN?
 Yes **No**; if yes, please describe: _____

SOLID AND HAZARDOUS WASTE:

If the project will generate solid waste during demolition or construction, describe alternatives considered for re-use, recycling, and disposal of, e.g., asphalt, brick, concrete, gypsum, metal, wood:

(NOTE: Asphalt pavement, brick, concrete and metal are banned from disposal at Massachusetts landfills and waste combustion facilities and wood is banned from disposal at Massachusetts landfills. See 310 CMR 19.017 for the complete list of banned materials.)

Temporary construction impacts will be associated with the construction of the shaft sites and surface connections, management of material removed from the tunnel and treatment of groundwater inflow. All demolition debris waste will be segregated and legally disposed of in regional landfills. Any material which cannot be separated and recycled (such as structural steel, electrical, metal plumbing) will be sorted and recycled. Concrete from the demolition will be stockpiled on-site and processed for use as site fill material during construction to the extent practicable. Any steel located within concrete will be removed and recycled. During construction, wood, metals, gypsum, cardboard and plastic will be segregated and sent to recycling facilities to the extent practicable. All construction debris will be sent to a solid waste sorting facility for separation of any recyclable materials.

Excavated materials from the tunnel construction will largely consist of broken rock. The preferred disposal of this material would be reuse for commercial purposes as the tunnel rock could be used for roadway subbase, other fill material, or possibly concrete aggregate. In the event that a commercial market is not available at the time of construction, one or more off-site disposal sites could be used. Potential disposal sites will be identified and evaluated in the DEIR.

Will your project disturb asbestos containing materials? **Yes** **No**; if yes, please consult state asbestos requirements at <http://mass.gov/MassDEP/air/asbhom01.htm>

The specific shaft site locations will be evaluated and confirmed in the DEIR. It is possible that some structures containing asbestos will have to be demolished as part of this Program. A hazardous materials assessment will be conducted prior to any demolition, if applicable. If that is the case, the asbestos containing materials (ACM) will be removed and handled and disposed of strictly according to state requirements.

Describe anti-idling and other measures to limit emissions from construction equipment:

Construction contractors will be required to adhere to all applicable regulations regarding control of construction vehicle emissions. Construction specifications will require that all diesel construction equipment used on-site would be fitted with after-engine emissions controls, and contractors will be required to utilize ultra-low sulfur diesel fuel and minimize idling time.

DESIGNATED WILD AND SCENIC RIVER:

Is this project site located wholly or partially within a defined river corridor of a federally designated Wild and Scenic River or a state designated Scenic River? ___Yes XNo; if yes, specify name of river and designation:

If yes, does the project have the potential to impact any of the “outstandingly remarkable” resources of a federally Wild and Scenic River or the stated purpose of a state designated Scenic River? ___Yes ___No; if yes, specify name of river and designation: _____; if yes, will the project will result in any impacts to any of the designated “outstandingly remarkable” resources of the Wild and Scenic River or the stated purposes of a Scenic River? ___Yes ___No; if yes, describe the potential impacts to one or more of the “outstandingly remarkable” resources or stated purposes and mitigation measures proposed.

ATTACHMENTS:

1. List of all attachments to this document.
 - Attachment A: Distribution List
 - Attachment B: ENF Figures
 - Attachment C: ENF Narrative
 - Attachment D: Alternatives Screening Report
 - Attachment E: ENF Public Notice

2. U.S.G.S. map (good quality color copy, 8-½ x 11 inches or larger, at a scale of 1:24,000) indicating the project location and boundaries.

See Attachment B: Figure 1

3. Plan, at an appropriate scale, of existing conditions on the project site and its immediate environs, showing all known structures, roadways and parking lots, railroad rights-of-way, wetlands and water bodies, wooded areas, farmland, steep slopes, public open spaces, and major utilities.

See Attachment B: Figures 1, 4, and 5

4. Plan, at an appropriate scale, depicting environmental constraints on or adjacent to the project site such as Priority and/or Estimated Habitat of state-listed rare species, Areas of Critical Environmental Concern, Chapter 91 jurisdictional areas, Article 97 lands, wetland resource area delineations, water supply protection areas, and historic resources and/or districts.

See Attachment B: Figures 2, 3, 4, and 7

5. Plan, at an appropriate scale, of proposed conditions upon completion of project (if construction of the project is proposed to be phased, there should be a site plan showing conditions upon the completion of each phase).

See Attachment C: Figures 2.2 and 2.3 for the Program Study Area. Specific tunnel alignments and shaft site locations will be further evaluated and disclosed in the DEIR.

6. List of all agencies and persons to whom the proponent circulated the ENF, in accordance with 301 CMR 11.16(2).

See Attachment A: Distribution List

7. List of municipal and federal permits and reviews required by the project, as applicable.

See Table 5.1 in Attachment C: ENF Narrative

LAND SECTION – all proponents must fill out this section

I. Thresholds / Permits

A. Does the project meet or exceed any review thresholds related to **land** (see 301 CMR 11.03(1))
 Yes **No**; if yes, specify each threshold:

Specific shaft site locations are unknown at the time. The Program may meet or exceed the following thresholds related to land; however, this will be confirmed as the Program progresses and specific shaft site locations are confirmed in the DEIR.

- 301 CMR 11.03(1)(b)(3)- Conversion of land held for natural resources purposes with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97.
- 301 CMR 11.03(1)(b)(5)- Release of an interest in land held for conservation, preservation or agricultural or watershed preservation purposes.

II. Impacts and Permits

A. Describe, in acres, the current and proposed character of the project site, as follows:

	Existing	Change	Total
Footprint of buildings ¹	0	25x25 ft connection shaft (up to 6) Approx. 0.09 acres 50x50 ft valve chamber (up to 6) Approx. 0.34 acres 28 ft diameter top of shaft structure (up to 6) Approx. 0.08 acres	approx. 0.51 acres
Internal roadways	TBD	Included with parking and other paved areas (See below)	TBD
Parking and other paved areas	TBD	Up to 4 acres, including roads and approximately 40 parking spaces	TBD
Other altered areas	TBD	TBD	TBD
Undeveloped areas	TBD	TBD	TBD
Total: Project Site Acreage	Approx. 11 acres	TBD	TBD

¹ This includes underground structures.

B. Has any part of the project site been in active agricultural use in the last five years? **Yes** **No**; if yes, how many acres of land in agricultural use (with prime state or locally important agricultural soils) will be converted to nonagricultural use?

Specific shaft site locations are unknown at the time and will be confirmed in the DEIR. Sites within active agricultural use will be avoided to the greatest extent practicable.

C. Is any part of the project site currently or proposed to be in active forestry use? **Yes** **No**; if yes, please describe current and proposed forestry activities and indicate whether any part of the site is the subject of a forest management plan approved by the Department of Conservation and Recreation:

Specific shaft site locations are unknown at the time and will be confirmed in the DEIR. Sites within

active forestry use will be avoided to the greatest extent practicable.

- D. Does any part of the project involve conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97? **Yes** **No**; if yes, describe:

Specific shaft site locations are unknown at the time and will be confirmed in the DEIR. Sites held for natural resources purposes in accordance with Article 97 will be avoided to the greatest extent practicable. Based on a very preliminary consideration of possible shaft sites and tunnel alignments, there is at least one potential site that could be subject to Article 97 requirements. It is possible that the tunnel will pass beneath properties subject to Article 97 requirements. If sites are selected on land protected under Article 97, the Authority will follow appropriate procedures to acquire the land in accordance with Article 97 regulations.

- E. Is any part of the project site currently subject to a conservation restriction, preservation restriction, agricultural preservation restriction or watershed preservation restriction? **Yes** **No**; if yes, does the project involve the release or modification of such restriction? **Yes** **No**; if yes, describe:

Specific shaft site locations are unknown at the time and will be confirmed in the DEIR. Sites within land subject to a conservation restriction, preservation restriction, agricultural preservation restriction or watershed preservation restriction will be avoided to the greatest extent practicable.

- F. Does the project require approval of a new urban redevelopment project or a fundamental change in an existing urban redevelopment project under M.G.L.c.121A? **Yes** **No**; if yes, describe:

- G. Does the project require approval of a new urban renewal plan or a major modification of an existing urban renewal plan under M.G.L.c.121B? **Yes** **No**; if yes, describe:

III. Consistency

- A. Identify the current municipal comprehensive land use plan

The following land use plans identified include, but are not limited to:

Waltham

- Title: City of Waltham Massachusetts 2015-2022 Open Space & Recreation Plan, 2015
- Title: Waltham Community Development Plan, June 2007

Boston

- Title: Open Space and Recreation Plan, 2015-2021, January 2015
- Title: Imagine Boston 2030
- Title: 2019-2021 Capital Improvement Program Boston Water and Sewer Commission

Needham

- Title: Needham, Massachusetts Community Development Plan, June 19, 2004

Weston

- Title: 2017 Weston Open Space and Recreation Plan, May 2017
- Title: Master Plan Weston Massachusetts, 1965

Belmont

- Title: Town of Belmont Comprehensive Plan 2010-2020- A Vision of Belmont: Mapping a Sustainable Future, April 12, 2010

Brookline

- Title: Brookline Comprehensive Plan, January 13, 2005
- Title: Brookline Comprehensive Plan January 2018 Status Update, 2018

Dedham

- Title: Town of Dedham Master Plan, April 2009
- Title: Dedham 2030 Master Plan, Underway

Newton

- Title: Newton Comprehensive Plan, November 19, 2007 with updates added November 7, 2011
- Title: Newton's Open Space and Recreation Plan 2020-2027, September 1, 2020

Watertown

- Title: Watertown Comprehensive Plan, June 23, 2015
- Title: Town of Watertown Open Space and Recreation Plan, 2015

Wellesley

- Title: Town of Wellesley Comprehensive Plan Update 2007-2017, 2006

- B. Describe the project's consistency with that plan with regard to:
- 1) economic development
 - 2) adequacy of infrastructure
 - 3) open space impacts
 - 4) compatibility with adjacent land uses

Consistency with each municipal land use plan will be described once the specific shaft site locations are confirmed. These details will be disclosed in the DEIR.

- C. Identify the current Regional Policy Plan of the applicable Regional Planning Agency (RPA)
RPA: Metropolitan Area Planning Council (MAPC)
Title: MetroCommon 2050
Date: Underway

- D. Describe the project's consistency with that plan with regard to:
- 1) economic development
 - 2) adequacy of infrastructure
 - 3) open space impacts

Consistency with the Regional Policy Plan will be described once the specific shaft site locations are confirmed. These details will be disclosed in the DEIR.

RARE SPECIES SECTION

I. Thresholds / Permits

- A. Will the project meet or exceed any review thresholds related to **rare species or habitat** (see 301 CMR 11.03(2))? ___ Yes X **No**; if yes, specify, in quantitative terms:

Specific shaft site locations are unknown at the time and will be confirmed in the DEIR. The Program is not anticipated to meet or exceed any review thresholds related to rare species or habitat. The following thresholds related to rare species, however, will be confirmed as the Program progresses and specific shaft site locations are confirmed:

- 310 CMR 11.03(2)(b)1. - Alteration of designated significant habitat.
- 310 CMR 11.03(2)(b)2. - Greater than two acres of disturbance of designated priority habitat, as defined in 321 CMR 10.02, that results in a take of a state-listed endangered or threatened species or species of special concern.

(NOTE: If you are uncertain, it is recommended that you consult with the Natural Heritage and Endangered Species Program (NHESP) prior to submitting the ENF.)

- B. Does the project require any state permits related to **rare species or habitat**? ___ Yes X **No**.

Specific shaft site locations are unknown at the time and will be confirmed in the DEIR. Sites within rare species habitat will be avoided to the greatest extent practicable. If work cannot be avoided within rare species habitat for any reason, the appropriate Massachusetts Endangered Species Act Review Checklist will be filed.

- C. Does the project site fall within mapped rare species habitat (Priority or Estimated Habitat?) in the current Massachusetts Natural Heritage Atlas (attach relevant page)? ___ Yes X **No**.

Specific shaft site locations are unknown at the time and will be confirmed in the DEIR. Sites within Priority or Estimated Habitat will be avoided to the greatest extent practicable. Attachment B: Figure 2 illustrates Priority or Estimated Habitat locations within the Program Study Area.

- D. D. If you answered "No" to all questions A, B and C, proceed to the **Wetlands, Waterways, and Tidelands Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Rare Species section below.

II. Impacts and Permits

- A. Does the project site fall within Priority or Estimated Habitat in the current Massachusetts Natural Heritage Atlas (attach relevant page)? ___ Yes ___ No. If yes,

- 1) Have you consulted with the Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (NHESP)? ___ Yes ___ No; if yes, have you received a determination as to whether the project will result in the "take" of a rare species? ___ Yes ___ No; if yes, attach the letter of determination to this submission.

- 2) Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes ___ No; if yes, provide a summary of proposed measures to minimize and mitigate rare species impacts

- 3) Which rare species are known to occur within the Priority or Estimated Habitat?
 - 4) Has the site been surveyed for rare species in accordance with the Massachusetts Endangered Species Act? ___Yes ___No.
 - 5) If your project is within Estimated Habitat, have you filed a Notice of Intent or received an Order of Conditions for this project? ___Yes ___No; if yes, did you send a copy of the Notice of Intent to the Natural Heritage and Endangered Species Program, in accordance with the Wetlands Protection Act regulations? ___Yes ___No.
- B. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___Yes ___No; if yes, provide a summary of proposed measures to minimize and mitigate impacts to significant habitat:

WETLANDS, WATERWAYS, AND TIDELANDS SECTION

I. Thresholds / Permits

- A. Will the project meet or exceed any review thresholds related to **wetlands, waterways, and tidelands** (see 301 CMR 11.03(3))? ___ Yes X **No**; if yes, specify, in quantitative terms:

Specific shaft site locations are unknown at the time and will be confirmed in the DEIR. It is anticipated all direct impacts to wetlands, waterways, and tidelands will be avoided. For this reason, the Program is not anticipated to exceed any review thresholds related to wetlands, waterways, and tidelands.

- C. Does the project require any state permits (or a local Order of Conditions) related to **wetlands, waterways, or tidelands**? X **Yes** ___ No; if yes, specify which permit:

Specific shaft site locations are unknown at the time and will be confirmed in the DEIR. Sites within wetlands, waterways, or tidelands will be avoided to the greatest extent practicable. While it is likely that work can practicably be avoided within wetlands resource areas, a local Order of Conditions could be required for work within the 100' Wetland Buffer Zone or Riverfront and this work would be described in the DEIR.

- C. If you answered "No" to both questions A and B, proceed to the **Water Supply Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wetlands, Waterways, and Tidelands Section below.

II. Wetlands Impacts and Permits

- A. Does the project require a new or amended Order of Conditions under the Wetlands Protection Act (M.G.L. c.131A)? X **Yes** ___ No; if yes, has a Notice of Intent been filed? ___ Yes X **No**; if yes, list the date and MassDEP file number: _____; if yes, has a local Order of Conditions been issued? ___ Yes ___ No; Was the Order of Conditions appealed? ___ Yes ___ No. Will the project require a Variance from the Wetlands regulations? ___ Yes X **No**.

- B. Describe any proposed permanent or temporary impacts to wetland resource areas located on the project site:

Specific shaft site locations are unknown at the time and will be confirmed in the DEIR. Associated impacts to wetland resource areas and associated buffer zones will be evaluated at that time.

- C. Estimate the extent and type of impact that the project will have on wetland resources, and indicate whether the impacts are temporary or permanent:

Coastal Wetlands	Area (square feet) or Length (linear feet)	Temporary or Permanent Impact?
Land Under the Ocean	<u>0</u>	<u>N/A</u>
Designated Port Areas	<u>0</u>	<u>N/A</u>
Coastal Beaches	<u>0</u>	<u>N/A</u>
Coastal Dunes	<u>0</u>	<u>N/A</u>
Barrier Beaches	<u>0</u>	<u>N/A</u>
Coastal Banks	<u>0</u>	<u>N/A</u>
Rocky Intertidal Shores	<u>0</u>	<u>N/A</u>
Salt Marshes	<u>0</u>	<u>N/A</u>
Land Under Salt Ponds	<u>0</u>	<u>N/A</u>

Land Containing Shellfish	<u>0</u>	<u>N/A</u>
Fish Runs	<u>0</u>	<u>N/A</u>
Land Subject to Coastal Storm Flowage	<u>0</u>	<u>N/A</u>
Inland Wetlands		
Bank (lf)	<u>TBD</u>	<u>TBD</u>
Bordering Vegetated Wetlands	<u>TBD</u>	<u>TBD</u>
Isolated Vegetated Wetlands	<u>TBD</u>	<u>TBD</u>
Land under Water	<u>TBD</u>	<u>TBD</u>
Isolated Land Subject to Flooding	<u>TBD</u>	<u>TBD</u>
Bordering Land Subject to Flooding	<u>TBD</u>	<u>TBD</u>
Riverfront Area	<u>TBD</u>	<u>TBD</u>

D. Is any part of the project:

- 1) proposed as a **limited project**? ___ Yes X **No**; if yes, what is the area (in sf)? _____
- 2) the construction or alteration of a **dam**? ___ Yes X **No**; if yes, describe: _____
- 3) fill or structure in a **velocity zone** or **regulatory floodway**? ___ Yes X **No**.
- 4) dredging or disposal of dredged material? ___ Yes X **No**; if yes, describe the volume of dredged material and the proposed disposal site: _____
- 5) a discharge to an Outstanding Resource Water (ORW) or an Area of Critical Environmental Concern (ACEC)? ___ Yes X **No**.
- 6) subject to a wetlands restriction order? ___ Yes X **No**; if yes, identify the area (in sf): _____
- 7) located in buffer zones? X **Yes** ___ No; if yes, how much (in sf) TBD

E. Will the project:

- 1) be subject to a local wetlands ordinance or bylaw? X **Yes** ___ No.
- 2) alter any federally-protected wetlands not regulated under state law? ___ Yes X **No**. If yes, what is the area (sf)? _____

III. Waterways and Tidelands Impacts and Permits

A. Does the project site contain waterways or tidelands (including filled former tidelands) that are subject to the Waterways Act, M.G.L.c.91? ___ Yes X **No**; if yes, is there a current Chapter 91 License or Permit affecting the project site? ___ Yes ___ No; if yes, list the date and license or permit number and provide a copy of the historic map used to determine extent of filled tidelands: _____

C. Does the project require a new or modified license or permit under M.G.L.c.91? ___ Yes X **No**; if yes, how many acres of the project site subject to M.G.L.c.91 will be for non-water-dependent use? Current ___ Change ___ Total ___
If yes, how many square feet of solid fill or pile-supported structures (in sf)? _____

D. For non-water-dependent use projects, indicate the following:

Area of filled tidelands on the site: _____

Area of filled tidelands covered by buildings: _____

For portions of site on filled tidelands, list ground floor uses and area of each use: _____

Does the project include new non-water-dependent uses located over flowed tidelands?

___ Yes ___ No

Height of building on filled tidelands _____

Also show the following on a site plan: Mean High Water, Mean Low Water, Water-dependent Use Zone, location of uses within buildings on tidelands, and interior and exterior areas and facilities dedicated for public use, and historic high and historic low water marks.

E. Is the project located on landlocked tidelands? ___ Yes X **No**; if yes, describe the project's impact _____

on the public's right to access, use and enjoy jurisdictional tidelands and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:

- F. Is the project located in an area where low groundwater levels have been identified by a municipality or by a state or federal agency as a threat to building foundations? ___ Yes **No**; if yes, describe the project's impact on groundwater levels and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:
- G. Is the project non-water-dependent **and** located on landlocked tidelands **or** waterways or tidelands subject to the Waterways Act **and** subject to a mandatory EIR? ___ Yes **No**; (NOTE: If yes, then the project will be subject to Public Benefit Review and Determination.)
- H. Does the project include dredging? ___ Yes **No**; if yes, answer the following questions:
What type of dredging? Improvement ___ Maintenance ___ Both ___
What is the proposed dredge volume, in cubic yards (cys) _____
What is the proposed dredge footprint ___ length (ft) ___ width (ft) ___ depth (ft);
Will dredging impact the following resource areas?
Intertidal ___ Yes ___ No; if yes, ___ sq ft
Outstanding Resource Waters ___ Yes ___ No; if yes, ___ sq ft
Other resource area (i.e. shellfish beds, eel grass beds) ___ Yes ___ No; if yes ___ sq ft

If yes to any of the above, have you evaluated appropriate and practicable steps to: 1) avoidance; 2) if avoidance is not possible, minimization; 3) if either avoidance or minimize is not possible, mitigation?

If no to any of the above, what information or documentation was used to support this determination? Provide a comprehensive analysis of practicable alternatives for improvement dredging in accordance with 314 CMR 9.07(1)(b). Physical and chemical data of the sediment shall be included in the comprehensive analysis.

Sediment Characterization

- Existing gradation analysis results? ___ Yes ___ No; if yes, provide results.
Existing chemical results for parameters listed in 314 CMR 9.07(2)(b)6? ___ Yes ___ No; if yes, provide results.
Do you have sufficient information to evaluate feasibility of the following management options for dredged sediment? ___ Yes ___ No; If yes, check the appropriate option.

Beach Nourishment ___
Unconfined Ocean Disposal ___
Confined Disposal:
 Confined Aquatic Disposal (CAD) ___
 Confined Disposal Facility (CDF) ___
Landfill Reuse in accordance with COMM-97-001 ___
Shoreline Placement ___
Upland Material Reuse ___
In-State landfill disposal ___
Out-of-state landfill disposal ___
(NOTE: This information is required for a 401 Water Quality Certification.)

IV. Consistency:

- A. Does the project have effects on the coastal resources or uses, and/or is the project located within the Coastal Zone? ___ Yes **No**; if yes, describe these effects and the projects consistency with the policies of the Office of Coastal Zone Management:
- B. Is the project located within an area subject to a Municipal Harbor Plan? ___ Yes **No**; if yes, identify the Municipal Harbor Plan and describe the project's consistency with that plan:

WATER SUPPLY SECTION

I. Thresholds / Permits

- A. Will the project meet or exceed any review thresholds related to **water supply** (see 301 CMR 11.03(4))? X **Yes** ___ No; if yes, specify, in quantitative terms:

The Program will meet or exceed the following thresholds related to water supply:

- 310 CMR 11.03(4)(a)3. – Construction of one or more new water mains ten or more miles in length

- B. Does the project require any state permits related to **water supply**? X **Yes** ___ No; if yes, specify which permit:

The Program may require the following State Agency Permits, which will be further evaluated as the design progresses:

- BRP WS 32 – Distribution System Modification
- WM 03: Water Management Withdrawal Permit

- C. If you answered "No" to both questions A and B, proceed to the **Wastewater Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Water Supply Section below.

II. Impacts and Permits

- A. Describe, in gallons per day (gpd), the volume and source of water use for existing and proposed activities at the project site:

	Existing	Change	Total
Municipal or regional water supply	<u>0</u>	<u>0</u>	<u>0</u>
Withdrawal from groundwater	<u>0</u>	<u>0</u>	<u>0</u>
Withdrawal from surface water	<u>0</u>	<u>0</u>	<u>0</u>
Interbasin transfer	<u>0</u>	<u>0</u>	<u>0</u>

(NOTE: Interbasin Transfer approval will be required if the basin and community where the proposed water supply source is located is different from the basin and community where the wastewater from the source will be discharged.)

- B. If the source is a municipal or regional supply, has the municipality or region indicated that there is adequate capacity in the system to accommodate the project? X **Yes** ___ No
- C. If the project involves a new or expanded withdrawal from a groundwater or surface water source, has a pumping test been conducted? ___ Yes X **No**; if yes, attach a map of the drilling sites and a summary of the alternatives considered and the results. _____

The Program will add redundancy to the Metropolitan Tunnel System. The Program does not involve a new or expanded withdrawal from a groundwater or surface water source other than groundwater infiltration into the tunnel during construction, which is a temporary condition.

- D. What is the currently permitted withdrawal at the proposed water supply source (in gallons per day)? Will the project require an increase in that withdrawal? ___ Yes X **No**; if yes, then how much of an increase (gpd)? _____

- E. Does the project site currently contain a water supply well, a drinking water treatment facility, water main, or other water supply facility, or will the project involve construction of a new facility? Yes **No**. If yes, describe existing and proposed water supply facilities at the project site:

	Permitted Flow	Existing Avg Daily Flow	Project Flow	Total
Capacity of water supply well(s) (gpd)	_____	_____	_____	_____
Capacity of water treatment plant (gpd)	_____	_____	_____	_____

- F. If the project involves a new interbasin transfer of water, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or proposed?

The Program will add redundancy to the Metropolitan Tunnel System. The Program does not involve a new interbasin transfer of water.

- G. Does the project involve:

- 1) new water service by the Massachusetts Water Resources Authority or other agency of the Commonwealth to a municipality or water district? Yes **No**
- 2) a Watershed Protection Act variance? Yes **No**; if yes, how many acres of alteration?
- 3) a non-bridged stream crossing 1,000 or less feet upstream of a public surface drinking water supply for purpose of forest harvesting activities? Yes **No**

III. Consistency

Describe the project's consistency with water conservation plans or other plans to enhance water resources, quality, facilities and services:

The Authority issued a Water System Master Plan in December 2018. The Master Plan identifies shortfalls in redundancy within the Metropolitan Tunnels system. It details the need for water supply redundancy to provide for system reliability, operational flexibility, and enhanced security.

In preparing the 2018 Master Plan, the Authority staff undertook a major review of potential alternatives that would achieve the redundancy goals. Page 7 of the Master Plan Executive Summary reads,

"Failure of the existing deep rock tunnels is not the major concern; potential failure of surface connections, valves and piping which could require isolation of the tunnel system is of prime concern. However, without redundant facilities, the tunnels cannot be taken off line for inspection, maintenance and needed repairs.

In 2017, staff presented a conceptual plan to construct both North and South tunnels to the Board of Directors for their consideration and was given authorization to move forward. A Tunnel Redundancy Department has been formed, initial work is underway and a future contract for preliminary design and MEPA review is expected to be procured in FY20."

This ENF describes the redundancy Program originally outlined in the 2018 Master Plan. By constructing the necessary redundant facilities, this Program enables the repair or rehabilitation of the existing Metropolitan Tunnel system.

WASTEWATER SECTION

I. Thresholds / Permits

- A. Will the project meet or exceed any review thresholds related to **wastewater** (see 301 CMR 11.03(5))? ___ Yes X **No**; if yes, specify, in quantitative terms:
- B. Does the project require any state permits related to **wastewater**? X **Yes** ___ No; if yes, specify which permit:

The Program may require the following State Agency Permits for the construction activities, which will be further evaluated as the design progresses:

- Surface Water Discharge Permitting
- Ground Water Discharge Permitting

- C. If you answered "No" to both questions A and B, proceed to the **Transportation -- Traffic Generation Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wastewater Section below.

II. Impacts and Permits

- A. Describe the volume (in gallons per day) and type of disposal of wastewater generation for existing and proposed activities at the project site (calculate according to 310 CMR 15.00 for septic systems or 314 CMR 7.00 for sewer systems):

	Existing	Change	Total
Discharge of sanitary wastewater	0	0	0
Discharge of industrial wastewater	0	0	0
TOTAL	0	0	0

	Existing	Change	Total
Discharge to groundwater	0	0	0
Discharge to outstanding resource water	0	0	0
Discharge to surface water	0	0	0
Discharge to municipal or regional wastewater facility	0	0	0
TOTAL	0	0	0

- B. Is the existing collection system at or near its capacity? ___ Yes X **No**; if yes, then describe the measures to be undertaken to accommodate the project's wastewater flows:
- C. Is the existing wastewater disposal facility at or near its permitted capacity? ___ Yes X **No**; if yes, then describe the measures to be undertaken to accommodate the project's wastewater flows:
- D. Does the project site currently contain a wastewater treatment facility, sewer main, or other wastewater disposal facility, or will the project involve construction of a new facility? ___ Yes X **No**; if yes, describe as follows:

	Permitted	Existing Avg Daily Flow	Project Flow	Total
Wastewater treatment plant capacity (in gallons per day)				

- E. If the project requires an interbasin transfer of wastewater, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or new?

The Program does not require an interbasin transfer of wastewater.

(NOTE: Interbasin Transfer approval may be needed if the basin and community where wastewater will be discharged is different from the basin and community where the source of water supply is located.)

- F. Does the project involve new sewer service by the Massachusetts Water Resources Authority (MWRA) or other Agency of the Commonwealth to a municipality or sewer district? ___Yes XNo
- G. G. Is there an existing facility, or is a new facility proposed at the project site for the storage, treatment, processing, combustion or disposal of sewage sludge, sludge ash, grit, screenings, wastewater reuse (gray water) or other sewage residual materials? ___Yes XNo; if yes, what is the capacity (tons per day):

	Existing	Change	Total
Storage			
Treatment			
Processing			
Combustion			
Disposal			

- H. Describe the water conservation measures to be undertaken by the project, and other wastewater mitigation, such as infiltration and inflow removal.

Temporary construction water quality impacts may be associated with the construction of shaft sites and surface connections, management of material removed from the tunnel and treatment of groundwater inflow. Tunnels will be bored/mined in rock several hundred feet below the surface. Groundwater will likely be encountered during construction. Leakage of water into the bored tunnel will be grouted from inside the tunnel, or other appropriate measures will be implemented, to reduce infiltration.

III. Consistency

- A. Describe measures that the proponent will take to comply with applicable state, regional, and local plans and policies related to wastewater management:

Specific shaft site locations are unknown at the time and will be confirmed in the DEIR. Applicable state, regional, and local plans and policies related to wastewater management will be determined after shaft sites have been selected.

The Proponent will comply with all applicable state, regional, and local plans and policies related to wastewater management.

- B. If the project requires a sewer extension permit, is that extension included in a comprehensive wastewater management plan? ___Yes ___No; if yes, indicate the EEA number for the plan and whether the project site is within a sewer service area recommended or approved in that plan:

The Program does not require a sewer extension permit.

TRANSPORTATION SECTION (TRAFFIC GENERATION)

I. Thresholds / Permit

- A. Will the project meet or exceed any review thresholds related to **traffic generation** (see 301 CMR 11.03(6))? ___ Yes X **No**; if yes, specify, in quantitative terms:
- B. Does the project require any state permits related to **state-controlled roadways**? X **Yes** ___ **No**; if yes, specify which permit:

The Program may require a MassDOT Highway Access permit during construction.

- C. C. If you answered "No" to both questions A and B, proceed to the **Roadways and Other Transportation Facilities Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Traffic Generation Section below.

II. Traffic Impacts and Permits

- A. Describe existing and proposed vehicular traffic generated by activities at the project site:

	Existing	Change	Total
Number of parking spaces	To be determined in DEIR (Site specific)	40	To be determined in DEIR (Site specific)
Number of vehicle trips per day	To be determined in DEIR (Site specific)	0-8	To be determined in DEIR (Site specific)
ITE Land Use Code(s):	To be determined in DEIR (Site specific)	TBD	To be determined in DEIR (Site specific)

- B. What is the estimated average daily traffic on roadways serving the site?

Roadway	Existing	Change	Total
1.	TBD	TBD	TBD
2.	TBD	TBD	TBD
3.	TBD	TBD	TBD

The specific roadways serving the site and their average daily traffic will be determined during the shaft site selection process and disclosed in the DEIR. Temporary construction traffic will be associated with the construction of the shaft sites and surface connections, management of material removed from the tunnel, and will be disclosed in the DEIR.

- C. If applicable, describe proposed mitigation measures on state-controlled roadways that the project proponent will implement:

Mitigation measures on state-controlled roadways will be appropriately determined once specific shaft sites are determined. Mitigation measures will be disclosed in the DEIR.

- D. How will the project implement and/or promote the use of transit, pedestrian and bicycle facilities and services to provide access to and from the project site?

The promotion of transit, pedestrian, and bicycle facilities will not be included as part of this Program, as access to the site locations will be for routine maintenance purposes.

- E. Is there a Transportation Management Association (TMA) that provides transportation demand

management (TDM) services in the area of the project site? ____ Yes X **No**; if yes, describe if and how will the project will participate in the TMA:

F. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation facilities? ____ Yes X **No**; if yes, generally describe:

G. If the project will penetrate approach airspace of a nearby airport, has the proponent filed a Massachusetts Aeronautics Commission Airspace Review Form (780 CMR 111.7) and a Notice of Proposed Construction or Alteration with the Federal Aviation Administration (FAA) (CFR Title 14 Part 77.13, forms 7460-1 and 7460-2)?

Not applicable.

III. Consistency

Describe measures that the proponent will take to comply with municipal, regional, state, and federal plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services:

Measures to comply with municipal, regional, state, and federal plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services will be determined once specific shaft site locations are confirmed. These measures will be disclosed in the DEIR.

TRANSPORTATION SECTION (ROADWAYS AND OTHER TRANSPORTATION FACILITIES)

I. Thresholds

- A. Will the project meet or exceed any review thresholds related to **roadways or other transportation facilities** (see 301 CMR 11.03(6))? ___ Yes X **No**; if yes, specify, in quantitative terms:
- B. Does the project require any state permits related to **roadways or other transportation facilities**? X **Yes** ___ No; if yes, specify which permit:

The Program may require a MassDOT Highway Access permit during construction.

- C. If you answered "No" to both questions A and B, proceed to the **Energy Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Roadways Section below.

II. Transportation Facility Impacts

- A. Describe existing and proposed transportation facilities in the immediate vicinity of the project site:

Transportation facilities will be described once the shaft sites have been selected and will be disclosed in the DEIR.

- B. Will the project involve any
- 1) Alteration of bank or terrain (in linear feet)?
To be determined during shaft site selection disclosed in the DEIR
 - 2) Cutting of living public shade trees (number)?
To be determined during shaft site selection disclosed in the DEIR
 - 3) Elimination of stone wall (in linear feet)?
To be determined during shaft site selection disclosed in the DEIR

III. Consistency

Describe the project's consistency with other federal, state, regional, and local plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services, including consistency with the applicable regional transportation plan and the Transportation Improvements Plan (TIP), the State Bicycle Plan, and the State Pedestrian Plan:

Consistency with the federal, state, regional, and local plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities will be described once the specific shaft site locations are confirmed. These details will be disclosed in the DEIR.

ENERGY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **energy** (see 301 CMR 11.03(7))?
___ Yes X **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **energy**? ___ Yes X **No**; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Air Quality Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Energy Section below.

II. Impacts and Permits

A. Describe existing and proposed energy generation and transmission facilities at the project site:

	Existing	Change	Total
Capacity of electric generating facility (megawatts)	_____	_____	_____
Length of fuel line (in miles)	_____	_____	_____
Length of transmission lines (in miles)	_____	_____	_____
Capacity of transmission lines (in kilovolts)	_____	_____	_____

B. If the project involves construction or expansion of an electric generating facility, what are:

- A. the facility's current and proposed fuel source(s)?
- B. the facility's current and proposed cooling source(s)?

C. If the project involves construction of an electrical transmission line, will it be located on a new, unused, or abandoned right of way? ___ Yes ___ No; if yes, please describe:

D. Describe the project's other impacts on energy facilities and services:

III. Consistency

Describe the project's consistency with state, municipal, regional, and federal plans and policies for enhancing energy facilities and services:

AIR QUALITY SECTION

I. Thresholds

- A. Will the project meet or exceed any review thresholds related to **air quality** (see 301 CMR 11.03(8))? ___Yes X **No**; if yes, specify, in quantitative terms:

- B. Does the project require any state permits related to **air quality**? ___Yes X **No**; if yes, specify which permit:

- C. If you answered "No" to both questions A and B, proceed to the **Solid and Hazardous Waste Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Air Quality Section below.

II. Impacts and Permits

- A. Does the project involve construction or modification of a major stationary source (see 310 CMR 7.00, Appendix A)? ___Yes ___No; if yes, describe existing and proposed emissions (in tons per day) of:

	Existing	Change	Total
Particulate matter	_____	_____	_____
Carbon monoxide	_____	_____	_____
Sulfur dioxide	_____	_____	_____
Volatile organic compounds	_____	_____	_____
Oxides of nitrogen	_____	_____	_____
Lead	_____	_____	_____
Any hazardous air pollutant	_____	_____	_____
Carbon dioxide	_____	_____	_____

- B. Describe the project's other impacts on air resources and air quality, including noise impacts:

III. Consistency

- A. Describe the project's consistency with the State Implementation Plan:

- B. Describe measures that the proponent will take to comply with other federal, state, regional, and local plans and policies related to air resources and air quality:

SOLID AND HAZARDOUS WASTE SECTION

I. Thresholds / Permits

- A. Will the project meet or exceed any review thresholds related to **solid or hazardous waste** (see 301 CMR 11.03(9))? ___ Yes X **No**; if yes, specify, in quantitative terms:

- B. Does the project require any state permits related to **solid and hazardous waste**? ___ Yes X **No**; if yes, specify which permit:

- C. If you answered "No" to both questions A and B, proceed to the **Historical and Archaeological Resources Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Solid and Hazardous Waste Section below.

II. Impacts and Permits

- A. Is there any current or proposed facility at the project site for the storage, treatment, processing, combustion or disposal of solid waste? ___ Yes ___ No; if yes, what is the volume (in tons per day) of the capacity:

	Existing	Change	Total
Storage	_____	_____	_____
Treatment, processing	_____	_____	_____
Combustion	_____	_____	_____
Disposal	_____	_____	_____

- B. Is there any current or proposed facility at the project site for the storage, recycling, treatment or disposal of hazardous waste? ___ Yes ___ No; if yes, what is the volume (in tons or gallons per day) of the capacity:

	Existing	Change	Total
Storage	_____	_____	_____
Recycling	_____	_____	_____
Treatment	_____	_____	_____
Disposal	_____	_____	_____

- C. If the project will generate solid waste (for example, during demolition or construction), describe alternatives considered for re-use, recycling, and disposal:

- D. If the project involves demolition, do any buildings to be demolished contain asbestos?
___ Yes ___ No

- E. Describe the project's other solid and hazardous waste impacts (including indirect impacts):

III. Consistency

Describe measures that the proponent will take to comply with the State Solid Waste Master Plan:

HISTORICAL AND ARCHAEOLOGICAL RESOURCES SECTION

I. Thresholds / Impacts

- A. Have you consulted with the Massachusetts Historical Commission? ___Yes X **No**; if yes, attach correspondence. For project sites involving lands under water, have you consulted with the Massachusetts Board of Underwater Archaeological Resources? ___Yes X **No**; if yes, attach correspondence
- B. Is any part of the project site a historic structure, or a structure within a historic district, in either case listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? X **Yes** ___No; if yes, does the project involve the demolition of all or any exterior part of such historic structure? ___Yes X **No**; if yes, please describe:

This will be determined upon shaft site selection. Preliminary investigations show that one or more sites could potentially include historic resources. The intent of the shaft site selection process will be to avoid historical and archaeological resource areas to the greatest extent practicable.

- C. Is any part of the project site an archaeological site listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? ___Yes X **No**; if yes, does the project involve the destruction of all or any part of such archaeological site? ___Yes X **No**; if yes, please describe:

This will be determined upon shaft site selection. The location of proposed work, most notably ground disturbance associated with shaft excavation, will be sited to avoid impacts to above-ground historic properties and archaeological sites to the maximum extent practicable.

- D. If you answered "No" to all parts of both questions A, B and C, proceed to the **Attachments and Certifications** Sections. If you answered "Yes" to any part of either question A or question B, fill out the remainder of the Historical and Archaeological Resources Section below.

II. Impacts

Describe and assess the project's impacts, direct and indirect, on listed or inventoried historical and archaeological resources:

This will be determined upon shaft site selection. Preliminary investigations show that one or more sites could potentially include historic resources. The intent of the shaft site selection process will be to avoid historical and archaeological resource areas to the greatest extent practicable.

III. Consistency

Describe measures that the proponent will take to comply with federal, state, regional, and local plans and policies related to preserving historical and archaeological resources:

The Massachusetts Historical Commission (MHC) will receive a copy of this ENF, which will also initiate review of the Program under State Register Review (M.G. L. Chapter 9, Sections 27-27c, as amended by Chapter 254 of the Acts of 1988). If it is determined that the Program will result in an adverse effect to historic properties, consultation with the MHC will continue to identify ways to avoid, minimize, or mitigate these adverse effects.



CERTIFICATIONS:

1. The Public Notice of Environmental Review has been/will be published in the following newspapers in accordance with 301 CMR 11.15(1):

Newspaper	Date
Boston Globe	March 25, 2021
Boston Herald	March 25, 2021
Belmont Citizen-Herald	March 25, 2021
Brookline Tab	March 25, 2021
Dedham Transcript Bulletin	March 28, 2021
El Mundo	March 25, 2021
Needham Times	March 25, 2021
Newton Tab	March 24, 2021
Waltham News Tribune	March 25, 2021
Watertown Tab	March 26, 2021
Wellesley Townsman	March 25, 2021
Weston Town-Crier	March 25, 2021

2. This form has been circulated to Agencies and Persons in accordance with 301 CMR 11.16(2).

Signatures:

	
_____ Date Signature of Responsible Officer or Proponent	_____ Date Signature of person preparing ENF (if different from above)
<u>Kathleen Murtagh</u> Name	<u>Lars Carlson</u> Name
<u>MWRA</u> Firm/Agency	<u>VHB</u> Firm/Agency
<u>100 First Avenue</u> Street	<u>101 Walnut Street</u> Street
<u>Boston, MA 02129</u> Municipality/State/Zip	<u>Watertown, MA 02472</u> Municipality/State/Zip
<u>617-570-5410</u> Phone	<u>617-607- 6237</u> Phone

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Attachment A: Distribution List

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Massachusetts Water Resources Authority



Metropolitan Water Tunnel Program

ENF Distribution List

March 2021

**PRELIMINARY DESIGN,
GEOTECHNICAL INVESTIGATION AND
ENVIRONMENTAL IMPACT REPORT**

MWRA Contract 7159

Revision 0

Prepared by
VHB in association with
CDM Smith and Jacobs

Revision Log

Revision Number	Version	Description	Date
R0	Final	Submitted to MEPA as part of the ENF	03/31/2021

1.0 Distribution List

The Metropolitan Water Tunnel Program Environmental Notification Form (ENF) has been distributed to federal, state, and municipalities listed in Table 1.1. In light of the COVID-19 response, the MEPA office is accepting and allowing electronic filings for state agency and public distribution, as required. Notices of Availability have been mailed to all parties indicating the filing location on MWRA’s website. Printed copies of the ENF have been mailed to the libraries and MEPA Office and may be requested by contacting Gabrielle Marrese, Project Engineer at Gabrielle.Marrese@mwra.com or 617-570-5469.

Table 1.1: Distribution List

Libraries		
Boston Public Library- Main Branch 700 Boylston Street Boston, MA 02116	Needham Public Library 1139 Highland Ave Needham Heights, MA 02494	Weston Public Library 87 School Street Weston, MA 02493
Belmont Public Library 336 Concord Ave Belmont, MA 02478	The Public Library of Brookline- Brookline Village 361 Washington Street Brookline, MA 02445	Dedham Public Library 43 Church Street Dedham, MA 02026
Newton Free Library 330 Homer Street Newton, MA 02459	Watertown Free Public Library 123 Main Street Watertown, MA 02472	Wellesley Free Library 530 Washington Street Wellesley, MA 02482
Waltham Public Library 735 Main Street Waltham, MA 02451		
Federal Government		
Environmental Protection Agency Jane Downing, Chief Drinking Water Branch 5 Post Office Square - Suite 100 Boston, MA 02109-3912	United States Army Corps of Engineers Attn: Colonel John A. Atilano II, Commander and District Engineer New England District 696 Virginia Road Concord, MA 01742	United States Fish and Wildlife Service David Simmons, Supervisor New England Field Office 70 Commercial St., Suite 300 Concord, NH 03301
State Agencies		
MEPA Office Attn: Page Czepiga 100 Cambridge Street, Suite 900 Boston, MA 02144	Department of Environmental Protection, Boston Office Commissioner’s Office One Winter Street Boston, MA 02108	Department of Environmental Protection, Northeast Regional Office Attn: MPEA Coordinator 205B Lowell Street Wilmington, MA 01887

Massachusetts Department of Transportation Public/Private Development Unit 10 Park Plaza, Suite #4150 Boston, MA 02116	Massachusetts Department of Transportation, District 6 Office Attn: MEPA Coordinator 185 Kneeland Street Boston, MA 02111	Massachusetts Department of Transportation, District 4 Office Attn: MEPA Coordinator 519 Appleton Street Arlington, MA 02476
Massachusetts Historical Commission The MA Archives Building 220 Morrissey Boulevard Boston, MA 02125	Massachusetts Department of Conservation and Recreation Attn: MEPA Coordinator 251 Causeway Street, Suite 600 Boston, MA 02114	Natural Heritage and Endangered Species Program Attn: Lauren Glorioso, Endangered Species Review Biologist 1 Rabbit Hill Road Westboro, MA 01581
Massachusetts Bay Transportation Authority Attn: MEPA Coordinator 10 Park Plaza, 6 th Floor Boston, MA 02116-3966	Massachusetts Office of Coastal Zone Management 251 Causeway Street #800 Boston, MA 02114	Massachusetts Department of Public Health 250 Washington Street Boston, MA 02108
Study Area Community Leaders		
Waltham	Boston	Needham
The Honorable Jeannette McCarthy City Hall Second Floor 610 Main Street Waltham, MA 02452	The Honorable Kim Janey, Mayor 1 City Hall Square, Suite 500 Boston, MA 02201	Kate Fitzpatrick, Town Manager 1471 Highland Avenue Needham, MA 02492
Weston	Belmont	Brookline
Leon A. Gaumond, Jr., Town Manager P.O. Box 378 Weston, MA 02493	Patrice Garvin, Town Administrator Town Hall 455 Concord Avenue, 1 st Floor Belmont, MA 02478	Melvin Kleckner, Town Administrator 333 Washington Street Brookline, MA 02445
Dedham	Newton	Watertown
Leon Goodwin, Town Manager 450 Washington Street Dedham, MA 02026	The Honorable Ruthanne Fuller, Mayor 1000 Commonwealth Avenue Newton Centre, MA 02459	Michael J. Driscoll, Town Manager Town Hall 149 Main Street Watertown, MA 02472
Wellesley		
Meghan Jop, Executive Director of General Gov't Services Selectmen's Office 525 Washington Street, 3 rd Floor Wellesley, MA 02482		

Municipalities		
Conservation Commissions		
Waltham Conservation Commission Attn: Chair 610 Main Street Waltham, MA 02452	Boston Conservation Commission Attn: Executive Director 1 City Hall Square, Room 709 Boston, MA 02201	Needham Conservation Commission Attn: Chair Needham Town Hall 1471 Highland Avenue Needham, MA 02492
Weston Conservation Commission Attn: Chair Weston Town Hall P.O. Box 378 Weston, MA 02493	Belmont Conservation Commission Attn: Chair Town Hall 455 Concord Avenue Belmont, MA 02478	Brookline Conservation Commission Attn: Chair 333 Washington Street Brookline, MA 02445
Dedham Conservation Commission Attn: Chair Dedham Town Hall 450 Washington Street Dedham, MA 02026	Newton Conservation Commission Planning and Development Department Attn: Chair 1000 Commonwealth Ave Newton, MA 02459	Watertown Conservation Commission Attn: Chair Conservation Office, Third Floor 149 Main Street Watertown, MA 02472
Wellesley Wetlands Protection Committee Attn: Chair 525 Washington Street, Lower Level Wellesley, MA 02482		
Departments of Public Works		
Waltham Department of Consolidated Public Works 610 Main Street Waltham, MA 02452	Boston Department of Public Works 1 City Hall Square, Room 714 Boston, MA 02201	Needham Department of Public Works Public Service Administration Building 500 Dedham Avenue Needham, MA 02492
Weston Public Works 190 Boston Post Road By-pass Weston, MA 02493	Belmont Department of Public Works Town Hall 455 Concord Avenue Belmont, MA 02478	Brookline Department of Public Works 333 Washington Street, 4th Floor Brookline, MA 02445
Dedham Department of Public Works 55 River Street Dedham, MA 02026	Newton Department of Public Works City Hall 1000 Commonwealth Avenue Newton Centre, MA 02459	Watertown Department of Public Works 124 Orchard Street Watertown, MA 02472
Wellesley Department of Public Works 20 Municipal Way Wellesley, MA 02481		

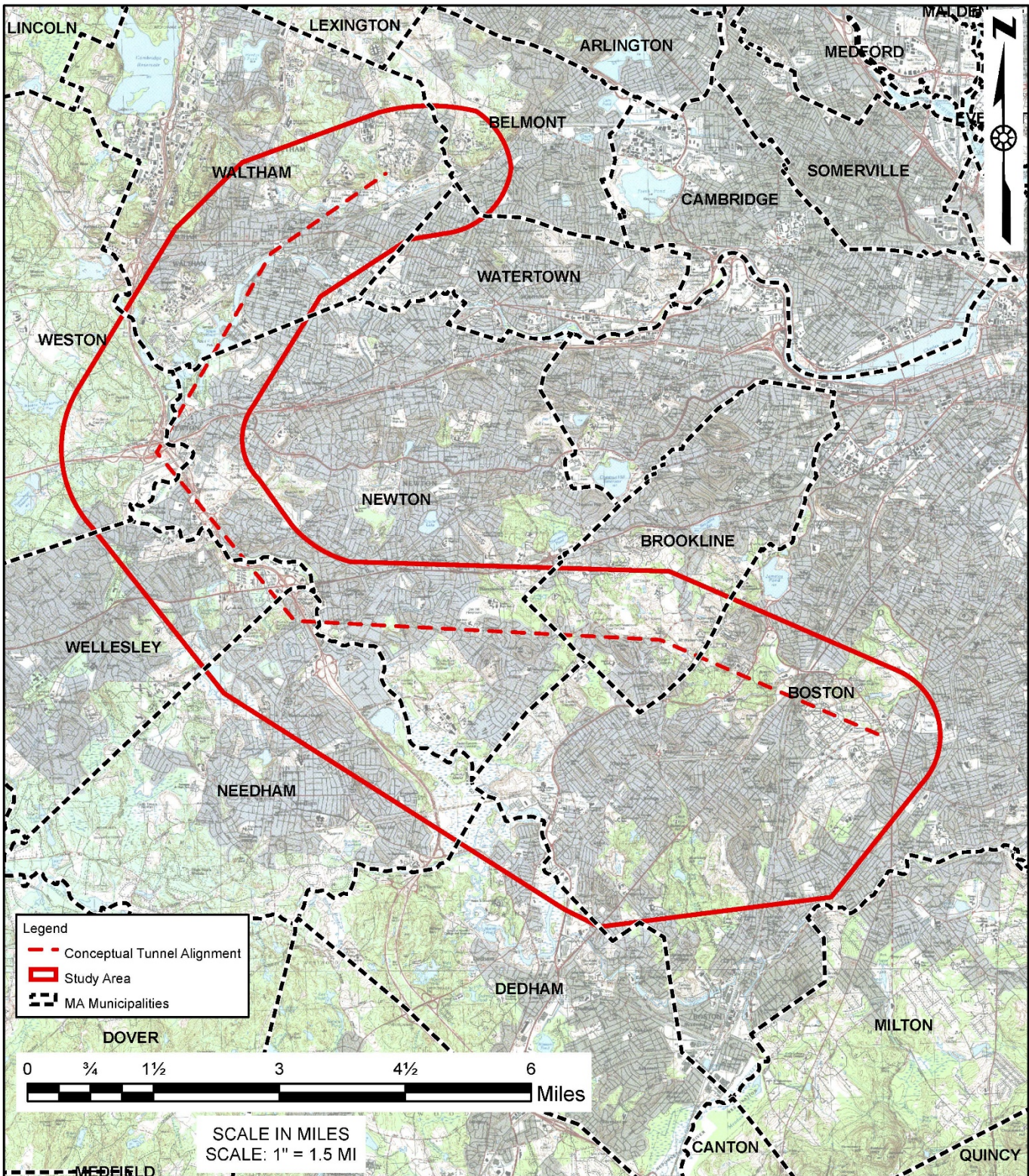
Planning Offices		
Waltham Planning Department Government Center 119 School Street Top Floor Waltham, MA 02451	Boston Planning & Development Agency One City Hall, Ninth Floor Boston, MA 02201	Needham Planning Department 500 Dedham Avenue Public Services Administration Building Suite 118 Needham, MA 02492
Weston Town Planner P.O. Box 378 Weston, MA 02493	Belmont Office of Community Development Homer Municipal Building 19 Moore Street, 2nd Floor Belmont, MA 02478	Brookline Planning and Community Development Department 333 Washington Street 3rd Floor Brookline, MA 02445
Dedham Planning and Zoning Department 450 Washington Street Dedham, MA 02026	Newton Department of Planning and Development 1000 Commonwealth Avenue Newton Centre, MA 02459	Watertown Department of Community Development and Planning 149 Main Street Watertown, MA 02472
Wellesley Planning Department 525 Washington Street Lower Level Wellesley, MA 02482		
Boards of Health		
Waltham Board of Health 610 Main Street Waltham, MA 02452	Boston Public Health Commission 1010 Massachusetts Avenue 2 nd Floor Boston, MA 02118	Needham Board of Health Town Hall 1471 Highland Avenue Needham, MA 02492
Weston Board of Health P.O. Box 378 Weston, MA 02493	Belmont Health Department Homer Building 19 Moore Street, 2nd Floor P.O. Box 56 Belmont, MA 02478	Brookline Health Department 11 Pierce Street Brookline, MA 02445
Dedham Health Department 450 Washington Street Dedham, MA 02026	Newton Health and Human Services Department City Hall Room 107 1000 Commonwealth Avenue Newton, MA 02459	Watertown Health Department 149 Main Street Watertown, MA 02472
Wellesley Health Department 90 Washington Street 2nd Floor Wellesley, MA 02481		


Community Groups and Interested Parties		
MWRA Advisory Board Joseph Favaloro, Executive Director 100 First Avenue, 4 th Floor Boston, MA 02129	Charles River Watershed Association Emily Norton, Executive Director 190 Park Road Weston, MA 02493	Mystic River Watershed Association Patrick Herron, Executive Director P. O. Box 390 Arlington, MA 02476
Massachusetts Rivers Alliance Julia Blatt, Executive Director 2343 Massachusetts Avenue Cambridge, MA 02140	Neponset River Watershed Association Ian Cooke, Executive Director 2173 Washington Street Canton, MA 02021	Alternatives for Community and Environment Dwaign Tyndal, Executive Director 2201 Washington Street, #302 Roxbury, MA 02119
Conservation Law Foundation Bradley Campbell, President 62 Summer St Boston, MA 02110	Metropolitan Area Planning Council 60 Temple Place Boston, MA 02111	Boston Region Metropolitan Planning Organization 10 Park Plaza, Suite 2150 Boston, MA 02116
Three Rivers Interlocal Council Attn: Josh Eichen 60 Temple Place Boston, MA 02111	MetroWest Regional Collaborative Attn: Leah Robins 60 Temple Place Boston, MA 02111	Inner Core Committee Attn: Karina Milchman 60 Temple Place Boston, MA 02111
Water Supply Citizens Advisory Committee to the MWRA (WSCAC) Lexi Dewey, Executive Director 485 Ware Road Belchertown, MA 01007		

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Attachment B: Figures

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**Metropolitan Water
Tunnel Program**

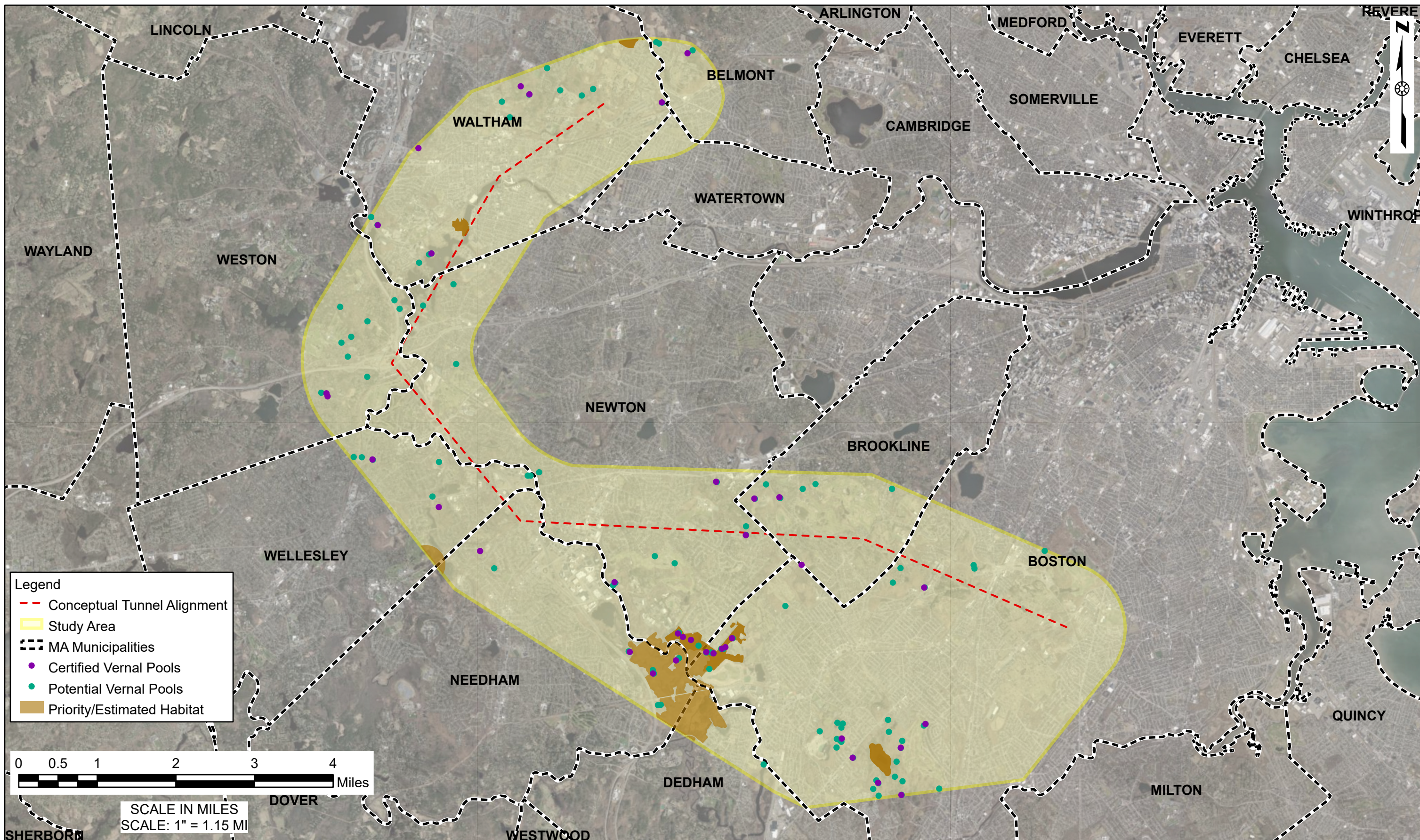
**MWRA Contract No. 7159
Preliminary Design, Geotech.
and Environmental
March 2021**



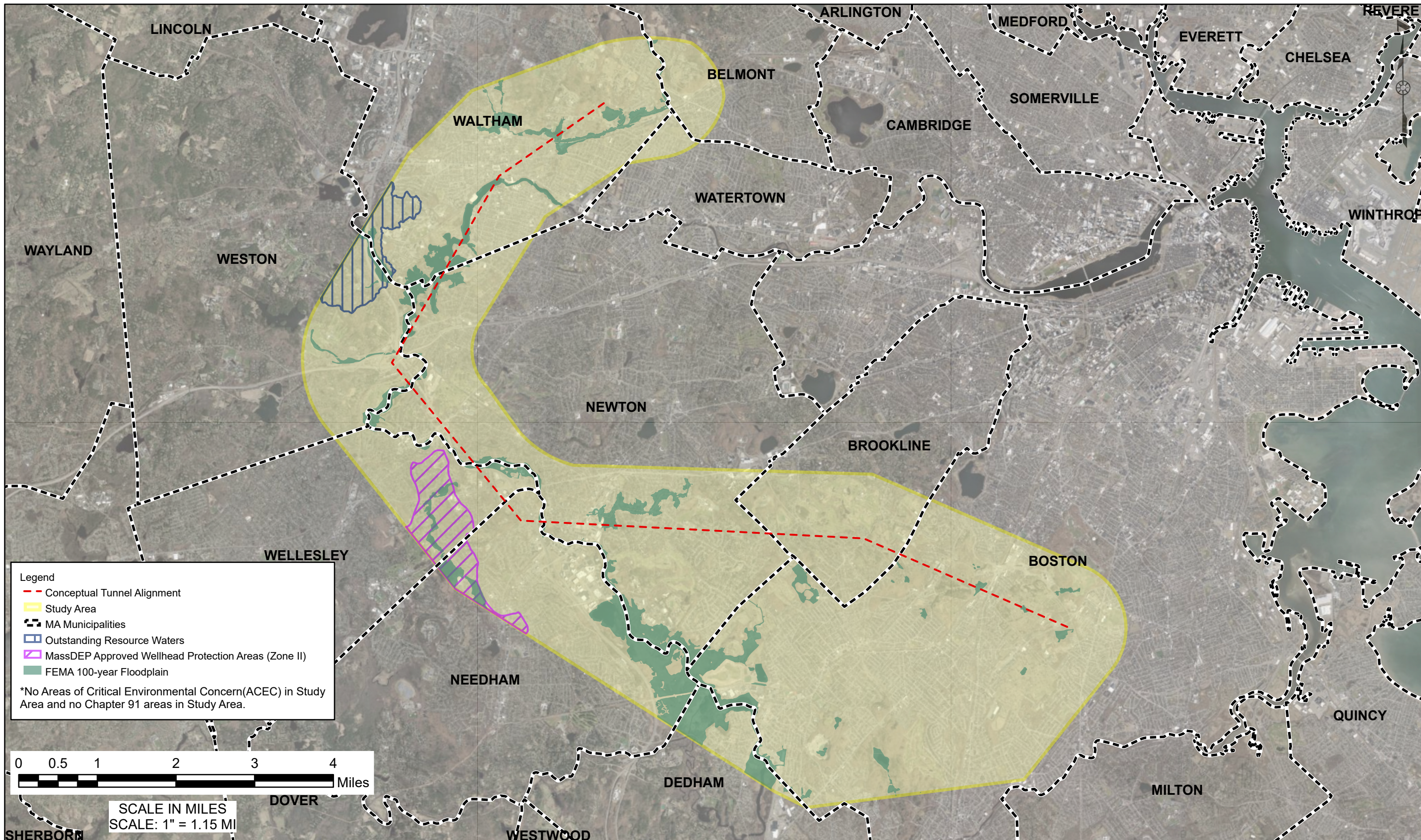
**Program Study Area
Figure 1**

 Source: USGS, MWRA

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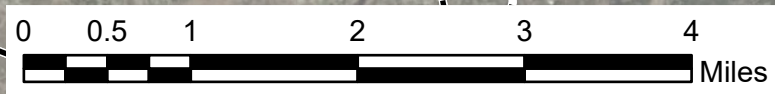
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Legend

- Conceptual Tunnel Alignment
- Study Area
- MA Municipalities
- Outstanding Resource Waters
- MassDEP Approved Wellhead Protection Areas (Zone II)
- FEMA 100-year Floodplain

*No Areas of Critical Environmental Concern (ACEC) in Study Area and no Chapter 91 areas in Study Area.



SCALE IN MILES
SCALE: 1" = 1.15 MI



**Metropolitan Water
Tunnel Program**

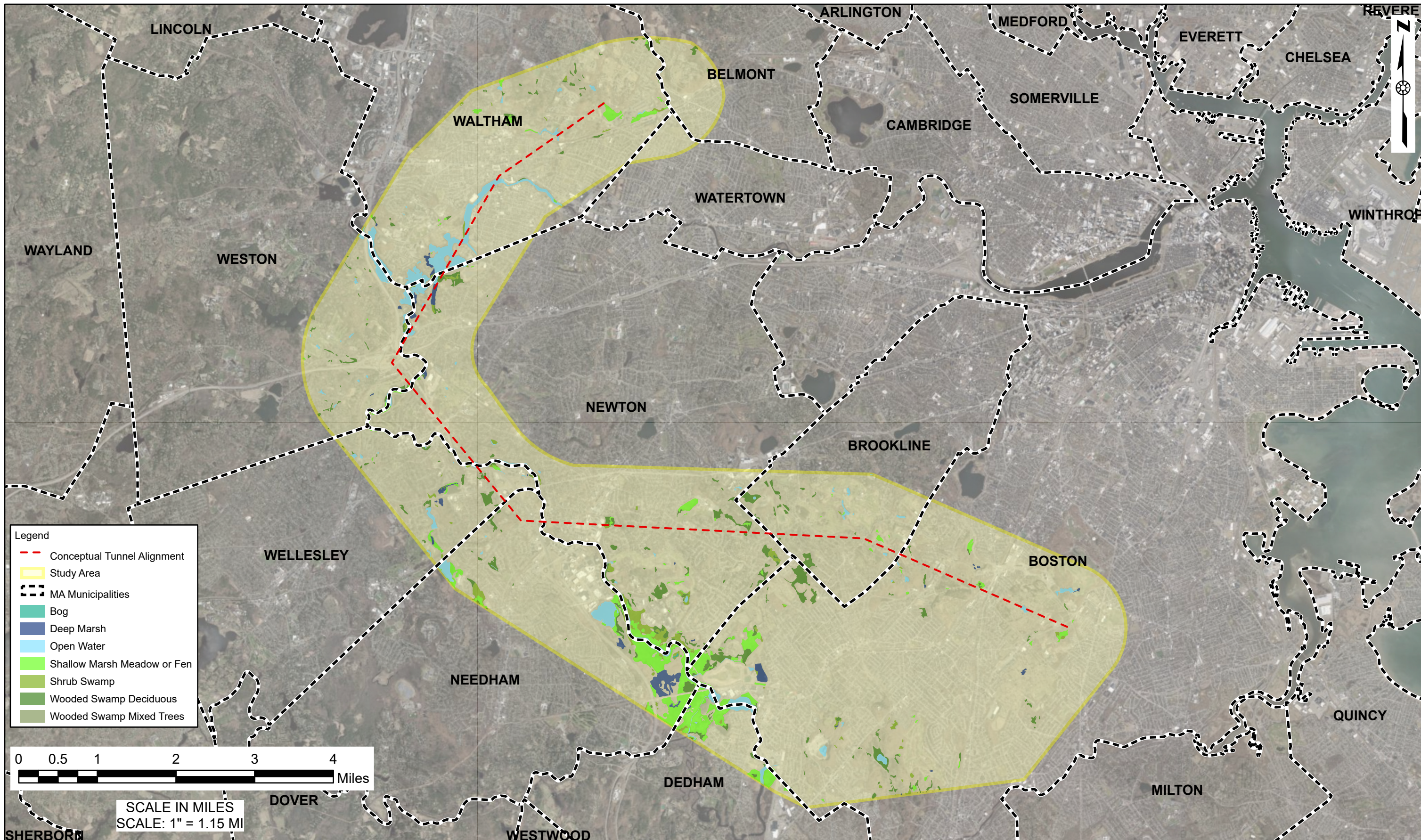
**MWRA Contract No. 7159
Preliminary Design, Geotech.
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March 2021**



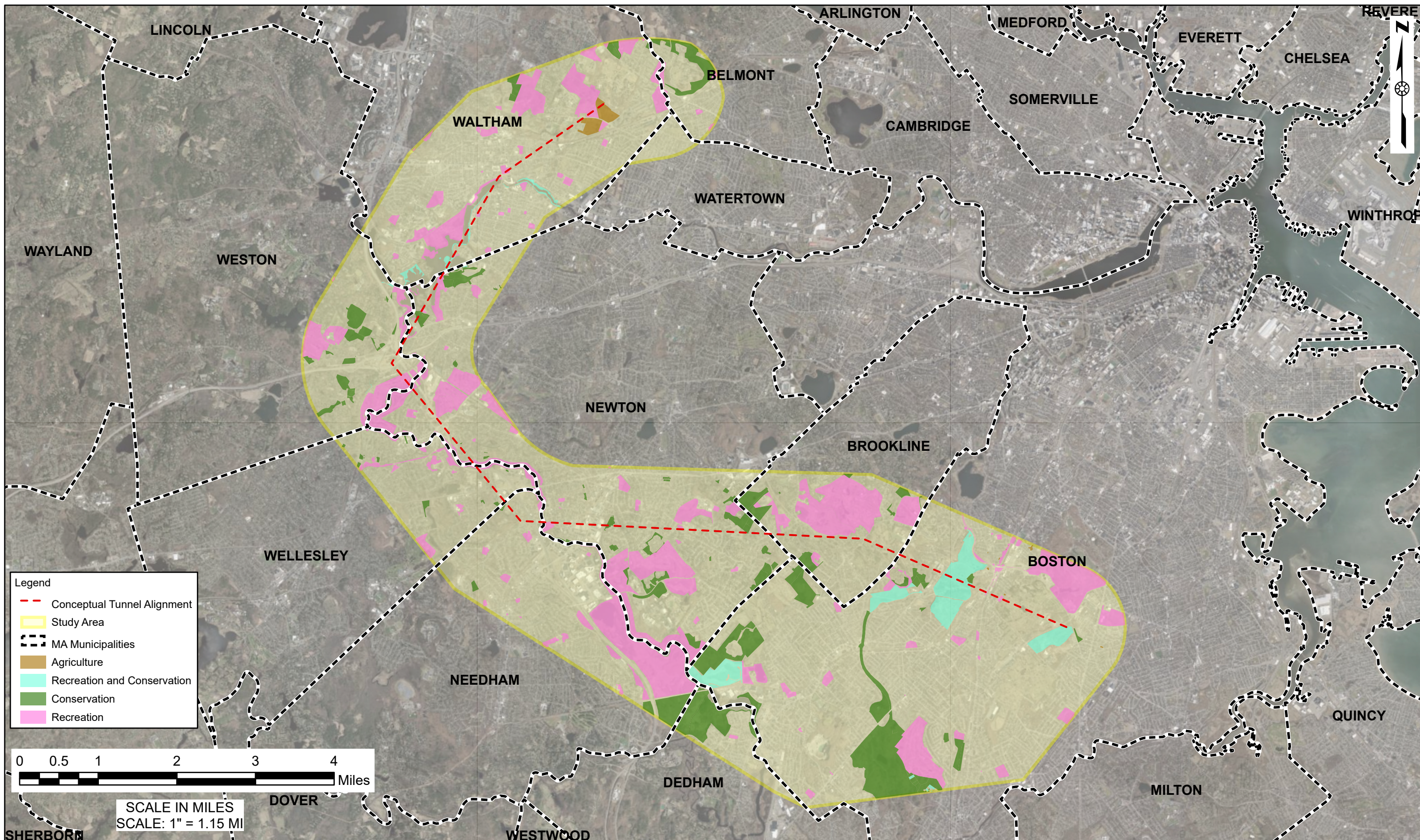
**Environmental Constraints
Figure 3**

Source: VHB, MassGIS

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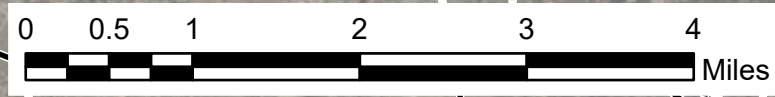


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Legend

- - - Conceptual Tunnel Alignment
- Study Area
- MA Municipalities
- Agriculture
- Recreation and Conservation
- Conservation
- Recreation



SCALE IN MILES
SCALE: 1" = 1.15 MI



**Metropolitan Water
Tunnel Program**

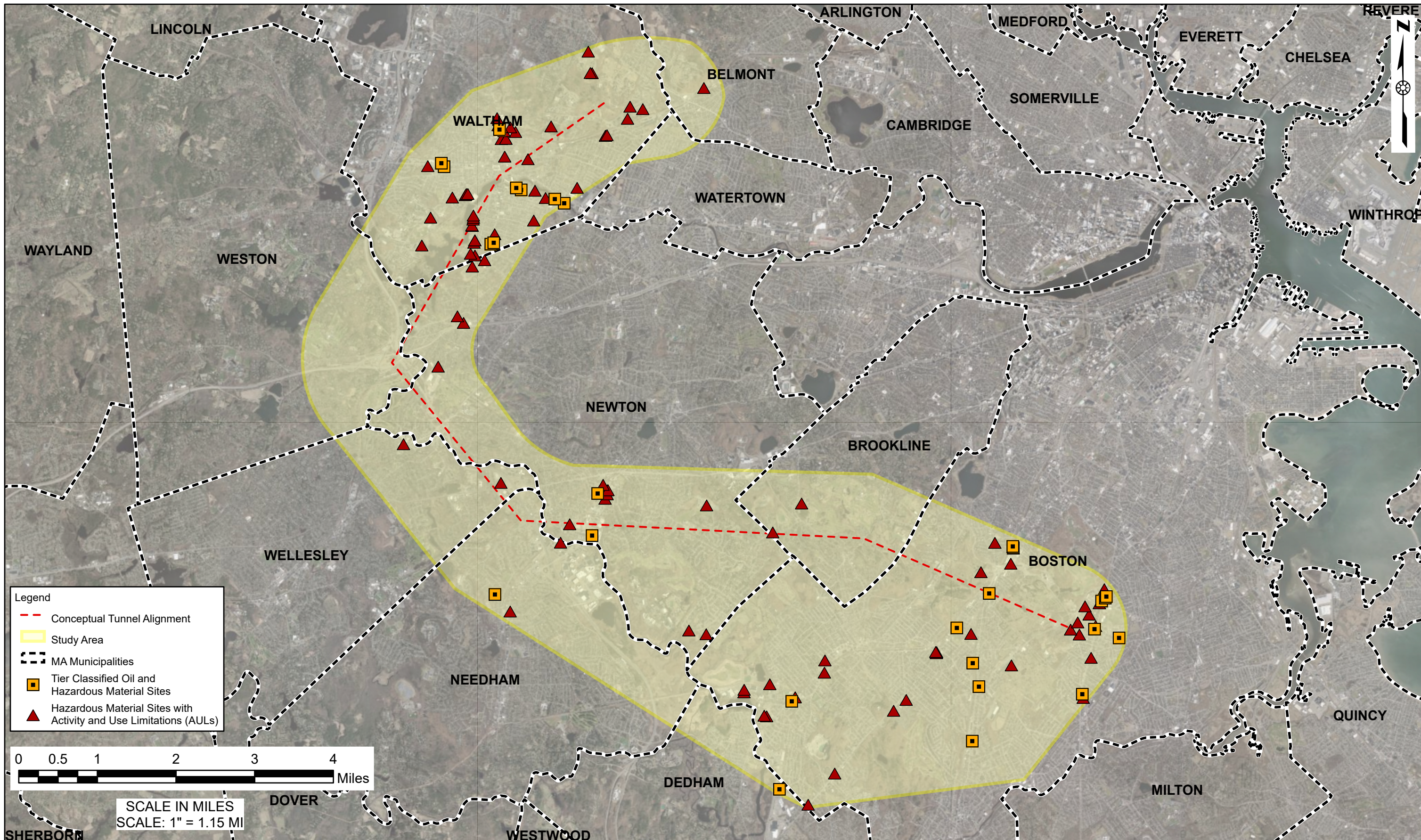
**MWRA Contract No. 7159
Preliminary Design, Geotech.
and Environmental
March 2021**



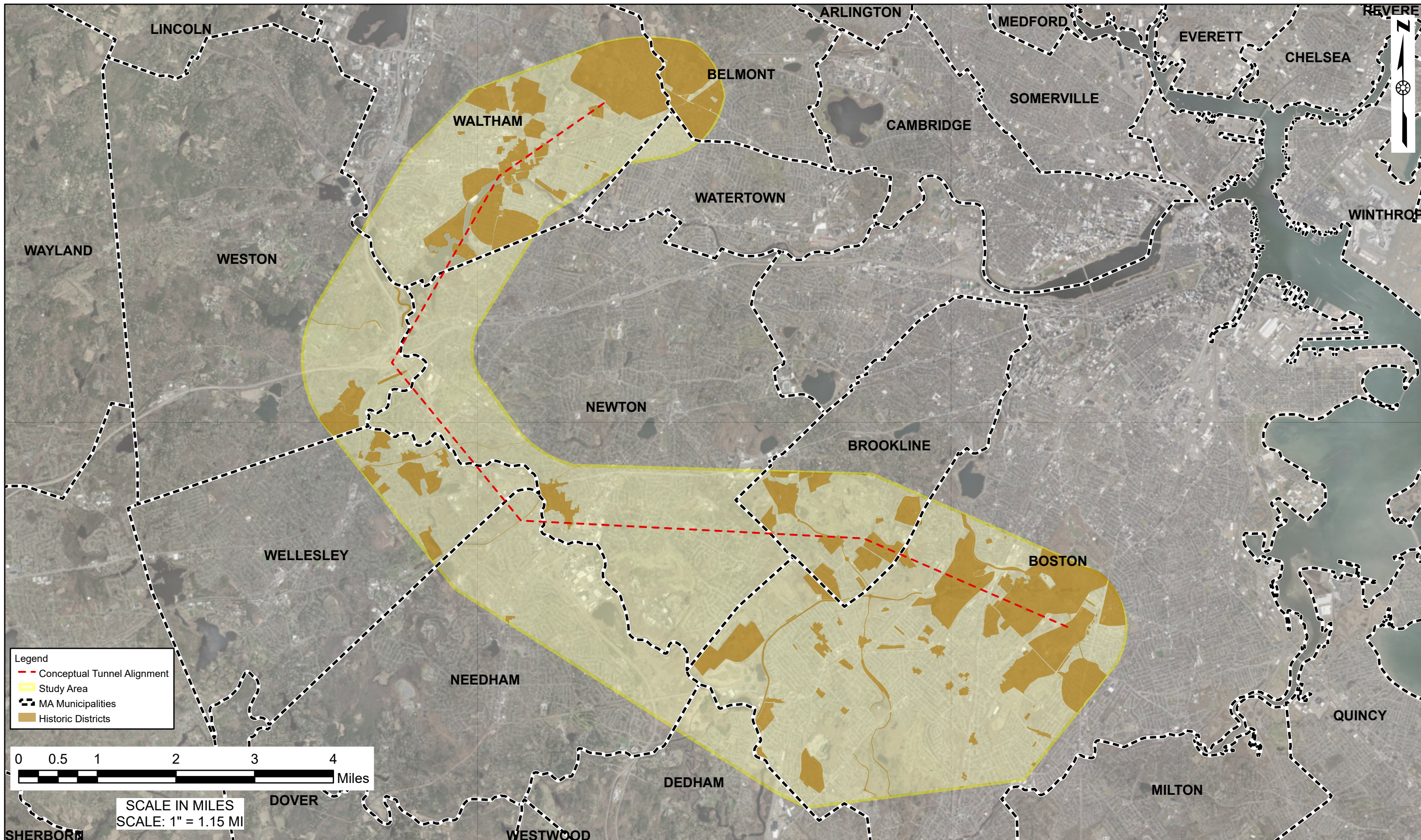
**Open Space Resources
Figure 5**

Source: VHB, MassGIS

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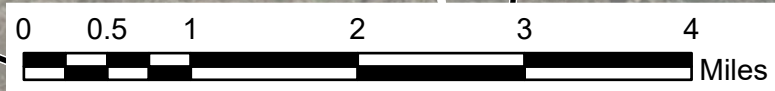


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Legend

- Conceptual Tunnel Alignment
- Study Area
- MA Municipalities
- Historic Districts



SCALE IN MILES
SCALE: 1" = 1.15 MI



**Metropolitan Water
Tunnel Program**

**MWRA Contract No. 7159
Preliminary Design, Geotech.
and Environmental
March 2021**



**Historic Districts
Figure 7**

Source: VHB, MassGIS

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Attachment C: ENF Narrative

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Massachusetts Water Resources Authority



Metropolitan Water Tunnel Program

ENF Narrative

March 2021

**PRELIMINARY DESIGN,
GEOTECHNICAL INVESTIGATION AND
ENVIRONMENTAL IMPACT REPORT**

MWRA Contract 7159

Revision 0

Prepared by
VHB in association with
CDM Smith and Jacobs

Revision Log

Revision Number	Version	Description	Date
RO	Final	Submitted as part of ENF Filing with MEPA	03/31/2021

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1.0 Introduction

The Massachusetts Water Resources Authority (MWRA, the Authority) is a Massachusetts public authority established by an act of the Legislature in 1984 and provides wholesale water and sewer services to 3.1 million people and more than 5,500 businesses in 61 communities in eastern and central Massachusetts.

The Authority plans to construct two new deep rock water supply tunnels (north and south alignments). Known as the Metropolitan Water Tunnel Program (the Program), this important new infrastructure will provide redundancy for MWRA's existing Metropolitan Tunnel System, which includes the City Tunnel (1950), City Tunnel Extension (1963) and Dorchester Tunnel (1976). The Metropolitan Tunnel System delivers 60 percent of the water that travels eastward from the Quabbin Reservoir, through a series of tunnels and aqueducts to the Authority's state-of-the-art John J. Carroll Water Treatment Plant in Marlborough, to serve 53 communities. Treated water is conveyed from the plant through the MetroWest Water Supply Tunnel (MWWST) and the Hultman Aqueduct. The new, redundant deep rock tunnels would originate at a site located at the western most portion of the Metropolitan Tunnel System roughly in the vicinity of the Interstate 95 (I-95 [also known as Route 128]) / Interstate 90 (I-90 [also known as Mass Pike]) interchange. The tunnels would be constructed such that water flows in two directions, with one tunnel traversing north towards Waltham and the other south towards Boston/Dorchester. Each tunnel will connect to existing water supply infrastructure at key locations to achieve redundancy goals. The boundaries of the Program Study Area are depicted in **Figure 1.1**.

The Program was conceived to address outstanding challenges, primarily that the existing Metropolitan Tunnel System cannot be maintained or repaired nor can emergencies be readily addressed because boil water orders are needed when implementing backup measures. As a result of the construction of the two new deep rock tunnels, the Program would allow the Authority to take its aging existing water tunnel system offline to be rehabilitated without interrupting water service to over 2.5 million¹ water customers.

The primary goal of the Program is to protect public health, provide sanitation, and provide fire protection, in line with the mission of the Authority.

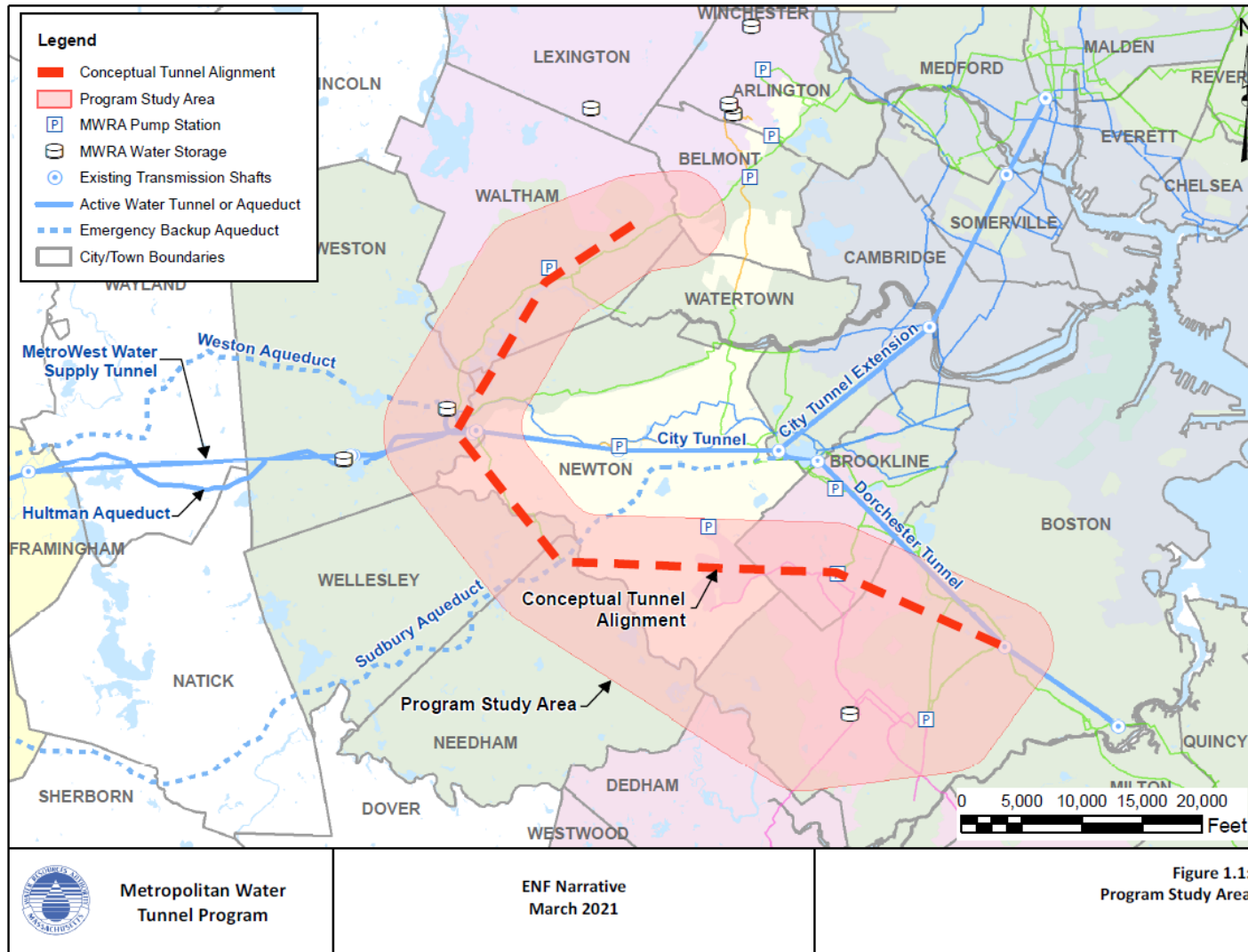
¹ The MWRA provides a total of 3.1 million people with water and sewer services, 2.5 million of whom are supplied with water only.

In support of this goal, the Program is intended to:

- Provide redundancy for the Metropolitan Tunnel System
 - Provide normal water service and fire protection when the existing tunnel system is out of service
 - Provide the ability to perform maintenance on the existing tunnel system year-round
 - Provide uninterrupted service in the event of an emergency shut down
 - Meet high day demand flow with no seasonal restrictions
 - Avoid activation of emergency reservoirs
- Meet customer expectations for excellent water quality
- Preserve sustainable and predictable rates at the water utility level
- Be constructable
- Avoid boil water orders

The Program is in the preliminary alternatives screening and environmental review stage which is documented in this Environmental Notification Form (ENF). Conceptual design will be initiated to support evaluation of impacts in the Environmental Impact Report (EIR). Program construction is planned to occur from approximately 2027 through 2037. It is expected that the proposed new deep rock tunnel system will be placed into service in or around 2037 and that the system will have a useful life of more than one hundred years. Therefore, the sizing of the proposed facilities will consider projected future water demands due to population and employment increases within the service area, increased water use efficiency, and possible additional demands associated with partially supplied MWRA communities requiring additional supply during drought conditions associated with climate change.

Figure 1.1: Program Study Area

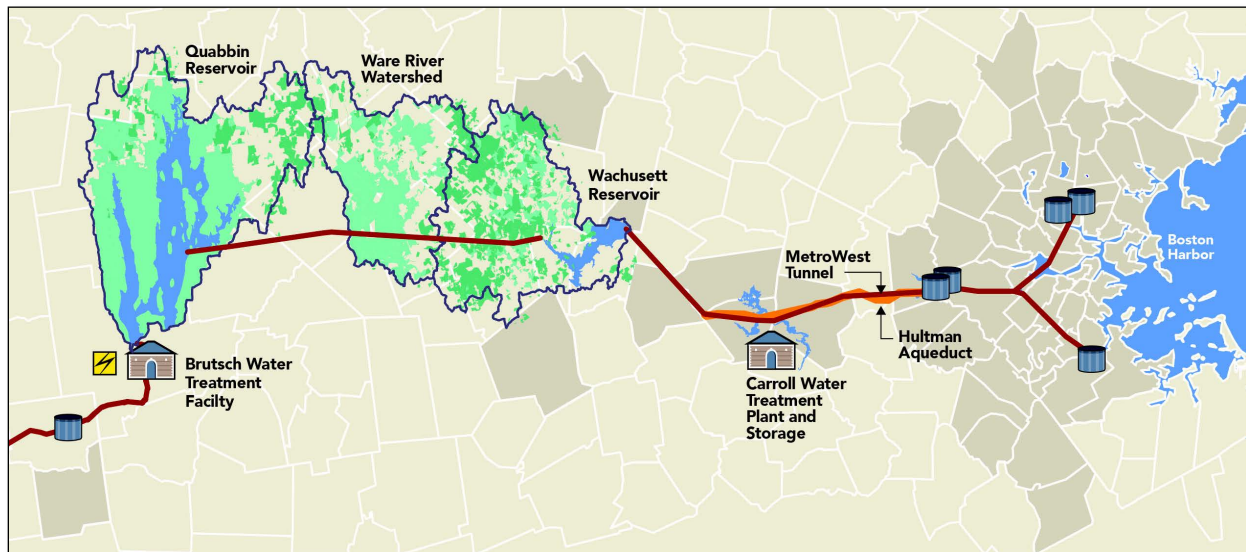


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1.1. Program Background

The MWRA water transmission system consists of Quabbin and Wachusett Reservoirs, the Ware River intake, and the deep rock tunnels and surface aqueducts that deliver water by gravity. The overall transmission and distribution system consist of approximately 100 miles of tunnels and aqueducts and 280 miles of surface pipeline that carry water from the source reservoirs to the communities. **Figure 1.2** demonstrates the MWRA water system.

Figure 1.2: MWRA Water System



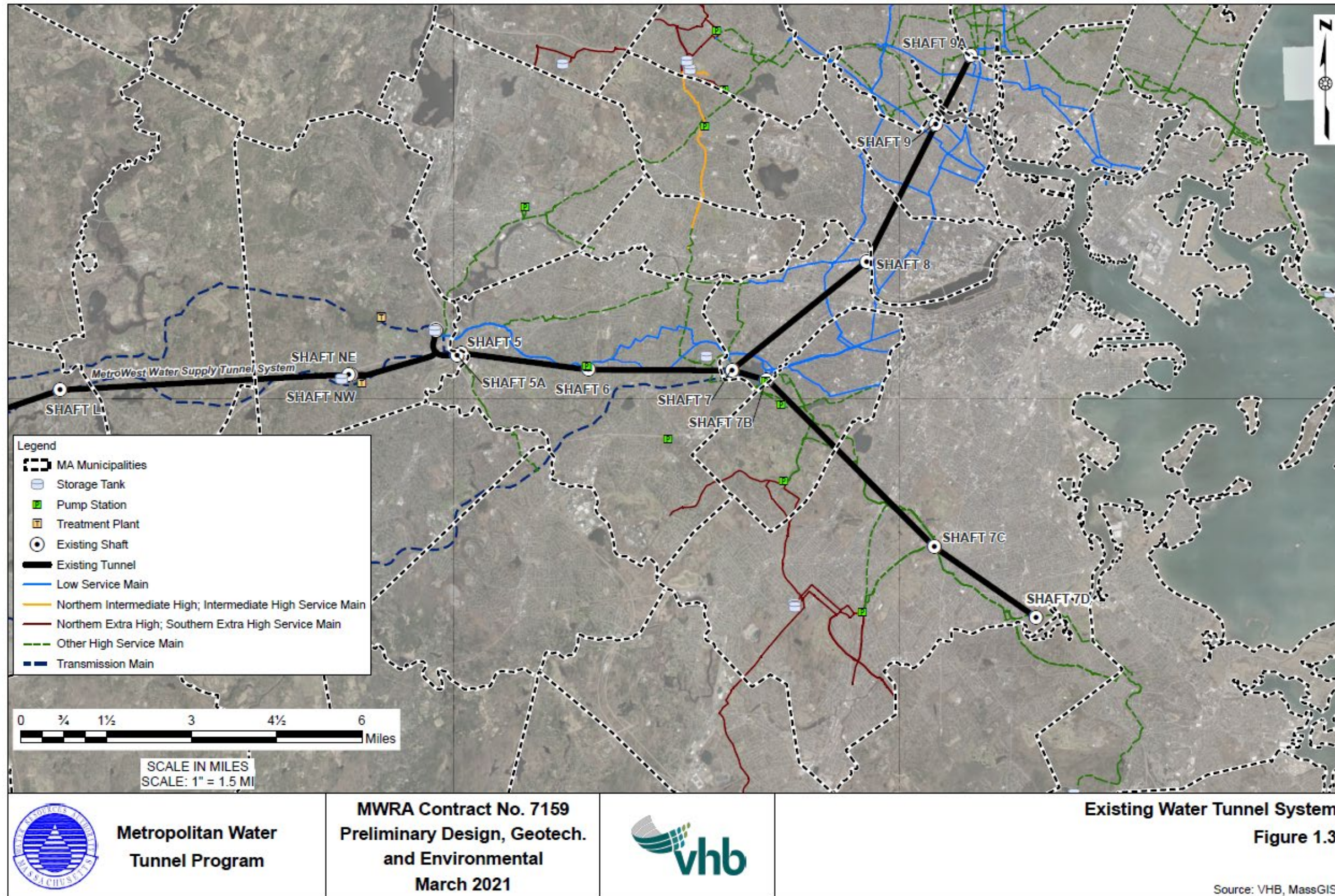
Source: MWRA

Recognizing its aging infrastructure and the need to conduct maintenance and repair without service disruption, the Authority and its predecessor agencies have been planning for system redundancy since the 1930s. Several versions of tunnel loops and redundant tunnels have been proposed over the years.

The MetroWest Water Supply Tunnel, completed in 2003, is a vital addition to system redundancy. The MetroWest Water Supply Tunnel is approximately 17.6 miles, consists of a 12- to 14-foot diameter, deep rock tunnel, and provides redundancy to the Hultman Aqueduct, which is a major transmission line from the John J. Carroll Treatment Plant in Southborough to Shaft 5 located near I-95/I-90 interchange. With the completion of the MetroWest Water Supply Tunnel project, a redundant water transmission system was created for approximately 25 miles from the Wachusett Reservoir to the beginning of the existing Metropolitan Tunnel System. However, a redundant system is still needed east of Shaft 5/5A, which includes the Metropolitan Tunnel System (See **Figure 1.3**).

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Figure 1.3: Existing Metropolitan Tunnel System



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The 2018 MWRA Water System Master Plan² prioritizes projects on a scale from 1 to 5, with 1 being projects considered critical and 2 through 5 being progressively lower priority. The highest priority projects will resolve critical threats to public health and prevent imminent system failure resulting in significant service loss. The Metropolitan Water Tunnel Program is designated as Priority 1 (Critical) project. Together, the City Tunnel, City Tunnel Extension, and Dorchester Tunnels supply approximately 60 percent of the total system daily demand and some of these tunnels, associated surface piping, ancillary valves, and equipment have been in operation for more than 60 years. This aging infrastructure and equipment should be inspected regularly and repaired if necessary. Valve reliability is one of the major areas of system vulnerability for the Metropolitan Tunnel System. However, these tunnels cannot currently be shut down for inspection or repair.

1.2. Program Purpose and Need

The Metropolitan Tunnel System (City Tunnel, City Tunnel Extension, and Dorchester Tunnels) was constructed in the 1950s to the 1970s and has been in continuous service ever since. While the concrete-lined deep rock tunnels have a long design life, some of the associated valves and piping have exceeded their limited design life and are currently in poor condition. In order to exercise, service, and replace some of these valves and piping without interruption to water supply, a redundant system is needed.

The purpose of the Metropolitan Water Tunnel Program is to enhance the reliability of the Metropolitan Tunnel System that serves the greater metropolitan Boston area to allow for system maintenance and repair, without disrupting service, and in a way that maintains the ability to provide water needed to support public health and safety.

1.2.1. Condition of Metropolitan Tunnel System

Each tunnel comprising the Metropolitan Tunnel System consists of concrete-lined deep rock tunnel sections linked to the surface through steel and concrete vertical shafts. At the top of each shaft, cast iron or steel pipe and valves connect to the MWRA surface pipe network. These pipes and valves are accessed through subterranean vaults and chambers. The tunnels and shafts, themselves, require little or no maintenance and represent a low risk of failure. However, many of the valves and piping are in poor condition.

Valve reliability for the Metropolitan Tunnels is a concern. The City Tunnel (1950) appurtenances are 70 years old and cannot be adequately maintained or replaced until a back-up exists. Failure of some valves can cut off a majority of the system's capacity to supply water and, due to the physical condition, age, and environment in which they were installed, have not been exercised for fear of failing in a closed position. At many of the top-of-shaft structures are smaller piping and valves of varying diameters (ranging from less than an inch to several inches in diameter) that provide air and vacuum relief, along with drains,

²Massachusetts Water Resources Authority Water System Master Plan, December 2018.
<https://www.mwra.com/publications/masterplan/2018/mp-water.pdf>

flushing connections, valve by-passes, and control piping for hydraulic valve actuators. Some of these pipes and valves are in a similar deteriorated condition as the main pipes and valves themselves. Failure of one of these smaller diameter connections could require a tunnel shut down to allow for a safe repair in some of these confined spaces. The amount of water that can flow out of a modest opening under high pressure can potentially be over 100 million gallons per day (MGD).

Some of these concerns can be mitigated somewhat through replacement of corroded bolts, wrapping or coating corroded pipeline segments, replacement of air valves, and installation of cathodic protection systems. A program is underway to implement some of these measures to reduce the risk of certain failures that would require complete tunnel shut down. However, all the potential failure points cannot be addressed without tunnel isolation and complete replacement or maintenance of failed or failing components at some point in the future.

1.2.2. A Case Study for Redundancy

The most recent incident that emphasized the need for redundancy occurred in May 2010 when MWRA experienced a major break on a ten-foot diameter pipe connection at Shaft 5 of the City Tunnel. The break occurred at a coupling on the surface pipe interconnection between the recently constructed MetroWest Water Supply Tunnel and the City Tunnel (**Figure 1.4**). Although the leakage was caused by just a one-inch gap in the pipe, approximately 250 million gallons per day of potable water was lost. A precautionary boil order was put in place for the metropolitan Boston area, and the Authority was able to repair and bring service back online swiftly. Using a combination of industry standards and case studies from water supply interruptions, the economic loss of an interruption of water supply to the metropolitan Boston area has been estimated at approximately \$300 million per day. This example demonstrates the importance of having a redundant system in place to enable the Authority to perform regular inspection, maintenance and rehabilitation of pipes, key valves and tunnels on a periodic basis for the Metropolitan Tunnel System, as well as to reliably respond in the event of infrastructure failure, without service disruption.

Figure 1.4: The Great Water Main Break of May 2010



Source: MWRA

2.0 Alternatives Analysis Summary

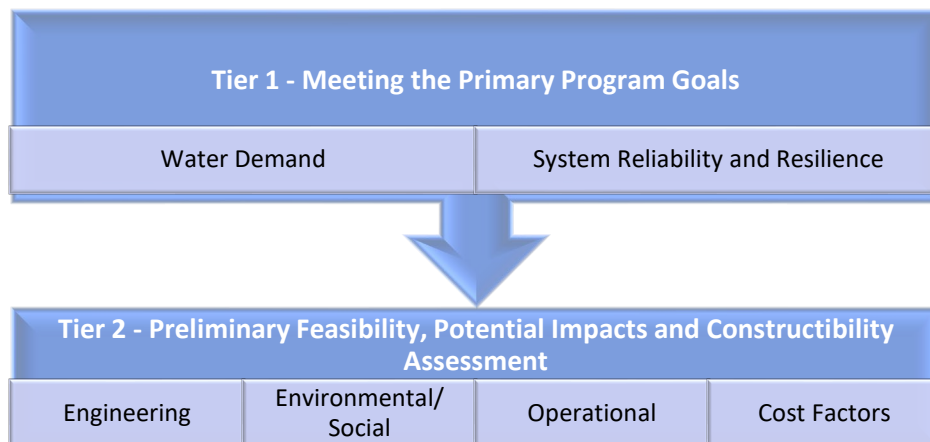
Two tiers of screening criteria were developed and applied for 28 (15 south and 13 north) alternative alignments from a site location in the vicinity of the I-95/I-90 Interchange. All 28 alternatives were evaluated against criteria established for meeting primary Program goals. To provide complete redundancy to the Metropolitan Tunnel System, both a north and a south alternative must be achieved. The proposed alternative considered operational changes, near surface large diameter pipes, deep tunnels, and various elements in combination. This two-tier alternatives screening process results in the two-tunnel concept proposed in the ENF.

Tier 1 criteria address the primary Program goals, and alternatives that do not meet the primary Program goals were eliminated from further consideration. Tier 2 of the screening process is a high-level preliminary assessment of each alternative in terms of its feasibility, potential impacts and constructability.

In some cases, certain north alternatives may only work when paired with certain south alternatives. Alternatives that satisfied Tier 1 criteria but would only work with another alternative that did not meet these criteria were also eliminated. For example, in the case where a north alternative satisfied Tier 1 criteria but must be combined with a south alternative which did not satisfy the Tier 1 criteria, the north alternative was eliminated from further evaluation.

Alternatives passing through the Tier 2 screening will be further evaluated in the next phase of conceptual design and alternatives assessment that will confirm the starting and end points of the north and south deep rock tunnel, and the specific alignment and connection points to the existing distribution system. **Figure 2.1** illustrates the two-tier alternative screening process.

Figure 2.1: Alternative Screening Process



Source: Metropolitan Water Tunnel Program Alternatives Screening Report, March 2021

Results of this analysis for each alignment alternative through the two-tier screening are documented in the Metropolitan Water Tunnel Program Alternatives Screening Report (Attachment D to the ENF). Below is a summary of the Alternatives Screening Report findings.

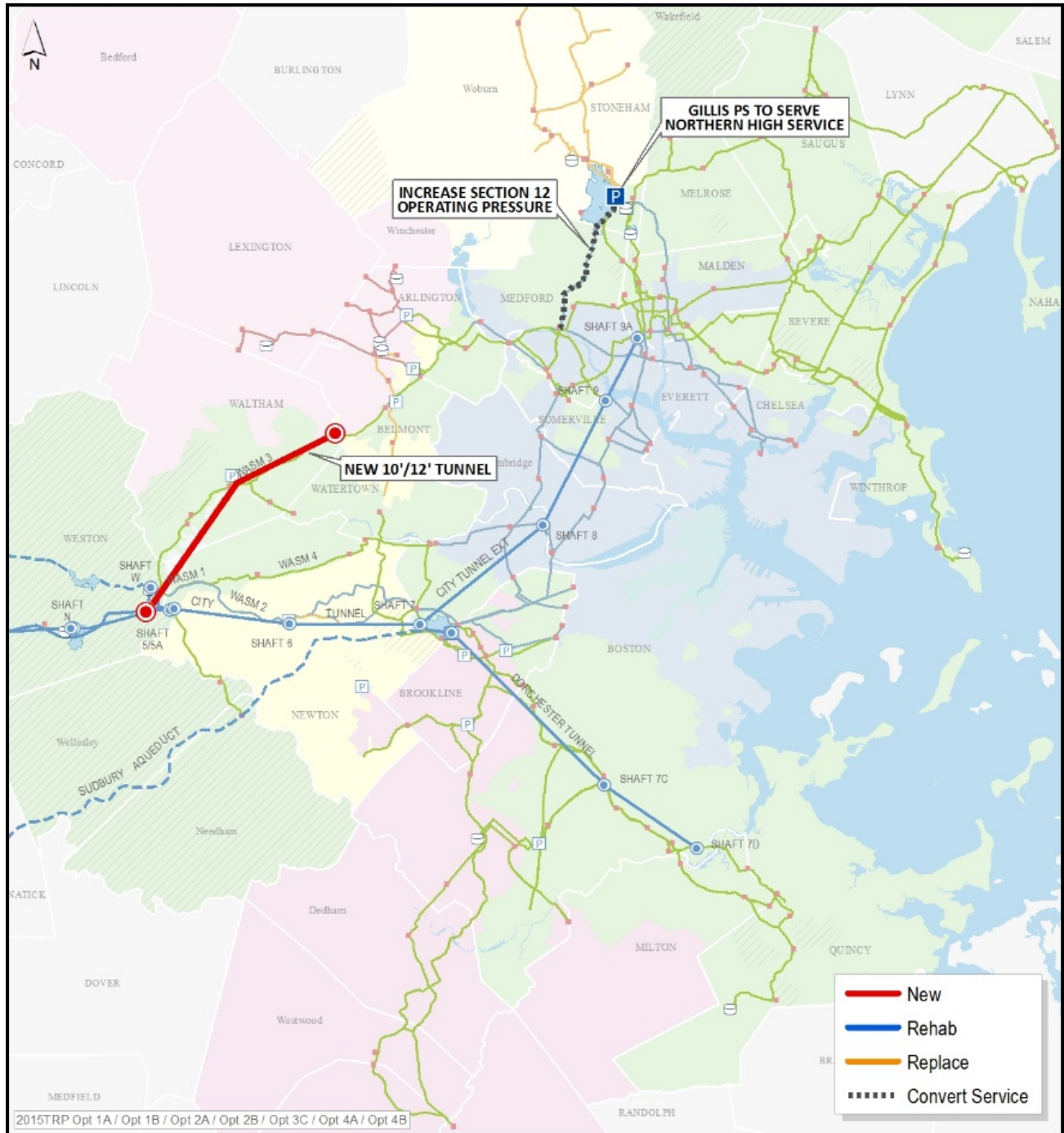
No-Build Alternative- With no redundancy in the Metropolitan Tunnel System under the No-Build Alternative, partial system shutdowns for planned maintenance of the aged infrastructure or unplanned emergencies cannot take place without imposing a boil water order with the associated impacts on public health and safety. The No-Build Alternative does not meet the Purpose and Need of the Program and was therefore eliminated.

North Alternatives - 13 alternatives were evaluated for the north portion of the system and can be grouped into three categories:

- 1) Operational changes to the existing system to increase capacity,
- 2) Increasing the capacity of the existing 60-inch Weston Aqueduct Supply Main 3 (WASM 3) pipeline by pumping or replacing WASM 3 with a larger capacity pipeline, and
- 3) Increasing capacity through construction of a new tunnel.

Based on the evaluation of the north alternatives using the Tier 1 and Tier 2 evaluation criteria, the alternative that moves forward for additional consideration is Alternative 8N (**Figure 2.2**). Alternative 8N consists of constructing approximately 4.5 miles of new 10-foot to 12-foot diameter deep rock tunnel providing water from the vicinity of the I-95/I-90 interchange in Weston (construction shaft site) to a point adjacent to WASM 3 in Waltham near the Belmont town line (construction shaft site). The development of this alternative will allow for the necessary connection to provide redundancy for the Northern Extra High Service serving Waltham. This alignment will have two to three intermediate shaft sites for connections to the existing Authority distribution system. The advancement of conceptual design will confirm the starting (launching) and end (receiving) points of the north deep rock tunnel, and the specific tunnel alignment and connection points to the existing distribution system and will be paired with a south alternative.

Figure 2.2: Selected North Alternative (8N)



Source: Metropolitan Water Tunnel Program Alternatives Screening Report, March 2021

South Alternatives - 15 alternatives were evaluated for the south portion of the system and can be grouped into three categories:

- 1) Construction of a surface pipeline or deep rock tunnel in the vicinity of Shaft 5/5A or Shaft N to connect to the Sudbury Aqueduct, and slip-lining the Sudbury Aqueduct to the Chestnut Hill Emergency Pumping Station (CHEPS), and improvements to the CHEPS,
- 2) Construction of a surface pipeline in the vicinity of Shaft 5/5A to the existing MWRA distribution system along the route of the Dorchester Tunnel, and
- 3) Increasing redundancy through construction of a new deep rock tunnel with connections to the existing MWRA distribution system.

Based on the evaluation of the south alternatives using the Tier 1 and Tier 2 evaluation criteria, the alternative that moves forward for additional consideration is Alternative 20S (**Figure 2.3**). Alternative 20S consists of a deep rock tunnel, including a connection with the Hultman Aqueduct, starting roughly in the vicinity of the I-95/I-90 interchange extending into Boston with a total tunnel length of approximately 10 miles. The exact cities/towns and connections will depend on the final alignment. Alternative 20S meets the Tier 1 and Tier 2 screening criteria and will proceed to the next level of conceptual design and alternatives assessment that will confirm the launching and receiving points of the deep rock tunnel, and the alignment of the south alternative with connection sites. This south alternative would be paired with the north Alternative 8N, both of which are deep rock tunnels.

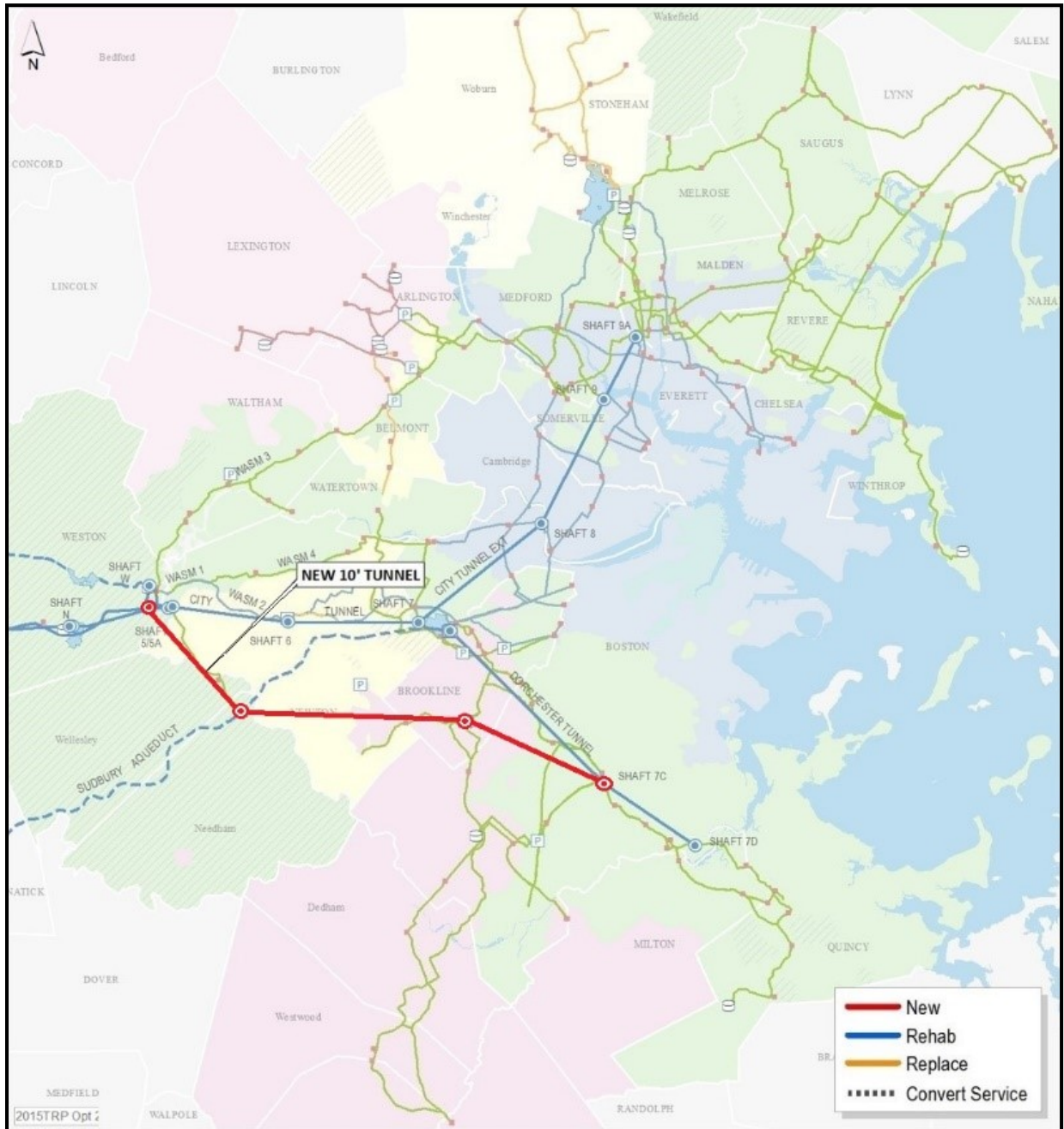
3.0 Impacts Analysis Methodology

Based on the alternatives assessment conducted to date, it has been determined that permanent surface impacts for this Program would include two deep rock tunnels with up to 12 separate shaft sites (launching and receiving construction shaft sites and intermediate shaft sites) with a total acreage of permanent surface facilities of approximately 11 acres. Construction-period impacts including drilling, laydown areas, and truck traffic will be temporary in nature. These impacts will be further assessed as the Program is developed and documented in the Draft Environmental Impact Report (DEIR) and Final Environmental Impact Report (FEIR), with the goal to avoid and minimize impacts to the greatest extent practicable.

The methodology for analyzing impacts for the ENF was based on a conservative approach which considers the Program Study Area that encompasses the north and south tunnel conceptual alignments, as well as the potential locations for construction and intermediate shaft sites (specific locations will be determined during the EIR stage). To develop an estimate of the impacted acreage that launching/receiving construction shaft sites³, and intermediate shaft sites may have, the MWRA reviewed as-built plans from the MetroWest Water Supply Tunnel project that was completed in 2003. From that review, prototype layouts for the two types of shafts were developed as a basis on which to calculate impacts, as described in further detail below.

³ Launching and receiving construction shaft sites have an approximately similar acreage.

Figure 2.3: Selected South Alternative (20S)



Source: Metropolitan Water Tunnel Program Alternatives Screening Report, March 2021

The Program is made up of three major components: two deep rock tunnels (north and south alignments); construction shaft sites (approximately 6) which would either be tunnel boring machine (TBM) launching or receiving shafts at the start or end of each of the two tunnels; and intermediate shaft sites (approximately 6) which would be raised bore shafts, which are small diameter shafts, for connections to existing MWRA or community water distribution infrastructure and/or access for tunnel construction. The final alignment of the tunnels and associated construction shaft sites (TBM launching, receiving) and intermediate shaft sites have yet to be determined.

The total Program acreage permanently impacted is the sum of the land required for up to 12 surface sites for the entire Program and is expected to be approximately 11 acres. Since specific sites have yet to be identified, the Preliminary Design Engineering Team developed a prototype layout for each type of site (**Figures 3.1** and **3.2**) to use as a basis to calculate site acreage, areas of impervious surfaces, and other site features as disclosed in the ENF Form.

Figure 3.1: Example Prototype Construction Shaft As-Built Site Layout

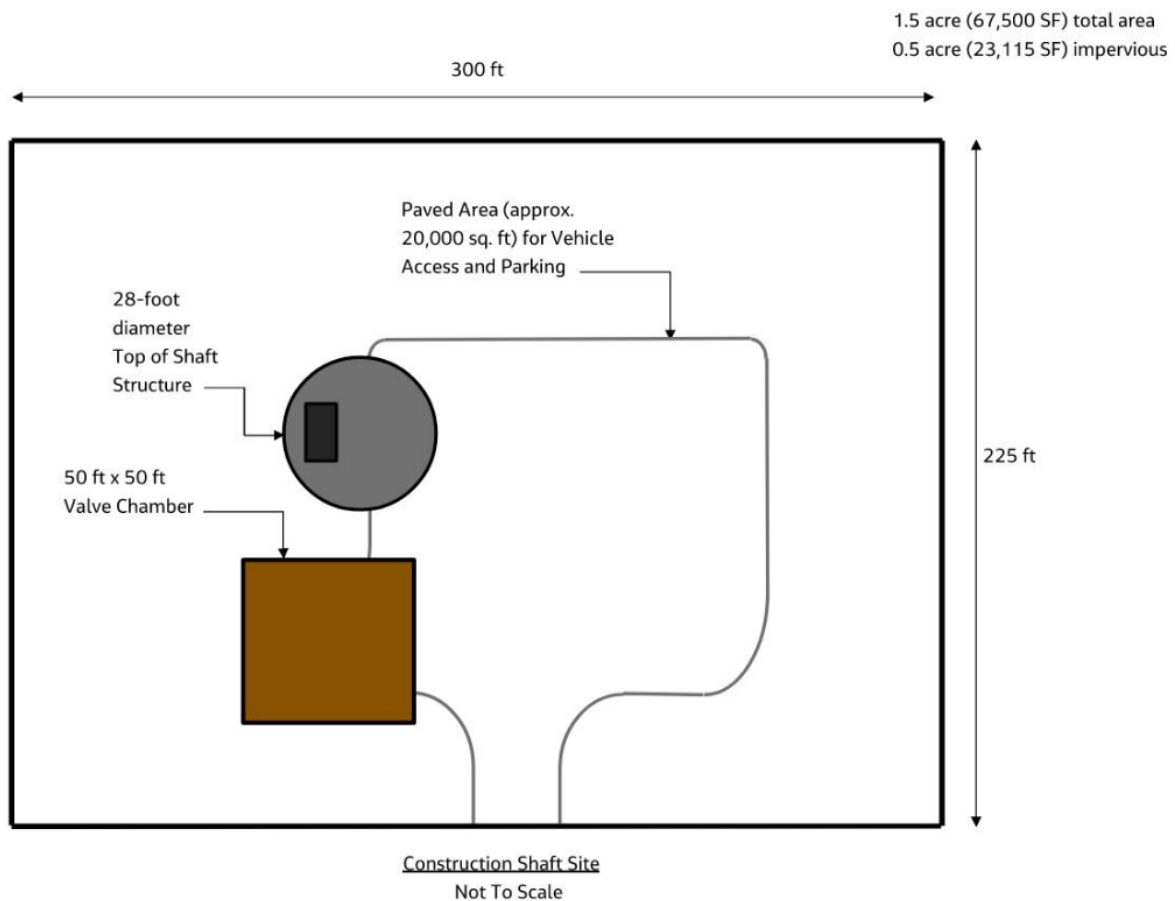


Figure 3.2: Example Prototype Intermediate Shaft As-Built Site Layout

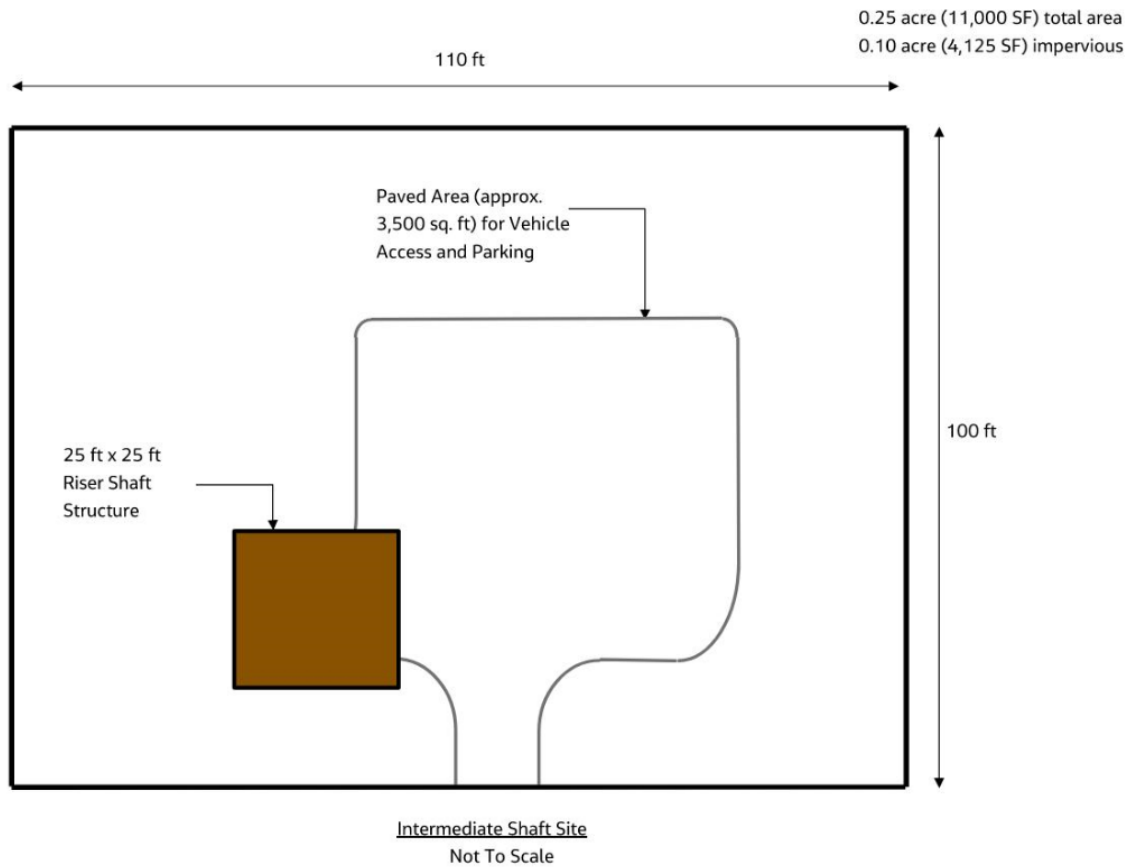


Table 3.1 provides a breakdown of each Program element and its component deep rock tunnel alignment, construction shaft sites (TBM launching and receiving), and intermediate shaft sites.

Table 3.1: Potential Program Elements

Program Component	Possible Number of Shaft Sites or Tunnel Length
Construction Shaft Sites ¹ (TBM launching or receiving)	Up to 6
Intermediate Shaft Sites ²	Up to 6
Deep Rock Tunnel Alignment (north and south) ³	Up to 14.5 miles

- 1 Includes TBM launching shaft sites(s) for drilling the deep rock tunnels for both the north and south tunnels and TBM receiving shaft sites to extract the TBM upon tunnel completion.
- 2 Intermediate shaft sites required for connections to distribution system and/or deep rock tunnel construction purposes.
- 3 No surface features.

To estimate the total impacts associated with each Program component, **Table 3.2** documents the anticipated total number of construction shaft sites and intermediate shaft sites from **Table 3.1** and calculates the associated estimated square footage using the prototypes in **Figures 3.1** and **3.2**. This allows for calculation of the impact totals at the completion of the Program. The Program Total presented in **Table 3.2** are disclosed in the ENF “Summary of Project Size & Environmental Impacts” table.

Table 3.2: Calculation of Potential Impacts of Completed Surface Sites (Estimated)

Type	# of Surface Sites	Existing Total Site SF	New SF of Land Altered ¹	Site Elements	Project Related SF of Impervious Area		
					Existing Parcel	Change	New
Construction Shaft Sites	6	6 x 67,500 = 405,000 SF	TBD	28 foot diameter Top of Shaft Structure (615 SF x 6 = 3,690 SF) 50 x 50 foot Valve Chamber (2,500 SF x 6 = 15,000 SF) Vehicle access and parking area (20,000 SF x 6 = 120,000 SF) (4-5 parking spots)	Site specific	138,690 SF	TBD
Intermediate Shaft Sites	6	6 x 11,000 = 66,000 SF	TBD	25 x 25 foot Connection Shaft Structure (625 SF x 6 = 3,750 SF) Vehicle access and parking area (3,500 SF x 6 = 21,000 SF) (2-3 parking spots)	Site specific	24,750 SF	TBD
Program Total	up to 12	471,000 SF	TBD		Site specific	163,440 SF	TBD

1 The confirmation of specific shaft site locations will inform the new acres of land altered; however, it is not anticipated that this will exceed a MEPA threshold.

Note: All calculations are estimates.

4.0 Community Outreach

The MWRA has begun to implement a robust community outreach strategy with stakeholders. Stakeholders include, but are not limited to, communities where shaft sites may be located or where the proposed tunnel alignments may traverse (i.e., Program Study Area) including local elected officials and municipal departments, property owners (public and private) of potential shaft and construction sites, select state agencies, and legislators. The Program Study Area includes the following ten communities: Belmont, Boston, Brookline, Dedham, Needham, Newton, Waltham, Watertown, Wellesley and Weston. It is expected that Program stakeholders will evolve as the Program advances to later stages of design and construction. The outreach strategy includes introductory meetings with each community within the Program Study Area, formation of a working group (one working group to start and may evolve into two or more as the program progresses) consisting of representatives from communities and stakeholders in the Program Study Area, coordination with MWRA's Advisory Board and Commonwealth agencies, as well as outreach to environmental advocacy groups. Further, MWRA is participating on an environmental justice (EJ) task force led by the Executive Office of Energy and Environmental Affairs (EEA) and will follow EEA guidelines pertaining to outreach to and inclusion of the environmental justice communities in the Program Study Area.

4.1. Introductory Meetings with Communities

MWRA Staff have already made contact with all ten communities within the Program Study Area to inform them of the Program, and have offered to meet with them (and have already met with some) to provide more information and answer any questions. Through this initial contact MWRA Staff have requested representatives of each community as the working group is formed.

4.2. Working Group(s)

MWRA is in the process of forming a working group which will include representatives of each of the ten communities within the Program Study Area who will participate in regular meetings with the Program Team, be kept informed on Program progress, and provide input on certain elements of the Program. The goals of the working group meetings are to provide a collaborative and transparent process for evaluating alternatives, and yield more informed comments during the Massachusetts Environmental Policy Act (MEPA) process. Other members of the working group include the MWRA Advisory Board and the Metropolitan Area Planning Council.

It is envisioned that the initial working group meeting(s) may be held prior to publishing the ENF or soon after. These working group meetings will continue on a regular basis during the evaluation of alternatives for the tunnel alignment and shaft locations. The MWRA Program Team, with assistance from the Preliminary Design Engineer Team, will make presentations to the working groups as the evaluation of alternative tunnel alignments progresses with the goal of arriving at a consensus for one preferred and up to two back up alternatives, which will be formally proposed in the DEIR. It is envisioned that the

MWRA Program Team will present the DEIR formally to the working group when it is published. Additional presentations within each community may occur as needed or requested.

4.3. State Agencies

The Program Team has organized meetings with EEA, the MEPA Office, Massachusetts Department of Transportation (MassDOT), Division of Capital Asset Management and Maintenance (DCAMM), Department of Conservation and Recreation (DCR), Massachusetts Department of Environmental Protection (MassDEP), and other critical agencies. Meetings have already been held with some state regulatory agencies, including MEPA staff and MassDEP to provide an overview of the Program and to seek preliminary guidance on the permitting strategy. Ongoing outreach with MEPA and MassDEP will be carried out as the Preliminary Design phase progresses, which will be scheduled to occur prior to major submittals, and more frequently as needed to provide updates on the Program or to address specific issues.

4.4. MWRA Board of Directors

The Program Team has and will continue to offer briefings for the MWRA Board of Directors to update them on Program status, including the filing of public documents. These meetings are open to the public.

4.5. MWRA Advisory Board

The Program Team has and anticipates continuing to offer briefings and hold meetings with the MWRA Advisory Board, which represents MWRA's member communities. Ongoing meetings with members from each of the communities within the Program Study Area may be held if requested by community representatives.

4.6. Environmental Advocacy Groups

The Program Team anticipates outreach to environmental advocacy groups such as the Massachusetts River Alliance, Conservation Law Foundation, and the Charles River Watershed Association, among others.

4.7. Environmental Justice Communities

The Program Team anticipates tailored outreach to EJ communities throughout the Program to facilitate their involvement. The Program Team will identify EJ communities within the Program Study Area and will use a combination of methods to enable full participation in the environmental review process, including public meetings. Methods may include translating outreach materials to languages prevalent in the subject communities, providing translators at public meetings and/or as requested by the community, and use of various social media platforms and media outlets as appropriate to reach the intended population.

5.0 List of Potential Permits and Approvals

Table 5.1 provides a list of potential permits and approvals that the Program may require. This list will be further evaluated as the design progresses and will be updated accordingly in future filings.

Table 5.1: Potential Permits and Approvals

Agency/Department	Permit/Approval/Action
Federal	
Environmental Protection Agency	National Pollutant Discharge Elimination System (“NPDES”) Construction General Permit
	NPDES Multi-Sector General Permit
U.S. Army Corps of Engineers	Section 404 Department of the Army Permit
Commonwealth of Massachusetts	
Executive Office of Energy and Environmental Affairs	Massachusetts Environmental Policy Act (MEPA) Review
Massachusetts Historical Commission	Review pursuant to MGL Ch. 9, Section 26-27C
Massachusetts Department of Transportation	Highway Access Permits
Department of Conservation and Recreation	Construction/Access Permits
Massachusetts Department of Environmental Protection	Section 401 Water Quality Certificate
	Chapter 91 License
	Distribution System Modification
	Surface Water Discharge Permit
	Ground Water Discharge Permit
	Water Management Act
	Natural Heritage and Endangered Species Program Review
Soils Management/Hazardous Waste Generation	
Commonwealth of Massachusetts General Court	Article 97 Land Disposition Legislation
Local	
Conservation Commissions	Wetlands Protection Act Order of Conditions
Departments of Public Works	Roadway Access Permits/Street Opening Permit

6.0 Schedule and Next Steps

The filing of this ENF initiates MEPA consultation and compliance for the Program. The MWRA anticipates that the Secretary’s Certificate on the ENF will require a DEIR and FEIR that will examine various construction shaft and intermediate shaft site locations and associated alignments for the proposed two-tunnel concept. The following subsections provide details of the Program’s progression followed by a timeline of activities in **Figure 6.1**.

6.1. Preliminary Geotechnical Data and Design Reports

To aid in the selection of the appropriate alignment for the deep rock tunnels, geotechnical subsurface investigation will be conducted during preliminary design in two phases at key locations within the

Program Study Area. A work plan for the first phase of the preliminary geotechnical investigations is currently being prepared with an anticipated start date of spring 2021 for the drilling of 10 deep rock borings and installation of monitoring instrumentation. Each boring is anticipated to be about 450 feet deep and is estimated to take about eight weeks to complete, including in-situ (on-site) testing. Additional geotechnical investigation and testing will be conducted as the tunnel alignment evaluation continues with additional borings and testing. In addition to the deep rock boring programs, other field work including geophysical survey programs will also be conducted.

A draft and final Preliminary Design Report will be prepared to support and provide the technical basis for the information included in the DEIR and FEIR. The Preliminary Design Report will include design criteria, construction considerations and operational requirements for the tunnels, shafts and near surface valve chambers and pipe connections. The Preliminary Design Report will include a detailed hydraulic analysis of the proposed tunnels using projected future water demands. In addition, the Preliminary Design Report will include preliminary design drawings, proposed construction packaging and schedule, and a preliminary cost estimate. **Figure 6.1** presents the schedule for major preliminary design activities.

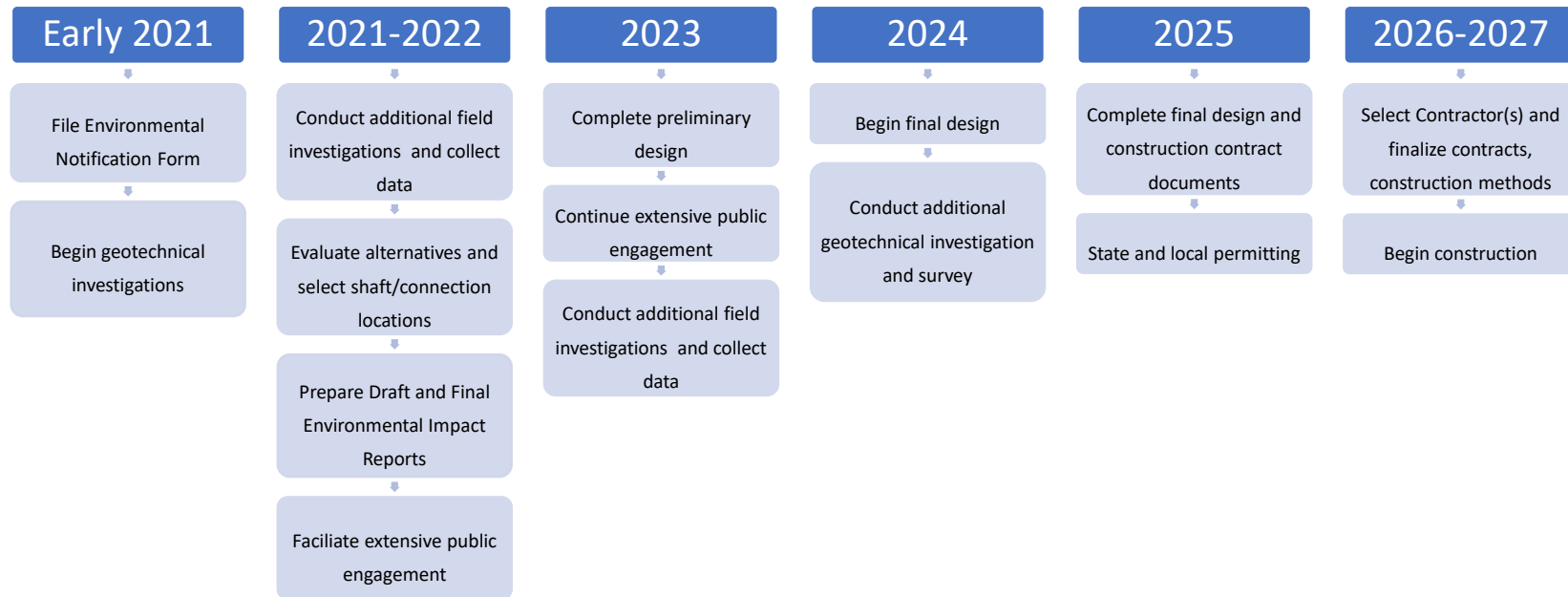
6.2. Tunnel Alignment Alternatives Evaluation/Environmental Impact Report

The MWRA has begun to identify potential locations for tunnel construction and connection shafts. Alternative tunnel alignments will be developed corresponding to the various shaft site locations. A preferred alternative and up to two backup alternatives (in the event the preferred alternative is determined to no longer effectively meet the Program goals) will be recommended. The preferred and any backup alternatives will be presented and fully evaluated in the DEIR and FEIR.

6.3. Final Design and Construction

Final design and the development of construction contract documents will be underway in 2025. The Final Design will be advanced to prepare procurement documents including Final Plans, Specifications, and a detailed Construction Cost Estimate. Based on these, a public bidding process will ensue by which a contractor (or contractors if multiple Contracts are issued) will be selected. Construction is anticipated to begin in 2026 or 2027.

Table 6.1: Program Timeline



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Attachment D: Alternatives Screening Report

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Massachusetts Water Resources Authority



Metropolitan Water Tunnel Program

Alternatives Screening Report

March 2021

PRELIMINARY DESIGN,
GEOTECHNICAL INVESTIGATION AND
ENVIRONMENTAL IMPACT REPORT

MWRA Contract 7159

Revision 0

Prepared by
CDM Smith in association with
JACOBS and VHB

Revision Log

Revision Number	Version	Description	Date
R0	Final	Final Document	03/31/2021

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1.0 Introduction

The Massachusetts Water Resources Authority (MWRA, herein referred to as the Authority) is a Massachusetts public authority established by an act of the Legislature in 1984 to provide wholesale water and sewer services to 3.1 million people and more than 5,500 businesses in 61 communities in eastern and central Massachusetts.

This Section of the Alternatives Screening Report includes a description of its purpose, an overview of the Metropolitan Water Tunnel Program, background information on the Authority's water system, and the need for redundancy. The background information on the Authority's water system is intended to provide a description of the entire water system, followed by more specific information on the Metropolitan Tunnel System, including the proposed redundant tunnels.

1.1. Purpose of Report

This Alternative Screening Report supports the MWRA's Metropolitan Water Tunnel Program (the Program), which will provide redundancy to the existing Metropolitan Tunnel System. This report documents the screening of alternatives to provide water supply redundancy to the current Metropolitan Tunnel System, by describing the development and application of pertinent evaluation criteria, resulting in the recommendation of an alternative.

The alternative alignments contained herein are only provided for illustrative purposes. It is anticipated that as preferred alternatives move into preliminary design, alignments will be further developed and refined.

1.2. Overview of Metropolitan Water Tunnel Program

Through the Program, the Authority will construct two new water supply tunnels that will provide redundancy for the Authority's existing Metropolitan Tunnel System, which includes the City Tunnel, constructed in 1950, the City Tunnel Extension, constructed in 1963 and the Dorchester Tunnel, constructed in 1976. The Program will allow the aging existing Metropolitan Tunnel System to be rehabilitated without interrupting service. The Program is in the preliminary design and environmental review stage. Final design will begin after preliminary design is complete, with tunnel construction planned to occur from approximately 2027 through 2037.

The Authority needs to build a redundant system that will allow for maintenance and repair to be performed on the City Tunnel, City Tunnel Extension and Dorchester Tunnel and supply safe drinking water, including during emergencies, to protect the public health. The Authority is an industry leader in infrastructure planning and projects, consistently taking a proactive, long-term view and approach to operating, maintaining, and developing the water system. Redundancy for the Metropolitan Tunnel System represents the next challenge for the Authority in improving reliability of this critical system for generations to come.

1.3. Background of the Authority's Water System

1.3.1. Description of the Water System

The Authority owns and operates a water system that serves approximately 2.5 million customers in 53 communities. Most of the communities are located in eastern Massachusetts, with additional communities in central parts of the state. See Figure 1-1 for an overview of the Authority's water system. The Quabbin and Wachusett Reservoirs, which are the main water supply sources, are located 65 and 35 miles west of Boston, respectively. Water from the Quabbin and Wachusett reservoirs travels through the Cosgrove Tunnel or Wachusett Aqueduct and is treated at the John J. Carroll Water Treatment Plant in Marlborough. The treated water is then conveyed from the plant through the MetroWest Water Supply Tunnel (MWWST) and the Hultman Aqueduct where it enters the Metropolitan Tunnel System. Treated water is delivered to cities and towns through a regional transmission system consisting of tunnels and aqueducts, and distribution systems consisting of surface pipelines. The water remains protected in a closed distribution network and storage reservoir system to maintain water quality up to the community connection points. The overall transmission and distribution system consists of approximately 100 miles of tunnels and aqueducts and 280 miles of surface pipelines that carry water from the source reservoirs to the user communities. MWRA has transmission system redundancy from the Wachusett Reservoir to the beginning of the Metropolitan Tunnel System in Weston.



Figure 1-1 The Authority's Water System

1.3.2. Description of the Metropolitan Tunnel System

The Metropolitan Tunnel System is a key component of the Authority's water system in that it provides drinking water to meet 60% of the Metropolitan Boston area's daily water demand. The remaining 40% is supplied through Weston Aqueduct Supply Mains (WASMs) and the Section 80 surface pipelines. The Metropolitan Tunnel System is comprised of three tunnels:

1. City Tunnel - The City Tunnel was constructed in 1950, and is a deep-rock facility, 12-feet in diameter. The City Tunnel transmits water from west to east, starting in Weston, continuing through Newton and ending in Boston. Where the City Tunnel ends in Boston, there are connections to large surface pipelines distributing water to several communities.
2. City Tunnel Extension – The City Tunnel Extension was constructed in 1963 and consists of a 10-foot diameter branch tunnel that extends 7.1 miles north of Boston, ending in Malden, serving most communities north of Boston. The City Tunnel Extension connects to the City Tunnel in Boston.
3. Dorchester Tunnel – The Dorchester Tunnel is a 10-foot diameter, deep-rock tunnel, constructed in 1976, extending 6.6 miles south ending in Boston at the Milton line. It serves the southern sections of the service area. The Dorchester Tunnel connects to the City Tunnel in Boston.

See Figure 1-2 for an overview of the existing Metropolitan Tunnel System.

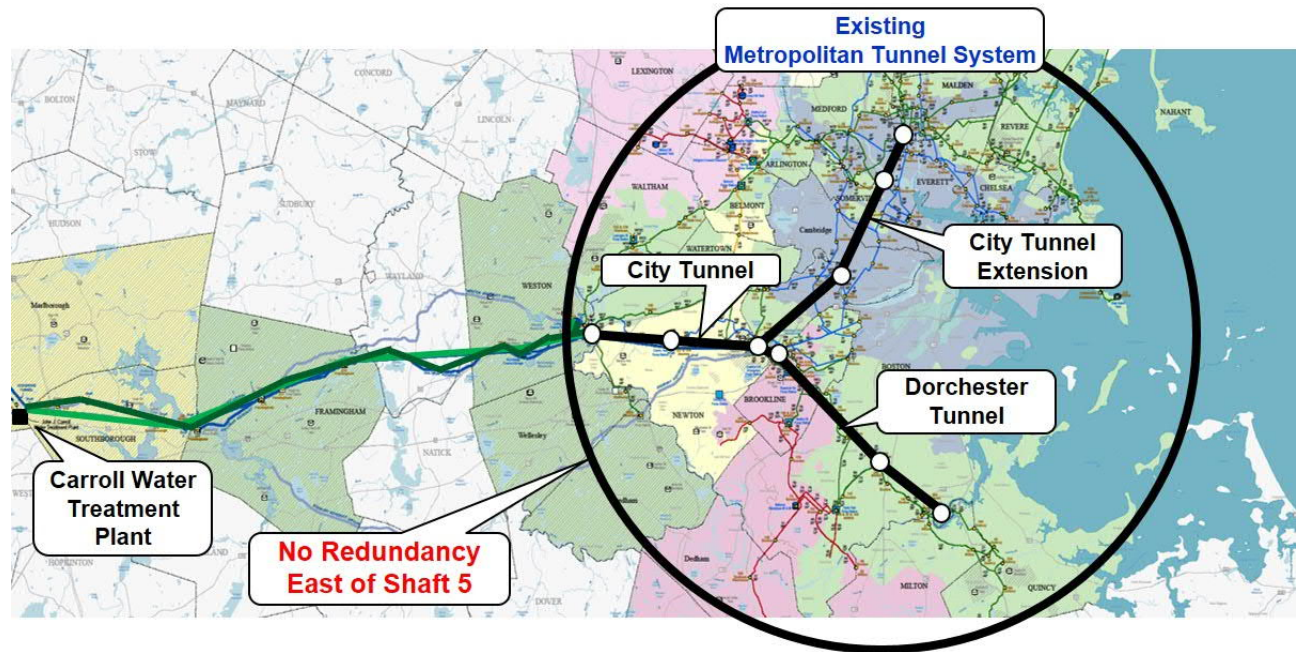


Figure 1-2 The Existing Metropolitan Tunnel System

1.4. Purpose of Redundancy

The Metropolitan Tunnel System was constructed between the 1950s and 1970s and has been in continuous service since construction. Each tunnel comprising the Metropolitan Tunnel System consists of concrete-lined deep rock tunnel sections linked to the surface through steel and concrete vertical shafts. At the top of each shaft, cast iron or steel pipe and valves connect to the MWRA surface pipe network. These pipes and valves are accessed through subterranean vaults and chambers. The tunnels and shafts, themselves, require little or no maintenance and represent a low risk of failure. However, many of the valves and piping are in poor condition.

Valve reliability for the Metropolitan Tunnels is a concern. As an example, the City Tunnel (1950) appurtenances are 70 years old and cannot be adequately maintained or replaced until a back-up exists. Failure of some valves can cut off a majority of the system's capacity to supply water and, due to the physical condition, age, and environment in which they were installed, have not been exercised for fear of failing in a closed position. These valves should be, but cannot be, replaced because shut down of the City Tunnel would be required.

While there are systems available in the event of a Metropolitan Tunnel System shutdown, these systems rely on pumping from open reservoirs containing nonpotable water, backup aqueducts, and undersized surface mains to distribute the nonpotable water with inadequate pressure. These backup options require use of emergency chlorination and issuing a boil water order to customers. The shortfalls of these backup options became evident in May 2010 when MWRA experienced a major break on a ten-foot diameter pipe connection at Shaft 5/5A of the City Tunnel. The break occurred at a coupling on the surface pipe interconnection between the recently constructed MetroWest Water Supply Tunnel and the City Tunnel. The MWRA had a redundant pipe (Hultman Aqueduct) at this location, but at the time of the break, the Hultman Aqueduct was being rehabilitated and was out of service.

The incident resulted in a release at a rate of approximately 250 MGD over a period of eight hours until the break was isolated. During this time, an emergency water source was activated to maintain water supply prior to shutting down the affected pipe. While the pipe was being repaired over the following two days, the Boston metropolitan area was supplied through alternate lower capacity mains with augmentation from an emergency raw water reservoir with chlorination. The water service area was issued a boil water order during these two days. This boil water order affected approximately 2 million people in 30 serviced communities.

2.0 History of the Program

2.1. History of Redundancy Planning for the Metropolitan Area

A redundant tunnel system was proposed as early as 1937. The plan included a proposed pressure aqueduct and tunnel system with a tunnel loop beginning in Weston near the Charles River and running east into Boston, turning north to Everett, looping west to Belmont, and connecting back to Weston. While

much of the 1937 plan for pressure aqueducts and tunnels was implemented from 1937 to present day, the proposed tunnel loop was never completed.

In 1990, a plan was proposed to construct a tunnel from Marlborough to Weston (the MetroWest Water Supply Tunnel) to provide redundancy for the Hultman Aqueduct and a future northern tunnel loop from Weston to Stoneham and Malden. The MetroWest Water Supply Tunnel was approved for construction and was completed in 2003. However, the proposed northern tunnel loop was never constructed.

2.2. Previous Evaluation of Metropolitan Area Redundancy Alternatives

In 2011, the MWRA completed a new evaluation of alternatives for redundancy within the metropolitan Boston area. This evaluation included surface pipe alternatives in addition to tunnel alternatives with an objective of incorporating redundancy planning into the existing pipeline asset management program (i.e., allocating funds already budgeted for rehabilitation of existing pipelines toward replacing the existing pipelines with larger pipelines). The result of that evaluation was a plan for constructing primarily large diameter surface pipes to provide redundancy. However, as the planning for this program progressed, it became apparent that the construction of large diameter pipelines through dense urban areas would cause unacceptable community disruption and had significant implementation challenges. Given the difficulties associated with the construction and significant community impacts associated with large diameter surface pipes together with operational reliability concerns, MWRA staff developed and evaluated the alternatives presented in the following sections, and selected the two-tunnel alternative presented in the Environmental Notification Form (ENF) based on the results of the evaluation.

2.3. Program Goals

The Metropolitan Water Tunnel Program was originated to address outstanding challenges, primarily to allow the existing Metropolitan Tunnel System to be maintained and repaired. Additionally, the Metropolitan Tunnel System cannot readily respond to emergencies because shutting down the system results in issuance of a required boil water order.

The first goal of the Program is to protect public health, provide sanitation, and provide fire protection. The Authority exists to provide these services. The Program is intended to:

1. Provide redundancy for the Metropolitan Tunnel System
 - a. Provide normal water service and fire protection when the existing tunnel system is out of service
 - b. Provide the ability to perform maintenance on the existing tunnel system year-round
 - c. Provide uninterrupted service in the event of an emergency shut down
 - d. Meet high day demand flow with no seasonal restrictions
 - e. Avoid activation of emergency reservoirs
2. Meet customer expectations for water quality
3. Preserve sustainable and predictable rates at the water utility level
4. Be constructible
5. Avoid boil water orders

3.0 Alternatives Screening Process and Screening Criteria

This section presents the evaluation process used to screen the 28 (15 south and 13 north) alternatives consistently and objectively against established criteria.

Two tiers of screening criteria were developed and applied. Tier 1 criteria address the primary Program goals, and alternatives that did not meet the primary Program goals were eliminated from further consideration.

The second tier of the screening process is a high-level preliminary assessment of each alternative in terms of its feasibility, potential impacts, and constructability. This two-tier screening process results in the two-tunnel concept proposed in the Environmental Notification Form. Figure 3-1 illustrates the two-tier alternative screening process.

The subsections below describe in detail the criteria and their application and Table 3-1 summarizes specific criterion thresholds that determined whether an alternative moved forward for further evaluation.

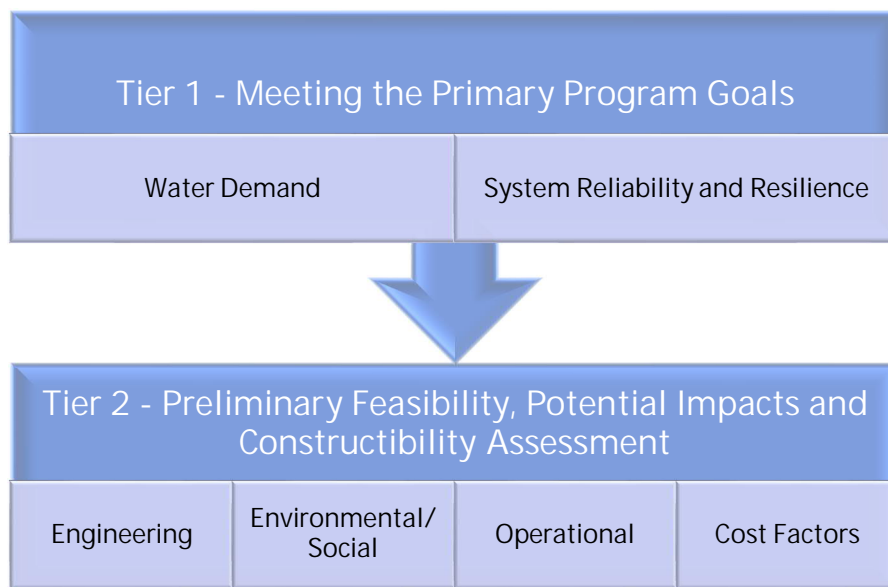


Figure 3-1: Two-Tier Alternative Screening Process

3.1. Tier 1 – Meeting the Primary Program Goals

The primary goals of the Program are to provide adequate redundancy to the Authority’s water system while meeting the water demands of its users and to provide reliability and resiliency of service to allow for the repair and improvement of the existing system. The Recommended Standards for Water Works (Water Supply Committee of the Great Lakes, 2007) states in the “10 States Standards”, which was the basis for development of the Massachusetts Department of Environmental Protection’s Guidelines for Public Water Systems, that designs should “...identify and evaluate single points of failure that could render a system unable to meet its design basis. Redundancy (geographically separated) and enhanced

security features should be incorporated into the design to eliminate single points of failure when possible, or to protect them when they cannot be eliminated." The Environmental Protection Agency's 2011 Guidance (EPA, 2011) recommends "Reduce outage risk through system redundancy/resiliency and repair capabilities..."

All 28 alternatives were evaluated against criteria established for meeting primary Program goals. The results of this screening process are presented graphically at the end of Sections 4 and 5 for the north and south alternatives, respectively. Overall, alternatives satisfying the Program's primary goals of meeting projected water demand and reliability criteria met the primary Program goals (green) and advanced to Tier 2. Alternatives not satisfying these primary Program goals were eliminated from further evaluation (red).

3.1.1. Water Demand

Under this criterion, the alternatives were evaluated for their ability to meet projected water demands using data from previously performed hydraulic modeling and analyses. The metropolitan water system typically experiences higher daily water demand ("high day demand") during the summer months. To ensure the alternatives could meet the water demands all year long, the hydraulic modeling and analyses was conducted with a high day demand applied to the system. If it was apparent that an alternative could not meet projected high day demands, that alternative was eliminated from further evaluation (red). If previously performed hydraulic modeling suggested the alternative would meet projected high day demands, the alternative satisfied this criterion (green).

3.1.2. System Reliability and Resilience

The Reliability and Resilience criterion addressed the ability of an alternative to provide uninterrupted service when the Metropolitan Tunnel System is offline for maintenance or in an emergency. An alternative must achieve redundancy without over-pressurizing pipelines in the MWRA or community water systems, which could increase the risk of pipeline breaks and cause service disruptions. If an alternative result in substantial water pressure increases or the use of an emergency pumping station without adequate pipe capacity and equalization storage, this could cause over-pressurization and surges in MWRA and local systems.

Alternatives that could cause over-pressurization and pressure surges did not meet system reliability and resiliency requirements, and were eliminated from further evaluation (red).

3.2. Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment

Alternatives satisfying Tier 1 criteria were further evaluated for their feasibility, potential impacts and constructability in Tier 2 of the screening process. Tier 2 involved a high-level assessment of alternatives in four categories. These categories were selected to capture the critical impacts of each alternative in terms of engineering, environmental and social impacts, changes to operations, and potential cost factors.

Alternatives that were evaluated positively in Tier 2 moved forward were for further evaluation (green). Alternatives that were evaluated negatively in Tier 2 were eliminated from further evaluation (red).

3.2.1. Engineering Criteria

3.2.1.1. Impact to Existing Utilities and Structures

Alternatives such as the installation of surface pipelines via open trench excavation would impact existing infrastructure, utilities, and structures. Surface pipeline installation could include large (48 to 84-inch) diameter pipeline over long distances and/or surface connections to existing infrastructure. Generally, a multi-phase construction approach would be required to first relocate existing utilities to make room for the new larger diameter pipeline, and then to install the new pipeline itself. Construction impacts could include, but not be limited to, utility relocation, underpinning of existing buildings or bridges, roadway closures and long-term impacts to existing infrastructure/utilities/structures (e.g., settlement). In addition, a multi phased construction approach would extend the construction duration and length of impact to communities. Proposed surface pipeline alignments within dense urban areas (e.g., Waltham, Newton, Boston) could have substantial impacts and a longer duration of construction compared to lesser developed areas. The potential extents of these impacts were considered in the alternative screening analysis.

Alternatives that would require only limited and geographically contained utility relocations with no major impacts on existing infrastructure, utilities, and structures were evaluated positively for this criterion (green). Alternatives that had extensive disruptions through dense urban areas of utility relocations, longer lengths of large diameter pipes, or major impacts on existing structures were evaluated negatively for this criterion (red)

3.2.1.2. Additional Water Supply Benefits

Some Program alternatives offer additional benefits by providing redundant connections to existing pumping stations.

Alternatives that can potentially provide additional water supply benefits were evaluated positively for this criterion (green). Alternatives that cannot reasonably provide such additional water supply benefits were evaluated negatively for this criterion (red).

In some cases, certain north alternatives may only be fully functional when paired with certain south alternatives. A negative evaluation on either the north or south segment on this criterion would impact both alternatives.

3.2.2. Environmental/Social Criteria

3.2.2.1. Vibration, Noise and Dust Pollution Impacts

Impacts such as vibration, noise, and dust pollution due to construction equipment and various construction activities were evaluated for all alternatives. These impacts can cause disruptions to local residences and businesses.

Alternatives that had the potential for only localized impacts to geographically limited areas during construction (such as tunnel alternatives) were evaluated positively for this criterion (green). Alternatives that had the potential for major geographically widespread sustained construction activities including multiple periods/phases for disruptions (such as surface pipeline alternatives), were evaluated negatively for this criterion (red).

3.2.2.2. Traffic Impacts

Potential traffic impacts during construction were an important criterion in the alternative's analysis. It would be beneficial to the public to keep prolonged road closures and/or road detours to a minimum in the impacted communities. Road closures and detours could have impacts to emergency vehicle operations and school bus routes.

In addition, many of the potentially impacted communities are serviced by Massachusetts Bay Transportation Authority (MBTA) bus routes. Construction along bus routes would require coordination with the MBTA and may cause bus service disruption and schedules delays.

Generally, traffic impacts for surface pipe installation are widely spread out geographically and over a long duration, possibly several years. Tunneling alternatives involve primarily trucking traffic at specific sites. Alternatives that had limited or geographically contained impacts to traffic operations or access to roadways were evaluated positively for this criterion (green). Alternatives that had the potential for widespread traffic impacts and public roadway closures/detours were evaluated negatively for this criterion (red).

3.2.3. Operational Criteria

This criterion addresses the potential impacts to operations and maintenance processes and procedures in addition to potential service disruptions. Surface piping tends to require more frequent maintenance compared to deep tunnels. Shallow excavations related to surrounding utilities and roadway improvement projects can impact the Authority's surface pipelines.

Alternatives that do not involve a substantial increase in surface piping were evaluated positively for this criterion (green). Alternatives that involve substantial lengths of new surface piping and associated maintenance were evaluated negatively for this criterion (red).

3.2.4. Cost Factors

3.2.4.1. Building Beyond Program Purpose / Sustainability and Predictability for Ratepayers

When selecting a preferred alternative, the financial impacts on ratepayers due to the construction of the infrastructure to achieve the Program goals must be considered. Evaluation under this criterion considered MWRA's multi-year rates management strategy to provide sustainable and predictable assessment to the impacts on ratepayers.

Alternatives were evaluated to determine if they included more infrastructure than needed to satisfy the primary goal of the Program outlined in Section 1.4. In general, longer pipelines or tunnels add capital

cost, upkeep/maintenance, and construction time. This could also result in delays to the delivery of the Program and benefits of service to the public.

Alternatives that presented more infrastructure and associated costs than necessary to create the required system redundancy and potential to delay the delivery of the project were evaluated negatively for this criterion (red).

Table 3-1: Alternative Screening Criteria

Tier 1 - Meeting the Primary Program Goals			
Evaluation Criteria	Evaluation Questions	Yes	No
Water Demand	Does the alternative meet projected high day demand?	Alternative meets projected high day demands	Alternative does not meet projected high day demands
System Reliability and Resilience	Does the alternative achieve redundancy and resiliency without over-pressurizing pipelines in the existing system or municipalities?	The alternative achieves redundancy and resiliency without over-pressurizing pipelines.	The alternative does not achieve redundancy and resiliency without potentially over-pressurizing pipelines.

Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment				
Category	Evaluation Criteria	Evaluation Questions	Positive	Negative
Engineering	Impact on Existing Utilities and Structures	Does the alternative minimize widespread areas of utilities relocations and impacts to existing structures?	Limited and geographically contained areas of utility relocations and minimal impacts on existing structures.	Extensive and geographically widespread areas of utility relocations with potential major impacts on existing structures.
	Additional Water Supply Benefits	i. Does the alternative provide redundancy to more communities that currently rely on a single water supply than other alternatives? ii. Does this (north or south) alternative tie to another (north or south) alternative that did not satisfy this criterion?	i. This alternative can potentially provide redundancy to more communities that currently rely on a single water supply than other alternatives. ii. This alternative does not tie to another alternative that did not satisfy this criterion.	i. This alternative provides redundancy to fewer communities that currently rely on a single water supply than other alternatives. ii. This alternative ties into another alternative that did not satisfy this criterion.

Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment				
Category	Evaluation Criteria	Evaluation Questions	Positive	Negative
Environmental/ Social	Vibration, Noise and Dust Pollution Impacts	What is the extent of construction activity impacts such as vibration, noise and dust pollution on residential and commercial areas?	Localized impacts or geographically limited areas during construction.	Potential for major geographically widespread impacts including multiple periods/phases for construction activities.
	Traffic Impacts	What is the extent of roadway closures, detours, and disruptions that will be required during construction?	Limited or geographically contained construction within roadways.	Widespread impacts and road closures/detours on public roadways.
Operational Criteria		Will the new alternative substantially increase the length of surface pipe in the water system and associated maintenance?	Length of surface pipe and associated maintenance is not substantially changed.	Substantial increase in length of surface pipe in the water system and associated maintenance.
Cost Factors	Building Beyond Program Purpose / Sustainability and Predictability for Ratepayers	Does the alternative include more infrastructure than the Program needs?	Alternative provides the redundancy needed with no additional significant infrastructure.	Alternative provides the redundancy needed plus significant additional infrastructure beyond what is needed potentially increasing schedule and delaying delivery of the beneficial use of the Program.

4.0 North Alternatives and Screening Evaluation

The thirteen alternatives evaluated for the north portion of the system can be grouped into the following three categories:

1. Operational changes to the existing system to increase capacity
2. Increasing the capacity of the existing 60-inch WASM 3 pipeline by pumping or replacing WASM 3 with a larger capacity pipeline
3. Increasing capacity through construction of a new deep rock tunnel

A narrative summarizing each of the alternatives and their evaluation is presented below.

4.1. Category 1 – Operational Changes to Existing System

4.1.1. Alternative 1N

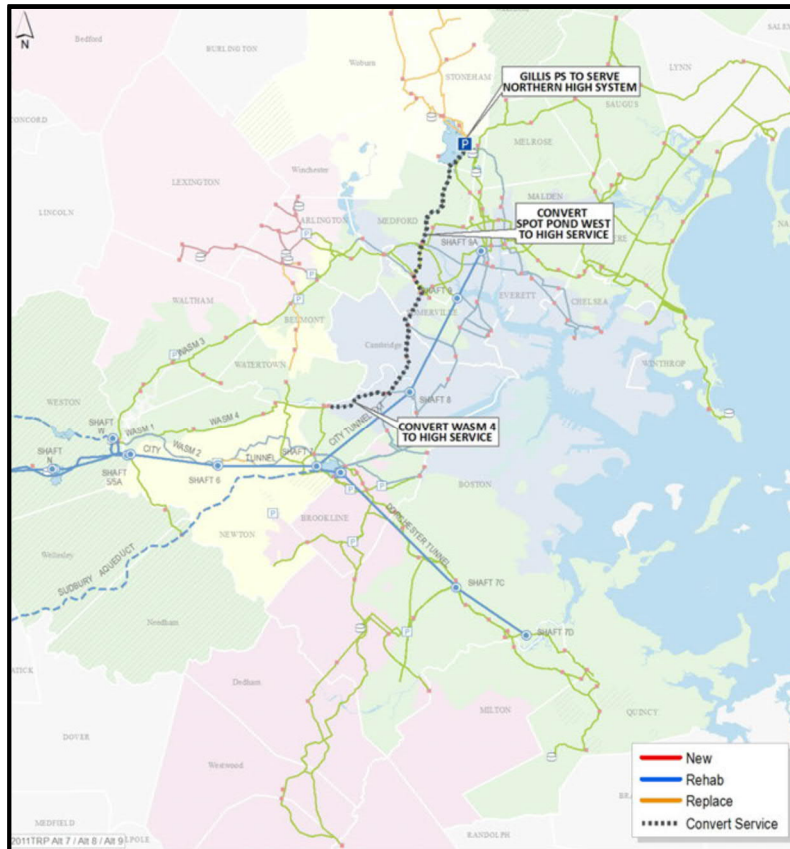


Figure 4-1: Alternative 1N

Alternative 1N consists of converting two miles of the existing 90-year old, 48-inch diameter WASM 4 pipeline and the entire seven miles of the existing 120-year old, 48-inch diameter West Spot Pond Supply Main (SPSM) pipeline to the high service system by increasing the water pressure in the pipelines in order to meet the required water demand. Both pipelines are aging water pipelines that have been rehabilitated to extend their useful life, however, they are still subject to external corrosion and thus have a limited remaining useful life. New pressure reducing valves would be needed to avoid over-pressurizing municipal systems along the West SPSM. This alternative requires a reconfiguration of the distribution system and increased use of the Gillis Pumping Station to sufficiently supply water to the Northern High Service System. The West SPSM would need to be evaluated to determine if it is capable of being operated at higher pressure, if not, it would require replacement.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Does not meet projected high day demand	Conversion of the West Spot Pond Supply Main from low to high service pressure has the potential to produce excessive pressure surges and swings that increases the risk of pipe failures

Alternative eliminated from further evaluation.

4.2. Category 2 – Replace WASM 3 with Larger Surface Pipeline and/or Add Pumping Station

This category of alternative involves increasing the diameter of existing surface pipelines; some alternatives include increasing pressure in the existing pipeline by the addition of an emergency pumping station.

4.2.1. Alternative 2N

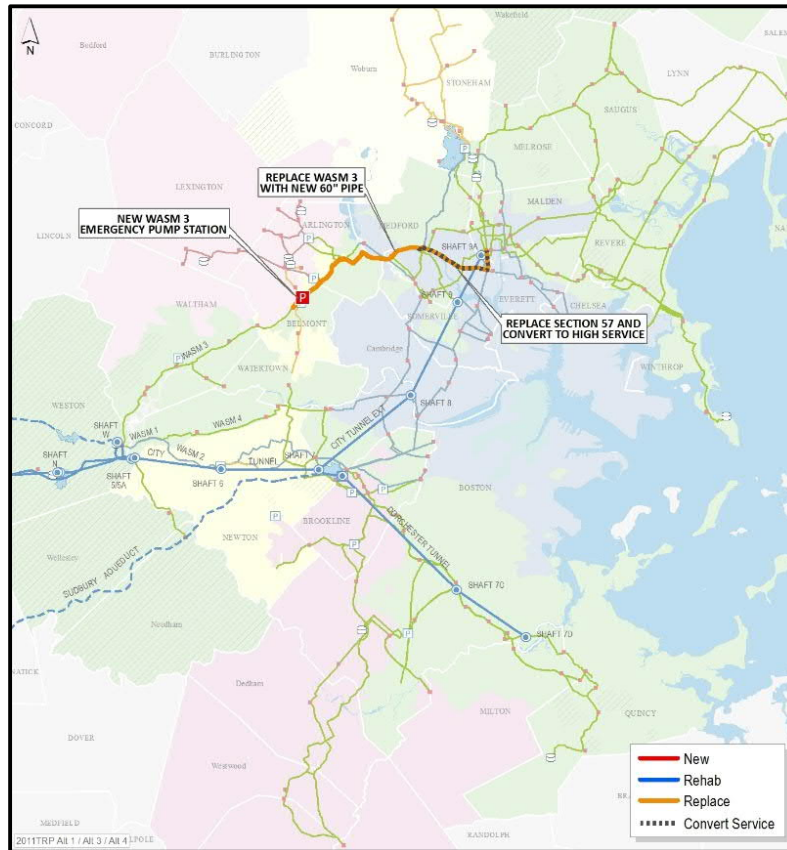


Figure 4-2: Alternative 2N

Alternative 2N involves constructing a new WASM 3 emergency pumping station in Belmont to increase the water pressure (and Hydraulic Grade Line (HGL) elevation) through the eastern portion of the WASM 3 pipeline. The alternative would also replace the existing 56-inch and 60-inch diameter WASM 3 pipeline with several miles of new 60-inch diameter pipeline constructed by open trench excavation from the discharge line of the new emergency pumping station in Belmont to the east to the Section 12 pipeline in Medford. Replacement of the pipeline is necessary because with the use of an emergency pumping station, the discharge pressure will exceed the structural capacity of the existing WASM 3 pipeline.

Section 57 is a pipeline in the Low Service system that currently carries minimal flow. In order to sufficiently meet the minimum required HGL elevations within the distribution pipelines in Somerville and Medford, Section 57 would be converted to the High Service system and would provide additional capacity to the service area east of Shaft 9A. Converting Section 57 to High Service would require a rehabilitation or replacement to handle the added flow.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Meets projected high day demand	Requires the construction of an emergency pumping station to the north. Has the potential to produce excessive pressure surges and swings that would increase the risk of pipe failures in MWRA and local water systems.

Alternative eliminated from further evaluation.

4.2.2. Alternative 3N

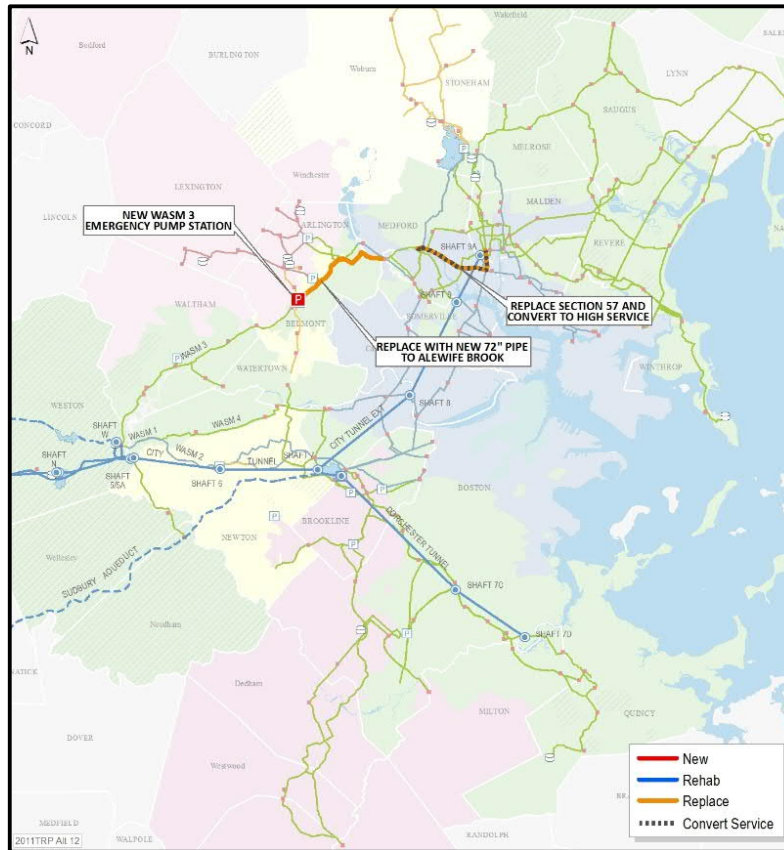


Figure 4-3: Alternative 3N

Similar to Alternative 2N, Alternative 3N involves constructing a new WASM 3 emergency pumping station in Belmont to increase the water pressure and HGL elevation through the eastern portion of the WASM 3 pipeline. This alternative would replace the existing 60-inch diameter WASM 3 pipeline with several miles of new 72-inch diameter pipeline by open trench excavation from the discharge line of the new emergency pumping station in Belmont eastward to Somerville. With the use of an emergency pumping station, replacement of the pipeline is necessary as the discharge pressure will exceed the structural capacity of the existing WASM 3 pipeline. The increase in diameter is also needed to increase the supply to meet redundancy requirements.

Alternative 3N would convert Section 57 to the High Service system by removing and replacing the pipeline and increasing the water pressure in the pipeline.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Meets projected high day demand	Requires the construction of an emergency pumping station to the north. Has the potential to produce excessive pressure surges and swings that would increase the risk of pipe failures in MWRA and local water systems.

Alternative eliminated from further evaluation.

4.2.3. Alternative 4N

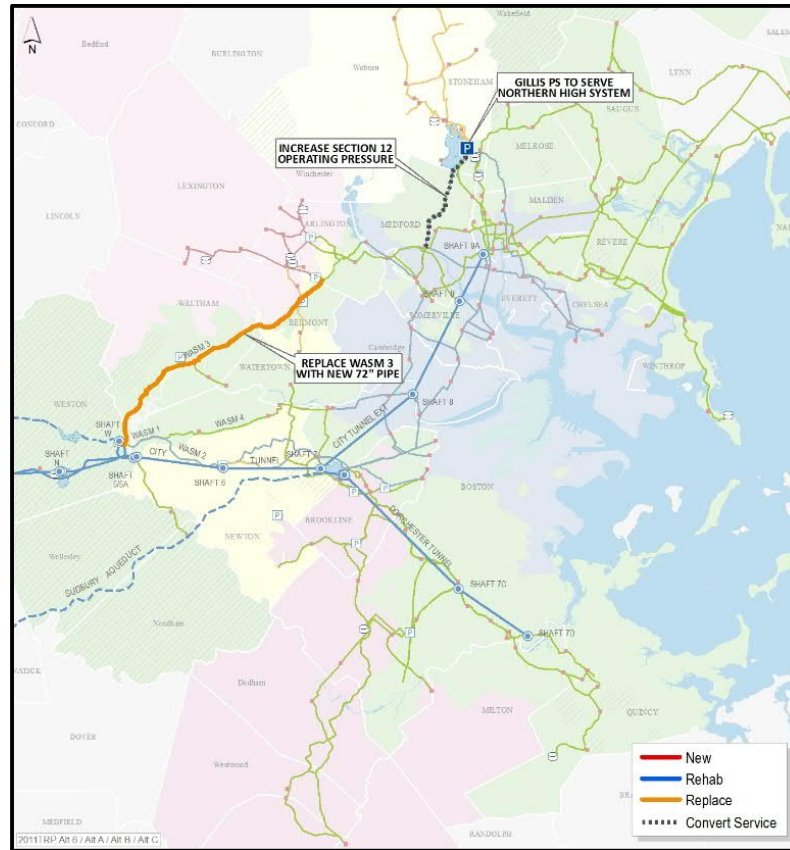


Figure 4-4: Alternative 4N

Alternative 4N involves replacing approximately seven miles of the existing 60-inch diameter WASM 3 pipeline with new, larger 72-inch diameter pipeline by open trench excavation through urban areas and roadways from Weston to the Spring Street Pumping Station in Arlington.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer
Extensive and geographically widespread areas of utility relocations, major impacts on existing structures.	Does not provide redundant connections to pump stations along WASM 3.	Major widespread impacts.	Widespread impacts and road closures/detours on public roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.

Alternative eliminated from further evaluation.

4.2.4. Alternative 5N

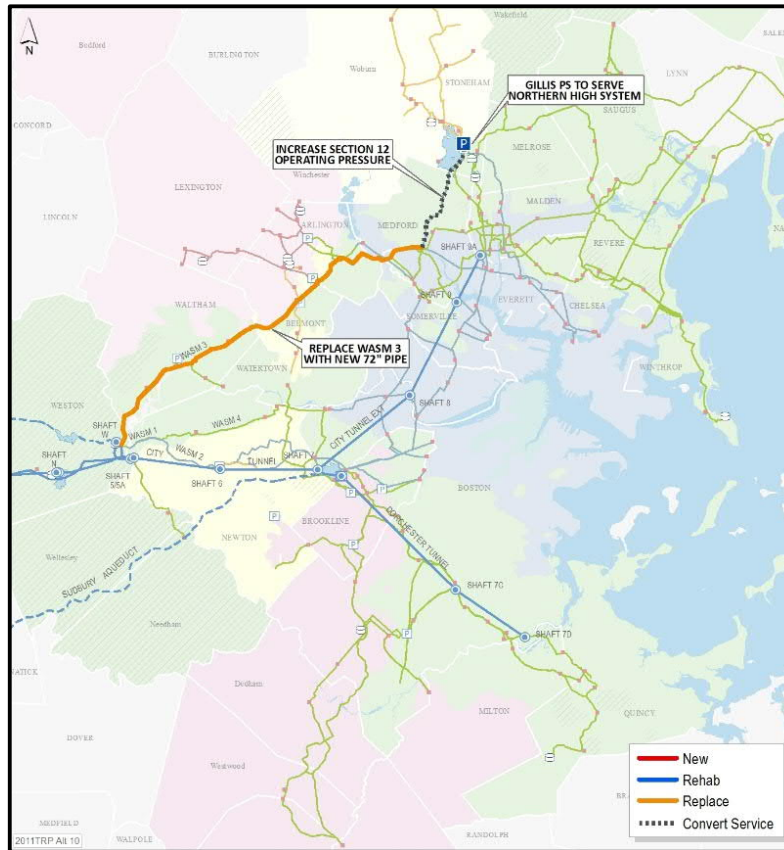


Figure 4-5: Alternative 5N

Alternative 5N would replace the existing 56-inch and 60-inch diameter WASM 3 pipeline with eleven miles of new 72-inch diameter pipe by open trench excavation through urban areas and roadways from Weston to Medford.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer
Extensive and geographically widespread areas of utility relocations, major impacts on existing structures.	Does not provide redundant connections to pump stations along WASM 3.	Major widespread impacts.	Widespread impacts and road closures/detours on public roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.

Alternative eliminated from further evaluation.

4.2.5. Alternative 6N

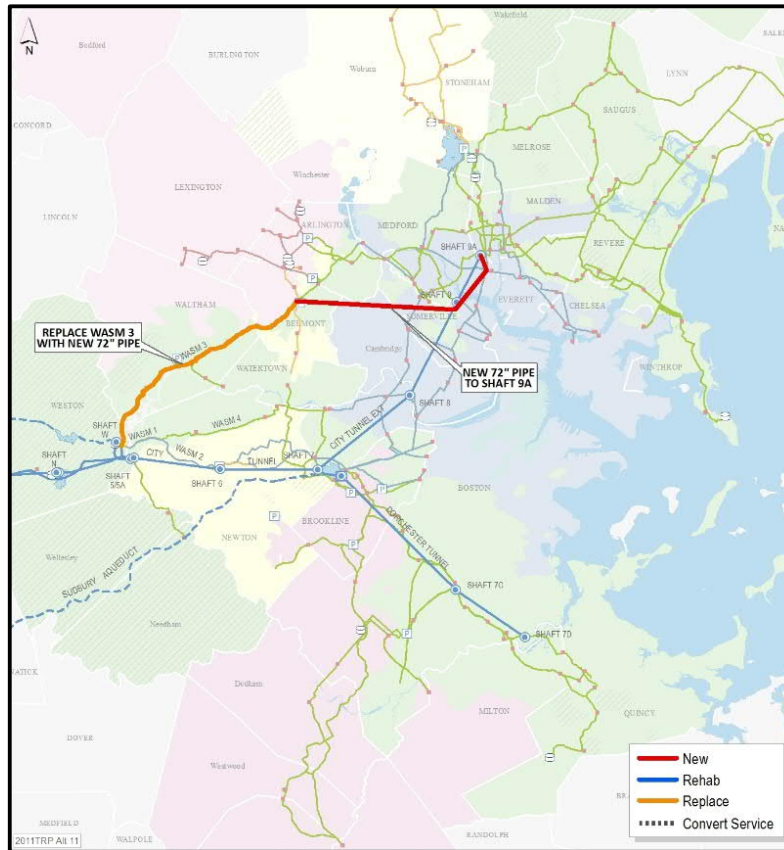


Figure 4-6: Alternative 6N

Alternative 6N would replace the existing 56-inch and 60-inch diameter WASH 3 pipeline with 7 miles of new 72-inch diameter pipe by open trench excavation through urban areas and roadways from Weston to Belmont.

This alternative would also involve constructing approximately 7 miles of new 72-inch diameter pipeline (referred to as the proposed WASH 5) from Belmont to Shaft 9A on the City Tunnel Extension at the Medford/Malden town line.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Does not meet projected high day demand	Meets system reliability and resilience

Alternative eliminated from further evaluation.

4.2.6. Alternative 7N

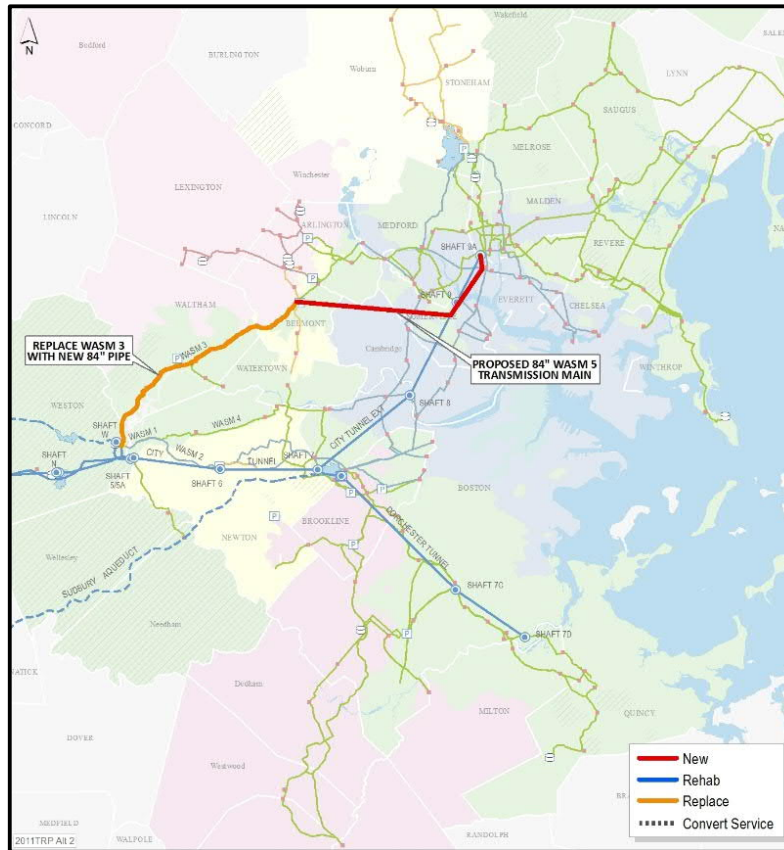


Figure 4-7: Alternative 7N

Alternative 7N consists of replacing the existing 56-inch and 60-inch diameter WASM 3 pipeline with 7 miles of new 84-inch diameter pipe by open trench excavation through urban areas and roadways from Weston to Belmont.

Construction of approximately 7 miles of new 84-inch diameter pipeline is referred to as the proposed WASM 5 from Belmont to Shaft 9A on the City Tunnel Extension at the Medford/Malden town line.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer
Extensive and geographically widespread areas of utility relocations, major impacts on existing structures.	Does not provide redundant connections to pump stations along WASM 3.	Major widespread impacts.	Widespread impacts and road closures/detours on public roadways.	Substantial increase in length of surface pipe and associated maintenance.	Alternative includes more infrastructure than necessary to meet Program goals.

Alternative eliminated from further evaluation.

4.3. Category 3 – Deep Rock Tunnel to the North

This category consists of deep rock tunnels constructed using Tunnel Boring Machines (TBM), and tunnel shaft connections to the existing distribution system.

4.3.1. Alternative 8N

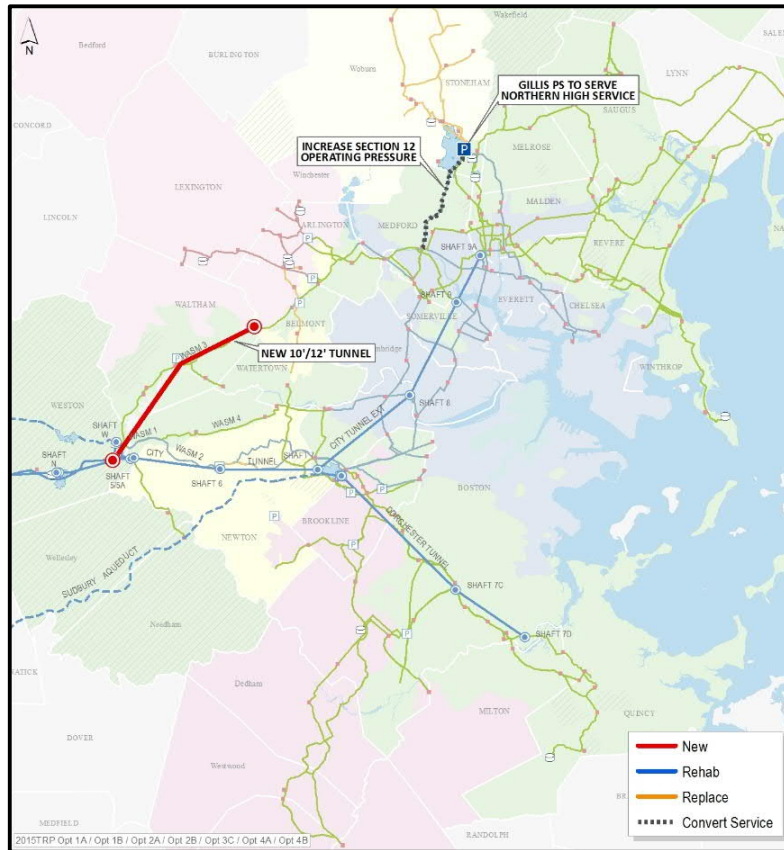


Figure 4-8: Alternative 8N

Alternative 8N consists of constructing approximately 4.5 miles of new 10-foot to 12-foot diameter water supply tunnel from the Shaft 5/5A site area in Weston to a point adjacent to WASH 3 in Waltham near the Belmont town line. This alignment will have three or more tunnel shaft sites for connections to existing MWRA surface pipelines. The alternative has the potential ability to make the connection to the Lexington Street Pumping Station in Waltham.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer
Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Can potentially provide new redundant connections to pump stations along WASH 3.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.

Alternative moved forward for further evaluation.

4.3.2. Alternative 9N

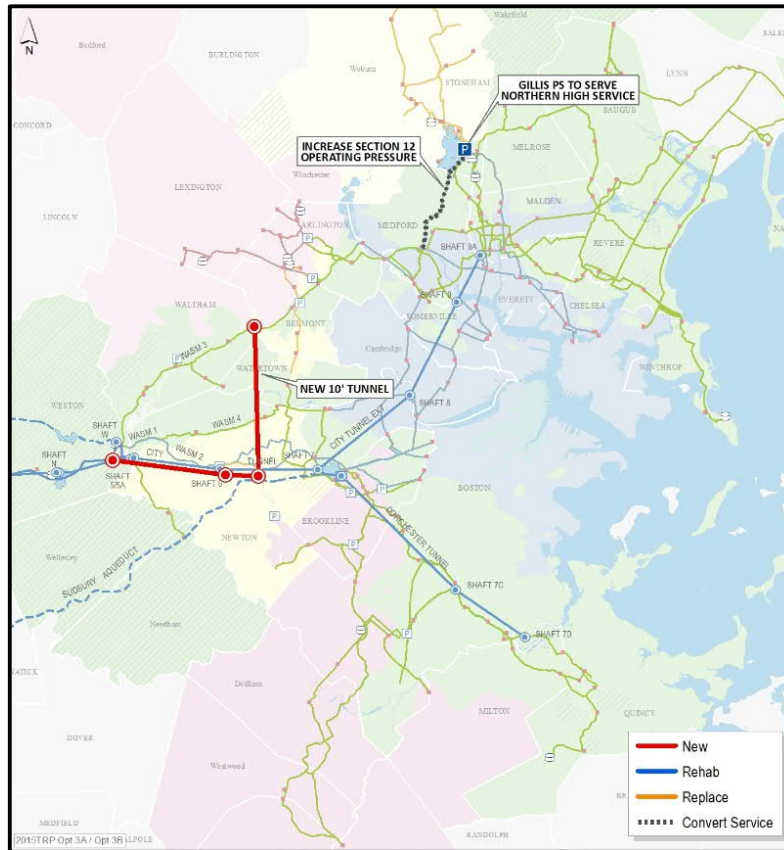


Figure 4-9: Alternative 9N

Alternative 9N consists of constructing approximately six miles of new 10-foot diameter water supply tunnel from the Shaft 5/5A site area in Weston east to Shaft 6 on the City Tunnel and north to a point adjacent to the WASM 3 in Waltham near the Belmont town line. This alignment will have four or more tunnel shaft sites for connections to existing MWRA pipelines.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer
Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Does not provide redundant connections to pump stations along WASM 3.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.

Alternative eliminated from further evaluation.

4.3.3. Alternative 10N

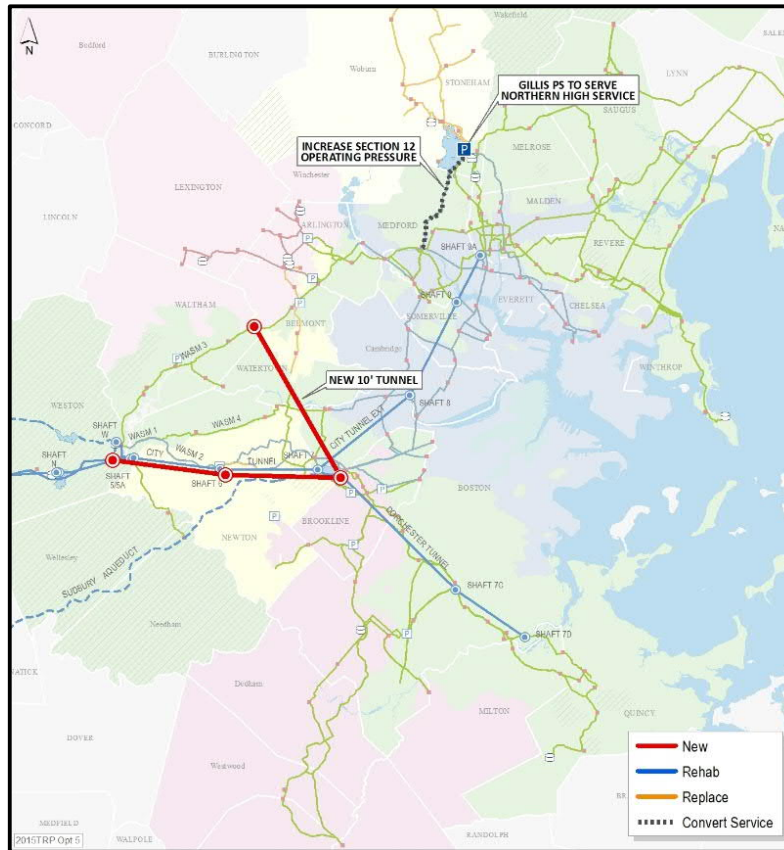


Figure 4-10: Alternative 10N

Alternative 10N consists of constructing approximately 10 miles of new 10-foot diameter water supply tunnel from the Shaft 5/5A site area in Weston east to Shaft 7B in Boston and northwest to a point adjacent to WASM 3 in Waltham near the Belmont town line. This alignment will have four or more tunnel shaft sites for connections to existing MWRA distribution system.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer
Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Does not provide redundant connections to pump stations along WASM 3.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.

Alternative eliminated from further evaluation.

4.3.4. Alternative 11N

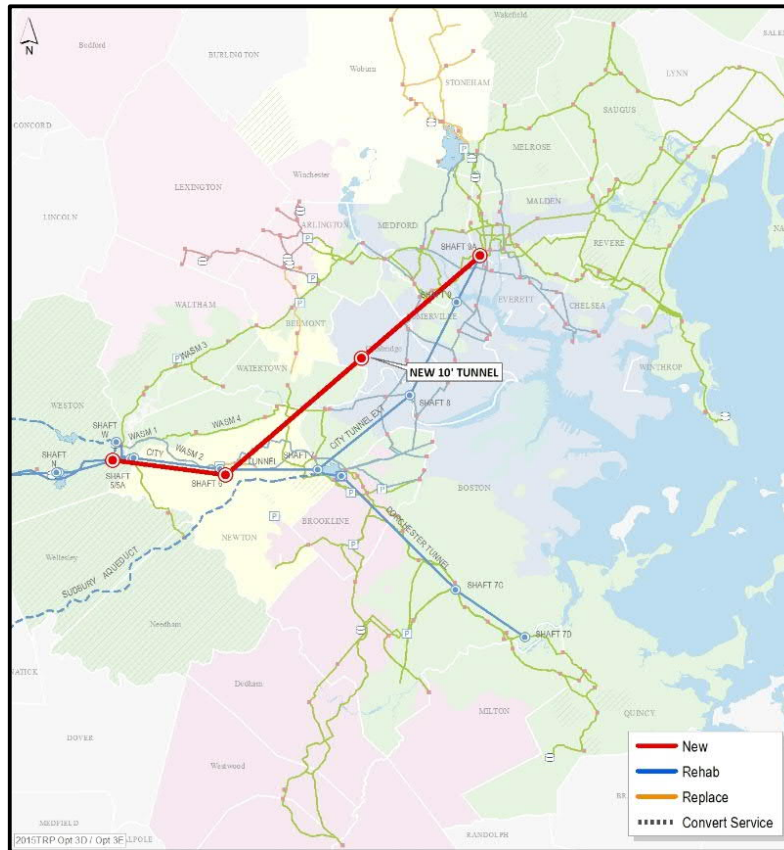


Figure 4-11: Alternative 11N

Alternative 11N consists of constructing approximately 11 miles of new 10-foot diameter water supply tunnel from the Shaft 5/5A site area in Weston east to Shaft 6 in Newton and northeast to a point adjacent to Shaft 9A near the Malden town line. This alignment will have four or more tunnel shaft sites for connections to existing MWRA distribution system.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer
Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Does not provide redundant connections to pump stations along WASM 3.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative includes more infrastructure than necessary to meet Program goals with the extension to the Malden Town line.

Alternative eliminated from further evaluation.

4.3.5. Alternative 12N

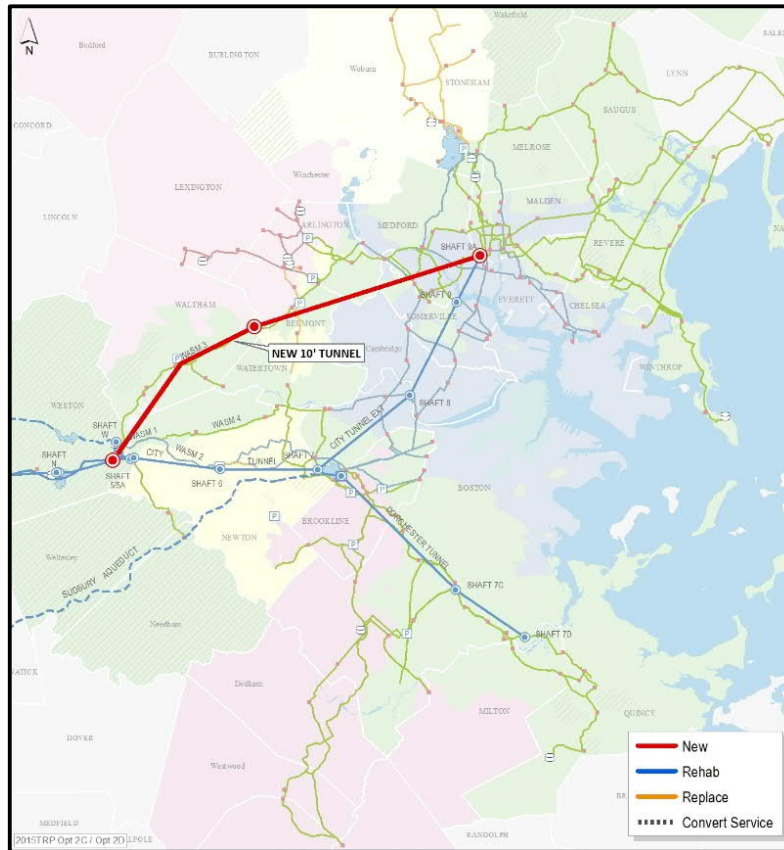


Figure 4-12: Alternative 12N

Alternative 12N consists of constructing approximately 10 miles of new 10-foot diameter water supply tunnel from the Shaft 5/5A site area in Weston northeast to a point adjacent to WASM 3 in Waltham near the Belmont town line and then northeast to Shaft 9A at the Malden town line. This alignment will have three or more tunnel shaft sites for connections to existing MWRA distribution system. The alternative has the potential ability to make the connection to the Lexington Street Pumping Station in Waltham.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional. Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer
Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Can potentially provide new redundant connections to pump stations along WASM 3.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative includes more infrastructure than necessary to meet Program goals with the extension to the Malden town line.

Alternative eliminated from further evaluation.

4.3.6. Alternative 13N

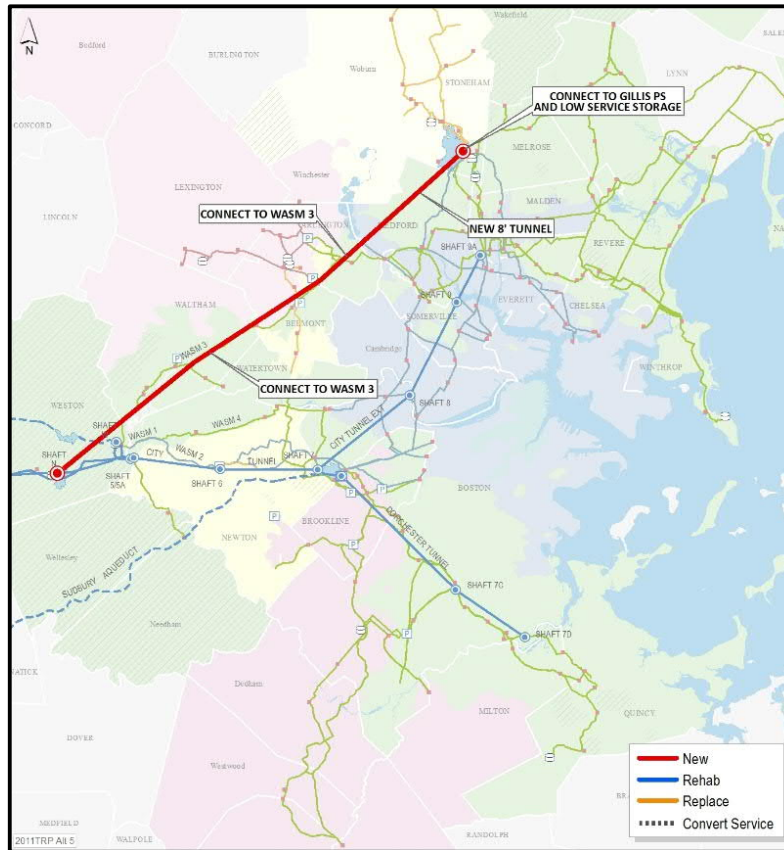


Figure 4-13: Alternative 13N

Alternative 13N consists of constructing approximately 13.5 miles of new 8-foot diameter water supply deep rock tunnel from Shaft N in Weston northeast to a point near Waltham center, northeast to a point adjacent to the WASM 3 in Waltham near the Belmont town line and then northeast to the Gillis Pumping Station and the Low Service Storage covered reservoir in Stoneham. The alternative has the potential ability to make the connection to the Lexington Street Pumping Station in Waltham.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Sustainability and Predictability
Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Can potentially provide new redundant connections to pump stations along WASM 3.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative includes more infrastructure than necessary to meet Program goals by extension to Stoneham and starting at Shaft N.

Alternative eliminated from further evaluation.

4.4. Summary

Based on the screening of the north alternatives using the Tier 1 and Tier 2 evaluation criteria, the alternative that advances for further evaluation is Alternative 8N. Alternative 8N consists of constructing approximately 4.5 miles of new water supply tunnel from the Shaft 5/5A site area in Weston to a point adjacent to WASM 3 in Waltham near the Belmont town line. This alternative will allow for a connection to provide redundancy for the Northern Extra High Service areas which serves Waltham. This alignment would have two to four tunnel shaft sites for connections to the existing Authority or local water systems. Tables 4-1 and Table 4-2 provide a summary of the Tier 1 and Tier 2 screening evaluation for the north alternatives. The advancement of this alternative to conceptual design will confirm the starting and end points of the north deep rock tunnel, and the specific alignment and connection points to the existing distribution system and will be paired with a south alternative.



Figure 4-14: Selected North Alternative (8N)

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Table 4-1: North Alternative Detailed Screening Analysis Tier 1

Alternative Number	Water Demand	System Reliability and Resilience	Status
1N	Does not meet projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
2N	Meets projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
3N	Meets projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
4N	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2
5N	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2
6N	Does not meet projected high day demand	Meets system reliability and resilience	Not advanced to Tier 2
7N	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2
8N	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2
9N	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2
10N	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2
11N	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2
12N	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2
13N	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2

Legend:

Alternative did not meet Program Goals (red)

Alternative met Program Goals (green)

Table 4-2: North Alternative Detailed Screening Analysis Tier 2

Alternative Number	Engineering		Environmental/Social		Operational Criteria	Cost Factors	Advanced for Further Evaluation
	Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts		Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer	
4N	Extensive and geographically widespread areas of utility relocations, major impacts on existing structures.	Does not provide redundant connections to pump stations along WASM 3.	Major widespread impacts.	Widespread impacts and road closures/detours on public roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides just the redundancy needed with no additional significant infrastructure or cost.	No
5N	Extensive and geographically widespread areas of utility relocations, major impacts on existing structures	Does not provide redundant connections to pump stations along WASM 3.	Major widespread impacts	Widespread impacts and road closures/detours on public roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides just the redundancy needed with no additional significant infrastructure or cost.	No
7N	Extensive and geographically widespread areas of utility relocations, major impacts on existing structures	Does not provide redundant connections to pump stations along WASM 3.	Major widespread impacts	Widespread impacts and road closures/detours on public roadways.	Substantial increase in length of surface pipe and associated maintenance.	Alternative includes more infrastructure than necessary to meet Program goals.	No
8N	Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Can potentially provide new redundant connections to pump stations along WASM 3.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.	Yes
9N	Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Does not provide redundant connections to pump stations along WASM 3.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.	No

Alternative Number	Engineering		Environmental/Social		Operational Criteria	Cost Factors	Advanced for Further Evaluation
	Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts		Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer	
10N	Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Does not provide redundant connections to pump stations along WASM 3.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.	No
11N	Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Does not provide redundant connections to pump stations along WASM 3.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative includes more infrastructure than necessary to meet Program goals.	No
12N	Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Can potentially provide new redundant connections to pump stations along WASM 3.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative includes more infrastructure than necessary to meet Program goals.	No
13N	Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Can potentially provide new redundant connections to pump stations along WASM 3.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative includes more infrastructure than necessary to meet Program goals.	No

Legend:

Alternative evaluated negatively for this criterion (red)

Alternative evaluated positively for this criterion (green)

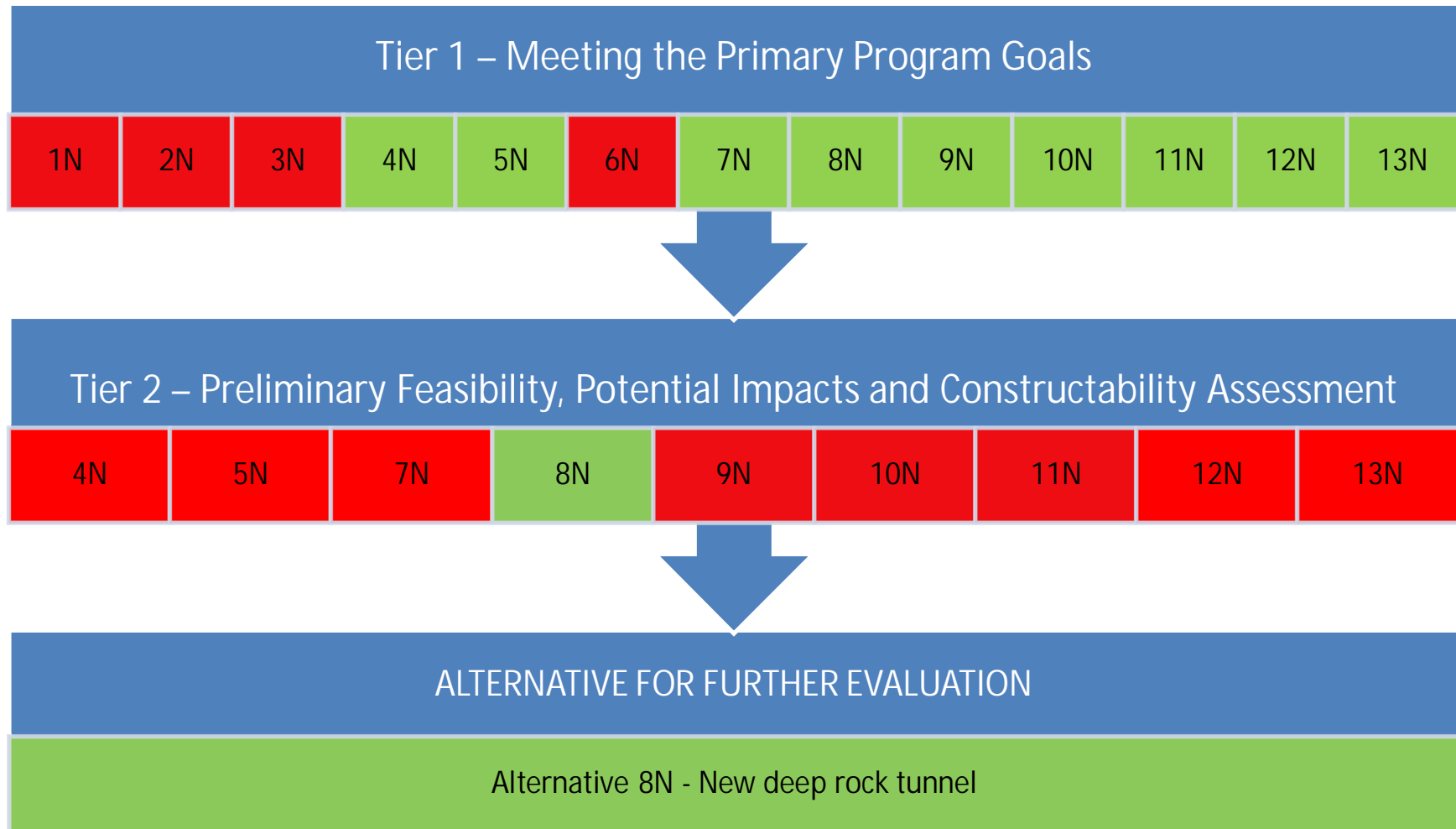


Figure 4-15: North Alternative Screening Summary

5.0 South Alternatives and Screening Evaluation

The 15 alternatives considered for the south portion of the system can be grouped into the following three categories:

1. Construction of a surface pipeline or Deep Rock Tunnel in the vicinity of Shaft 5/5A or Shaft N to connect to the Sudbury Aqueduct, and sliplining the Sudbury Aqueduct to the Chestnut Hill Emergency Pumping Station (CHEPS), and improvements to the CHEPS,
2. Construction of a surface pipeline in the vicinity of Shaft 5/5A to the existing MWRA distribution system along the route of the Dorchester Tunnel, and
3. Construction of a new deep rock tunnel with connections to the existing MWRA distribution system.

Some of the tunnel and surface pipe alternatives considered in the 2011 and 2012 studies include a connection to Shaft 6 of the City Tunnel, located behind the Authority's Commonwealth Avenue Pumping Station (CAPS). This connection point was originally included to supply the Intermediate High and Northern High pressure zones. However, this connection to the CAPS is no longer needed due to recent upgrades at the pumping station and other pipeline improvements in the vicinity that are being implemented since the alternatives were developed. While this connection is shown in several alternatives during the analysis, it is not a distinguishing factor in the screening assessment. A narrative of the south alternatives and the screening evaluation is presented below.

5.1. Category 1 – Pipeline to Sudbury Aqueduct/Slipline Sudbury Aqueduct or Deep Rock Tunnel to Chestnut Emergency Pumping Station

This group of alternatives focus on bringing the water supply to the existing CHEPS. To achieve this, a variety of options were evaluated, including sliplining the Sudbury Aqueduct, new deep rock tunnels, and new surface pipeline sections.

All of the Category 1 alternatives require improvements to the CHEPS to provide regular (non-emergency) supply through the Southern High Service surface pipelines. Pumping into the Southern High will raise pressures and possibly create surges in the aging surface pipelines in this service area. The proposed improvements to the CHEPS include new motors and variable speed drives to accommodate the continuous pumping. The pumping station will also need retrofits to the HVAC systems and a standby emergency generator.

Sliplining of the Sudbury Aqueduct is an element of some of this group of alternatives. Sliplining is a method of trenchless rehabilitation, with limited surface excavation except for necessary pits located along the Aqueduct to allow for equipment access. Sliplining would allow for pressurization of the Sudbury Aqueduct to provide adequate supply to the Southern High Service system via the CHEPS at the Chestnut Hill area in Boston.

The proposed surface pipeline connections from the Sudbury Aqueduct to the CAPS would be a redundant suction supply connection and ensure continuous supply to Newton during emergency conditions resulting from other failures.

A note regarding the naming conventions of the alternatives: to be consistent with the descriptions of alternatives used in previous documents, there are no Alternatives 1S through 4S.

5.1.1. Alternative 5S

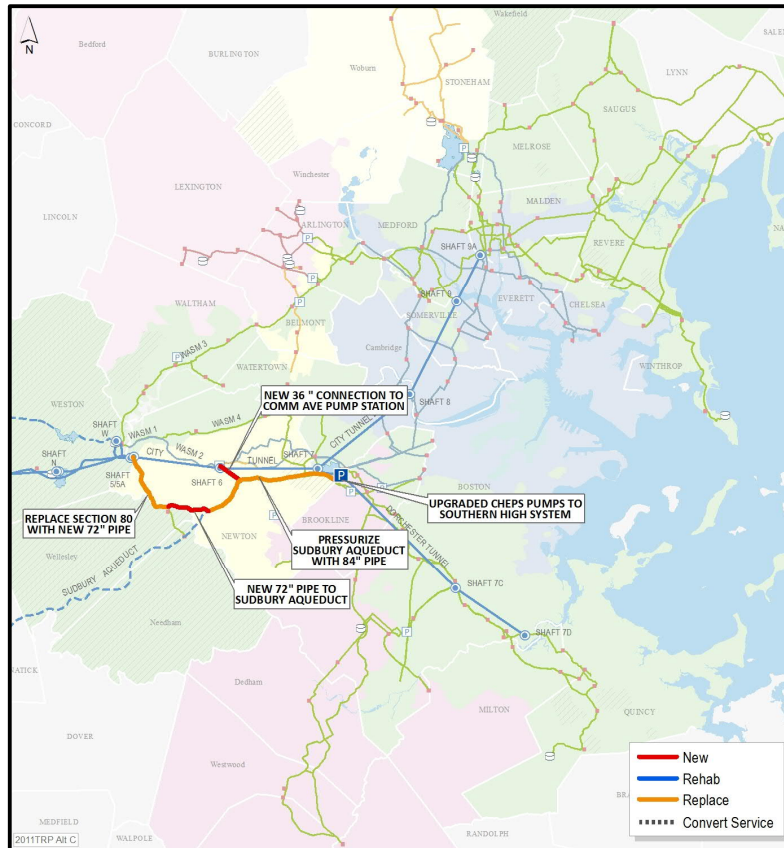


Figure 5-1: Alternative 5S

Alternative 5S consists of replacing approximately 1 mile of the existing 48-inch diameter Section 80 pipeline with new 72-inch diameter surface pipeline by open trench excavation from Weston through Newton. A new 2.5-mile 72-inch surface pipeline would be installed from the Section 80 pipeline at the Newton Lower Falls/Wellesley town line over to the existing Sudbury Aqueduct just west of Newton Center.

Approximately 3 miles of the Sudbury Aqueduct would be pressurized with a new 82-inch diameter pipeline liner via sliplining. The CHEPS would need improvements to supply the southern spine pipelines.

A new 36-inch diameter surface pipeline would be constructed from the Sudbury Aqueduct to the CAPS.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Meets projected high day demand	Does not achieve redundancy without over-pressurizing pipelines because it relies on using CHEPS to provide regular (non-emergency) supply to the undersized aging southern spine pipelines

Alternative eliminated from further evaluation.

5.1.2. Alternative 6S

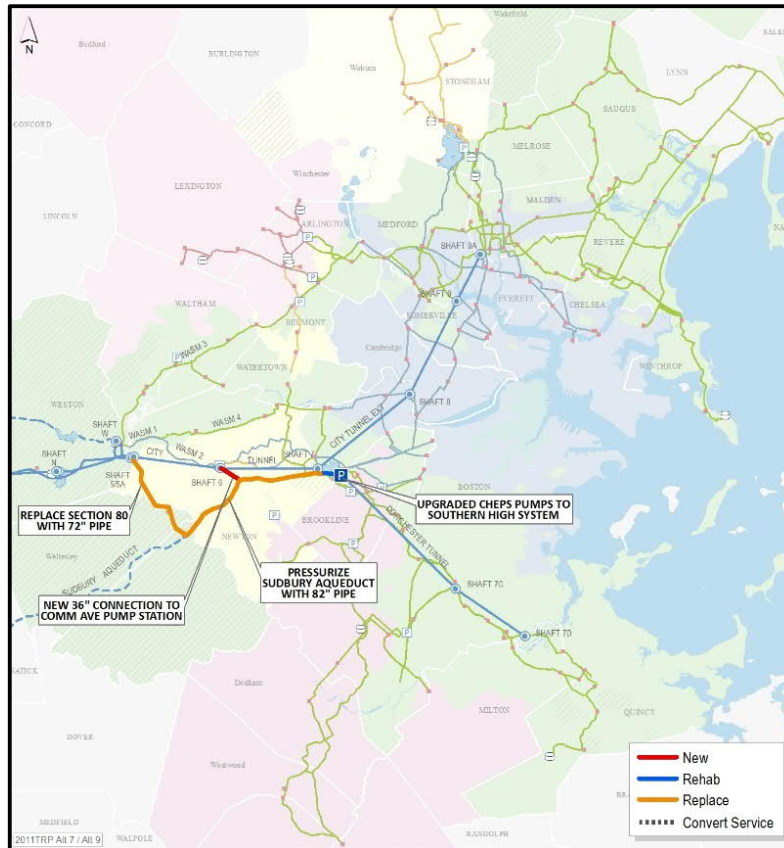


Figure 5-2: Alternative 6S

Alternative 6S consists of replacing the entire existing 48-inch diameter Section 80 pipeline with approximately 3 miles of new 72-inch diameter surface pipeline by open trench excavation from Shaft 5/5A in Weston to Needham at the Sudbury Aqueduct. Approximately 5 miles of the Sudbury Aqueduct would be pressurized with a new 82-inch diameter pipeline liner via sliplining.

The CHEPS would need improvements to supply the southern spine pipelines. A new 36-inch diameter surface pipeline would be constructed from the Sudbury Aqueduct to the CAPS.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Meets projected high day demand	Does not achieve redundancy without over-pressurizing pipelines because it relies on using CHEPS to provide regular (non-emergency) supply to the undersized aging southern spine pipelines

Alternative eliminated from further evaluation.

5.1.3. Alternative 7S

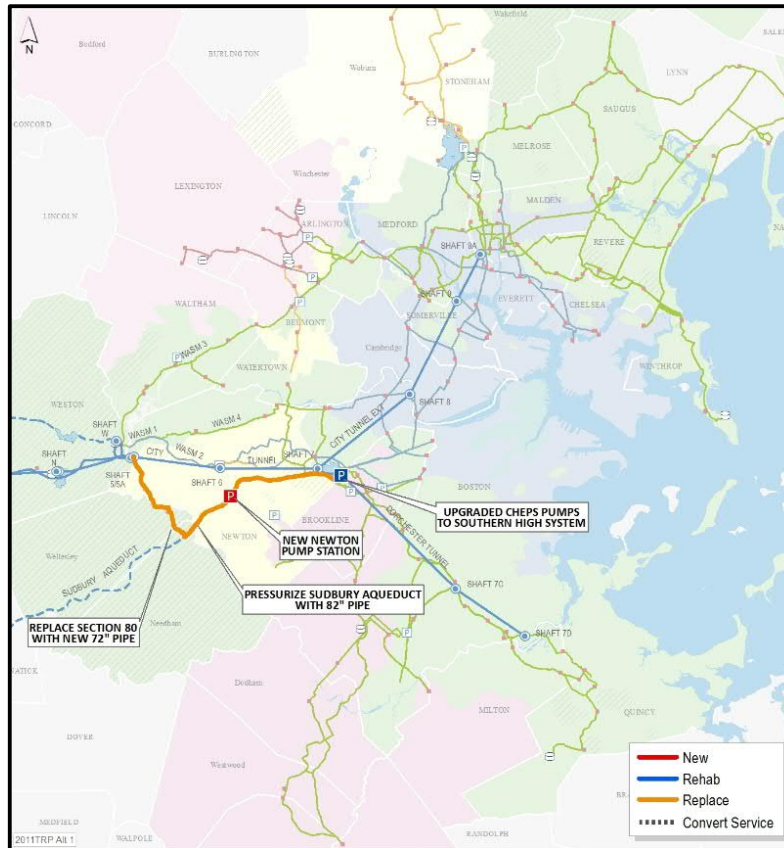


Figure 5-3: Alternative 7S

Alternative 7S consists of replacing the entire existing 48-inch diameter Section 80 pipeline with approximately 3 miles of new 72-inch diameter surface pipeline by open trench excavation from Shaft 5/5A in Weston to Needham at the Sudbury Aqueduct.

Approximately 5 miles of the Sudbury Aqueduct would be pressurized with a new 82-inch diameter pipeline liner via sliplining. The CHEPS would need improvements to supply the southern spine pipelines.

A new pumping station would be constructed along the Sudbury Aqueduct to provide water supply to the city.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Meets projected high day demand	Does not achieve redundancy without over-pressurizing pipelines because it relies on using CHEPS to provide regular (non-emergency) supply to the undersized aging southern spine pipelines

Alternative eliminated from further evaluation.

5.1.4. Alternative 9S

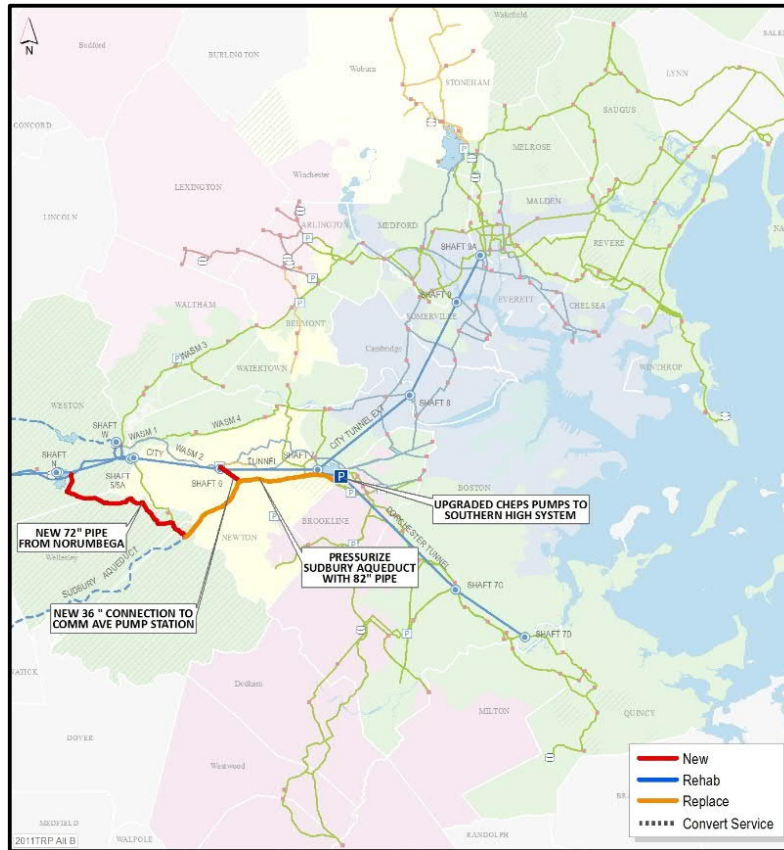


Figure 5-4: Alternative 9S

Alternative 9S consists of constructing approximately 4.5 miles of new 72-inch diameter surface pipeline starting at the Shaft N in Weston through Needham up to the Sudbury Aqueduct.

Approximately five miles of the Sudbury Aqueduct would be pressurized with a new 82-inch diameter pipeline liner via sliplining. The CHEPS would need improvements to supply the southern spine pipelines.

A new 36-inch diameter surface pipeline will be constructed from the Sudbury Aqueduct to the CAPS.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Meets projected high day demand	Does not achieve redundancy without over-pressurizing pipelines because it relies on using CHEPS to provide regular (non-emergency) supply to the undersized aging southern spine pipelines

Alternative eliminated from further evaluation.

5.1.5. Alternative 11S

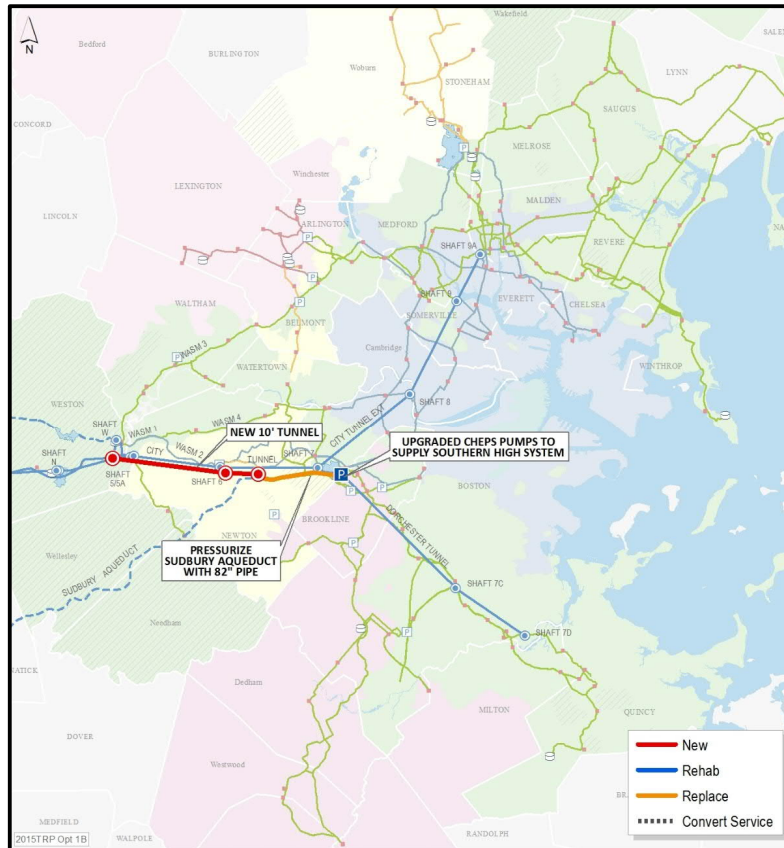


Figure 5-5: Alternative 11S

Alternative 11S consists of constructing approximately 3.5 miles of new 10-foot diameter deep rock tunnel from a connection with the Hultman Aqueduct near Shaft 5/5A in Weston to Shaft 6 on the City Tunnel and then east to a point adjacent to the Sudbury Aqueduct in Newton.

Approximately 2 miles of the Sudbury Aqueduct would be pressurized with a new 82-inch diameter pipeline liner via sliplining. The CHEPS would need improvements to supply the southern spine pipelines.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Meets projected high day demand	Does not achieve redundancy without over-pressurizing pipelines because it relies on using CHEPS to provide regular (non-emergency) supply to the undersized aging southern spine pipelines

Alternative eliminated from further evaluation.

5.1.6. Alternative 12S

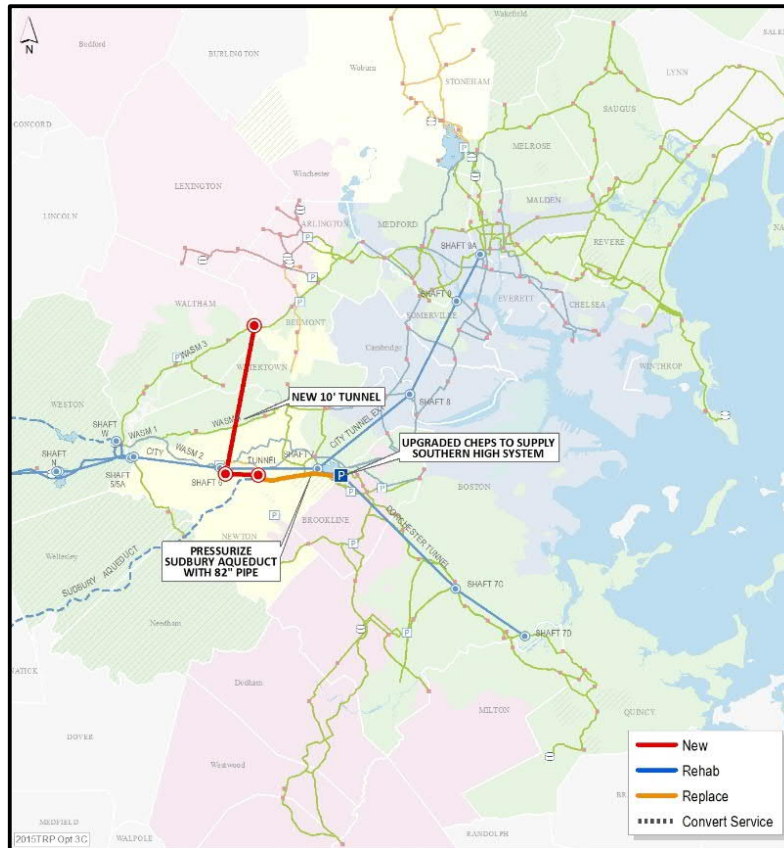


Figure 5-6: Alternative 12S

Alternative 12S consists of constructing approximately 4.5 miles of new 10-foot diameter deep rock tunnel in two sections. One section would be from Shaft 6 on the City Tunnel to the Sudbury Aqueduct in Newton and the other from Shaft 6 to a point on the WASM 3 near the Belmont/Waltham town line. It should be noted that this alternative does not make a connection at the Shaft 5/5A area and requires pairing with a north alternative to be functional.

Approximately 2 miles of the Sudbury Aqueduct would be pressurized with a new 82-inch diameter pipeline liner via sliplining. The CHEPS would need improvements to supply the southern spine pipelines.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Meets projected high day demand	Does not achieve redundancy without over-pressurizing pipelines because it relies on using CHEPS to provide regular (non-emergency) supply to the undersized aging southern spine pipelines

Alternative eliminated from further evaluation.

5.1.7. Alternative 14S

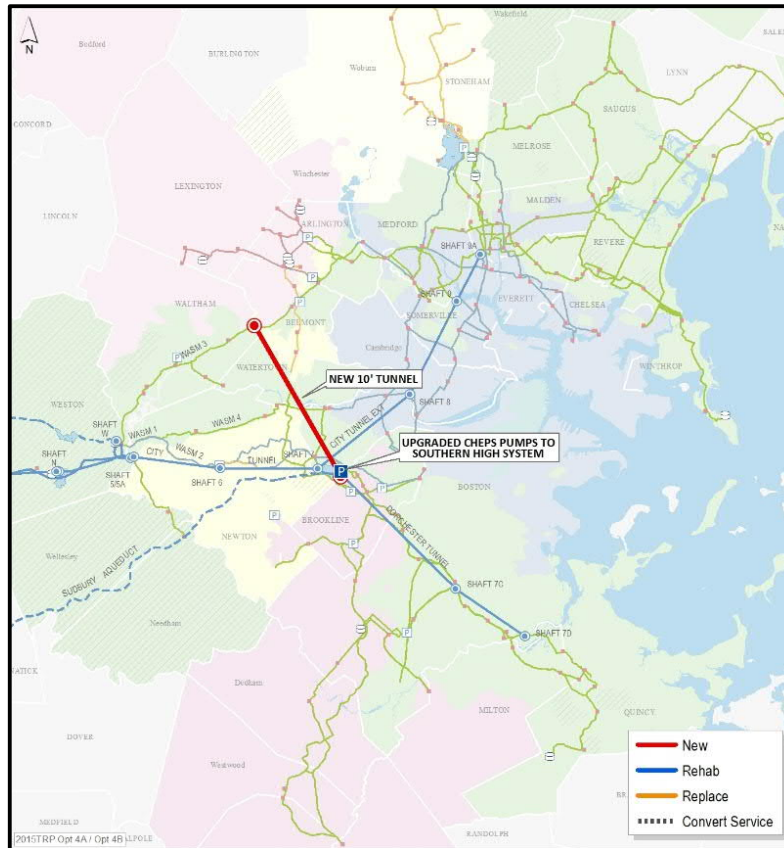


Figure 5-7: Alternative 14S

Alternative 14S consists of constructing approximately 4.5 miles of new 10-foot diameter deep rock tunnel from Shaft 7B on the Dorchester Tunnel northwest to a point on the WASH 3 near the Belmont/Waltham town line. Improvements to the CHEPS would be required to supply the southern spine pipelines. It should be noted that this alternative does not make a connection at the Shaft 5/5A area and requires pairing with a north alternative to be functional.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Meets projected high day demand	Does not achieve redundancy without over-pressurizing pipelines because it relies on using CHEPS to provide regular (non-emergency) supply to the undersized aging southern spine pipelines

Alternative eliminated from further evaluation.

5.1.8. Alternative 15S

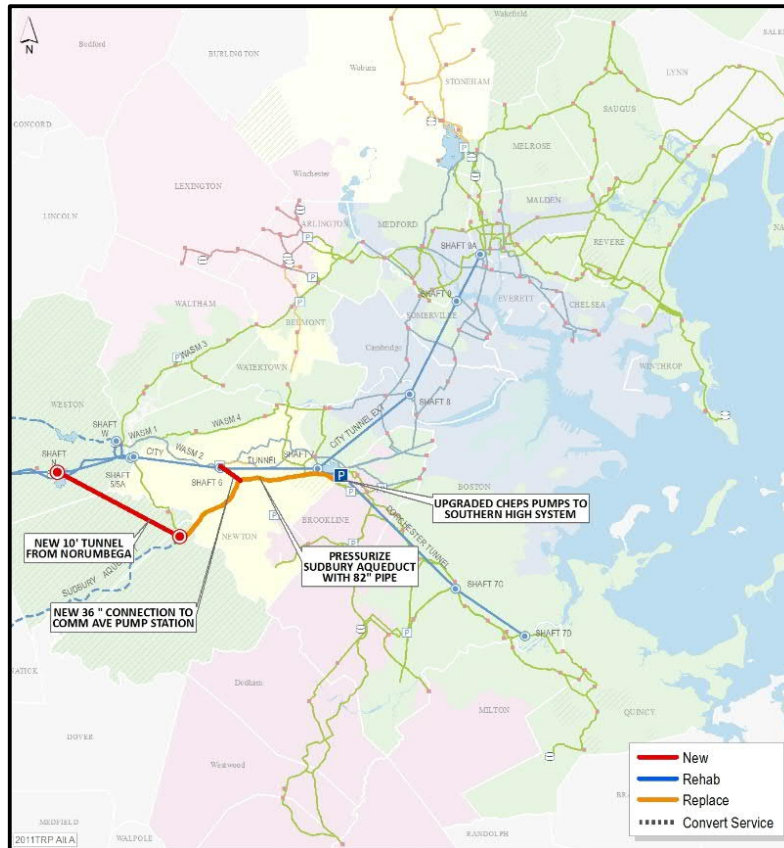


Figure 5-8: Alternative 15S

Alternative 15S consists of constructing approximately 3.5 miles of new 10-foot diameter deep rock tunnel from Shaft N in Weston southeast to the end of Section 80 adjacent to the Sudbury Aqueduct in Needham.

Approximately five miles of the Sudbury Aqueduct would be pressurized with a new 82-inch diameter water pipeline liner via sliplining. The CHEPS would need improvements to supply the southern spine pipelines.

A new 36-inch diameter surface pipeline would be constructed from the Sudbury Aqueduct to the CAPS.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Meets projected high day demand	Does not achieve redundancy without over-pressurizing pipelines because it relies on using CHEPS to provide regular (non-emergency) supply to the undersized aging southern spine pipelines

Alternative eliminated from further evaluation.

5.1.9. Alternative 16S

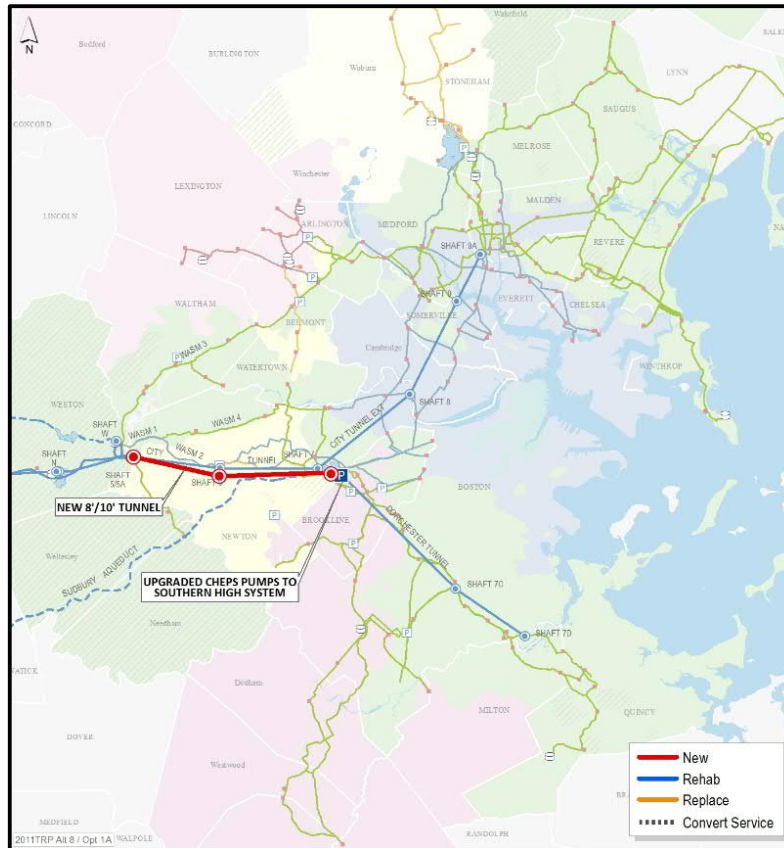


Figure 5-9: Alternative 16S

Alternative 16S consists of constructing approximately 6 miles of new 8-foot or 10-foot diameter deep rock tunnel from a connection with the Hultman Aqueduct near Shaft 5/5A in Weston to Shaft 6 on the City Tunnel and Shaft 7B on the Dorchester Tunnel at Chestnut Hill. Improvements to the CHEPS would be required to supply the southern spine pipelines.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Meets projected high day demand	Does not achieve redundancy without over-pressurizing pipelines because it relies on using CHEPS to provide regular (non-emergency) supply to the undersized aging southern spine pipelines

Alternative eliminated from further evaluation.

5.2. Category 2 – Replacement Pipeline to Surface Mains with or without New Pumping Station

This group of alternatives focuses on the installation of new large diameter surface pipelines with a final connection to existing pipelines located near the Dorchester Tunnel close to Shaft 7C. These alternatives include constructing new Newton and Southern High Pumping Stations and a new emergency generator to allow the CHEPS to provide supply to the Southern High System during emergency conditions.

5.2.1. Alternative 8S

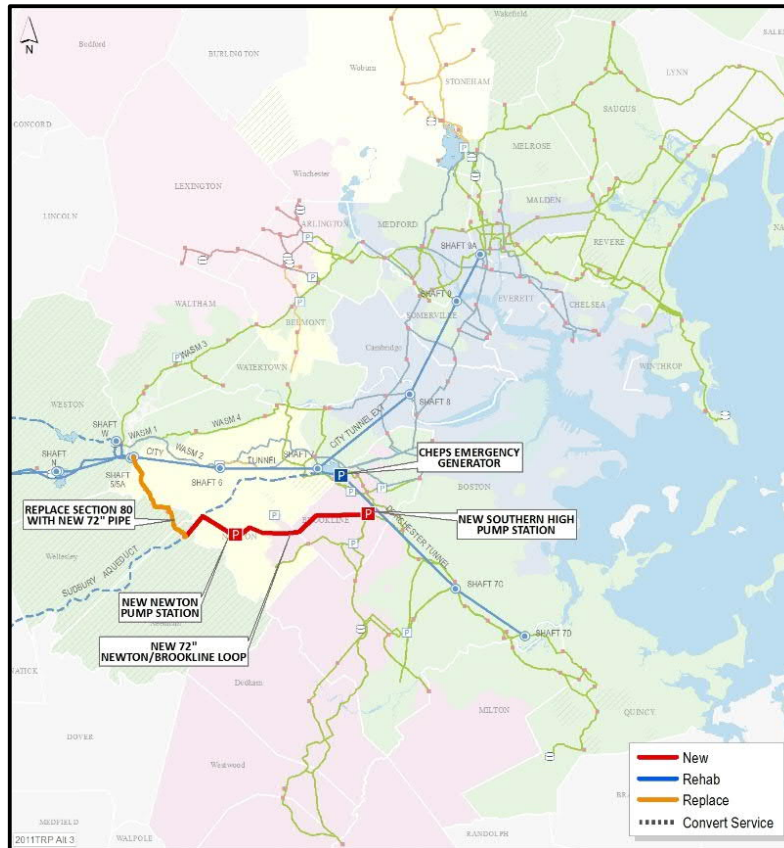


Figure 5-10: Alternative 8S

Alternative 8S consists of replacing the entire existing 48-inch diameter Section 80 pipeline with approximately 3 miles of new 72-inch diameter surface pipeline by open trench excavation from Shaft 5/5A in Weston to Needham Pumping Station at the Sudbury Aqueduct. Approximately 5.5 miles of new 72-inch diameter surface pipeline will also be installed by open trench excavation through Newton and Brookline.

One new pumping station would be needed in Newton along the pipeline route, and one in Brookline at the proposed connection with the Dorchester Tunnel.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Does not meet projected high day demand	Does not achieve redundancy without over-pressurizing pipelines because it relies on using CHEPS to provide regular (non-emergency) supply to the undersized aging southern spine pipelines

Alternative eliminated from further evaluation.

5.2.2. Alternative 10S

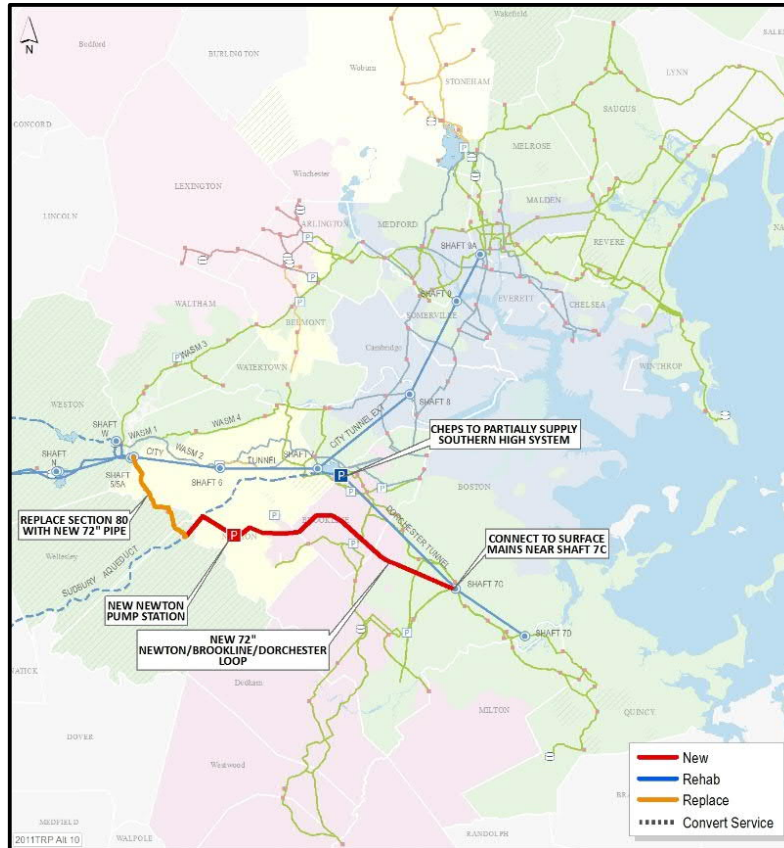


Figure 5-11: Alternative 10S

Alternative 10S consists of replacing the entire existing 48-inch diameter Section 80 pipeline with approximately 3 miles of new 72-inch diameter surface pipeline by open trench excavation from Shaft 5/5A in Weston to Needham at the Sudbury Aqueduct. Approximately 8.5 miles of new 72-inch diameter surface pipeline would also be installed by open trench excavation through Newton, Brookline, and Boston.

A new pumping station would be constructed in Newton along the pipeline route and the CHEPS would be utilized to partially supply the southern spine pipelines.

Tier 1 – Meeting the Primary Program Goals	
Water Demand	System Reliability and Resilience
Does not meet projected high day demand	Does not achieve redundancy without over-pressurizing pipelines because it relies on using CHEPS to provide regular (non-emergency) supply to the undersized aging southern spine pipelines

Alternative eliminated from further evaluation.

5.3. Category 3 – New Deep Rock Tunnel to Dorchester Tunnel Shaft 7C

The third category of south alternative would create redundancy by constructing a deep rock tunnel with a final connection point near Shaft 7C. Connecting near the Dorchester Tunnel at Shaft 7C would eliminate the need to pump through the Chestnut Hill Emergency Pumping Station. Other critical connection points for the tunnel include a connection at the Hultman Aqueduct in Weston, at the end of the Section 80 pipeline in Needham, Shaft 6 in Newton, and at the Newton Street Pumping Station in Brookline.

5.3.1. Alternative 17S

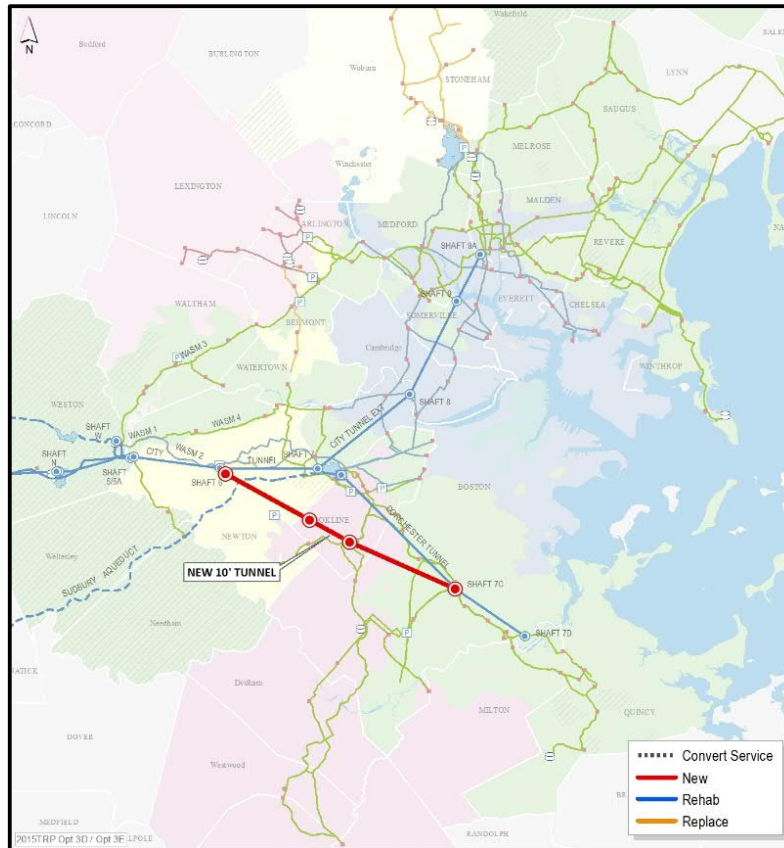


Figure 5-12: Alternative 17S

Alternative 17S consists of constructing approximately 7 miles of new 10-foot diameter deep rock tunnel from Shaft 6 on the City Tunnel in Newton to Shaft 7C on the Dorchester Tunnel. This alternative does not make a connection at the Shaft 5/5A and would have to be paired with Alternative 11N to be functional. Alternative 17S could also be combined with 9N or 10N and achieve north-south redundancy. However, both 9N and 10N have unnecessary extra lengths of tunnel which makes these options less efficient than pairing Alternative 17S with Alternative 11N.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer
Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Tied to Alt. 11N – Does not provide redundant connections to pump stations along WASM 3 and Section 80.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.

Alternative eliminated from further evaluation.

5.3.2. Alternative 18S



Figure 5-13: Alternative 18S

Alternative 18S consists of constructing approximately 9.5 miles of new 10-foot diameter deep rock tunnel from a connection with the Hultman Aqueduct near Shaft 5/5A to a connection at Shaft 6, southeast to a connection with the Newton Street Pumping Station in Brookline and then southeast to a connection near Shaft 7C on the Dorchester Tunnel.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer
Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Does not provide redundant connections to pump stations along Section 80.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.

Alternative eliminated from further evaluation.

5.3.3. Alternative 19S

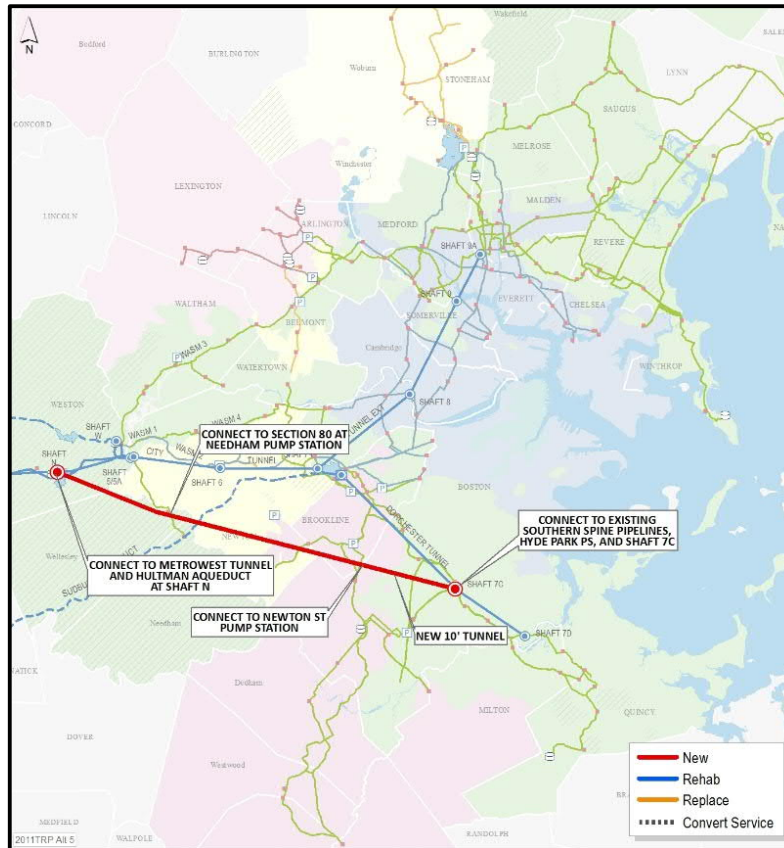


Figure 5-14: Alternative 19S

Alternative 19S consists of constructing approximately 11 miles of new 10-foot diameter deep rock tunnel from Shaft N in Weston, southeast to a connection at the end of Section 80 in Needham, southeast to a connection at the Newton Street Pumping Station in Brookline and then southeast near Shaft 7C on the Dorchester Tunnel. This alternative provides an initial connection starting at Shaft N in Weston.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer
Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Can potentially provide new redundant connections to pump stations along Section 80.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative includes more infrastructure than necessary to meet Program goals by starting at Shaft N. The Authority already has redundancy from Shaft N to Shaft 5/5A

Alternative eliminated from further evaluation.

5.3.4. Alternative 20S

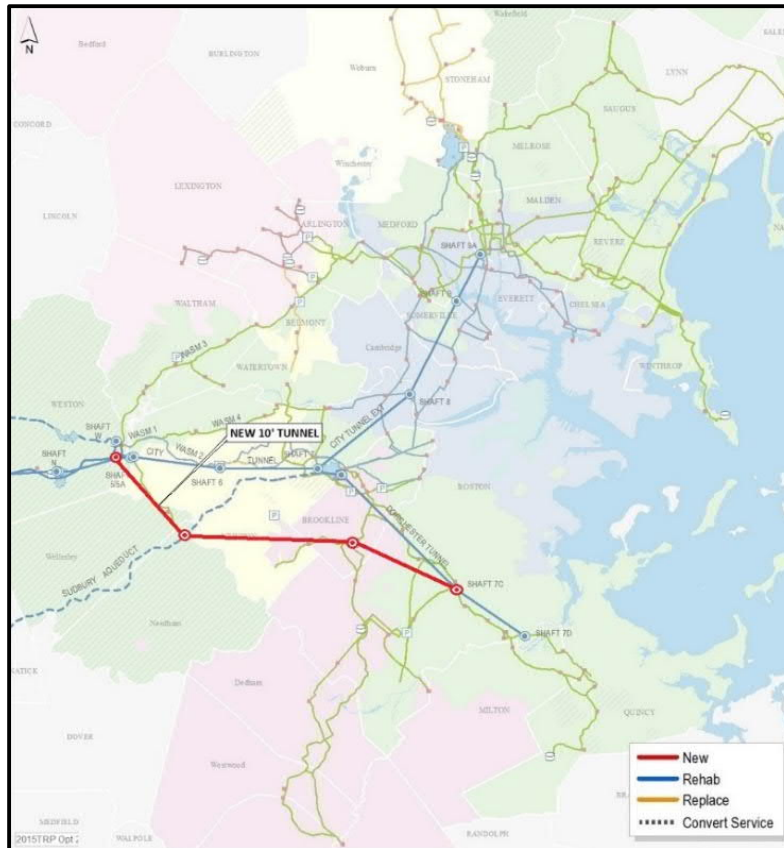


Figure 5-15: Alternative 20S

Alternative 20S consists of constructing approximately 10 miles of new 10-foot diameter deep rock tunnel from a connection with the Hultman Aqueduct near Shaft 5/5A to a connection at the end of Section 80 in Needham, southeast to a connection at the Newton Street Pumping Station in Brookline and then southeast to a connection near Shaft 7C on the Dorchester Tunnel.

Tier 1 – Meeting the Primary Program Goals					
Water Demand			System Reliability and Resilience		
Meets projected high day demand			Meets system reliability and resilience		
Tier 2 – Preliminary Feasibility, Potential Impacts and Constructability Assessment					
Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration Noise and Dust Pollution Impacts	Traffic Impacts	Operational Criteria	Building Beyond Program Purpose / Sustainability and Predictability for Rate Payer
Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Can potentially provide new redundant connections to pump stations along Section 80.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.

Alternative moved forward for further evaluation.

5.4. Summary

Based on the screening of the south alternatives using the Tier 1 and Tier 2 evaluation criteria, the alternative that advances for further evaluation is Alternative 20S. Alternative 20S consists of constructing approximately 10 miles of new water supply tunnel from the Shaft 5/5A area in Weston to a point adjacent to existing water surface mains near Shaft 7C of the Dorchester Tunnel in Boston. Implementation of this alternative would allow for redundant connections to the MWRA water system and pump stations serving Needham and Wellesley. This alignment requires two to six tunnel shaft sites for connections to the existing Authority or local water systems. Table 5-1 and Table 5-2 provide a summary of the Tier 1 and Tier 2 screening evaluation for south alternatives. The advancement of conceptual design will confirm the starting and end points of the south deep rock tunnel, and the specific alignment and connection points to the existing distribution system and will be paired with a north alternative.

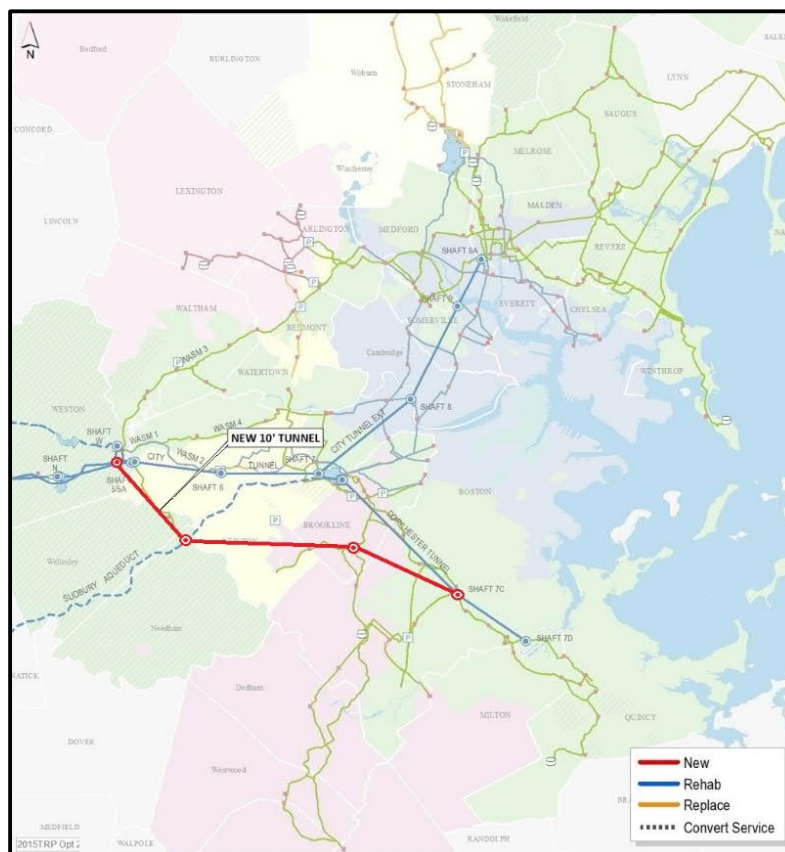


Figure 5-16: Selected South Alternative (20S)

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Table 5-1: South Alternative Detailed Screening Analysis Tier 1

Alternative Number	Water Demand	System Reliability and Resilience	Status
5S	Meets projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
6S	Meets projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
7S	Meets projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
9S	Meets projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
11S	Meets projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
12S	Meets projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
14S	Meets projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
15S	Meets projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
16S	Meets projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
8S	Does not meet projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
10S	Does not meet projected high day demand	The alternative does not achieve redundancy without over-pressurizing pipelines	Not advanced to Tier 2
17S	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2
18S	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2

Alternative Number	Water Demand	System Reliability and Resilience	Status
19S	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2
20S	Meets projected high day demand	Meets system reliability and resilience	Advanced to Tier 2

Legend:

Alternative did not meet Program Goals (red)

Alternative met Program Goals (green)

Table 5-2: South Alternative Detailed Screening Analysis Tier 2

Alternative Number	Engineering		Environmental/Social		Operational Criteria	Cost Factors	Advanced for Further Evaluation
	Impact on Existing Utilities and Structures	Additional Water Supply Benefits	Vibration, Noise and Dust Pollution Impacts	Traffic Impacts		Sustainability and Predictability for Ratepayer	
17S	Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Tied to Alt. 11N – Does not provide redundant connections to pump stations along WASM 3 and Section 80.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.	No
18S	Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Does not provide redundant connections to pump stations along WASM 3 and Section 80.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.	No
19S	Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Can potentially provide new redundant connections to pump stations along Section 80.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative includes more infrastructure than necessary to meet Program goals.	No
20S	Limited and geographically contained areas of utility relocations and no major impacts on existing structures.	Can potentially provide new redundant connections to pump stations along Section 80.	Only localized impacts for geographically limited areas during construction.	Only limited or geographically contained construction within roadways.	Length of surface pipe and associated maintenance is not substantially changed.	Alternative provides the redundancy needed with no additional significant infrastructure or cost.	Yes

Legend:

Alternative evaluated negatively for this criterion (red)

Alternative evaluated positively for this criterion (green)

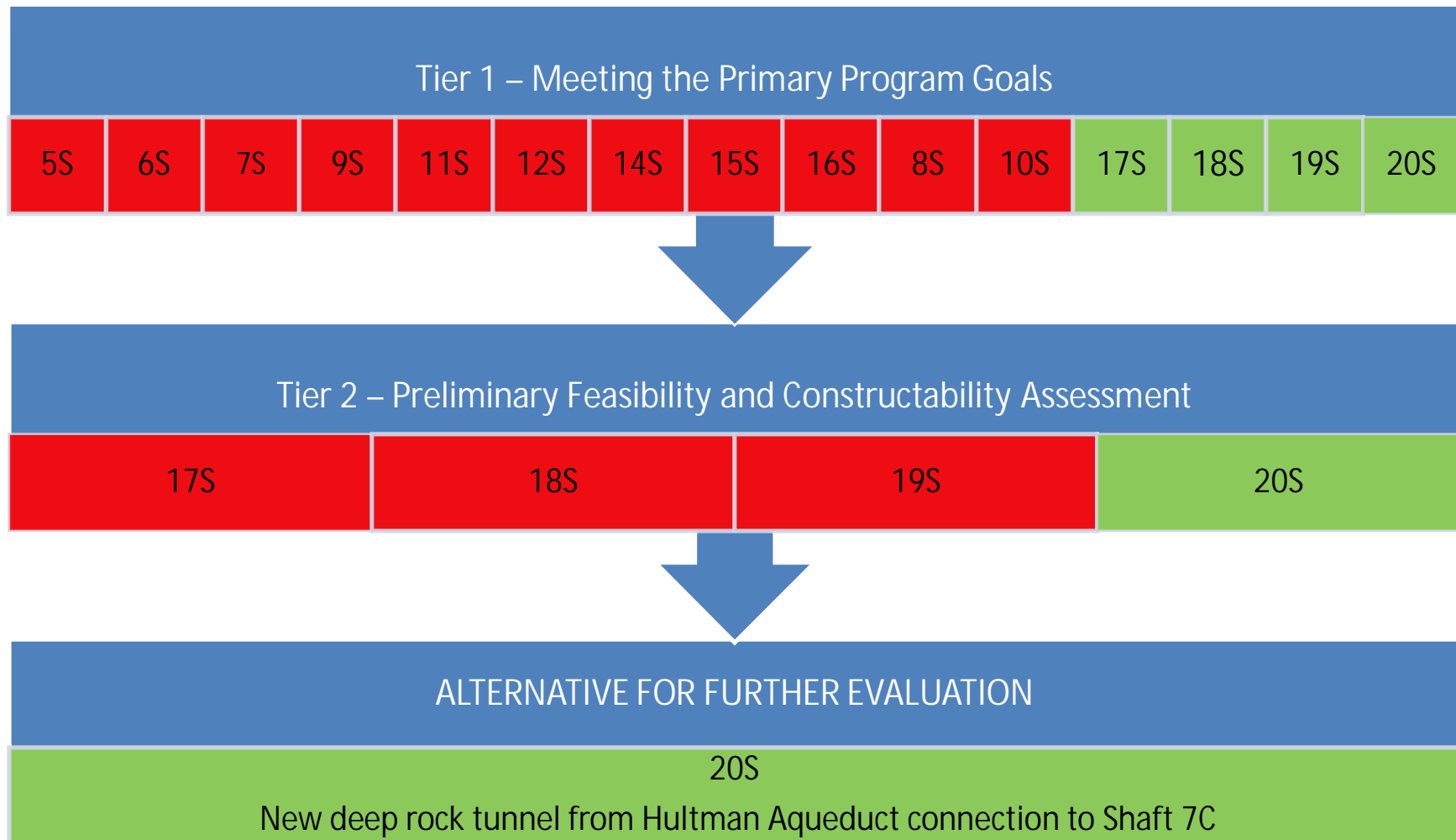


Figure 5-17: South Alternative Screening Summary

6.0 Next Phase of Assessment and Analysis

The north and south alternatives that proceeded through the Tier 1 and Tier 2 screening analysis include a common connection point at the Hultman Aqueduct site in Weston near Shaft 5/5A and two deep rock tunnel Alternatives 8N and 20S along northern and southern routes.

The next stage of alternative development is to identify various tunnel alignments and shaft locations within the Study Area indicated in Figure 6-1. These tunnel alignments will include a series of potential intermediate connections to the MWRA and community water distribution systems.

It is proposed that alternative tunnel alignments, construction shaft locations and intermediate shaft locations within this Study Area will be evaluated in the Draft Environmental Impact Report.

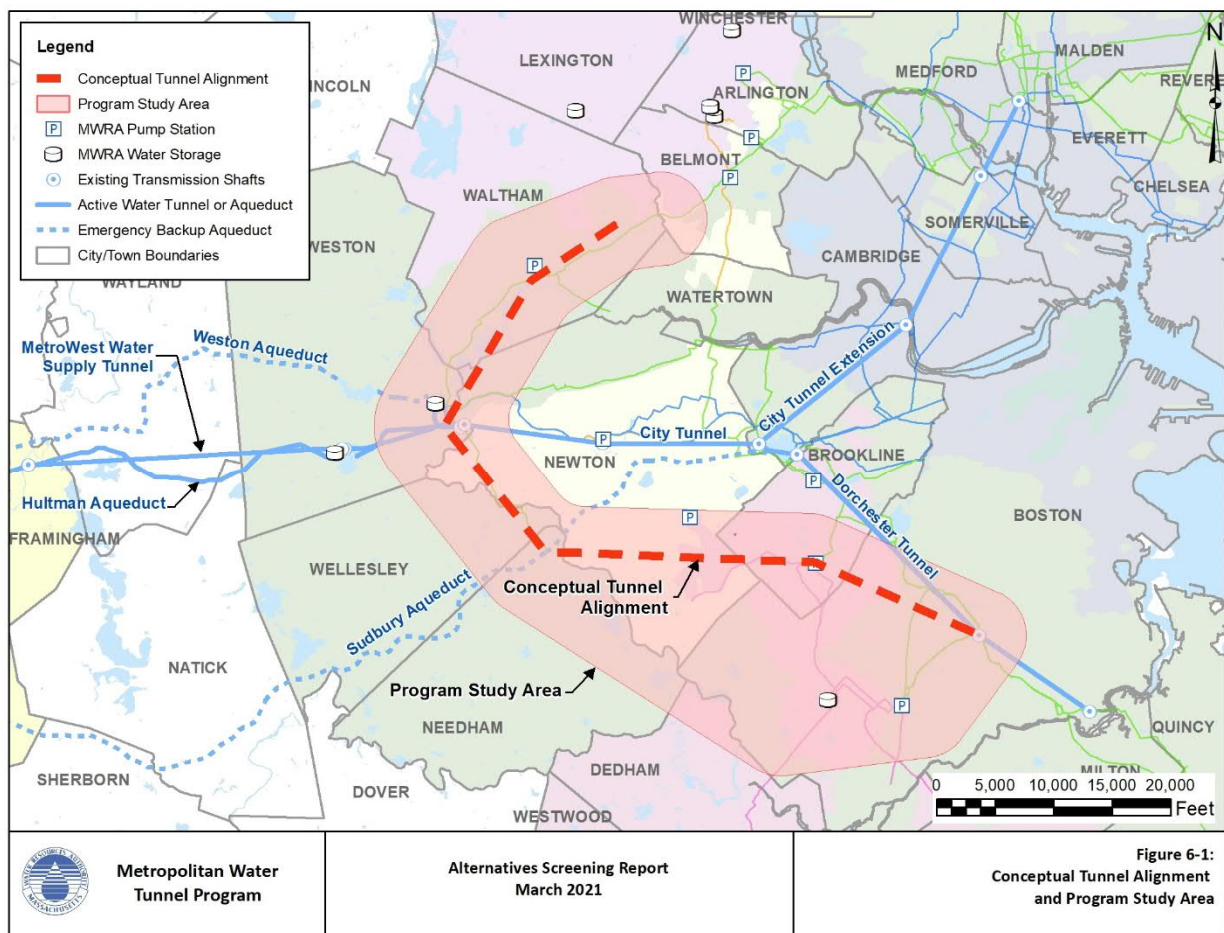


Figure 6-1: Conceptual Tunnel Alignment and Program Study Area

6.1. Study Area

The conceptual tunnel alignments, potential shaft locations and connections are shown in Figure 6-1. The initial tunnel connection sites are discussed in this document, however additional connection sites may be considered by the Authority. The preliminary design will evaluate potential tunnel alignments, construction shaft locations, intermediate shaft locations and potential additional connections to existing Authority or community facilities within this study area.

7.0 Conclusion

This report summarizes the Metropolitan Water Tunnel Program alternatives evaluated by the Authority. The information provided supports the proposed two-tunnel alternative, shown as Alternatives 8N and 20S in this report. The proposed plan limits community disruptions and construction impacts to the locations of the tunnel construction and connection shaft sites. The two-tunnel alternative meets the strategic objective of a resilient water supply system capable of providing continuous safe drinking water during emergency or maintenance shut downs of the existing tunnel system, without use of a boil order, without impacting the ability to provide for local fire protection, and without noticeable changes in customers' water quality, flow or pressure. The two-tunnel alternative has the ability to meet high demand conditions which extends the potential time frame for future maintenance and rehabilitation activities. Options for specific tunnel alignments, TBM launch and TBM retrieval (terminus) sites, and critical connection points are proposed to be further evaluated in the Draft Environmental Impact Report for the Metropolitan Water Tunnel Program.

8.0 References

1. Water Supply Committee of the Great Lakes. 2007. *Recommended Standards for Water Works: Policy for the Review and Approval of Plans and Specifications for Public Water Supplies*. New York, Health Research Inc.
2. U.S. Environmental Protection Agency. June 2011. *Planning for an Emergency Drinking Water Supply*. Washington, D.C.: U.S. Environmental Protection Agency, National Homeland Security Research Center, EPA 600/R-11/054.

Attachment E: Public Notice

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***Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs***

MEPA Office

100 Cambridge St., Suite 900
Boston, MA 02114
Telephone 617-626-1020

The following should be completed and submitted to a local newspaper:

PUBLIC NOTICE OF ENVIRONMENTAL REVIEW

PROJECT: Metropolitan Water Tunnel Program

LOCATION: Belmont, Boston, Brookline, Dedham, Needham, Newton, Waltham, Watertown, Wellesley, Weston

PROPONENT: Massachusetts Water Resources Authority (MWRA)

The undersigned is submitting an Environmental Notification Form ("ENF") to the Secretary of Energy & Environmental Affairs on or before March 31, 2021

This will initiate review of the above project pursuant to the Massachusetts Environmental Policy Act ("MEPA", M.G.L. c. 30, s.s. 61-62I). Copies of the ENF may be obtained from:

Gabrielle Marrese

Gabrielle.Marrese@mwra.com

617-570-5469

Este ENF (Formulario de notificación medioambiental) contiene información importante sobre un proyecto de construcción propuesto en las comunidades mencionadas. Sírvase hacerlo traducir o hable con alguien que lo comprenda.

During the interim Covid-19 response period, electronic copies of the ENF are also being sent to the Conservation Commission and Planning Board of Belmont, Boston, Brookline, Dedham, Needham, Newton, Waltham, Watertown, Wellesley, Weston.

The Secretary of Energy & Environmental Affairs will publish notice of the ENF in the Environmental Monitor, will receive public comments on the project for 20 days, and will then decide, within ten days, if an Environmental Impact Report is needed. A site

visit and consultation session on the project may also be scheduled. All persons wishing to comment on the project, or to be notified of a site visit or consultation session, should email MEPA@mass.gov. Mail correspondence will continue to be accepted, though responses may be delayed. Mail correspondence should be directed to the Secretary of Energy & Environmental Affairs, 100 Cambridge St., Suite 900, Boston, Massachusetts 02114, Attention: MEPA Office, referencing the above project.

By Massachusetts Water Resources Authority (MWRA)

***Mancomunidad de Massachusetts
Oficina Ejecutiva de Energía y Asuntos Ambientales***

MEPA Office

100 Cambridge St., Suite 900
Boston, MA 02114
Teléfono: 617-626-1020

El siguiente aviso debe completarse y enviarse a un periódico local:

AVISO PÚBLICO DE REVISIÓN MEDIOAMBIENTAL

PROYECTO: Programa de red de cañerías del área metropolitana

UBICACIÓN: Belmont, Boston, Brookline, Dedham, Needham, Newton, Waltham, Watertown, Wellesley, Weston

PROPONENTE: Autoridad de Recursos Hídricos de Massachusetts (MWRA)

El abajo firmante presentará un Formulario de notificación medioambiental («ENF», por sus siglas en inglés) a la Secretaría de Energía y Asuntos Ambientales el 31 de marzo de 2021, o antes.

Esto dará inicio a la revisión del proyecto antes mencionado conforme a la Ley de Políticas Medioambientales de Massachusetts («MEPA», Leyes Generales de Massachusetts, capítulo 30, secciones 61-62I). Pueden solicitarse copias del formulario a:

Gabrielle Marrese

Gabrielle.Marrese@mwra.com

617-570-5469

Este ENF (Formulario de notificación medioambiental) contiene información importante sobre un proyecto de construcción propuesto en las comunidades mencionadas. Sírvase hacerlo traducir o hable con alguien que lo comprenda.

Durante el período provisional por la respuesta a la Covid-19, las copias electrónicas del ENF también se envían a la Comisión de Conservación y Dirección de Planificación de Belmont, Boston, Brookline, Dedham, Needham, Newton, Waltham, Watertown, Wellesley, Weston.

La Secretaría de Energía y Asuntos Ambientales publicará un aviso del formulario ENF en el Monitor Ambiental, recibirá comentarios públicos sobre el proyecto durante 20 días y luego decidirá, en un plazo de diez días, si hace falta un Informe de impacto ambiental. También podrían programarse una visita al lugar de las obras y una sesión de consulta sobre el proyecto. Las personas interesadas en dar su opinión sobre el proyecto o en recibir un aviso sobre una visita al lugar o una sesión de consulta deben enviar un correo electrónico a MEPA@mass.gov. Seguimos aceptando correspondencia por correo, aunque las respuestas por este medio pueden demorarse. La correspondencia por correo debe dirigirse a: Secretary of Energy & Environmental Affairs, 100 Cambridge St., Suite 900, Boston, Massachusetts 02114, Attention: MEPA Office, mencionando el proyecto anterior.

Presentado por Autoridad de Recursos Hídricos de Massachusetts (MWRA)