



Massachusetts Water Resources Authority

**Metropolitan Water Tunnel Program
Water Supply Citizens Advisory Committee**

Program Update

February 8, 2022



Agenda

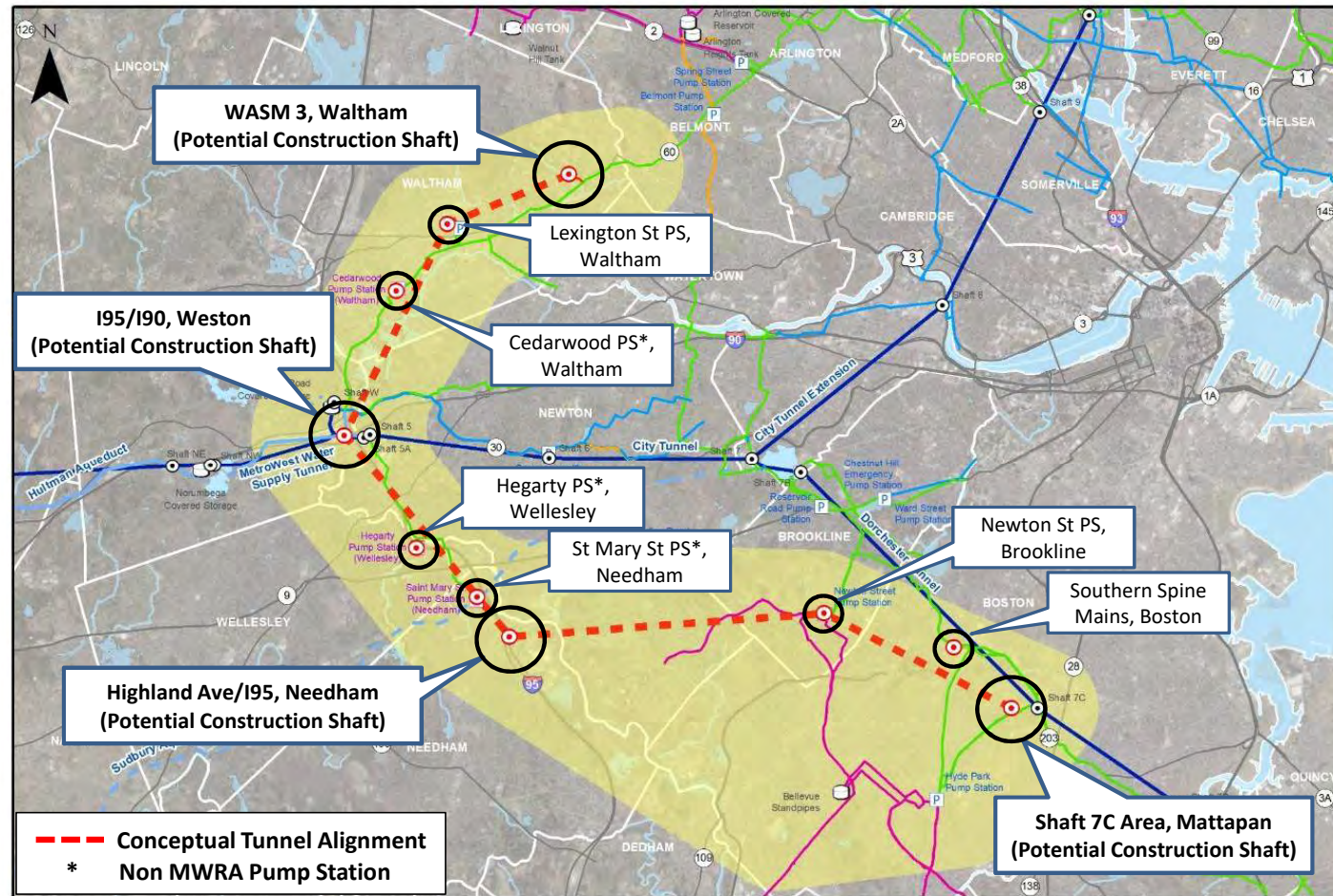
- Metropolitan Water Tunnel Program Update
- Geotechnical Investigation Overview
- Alternatives Evaluation Process and Criteria
- MEPA Review Process
- Community Outreach
- Ongoing and Upcoming Work
- Questions





Metropolitan Water Tunnel Program

- ~14 miles of 10 ft diameter, hard rock, pressure tunnel
- Time to complete: 17 to 23 years (design - commissioning)
- Current plan is for tunnels to begin in the Mass Pike/Route 128 vicinity
- Northern Tunnel - ~4.5 miles, ends in Waltham/Belmont area @ WASM3
- Southern Tunnel - ~9.5 miles, ends in Mattapan near Shaft 7C
- Anticipate first tunnel construction to start in 2027
- Estimated cost - ~\$1.5B (2021\$)



Conceptual for discussion only



Program Update

- Geotechnical Field Investigation - **ongoing**
- MEPA Review Process – **ongoing**
- Community & Stakeholder Outreach - **ongoing**
- Evaluation of Alternatives – tunnel shaft sites and alignments – **getting really close**
- Other field Investigations – **2022**
- Preliminary Design – **about to start**

- Program Schedule
 - Currently in preliminary design – thru Jan 2024
 - Begin final design in 2024
 - Targeting construction to start in 2027
 - Targeting construction to be complete by ~2037



Purchase of School Street Parcel

- MWRA acquired a parcel at 167-173 School Street in Waltham
- Site will be used for construction of a valve vault & shaft connecting to the tunnel below
- Previously used as satellite parking for Chateau Restaurant
- Close to existing MWRA infrastructure - Lexington St PS



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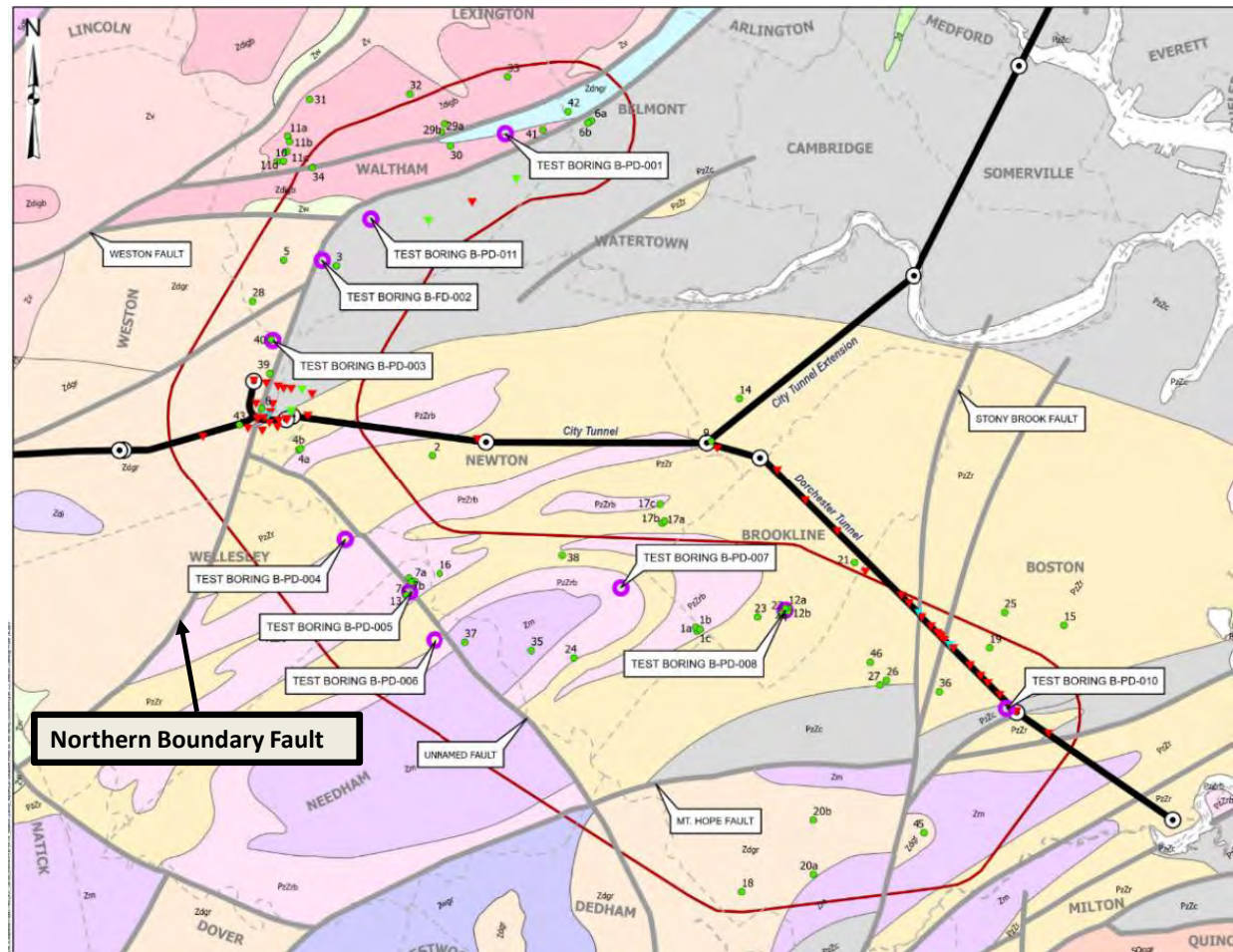
Geotechnical Investigation Overview



Geotechnical Field Investigation – Why is it Needed

Why?

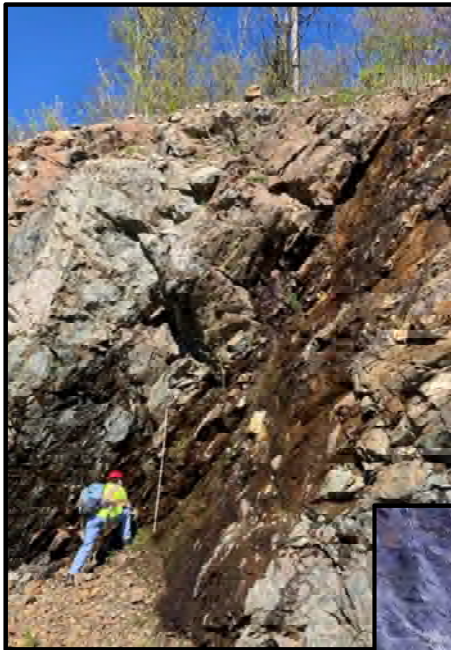
- Collect information about ground conditions (complex geology) to support alternatives evaluation of tunnel routes
- Provide information for the design and construction of the Program



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Phase 1A Program – Bedrock Outcrop Survey



Waltham

Where bedrock is exposed at the surface, detailed rock characteristics are recorded to help better understand the underlying rock mass



Border Rd in Waltham



Roadway rock cut on Border Rd in Waltham

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Phase 1A Program – Seismic Refraction Survey

Non-invasive method used to determine subsurface conditions including variations in top of bedrock



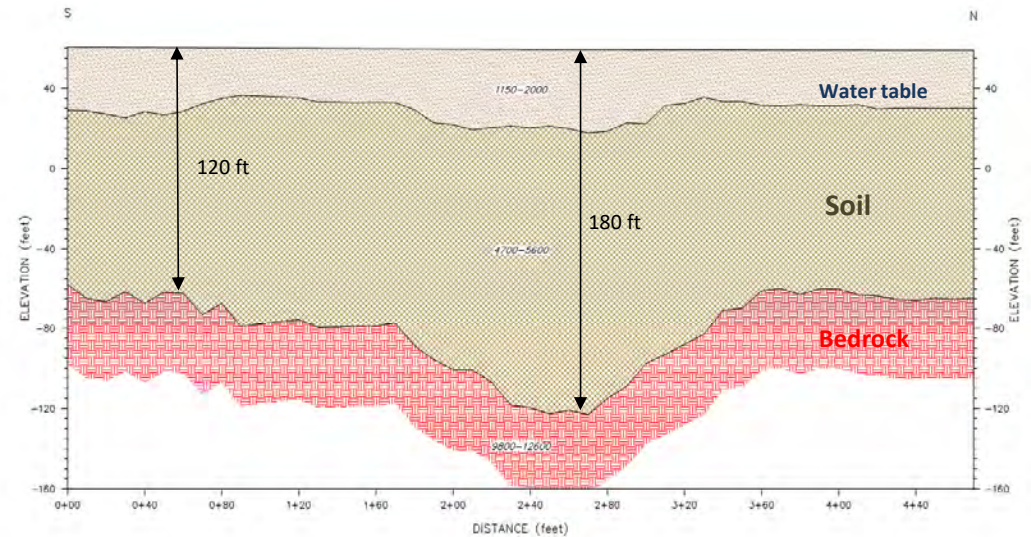
Hamilton Field in Newton



Mount Feake Cemetery in Waltham



McDevitt Middle School in Waltham



NOTES:

1. Estimated accuracy (standard deviation) of depth of bedrock is $\pm 10\%$ or 2 feet, whichever is greater.
2. The depths determined for bedrock are depths of competent rock, weathered and/or fractured bedrock might occur at shallower depths.
3. Surface elevations estimated from plans provided by MWRA.
4. Data were analyzed using the Generalized Reciprocal Method.

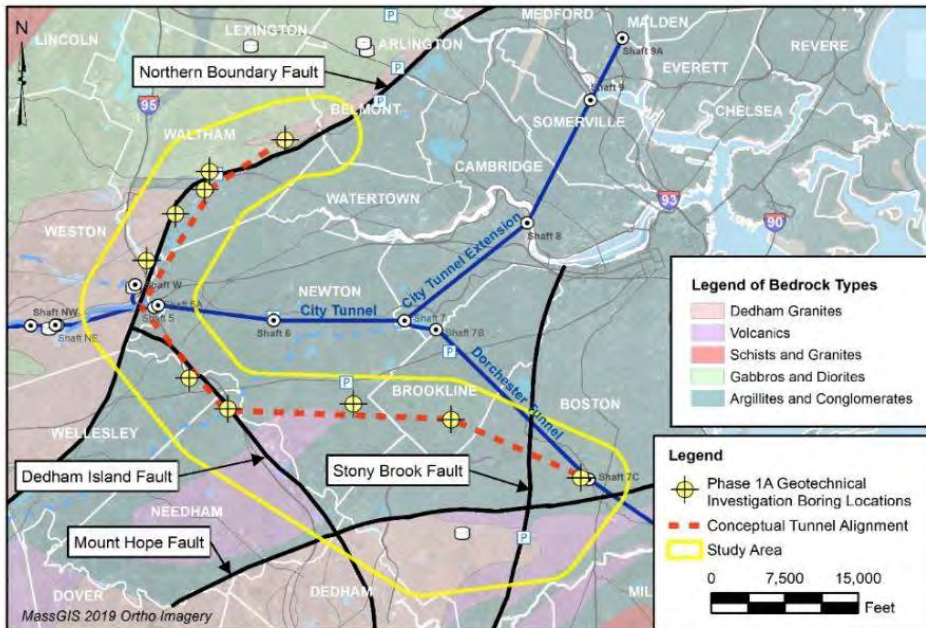
LEGEND

- | | | | |
|--|---------------------------------|-----------|--|
| | Unsaturated soils | 4000-7000 | Velocity (fps) |
| | Unsaturated/
saturated soils | | Interface determined from
seismic refraction data |
| | Bedrock | | |

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Phase 1A Program – Test Borings



Phase 1A = 10 Test Borings:

- Waltham – Fernald Property - 445 ft
- Waltham – School St - 424 ft
- Waltham – Felton Street - 411 ft
- Waltham – Cedarwood PS - 437 ft
- Weston – DCR, Norumbega Tower Park - 433 ft
- Wellesley – Hegarty PS - 416 ft
- Needham – St Mary St PS - 513 ft
- Newton – Newton South High School - 470 ft
- Brookline – Newton Street PS - 548 ft
- Boston – DCR/Boston Light, American Legion Hwy - 412 ft



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Phase 1A Program – Test Borings



Hard Quartz in Waltham



Pink Granite in Waltham



Roxbury Conglomerate (aka "Pudding Stone") in Brookline

- Drilling of all 10 borings completed (Ph1A)
- Average of 451 ft deep
- >4,110 lf of rock core collected



Detailed Core Logging & Sample Selection



Field Logging



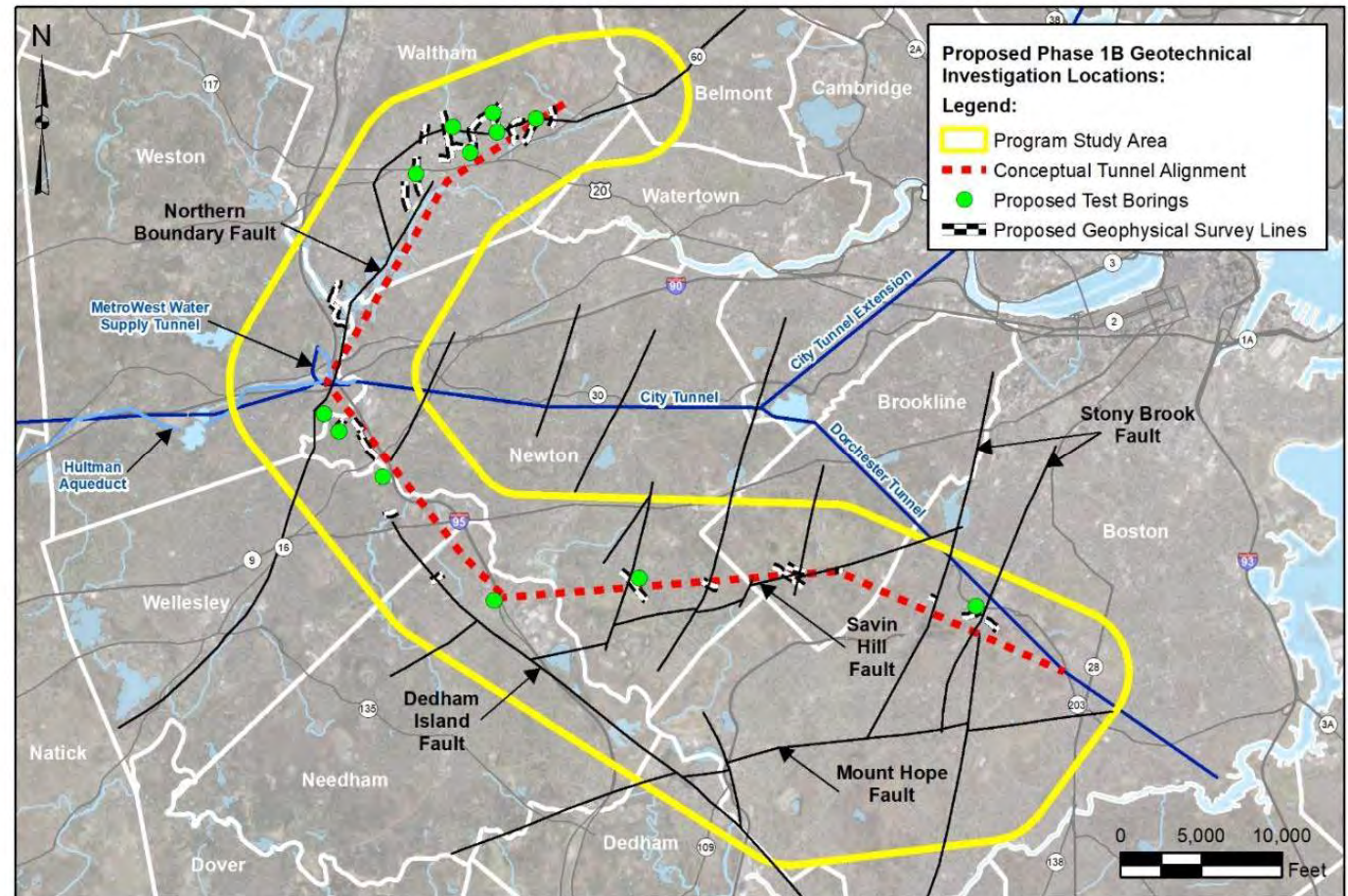
Core Storage at DITP

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Phased Approach to Geotechnical Investigations

- Phase 1A Program (2021):
 - Provides important data and initial understanding of geologic conditions along possible tunnel alignments
 - Advances our understanding of geologic faults located along these alignments
- Phase 1B Program (2022):
 - Continue data gathering and refinement
 - Support preliminary design
- Phase 2, 3, 4...



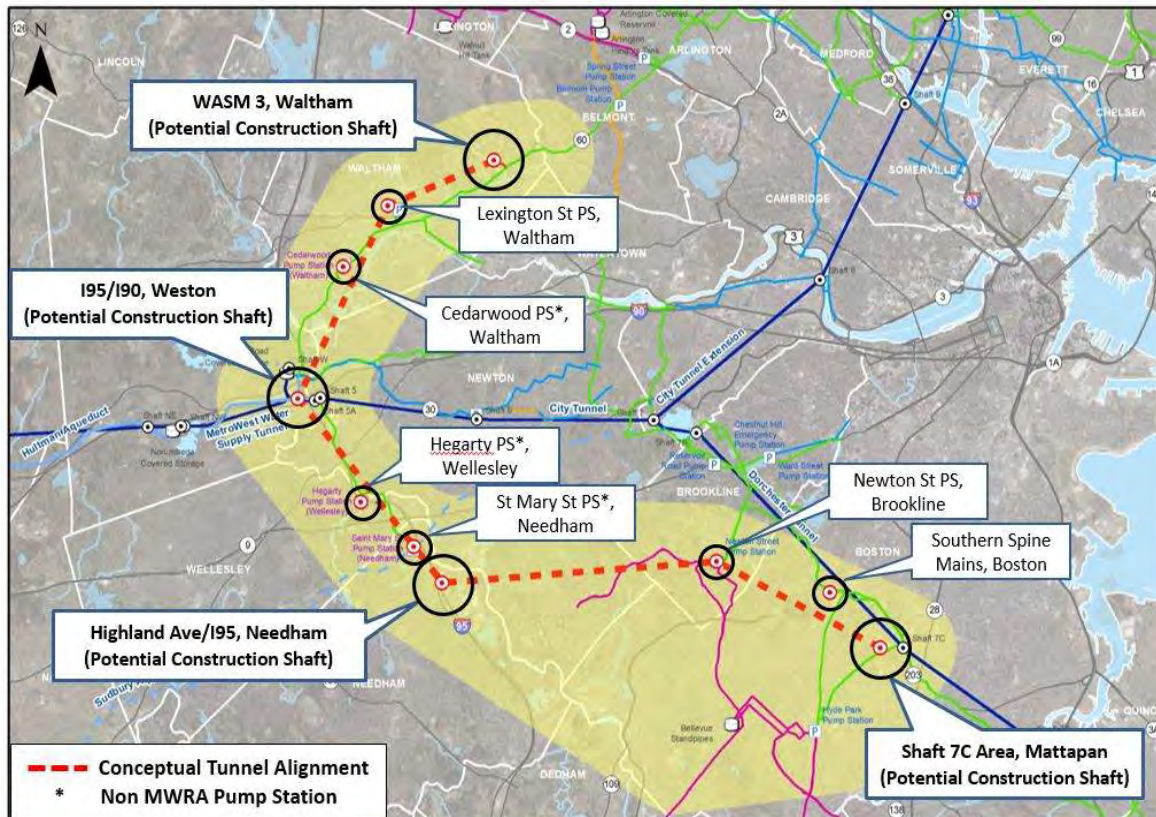
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Alternatives Evaluation Process and Criteria



Alternatives Evaluation



- Currently evaluating various alternatives that link specific shaft sites considering:
 - Land availability & suitability
 - Environmental impacts
 - Geology
 - Constructability
 - Schedule
 - Cost
- Sites currently under consideration are owned/controlled by MWRA, Waltham, Wellesley, MassDOT, DCR, and DPH
- Will identify 1 preferred and 2 back up alternatives for further evaluation in the DEIR
- Preliminary design will be for one alternative (preferred)

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How We Assembled Alternatives and Narrowed the Selection

- Started with Two-Tunnel Concept (North and South Tunnels)
- > 30 alternatives:
 - Program study area, system hydraulics, connection points, possible shaft sites (undeveloped/suitable), link tunnel segments, etc.
- Narrowed to 10 alternatives:
 - Land availability, constructability, operations, environmental & social, reasonableness, etc. etc. etc.
- Reduce from 10 to 3 alternatives:
 - All 3 alternatives will be evaluated equally in the DEIR
- Select the preferred alternative:
 - Land availability, more constructability issues, contract packaging/interfaces, phasing, sequencing, schedule, in service, cost, etc.
 - Carried forward to preliminary design



Preliminary Key Locations

Possible Construction Shaft Sites

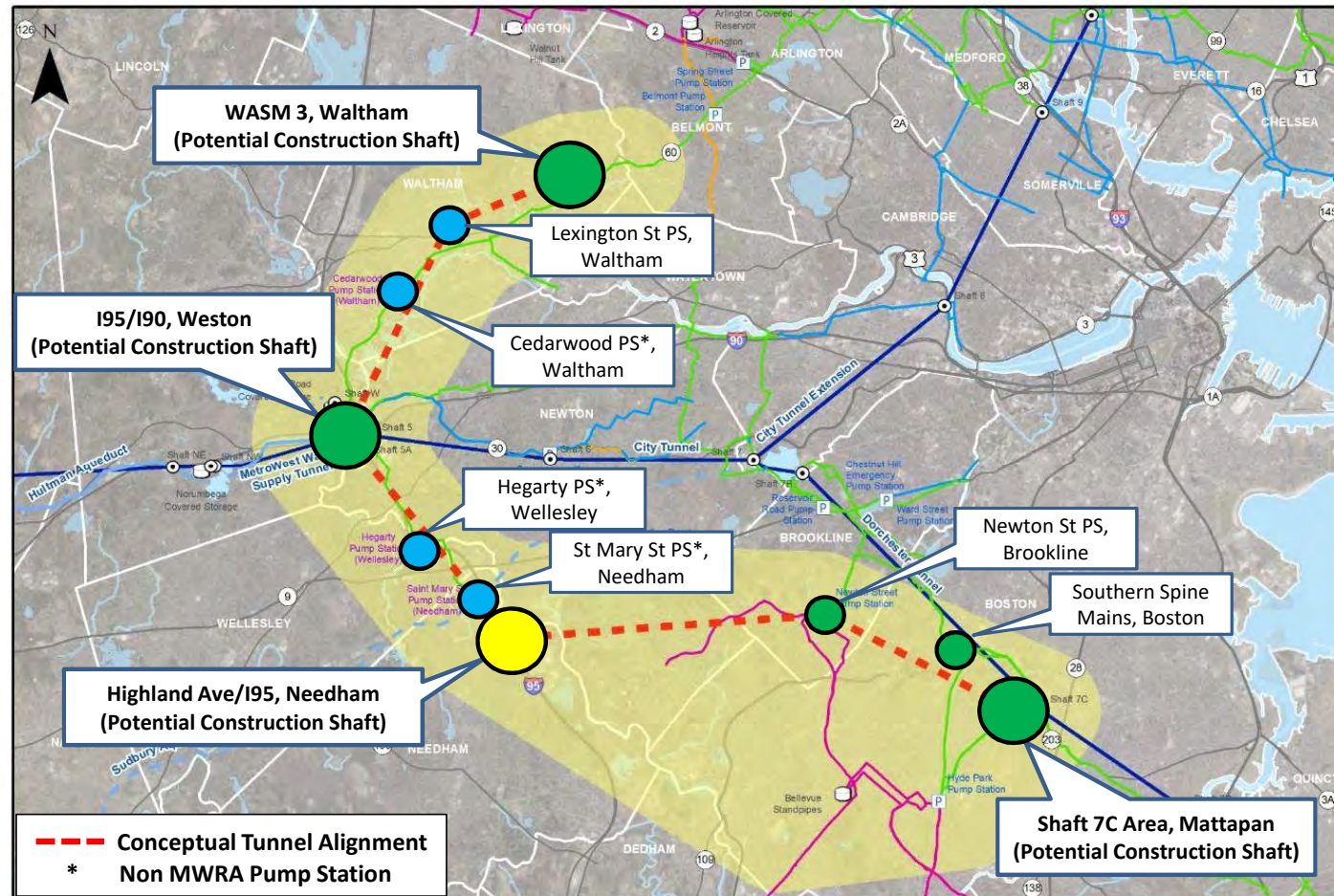
- Fernald Property, Waltham
- I90/I95 Interchange, Weston
- Highland Ave/I95 Interchange, Needham
- American Legion, Mattapan

Possible Connection Shaft Sites

- Lexington St Pump Station, Waltham
- Cedarwood Pump Station, Waltham
- Hegarty Pump Station, Wellesley
- St. Mary Street Pump Station, Needham
- Newton Street Pump Station, Brookline
- Southern Spine Mains, Boston

Final shaft locations subject to permits and real estate acquisition

- * Non MWRA Pump Station
- Required Connection (required for system redundancy)
- Secondary Connection (provides local benefit)
- Construction Shaft (no connection)



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Short List of Shaft Sites

Construction Shaft Sites:

- WASM3
 - Fernald Property
- I90/I95 Interchange
 - Bifurcation
 - Tandem Trailer (& Park Road)
 - Park Road
 - Riverside Park (& @ Hultman)
- I95/Highland Ave Interchange
 - NW cloverleaf
 - NE cloverleaf
- Shaft 7C
 - American Legion

Connection Shaft Sites:

- School St, Waltham
- Cedarwood PS*, Waltham
- Hegarty PS*, Wellesley
- St Mary St PS*, Needham
- Newton St PS, Brookline
- Section 39/Southern Spine Mains, Boston

* Non-MWRA PS



Alternatives Evaluation Process



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Evaluation Criteria



Constructability/ Engineering

- Availability of Utilities
- Ground Water discharge
- Flushing/Disinfection/Dewatering
- Construction Dewatering
- Proximity to Highways
- Proximity to Faults
- Length of Tunnel
- Proximity to Sensitive Existing Infrastructure



Land Availability

- Space and Right of Way for Construction
- Space and Right of Way for Permanent Facilities
- Precludes Other Beneficial Uses



Environmental

- Wetlands
- State/Federal Listed Species
- Article 97
- Mass Contingency Plan



Operations

- Flexibility of Operations
- Maintenance Provisions



Social/Community

- Cultural Resources
- Community Impacts/ Environmental Justice
- Traffic Disruption
- Commercial Disruption
- Construction Period Impacts from Air and Noise



Cost

- Relative Construction Costs



Schedule

- Timing to Achieve Beneficial Use
- Flexibility of Implementation

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Steps in Alternatives Evaluation

- Rate each alternative against the evaluation criteria
- Finalize selection of the 3 short listed alternatives to go into the DEIR
- Deeper dive into constructability, phasing, sequencing, schedule, costs, etc. on the 3 short listed alternatives
- Continue Stakeholder Outreach
 - i.e., MassDOT, DCR, DCAMM, Municipalities, Utilities
- Agreement on shaft sites with property owners
- Select the preferred alternative



MEPA Review Process & Community Outreach

MEPA Review

- Environmental Notification Form (ENF) submitted to MEPA for public comment in March 2021
- Six comment letters were received
- Received Secretary's Certificate which outlines the DEIR requirements
- Plan to submit DEIR in fall 2022, FEIR in summer 2023

Community & Stakeholder Outreach

- Met with all 10 communities in the study area
- Working Group has been established and meeting regularly
- Met with DEP, MassDOT, DCR, DPH and DCAMM





Ongoing and Upcoming Work

- Finalize alternatives evaluation - soon
- Submit DEIR to MEPA in fall 2022
- Begin survey work this year
- Plan for Phase 1B geotechnical program for spring - fall 2022
- Continue preliminary design work
- Continue to meet with community leaders and stakeholders
- Continue shaft sites real estate acquisition efforts
- Engage our Expert Review Panel regularly
- Prepare for geotechnical assistance, final design(s), and construction management professional services contracts
- Prepare for tunnel construction contracts





Fun Stuff

- Shaft site names
- Tunnel names
- Program Logo
- TBM names
- School Education Program
- ...
-
-
-
- Ground Breaking!

**Poster and Writing Contest Winners
2020-2021**
Massachusetts Water Resources Authority





Metropolitan Water Tunnel Program

- Contact Us
 - Carmine DeMaria, Community Relations Coordinator
 - 617-305-5725
 - Carmine.DeMaria@mwra.com
 - Tunnels.info@mwra.com
- <https://www.mwra.com/mwtp.html>
 - Meeting notices, agendas, presentations, minutes



Questions?



Thank you for your
continued partnership!