



Metropolitan Water Tunnel Program

Working Group Meeting No. 2

June 2, 2021



Agenda

- Welcome
- MEPA Process and ENF Certificate
- Geotechnical Field Investigation
 - What, Where, When, Why
- Next Steps
- Group Discussion





Ground Rules

- Audio Settings
 - Please **mute** your audio unless you are presenting or have been given the floor by the facilitator
- Video Settings
 - Please have your video **turned on**
- Questions/Comments
 - Please either select the “**raise hand**” **control** in the control panel or
 - Please **physically raise your hand** or
 - Members can enter questions or comments in the **chat** under the chat panel



MEPA Process and ENF Certificate

- Environmental Notification Form (ENF) filed and published in the Environmental Monitor April 7, 2021
- Secretary's Certificate for the ENF was issued on May 7, 2021
 - Posted on Tunnel Program web page:
<https://www.mwra.com/mwtp/assets/resources/enf/16355-ENF-Metropolitan-Water-Tunnel%20Program-2021-05-07.pdf>
 - Received comments from Charles River Watershed Association, DCR, Mass DEP, WSCAC, City of Newton, MHC





MEPA Process and ENF Certificate

- Next Steps:
 - Follow up meetings with communities, advocacy groups and state agencies
 - Evaluation of alternatives
 - Environmental analysis in preparation of Draft Environmental Impact Report (DEIR) based on ENF Certificate

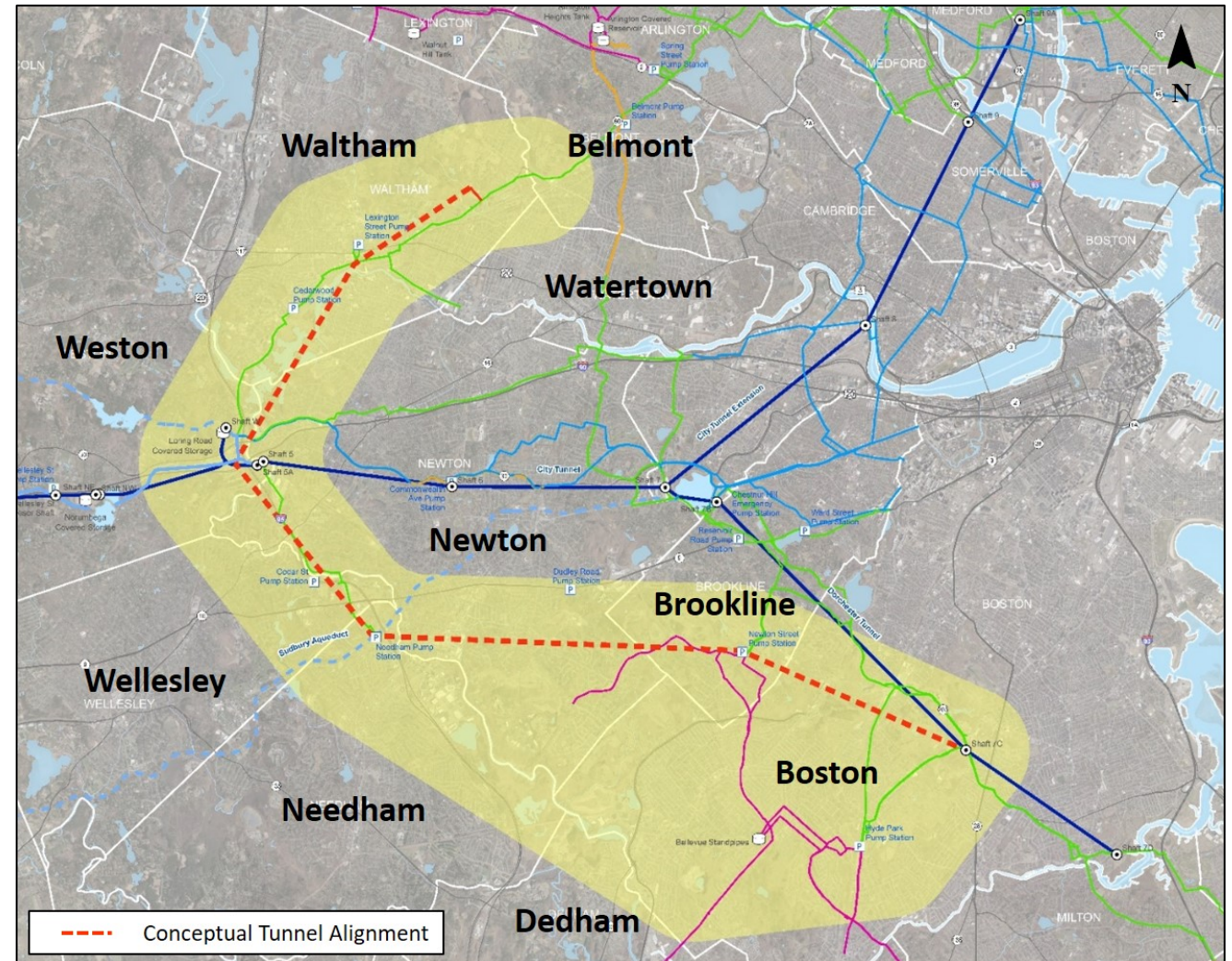


Geotechnical Field Investigation



Geotechnical Field Investigation

- Conducted within the Program Study Area
- Currently conducting the first phase of preliminary design
- Multiple similar phases over the next ~ 5 years

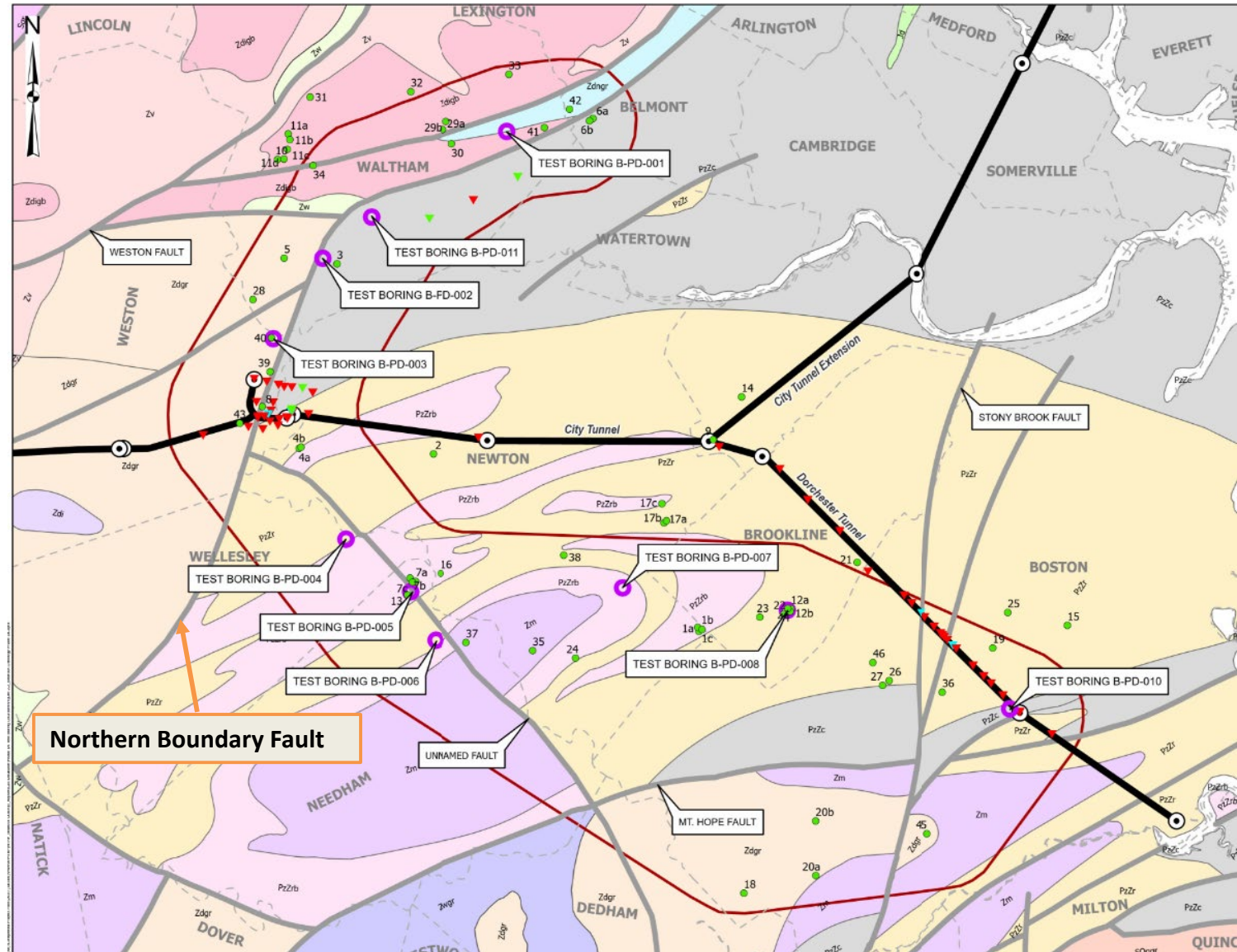




Geotechnical Field Investigation

Why?

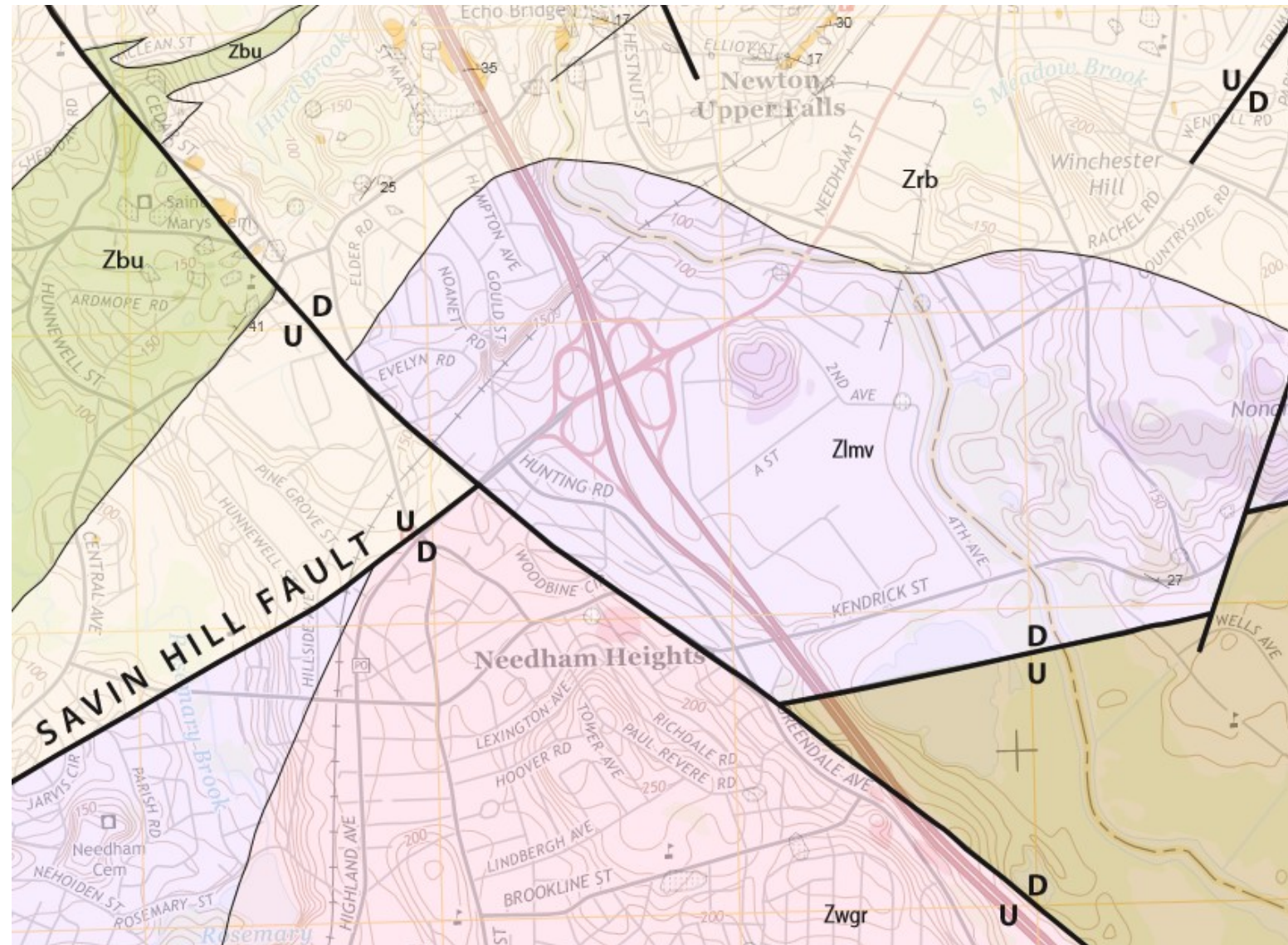
- Collect information about ground conditions (complex geology) to support alternative evaluation of tunnel routes
- Provide information for the design and construction of the Program





Geotechnical Field Investigation

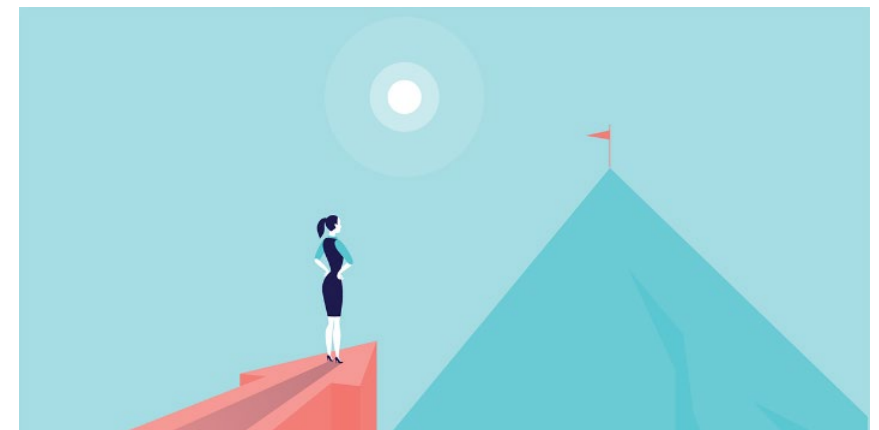
- Local geologic maps depict wide variety of rock types in complex relationships
- Geotechnical field investigations build upon regional geologic knowledge
- Investigations provide more detail, help to resolve uncertainties





Geotechnical Field Investigation – Preliminary Design

- Two-phase program during preliminary design (thru 2023)
- Goals
 - Provide framework on the Program geotechnical and geological settings
 - Support alignment alternatives evaluation
 - Support preliminary design, contract packaging and cost estimate





Geotechnical Field Investigation – Preliminary Design

- What is in the initial phase Geotechnical Investigation Program?
 - Bedrock Outcrop Mapping
 - Surface Geophysical Survey
 - Borings and Field Testing
 - Monitoring Wells / Piezometers
 - Laboratory Testing





Bedrock Outcrop Mapping

- What is it?
 - Outcrop mapping is a systematic way to locate and record visible exposures of bedrock. Geologic conditions including rock type, structural features and fracture information are observed and documented
- What will I see?
 - Two to four people standing next to an area with exposed bedrock to observe its characteristics, measure orientation of joints, take photos and record information
 - No equipment beyond handheld tools





Geotechnical Field Investigation – Bedrock Outcrop Mapping

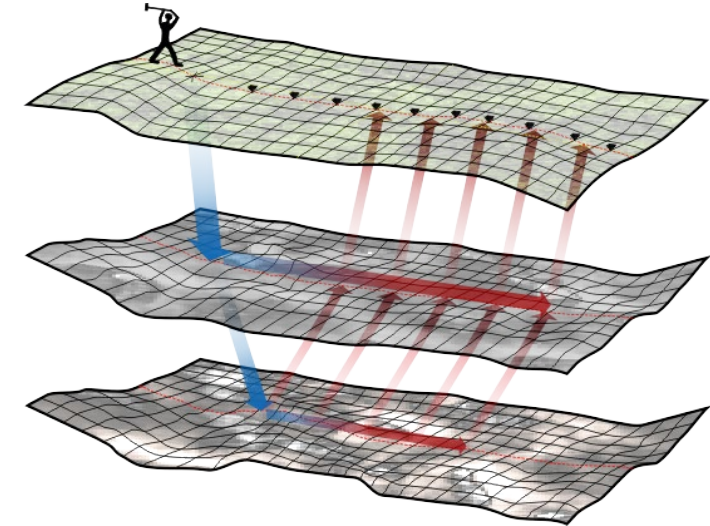
- Where is it?
 - Outcrops throughout the Program Study Area have been identified and only locations accessible from a public right-of-way will be mapped at this time
- How long will it take?
 - Depends on the size and complexity of the rock exposure. Outcrop mapping at each location is anticipated to take several hours to a few days





Surface Geophysical Survey

- What type of Surface Geophysical Survey?
 - Seismic Refraction Survey
- What it is?
 - Non-intrusive testing that utilize ground-based vibration sensors to measures refraction of seismic waves vibration through soil and rock layers to characterize the subsurface geologic conditions, and to evaluate depths to top of rock and groundwater.
 - Energy source like a sledgehammer striking a piece of wood or metal will be used to generate the “shots” and small geophones placed on ground will be used to measure the signals.
 - No excavation and no heavy equipment

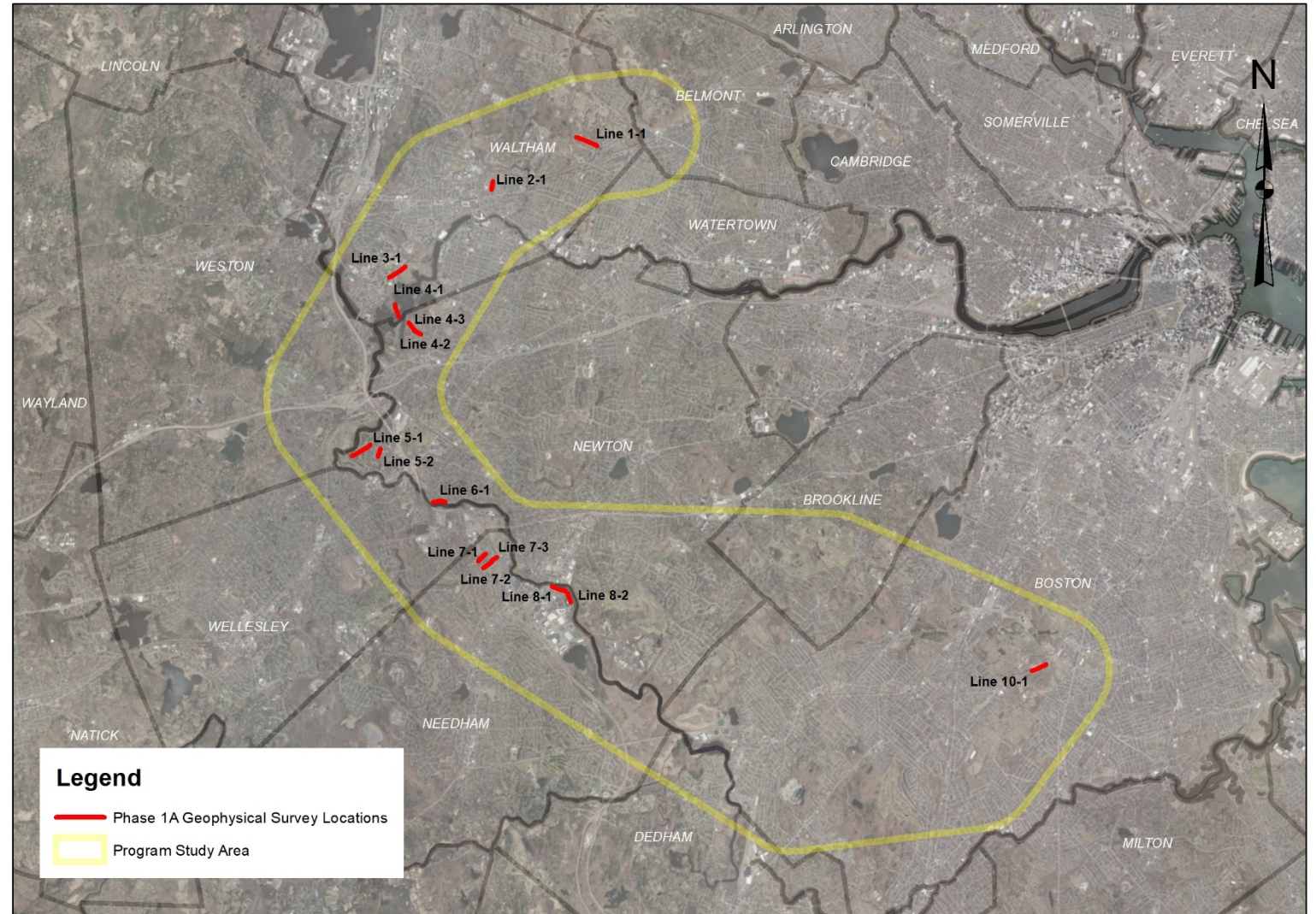


<https://geospectrum.pl/en/geophysics/seismic/refraction/>



Geotechnical Field Investigation – Surface Geophysical Survey Locations

- Where are they?
 - At 14 locations in Waltham, Newton, Needham and Boston, all on public land
 - Each survey line varies from about 250 ft to 1,500 ft long



0 10,000 Feet



Geotechnical Field Investigation – Surface Geophysical Survey

- What will I see?
 - A series of small geophones (vibration sensors) linked together by a wire placed about 10 ft apart in a straight line and connected to a seismograph
 - A sledgehammer hitting ground to generate signal
 - Few people conducting test with stroller size equipment
- How long will it take?
 - Depends on the length of the survey line
 - Usually about half-day to two days for each line

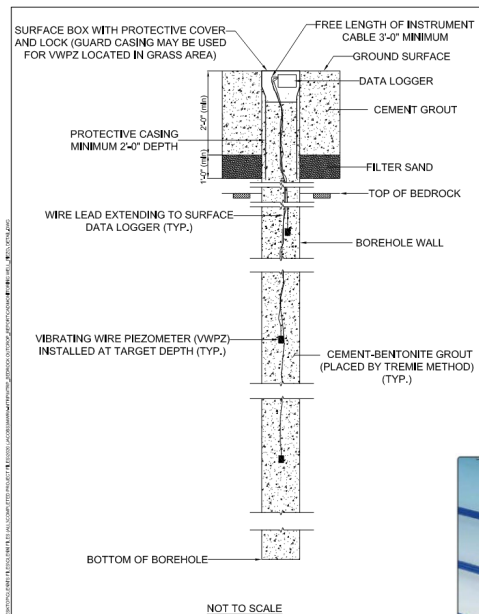




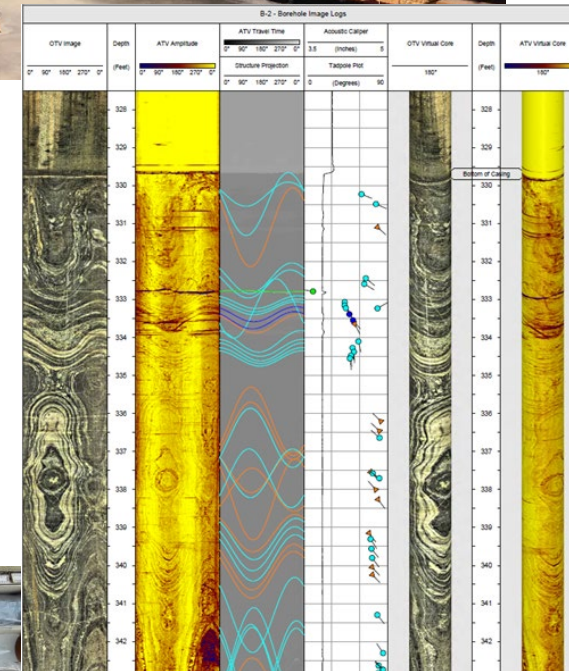
Geotechnical Field Investigation – Test Borings

Test Borings

- What is in this phase of the test boring program?
 - 10 Test Borings (~4-inches diameter)
 - Each about 400 to 550 feet depth
 - Lots and lots of rock core!
 - Downhole geophysical logging
 - Permeability testing
 - Installation of piezometers (for water level measurement) upon completion



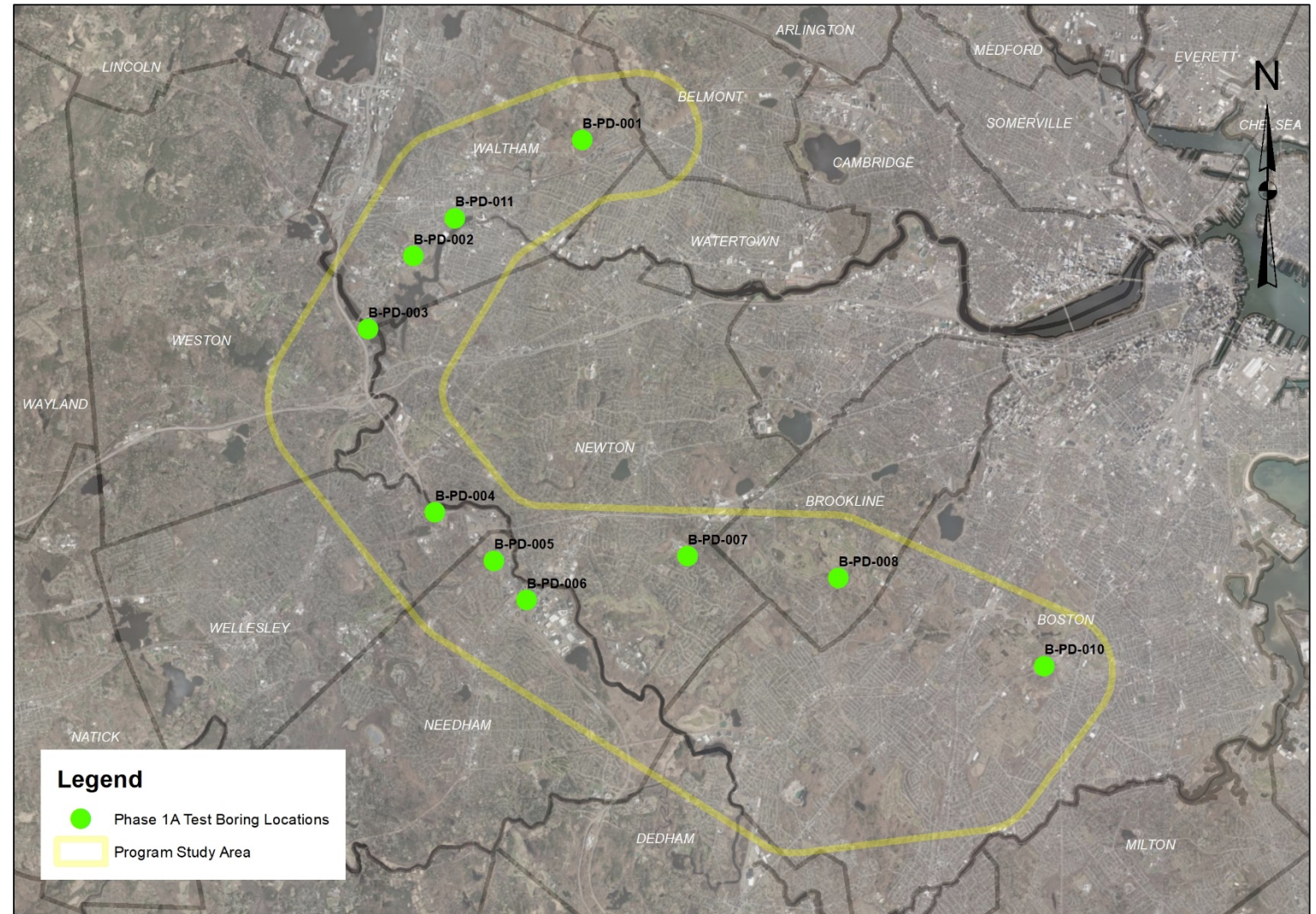
• Model 4500C, 4500S, 4500H, 4500P and 4500HD Vibrating Wire Piezometers (front to back)





Geotechnical Field Investigation – Test Boring Locations

- Where will they be?
 - On public property and outside of roadways (for now)
 - Locations coordinated with each individual site owner and communities





Geotechnical Field Investigation – Test Borings

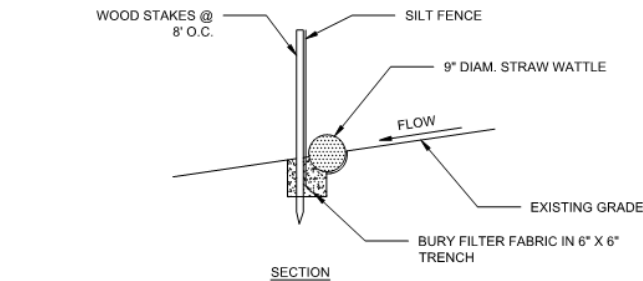
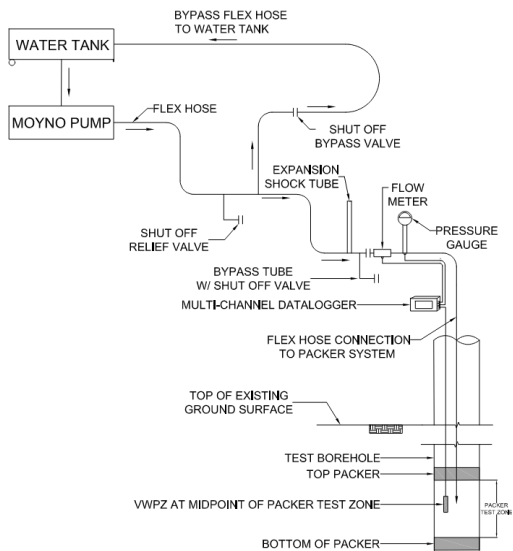
- How long will it take?
 - Given the depth and all the testing to be done within each borehole, it is anticipated each boring will typically take about 6 to 8 weeks to complete
 - Up to 4 drill rigs at a time to accelerate program
 - Sequence will be coordinated with permits and site requirements





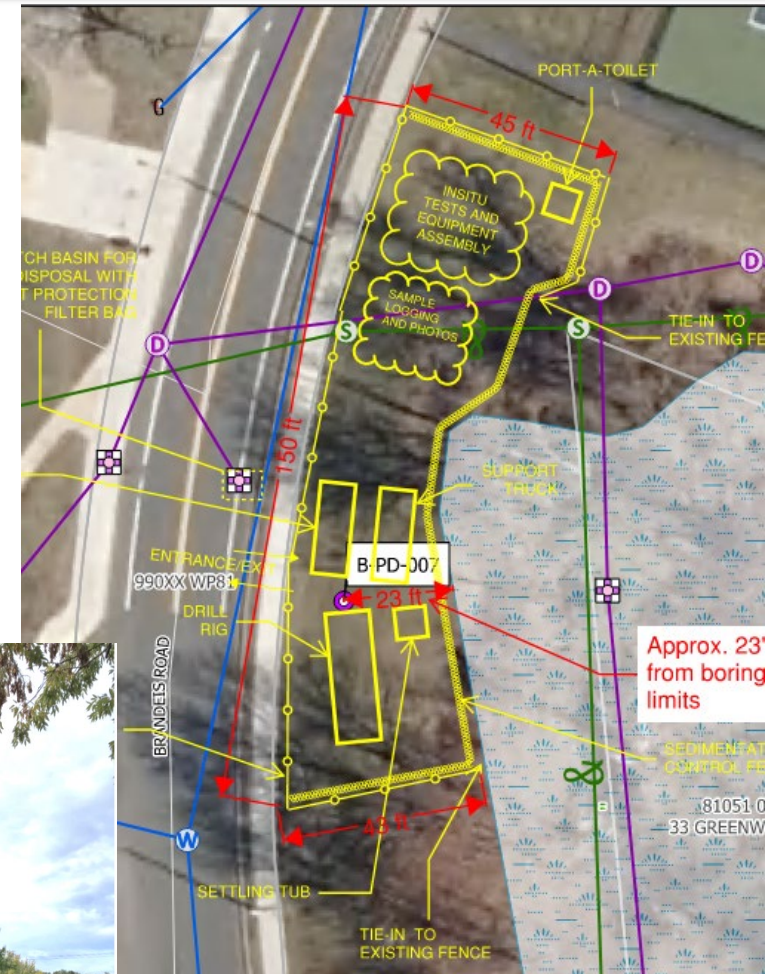
Geotechnical Field Investigation – Test Borings

- What will I see?
 - Typically fenced-in work area
 - Erosion and sedimentation control in coordination with local Conservation Commission
 - Drill rig, support truck, water truck/tanks, testing equipment, area for rock core logging, etc. with about 3 to 6 person crew



SEDIMENTATION CONTROL FENCE (STRAW WATTLE)

DETAIL C
NTS





Geotechnical Field Investigation – Test Borings

- What will I see?
 - Instruments to measure groundwater will be installed in each borehole upon completion, with roadbox/casing at ground surface
 - Spoils drummed and remove offsite
 - Work site restored upon completion





Geotechnical Field Investigation - Schedule

- Anticipated Schedule
 - Bedrock outcrop mapping: Ongoing
 - Surface geophysical survey: Ongoing
 - Test borings: June through fall 2021





Upcoming Meetings

- Early August (8/4/2021)
 - Introduction to Tunneling – How is it done?
- September
 - Preliminary Alternatives and Evaluation Criteria
- October
 - Conceptual Designs
- Future topics
 - Shaft Sites, Community Engagement, Costs & Financing, Environmental Mitigation, Site Visits
 - Tell us what you want to hear about/discuss
- MWRA Program Team can provide individual briefings/presentations to your community/organization at any time. Just ask!



Metropolitan Water Tunnel Program

- Contact Us
 - Sean Navin, Working Group Facilitator
 - 617-788-1112
 - Sean.Navin@mwra.com
 - Tunnels.info@mwra.com
- <https://www.mwra.com/mwtp.html>
 - Meeting notices, agendas, presentations, minutes



Metropolitan Water Tunnel Program



Thank You!