

WELCOME

DELCORA WASTEWATER TUNNEL PROJECT PUBLIC MEETING – April 21, 2022



Public Meeting

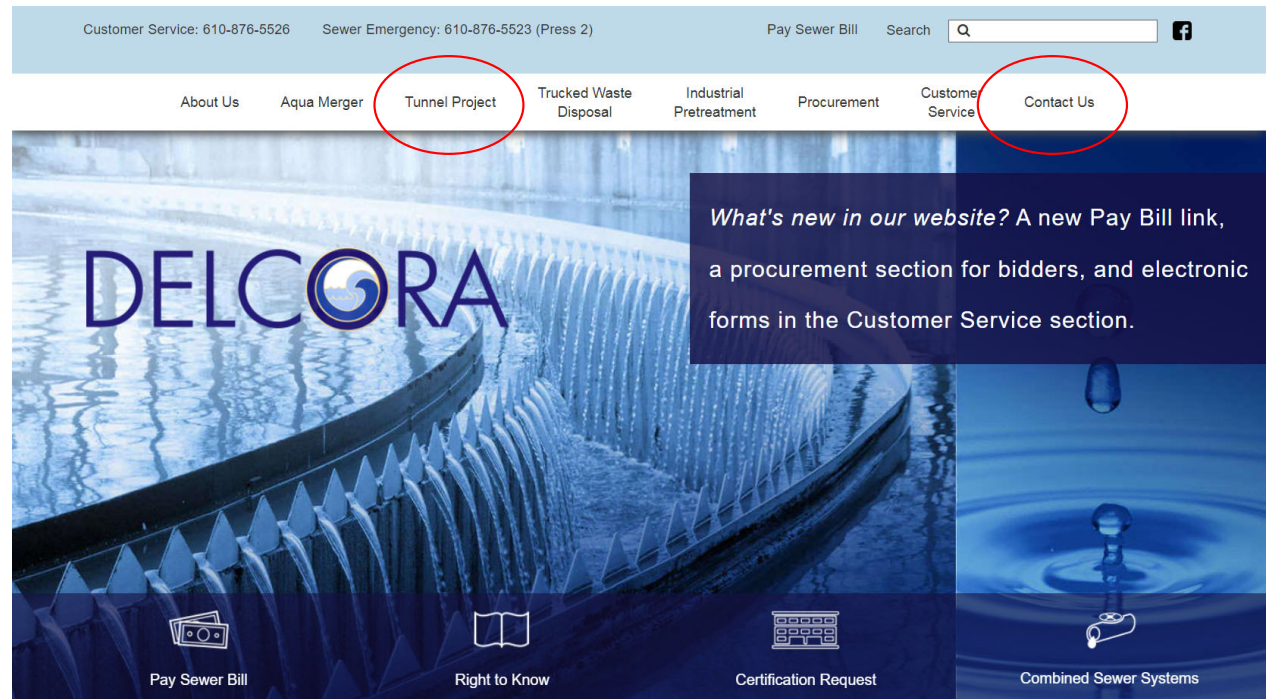
DELCORA has scheduled a public meeting to discuss the planned expansion of its wastewater system through the construction of a tunnel, including the protection of historic properties. Please join us!

WHEN: Thursday, April 21
TIME: 6:00 PM
WHERE: Norwood Borough Hall
10 W. Cleveland Ave.,
Norwood, PA 19074

Come to learn, listen and share!

Please contact DELCORA

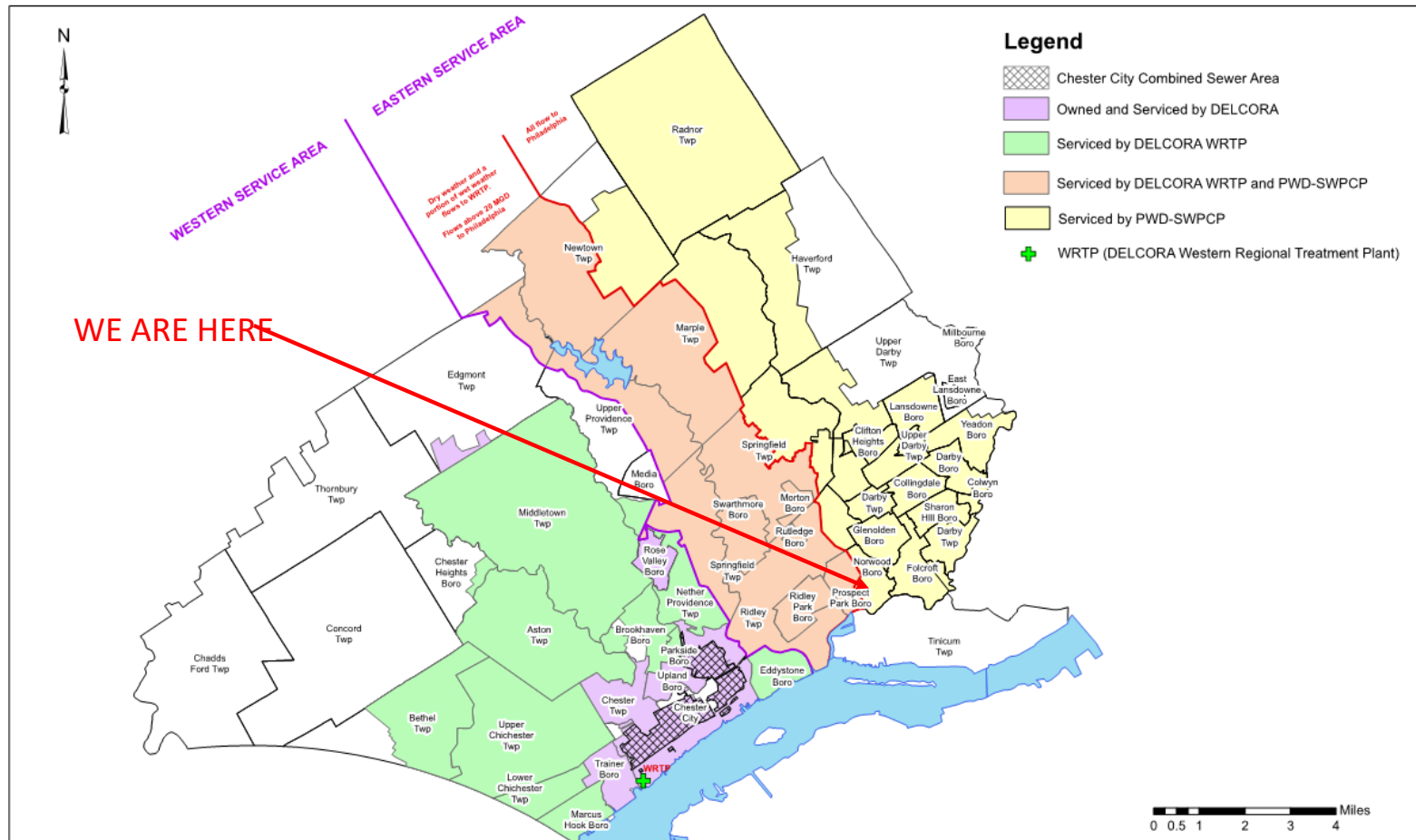
- Mailbox: 610-876-5523
Ext. 272
- DELCORA website –
Contact Us tab:
<https://www.delcora.org/contact/contact-us/>
- DELCORA website –
tunnel tab
- TBD: Construction
Updates – Facebook?



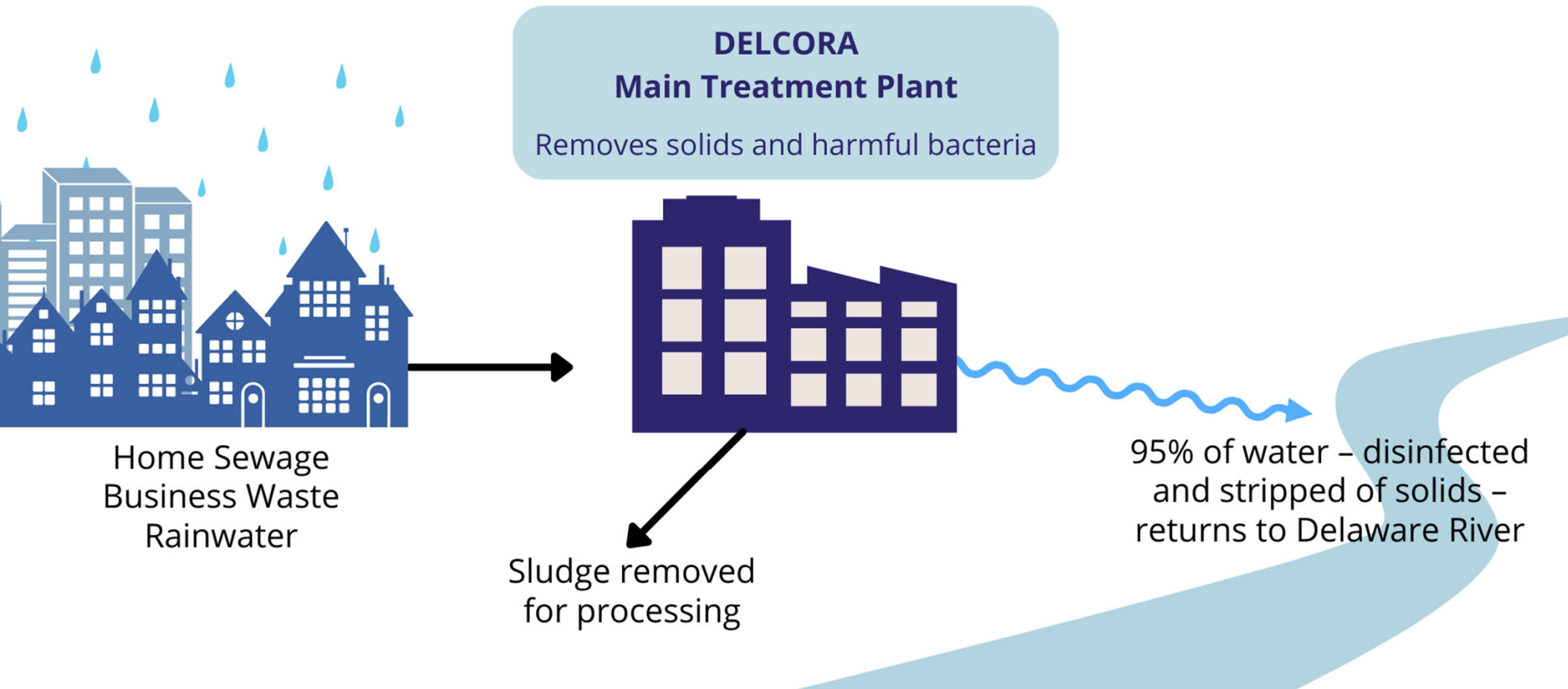
Meeting Purpose

- Present information about **DELCORA**
- Provide details of a planned **DELCORA** Wastewater Tunnel
- Discuss community impacts, especially historical structure concerns
- Listen and respond to comments and questions regarding the project

Who does DELCORA Serve?



What Does DELCORA Do?

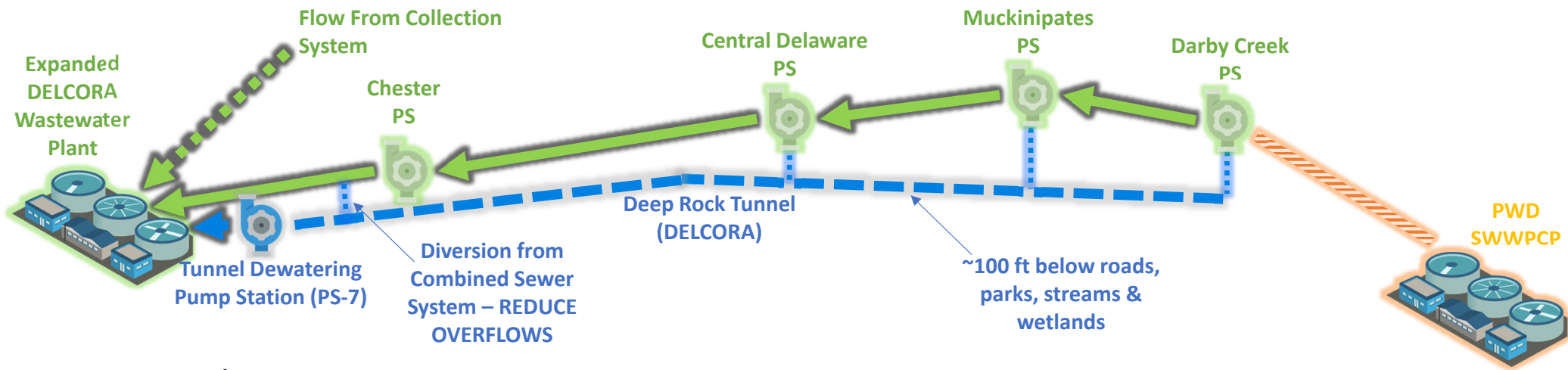


What does DELCORA do?

- On a daily basis, the plant treats the equivalent volume of 1,400 typical-sized residential pools
- Compared to what comes into the treatment plant, what comes out of the plant at least 95% cleaner and completely disinfected

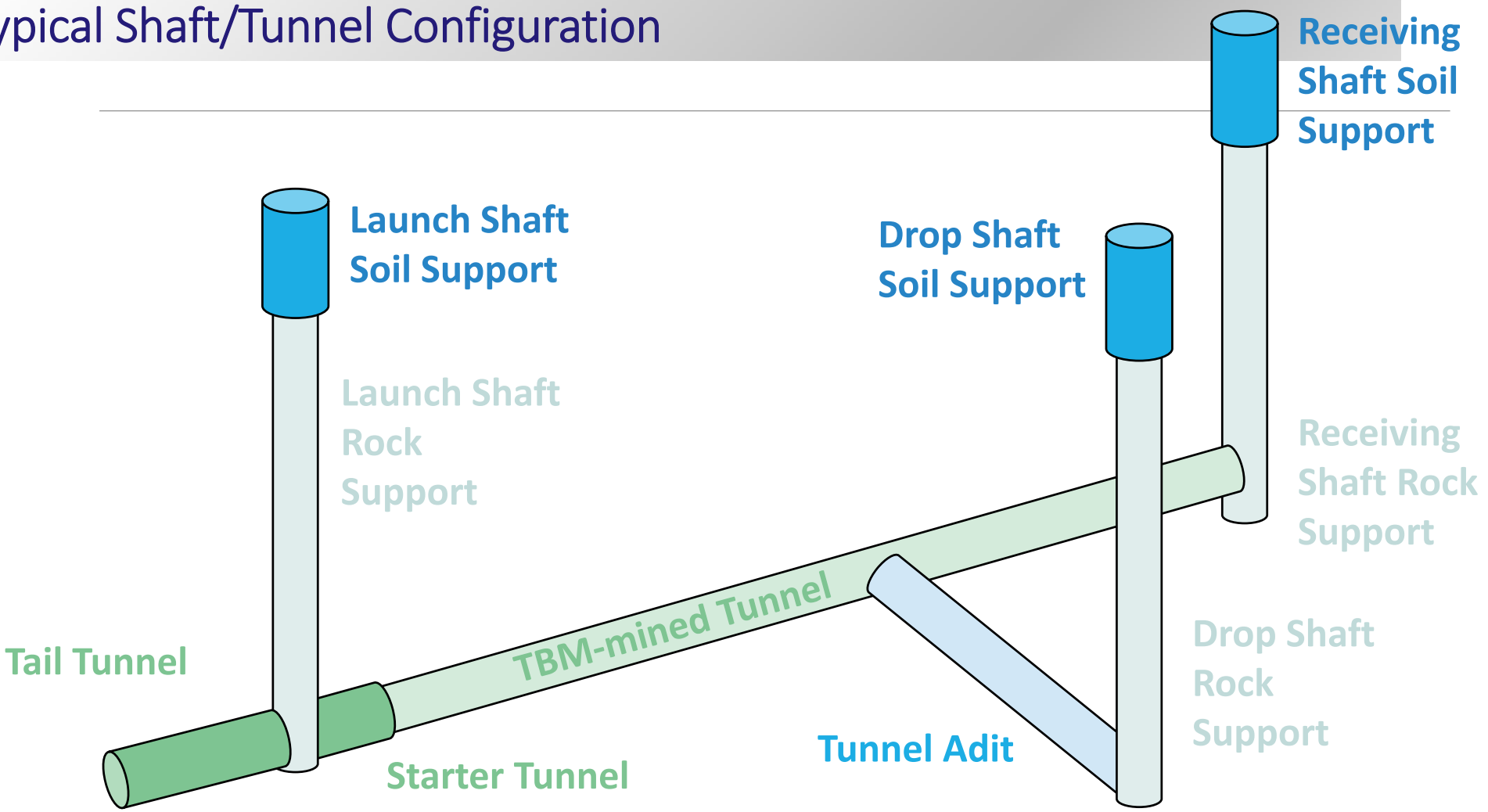


Proposed System DELCORA Wastewater Tunnel



- Saving \$410M by leaving Philly system and Building a tunnel
- Combined Sewer Overflows reduced by over 95%

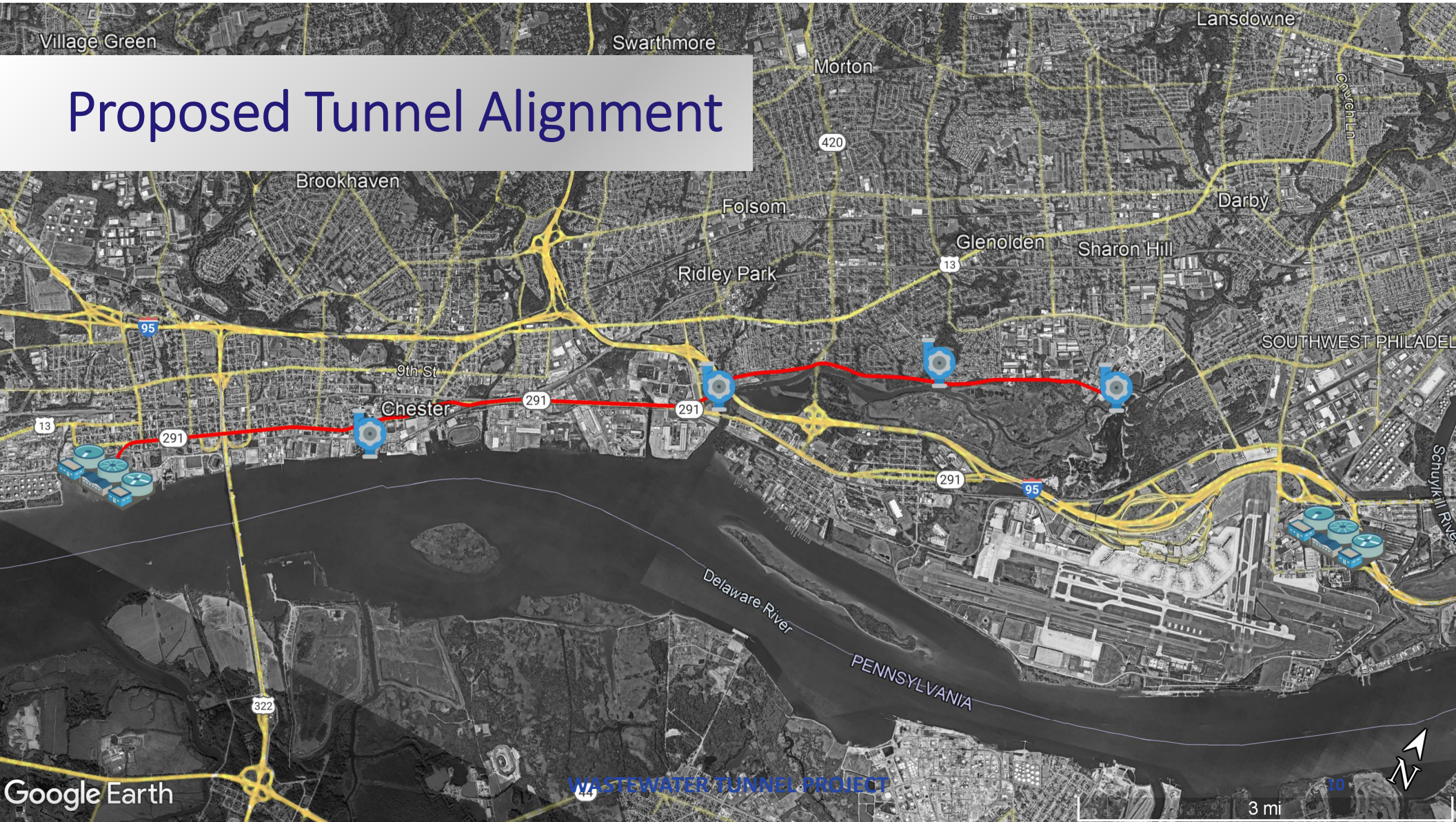
Typical Shaft/Tunnel Configuration



HDD Pipeline is NOT a tunnel



Proposed Tunnel Alignment

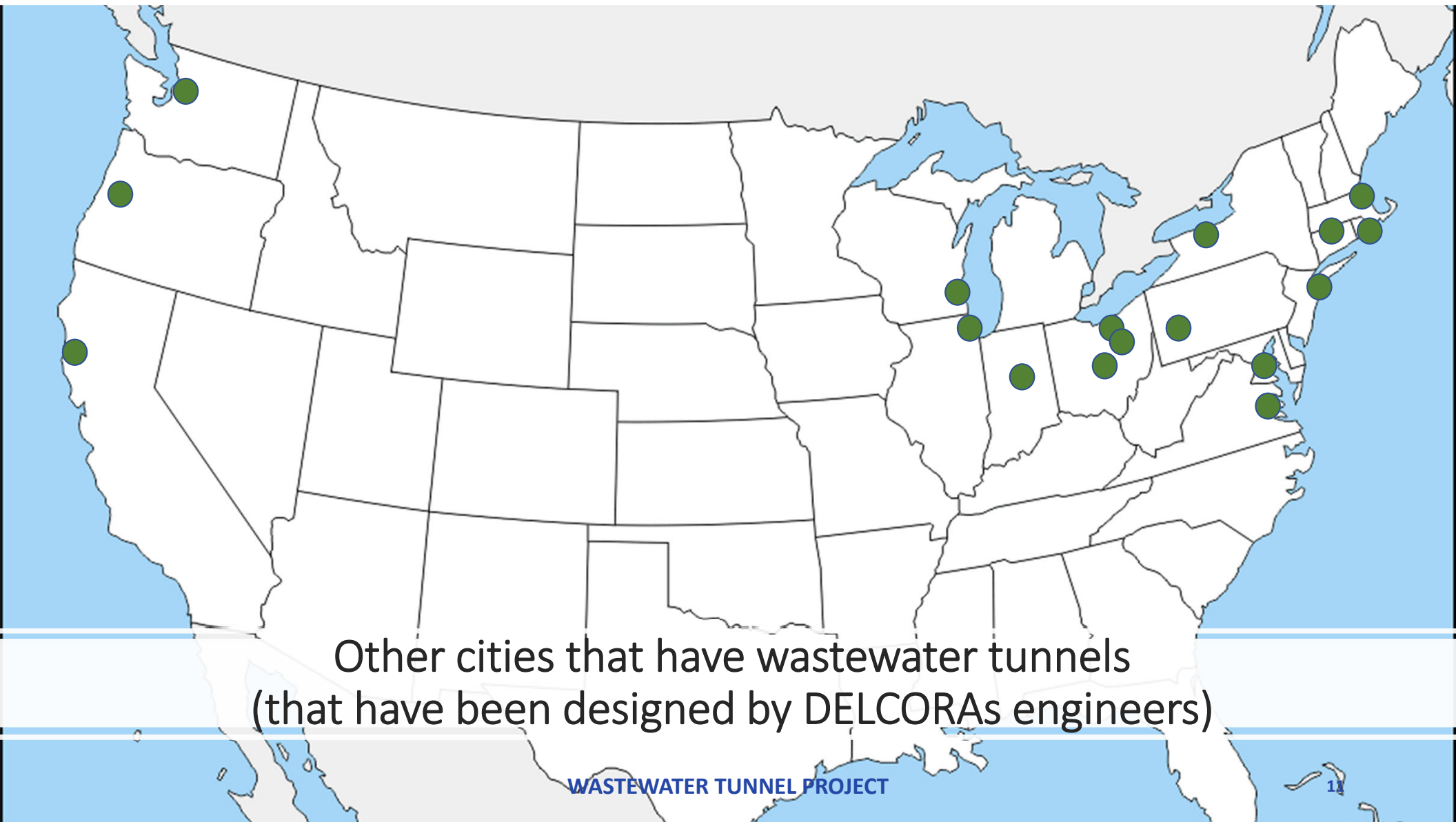


Google Earth

WASTEWATER TUNNEL PROJECT

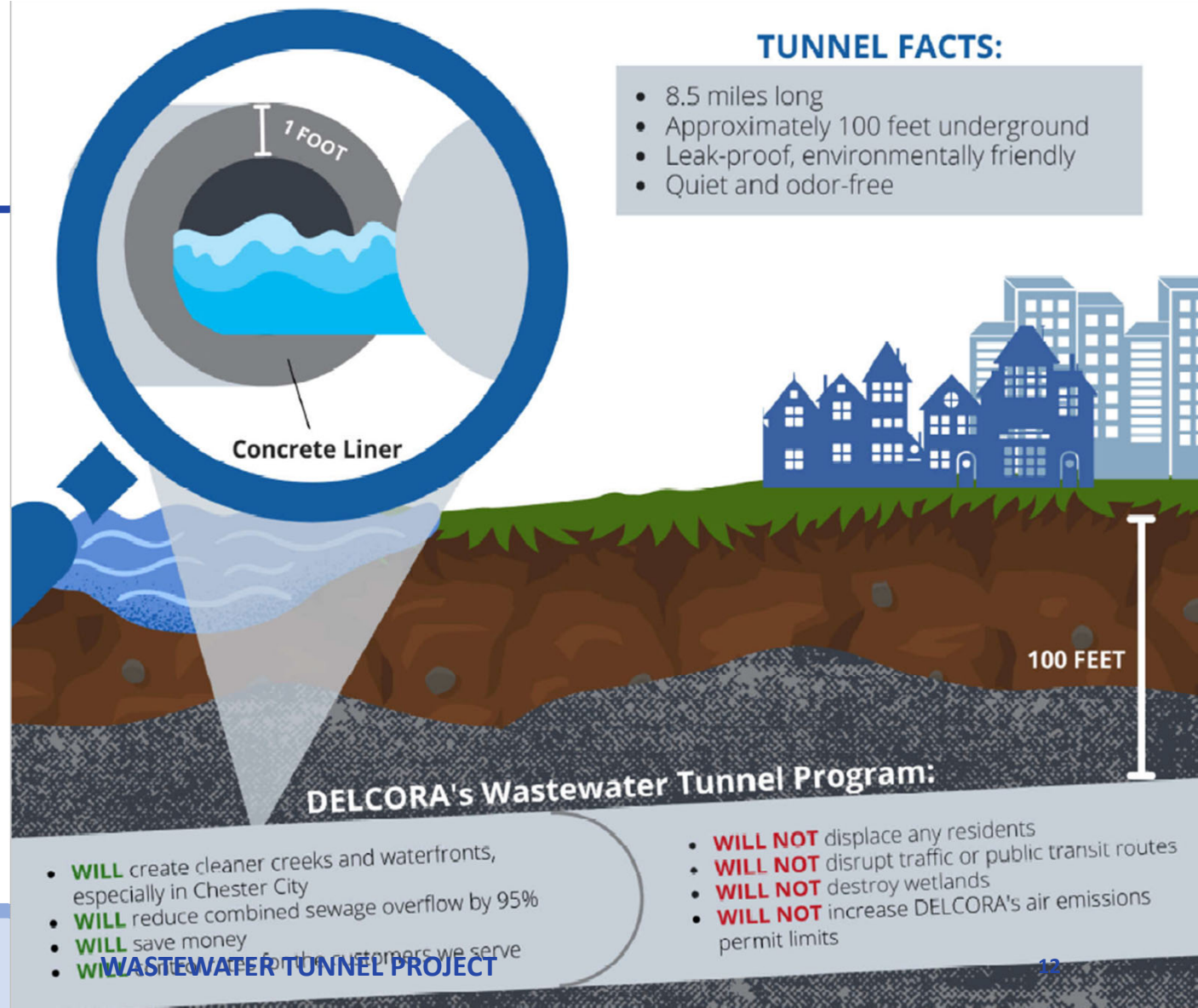
3 mi

10'



Community Impacts

- Soil Disturbance
- Traffic and bus route disruption
- Noise
- Odors
- Dust
- Historical Structures



Agenda

1

DELCORA Tunnel Overview

2

Tunnel in Norwood & Prospect Park

3

Tunneling Below the Morton House & Morton Homestead

4

Vibrations Created during Tunneling

5

Risks, Monitoring, and Control

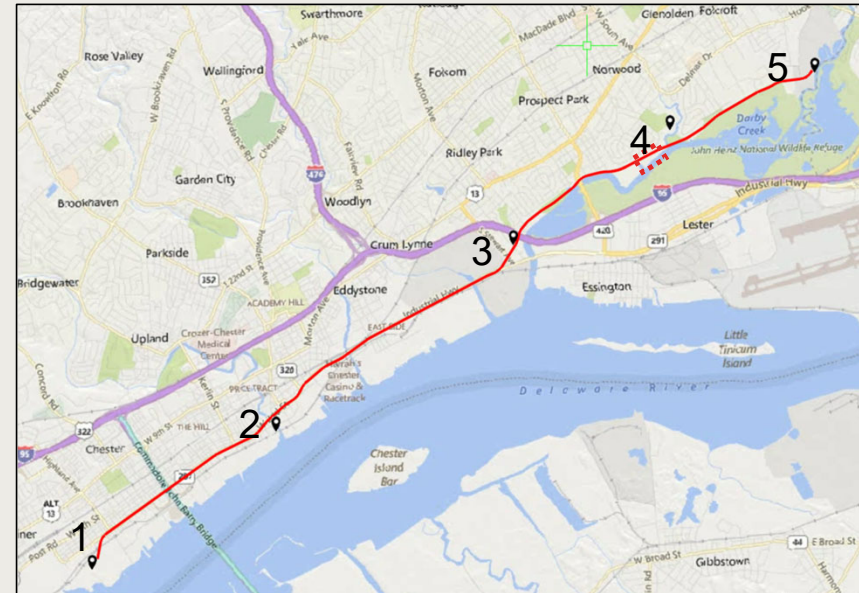
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Questions, Discussion & Next Steps

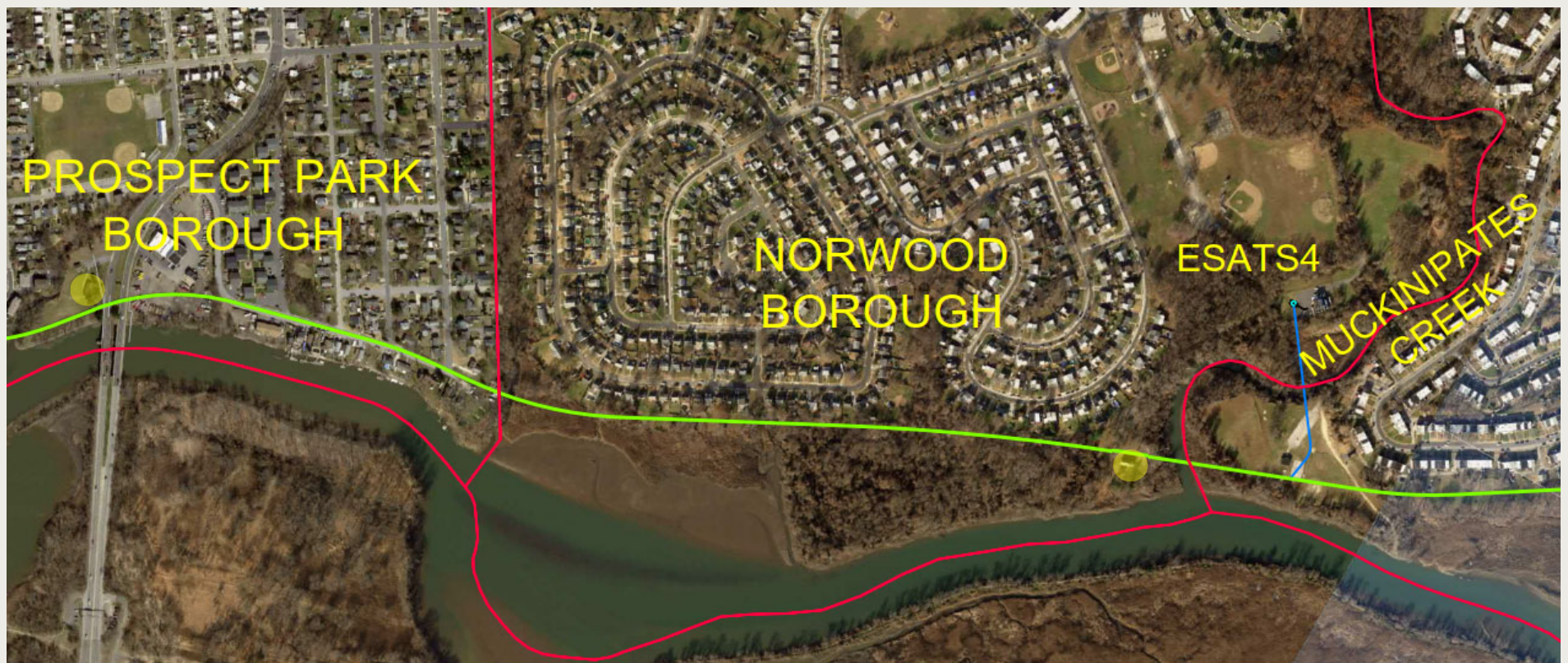
DELCORA ESA Tunnel Configuration

Tunnel Boring Machine (TBM) Construction Method

- ~44,000 lf
- Avg. of 100 ft below surface
- 14 ft finished diameter
- 5 deep shafts at DELCORA facilities
- Controlled mining deep in bedrock

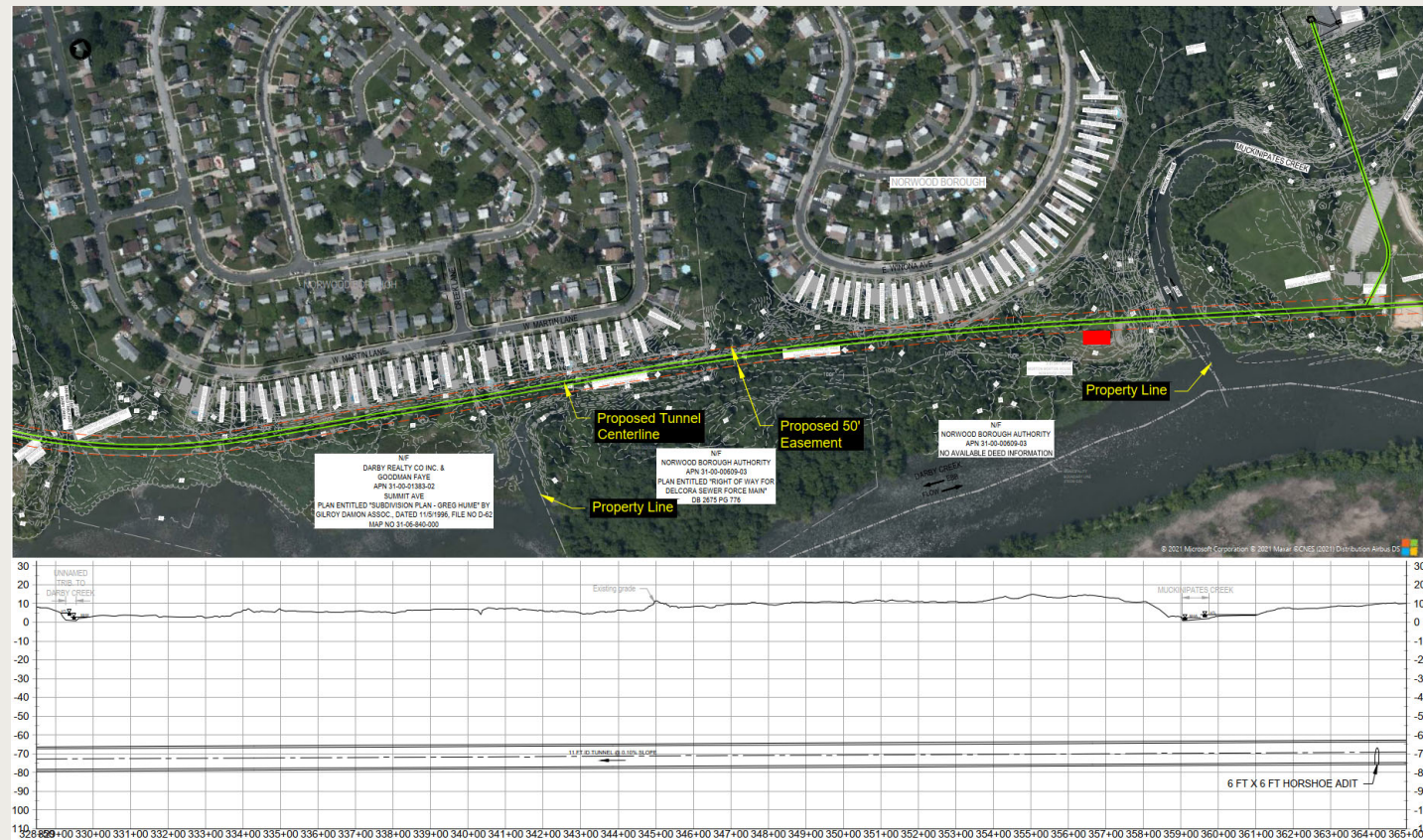


DELCORA Tunnel in the Region



ESA Tunnel Configuration at Norwood

- ~3,075 LF crossing Borough property
- Adjacent to, but deep (~75') below some structures (Morton House)
- No surface disruption from tunneling

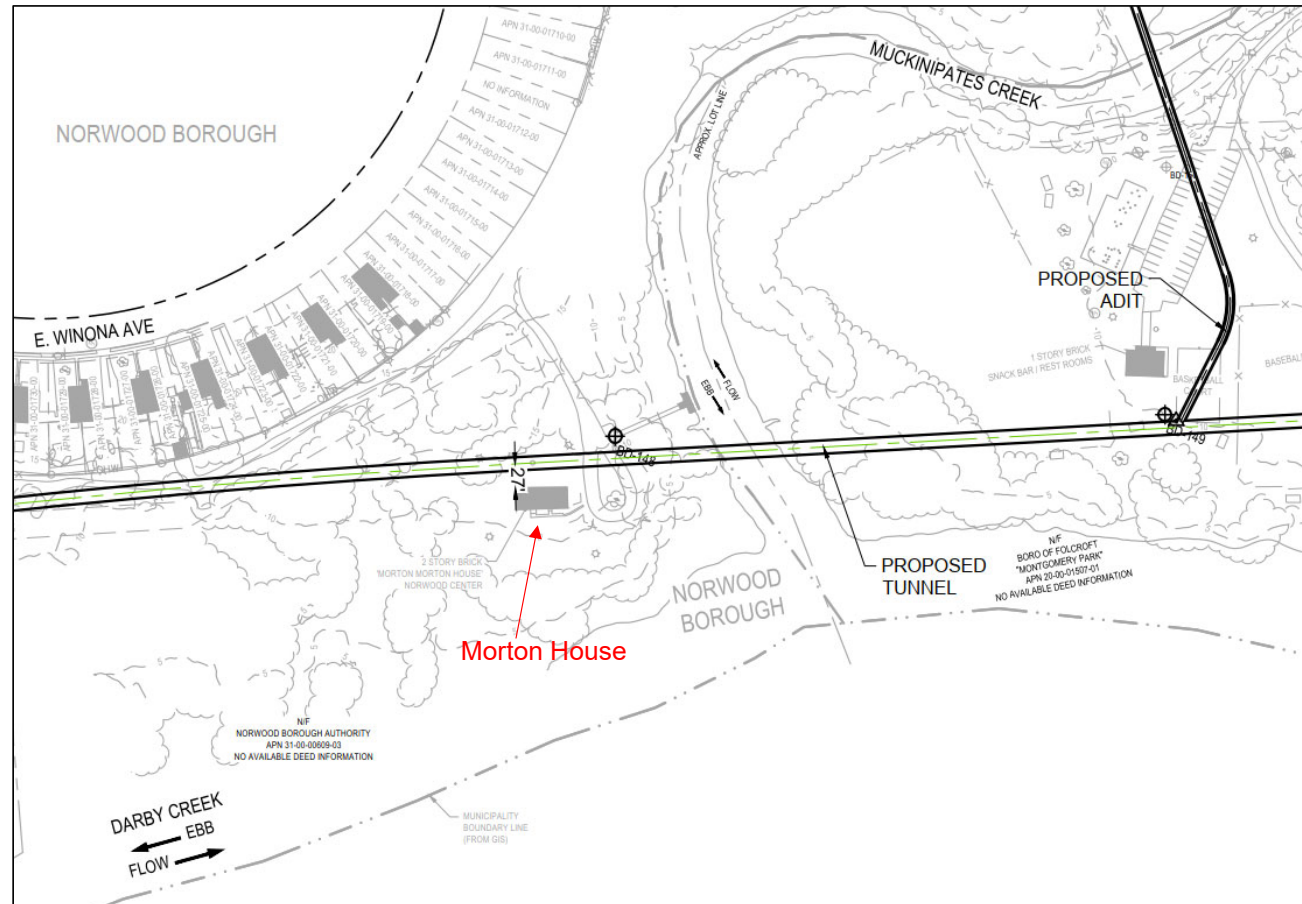


Morton Morton House (Norwood)

Plan View

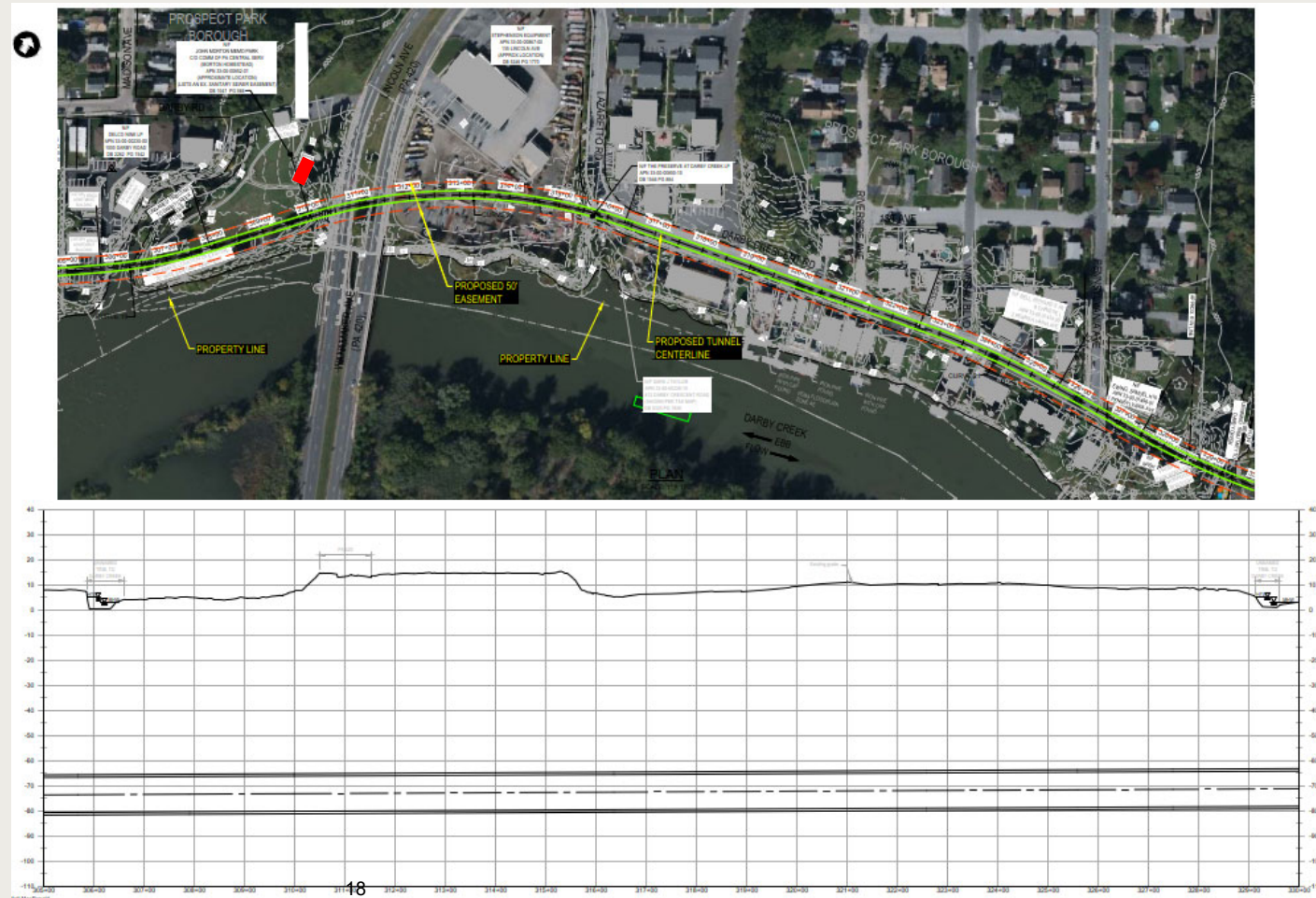
Proposed Tunnel Alignment

- 27' from Morton House to tunnel centerline
- Alignment constrained by tunneling machine turning radii and minimizing property interference and easements



ESA Tunnel Configuration at Prospect Park

- ~2,500 LF crossing Prospect Park property
- Adjacent to and deep (~75') below commercial and residential structures
- Passes under PA420
- No surface disruption from tunneling

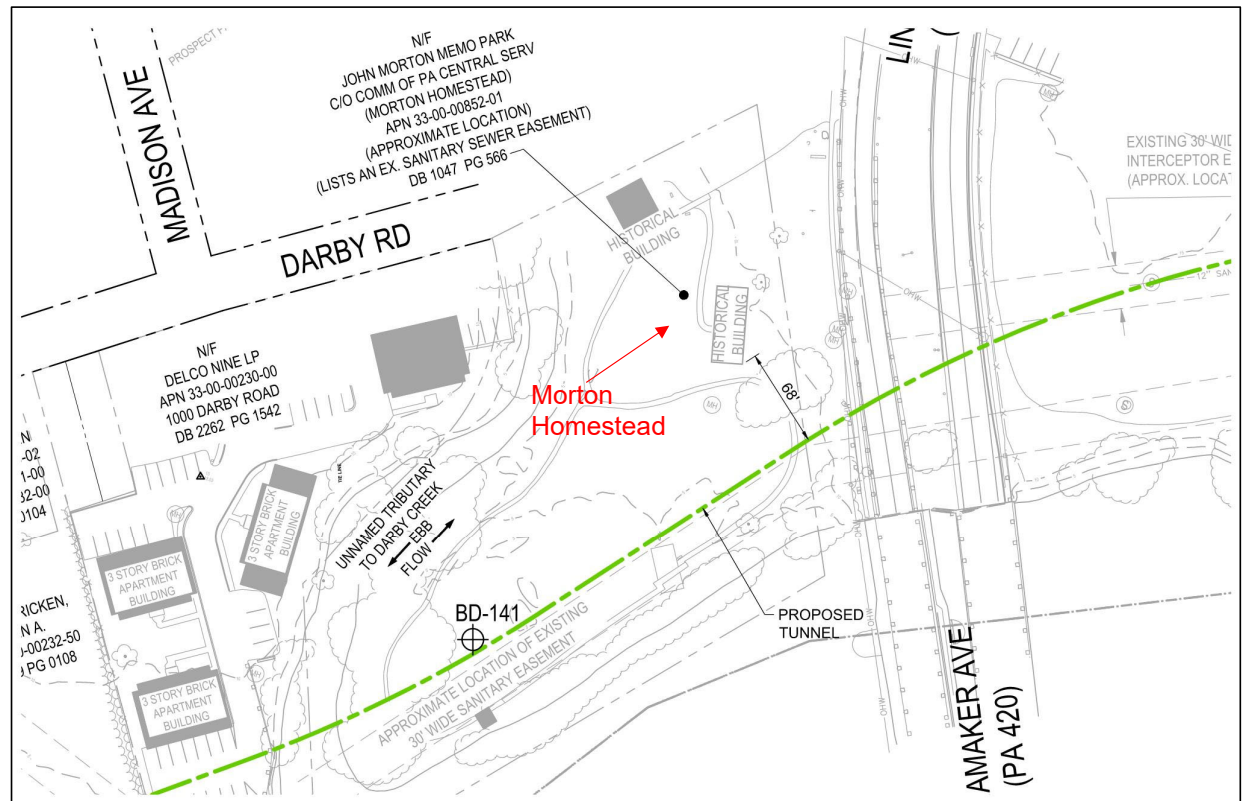


John Morton Homestead (Prospect Park)

Plan View

Proposed Tunnel Alignment

- 68' from Morton Homestead to tunnel centerline
- Alignment constrained by tunneling machine turning radii and minimizing property/infrastructure interference and needed easements

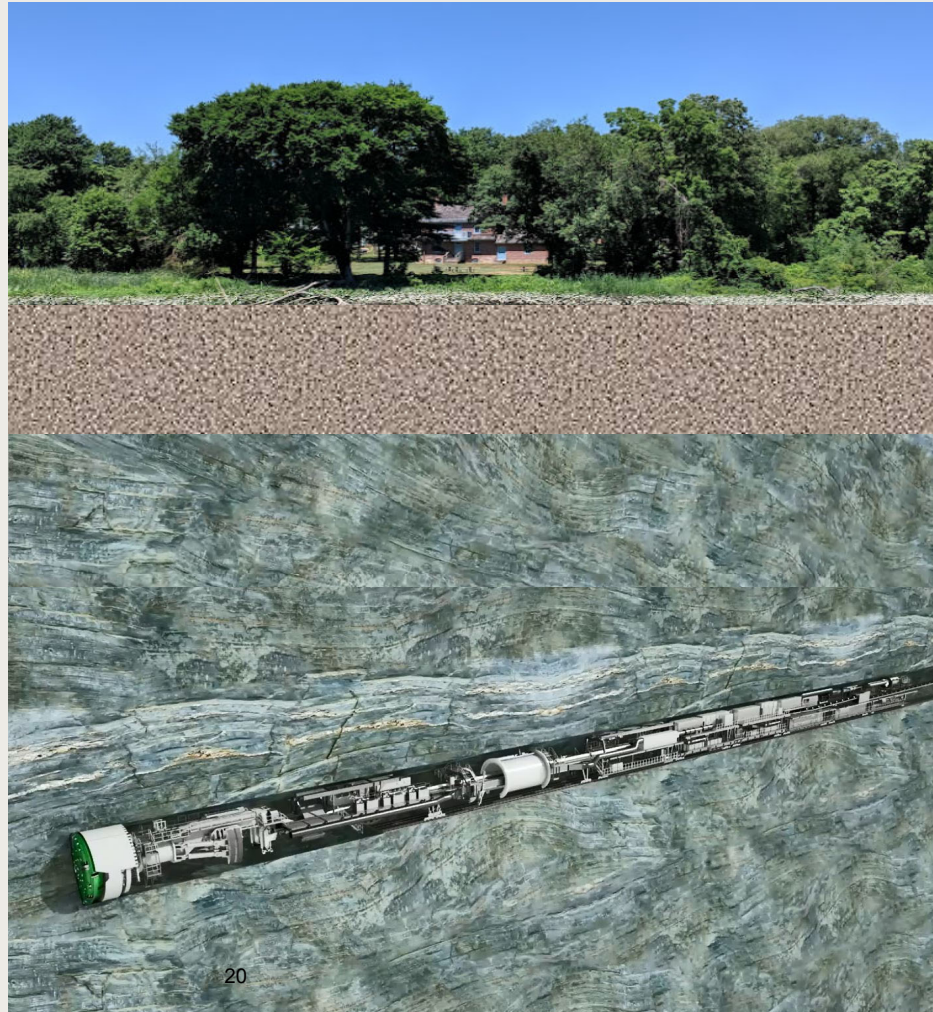


TBM Mining below the Morton House & Morton Homestead

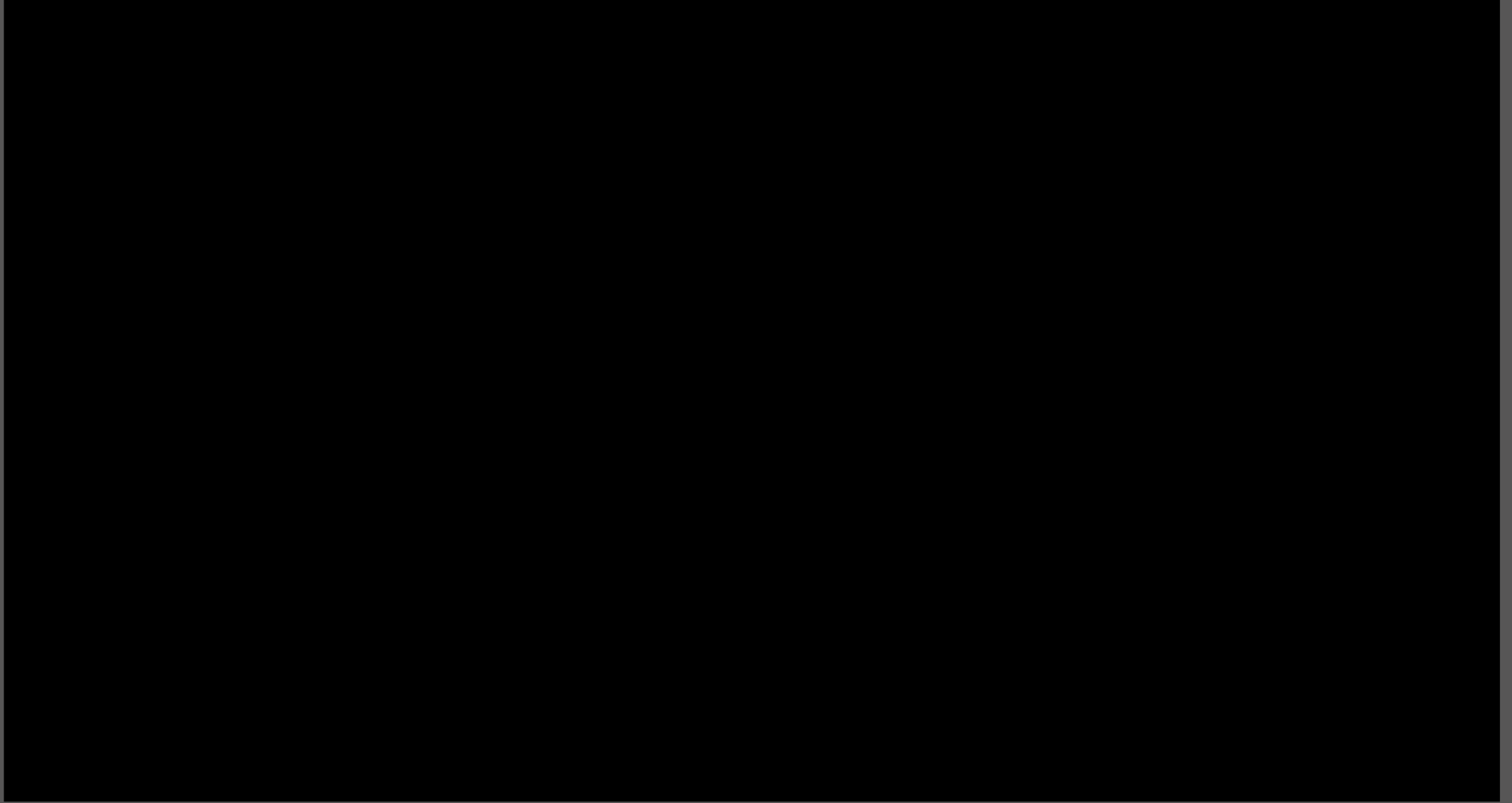
Schematic Profile

Mining at Depth

- 75' vertical separation between TBM and historic structures
 - 15 ft of soil and 60 ft of rock
- Slow “grinding” process
- Active mining only lasts days
- Negligible vibrations



TBM Mining Video

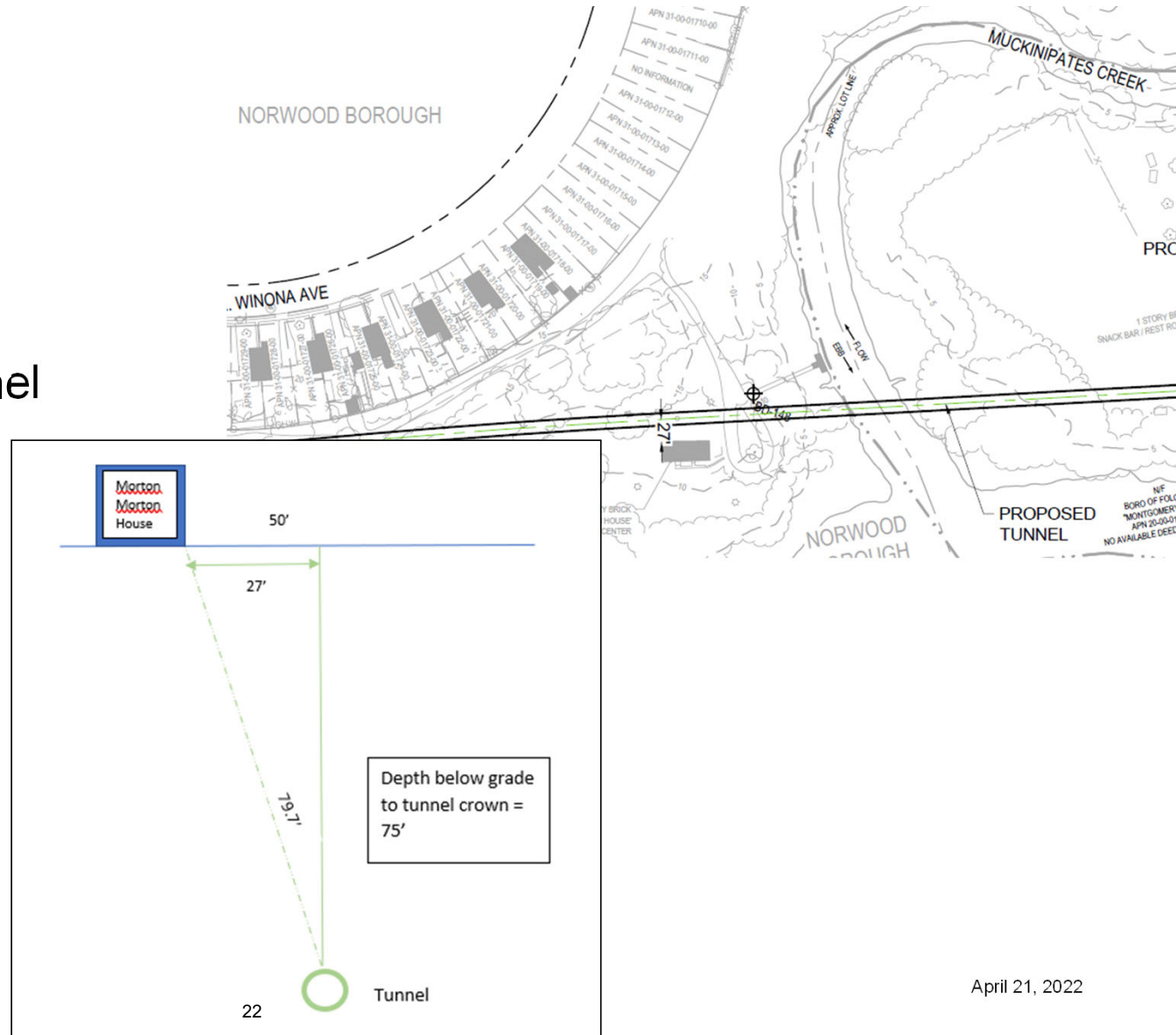


Morton Morton House

Plan & Section View

Considered Alignment Modifications

- Existing 27 ft offset to tunnel centerline
- Vertical distance controls separation of TBM from Morton House
- Vibrations dissipate dramatically with distance from source

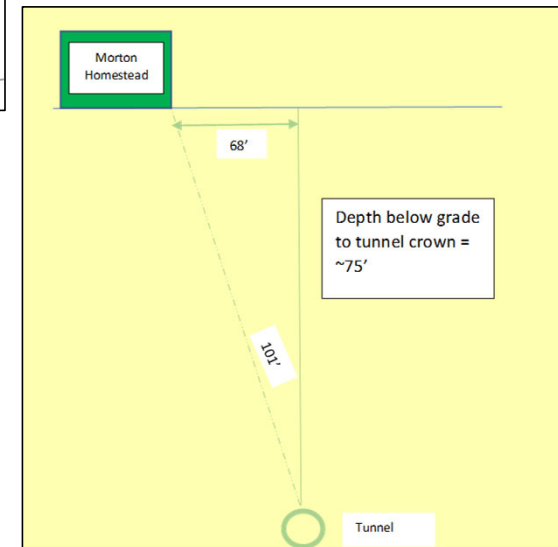
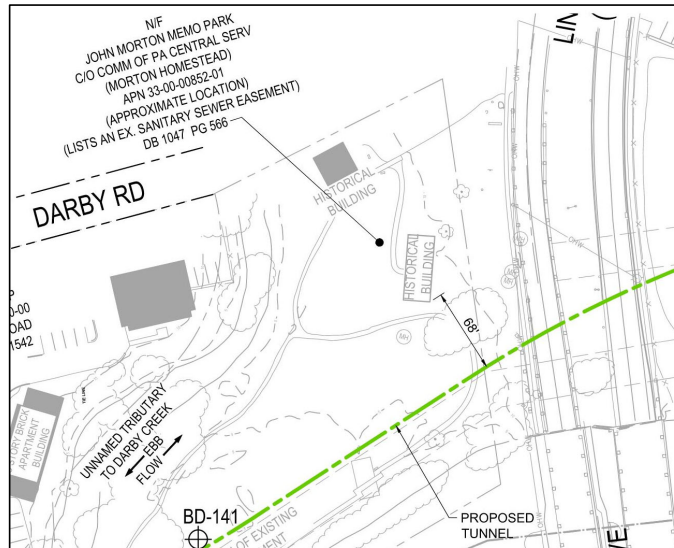


John Morton Homestead

Plan & Section View

Considered Alignment Modifications

- Existing 68 ft offset to tunnel centerline
- Direct distance determines separation of TBM from structure (>100')

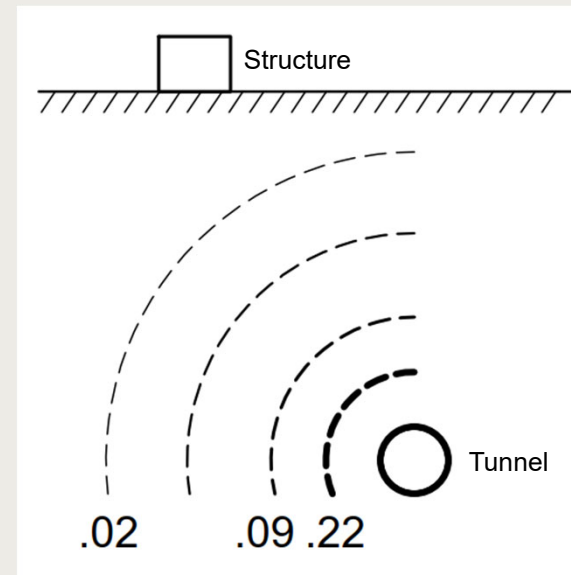


Vibration Dissipation

TBM & Common Construction Vibrations

Negligible Vibrations

- Measured as PPV
- Rapidly decreases with distance from the source
- Total or direct distance most important, not horizontal offset
- Very limited duration of TBM near structure



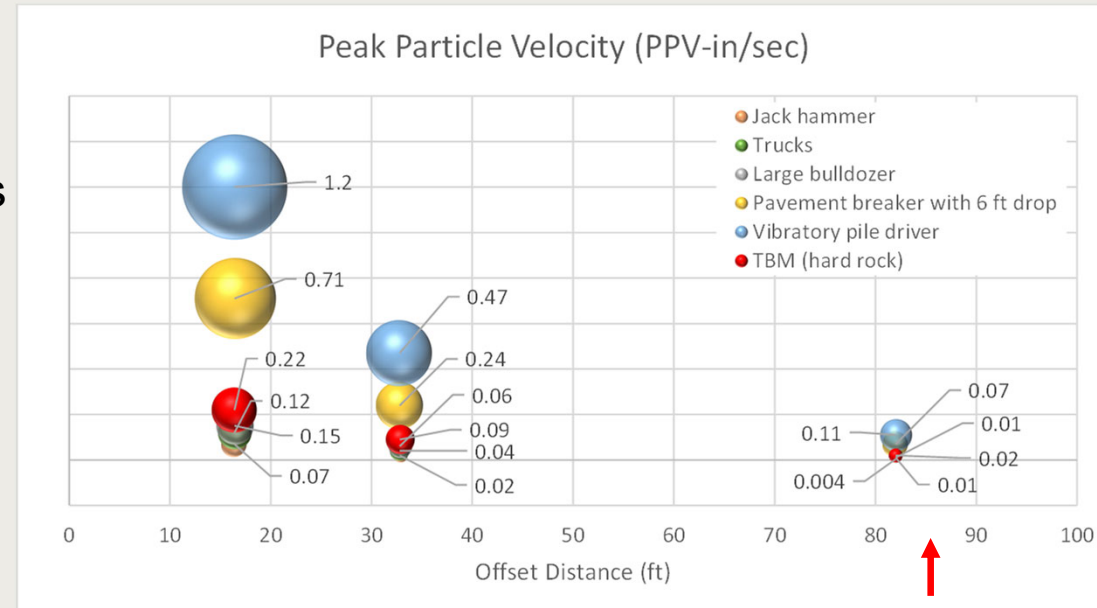
Equipment	Distance		
	16.4 feet	32.8 feet	82 feet
Jack hammer	0.07 in/s	0.02 in/s	0.004 in/s
Trucks	0.12 in/s	0.04 in/s	0.01 in/s
Large bulldozer	0.15 in/s	0.06 in/s	0.01 in/s
TBM (hard rock)	0.22 in/s	0.09 in/s	0.02 in/s
Pavement breaker with 6 ft drop	0.71 in/s	0.24 in/s	0.07 in/s
Vibratory pile driver	1.2 in/s	0.47 in/s	0.11 in/s

Vibration Relationships

TBM vs. Common Construction Vibrations

Negligible Vibrations

- Measured as PPV
- Well below any damage threshold
- Similar to heavy truck traffic
- Very limited duration (few days)
- Effectively “imperceptible”
 - (>0.05 in/sec)



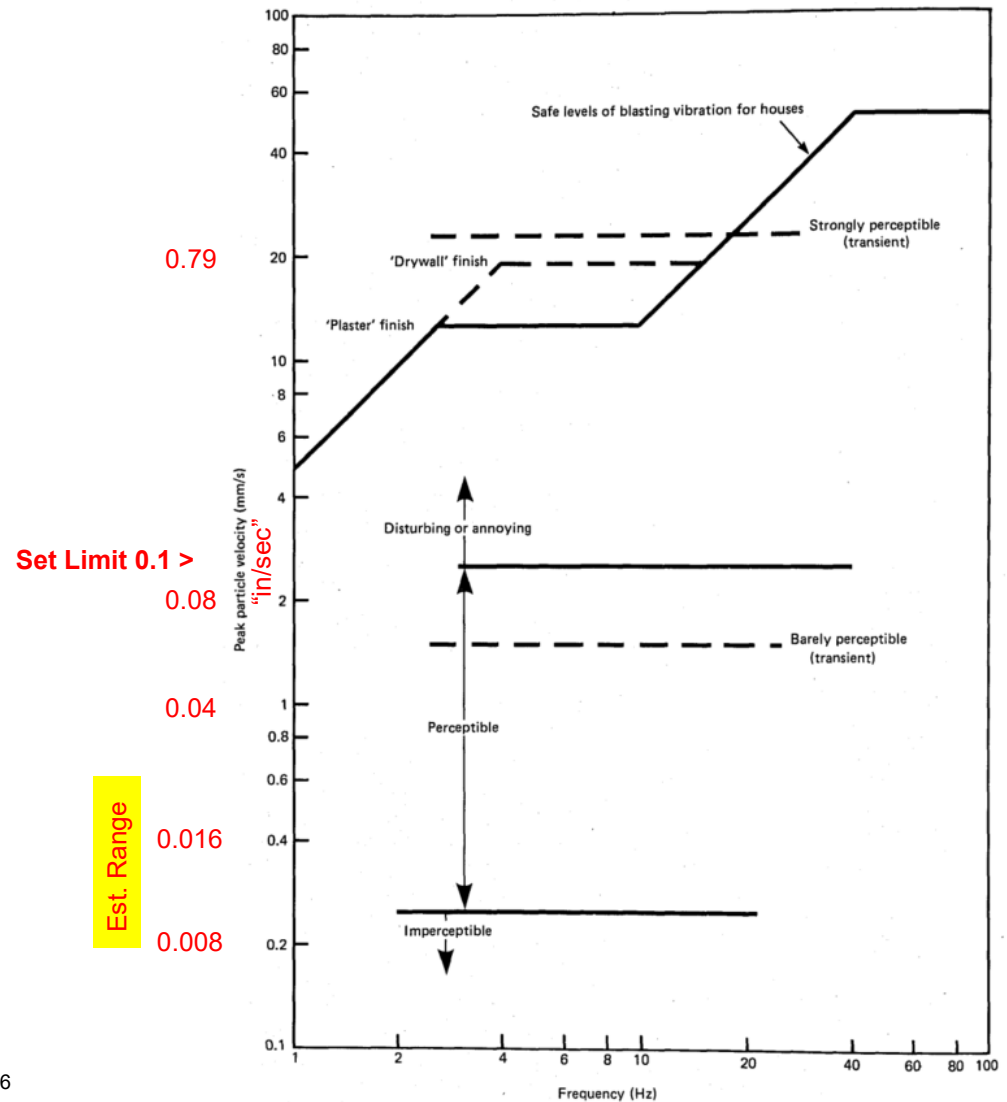
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Vibrations and Perception

PPV vs. Frequency

Transient and Continuous

- Upper graph shows typical Building Code limits
- Lower portion shows less perceptible levels
- Units in mm/s (1 mm/s = 0.04 in/sec)
- Proposed threshold limit of 0.1 in/sec



Morton Morton House

Tunnel Construction Management

Monitoring

- Pre-tunneling building survey
- Vibration monitoring during active tunneling
- Contingency/Emergency Action Plan if vibration threshold approached
- Post-tunneling building survey
- Written documentation



Please contact DELCORA

- Mailbox: 610-876-5523
Ext. 272
- DELCORA website –
Contact Us tab:
<https://www.delcora.org/contact/contact-us/>
- DELCORA website –
tunnel tab
- TBD: Construction
Updates – Facebook?

