

Falmouth Wastewater Management and Planning Update

West Falmouth Village Association Meeting

March 2, 2023

Amy Lowell, Wastewater Superintendent

Falmouth's Existing Wastewater System

- ~ 11% of developed properties are connected to sewer system (~2,400 parcels)
- Rest of properties have septic systems/cesspools
- Main WWTF handles septage from Falmouth properties



Wastewater System History

- 1940s/50s - Woods Hole collection system constructed; outfall to Great Harbor
- Mid 1980s - Collection system for Main St, Surf Drive, etc, to secondary treatment plant and discharge off of Blacksmith Shop Road
- 2005 - New tertiary wastewater treatment plant constructed
- 2017 - Little Pond Sewer Area project completed, including collection system and two new recharge beds 14 & 15 north of the West Falmouth Harbor watershed.

Falmouth Main Plant - Tertiary Wastewater Treatment Process

- Influent fine screen
- Sequencing Batch Reactors (SBRs)
- Denitrification filters
- Ultraviolet disinfection
- Recharge through open sand beds
- Septage + sludge from SBRs is thickened
 - Filtrate returns to SBRs for treatment
 - Thickened sludge is hauled offsite



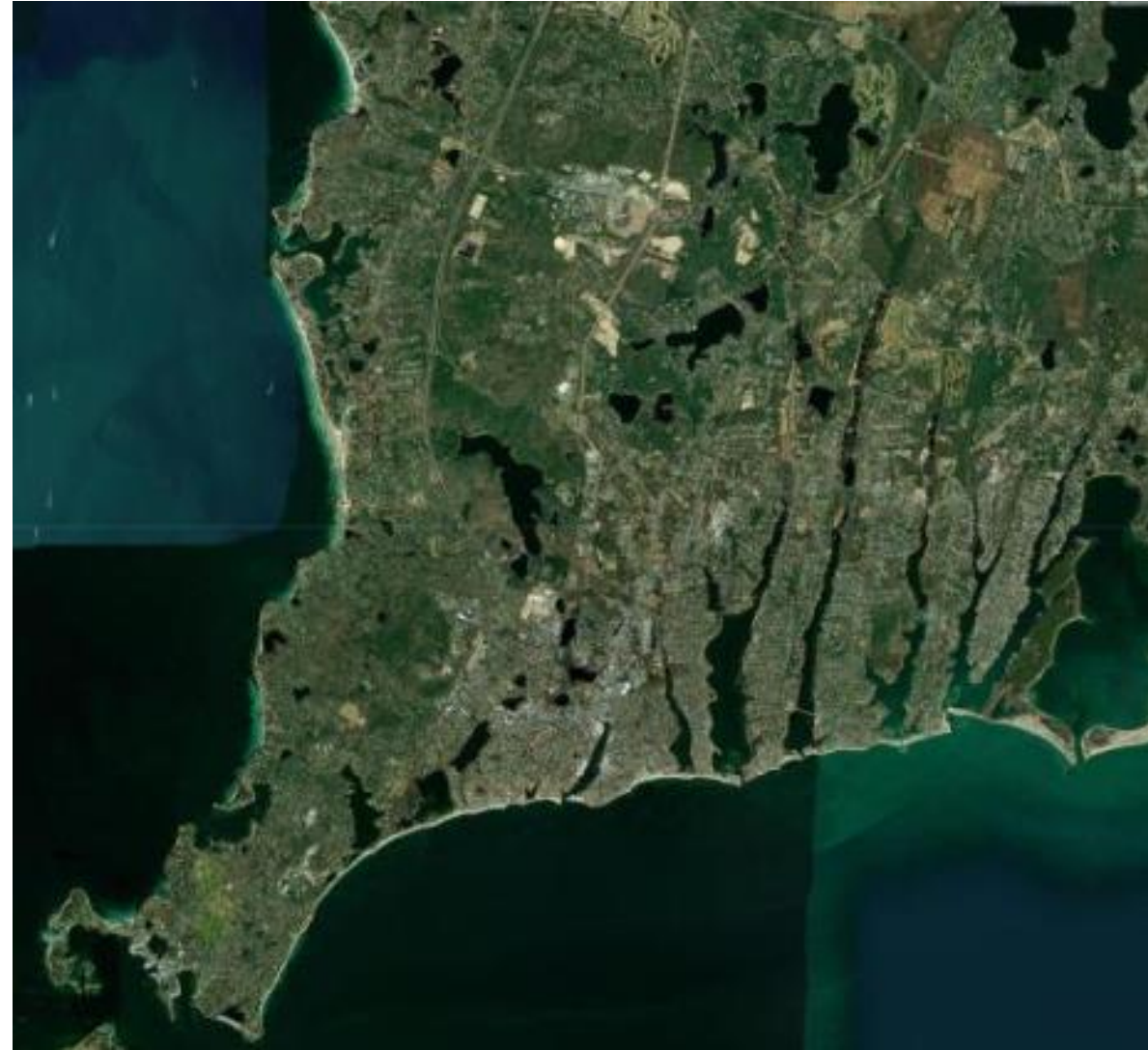
Main WWTF Groundwater Discharge Permit Effluent Limits - Continued

- Biochemical Oxygen Demand & Total Suspended Solids limit = 30 mg/L
 - Actual average 2020 < 3.0 mg/L
- Average total nitrogen concentration target = 3 mg/L
 - Actual average 2020-2022 = 3.2 mg/L
- Total nitrogen load limit to the West Falmouth Harbor watershed limit = 4,109 lbs/year
 - Actual 2020-2022 < 3,000 lbs/year



Scale and challenges of the watershed nitrogen reduction effort in Falmouth

- 14 watersheds (40% of all Cape Cod listed watersheds)
- 100% nitrogen removal required in many portions of the watersheds
- Falmouth land area is 44 square miles, with varying development density
- Cost
- Siting future effluent discharge

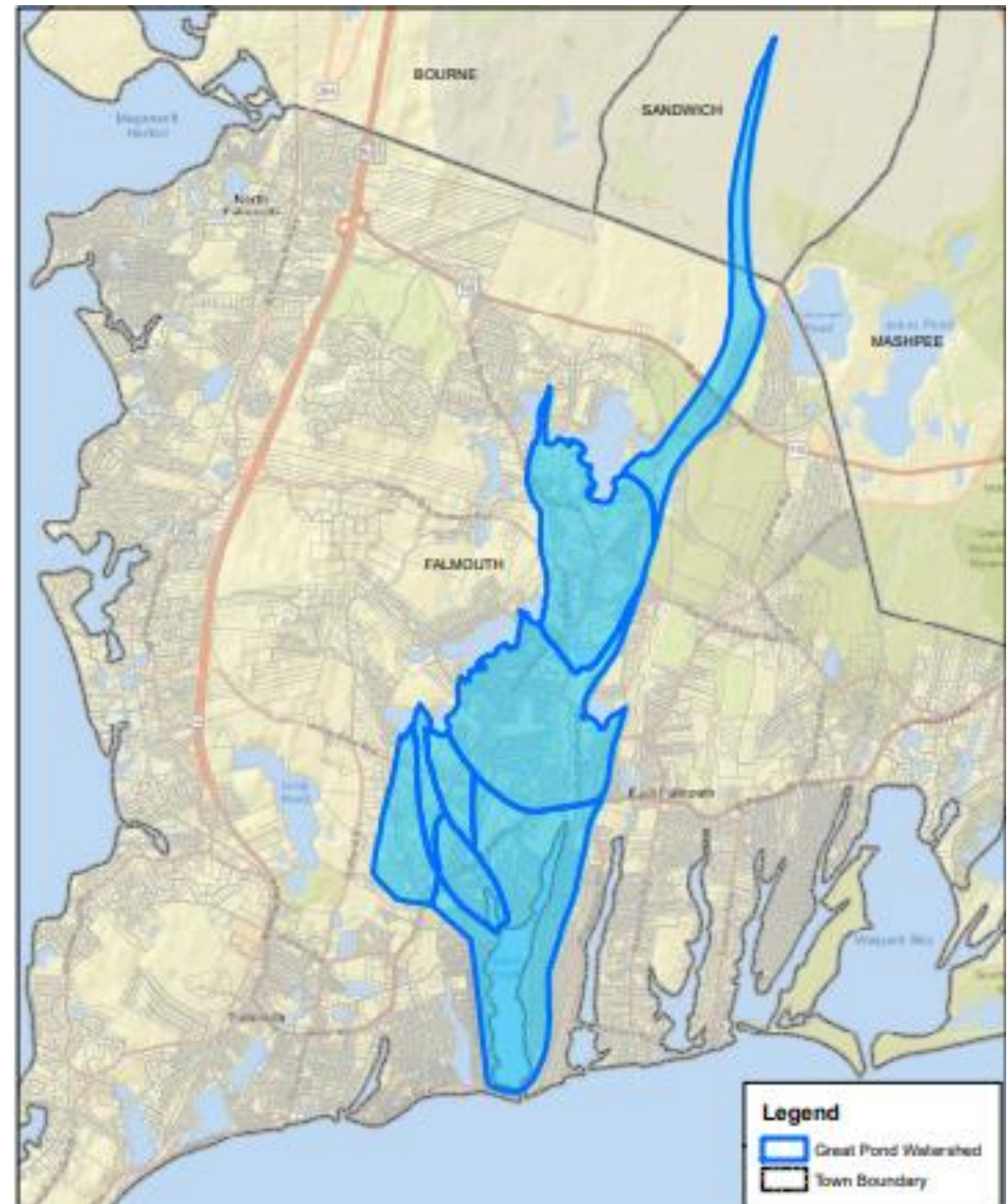


Current focus of sewer planning

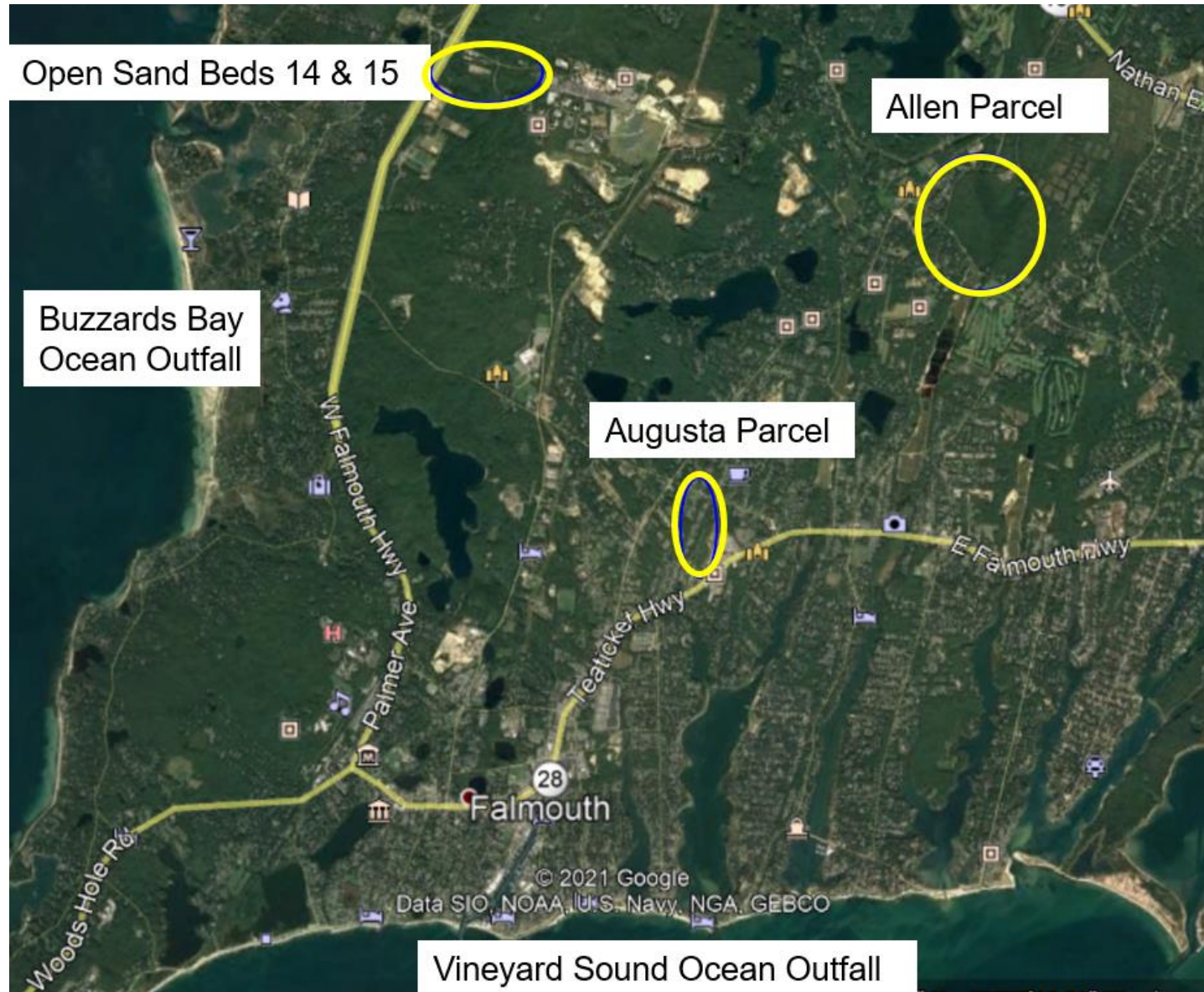
- Improve water quality in impaired coastal ponds by reducing nitrogen load
- The Town's approach:
 - Address most impacted estuaries first
 - Use financial "windows of opportunity" to pay for projects without increasing taxes
 - Use alternatives where feasible and cost effective
 - Sewer only where necessary

Next estuary: Great Pond

- Great Pond next because: greatly impacted by nutrients, adjacent to existing sewer area
- Because of the density of development in the lower watershed and the amount of nitrogen removal required, sewerage is the core of the strategy for improving water quality
- Biggest challenge is siting of discharge for treated wastewater.
- In discharge site evaluation, considered future flows.



Potential future treated effluent discharge sites



GHD and the Great Pond TWMP Working Group analyzed and reviewed the follow factors:

Parcel size

Location

Distance to the WWTF

Nitrogen receptors

Legal restrictions

Energy use

Odor/noise

Existing land use

Soil borings

Mounding models

Hydraulic capacity

Ownership

Phosphorus receptors

Zoning

Permitting

Discharge method

Adjacent land use

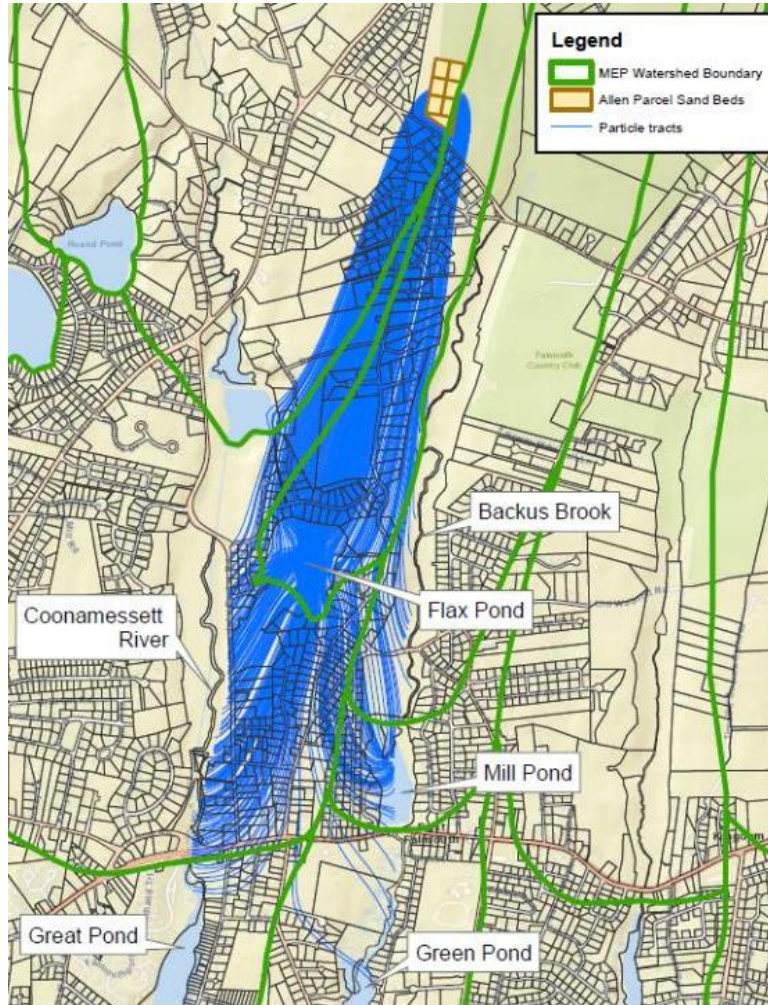
Potential other uses

Topography

Public acceptance

Allen Parcel and Augusta Parcels

Allen



Main Pros:

Large discharge capacity

Located in southcoast pond watersheds

Allen - upgradient of freshwater systems

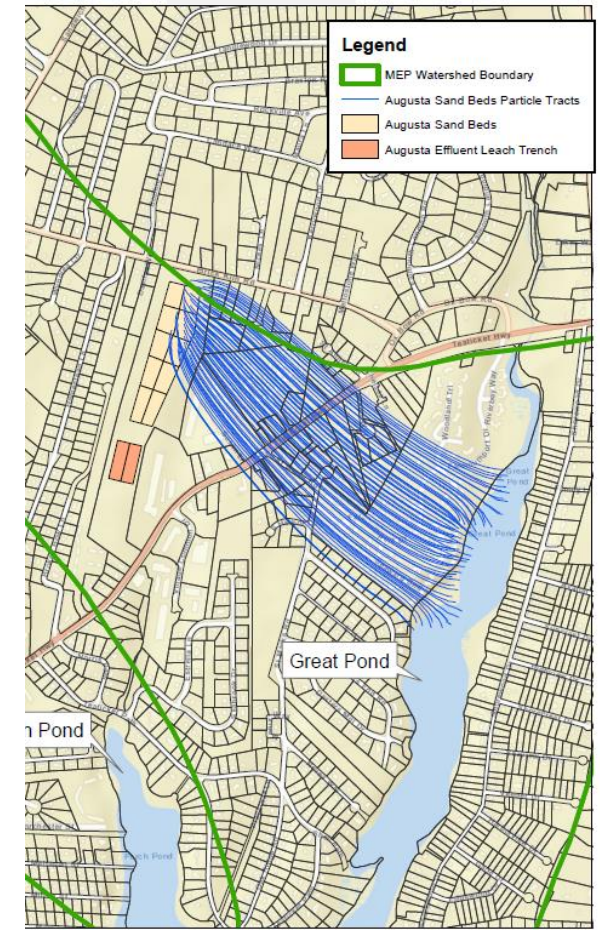
Augusta – returns nitrogen load to north end of Great Pond

Main Cons:

Four miles from WWTF

Cost: \$27-29 million

Augusta



Sand beds 14 & 15

Main Pros:

0 miles from plant, no lift station needed

Cost: \$1.4 million

Main Cons:

Upgradient of a freshwater system

Some nitrogen goes to Herring Brook

Limited area / capacity (500,000 gpd)



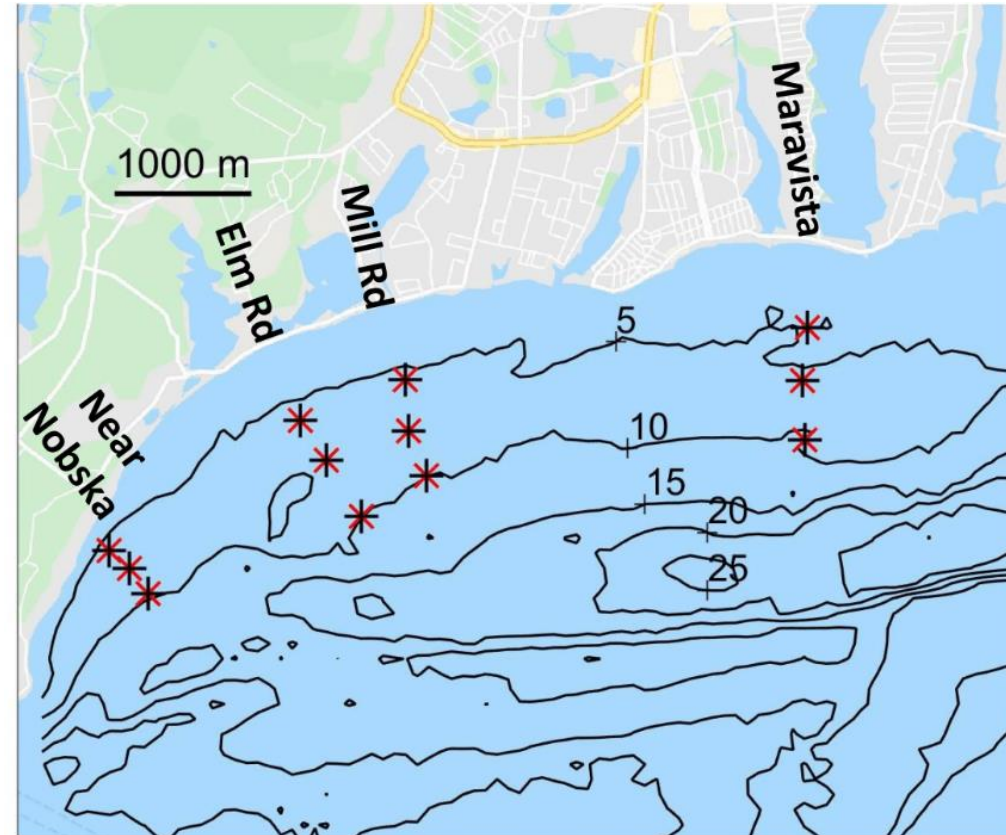
Ocean Outfall

Main Pros:

- Eliminates impacts to fresh and saltwater ponds
- Largest discharge capacity

Main Cons:

- Lengthy permitting process
- Land distance from WWTF 2 – 7 miles
- Unknown public acceptance
- Cost: unknown**



Effluent Discharge Plan

(Select Board voted June 2022)

1. Designate existing open sand beds 14 & 15 as the treated effluent discharge site for the projected ESRA/TASA flows in the short-term contingent on the evaluation report results for Herring Brook
2. Consider ocean outfall options in Buzzards Bay and Vineyard Sound, along with land-based options at the Allen and Augusta parcels, for projected mid-term and long-term wastewater flows

Outfall Evaluation – Feasibility and Cost

- Hydrodynamic modeling of outfall alternatives
- Collection and review of existing available data
- Initial discussions with regulators about data collection and permitting
- Refine cost estimate - determine affordability
- Public discussion

Next Steps

- 2023-2025 – Construct WWTF Improvements
- 2025-2026 – Construct Phase 1 sewers (Teaticket Peninsula) and expanded effluent discharge area
- Meanwhile: Evaluate ocean outfall option for future discharge
- Beyond 2026:
 - Construct Phase 2 sewers (Acapesket)
 - Complete Targeted Watershed Management Plans for Green Pond, Bournes Pond and Waquoit Bay
 - Design/Construct next phases of collection system and discharge

Article 24 : Supplemental Appropriation for Wastewater Treatment Facility Improvements

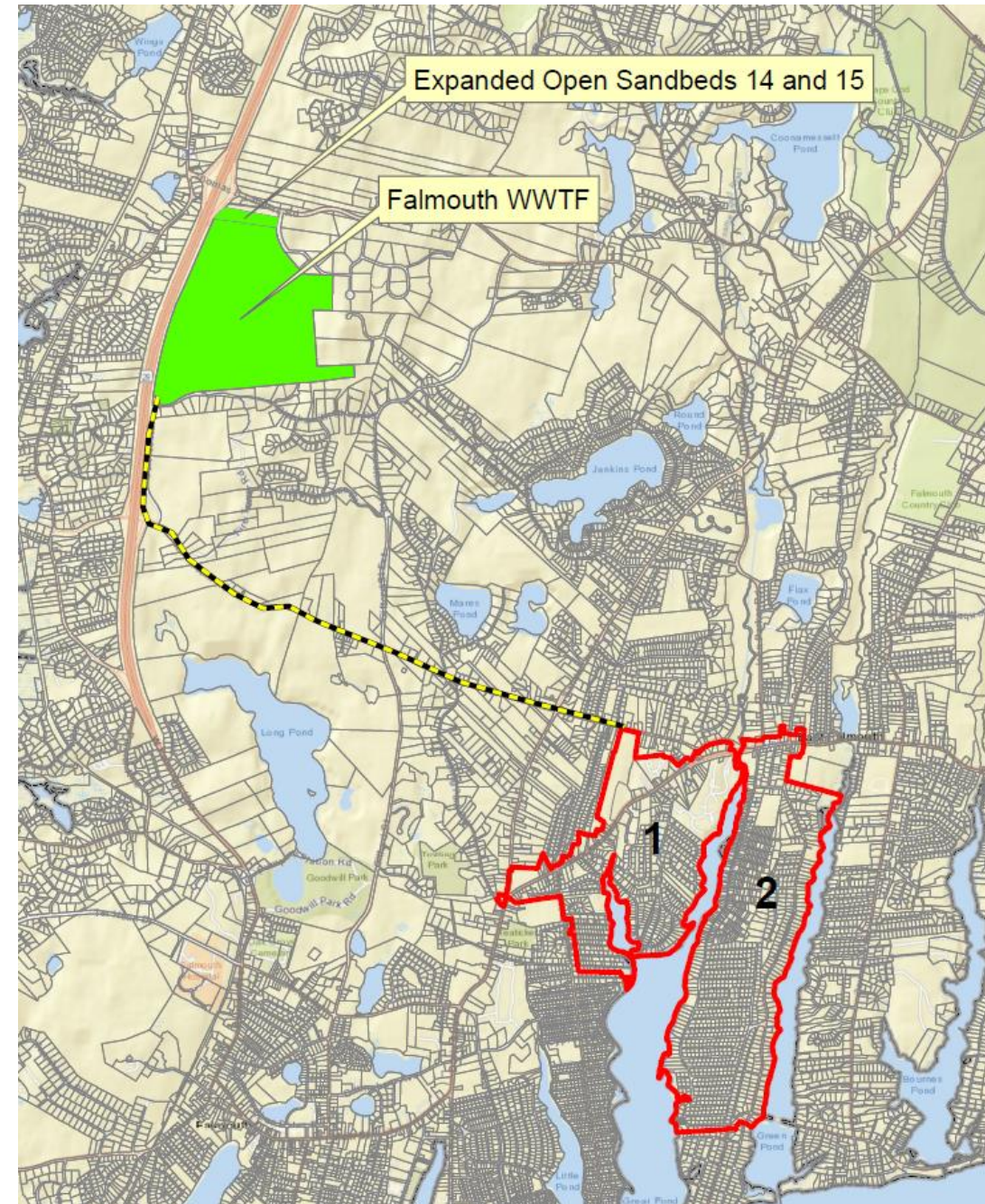


Wastewater Treatment Facility (WWTF) Improvements - Background -

- Appropriated \$24M for construction in April 2022
- Designed in 2022 using ARPA funds
- New estimate of project cost is \$9.5M more than the amount appropriated in 2022
- Due to inflation, not scope increase

Article 25 Design and Permitting Appropriation

- \$4.5 Million
- Collection and Transmission System – Phase 1 Area
- Expansion of recharge area at beds 14 and 15



Questions/Discussion