EDGARTOWN CWMP UPDATE

Alternatives & Draft Recommendations

Project Director: Ian Catlow, PE
June 20, 2024

Tighe&Bond

OVERVIEW

- **CWMP Drivers & TMDL**
- **Needs Analysis Summary**
- **Alternatives Analysis**
- **Draft Recommended Plan**
- **Adaptive Management**
- **Project Funding**
- **Next Steps**
  - Evaluate Recommended Plan Impacts
  - Finalize CWMP Report
  - MEPA Review

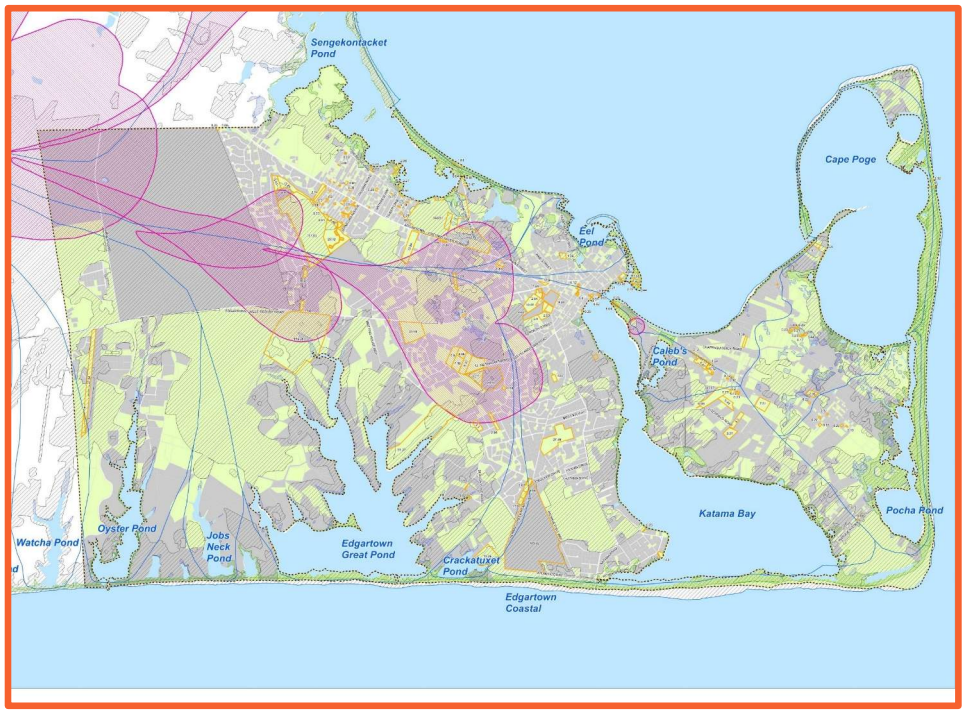
Photo Credit: Edgartown Great Pond Cut, Great Pond Foundation

PROJECT DRIVERS

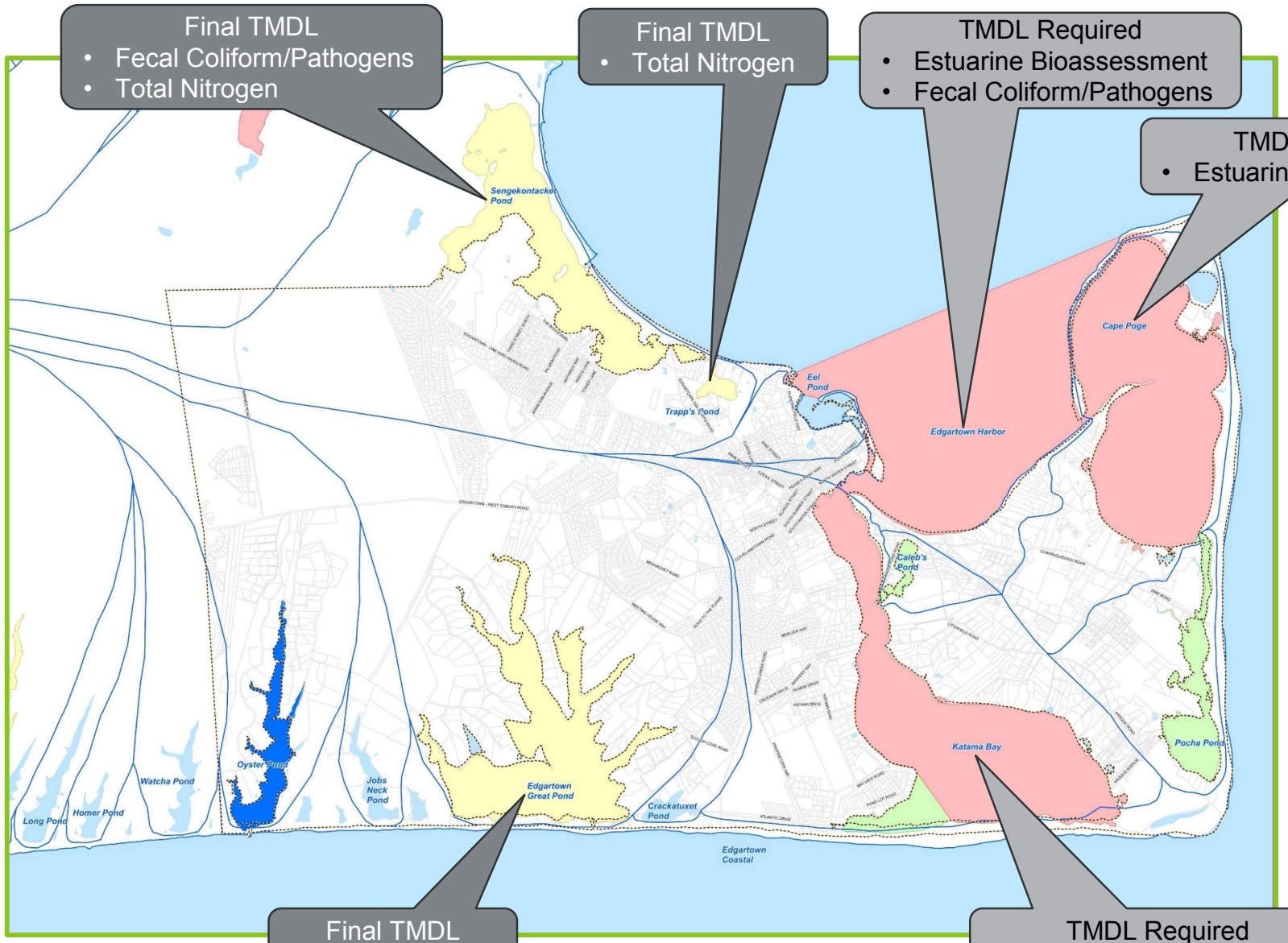
- **Water Quality**
  - Total Maximum Daily Load (TMDL)
  - Title 5 & MassDEP's "Watershed Permit"
  - Protect Drinking Water Supplies
- **Infrastructure Planning**
  - Evaluate Existing Systems
  - Plan for Future Expansion & Renewal
- **Growth & Economics**
  - 20-Year Planning Horizon
    - ❖15% Population Growth
  - Support Tourism & Recreation
  - Support Working Waterfront

EVALUATION OF WASTEWATER NEEDS

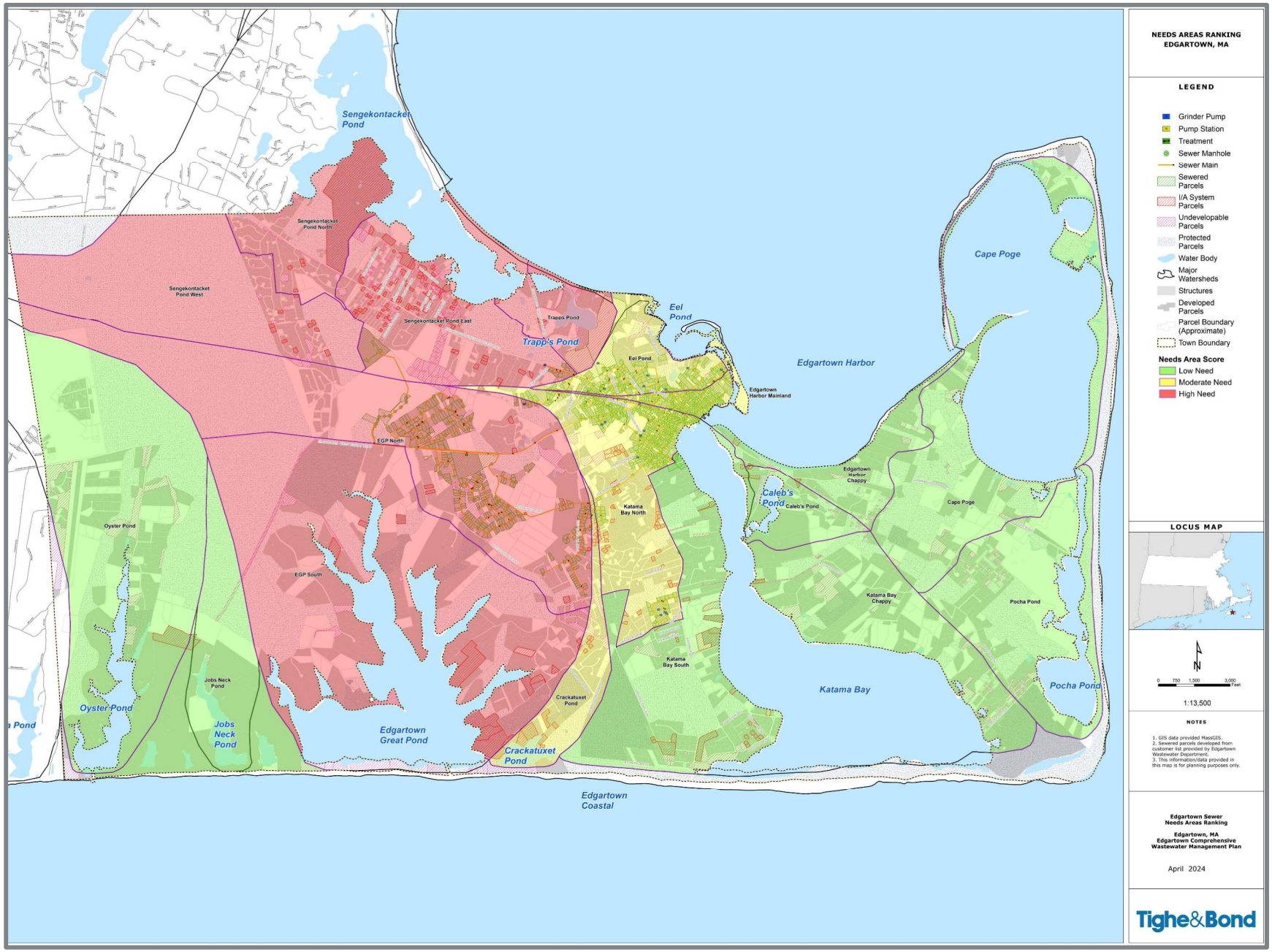
- **Septic System Performance**
  - Soil & Groundwater Conditions
  - Lot Size
  - Pump Out Frequency
- **Environmental Resources**
  - Water Supply, Wetlands, Etc.
- **Total Maximum Daily Loads (TMDL)**



TOTAL MAXIMUM DAILY LOADS (TMDL)



NEEDS ANALYSIS RESULTS



ALTERNATIVE SCREENING

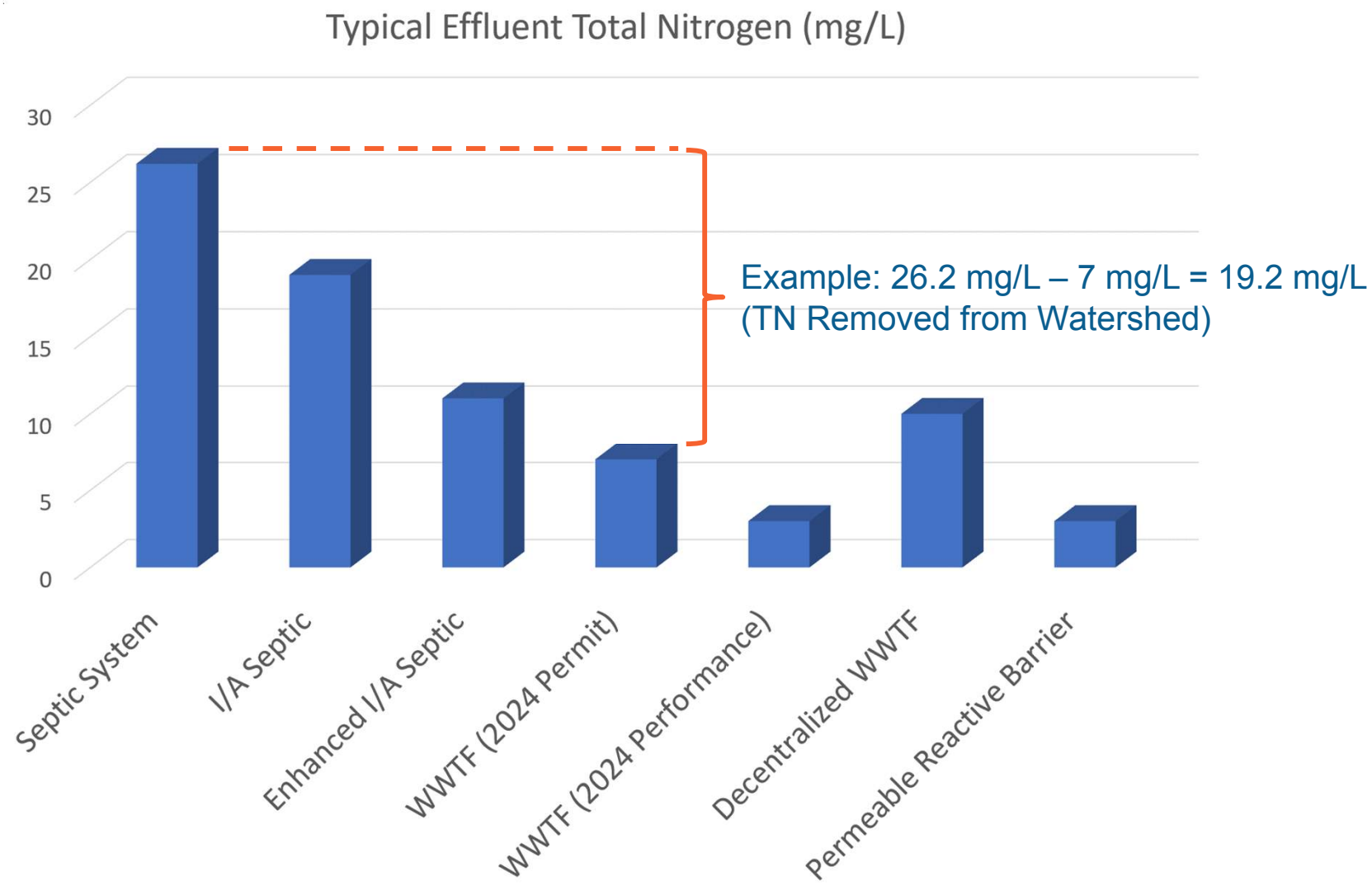
Traditional Options

- Septic Systems
- Enhanced Innovative/Alternative (E I/A) Systems
- Satelite/Decentralized/Cluster Systems
- Sewering

Non-Traditional Options

- Permeable Reactive Barriers
- Fertilizer Management
- Shellfish Aquaculture
- Enhanced Flushing

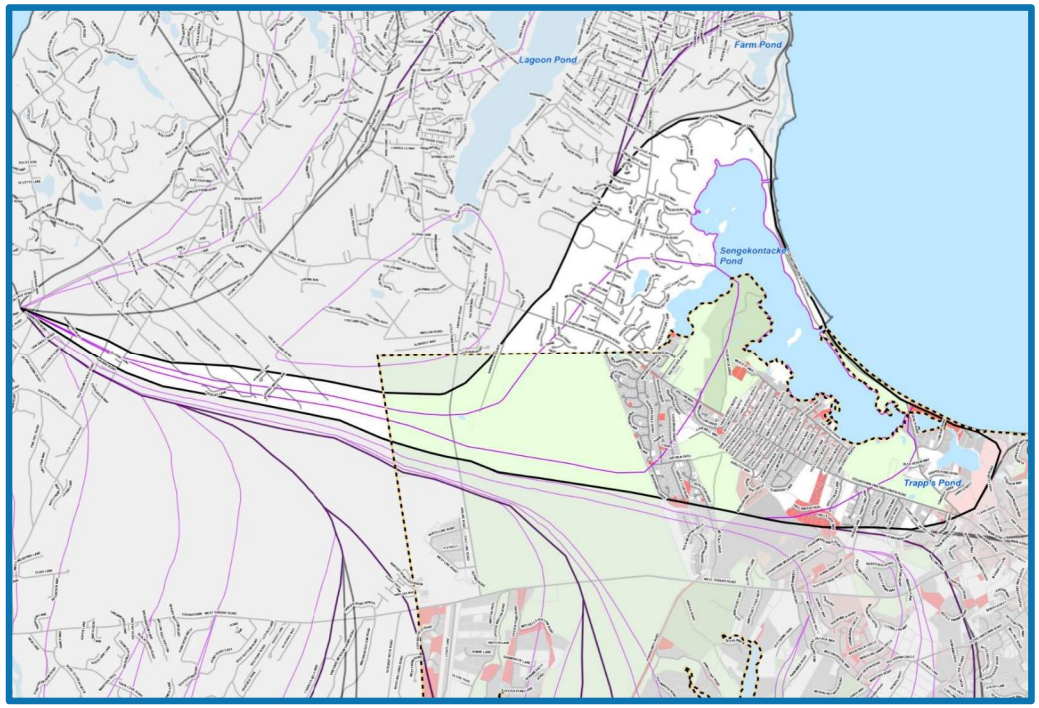
RELATIVE BENEFIT OF ALTERNATIVES



SENGEKONTACKET TMDL

Sub-Embayment	TMDL (kg N/day)	Required % TN Reduction
Farm Neck	12.73	0
Majors Cove	12.27	-45.2%
Ocean Heights	19.19	0
State Beach	1.72	0
Trapp's Pond	4.17	-64.1%

Embayment	TMDL
Sengekontacket Pond	Geometric Mean Fecal Coliform <= 14 organisms per 100 mL

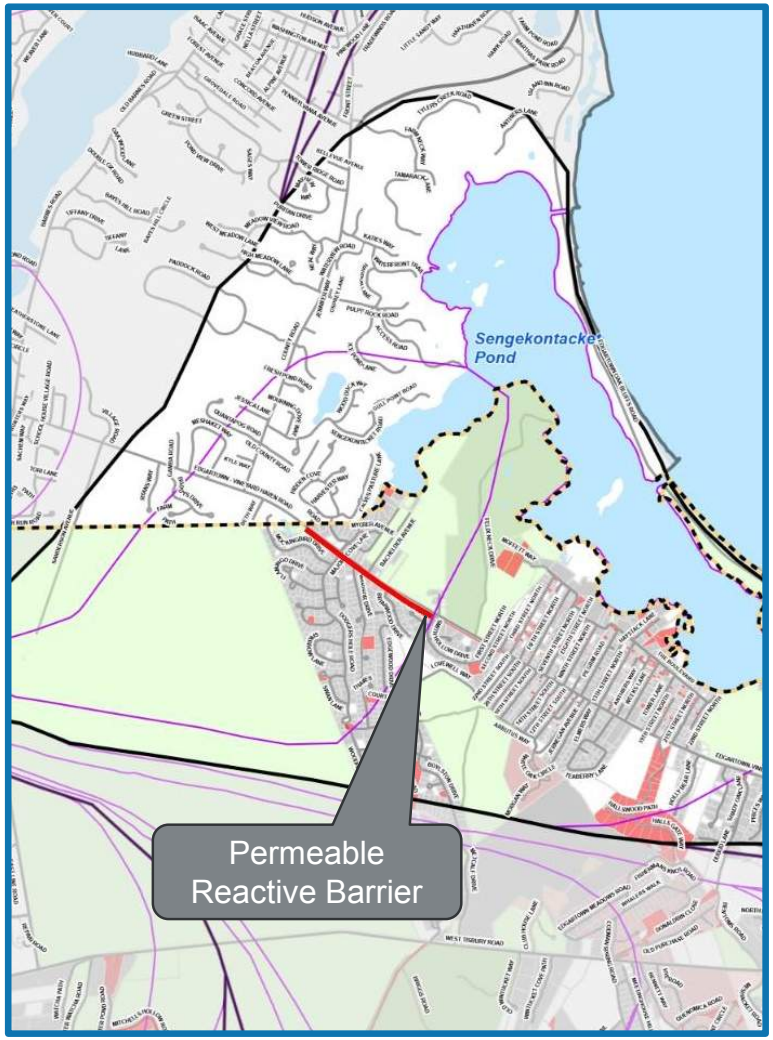


Notes:
1. Mass loads have been apportioned between Towns based on land area for planning purposes. 65% of Major's Cove is located in Sengekontacket.
2. Final Pathogen TMDL for the Islands Watershed, April 2020 cites septic systems and waterfowl as main contaminant sources.

SENGEKONTACKET – MAJORS COVE ALTERNATIVES

Alternatives to Achieve TMDL

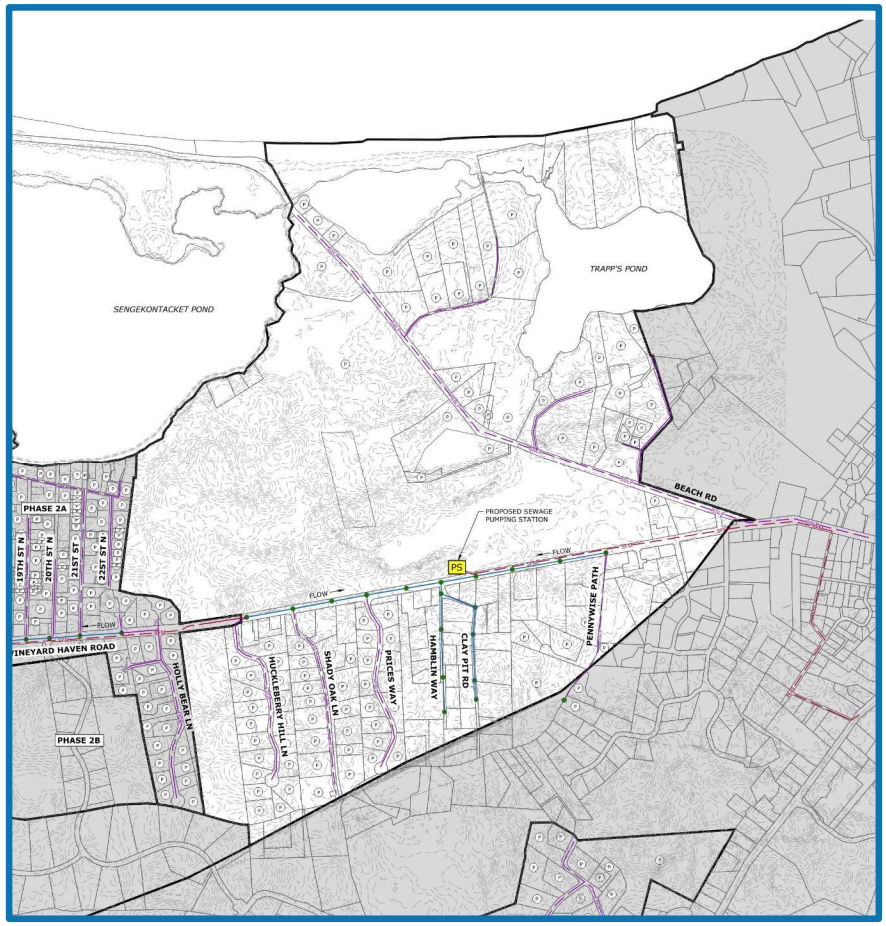
- Enhanced I/A Systems
  - Watershed-Wide Use Insufficient to Achieve TMDL
- Sewer Extension
  - Treat At WWTF & Return to Ocean Heights Sub-watershed
  - 171 Connections, 200 Parcels
  - Capital Cost $39,800,000
- Permeable Reactive Barrier
  - Capital Cost $6,600,000



SENGEKONTACKET – TRAPP'S POND ALTERNATIVES

Alternatives to Achieve TMDL

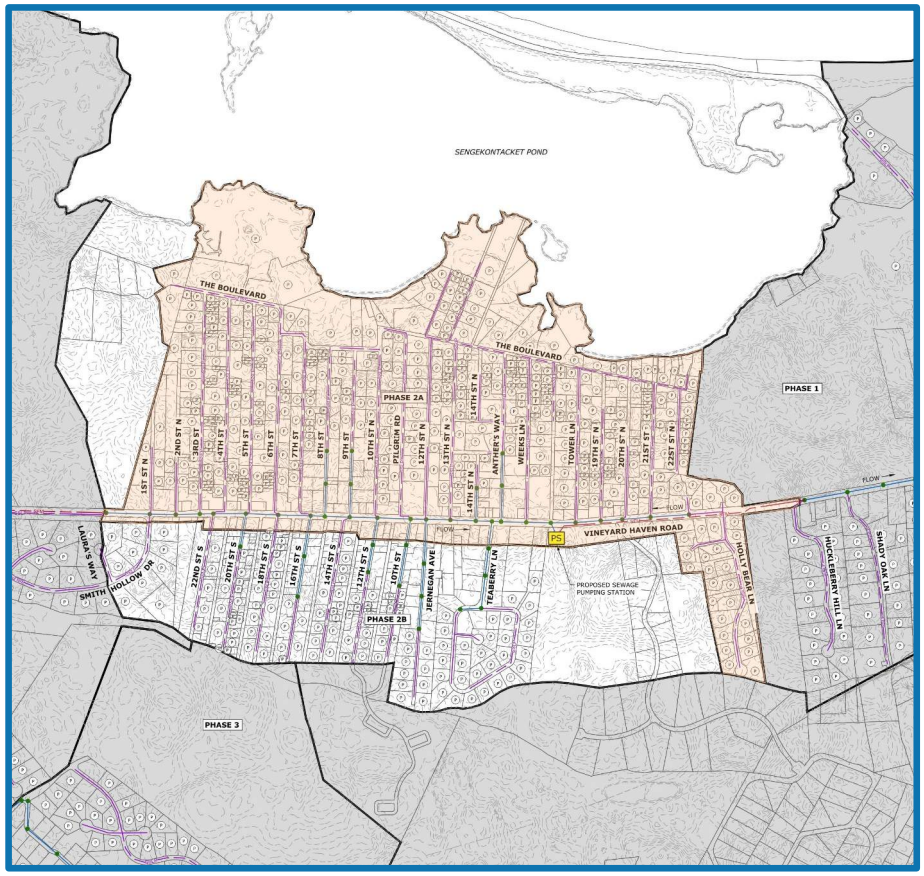
- Enhanced I/A Systems
  - Watershed-Wide Use Insufficient to Meet TMDL Goal
- Permeable Reactive Barrier
  - Beach Road Location Insufficient to Meet TMDL Goal
- Sewer Extension
  - Treat At WWTF & Return to Ocean Heights Sub-watershed
  - 87 Connections, 131 Parcels
  - Capital Cost $24,100,000



SENGEKONTACKET – OCEAN HEIGHTS ALTERNATIVES

Alternatives to Achieve TMDL

- Pathogen TMDL Drives Sewering
- Load Transfer from Majors Cove & Trapp's Pond Also Require Sewering
- Two Phase Approach
  - Phase I – Sewer Area North of Edgartown-VH Road
  - 522 Service Connections
  - Capital Cost $48,800,000
  - Phase II – Sewer Area South of Edgartown-VH Road (If Needed)
  - 221 Service Connections
  - Capital Cost $16,500,000

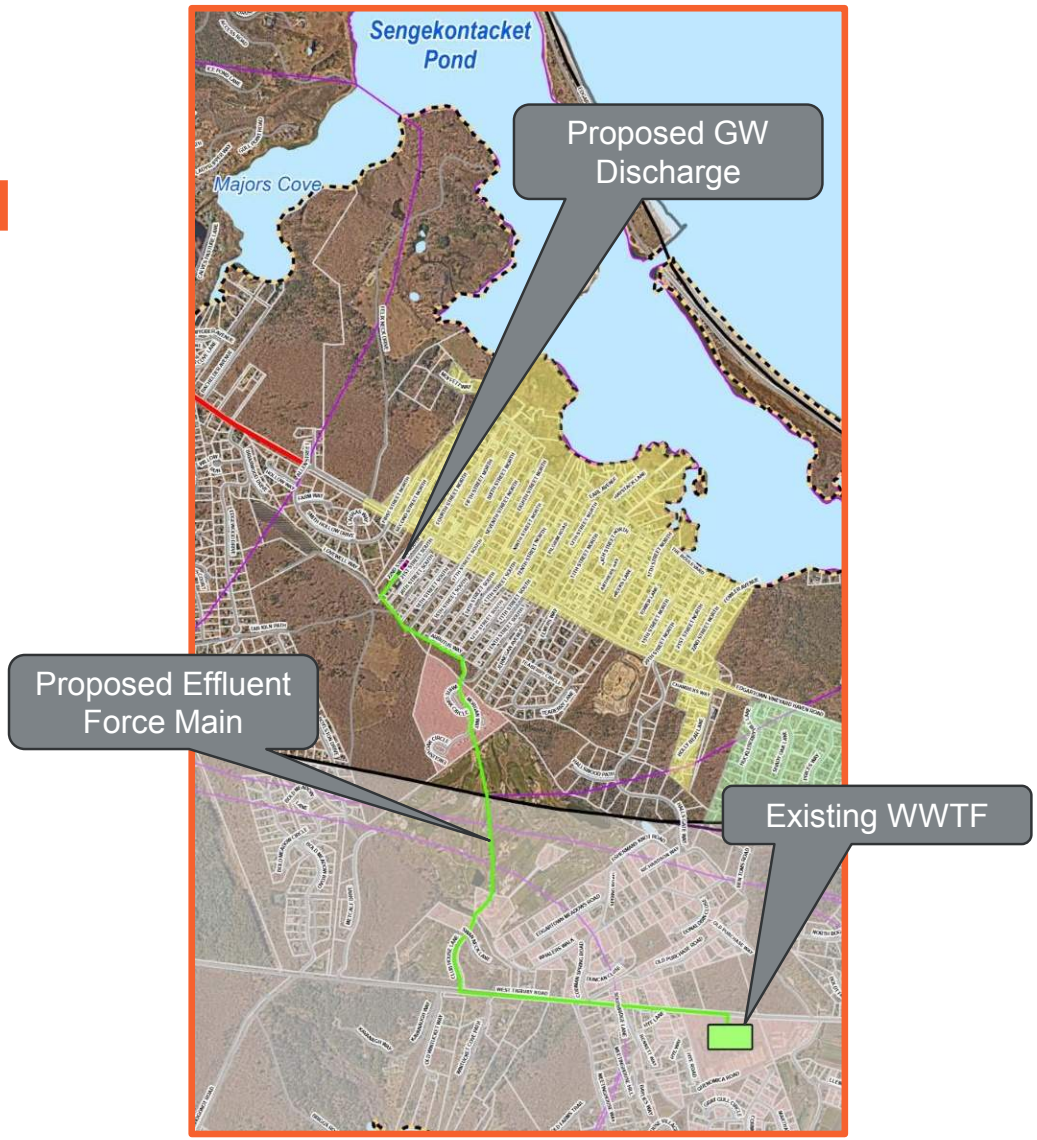


SENGEKONTACKET – OCEAN HEIGHTS ALTERNATIVES

WWTF Effluent Returns to Ocean Heights to Reduce Majors Cove & Trapp's Pond TN Load

System Includes:

- Existing 4" Force Main
- 6,300 LF Proposed 6" Force Main ($2,300,000)
- Proposed Pump Station at WWTF
- WWTF Effluent Filtration
- Proposed Groundwater Discharge



WASTEWATER TREATMENT ALTERNATIVES

Alternate #1 Existing WWTF Upgrade

- Modify Existing Carousels to Achieve TN<3 mg/L
- New Effluent Filtration Prior to Subsurface Discharge
- New UV Disinfection System
- Relocate Plant Water System
- New Tertiary Building for Filters and UV
- Effluent Pump Station (for Remote Discharge in Sengekontacket)
- Replace Aging Equipment at WWTF (Secondary System Only)

- **Capital Cost $26,200,000**

WASTEWATER TREATMENT ALTERNATIVES

- **Alternate #2 Proposed Sengekontacket WWTF**
  - Sited in Ocean Height's Neighborhood
  - Capacity
    - Average Day = 40,000 gallons
    - Peak Day = 100,000 gallons
  - Membrane BioReactor for TN <7 mg/L
  - New 50' x 60' Building
  - Replaces Ageing Equipment at Main WWTF
    - Secondary System only to Maintain Level of Service
  - Excludes:
    - Pump Station
    - GW Discharge System
  - **Capital Cost $35,000,000**

OCEAN HEIGHTS GROUNDWATER DISCHARGE

Utilize 22nd Street South Town Owned Parcel

Geotech Investigations Show Clean Sand & Gravel With Groundwater Over 60 FT Below Grade

Wick Well Discharge

- Average Day Flow 150,000 GPD +/-
- 3-4 Wells Subject to Further Investigation & Permitting
- Capital Cost $2,600,000

SENGEKONTACKET NON-STRUCTURAL BEST MANAGEMENT PRACTICES

Additional TMDL Attainment Activities

- Fertilizer Management Bylaw
  - DEP Allows 25% Load Reduction
  - Modeling Needed to Determine TN Removal Value
- Shellfish Aquaculture
  - Pilot Needed to Quantify Benefit
- Pet Waste Reduction Plan


Photo: MV Seafood Collaborative


Photo: Trulia


Photo: Brindleybeach.com

EDGARTOWN GREAT POND TMDL

Embayment	TMDL (kg N/day)	Required % TN Reduction
Edgartown Great Pond	46	17.8%

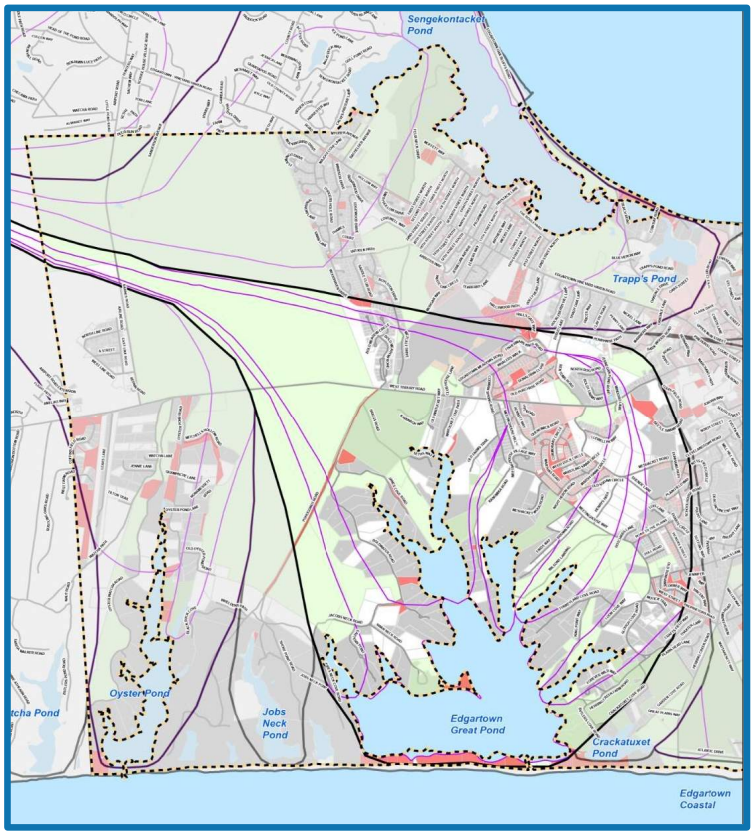
Removal of 4.55 kg TN/Day Needed

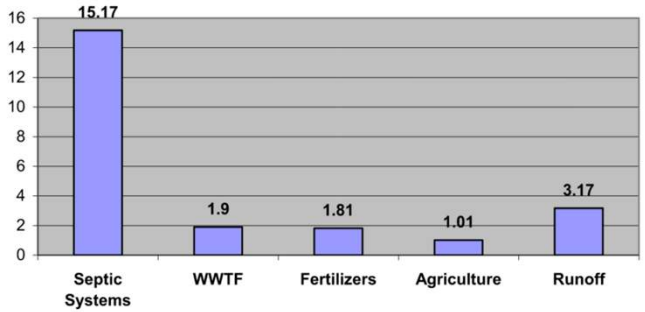
Septic Systems Are 74% of TN Load

WWTF Load Smaller Due to Good Performance

Fertilizer Small But Significant

- DEP Allows 20% Load Reduction With Bylaw





Controllable Nitrogen Loads (kg/day)

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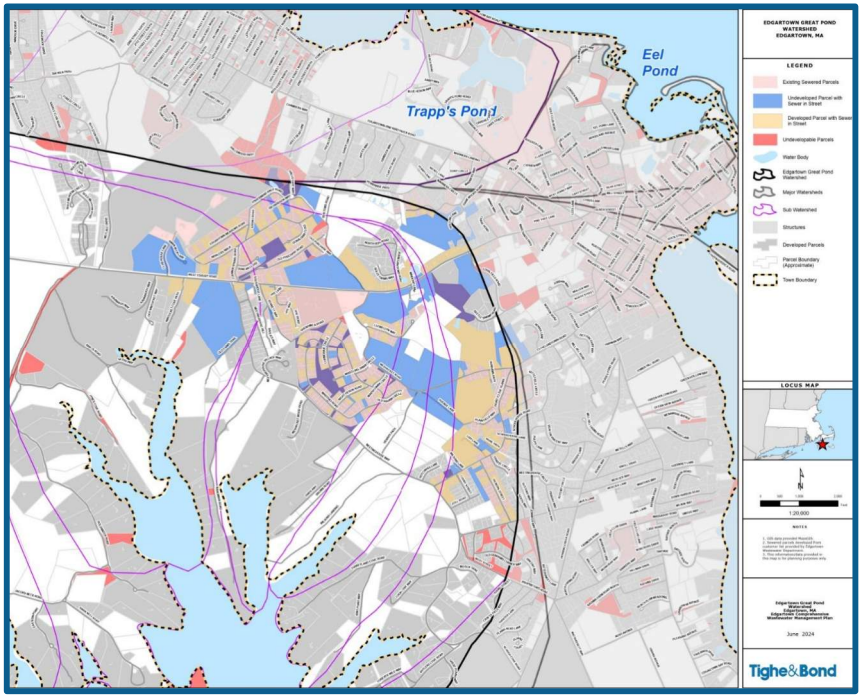
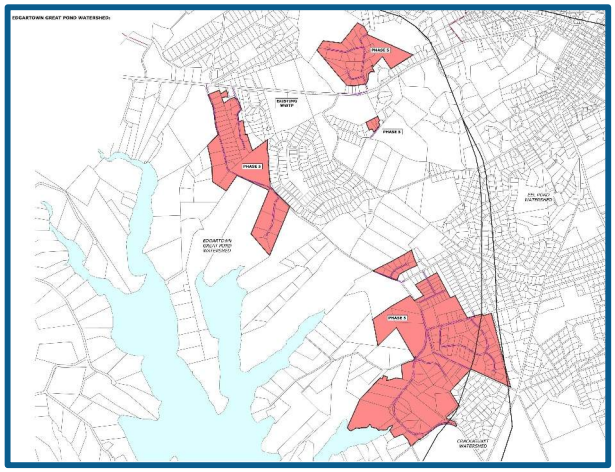
EDGARTOWN GREAT POND ALTERNATIVES

Alternatives to Achieve TMDL

- Infill Connections
  - 203 Connections Possible
  - 2.4563 kg/day TN Associated With Infill
- Sewer Extension
  - 190 Connections
  - Capital Cost $14,600,000
- Enhanced I/A Systems
  - 149 Systems, Added to Infill Connections
  - More Needed With Growth
  - Capital Cost $7,450,000





EDGARTOWN GREAT POND ALTERNATIVES

Alternatives to Achieve TMDL

- Permeable Reactive Barrier
  - Investigate Meetinghouse Way Location
  - Capture WWTF Plume
  - Capital Cost $2,000,000
- Fertilizer Bylaw Implementation
  - DEP Allows 25% Load Reduction
  - 1.81 kg TN/day x 25% = 0.4525 kg/day
- Increased Pond Breaching
  - Prior Modeling Suggests Efficacy
  - Added Modeling Required to Evaluate
  - Modeling Cost $200,000 +/-

KATAMA BAY & EDGARTOWN HARBOR ALTERNATIVES

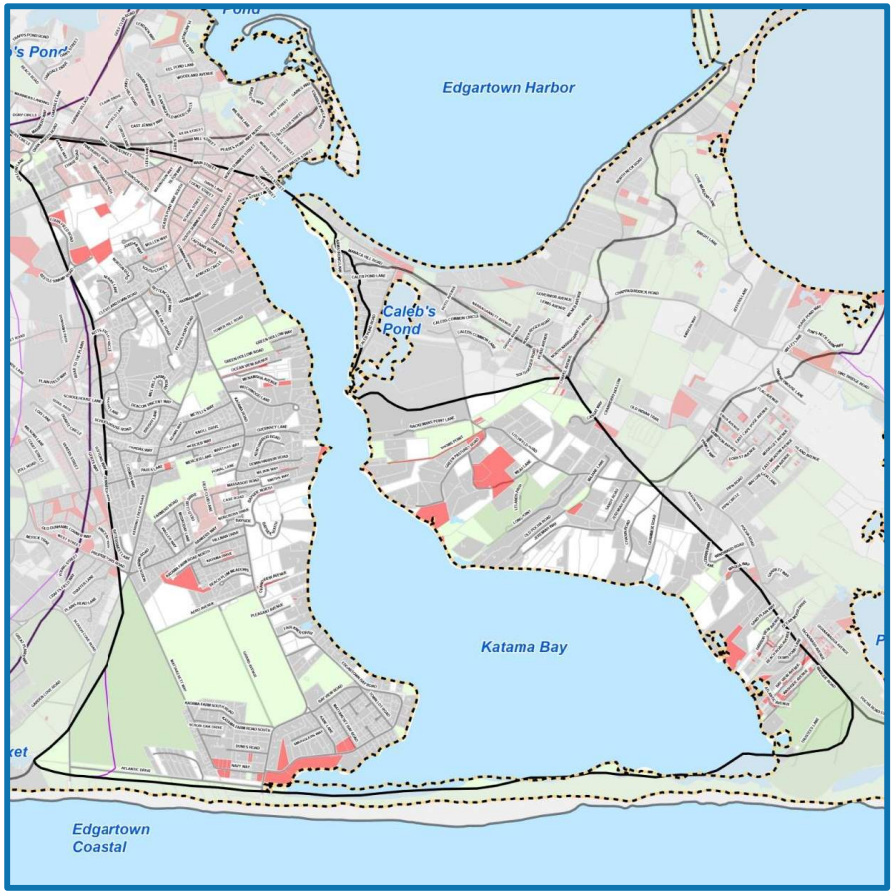
No Existing TMDL

TMDL Needed for Pathogens

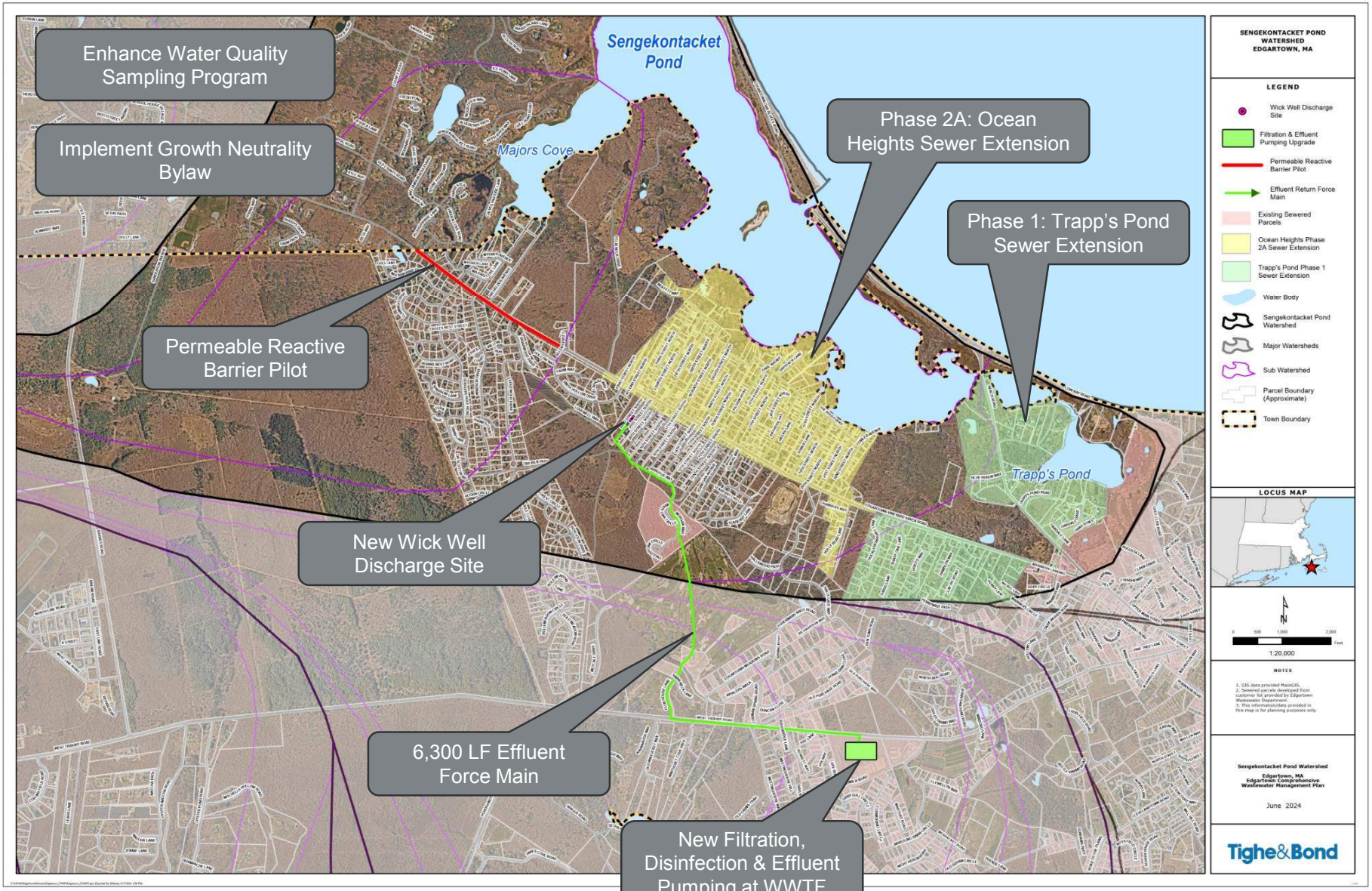
- Fecal Coliform
- Enhance Sampling Program

MassDEP Recommends TN Planning

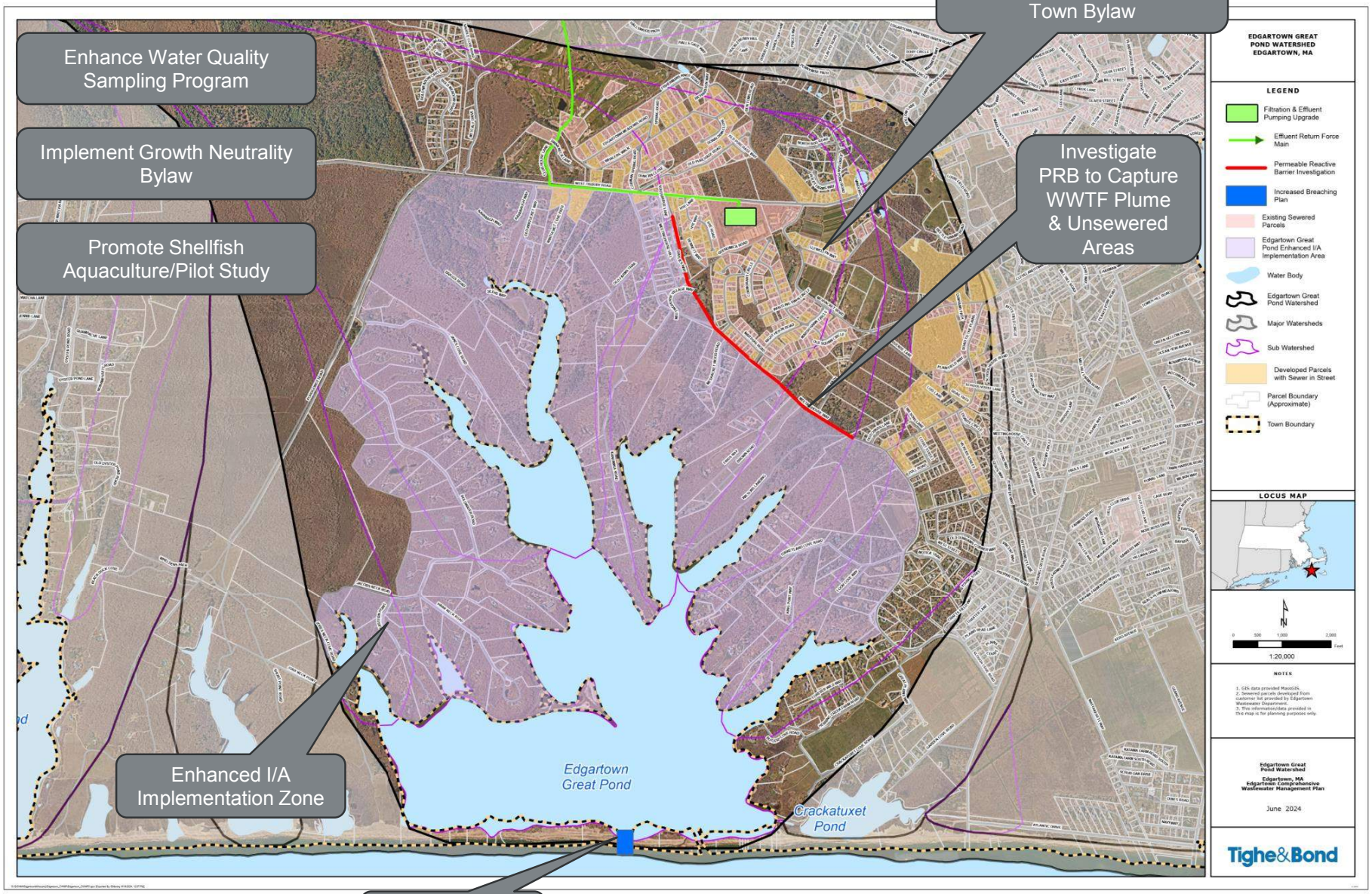
- Implement Regular Sampling Program
- Revisit TN Removal Needs As Data Develops
- Consider E I/A Requirements for New Construction & Repairs



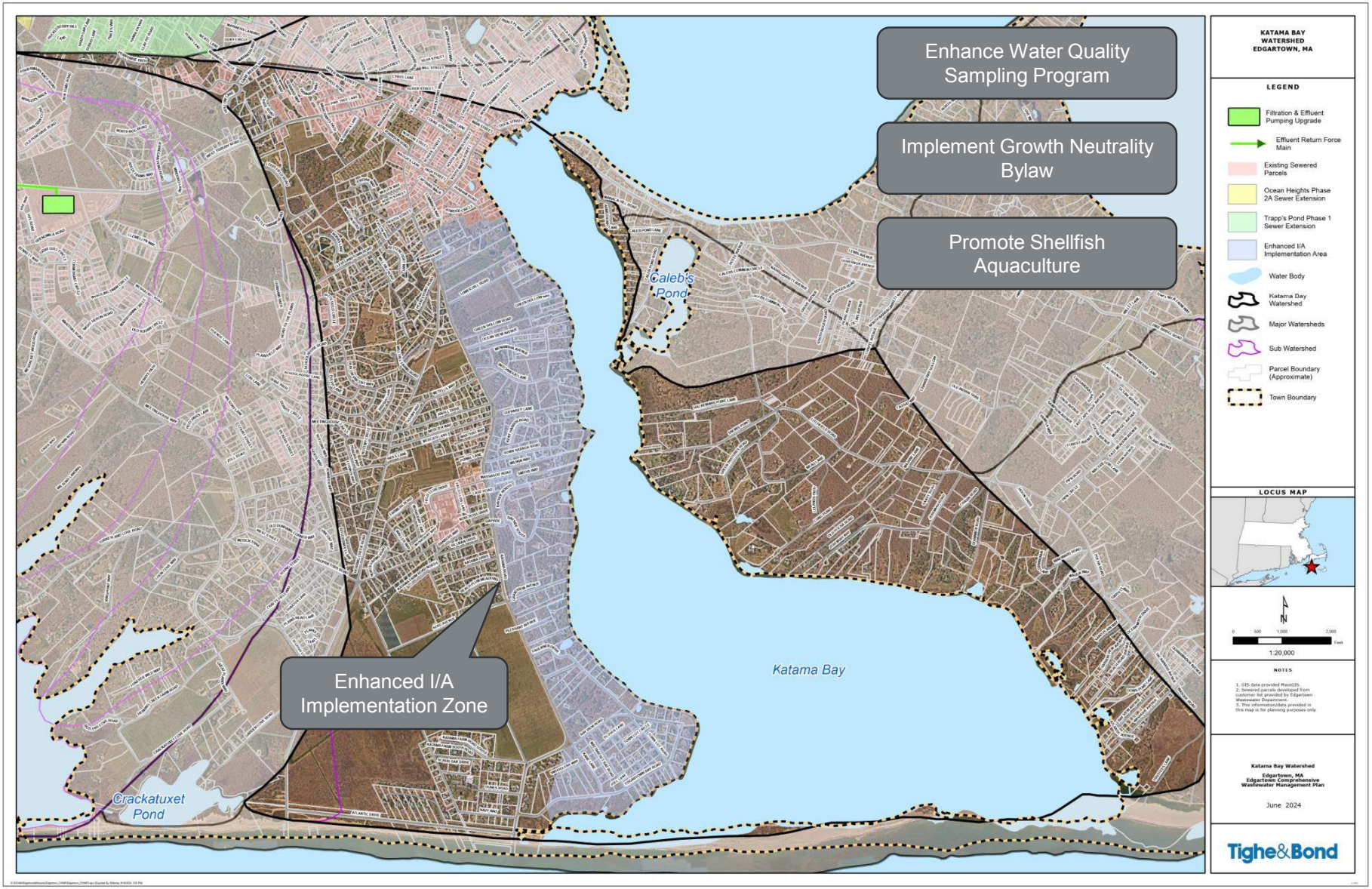
DRAFT RECOMMENDED PLAN - SENGEKONTACKET



DRAFT RECOMMENDED PLAN – EDGARTOWN GREAT POND



DRAFT RECOMMENDED PLAN – KATAMA BAY & EDGARTOWN HARBOR



ADAPTIVE MANAGEMENT APPROACH

Adaptive Management Goals

- Collect Data to Inform Decision Making
- Adjust Plans When Supported by Data Collection

Embayment Monitoring

- Sentinel Stations, Habitat Restoration, Nutrients, Pathogens & Other Water Quality Parameters

Enhanced I/A System Monitoring

- Responsible Management Entity

Groundwater Monitoring

- Confirm TN Plume Locations
- Support PRB Evaluations

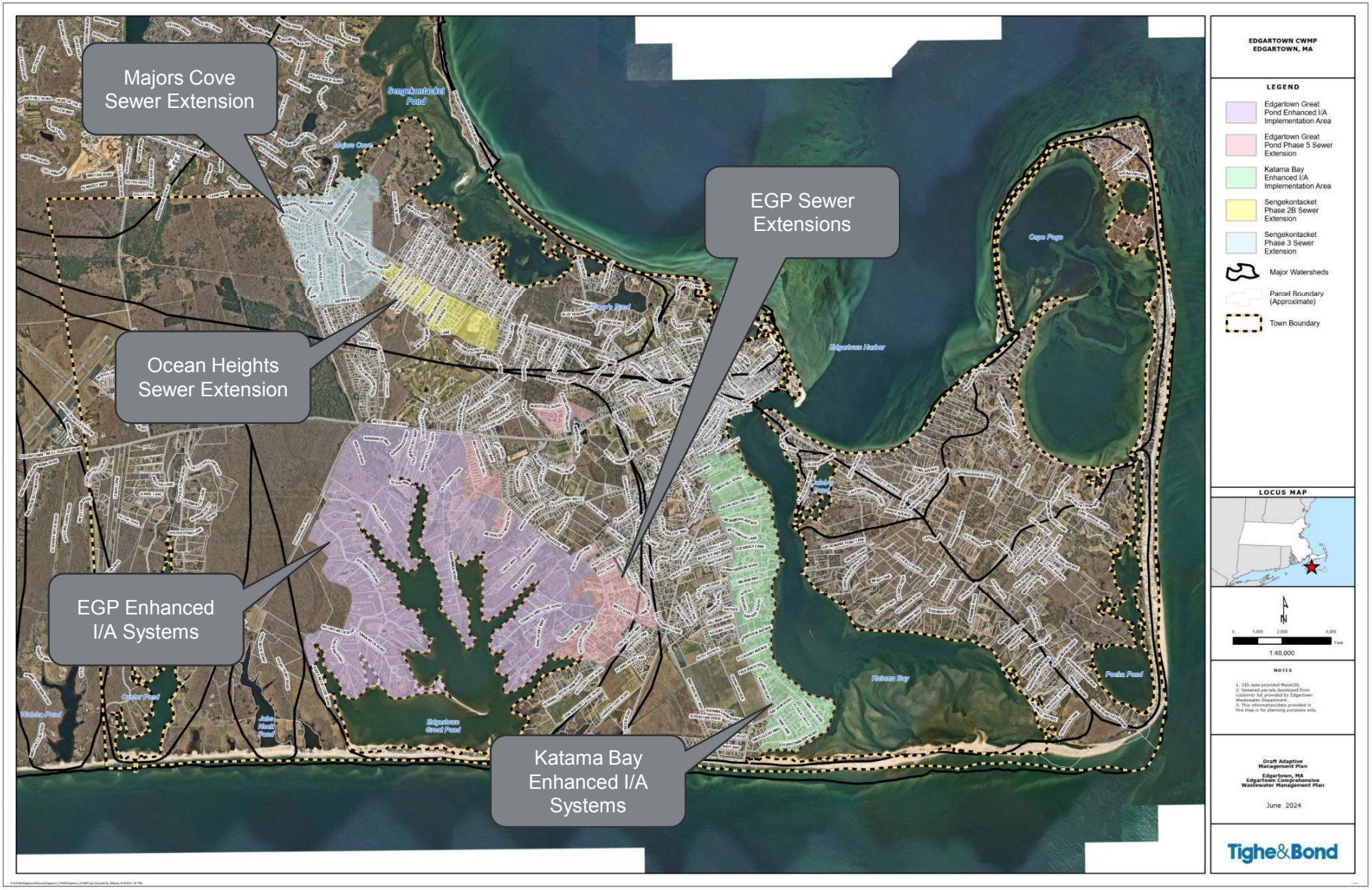
WWTF Monitoring

- Support Permit Compliance & Design

Leverage Teams for Data Collection

- Town Staff, Watershed Groups, SMAST, DMF, Etc.

DRAFT ADAPTIVE MANAGEMENT CONTINGENCY PLAN



FUNDING OPTIONS

Clean Water State Revolving Fund (SRF)

Awarded Annually Based on Application Process

0% Loan Funding Contingent On:

- CWMP Completion
- No Nutrient Related Consent Orders
- Growth Neutrality Bylaw

Loan Forgiveness Based On Disadvantaged Community Status

- Edgartown Not List in 2024

USDA Funding

Rolling Application Process

Must Have Population <10,000 & MHI < 80% State Average

Up To 45% Grant Available

- Subject to Availability of Funds

2.75% Loan for 40 Years

USDA Administers Congressionally Designated Spending (Earmark Program)

FUNDING OPTIONS

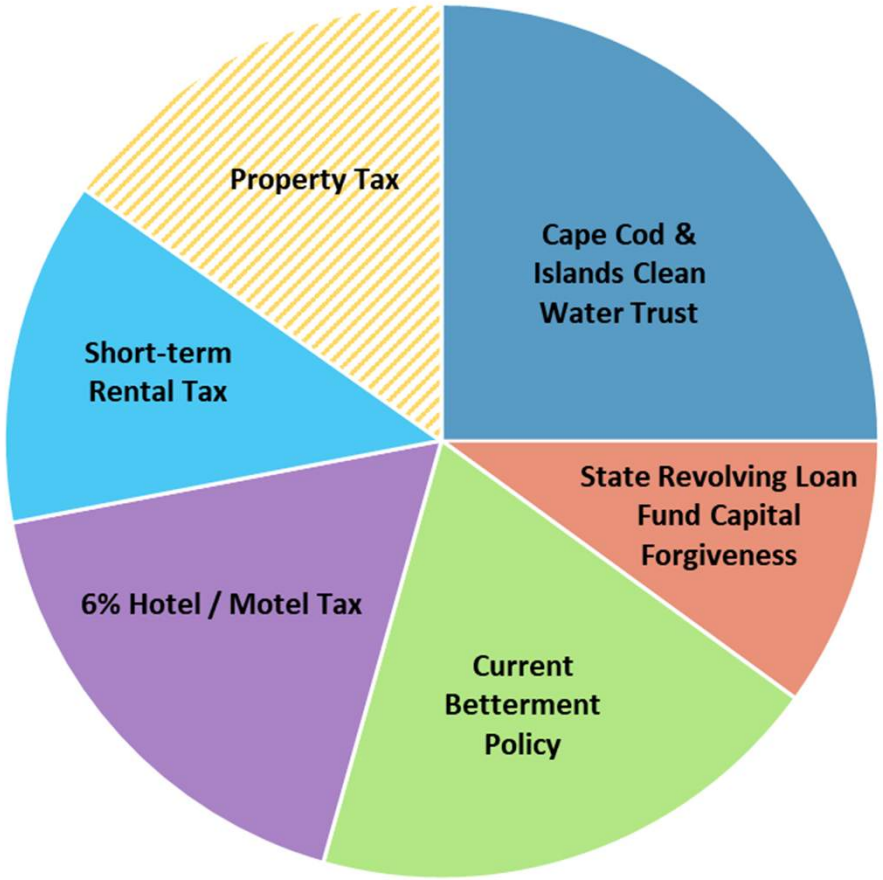
Cape Cod & Islands Water Protection Fund

Available to Communities Accepting Short Term Rental Tax

- 2.75% Excise Tax on Short Term Rentals/Hotels

25% Grant Available

- Subject to SRF Intended Use Plan Listing
- Can Fund New Projects or Some Debt Incurred Prior to Establishment of Fund
- Requires “208 Consistency Review”



Example: Orleans Funding Makeup

Note:
Programs Can Be Combined To Maximize Benefit

CWMP PROCESS

Phase 1	Existing Conditions Assessment Future Conditions Assessment Needs Analysis
Phase 2	Alternatives Analysis Recommended Plan
MEPA Review of CWMP	Public Input Regulatory Review
Watershed Permits	Sengekontacket Pond Edgartown Great Pond Establish 20-Year Plan

NEXT STEPS

Complete Draft CWMP Report & Submit to MEPA

- August/September 2024

MEPA Issues DEIR Scope

- November 2024
- Investigation & Modeling Discharge Site
- Model Growth & Flushing at Edgartown Great Pond
- Evaluate Habitat & Species Impacts of Plan
- Evaluate Archeological Impacts
- DEIR Funded at 2025 ATM

Preliminary Design Activities

- Funded at 2025 ATM
- Field Survey
- Wetlands Flagging/Permitting
- Geotechnical Investigations
- Basis of Design Report
  - Collection System
  - WWTF
- Opinions of Probable Construction Cost

QUESTIONS & DISCUSSION