

Barnstable Water Resources Protection

Special Town Council Workshop:
Comprehensive Wastewater Management Plan

Plan Approval and Implementation

June 13, 2024

Town Hall Hearing Room



Town of Barnstable
Department of Public Works



PRESENTATION OVERVIEW

- **Plan Summary**
- **Plan Approval/Permitting Process**
- **Review of the Approved Plan**
- **Review of Adaptive Management Updates**
- **Sewer Expansion Implementation**
- **Status of Sewer Expansion Projects**
- **Non-Traditional Projects update**
- **Monitoring program**



Plan Summary

Prepared by Town Staff

Identifies wastewater needs and evaluates alternatives

Designed to address multiple wastewater needs

- Nitrogen needs (TMDL Compliance)
- Pond and Lake Protection
- Water Supply Protection
- Targeted Economic Development
- Other Sanitary Needs (Flood Zones, etc.)

Watershed-by-watershed approach

Achieves TMDLs via traditional solutions (sewers and treatment)

- MEP/SMASST model confirmation

Three, 10-year Phases (30 years total) of sewer expansion

- Each phase includes multiple projects

Non-traditional projects installed “at risk” and measured

Plan is adaptive (adaptive management)

Establishes a monitoring program



Town of Barnstable, Massachusetts

Comprehensive Wastewater Management Plan / Single Environmental Impact Report



Volume 1: Report Text, Tables and Figures

November, 2020

Plan Approval

Town process

- Water Resources Advisory Committee (WRAC)
- Public engagement
- Plan updates in response to community engagement (ex: 60 years to 30 years)
- Multiple Town Council Briefings

Massachusetts Environmental Policy Act (MEPA) Approval


- Submitted Expanded Environmental Notification Form (EENF): 2/10/2020
- Received Secretary's Certificate for EENF: 4/3/2020
- Refined plan to address comments received
- Submitted Single Environmental Impact Report (SEIR): 11/23/2020
- Received Secretary's Certificate for SEIR: 12/30/2020
- Received Secretary's Certificate for Special Review Procedures (SRP): 1/8/2021
- 5 Year Adaptive Management Plan Updates Required

Cape Cod Commission 208 Consistency Determination

- Received 208 Consistency Approval: 4/16/2021
- Annual Reports Required

MassDEP Watershed Permit

- Regulations became effective July 7, 2023
- Application Submitted September 1, 2023


The Commonwealth of Massachusetts
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December 30, 2020

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
SINGLE ENVIRONMENTAL IMPACT REPORT

PROJECT NAME : Barnstable Comprehensive Wastewater Management Plan
PROJECT MUNICIPALITY : Barnstable
PROJECT WATERSHED : Cape Cod
EEA NUMBER : 16148
PROJECT PROPONENT : Town of Barnstable
DATE NOTICED IN MONITOR : November 23, 2020

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G. L. c. 30, ss. 61-62I) and Section 11.08 of the MEPA regulations (301 CMR 11.00), I have reviewed the Single Environmental Impact Report (Single EIR) and hereby determine that it **adequately and properly complies** with MEPA and its implementing regulations.

Project Description

As previously described in the Expanded Environmental Notification Form (EENF)/Comprehensive Wastewater Management Plan (CWMP) and reiterated in the Single EIR, the CWMP describes the Town of Barnstable's plan to address water quality management concerns resulting from population growth and increased development. The CWMP is a 30-year plan focused on traditional sewerage solutions to replace the current dependence on septic systems; these solutions will be implemented in three 10-year phases. The plan has been designed to address multiple goals and needs of the community, specifically: nutrient removal, pond protection, drinking water protection, economic development and other related concerns regarding wastewater management.

MEPA Special Review Procedures

CWMP is a Master Planning Document

- MEPA and Town Staff agreed an SRP was appropriate due to nature of project
- Town staff prepared recommended SRP as part of SEIR filing
- MEPA approved SRP substantially consistent with Town staff recommendation
- SRP identifies which projects will require further MEPA Review (Notice of Project Change)

SRP categorizes projects into 6 Categories

1: Sewer System Expansion Program

- “Necessary to execute the program as dozens of smaller, more manageable projects”
- “MEPA review will not be necessary for implementation of these future sewer expansion projects (including construction of pump stations), provided they are located within the Wastewater Needs Areas identified in CWMP and do not result in material changes to environmental impacts from those disclosed in the CWMP”

2: WPCF Rehabilitation Projects

- Projects that rehabilitate existing facilities at WPCF, but do not increase the permitted flow/discharge and do not exceed MEPA thresholds, require no further MEPA review.
- Solids Processing Upgrades, Headworks Facility, Backup Power

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January 8, 2021

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ESTABLISHING A SPECIAL REVIEW PROCEDURE

PROJECT NAME : Barnstable Comprehensive Wastewater Management Plan
PROJECT MUNICIPALITY : Barnstable
PROJECT WATERSHED : Cape Cod
EEA NUMBER : 16148
PROJECT PROPONENT : Town of Barnstable
DATE NOTICED IN MONITOR : November 23, 2020

Pursuant to the Massachusetts Environmental Policy Act (MEPA: M.G. L. c. 30, ss. 61-62) and Section 11.09 of the MEPA regulations, I hereby establish a Special Review Procedure (SRP) to guide the implementation of the Comprehensive Wastewater Management Plan (CWMP) for the Town of Barnstable. Notice of the issuance of this SRP will be published in the next edition of the Environmental Monitor on January 22, 2021.

Project Description

As previously described in the Expanded Environmental Notification Form (EENF) Comprehensive Wastewater Management Plan (CWMP), the CWMP describes the Town of Barnstable's plan to address water quality management concerns resulting from population growth and increased development. The CWMP is a 30-year plan focused on traditional sewerage solutions to replace the current dependence on septic systems; these solutions will be implemented in three 10-year phases. The plan has been designed to address multiple goals and needs of the community, specifically: nutrient removal, pond protection, drinking water protection, economic development and other related concerns regarding wastewater management.

MEPA Special Review Procedures

3: WPCF Expansion Projects

- Projects that will require modification to the WPCF's Groundwater Discharge Permit.
- These project require filing of Notice of Project Change if MEPA review threshold exceeded (expansion of existing wastewater treatment and/or disposal of 100,000 gpd of 10% of existing capacity)
- **Example: Nitrogen Improvements at WPCF Project**

4: Expansion of Effluent Disposal Capacity

- Expansion of effluent disposal capacity which exceeds a MEPA threshold require filing of NPC

5: Non-traditional Solutions

- MEPA recognizes that each non-traditional project will have a unique permitting pathway
- **File NPC if project exceeds a MEPA threshold**

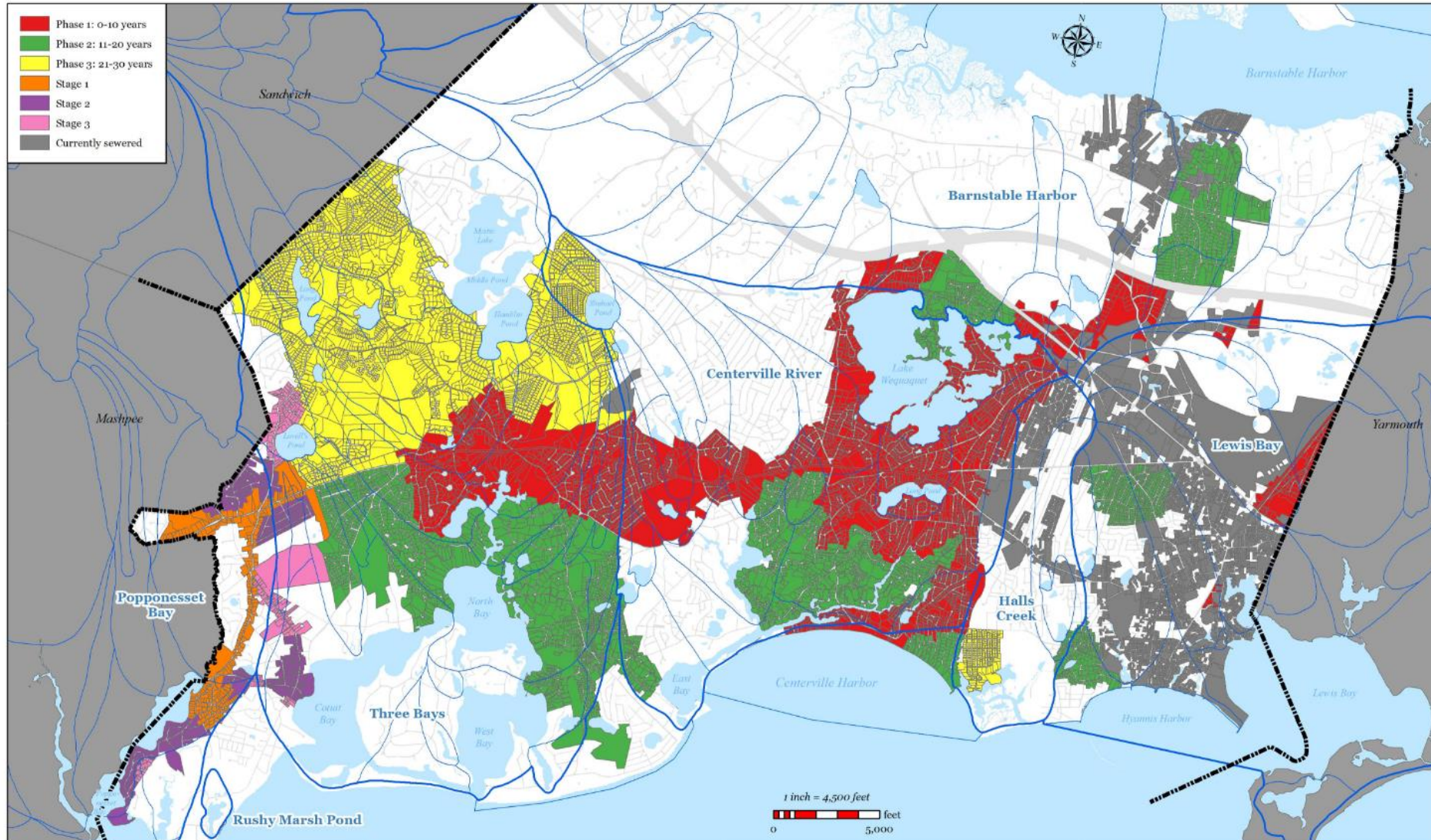
6: Inter-municipal Partnerships

- Should an intermunicipal wastewater partnership materialize in the future and result in projects that exceed a MEPA threshold, the Town should consult with the MEPA Office to determine the appropriate filing (ENF or NPC).

The SRP does not waive the Town's obligation to secure all other necessary permits that maybe be necessary for each individual project (example: MassDEP, MassDOT, Conservation, Historic, etc.)

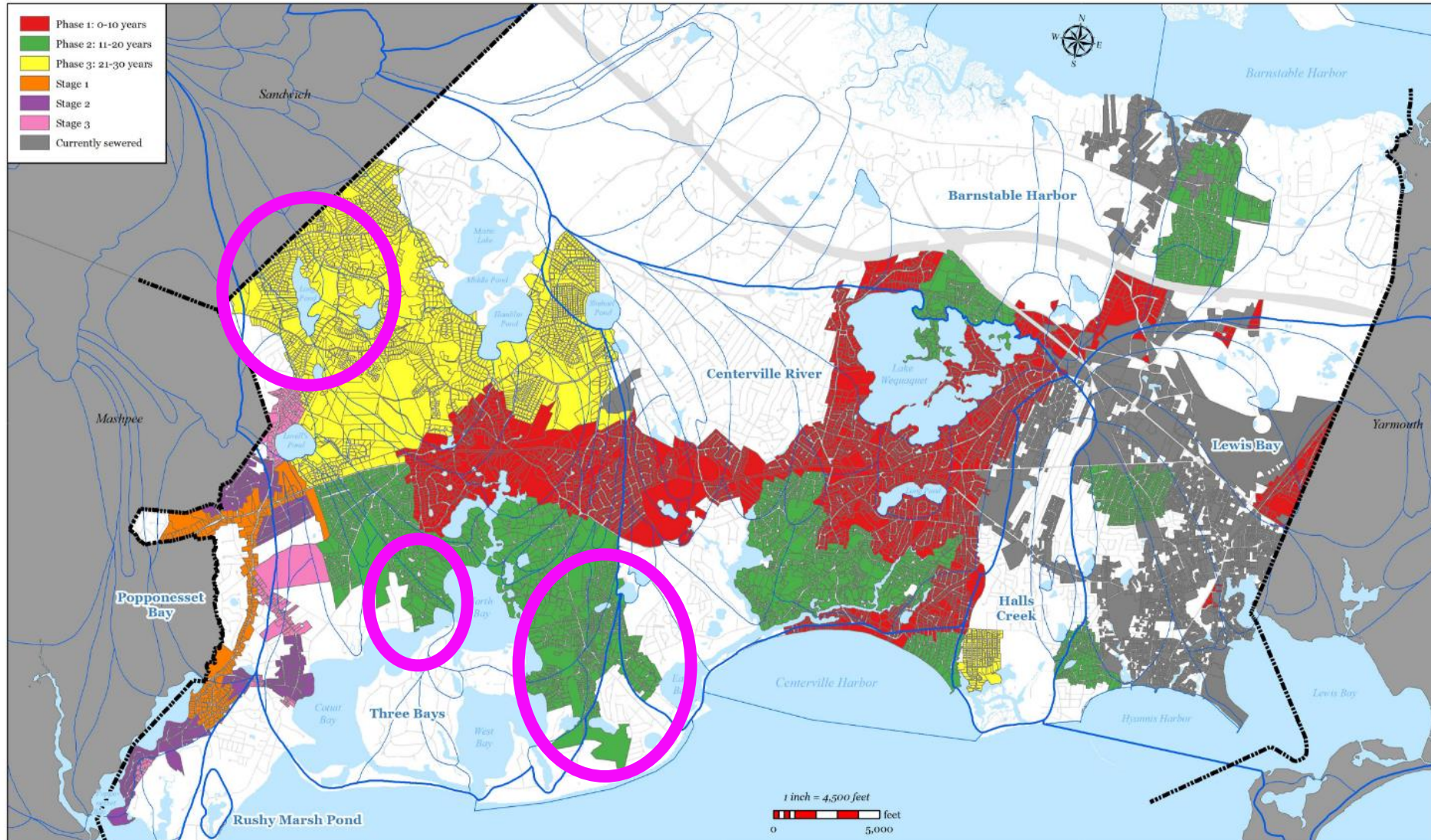
Sewer Expansion Phasing Plan

As Found in CWMP/SEIR, November, 2020



Sewer Expansion Phasing Plan

As Found in CWMP/SEIR, November, 2020



Phase 1 Goals

Sewers

- **Construction of sewers on Route 28**
 - Backbone of westerly sewer expansion
- **Sewer expansion adjacent to impaired ponds in Centerville**
 - Lake Wequaquet, Bearses Pond, Shallow Pond, Long Pond, Red Lily Pond, Lake Elizabeth
- **Sewer expansion in identified economic develop areas**
 - Route 28, Route 132, Old Yarmouth Road “triangle”
- **Sewer expansion in flood zones**
 - Craigville Beach / Long Beach region
- **Sewer expansion in adjacent to Prince Cove and Warren’s Cove**
 - Most impaired water bodies in Three Bays

Treatment

- **Upgrades at BWPCF identified in CWMP**
 - Nitrogen, Headworks and Solids Processing Upgrades
- **Effluent disposal solution**
 - Increase permitted discharge capacity

Non-Traditional

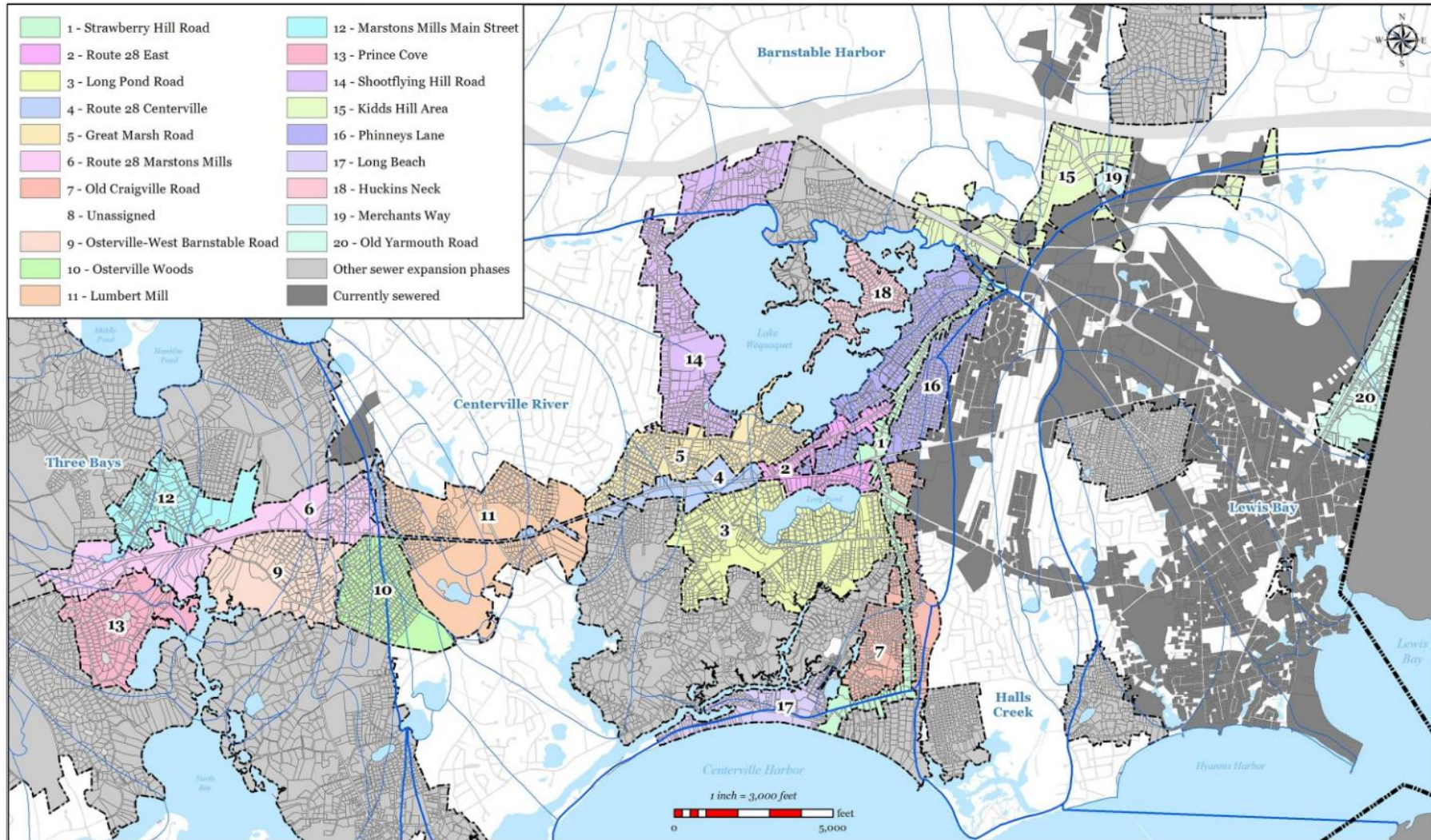
- **Implementation of non-traditional projects in Three Bays Watershed**
 - Mill Pond Dredging
 - Warren’s Cove Aquaculture
 - Cotuit Cut Dredging
 - Green Stormwater Projects

Other Goals

- **Continued pursuit of potential regional solutions**
- **Continue monitoring program**

Phase 1 Sewer Expansion Implementation Plan

As found in CWMP/SEIR, November, 2020



Adaptive Management

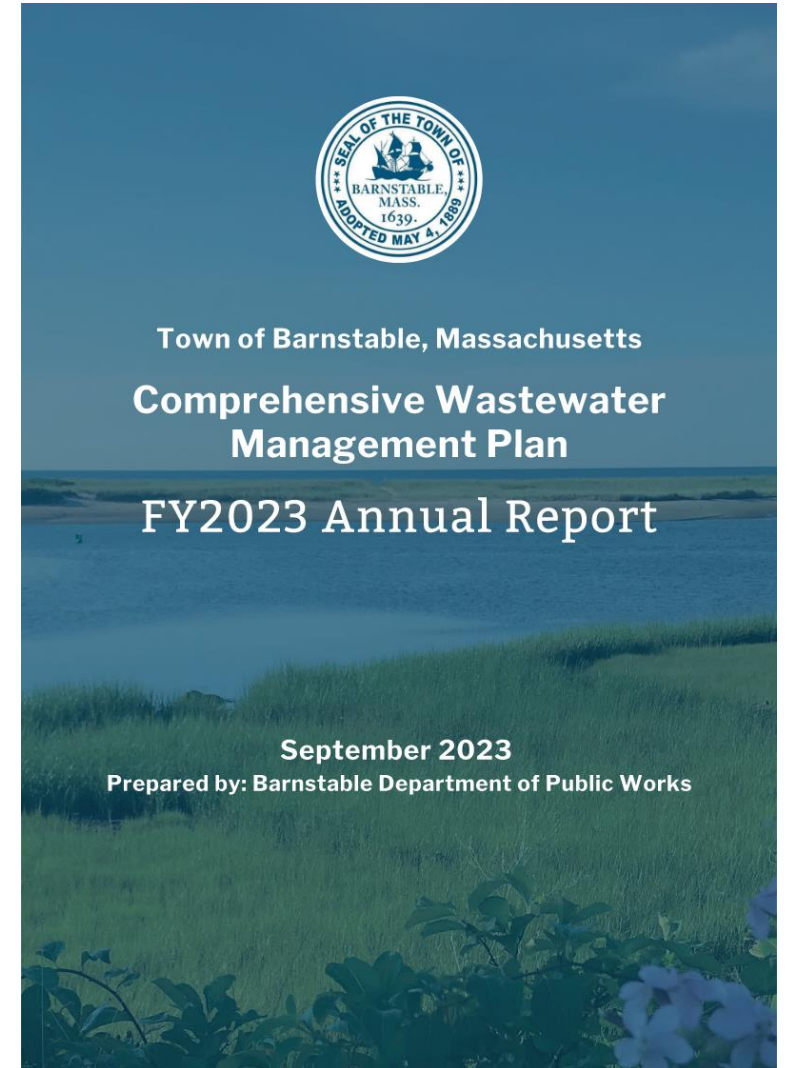
CWMP is intended to be adaptive to allow the Town to take advantage of opportunities, respond to changing environmental conditions, land use updates, improved technologies, and other unknowns

Adaptive Management Plan Update required to be prepared every five years

- Report on progress of plan and changes
- First update anticipated end of 2025

Annual Report prepared each year and submitted to Cape Cod Commission

- Annual Report documents any updates that occur during the year



Adaptive Management Updates to Date

Centerville Village Sewer Expansion

- Sewer expansion along proposed Park City Wind Route
- Portions of route originally in Phase 2, moved to Phase 1
- Expedite schedule of route to front half of Phase 1
- Further divided into North Phase and South Phase and includes Route 28 from Phinney's Lane to Old Stage Road

Route 28 West Sewer Expansion

- Route 28 from Old Stage Road to Route 149. "Backbone" of western expansion.
- Originally two projects, combined into one
 - **Reduces duration of work within Route 28 and gets to Three Bays Watershed sooner**
- Design dictated expediting portions of Osterville-West Barnstable Road and Bumps River Road

Main Street, Marstons Mills

- Moved to Phase 2 to offset additions to Phase 1
- Maximize life of infrastructure investment from streetscape project

Shubael Pond

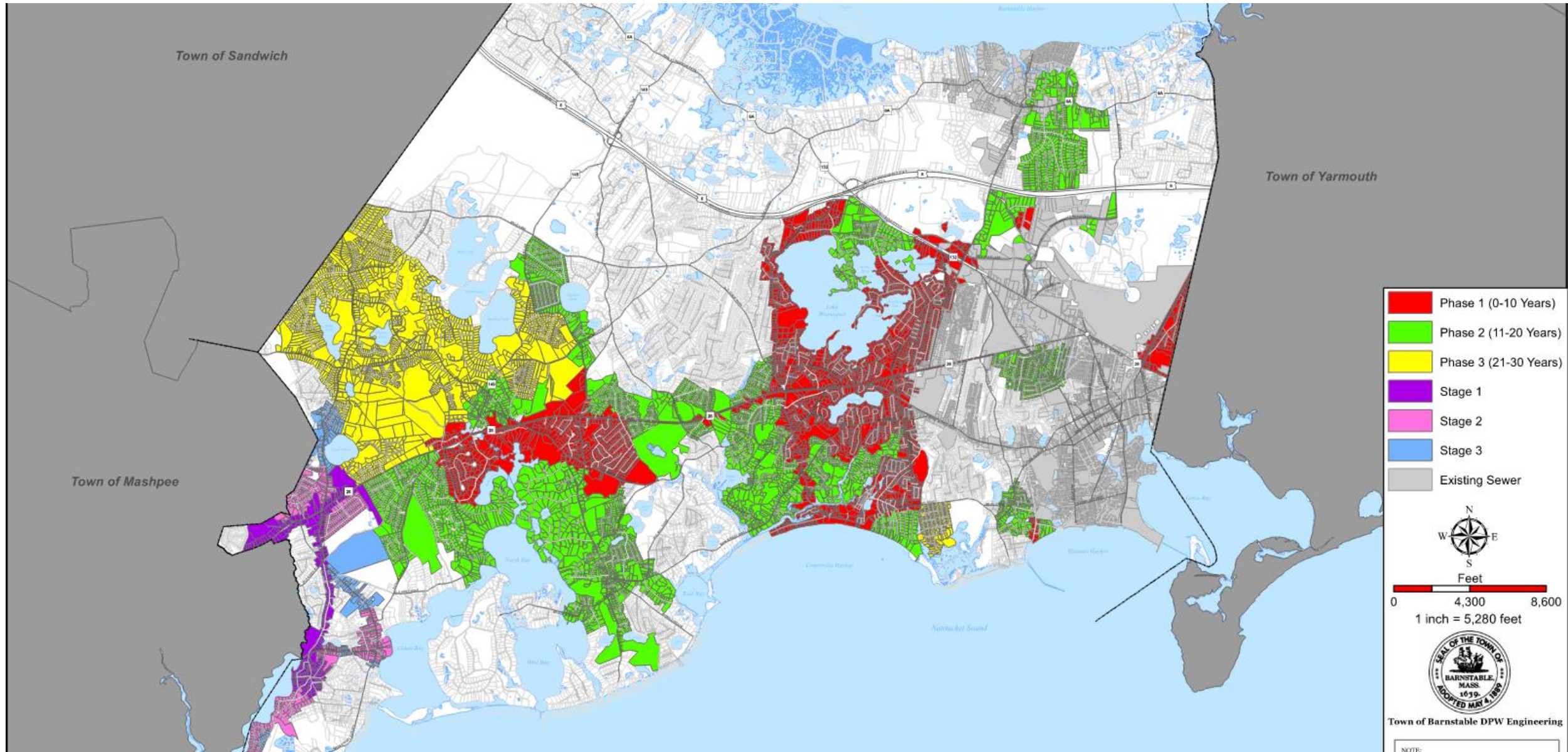
- Pond Management Plan recommended wastewater mitigation to improve pond water quality
- Advance sewer expansion from Phase 3 to Phase 2

Hyannis Avenue Extension

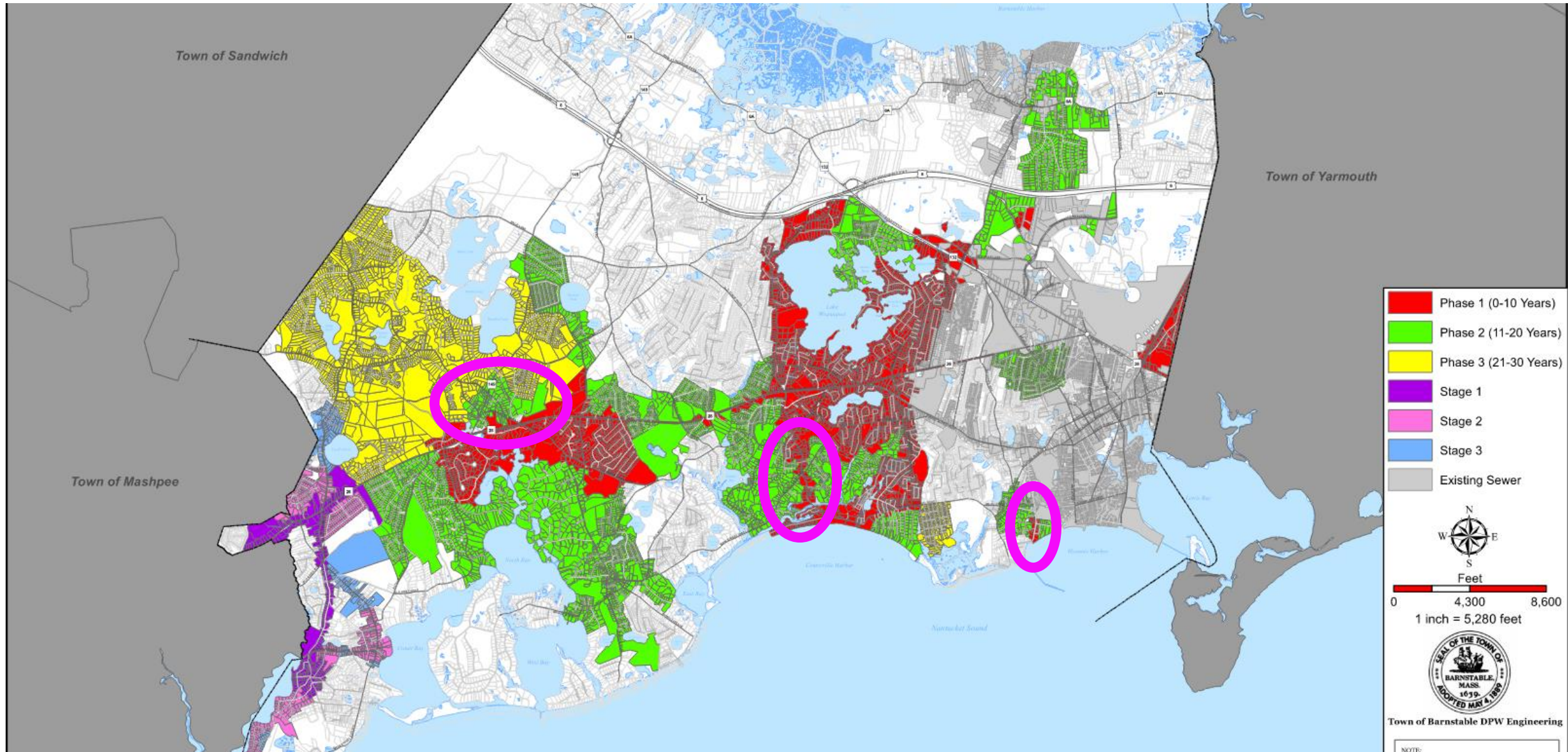
- Public/private partnership with property owner at 10 Hyannis Avenue to extend the municipal sewer
- 11 Connections to date

Phase 1 Project Implementation Schedule Updates

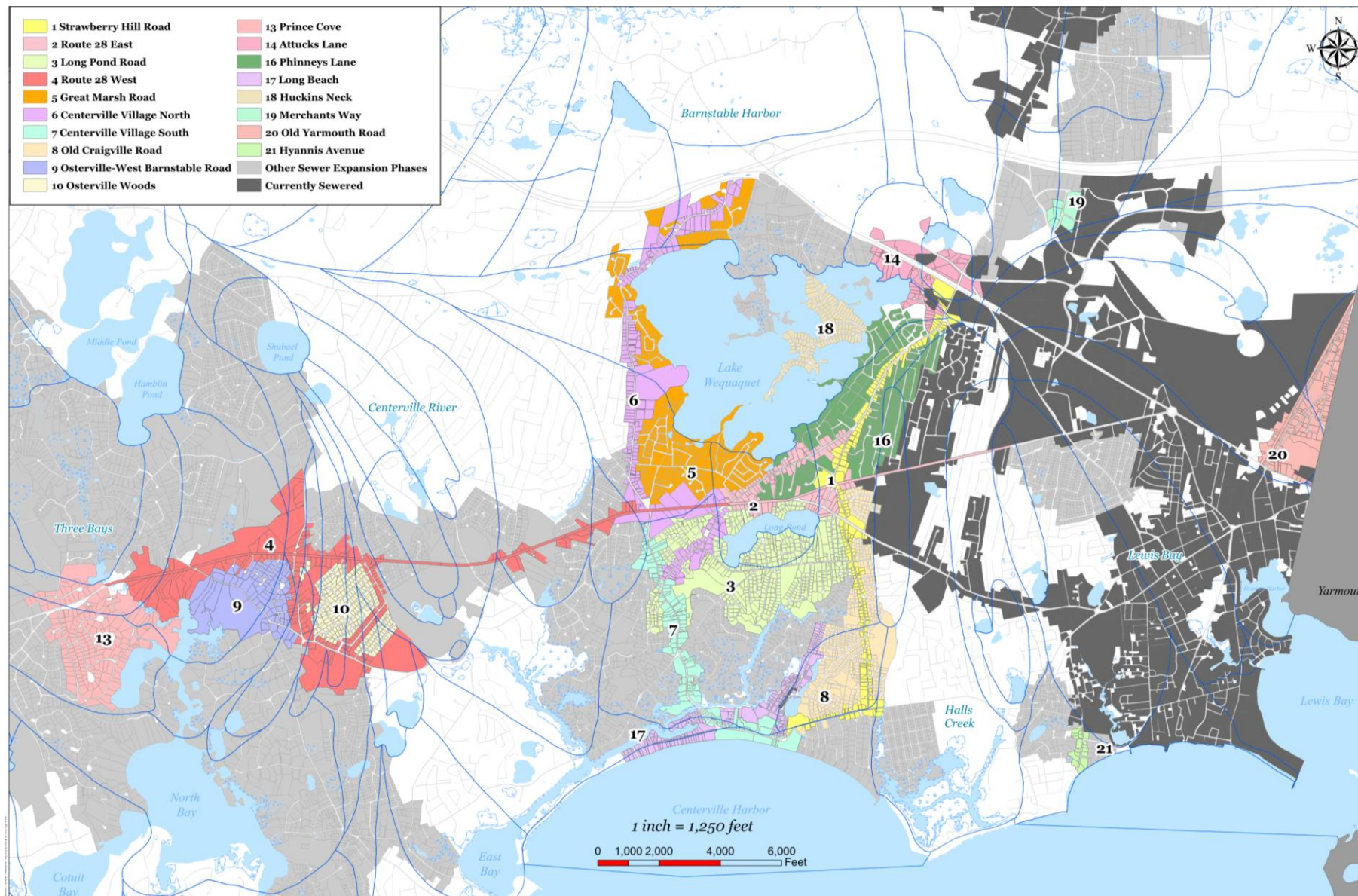
Sewer Expansion Phasing Plan, June 2024



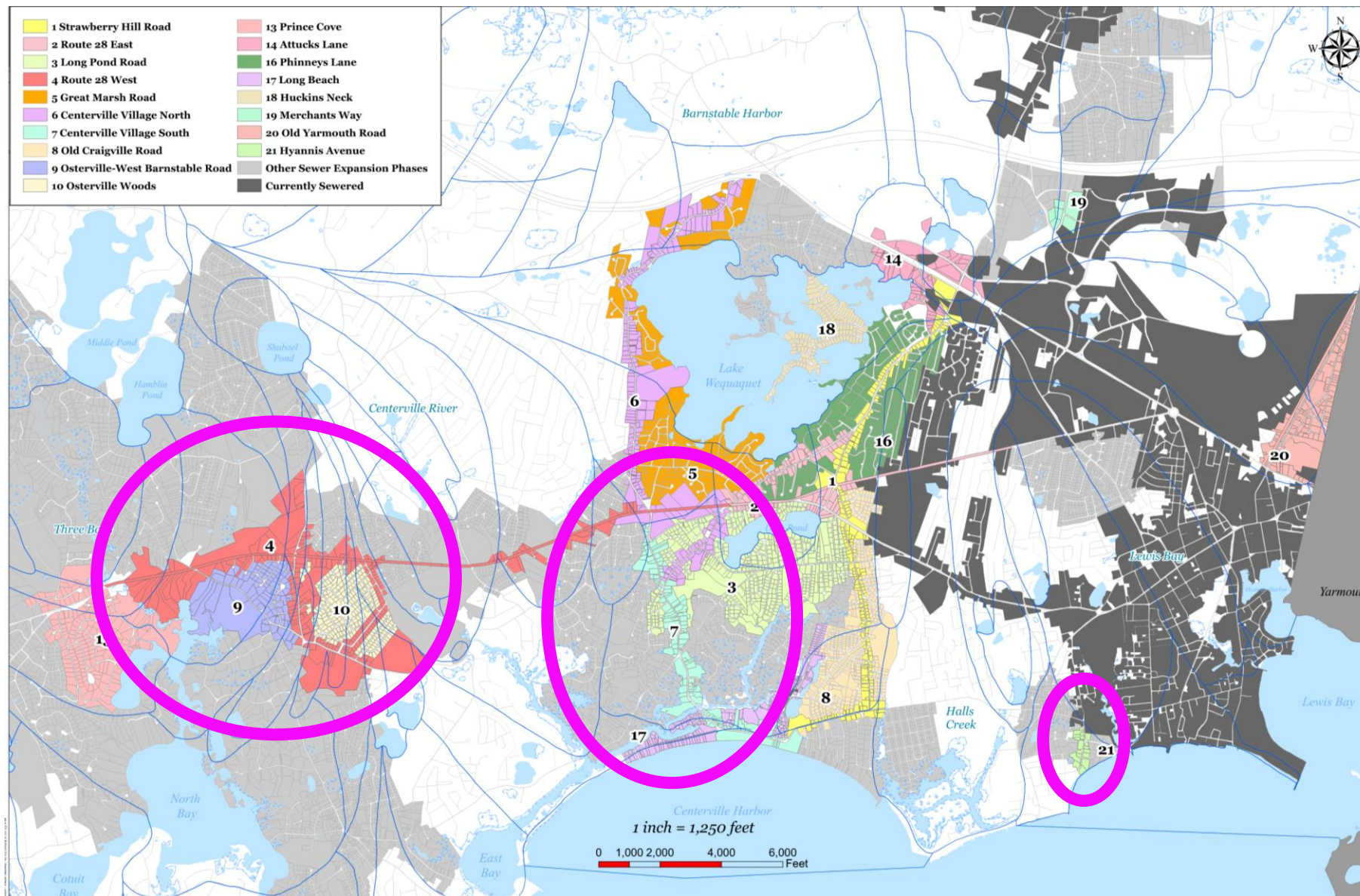
Sewer Expansion Phasing Plan, June 2024



Phase 1 Sewer Expansion Implementation Plan, June 2024



Phase 1 Sewer Expansion Implementation Plan, June 2024



Phase 1 Sewer Expansion Plan Schedule

Town of Barnstable CWMP - Phase 1 Implementation Plan													
Project	Pre-CWMP			Phase 1									
	FY19	FY20	FY21	FY22 Year 1	FY23 Year 2	FY24 Year 3	FY25 Year 4	FY26 Year 5	FY27 Year 6	FY28 Year 7	FY29 Year 8	FY30 Year 9	FY31 Year 10
Merchants Way	<i>Grant</i>	<i>Grant</i>											
Strawberry Hill Road		\$835,000	\$14,125,023										
Route 28 East		\$800,000		\$22,000,000									
Centerville Village (Park City Wind Route)				\$2,750,000		\$30,900,000							
WPCF Upgrades - Phase 1			\$200,000	\$5,850,000			\$109,330,000						
Route 28 West		\$612,000		\$3,500,000			\$59,650,000						
Phinney's Lane	\$315,000	\$735,000						\$40,000,000					
Long Pond Area	\$402,000	\$938,000							\$38,000,000				
Long Beach						\$350,000	\$750,000		\$9,000,000				
WPCF Upgrades - Phase 2										\$63,399,000			
Old Yarmouth Road			\$1,775,000		\$275,000	\$650,000				\$12,750,000			
Great Marsh Road (Now combined w/ Shootflying Hill Road Project)					\$375,000			\$2,500,000		\$38,000,000			
South County Road								\$600,000	\$1,500,000		\$21,000,000		
Prince Cove									\$750,000	\$1,500,000	\$25,000,000		
Huckins Neck									\$300,000	\$700,000		\$10,000,000	
Old Craigville Road					\$600,000	\$1,500,000						\$22,500,000	
Osterville Woods										\$600,000	\$1,400,000		\$19,000,000
Lumbert Mill												TBD	TBD
CAPITAL COSTS	\$717,000	\$3,920,000	\$16,100,023	\$34,100,000	\$1,250,000	\$33,400,000	\$169,730,000	\$43,100,000	\$49,550,000	\$116,949,000	\$47,400,000	\$32,500,000	\$19,000,000
NEW PARCELS CONNECTED	0	7	0	0	0	329	0	351	147	794	721	695	790
COMBINED FLOW (GPD)	1,670,000	1,670,000	1,670,000	1,670,000	1,670,000	1,732,000	1,732,000	1,798,000	1,848,000	1,978,000	2,083,600	2,216,600	2,333,600

Legend	
Evaluation and/or Preliminary Design	
Final Design	
Construction	

Notes:
 1: Bold and italicized are funds that have already been appropriated.
 2: Non-traditional projects not included

Total capital appropriations for CWMP to Date: \$274,306,923

FY25-FY29 Capital Improvement Plan

DEPT	PRIORITY	PROJECT TITLE	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	TOTALS
CWMP	1	Nitrogen Removal Improvements and Water Pollution Control Facility Upgrade	109,330,000	-	63,399,000	-	-	172,729,000
CWMP	2	Rt. 28 West Sewer Expansion	59,650,000	-	-	-	-	59,650,000
CWMP	3	Long Beach Sewer Expansion	750,000	-	9,000,000	-	-	9,750,000
CWMP	4	Great Marsh Road Sewer Expansion – Design and Permitting	-	2,500,000	-	38,000,000	-	40,500,000
CWMP	5	Mill Pond Dredging	-	5,000,000	150,000	-	-	5,150,000
CWMP	6	South County Rd Sewer Expansion	-	600,000	1,500,000	-	21,000,000	23,100,000
CWMP	7	Phinney's Lane Neighborhoods Sewer Expansion	-	40,000,000	-	-	-	40,000,000
CWMP	8	Effluent Disposal Alternatives	-	TBD	-	TBD	-	-
CWMP	9	Warren's cove Aquaculture Project - Design and Permitting	-	TBD	-	TBD	-	-
CWMP	10	Prince Cove Sewer Expansion	-	-	750,000	1,500,000	25,000,000	27,250,000
CWMP	11	Huckins Neck Rd Sewer Expansion	-	-	300,000	700,000	-	1,000,000
CWMP	12	Long Pond Area Sewer Expansion	-	-	38,000,000	-	-	38,000,000
CWMP	13	Old Yarmouth Rd Sewer Expansion	-	-	-	12,750,000	-	12,750,000
CWMP	14	Osterville Woods Sewer Expansion - Design and Survey	-	-	-	600,000	1,400,000	2,000,000
TOTAL COMPREHENSIVE WASTEWATER MANAGEMENT			\$ 169,730,000	\$ 48,100,000	\$ 113,099,000	\$ 53,550,000	\$ 47,400,000	\$ 431,879,000

Consistency with Phase 1 Goals

- Yellow: Construction of sewers on Route 28
- Light Blue: Sewer expansion adjacent to impaired ponds in Centerville
- Blue: Sewer expansion in identified economic develop areas
- Magenta: Sewer expansion in flood zones
- Grey: Sewer expansion in adjacent to Prince Cove and Warren's Cove
- Green: Upgrades at BWPCF identified in CWMP and effluent disposal solutions
- Purple: Non-traditional Projects

Typical Sewer Expansion Project Schedule and Approach

Each sewer expansion project is a multi-year effort

DPW Staff manages and oversees all aspects, so the Town maintains control and continuity of program

- Town Staff, Consultants, and Contractors involved
- DPW Staff performs project management, preliminary design, financial requests, and construction inspection/oversight, sewer connection inspections/oversight, and public outreach

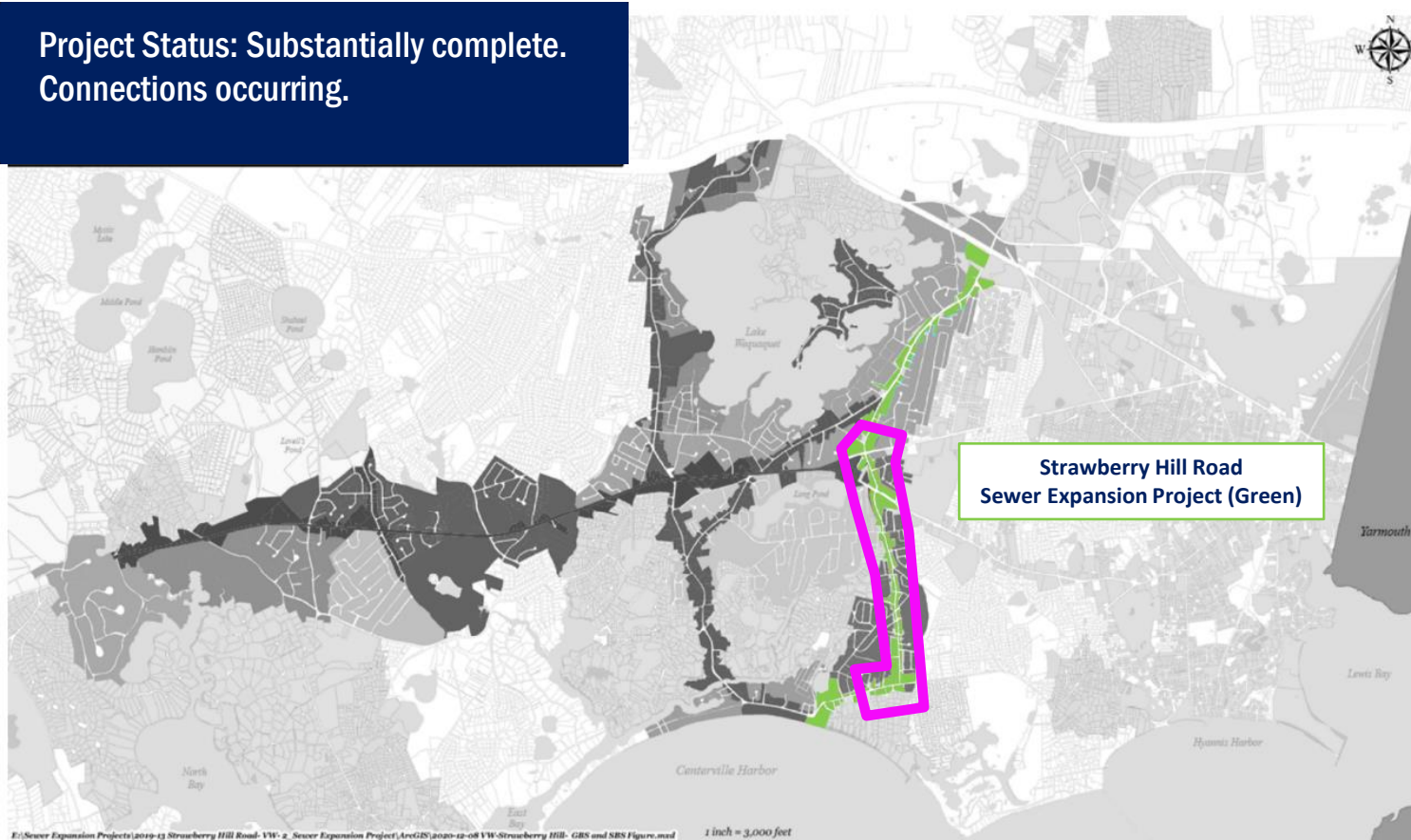
State Revolving Fund (SRF) deadlines drive project schedules

MILESTONE	Fiscal Year 1				Fiscal Year 2				Fiscal Year 3				Fiscal Year 4				Fiscal Year 5				Fiscal Year 6				Fiscal Year 7																						
	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M
Funding Request for Preliminary Design/Survey																																															
Designer Selection for Survey																																															
Survey																																															
Preliminary Design																																															
Funding Request for Final Design																																															
Designer Selection for Final Design																																															
Final Design																																															
Construction Bids																																															
SRF Project Evaluation Form (PEF) Submittal																																															
SRF Intended Use Plan (IUP) Released																																															
SRF Loan Commitment Application Deadline																																															
Funding Request for Construction																																															
SRF Construction Contract Execution Deadline																																															
Construction																																															
Sewer Connections																																															

LEGEND
Financial Milestone
Performed by Town Staff
Contracted
Homeowner Obligation

Strawberry Hill Road Sewer Expansion Project

**Project Status: Substantially complete.
Connections occurring.**



Project Substantially complete

- Addressing punch list items and restoration.

144 Parcels currently eligible to connect

- By next week, all are anticipated to have received their order to connect letter from Health Dept.
- 1 connection completed to date.

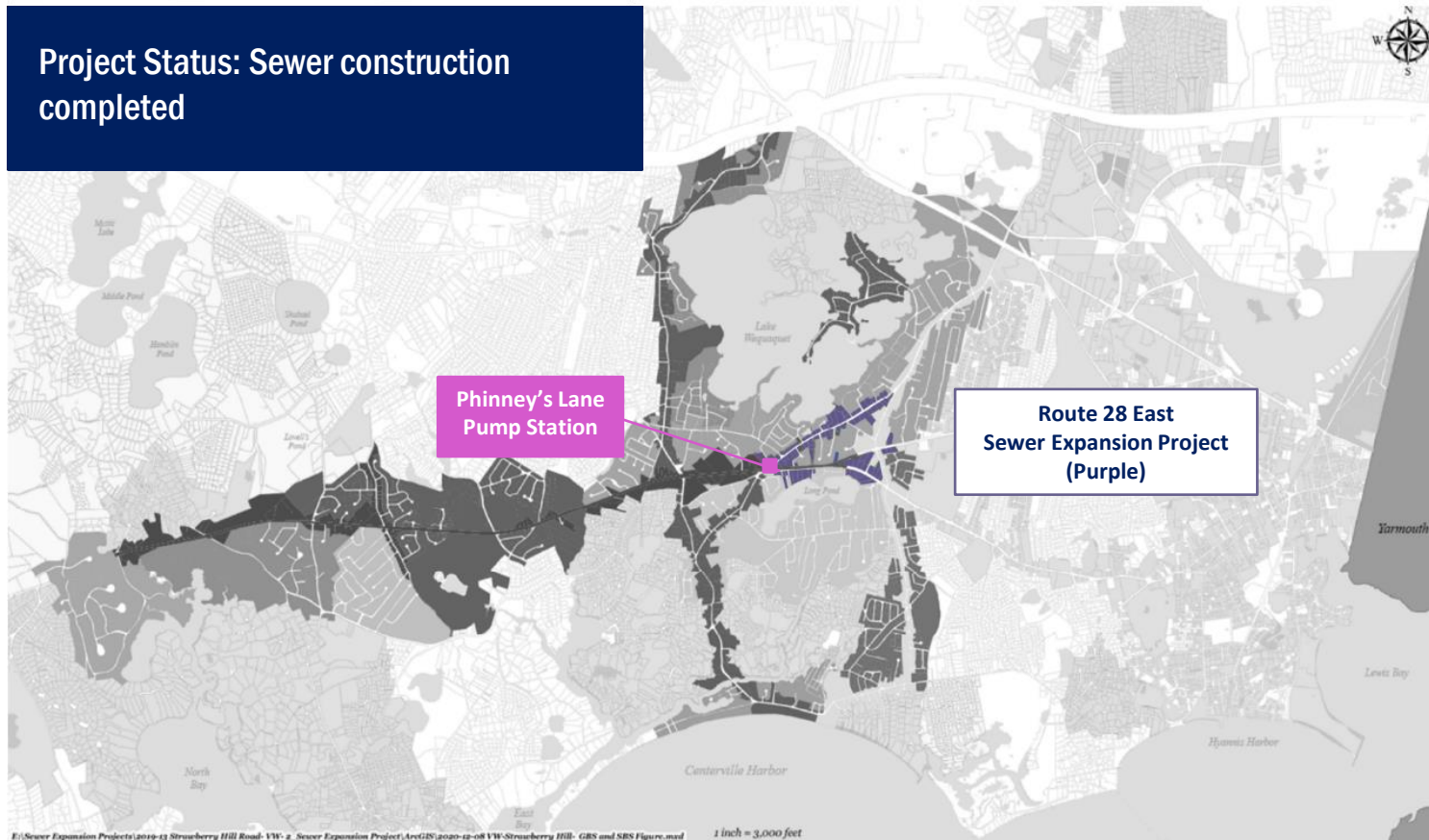
72 Parcels along project route are not eligible to connect until additional infrastructure is installed during current/future projects

- Phinneys Lane from Wequaquet Lane to Old Strawberry Hill Road: Upon completion of Route 28 East Project
- Craigville Beach Road from Covells Beach to Jackson Avenue: Upon completion of Centerville Village Sewer Expansion project – South Phase

Project projected to be completed ±\$275,000 under budget

Route 28 East Sewer Expansion Project

Project Status: Sewer construction completed



Fundamental infrastructure to support the sewer expansion program

Remain on track for connections this Fall

Project projected to be completed ±\$1,250,000 under budget

Sewer Contract:

- All below grade work has been completed.
- Remaining work includes paving, punch list and restoration.
 - Phinney's Lane paving from Strawberry Hill Road to Wequaquet Lane to be completed in the fall.
 - West Main Street paving to be completed next week
- ±11 Grinder Pumps anticipated

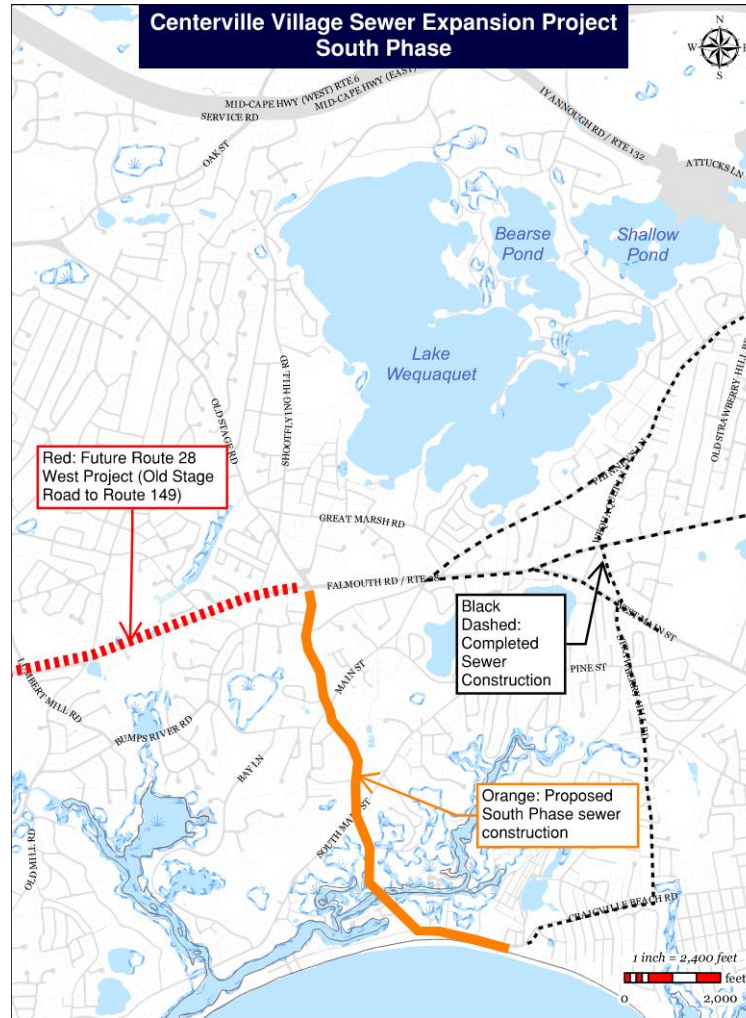
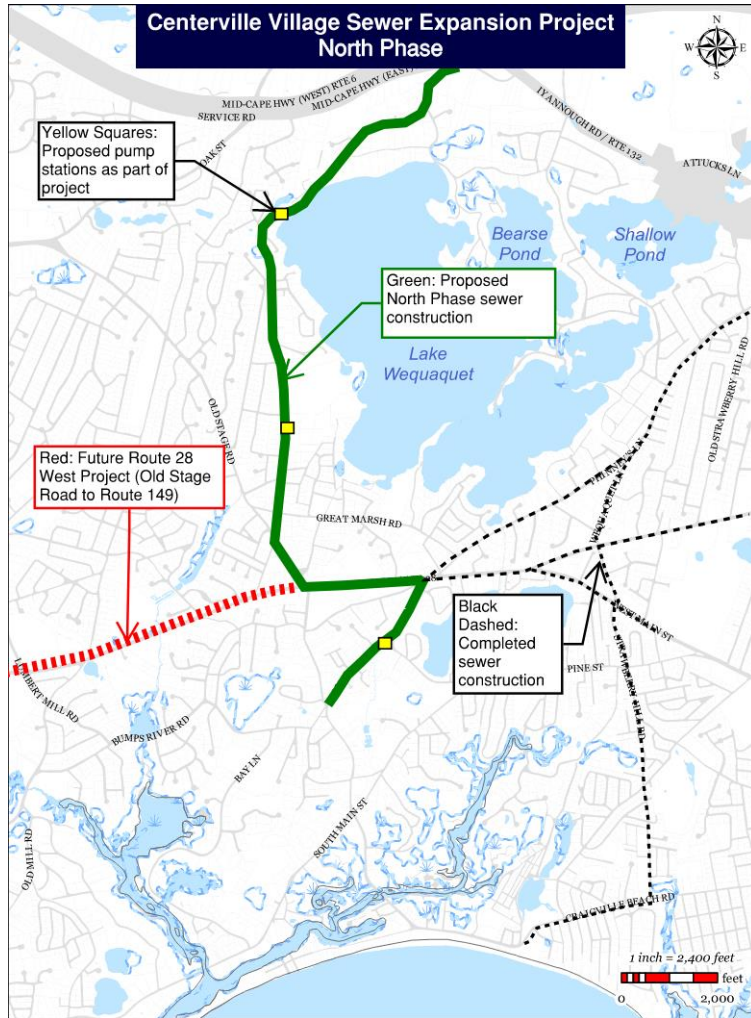
Phinney's Lane Pump Station:

- Finalizing utility services, testing and punch list items
- Anticipated substantial completion this fall.

Phinney's Lane Pump Station



Centerville Village Sewer Expansion Project



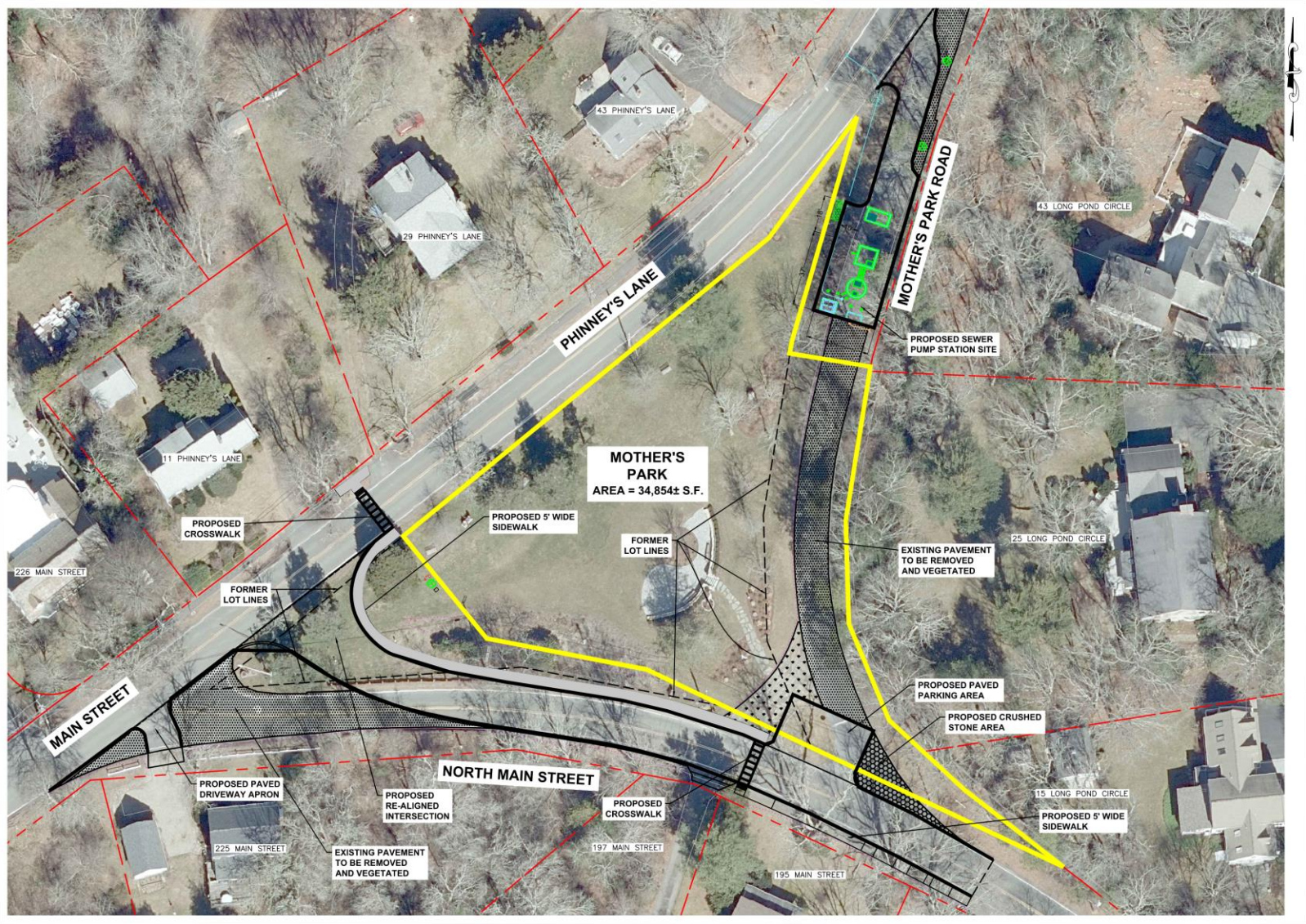
North Phase:

- Bids opened May 17, 2024
- C.C. Construction apparent low bidder at \$20,380,342.14
 - Notified of contingent intent to award
- Mother's Park Pump Station Article 97 legislation is pending
 - Cannot award full contract until completed
 - SRF extension of award date to October 1
- Construction anticipated to commence this fall
 - Construction anticipated Fall 2024.
 - 870 calendar dates from Notice to Proceed.
 - Anticipate completion end of 2026.

South Phase:

- Continuing design effort
- Construction start: Currently TBD?

Centerville Village Sewer Expansion Project Mother's Park Pump Station and Improvements



Route 28 West Sewer Expansion Project

Project Status: Design on-going



Route 28 from Old Stage to Route 149

- “Backbone” of western expansion

Includes portions of Osterville-West Barnstable Road, Bumps River Road, Oldham Road, and Old East Osterville Road

5 Pump stations in project

- Five Corners Road at Route 28
- Osterville West Barnstable Road at Concord Lane
- Former Marstons Mills Schools Property
- Cape Cod Collaborative Property
- Town owned property at 181 Oldham Road

#3 Ranked Project on the 2024 SRF Clean Water Intended Use Plan

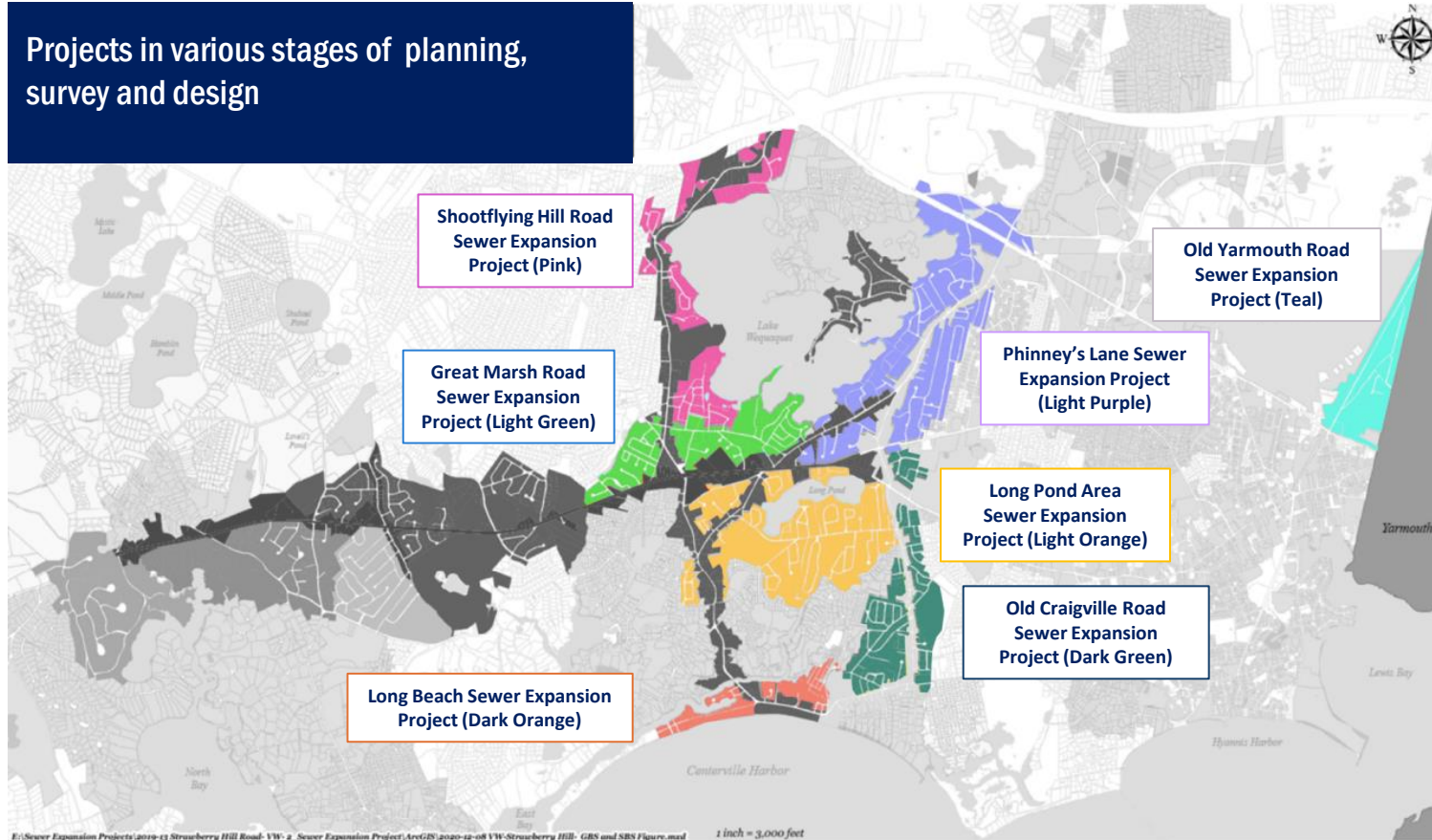
Town Council approved \$59,650,000 for Construction on 4/25/24

Project at 60% Design

Construction Anticipated: 2025-2027

Other Funded Sewer Expansion Projects

Projects in various stages of planning, survey and design



Phinney's Lane Neighborhoods

- RFP this summer for designer selection
- Private roadway utility easements
- Construction: FY26 – FY30

Great Marsh Road / Shootflying Hill Road

- Preliminary design and survey on-going
- Construction: FY28 – FY30

Long Pond Area

- Preliminary design and survey on-going
- Construction: FY27 – FY30

Long Beach Area

- Preliminary design and survey on-going
- Construction: FY27 – FY28

Old Yarmouth Road Area

- Preliminary design and survey on-going
- Construction: FY28 – FY30

Old Craigville Road Area

- Preliminary design and survey on-going
- Construction: FY30 – FY32

Non-Traditional Projects

Mill Pond Dredging

- Continued coordination with NHESP and other regulatory agencies to develop a potentially permissible project
- Contracting with Woods Hole Group to complete design and permitting

Warren's Cove Aquaculture

- Town Council approved funding for feasibility study
- Anticipate RFP later this year

Cranberry Bogs

- Continue to coordinate with BCWC

I/A Septic Systems

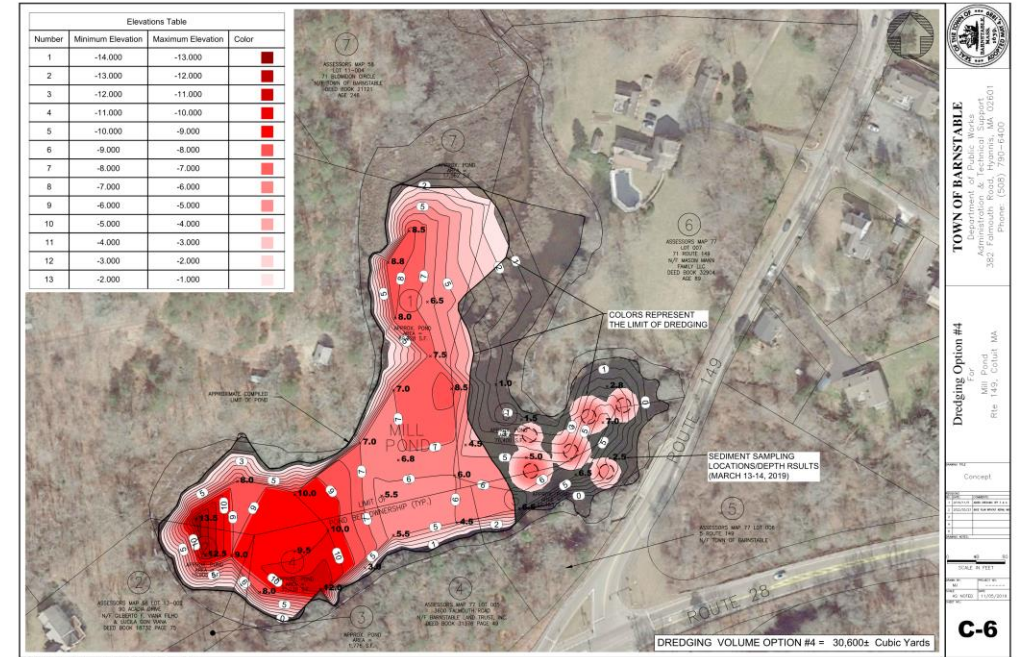
- Continue to coordinate with BCWC
- As effective systems move closer to general approval, continue to review opportunities to incorporate into plan in targeted locations as part of Adaptive Management Plan updates?

Cotuit Cut

- Completed in 2020
- Monitoring has indicated no significant water quality improvements

Three Bays Stormwater Project

- 7 sites completed, 1 in design



Non-Traditional Projects

Table 1. Summary of Three Bays stormwater constructed BMPs sites and practices (2018-2022).

Retrofit ID	Site Name	Practice Type	Location (Address)
CW-1	Cordwood Landing	Bioretention	590 Cordwood Road, Cotuit, MA 02635
PC-1	Prince Cove	Sand Filter	0 Prince Avenue, Marstons Mills, MA 02648
CO-7	Ropes Beach	Gravel Wetland	85 Old Shore Road, Cotuit, MA 02635
LR1-4C	Putnam Avenue	Bioretention	16-52 Captain Isaiah Road, Cotuit, MA 02635
LR1-4D	Putnam Avenue	Dry Swale	325-451 Putnam Avenue, Cotuit, MA 02635
CO-2	Cotuit Library	Bioretention	871 Main Street, Cotuit, MA 02635
WC1-1C	South County Road	Water Quality Unit	1774-1812 South County Road, Osterville, MA 02655
WC1-1A&B	South County Road	Dry Swales	1774-1812 South County Road, Osterville, MA 02655
MMR-19	River Road	Dry Swales	465 River Road at Rosa Lane, Marstons Mills, MA 02648



Monitoring Program

Groundwater travel time to embayments can be years to decades

- Measurable water quality improvements will not be immediate
- So how do we track program success?

3 Prong Monitoring Approach

- GIS Based Tracking of Sewer Expansion
- Embayment Monitoring Program
- Non-Traditional Project Monitoring Programs

GIS Based Tracking of Sewer Expansion

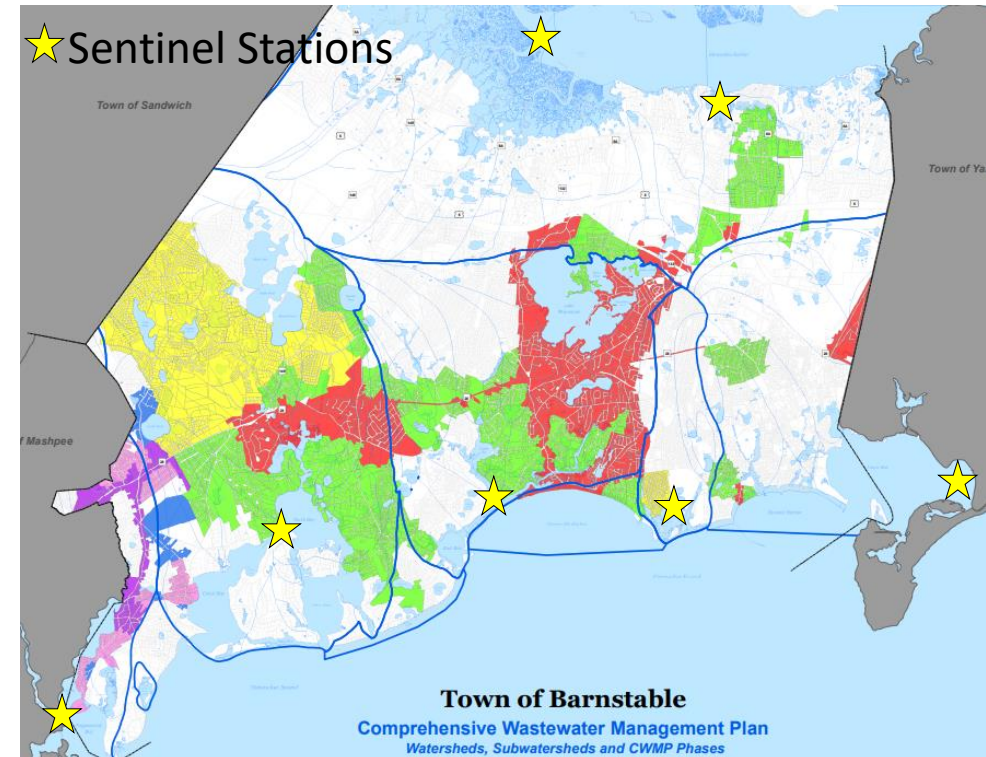
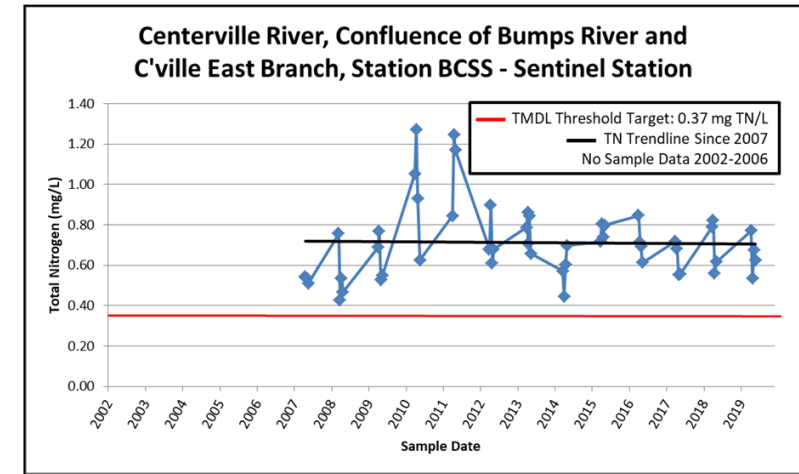
- “Real-time” tracking of implementation
- Town developed GIS tool that allows for spatial tracking of sewer infrastructure implementation and sewer connections
- Uses water data to track wastewater generation, projected nitrogen removals, etc.

Embayment Monitoring Program

- “Long-term” establishment of baseline and tracking of water quality improvements
- Annual program that was initiated in 2002

Non-Traditional Project Monitoring Program

- As each project is unique, a monitoring program will be developed and implemented on a project-by-project basis.





Questions?