APPENDIX D: PHASE II PUBLIC PARTICIPATION

Wastewater Advisory Committee

Agenda

Date	Time	Location
Monday, April 11, 2022	4:00 PM	Bourne High School – Library 75 Waterhouse Road, Bourne

Note this meeting is being televised, streamed or recorded by Bourne TV.

4:00 PM Call Public Session to Order in Open Session

All items on the agenda are subject to deliberation and votes.

1. Call to Order
   If anyone is audio or videotaping, they need to acknowledge it at this time.
2. Note excused/absent members
3. Workshop with Environmental Partners
   a. Review and discussion of Technology Matrix
   b. Review and discussion of Draft Evaluation Criteria.
4. Adjourn

Technology Matrix and Evaluation Criteria Review

Wastewater Advisory Committee
Comprehensive Wastewater Management Plan

ENVIRONMENTAL PARTNERS
— An Apex Company —

April 11, 2022

CWMP Status Update

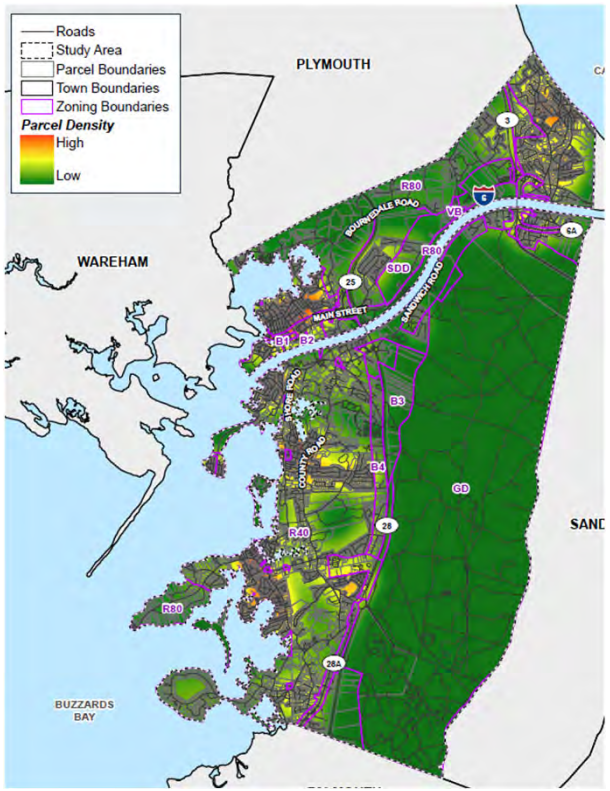
- Draft Needs Assessment Completed
- Kicked off Alternatives Analysis
  - Evaluating Technologies best suited for Bourne
  - Drafted Evaluation Criteria

Phase I: Needs Assessment Recap

- Study organized by watershed boundaries
- Analyzes current and future wastewater management needs using
  - Current zoning
  - Build-out based on current zoning
- Identifies nitrogen loading reduction requirements for all watersheds
  - With and without Nitrogen TMDLs

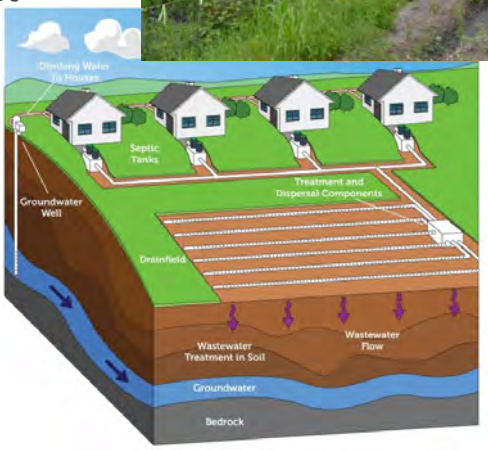
Embayment	Total Nitrogen Load Values, kg-N/year		Total Watershed Threshold kg-N/year	Total Load to Remove kg-N/yr.	Bourne's % Responsibility for Removal	Bourne Total Removal (kg-N/yr.)
	Wastewater	Total Load				
Megansett-Squeteague Harbor	7,611	11,658	1,446	1,446	39%	564
Phinneys Harbor	5,948	8,730	7,024	1,706	100%	1,706
Buttermilk Bay	4,058	5,610	4,208	1,402*	100%	1,402
Pocasset Harbor	7,958	12,479	9,359	3,120*	100%	3,120
Pocasset River	3,762	5,157	3,868	1,289*	100%	1,289
Buzzards Bay	16,830			4,208*	TBD	TBD
Cape Cod Canal	164,028			41,007*	TBD	TBD
					Total	8,072

*25% Removal assumed; Subject to change after MassDEP review



Phase II: Alternatives Analysis – Identifying Technologies

- Onsite Systems
  - Conventional Title 5 Systems
  - Innovative Alternative (IA) Onsite Systems
  - Cluster Systems
- Traditional Wastewater Treatment and Sewer Collection Systems
- Stormwater Controls
- Innovative & Alternative
  - Permeable Reactive Barriers
  - Aquaculture
  - Urine Recycling
- Policies & Bylaws



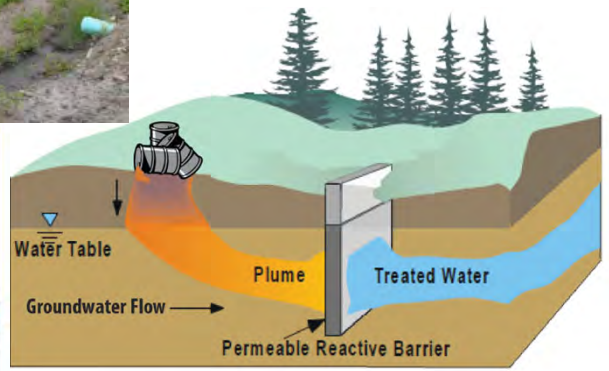
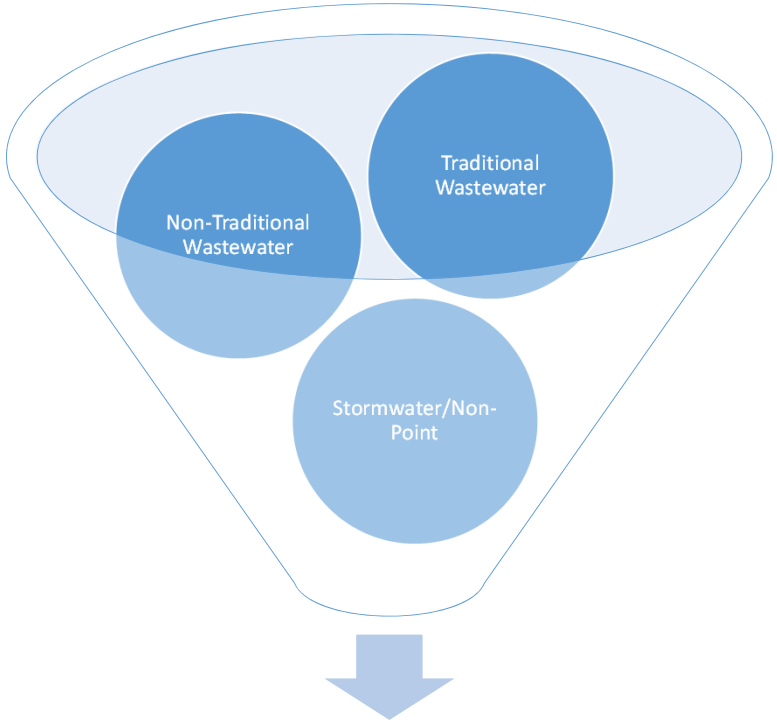


Image Sources: EPA, City of Cambridge MA

The Challenge:



Customized Solutions for Bourne

Review Draft Technology Matrix

Handout

Our Alternatives Analysis Will Be:

Community-Minded

- Transparent
- Offer Opportunities for Learning
- Adaptable

Innovative

- Boost our Blue Economy
- Best Practices
- Resilient to Climate Change
- Restore Habitats

Cost-Effective

- Funded by Grants
- Affordable
- Equitable

…are we missing anything?

Review Draft Evaluation Criteria

Handout

Next Steps:

Spring 2022	• Public Presentation of Alternatives Evaluation Criteria
Summer 2022	• Presentation of Alternatives Analysis • Town wide workshop
Fall 2022	• Draft Recommended Plan
Winter 2023	• Submit Final Recommended Plan

THANK YOU

ENVIRONMENTAL PARTNERS
— An Apex Company —

Draft Alternative Technology Matrix

Category	Expected Nitrogen Removal (%)	Technology by Watershed	Meganset Squeteague	Phinneys	Buttermilk Bay	Pocasset Harbor	Pocasset River	Buzzards Bay	Cape Cod Canal
PRIMARY									
Green Infrastructure	*63%*	*Phytoirrigation*							
	66%	*Hydroponic Treatment*							
	81%	*Constructed Wetlands - Surface Flow*							
	81%	*Constructed Wetlands - Subsurface Flow*							
	90%	*Constructed Wetlands - Groundwater Treatment*							
System Alterations	*12%*	*Inlet / Culvert Widening*							
	18%	*Coastal Habitat Restoration*						*X*	*X*
	25%	*Floating Constructed Wetlands*							
	No Data	*Pond and Estuary Circulators*							
	83%	*Surface Water Remediation Wetlands*							
	No Data	*Chemical Treatment of Ponds*							
	88%	*Pond and Estuary Dredging*							
On-Site Systems	*100%*	*Tight Tanks*	*X*	*X*	*X*	*X*	*X*	*X*	*X*
	0%	*Title 5 Septic System Replacement*						*X*	*X*
	28%	*Innovative/Alternative (I/A) Systems**	*X*	*X*	*X*	*X*	*X*	*X*	*X*
	50%	*Innovative/Alternative (I/A) Enhanced Systems**			*X*	*X*	*X*	*X*	*X*
Decentralized Systems	*43-70%*	*Cluster Treatment System*		*X*	*X*	*X*	*X*	*X*	*X*
	50-80%	*Experimental On-site System Technologies*						*X*	*X*
	No Data	*On-Site Grey Water Treatment*		*X*	*X*	*X*	*X*	*X*	*X*
SECONDARY									
Innovative Resource-Management Technologies	*12%*	*Aquaculture*		*X*	*X*	*X*		*X*	
	70%	*Phytoremediation*	*X*	*X*	*X*	*X*	*X*	*X*	*X*
	70%	*Fertigation Wells - Turf*							
	70%	*Fertigation Wells - Cranberry Bogs*					*X*		*X*
	73%	*Permeable Reactive Barriers (PRBs)*				*X*	*X*		
Waste Reduction Toilets	*24%*	*Toilets: Urine Diverting*							
	24%	*Public Facility: Urine Diverting*					*X*	*X*	*X*
	62%	*Toilets: Composting*						*X*	*X*
	62%	*Toilets: Incinerating*							
	62%	*Toilets: Packaging*							
Non-Structural Technologies	*50%*	*Fertilizer Management*	*X*	*X*	*X*	*X*	*X*	*X*	*X*
	50%	*Stormwater BMPs*	*X*	*X*	*X*	*X*	*X*	*X*	*X*
	63%	*Remediation of Existing Development*	*X*	*X*	*X*	*X*	*X*	*X*	*X*
	100%	*Compact and Open Space Development*			*X*	*X*		*X*	*X*
	100%	*Transfer of Development Rights*							*X*
		Total Alternatives Recommended	**6**	**9**	**11**	**12**	**12**	**16**	**17**

*Responsible Management Entity (RME) Utility Operation Strongly Recommended if IA Systems are adopted as part of Plan

Helen Gordon

From: Mary Jane Mastrangelo <mjm@mrainc.org>
Sent: Wednesday, June 29, 2022 4:21 PM
To: mmccollem@townofbourne.com
Cc: Helen Gordon; Kate Roosa
Subject: [EXT] FW: Some thoughts on your June 22 WAC discussions
Attachments: 339C0596-B114-4DBE-BABC-949005C9A108.jpeg

FYI

From: Robert Dwyer <rdwyerphd@gmail.com>
Sent: Wednesday, June 29, 2022 9:37 AM
To: Kathy Fox Alfano <kfoxalfano@gmail.com>; Mary Jane Mastrangelo <mjm@mrainc.org>; Keith Barber <jkeithbarber@gmail.com>; Elmer Clegg <elmer.clegg@gmail.com>; Lydon, Timothy <Tlydon@townofbourne.com>
Subject: Some thoughts on your June 22 WAC discussions

Dear WAC members and meeting attendees,

I was able to watch the latter part of the Bourne Community TV replay of your WAC June 22 meeting Monday evening.

I thought your discussions were very fruitful, especially your review of different options that might be presented to the voters and to citizens. Like you, I was excited and encouraged to learn about the proposed Mass. regulation to require nitrogen-removing upgrades to existing and new septic systems.
I do have a few bits of information that I'd like to contribute to your ongoing discussions:

TMDLs:
I inferred from the conversations that some committee members thought that the TMDL listings of watersheds in Bourne by DEP were a "done deal". However, the process of identifying and improving impaired waters is actually very dynamic, both for the number of waterbodies/watersheds identified, and for future identification of WQ problems in ones that appear OK at present. . The state must update its list of impaired waters every two years, as specified in section 303(d) of the Clean Water Act. Once a water body is added on the list, the process is long and involved: first there is the notice that a TMDL is needed for each pollutant listed as impairing water quality. Next the TMDL process is executed, including identifying sources of the pollutant, monitoring, modeling and other activities to be included in a management plan that will put the watershed on a pollutant "diet". Following that, there's a long process of executing the management plan, and monitoring the reduction and eventual elimination of the impairment, restoring the body to its unimpaired "fishable-swimmable" designated use.

During term of the new Bourne CWMP, it's likely that other watersheds and water bodies (beyond Phinneys and Squeteague Harbors) will be identified as impaired, put on the 303(d) list and begin the TMDL process. The CWMP needs to include flexibility to deal with these changes.

Scope of coverage of the proposed DEP septic system upgrade regulation:

Please refer to the attached NASA sea surface chlorophyll photo from February 2020. Algal blooms are apparent in Buzzards Bay and around most of the shores of the Cape – suggesting that Nitrogen is coming from most of the shoreline. The only possible exceptions are the Cape Cod Bay beaches along Sandwich and Barnstable, and the beaches of the Outer Cape; most of these areas don't have much in terms of watershed discharge across the beaches in any case.

But Mass. DEP has not listed most of this shoreline as impaired. based on this photo and from a lot of other data, I think that the DEP is narrowly applying criteria to a small list of water bodies as impaired by nitrogen, thus requiring TMDLs. However, I think the new septic upgrade requirement should be applied by DEP and by the town boards of health very widely, not just to the watersheds and bays currently in the TMDL process for nitrogen.

I think the most egregious example of this is DEP's failure to recognize the clearly declining water quality of the main stem of Buzzards Bay, and list it on the impaired waters biennial list. The nitrogen fertilizing this algal growth is comeing from most or all of the bay's shoreline. The long-term consequences of not recognizing and working to correct this impairment from bay-wide over enrichment with nitrogen will be piece-meal application of nutrient reduction requirements. I think this narrow approach will ultimately fail to improve the water quality of the main stem of the bay. This failure may not be recognized for decades, and will require a costly revisiting of the whole process.

I think the state's proposed nitrogen removal regulations for new in existing septic systems should be applied to the whole town of Bourne, with a possible exception of some parts of Sagamore Beach where the surficial groundwater discharges into Cape Cod Bay. Further, these new requirements will have to be imposed in all of the other Cape and Southcoast towns that discharge surface water or groundwater flow into Buzzards Bay.

Focus on improving the septic systems of houses closer to the bay?

I respectfully disagree with Elmer Clegg's perspective that the focus septic improvements should be on houses that are closer to the bay than on houses and septic systems that are further inland. All of the water in the unconfined groundwater aquifer flows downhill towards Buzzards Bay, the Canal, Cape Cod Bay, etc. With regard to the nitrogen in septic system groundwater discharges, it will all eventually reach one of the marine water bodies. It's only a matter of time; these downgradient water flows are at the rate of 2 to 4 feet a day. A septic system discharging far inland, will take longer, but its nitrogen load will eventually reach Buzzards Bay. The nitrogen already in the ground water from inland septic systems (even after they have been improved) could still be discharging into the bay for decades.

Phosphorus, the pollutant that controls algal growth in freshwater bodies, is a bit different. Phosphorus actually adsorbs to soil particles, so it is attenuated as groundwater flow leaches towards freshwater ponds. Thus, a septic system located far from a freshwater body will contribute less phosphorus than one close to the perimeter of a pond. (For instance, I'm a bit skeptical about the effectiveness of the pilot tests of the NitROW removal system at a number of houses around freshwater Shubael pond in Marstons Mills.) I think Tim Lydon alluded to this N vs P difference a bit, but I couldn't hear all of his discussion.

My conclusion and recommendation:

1) I suggest that the CWMP be written with enough flexibility to expect, and respond to, future listings of additional watersheds as impaired on future iterations of DEP's 303(d) list, including the main stem of Buzzards Bay.

2) When DEP issues the draft regulation for public comment, I suggest that the WAC file Comments that recommend that the proposed septic system upgrades be widely and rapidly imposed, and that the regulation

also include a mechanism for financial assistance for homeowners to make these expensive upgrades, as well as funds for the towns to carry out in the many activities that they will need to undertake to implement these complicated regulations.

Note: I only emailed this to participants in the room on June 22 for whom I could quickly dig up email addresses. Feel free to forward to anybody else. I'm of course available to discuss any of these comments. I had hoped to be in the audience for more of your meetings, but I've had family issues to deal with.

Thanks to all members of the WAC for your continued hard work.

Bob Dwyer
917-403-5477

Board of Sewer Commissioners Meeting Agenda

Date	Time	Location
August 9, 2022	6:30 PM	Bourne Community Center 239 Main St., Buzzards Bay

Note this meeting is being televised, streamed or recorded by Bourne TV. All items within the meeting agenda are subject to deliberation and vote(s) by the Board of Sewer Commissioners.

6:30 P.M. Call Public Session to Order in Open Session

1. Moment of Silence to recognize our Troops and our public safety personnel
2. Salute to the Flag
3. Vision: Bourne is a proud community that embraces change while respecting the rich heritage of the town and its villages. It is a municipality based on strong fiscal government with a durable economy that recognizes the rights of all citizens, respects the environment, especially the coastal areas of the community and the amenities that it affords. Bourne embraces excellent education, and offers to citizens a healthy, active lifestyle.
4. Mission: Bourne will maximize opportunities for social and economic development while retaining an attractive, sustainable and secure coastline and environment for the enjoyment of residents and visitors. Through responsible and professional leadership and in partnership with others, Bourne will strive to improve the quality of life for all residents living and working in the larger community.
5. Public Comment on Non-Agenda Items: Public comments are allowed for up to a total of 12 minutes at the beginning of each meeting. Each speaker is limited to 3 minutes for comment. Based on past practice, members of the Board are not allowed to comment or respond.
6. Board of Sewer Commissioners Business
    a. Discuss and vote on FY23 sewer user rates
    b. CWMP – Public Meeting for Phase II – Alternatives Analysis
7. Adjourn

Town of Bourne
Comprehensive Wastewater Management Plan

Alternatives Analysis Public Presentation

ENVIRONMENTAL PARTNERS
— An Apex Company —

Agenda

- Review Workshop Goals
- Provide Technology Overview
- Review Evaluation Process and Results
- Present Alternatives by Watershed
- Review Next Steps & Schedule
- Discussion

Workshop Goals

- Provide Technology Overview
- Review Evaluation Criteria
- Discuss Recommended Technologies by Watershed

Refresher: What is a Comprehensive Wastewater Management Plan?

- Town-wide water quality assessment and solutions
- Aligns with 2019 Local Comprehensive Plan Goals for growth and development
- 20-year planning to meet water quality goals

What is the goal of our alternatives analysis?

- Remove nitrogen based on the goals set in our Needs Assessment
  - TMDLs
  - 25% Reduction across Nitrogen Impaired Watersheds
- Objectives
  - 208 Plan Compliant solutions
  - Alignment with Town Goals
- Process
  - Started with Cape Cod Commission Technology Matrix
  - Drafted evaluation criteria
  - Process of Elimination through Wastewater Advisory Committee

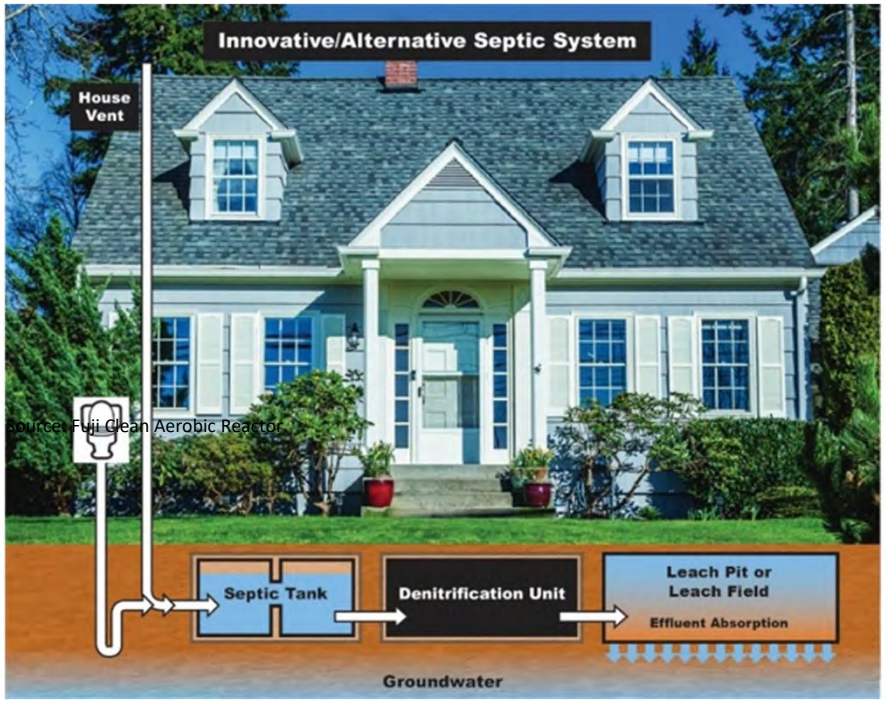
Watersheds	Total Nitrogen Load Values, kg-N/year		Bourne Total Removal (kg-N/yr.)
	Wastewater	Total	
Megansett-Squeteague Harbor	7,611	11,658	564
Phinneys Harbor	5,948	8,730	1,706
Buttermilk Bay	4,058	5,610	1,402
Pocasset Harbor	7,958	12,479	3,120
Pocasset River	3,762	5,157	1,289
Buzzards Bay	16,830		TBD
Cape Cod Canal	164,028		TBD
		Total	8,072

Alternatives Approach

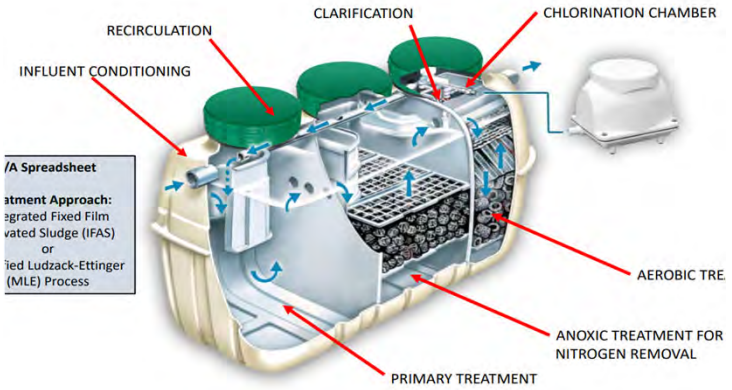
- Identifies management strategies for achieving the TMDL goal for each watershed
- Focuses on on-site and limited sewering approaches
- Does not consider a Buzzards Bay outfall
- Concept strategies to demonstrate that the TMDL goals can be achieved
  - Broad scale and conceptual at this point
  - Specific approaches to be developed in next CWMP phase
  - Will recognize existing I/A systems as part of the solution
- More detailed alternatives will develop costs (construction and O&M) and cost allocation strategies
- EP and the Town are aware and involved in the Title 5 regulation change process with MassDEP

Technology Toolbox

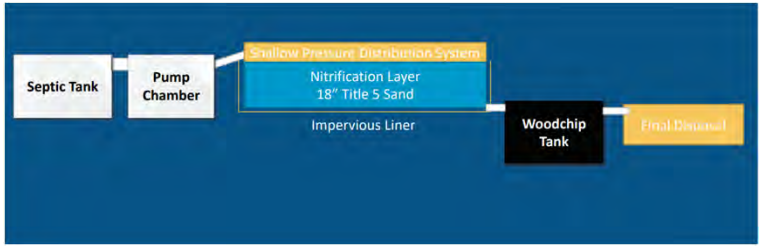
Innovative/Alternative Onsite Systems



Source: EPA



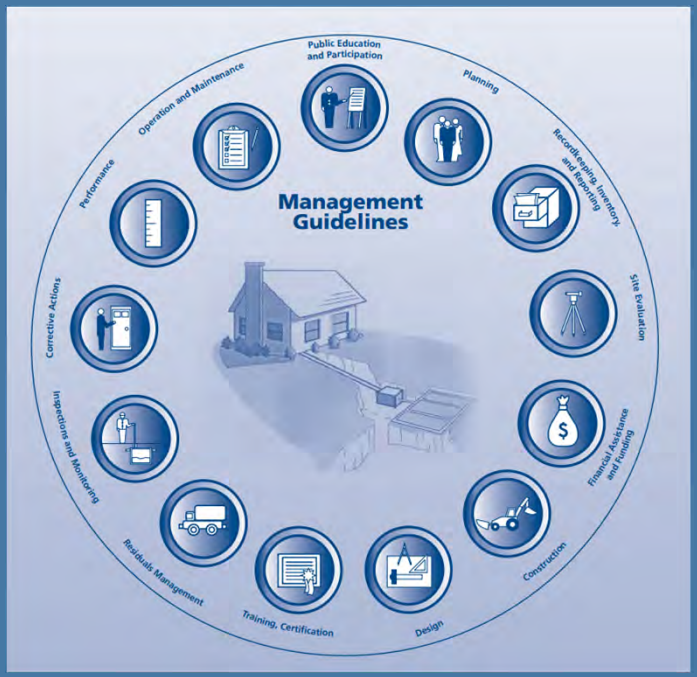
Source: Fuji Clean



Source: "Layer Cake" passive system

Responsible Management Entities (RMEs):

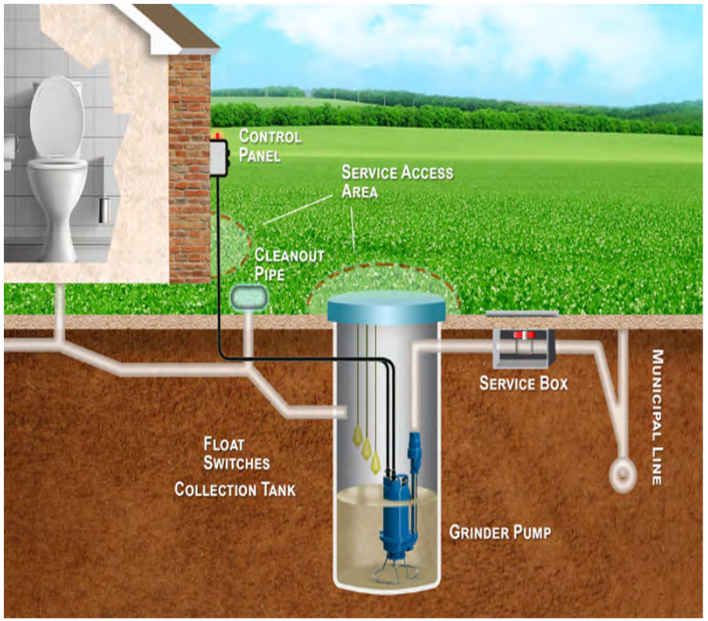
- Requires a regulatory agent/avenue for oversight
- Provides monitoring and oversight for each individual system
- MassDEP requires use of RMEs



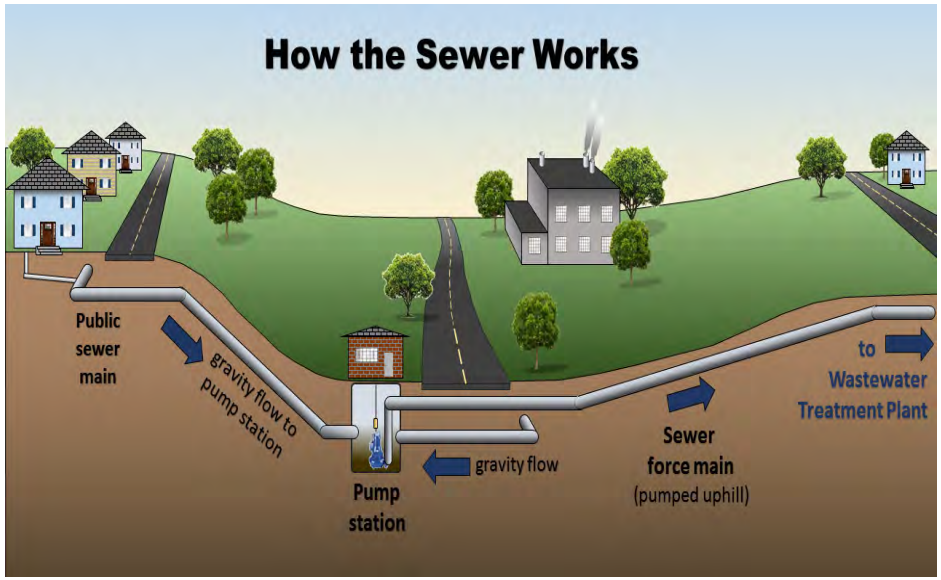
Stormwater Best Management Practices (BMPs)

Bioretention Areas & Rain Gardens

Collection Systems



Source: Empowering Pumps & Equipment



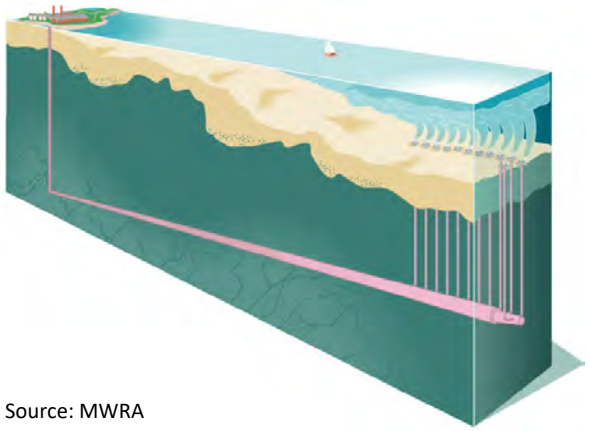
Source: City of Caldwell

Wastewater Treatment

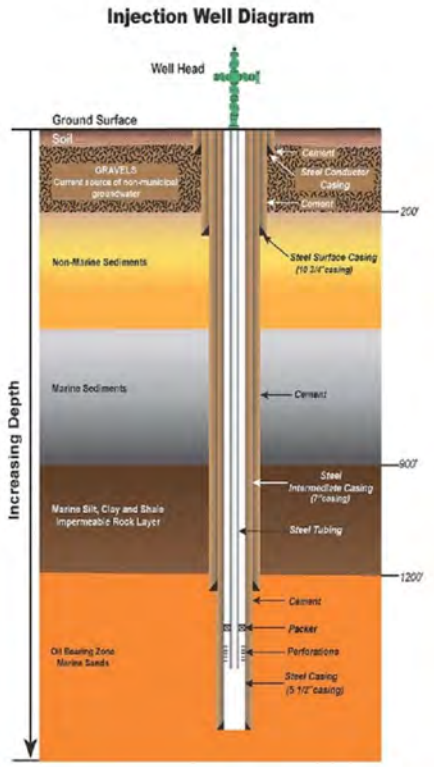
Source: Daniel Ackerman, CAI

Source: Carlin Contracting, Inc.

Effluent Disposal



Source: MWRA



Source: CA Department of Conservation

Alternatives by Watershed

Reminder

- Identifies management strategies for achieving the TMDL goal for each watershed
- Focuses on on-site and limited sewering approaches
- Does not consider a Buzzards Bay outfall
- Concept strategies to demonstrate that the TMDL goals can be achieved
  - Broad scale and conceptual at this point
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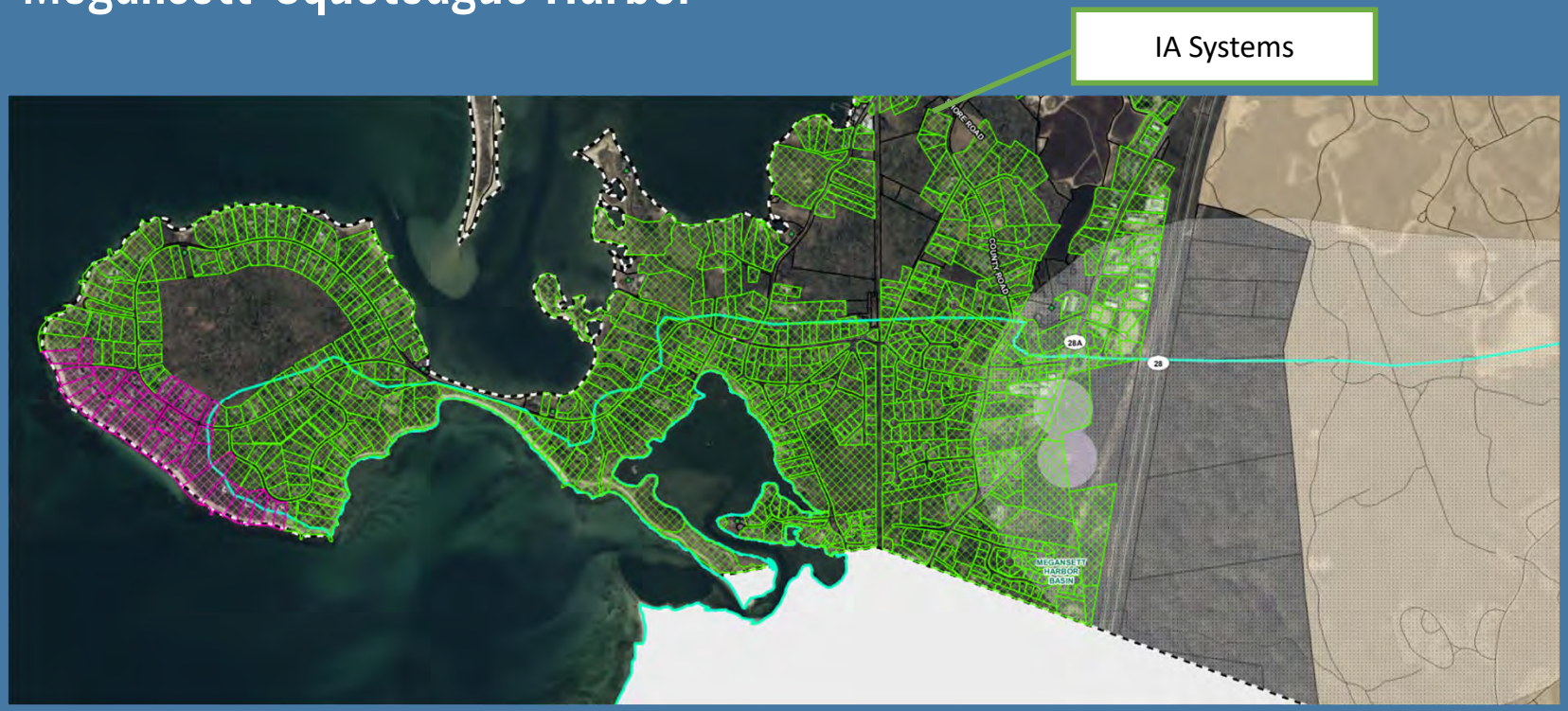
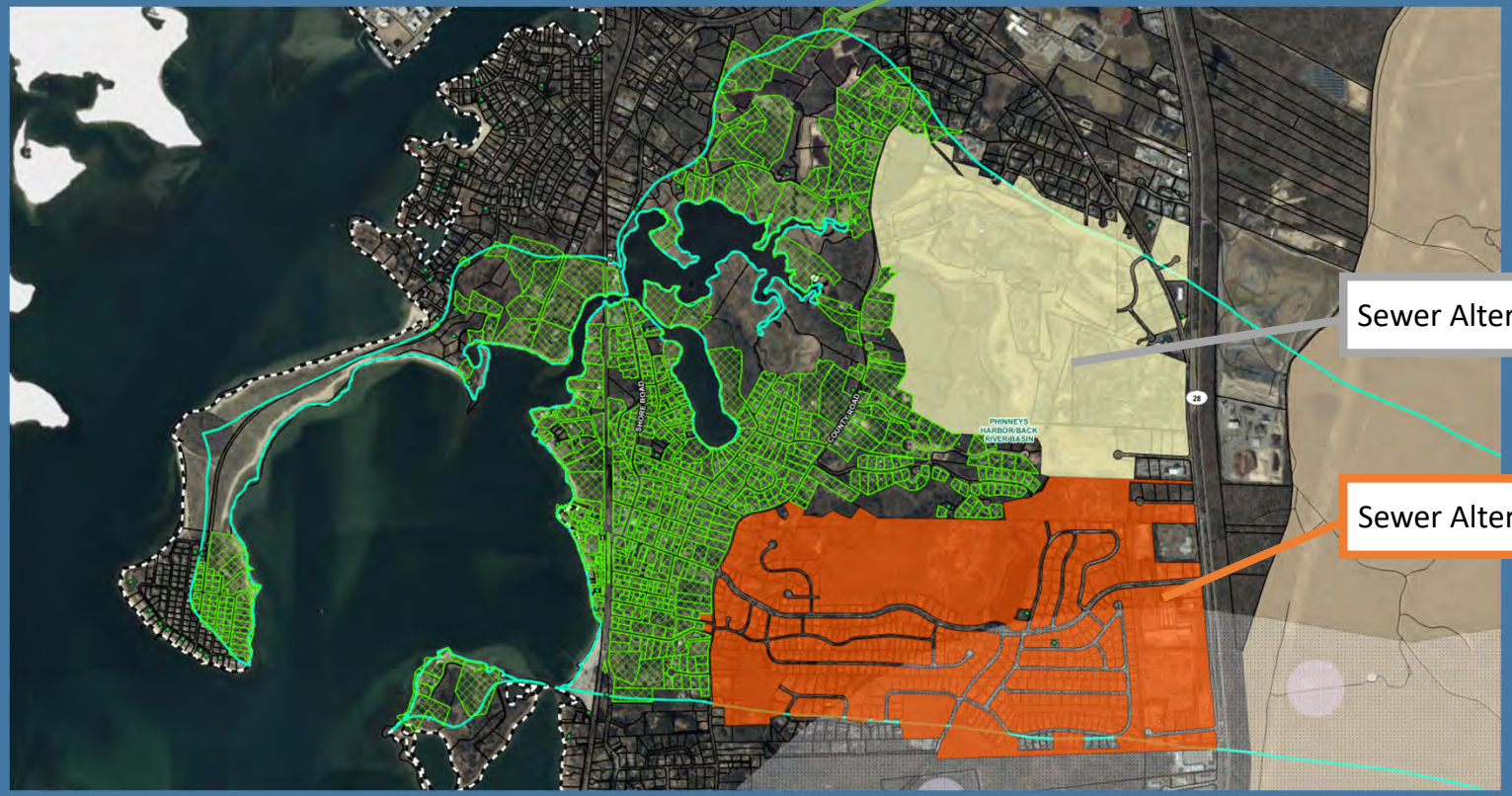
Megansett-Squeteague Harbor



Megansett-Squeteague Harbor

Alternative	Number of Parcels	Nitrogen Reduction Predicted (kg N/y)
I/A General Use System	483	545
Stormwater BMP	-	219
Total Estimated Removal		**764**
TMDL Removal Requirement		*600*
Removal Goal Met?		*Yes*

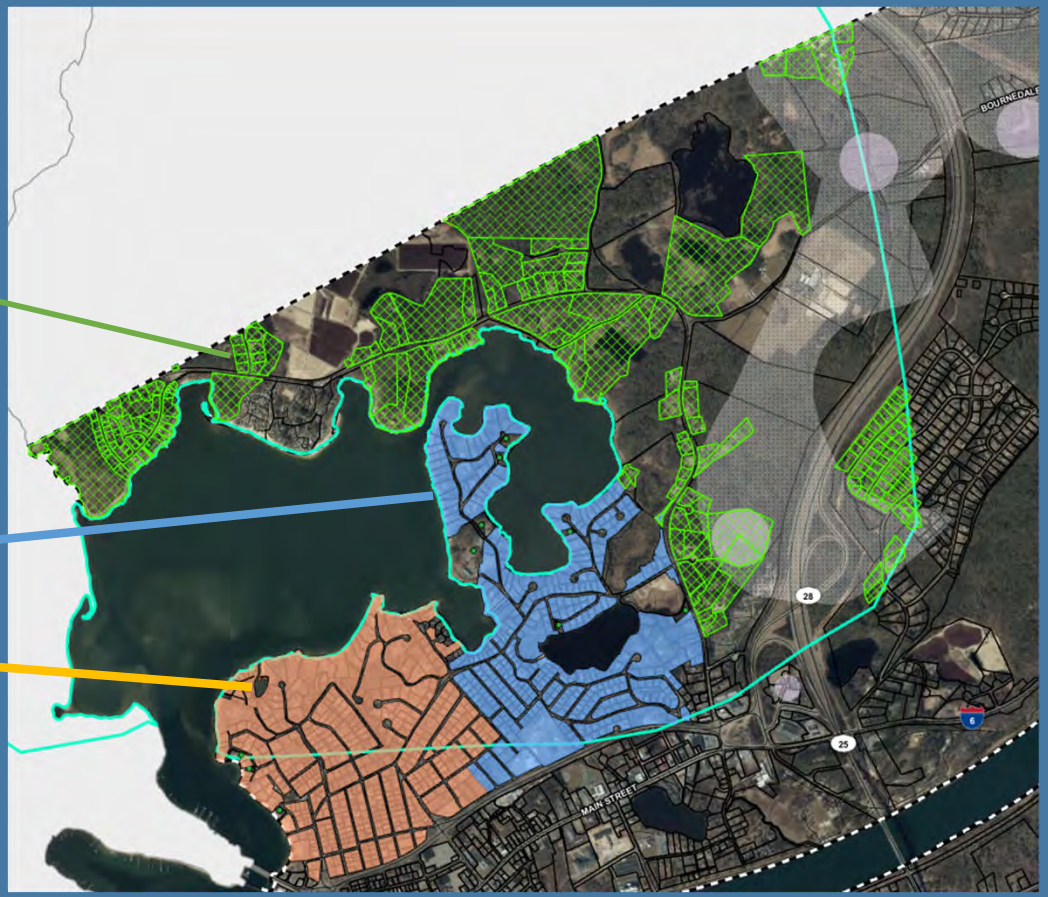
Phinney's Harbor



Phinney's Harbor

Alternative	Number of Parcels	Estimated Nitrogen Reduction (kg N/y)
I/A General Use System	646	729
Sewer Alternative 2A	18	60
Sewer Alternative 2B	481	1,598
Stormwater BMP	-	383
	Total	**2,770**
	TMDL Removal Goal	*1,706*
	Removal Goal Met?	*Yes*

Buttermilk Bay



Buttermilk Bay

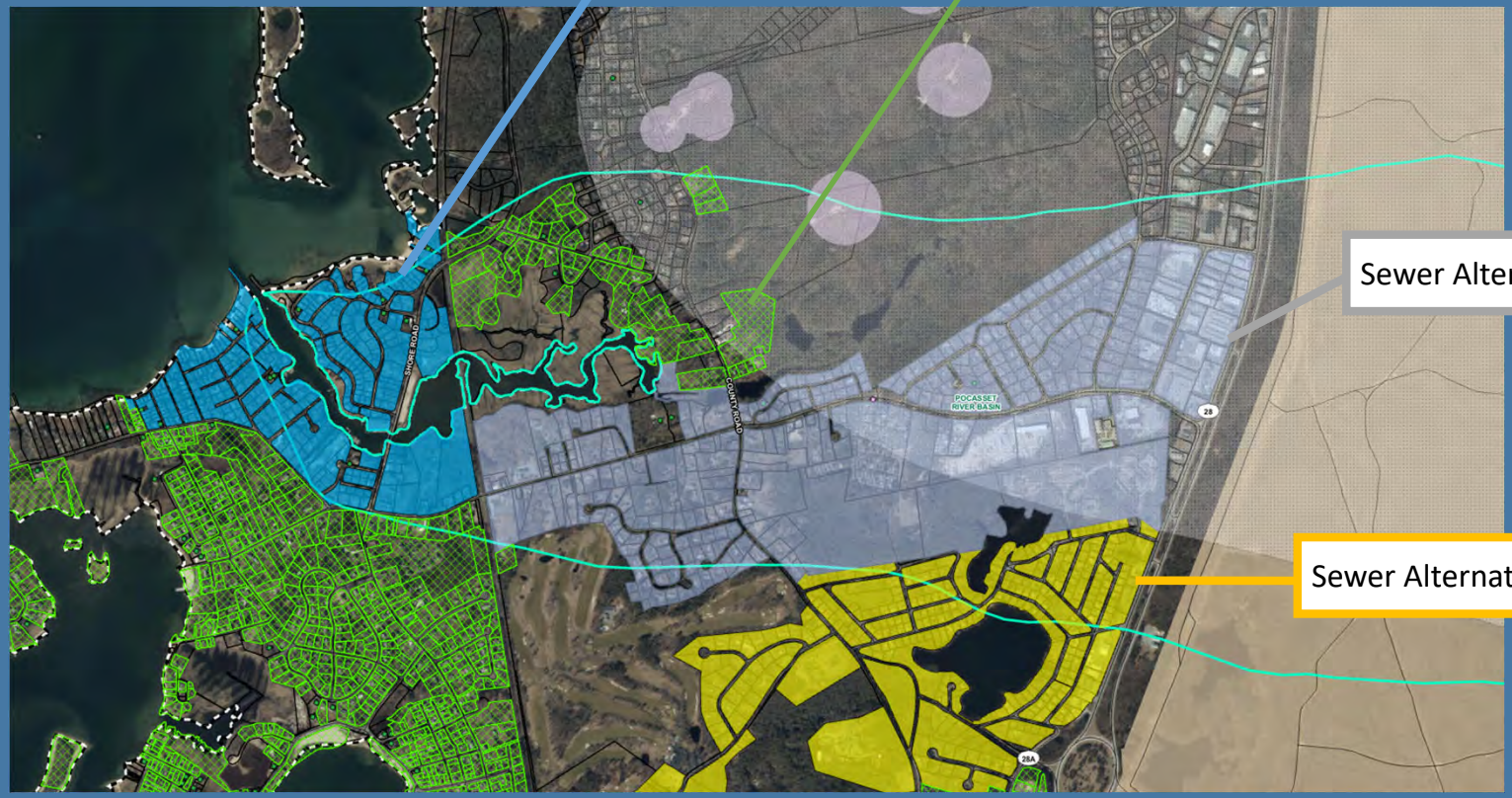
Alternative	Number of Parcels	Estimated Nitrogen Reduction (kg-N/y)
I/A General Use System	266	266
Sewer Alternative 1A	349	1,029
Sewer Alternative 1B	187	551
Stormwater BMP	-	177
	Total	**2,023**
	Nitrogen Removal Goal	*1,402*
	Removal Goal Met?	*Yes*

Pocasset Harbor

Pocasset Harbor

Alternative	Number of Parcels	Estimated Nitrogen Reduction (kg-N/y)
I/A General Use System	1,107	1,249
Sewer Alternative 3A	12	40
Sewer Alternative 3B	70	232
Sewer Alternative 4A	359	1,192
Stormwater BMP	-	470
Total		**3,183**
Nitrogen Removal Goal		*3,129*
Removal Goal Met?		*Yes*

Pocasset River



Pocasset River

Alternative	Number of Parcels	Estimated Nitrogen Reduction (kg-N/y)
I/A General Use System	45	51
Sewer Alternative 3A	260	864
Sewer Alternative 3B	197	654
Sewer Alternative 4A	108	359
Stormwater BMP	-	215
	Total	**2,143**
	Nitrogen Removal Goal	*1,289*
	Removal Goal Met?	*Yes*

Next Steps

Project Schedule and Phase IV

Next Steps: Project Team

Summer 2022

- Public Presentation of Alternatives Evaluation
- Incorporate Public Feedback into Analysis

Fall 2022/ Winter 2023

- Quarterly Update to Sewer Commission
- Meet with Wastewater Advisory Committee
- Public Presentation of Draft Recommended Plan
- Incorporate Public Feedback into Plan

Spring/Fall 2023

- Quarterly Updates to Sewer Commission
- Finalization of Recommended Plan
- Town Meeting Action

Next Steps: Residents & Stakeholders

- Email questions and feedback
  - Bourne.CWMP@envpartners.com
    - Don't forget the dot!
- Visit the following Town Webpages
  - CWMP Page
    - https://www.townofbourne.com/comprehensive-wastewater-management-plan-cwmp
  - Wastewater Advisory Committee
    - https://www.townofbourne.com/wastewater-advisory-committee

THANK YOU

Questions or feedback?
Email the project team:
Bourne.CWMP@envpartners.com

ENVIRONMENTAL PARTNERS
— An Apex Company —

ENVIRONMENTAL PARTNERS

— An Apex Company —

1900 Crown Colony Drive, Suite 402

Quincy, MA 02169

P: 617.657.0200 F: 617.657.0201

envpartners.com