

**MINUTES  
JOINT WORKSHOP  
BOARD OF SELECTMEN  
HARWICH COMMUNITY CENTER  
100 OAK ST., HARWICH, MA  
MULTI-PURPOSE ROOM  
Thursday, April 7, 2016  
6:00 p.m.**

**APPROVED**

**SELECTMEN PRESENT:** Cebula, Hughes, LaMantia, MacAskill

**OTHERS PRESENT:** Town Administrator Christopher Clark and others as noted on attached list.

A joint workshop was held on wastewater issues with the Board of Selectmen, Wastewater Implementation Committee, Finance Committee, Capital Outlay Committee, Board of Health, Planning Board, Conservation Commission, Water Commissioners, Chamber of Commerce and Monomoy School Committee with speakers and topics as follows:

**INTRODUCTION** – PETER HUGHES, Chairman of the Harwich Board of Selectmen

**WELCOME - MODERATOR BRIAN DUDLEY**, Massachusetts Department of Environmental Protection

**SPEAKERS -**

1. BRIAN DUDLEY, MASS DEP: Enforcement, Alternatives, Regulatory Treatment
2. PATTI DALEY, Cape Cod Commission: 208, Local Responsibility, TMDL, Submittal Requirement
3. DAVID YOUNG, CDM Smith, Harwich Wastewater Consultant: CWMP Status and Upcoming Events
4. CHRISTOPHER CLARK, Harwich Town Administrator: Harwich Finance, Debt Exclusion, Debt Service

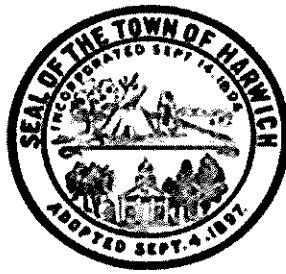
Break out sessions followed (see attached questions). There was no action by the Board of Selectmen and no votes were taken.

The meeting adjourned at 8:05 p.m.

Respectfully submitted,

Ann Steidel  
Recording Secretary

| <b>Name</b>         | <b>Representing</b>                                 |
|---------------------|---|
| Ameres, Mark        | Finance Committee                                   |
| Atkinson, James     | Planning Board (PB)                                 |
| Ballantine, Larry   | Finance Committee                                   |
| Bayerl, Cynthia     | Board of Health                                     |
| Carpenter, Scott    | Monomoy Regional School District                    |
| Cebula, Linda       | Board of Selectmen                                  |
| Crabtree, Ernest    | Conservation Commission                             |
| de Bakker, Peter    | Water Implementation Committee (WIC), PB            |
| DeCosta, Dana       | Finance Committee, COC                              |
| Donahue, Noreen     | Water Implementation Committee, Finance Committee   |
| Gingras, Jeremy     | Water Implementation Committee, Chamber of Commerce |
| Harlow, Christopher | Water Implementation Committee, COC                 |
| Hooper, Linclon     | Highway and Maintenance Director                    |
| Hughes, Peter       | Board of Selectmen                                  |
| LaMantia, Angelo    | Board of Selectmen                                  |
| Larios, Richard     | Finance Committee, COC                              |
| MacAskill, Michael  | Board of Selectmen, WIC                             |
| McManus, Ed         | Finance Committee                                   |
| McParland, Joe      | COC   |
| O'Leary, Carolyn    | Conservation Commission                             |
| Pfeger, Sharon      | Water Implementation Committee                      |
| Rep. Sarah Peake    | State Representative                                |
| Russell, Terry      | Monomoy Regional School District                    |
| Sarantis, Robert    | Conservation Commission                             |
| Stello, Tom         | Planning Board (PB)                                 |
| Thompson, Allin     | Water Implementation Committee, Water Commission    |
| Wall, Peter         | COC   |
| <b>STAFF</b>        |   |
| Charleen Greenhalgh | Assistant Town Administrator                        |
| David Spitz         | Town Planner  |
| Chris Clark         | Town Administrator                                  |
| Robert Caffarelli   | Town Engineer                                       |
| Uowski, Amy         | Conservation Agent                                  |
| Tierney, Meggan     | Health Agent  |
| Dave Young          | Consulting Engineer                                 |



The Harwich Board of Selectmen, Wastewater Implementation Committee, Finance Committee, Capital Outlay Committee, Board of Health, Planning Board, Conservation Commission, Water Commissioners, Chamber of Commerce and Monomoy School Committee will hold a joint workshop for Town Board and Committee Members on Thursday, April 7, 2016 from 6:00 pm to 8:00 pm in the Multi-purpose Room at the Harwich Community Center, 100 Oak Street, Harwich, MA 02645

**I. WORKSHOP CALL TO ORDER: 6:00 PM**

**II. INTRODUCTION**

PETER HUGHES, Chairman of the Harwich Board of Selectmen

**III. WELCOME**

MODERATOR BRIAN DUDLEY, Massachusetts Department of Environmental Protection

**IV. SPEAKERS**

1. BRIAN DUDLEY, MASS DEP: Enforcement, Alternatives, Regulatory Treatment
2. PATTY DALEY, Cape Cod Commission: 208, Local Responsibility, TMDL, Submittal Requirement
3. DAVID YOUNG, CDM Smith, Harwich Wastewater Consultant: CWMP Status and Upcoming Events
4. CHRISTOPHER CLARK, Harwich Town Administrator: Harwich Finance, Debt Exclusion, Debt Service

**V. BREAK OUT SESSIONS**

**VI. MODERATOR WRAP-UP**

**VII. ADJOURNMENT**

## Addressing Nitrogen Management

Prepared for  
The Harwich Wastewater Forum  
by  
Brian Dudley  
MassDEP  
April 7, 2016



### Why Are We Here?

- Nitrogen pollution has become a major issue
- Solutions are complex, not simple
- Equal level of understanding

- Impacts to drinking water
  - “Blue baby” syndrome
- Impacts to coastal surface waters
  - Algal blooms
  - Fish kills

## Sources of Nitrogen

- Wastewater (septic systems, treatment plants) – Controllable
- Fertilizer – Controllable
- Stormwater – Controllable
- Sediments (benthic flux) – Semi-controllable
- Atmospheric deposition – Non-controllable

## Options for Solutions

- Traditional
  - Target wastewater (largest contributor)
  - Title 5 and Title 5 I/A systems
  - Cluster systems (Title 5 or small treatment plant)
  - Municipal treatment

## Options for Solutions

- Non-traditional
  - Natural attenuation
  - Inlet openings
  - Shellfish
  - Permeable reactive barriers (PRBs)
  - Floating constructed wetlands

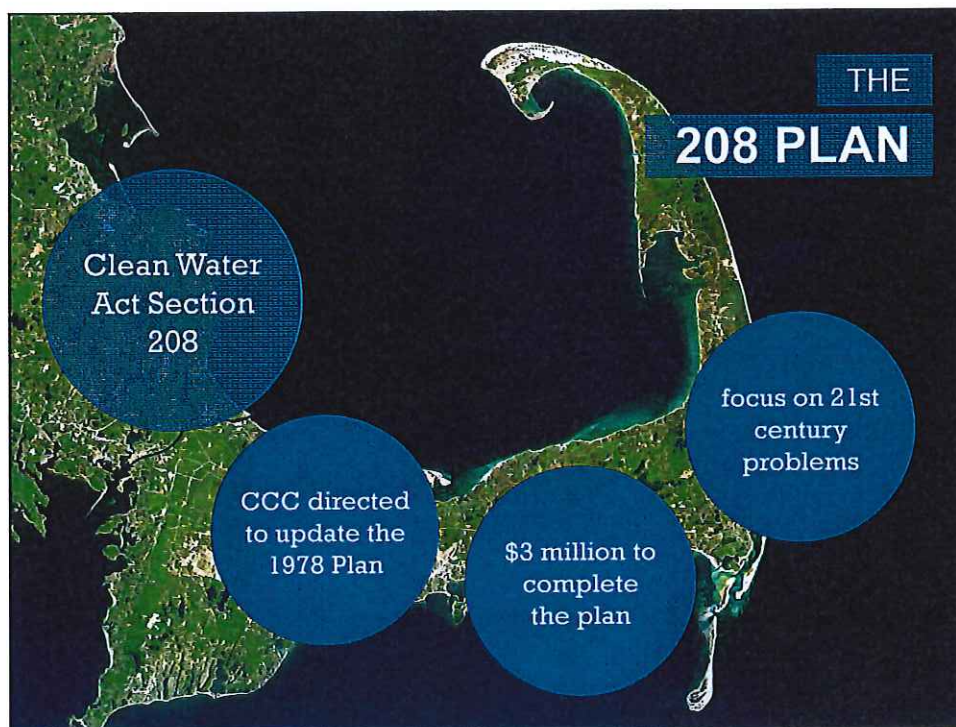
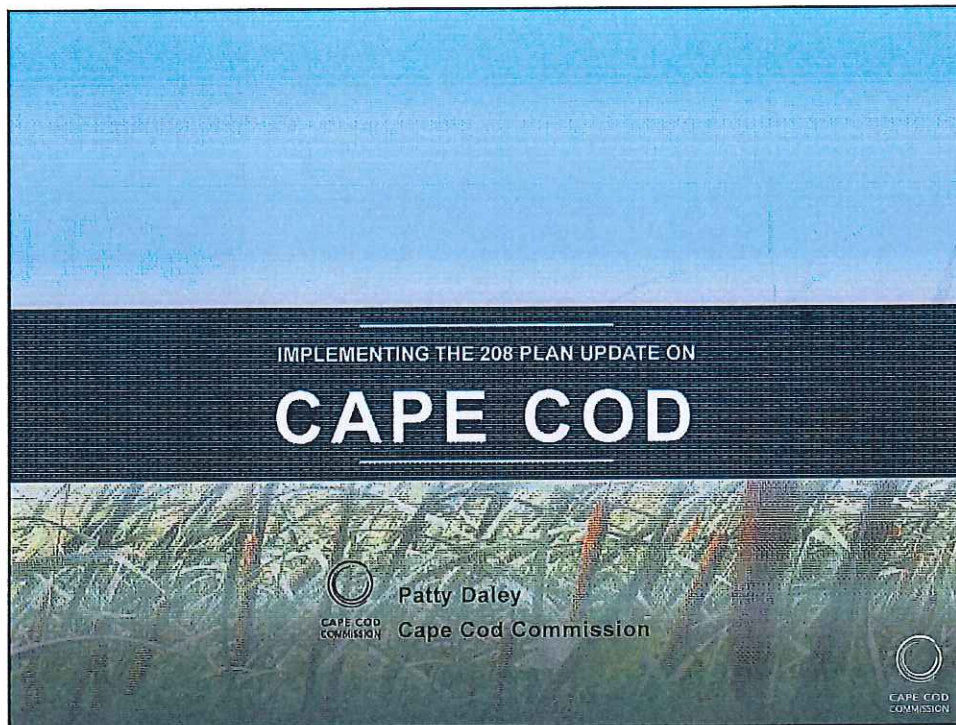


## Implementation

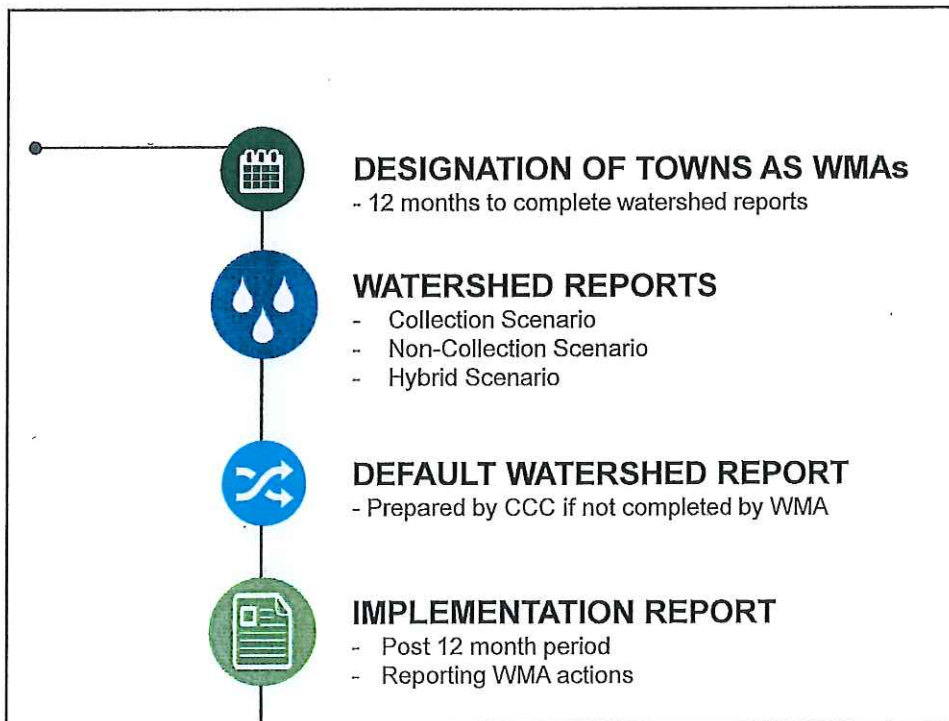
- Harwich has developed a draft CWMP
  - Looks at a variety of options
  - Specific to Harwich's needs
  - Proposes partnership with Chatham
    - Helps achieve economies of scale
- Approved CWMP necessary for 0% interest loan

## Regulatory

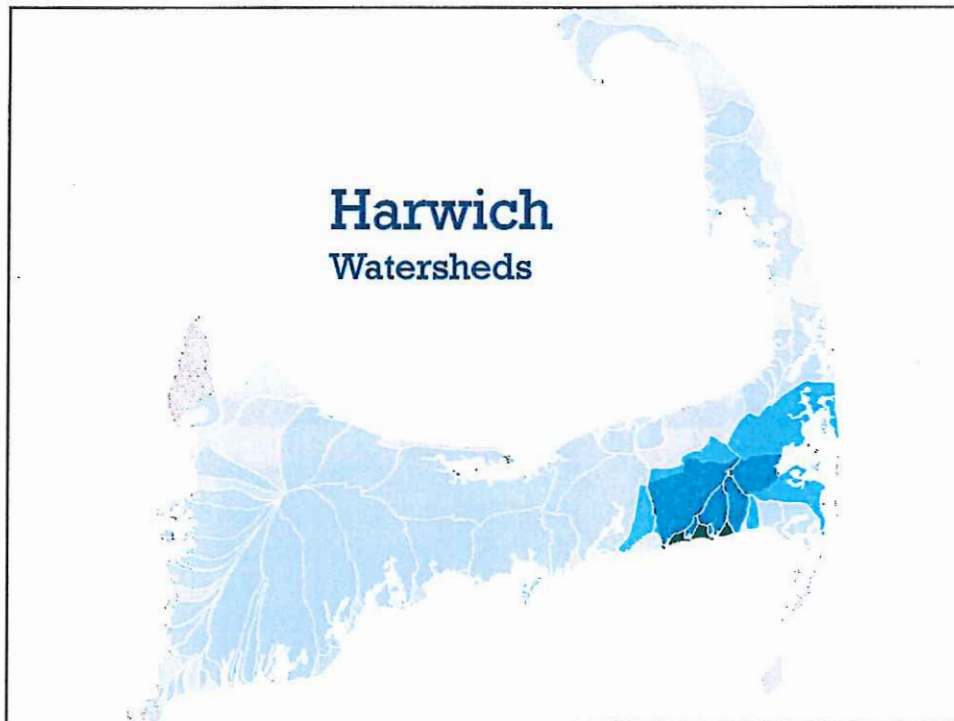
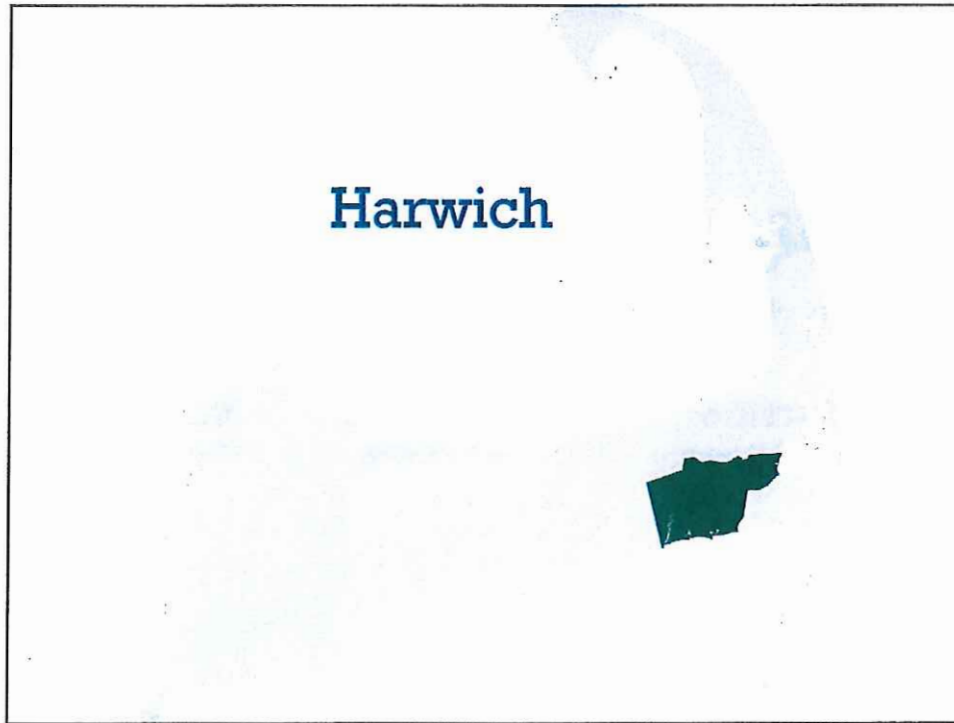
- Goal is to work towards voluntary compliance
  - MassDEP is developing a watershed permit
  - Voluntary, but with incentives
- MassDEP does have statutory authority to require compliance
  - Designate Nitrogen Sensitive Areas
  - Create Water Pollution Abatement Districts
  - Eliminate Title 5 exemption from GWDP regulations
- We all live with threat of third party lawsuits

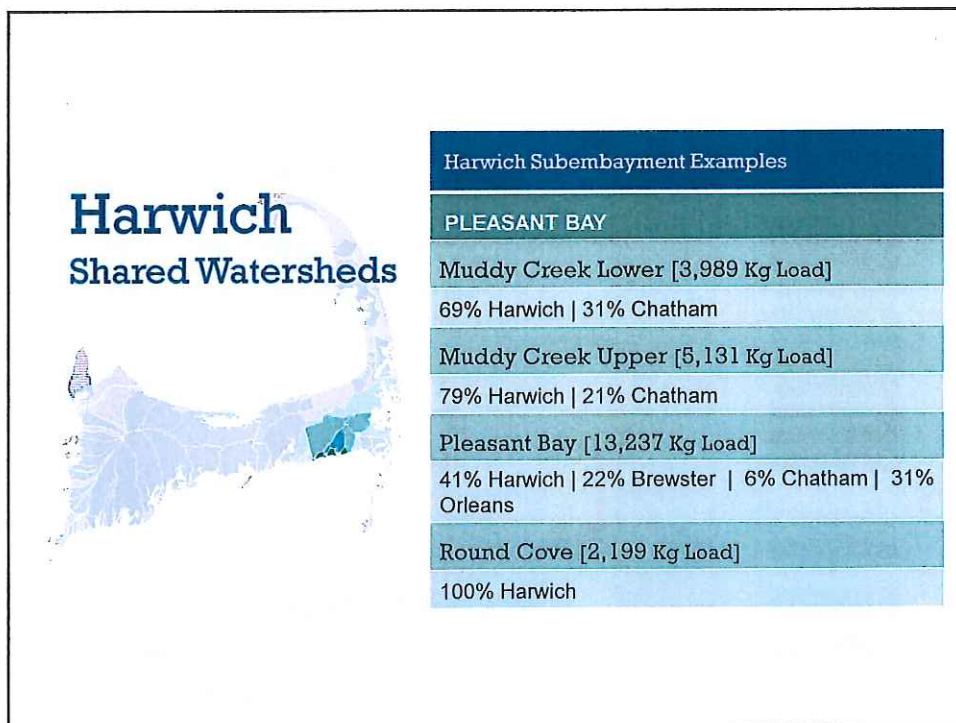
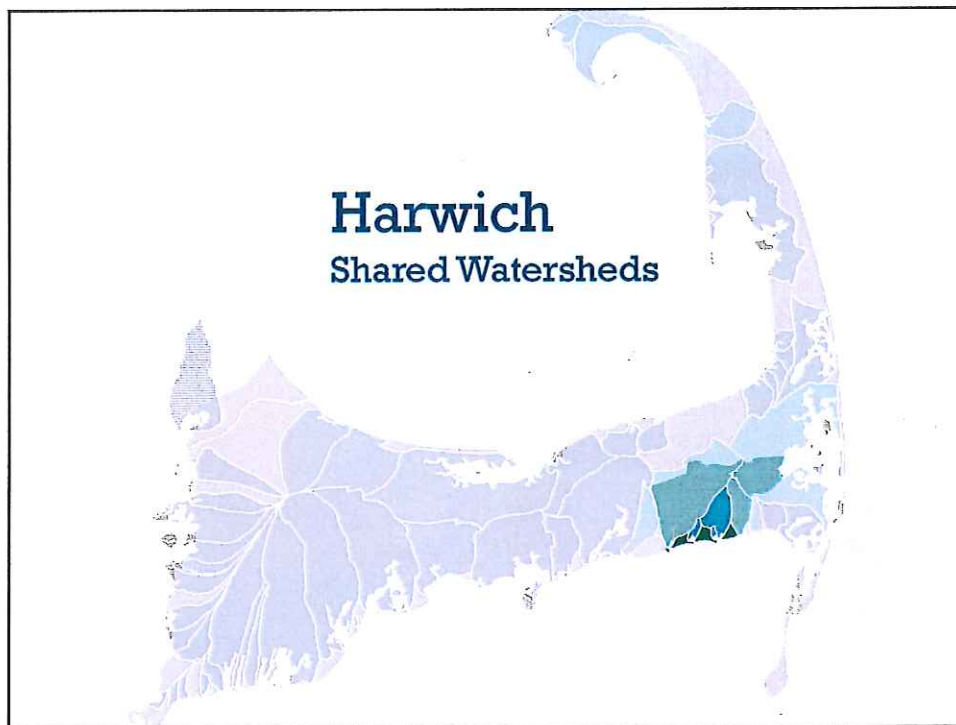














# Regulatory Streamlining

strategies to successfully implement established water quality goals

## TARGETED



Targeted watershed plans reduce upfront planning time, lower cost & focus attention where most needed

N+P+K  
MGMT

Reductions in fertilizer use and stormwater runoff supported by performance monitoring, should lower nitrogen reduction targets

BMPs

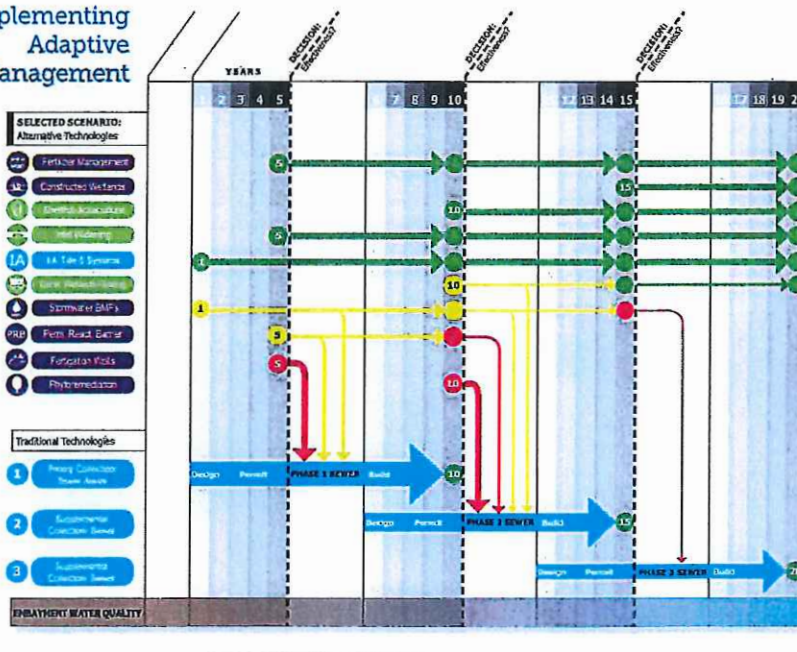
REDUCTION CREDITS

## WATERSHED PERMIT



We'll allocate nitrogen loads on a watershed basis. The watershed permit lists technology options identified for implementation by stakeholders to each permittee's specified annual discharge limit.

## Implementing Adaptive Management





# Stakeholder Process

strategies for establishing consensus in a regional planning process

## OBJECTIVE

Facilitation to build collaboration & agreement



## ON SCHEDULE



Oversight kept the process on time & on track

Built consensus to identify solutions at the watershed level

## AGREEMENT



## AFFORDABLE

Financial impact on homeowners considered in every watershed solution

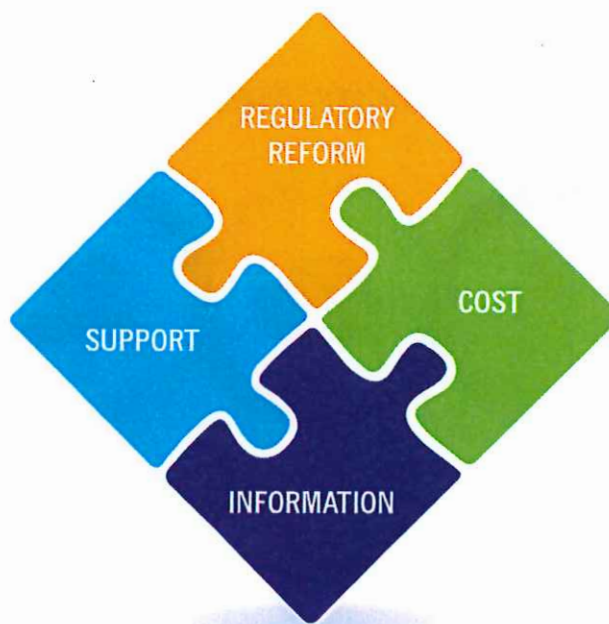


Ensure regulatory flexibility in planning & permitting

## FLEXIBLE

## ENGAGING

Involve the broader community through web-based engagement initiatives



## Simplifying the Process



OFFERING  
TECHNICAL  
ASSISTANCE

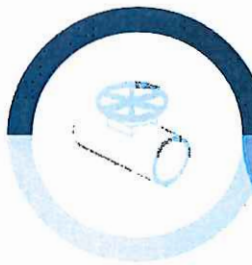


INCREASING  
REGULATORY  
FLEXIBILITY

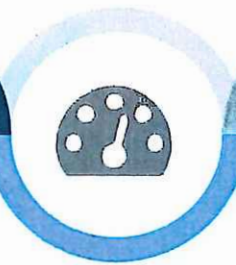


PROVIDING  
ACCESS TO  
FINANCIAL  
RESOURCES

## Cost Saving Measures



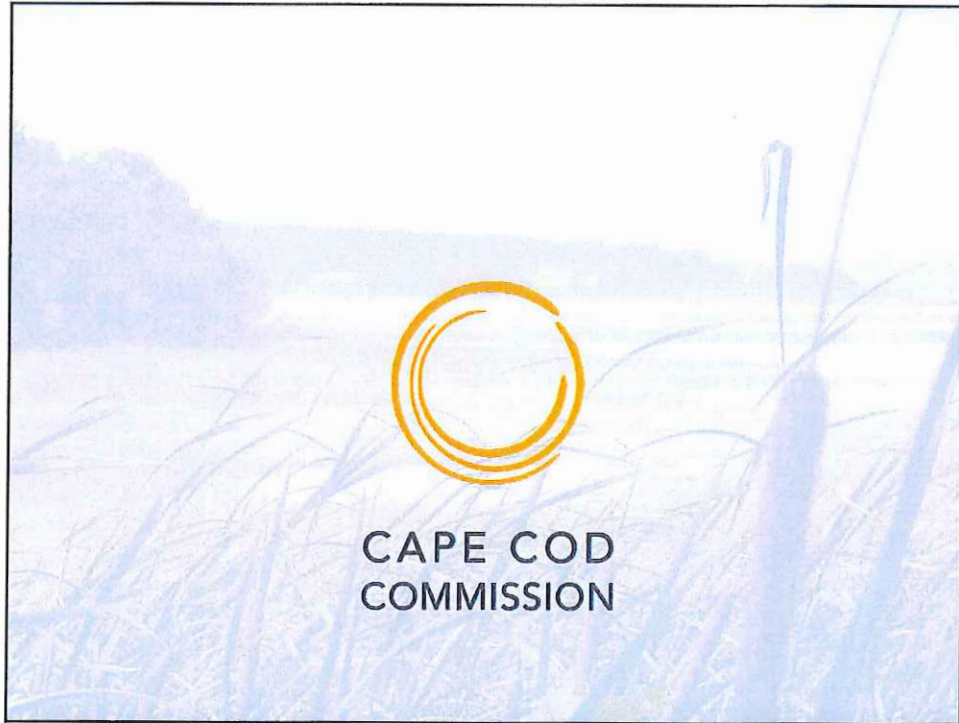
Considering collection  
and treatment in  
areas where it's most  
appropriate

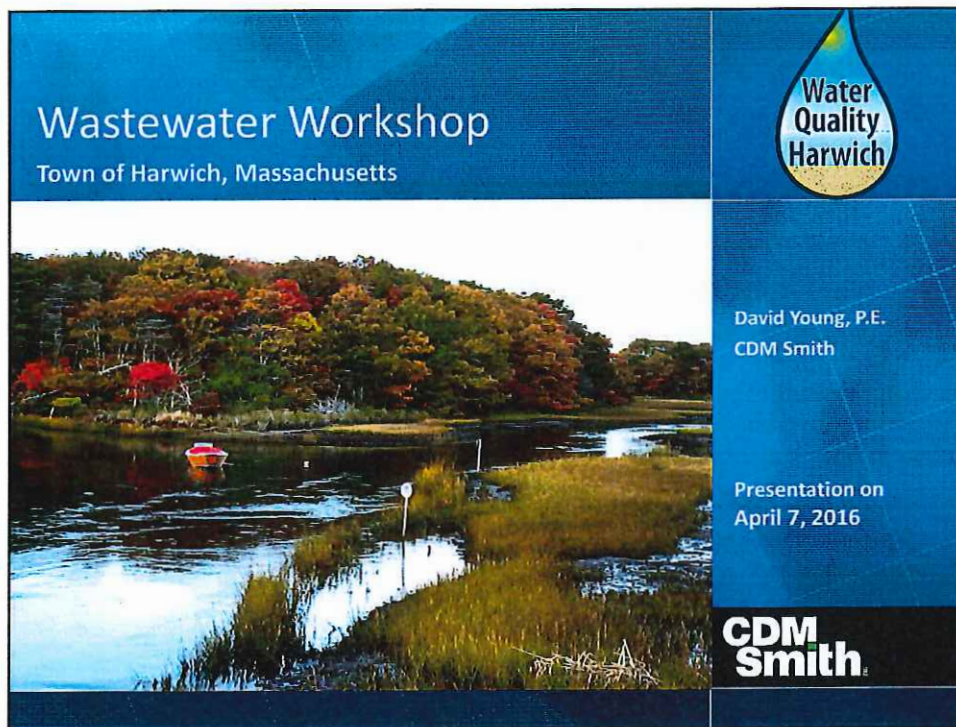


Broadening the use of  
remediation and  
restoration  
technologies




Cost sharing results in  
a lower cost for  
residents and  
affordable scenarios







**Wastewater Workshop**  
Town of Harwich, Massachusetts



David Young, P.E.  
CDM Smith

Presentation on  
April 7, 2016




**Wastewater Implementation Committee (WIC)**



- WIC Members:
  - Peter de Bakker, Chair
  - Chris Harlow, Vice Chair
  - Allin Thompson, Clerk
  - Jeremy Gingras
  - Heinz Proft
  - Bob Cafarelli
- Liaisons: Michael MacAskill, Chris Clark, Noreen Donahue
- Consultant: CDM Smith (David Young)










## Presentation

- What is the issue?
- What are the solutions?
- What is the Harwich recommended program?
- Questions and comments.



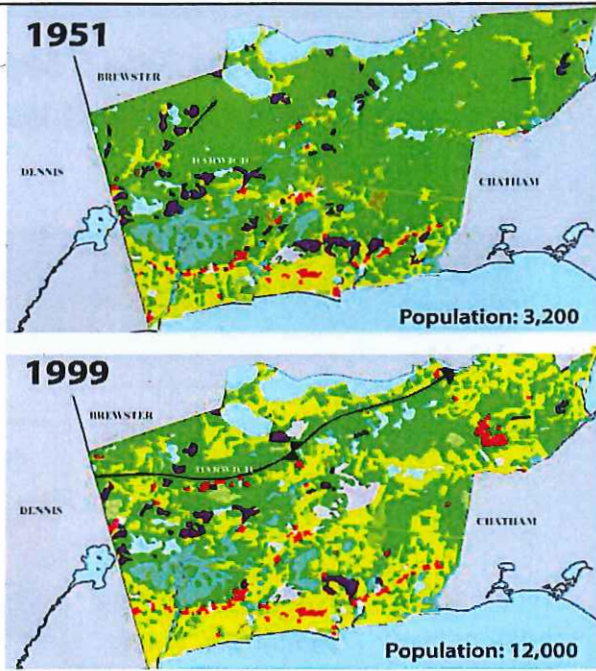
## What is the issue?



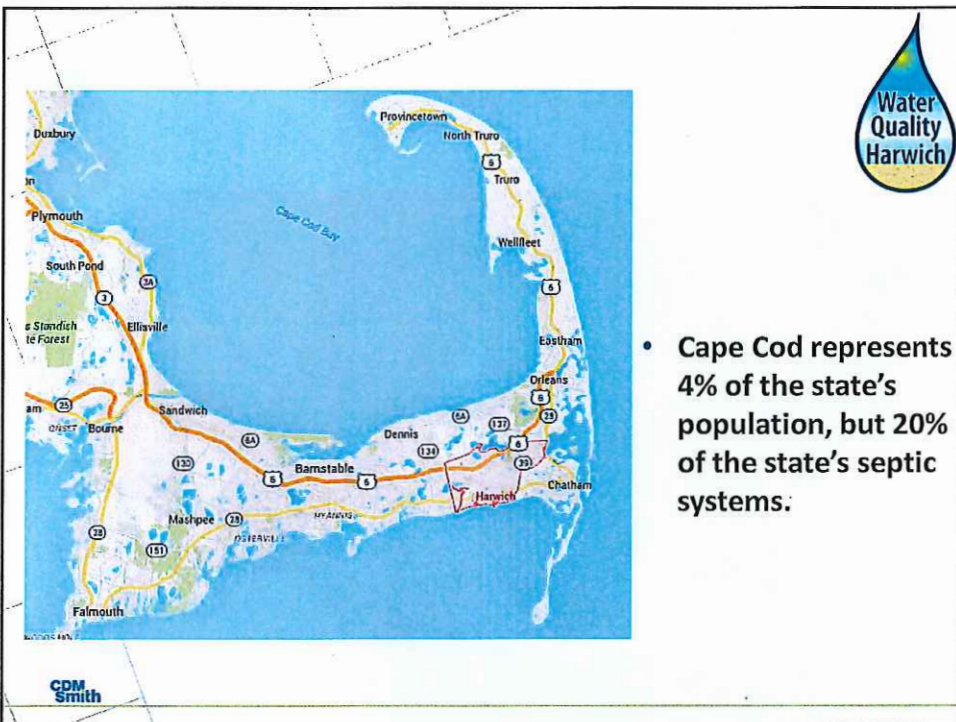


### Harwich Land Use Development 1951 and 1999

- 400% population growth from 1951 to 1999



CDM Smith



CDM Smith

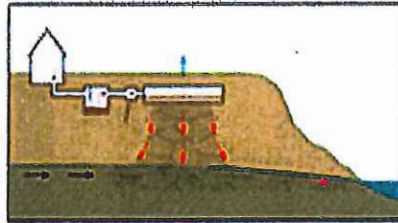
# Nutrients From Title 5 Septic Systems Is Our Biggest Issue



Septic Systems Permit  
Nitrogen to:

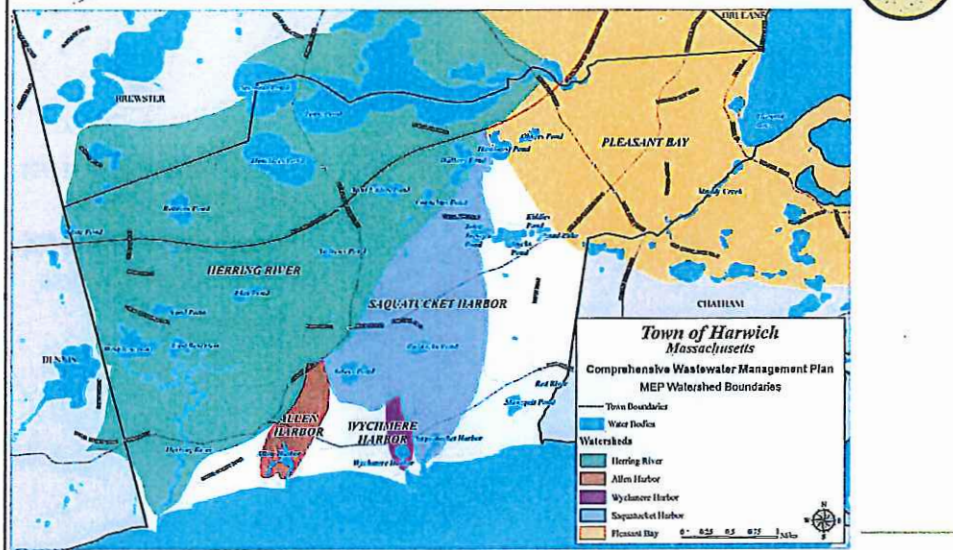
Invade Our Ground  
Water

Travel with  
Groundwater to the  
Beaches & Rivers




CDM  
Smith


# What is a watershed?



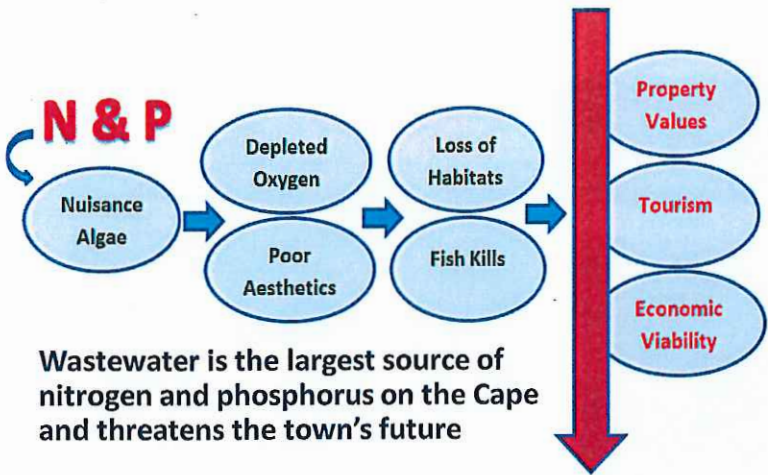

## What is the Massachusetts Estuaries Project (MEP)?



- Partnership
  - Massachusetts DEP (Department of Environmental Protection)
  - UMASS/Dartmouth School of Marine Science and Technology (SMAST)
  - Local communities
  - Also CCC and USGS
- Ongoing program to protect/improve coastal water quality
- Monitoring and evaluating environmental health of coastal embayments




## The Issue...



**N & P**

Nuisance Algae → Depleted Oxygen / Poor Aesthetics → Loss of Habitats / Fish Kills → Property Values, Tourism, Economic Viability

**Wastewater is the largest source of nitrogen and phosphorus on the Cape and threatens the town's future**






### Beaches, Rivers & Harbors Are Severely Impacted By Nutrients

**Water Quality Harwich**

**Healthy Nutrient Levels**



```
graph TD; A[Healthy Levels of Nutrients] --> B[Algae Growth is Limited]; B --> C[Sunlight Penetrates Clear Water]; C --> D[Submerged Aquatic Grasses Use Sunlight To Make Food]; D --> E[Healthy Grasses Provide Habitat For Other Organisms]; D --> F[Grasses Produce Oxygen]; E --> G[Healthy Aquatic Community]; F --> G;
```


CDM Smith

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### Beaches, Rivers & Harbors Are Severely Impacted By Nutrients

**Water Quality Harwich**

**Unhealthy Nutrients Levels**




```
graph TD; A[Excess Levels of Nutrients] --> B[Algae Use Nutrients To Grow and Reproduce Rapidly]; B --> C[Algae Cloud Water and Block Sunlight]; B --> D[Algae Use Up Nutrients and Die]; C --> E[Submerged Grasses Die]; D --> F[Bacteria Feed on Dead Algae]; E --> G[Loss of Grass Habitat]; F --> H[Dissolved Oxygen Levels Are Decreased]; G --> I[Bay Organisms That Breathe Oxygen or Live in Grasses Are Stressed or Die]; H --> I;
```


CDM Smith

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## Total Maximum Daily Load (TMDL) for Total Nitrogen




- MassDEP (Department of Environmental Protection) has issued draft TMDLs for total nitrogen for the Herring River Estuarine System and the Allen, Wychmere and Saquatucket Harbor Embayment Systems.
- TMDLs based on information presented in the MEP reports.
- Final TMDLs to be issued by EPA in near future.
- Authority is provided by Federal Clean Water Act (CWA)

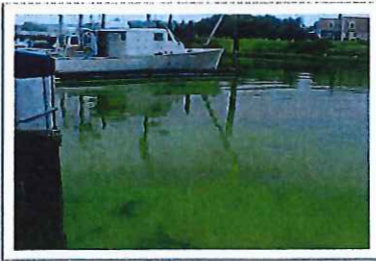


## Algae Blooms in Harwich waters






Hinckley Pond (P)

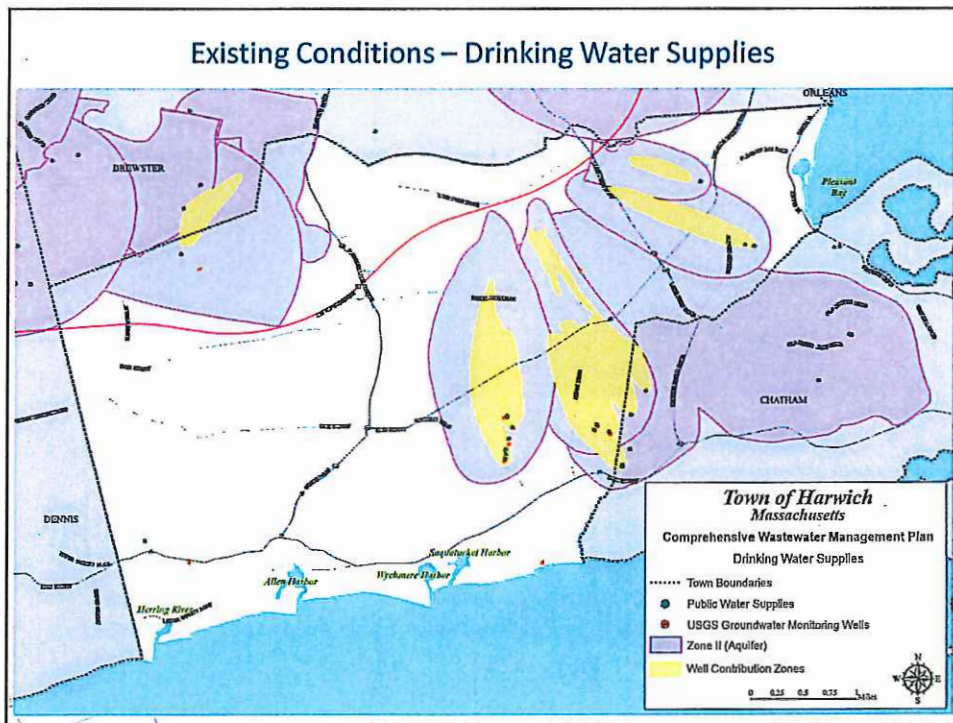
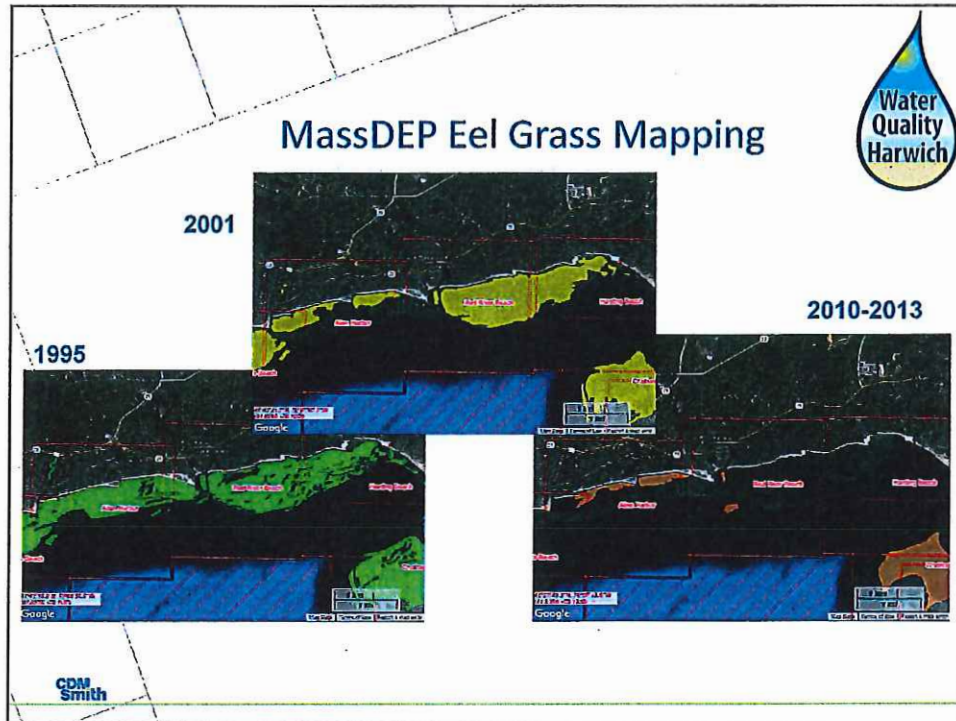


Allen Harbor (N)

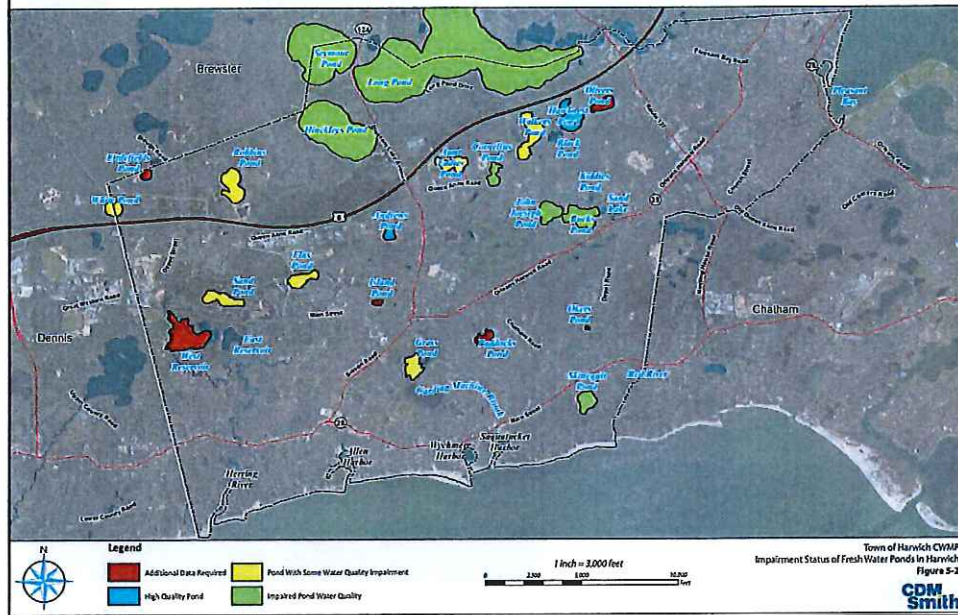
- Both fresh and salt water areas have been affected by algae blooms.
- Excessive nutrients in water bodies can cause algae blooms
- When the algae dies it decomposes and depletes dissolved oxygen levels which results in an unhealthy environment for fish and other organisms.







### Impaired Fresh Water Ponds in Harwich



Water Quality Harwich

What are the solutions?

CDM Smith

## What is a Comprehensive Wastewater Management Plan (CWMP)?

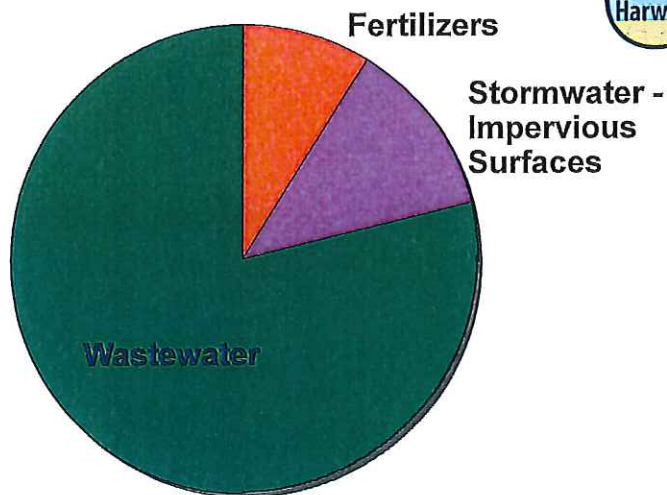


- Addresses Town-wide Wastewater Management Needs
  - Nitrogen Management (MEP)
  - Pond Water Quality (P)
  - Drinking Water (N,CEC)
  - Title 5 Issues
  - Socio – Economic



CDM Smith

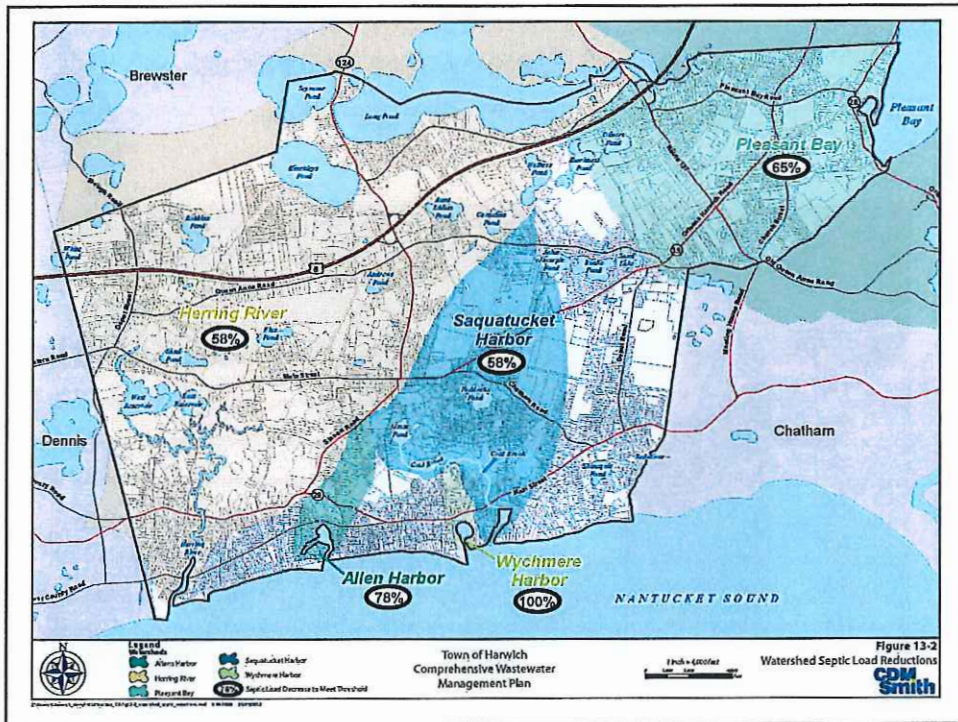
## Controllable Sources of Nitrogen

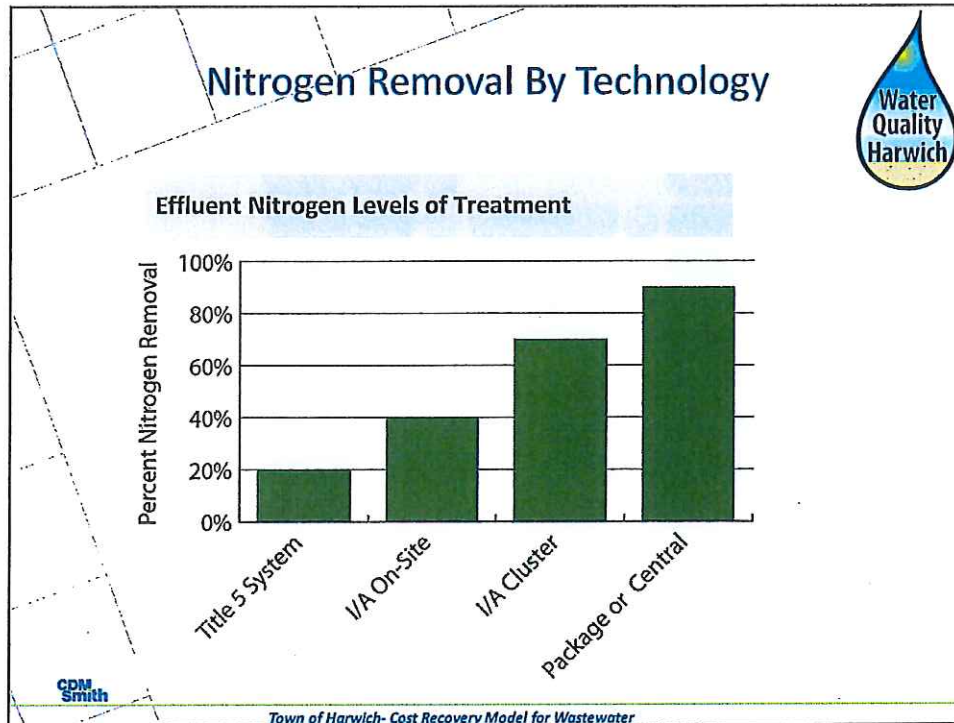


Local Control – Typical Percentages

CDM Smith







### Summary of Wastewater Scenarios and Effluent Recharge Sites

| Wastewater Service Scenario | Herring River Recharge Site (HR-12) | Saquatucket Harbor Recharge Site (SH-2) | Pleasant Bay Recharge Site (PB-3) | Outside MEP Watershed Recharge Site (OW-2) | Treatment Only At HR-18 : Ocean Used for Recharge (Outfall) |
|-----------------------------|-------------------------------------|---|-----------------------------------|--|---|
| 1A                          | X                                   | X                                       | X                                 |  |   |
| 2A                          | X                                   | X                                       | X                                 |  |   |
| 3A                          | X                                   |   |                                   |  |   |
| 4A                          | X                                   |   | X                                 |  |   |
| 5A                          | X                                   |   | X                                 |  |   |
| 6A                          | X                                   | X                                       | X                                 | X  |   |
| 7A                          | X                                   | X                                       | X                                 | X  |   |
| 8A                          |                                     |   |                                   |  | X   |

CDM Smith

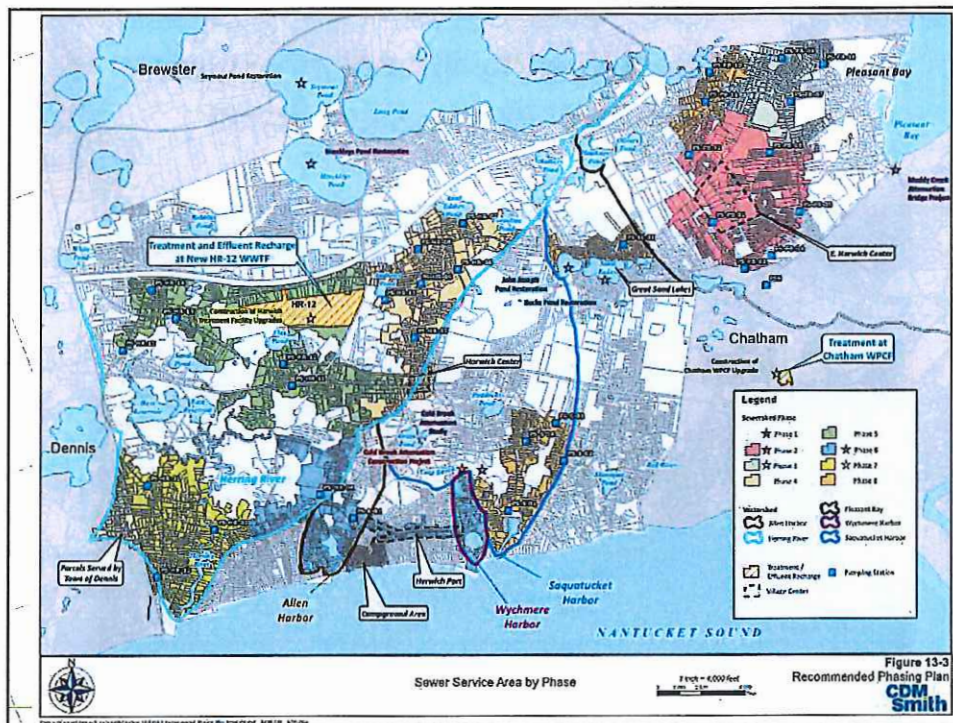




# What is the Harwich recommended program?

CDM Smith

Town of Harwich- Cost Recovery Model for Wastewater



## Nitrogen Reduction via Increased Flushing at Muddy Creek



CDM  
Smith

## Nitrogen Reduction by Natural Attenuation at Cold Brook Bogs – Bank Street



CDM  
Smith



### Chatham Wastewater Treatment Plant (1.1 million gallon per day average flow with open infiltration basins)



CDM  
Smith

### Seeded Shellfish Areas



Herring River



Allen's Harbor

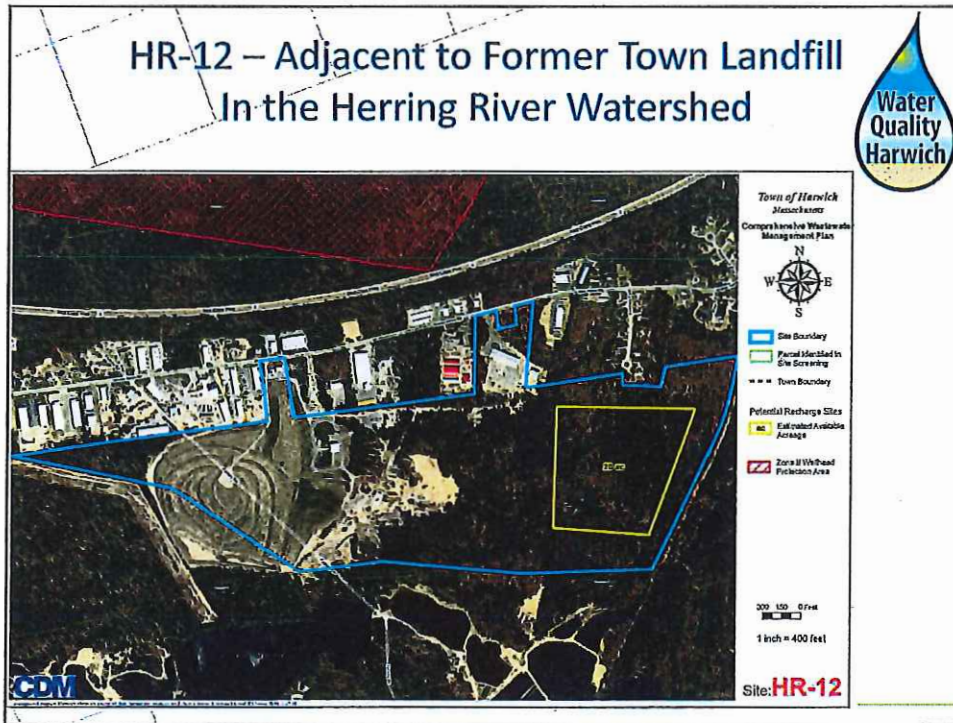


CDM  
Smith Round Cove/Pleasant Bay



Wychmere Harbor





### PRB - Construction Techniques

**One-Pass Trenching**

**One-Pass Trenching**

**Traditional Trenching**

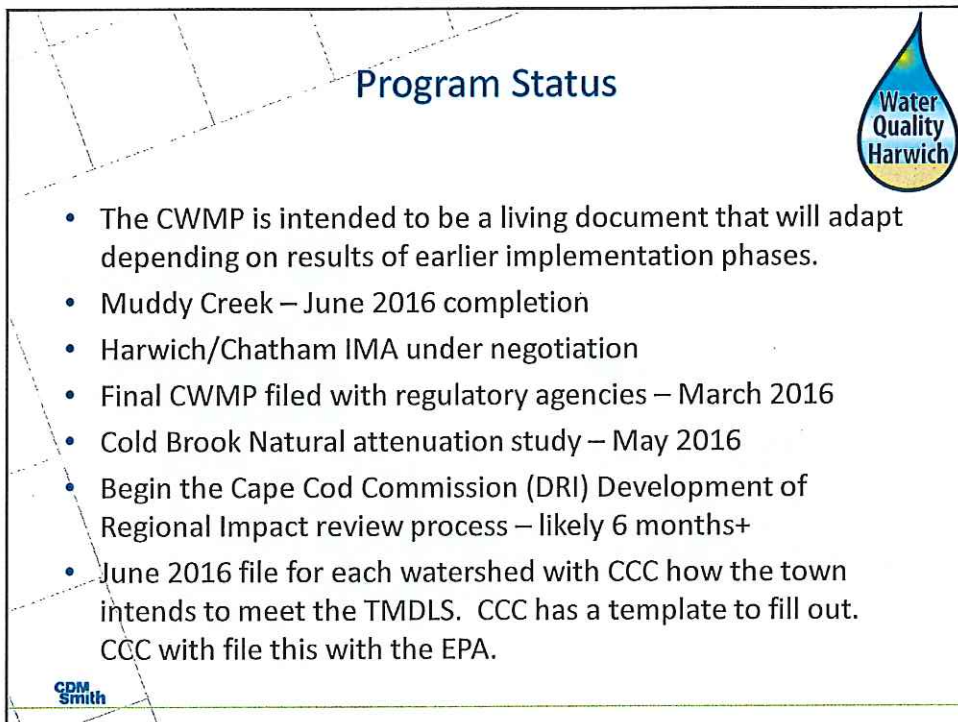
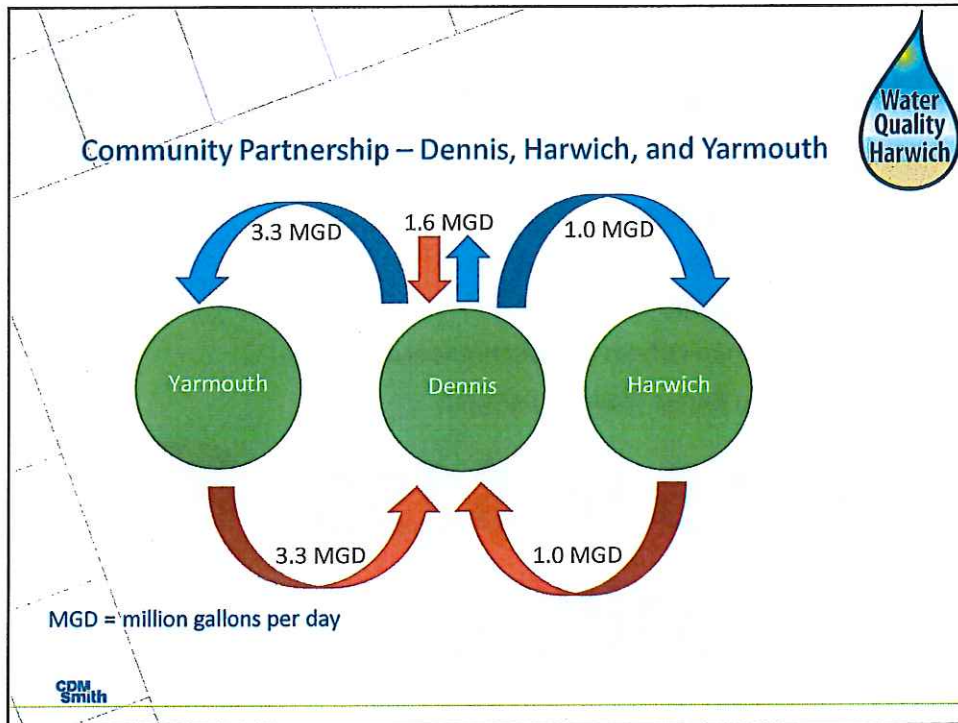
**Traditional Trenching**

Water Quality Harwich


CDM Smith

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PRB Demonstration Project





# Summary of Harwich Utility




- 180 Miles of Utility Pipes
- 5 Pumping Stations
- 3 Storage Tanks
- Treatment Facility
- Administration Offices and Maintenance Garages
- Capital Cost Range (Today's Dollars):




## \$215 to \$255 Million




## The Consequences...



- "The cost of doing nothing is economically devastating to every Cape homeowner."
  - Cape Cod Commission – 208 Plan, 2014



Algae Bloom in Allen Harbor, Harwich, Swan Pond, Dennis and Mill Creek, Yarmouth





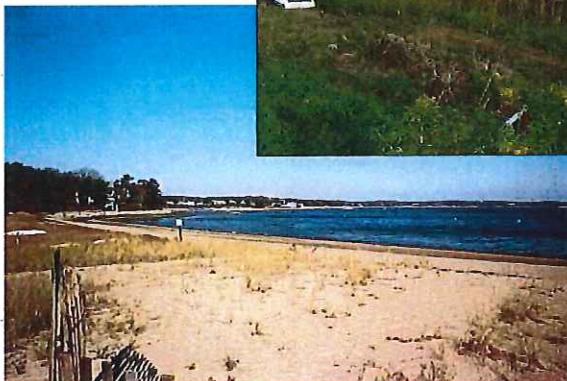
## Program Summary



- This is a complex planning process – one that will continue indefinitely – as things will change – adaptive management.
- The CWMP is intended to be a living document that will adapt depending on results of earlier implementation phases.
- Most properties in town contribute to the problem – not just those along a water body or those proposed for sewerage.
- All benefit from improved water quality.

CDM  
Smith

Questions  
and  
Comments:



CDM  
Smith

# Recommended Cost Recovery Model For Wastewater Program

Christopher Clark  
Town Administrator  
Town of Harwich

## WIC Strategy

- ▶ Wastewater program is proposed to be implemented in eight phases over 40 years. Many variables will change over that timeframe.
- ▶ Focus cost recovery model on first three implementation phases.
- ▶ Keep the cost model simple.

## WIC Strategy

- ▶ Everyone in town contributes to the nitrogen problem so everyone should help pay for the restoration of water quality.
- ▶ Develop a dedicated funding source that will help stabilize costs over the life of the program.
- ▶ Include a component that links water use (nitrogen contributed) to the amount a resident or business owner pays.

*Town of Harwich- Cost Recovery Model for Wastewater*

## Recommended WIC Cost Recovery Model Components

- ▶ Infrastructure investment fund
- ▶ Town-wide property tax
- ▶ Sewer enterprise account/ water use surcharge

*Town of Harwich- Cost Recovery Model for Wastewater*



## BOS Motion

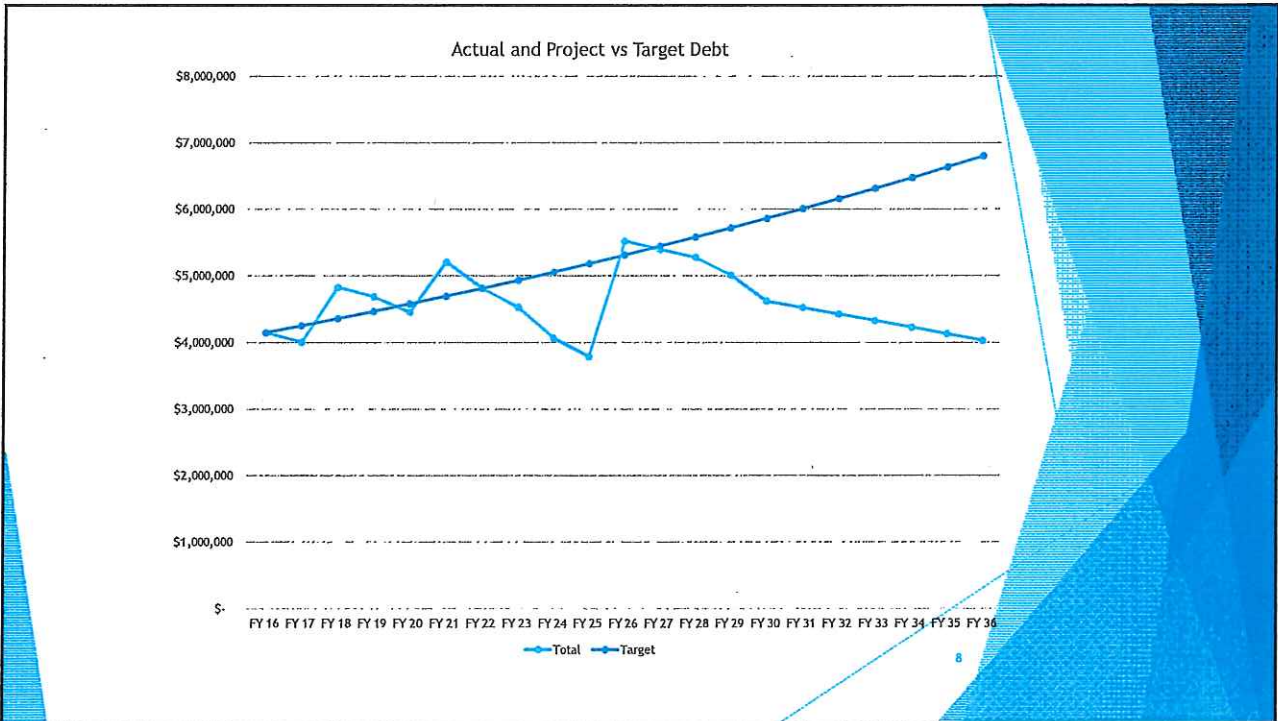
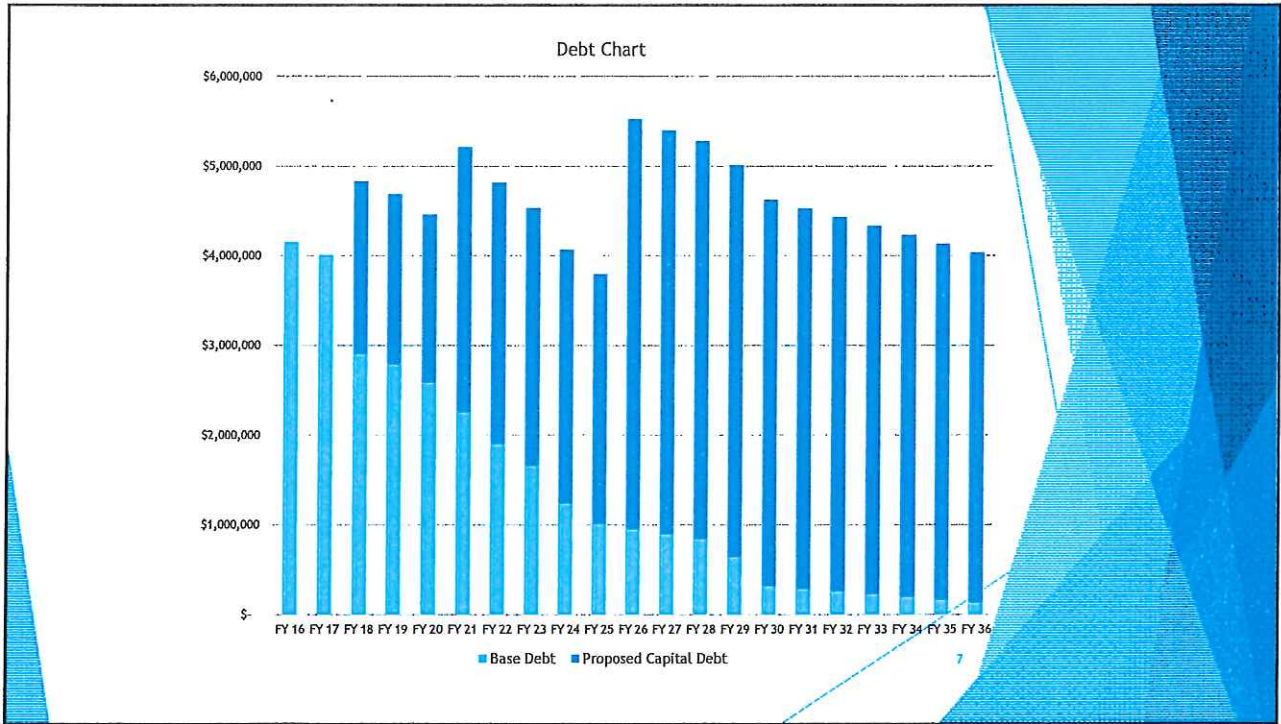
- ▶ The Harwich Board of Selectmen endorse a cost recovery policy for wastewater program implementation that utilizes the combination of town wide property taxes, an infrastructure investment fund and a sewer enterprise account based on water consumption. Where appropriate, grant funds will be applied for and if awarded will be used to offset costs as applicable. This policy will be utilized to support the implementation of at least the first three phases of the eight phase program and is subject to change should other potential beneficial funding programs become available to the town and the actions of town meeting and subsequent ballot results

*Town of Harwich- Cost Recovery Model for Wastewater*

## Wastewater Program Costs by Phase

- ▶ Phase 1: 2015 to 2016      \$2,550,000  
Natural nitrogen attenuation projects  
(Muddy Creek and Cold Brook) and effluent recharge site.
- ▶ Phase 2: 2016 to 2020      \$24,300,000  
Design and Construct Pleasant Bay collection system (south).
- ▶ Phase 3: 2021 to 2025      \$21,010,000  
Additional Pleasant Bay sewers and Chatham connection costs.

*Town of Harwich- Cost Recovery Model for Wastewater*





## Harwich Cost Assumptions

- ▶ Average home assessed value is \$400,000.
- ▶ FY15 property tax revenue \$47 million and will increase at 2.5 % annually.
- ▶ Tax rate for FY15 is \$8.97/ \$1,000 valuation.
- ▶ Average homeowner water consumption is 70,000 gallons per year.
- ▶ Used 638 Million gallons average annual water volume billed to calculate average water rate.
- ▶ Highest debt service is in Year 2026

*Town of Harwich- Cost Recovery Model for Wastewater*

## Costs to Homeowner on Sewer

- ▶ Infrastructure investment fund           \$ 54
- ▶ Property tax increase                   \$133
- ▶ Sewer enterprise cost                   \$ 57
- ▶ Total   \$ 244
- ▶ Plus initial hook-up loan cost
- ▶ Plus annual O&M cost initially estimated to be   \$145-\$175

*Town of Harwich- Cost Recovery Model for Wastewater*



## Costs to Homeowner Not on Sewer

- ▶ Infrastructure investment fund      \$ 54
- ▶ Property tax increase                \$133
- ▶ Sewer enterprise cost                \$ 57
- ▶ Total                                        \$ 244
- ▶ Plus O&M cost to pump their septic system once every three years estimated to be \$300 to \$350 and septic system replacement/upgrade every 20 to 25 years at \$13,000.

*Town of Harwich- Cost Recovery Model for Wastewater*

**Harwich Wastewater Summit – April 7, 2016**  
**Break-out Group Question Results**

**1. Is there any doubt we have a water quality issue in Harwich?**

No. It was the consensus of the groups that a water quality issue exists in Harwich.

Other comments:

- Need to bring this to the next level.
- Identify the Specifics: How big is the problem? What do we need to do next? When?
- Possibly up to 50% of the general population may have doubts.
- People at the table agree; however don't believe that the Town agrees.

**2. Do you want the town to deal with this wastewater program and schedule or a 3<sup>rd</sup> party regulator to mandate it for the town?**

It was the consensus of the groups that the Town should retain control and oversight of the wastewater program

**3. Would you be willing to partner with abutting/ neighboring communities to work towards a solution and save money?**

It was the consensus of the groups to partner with neighboring communities.

Other comments:

- Already working with Chatham for East Harwich.
- Dennis
- Pollution does not have borders.
- Caution: fall out with another town, what would happen?

**4. List the top 5 major impacts that could happen if we do nothing.**

- Decrease in property values
- Environmental issues continue
- Impact on economics of community, image of town, tourism, overall business retention and development
- CLC lawsuit and enforcement by EPA and courts and cost of litigation
- We lose the ability to shape the Town's destiny, no control over timing, costs, technical decisions
- Restrictions on growth
- Reduced drinking water quality
- People move out, decline in population
- Downgrade of quality of life

- Loss of tax revenue due to deterioration of tax base.
- Loss of income for fishermen and tourism
- Aesthetics
- Increase costs for clean-up in the future

**5. Do you support economic growth and development to help support and implement the wastewater infrastructure/planning/to help mitigate costs?**

Yes. Other comments:

- Smart growth is important
- Depending on the type and impact of the development
- Balance of development is important; need for affordable housing; clean drinking water
- Protection of those on fixed incomes.
- Aesthetics important and community character

**6. What is the best way to engage citizens in wastewater planning and implementation?**

- Engage citizens
  - Clearly state the consequences of doing nothing
  - Stop going over and over the past, state with where the town needs to go
  - Need a small group to champion the educational aspect
    - Identify the locations and groups to talk to
    - Line up speakers
    - In short the advertising group. Not the people who have been heavily involved in the planning and assessing
    - It is time for the promo people, the sales people
- Use children and grandchildren – Education – Start with the kids
- Newspapers/Coffee Shops/Meeting/Internet
- Propose an actual tax to get people's attention
- Public outreach specialist
- Strategic outreach
- Forces on going forward
- Highlight negative impacts on tourist economy and real estate values
- Get people to come to forums
  - Branch out to other forums/groups
  - Have specific topics, more in-depth topics at each forum
  - Neighborhood meetings: target issue(s) to specific neighborhoods