

**MINUTES OF THE
CAPE COD WATER PROTECTION COLLABORATIVE
Governing Board Committee
November 9, 2016**

A meeting of the Cape Cod Water Protection Collaborative was held on November 9, 2016 at 9:00 a.m. in the Strategic Information Office, Innovation Room, 3195 Main Street, Barnstable, MA.

Members:

Barnstable	Jessica Rapp Grassetti	Present
Bourne	Stephen Mealy	Present
Brewster	Ryan Bennett	Present (arrived at 9:10 a.m)
Chatham	Florence Seldin	Present
Dennis	Paul McCormick	Absent
Eastham	Jane Crowley	Absent
Falmouth	Susan Moran	Present
Harwich	Larry Ballantine	Present
Mashpee	Tom Fudala	Present (arrived at 9:10 a.m.)
Orleans	Sims McGrath	Present
Provincetown	Vacant	Vacant
Sandwich	Frank Pannorfi	Absent
Truro	Patricia Pajaron	Present
Wellfleet	Curt Felix	Present
Yarmouth	Jeffrey Colby	Present
County Appointee	Lindsey Counsell	Absent
County Appointee	Vacant	Vacant
Ex-officio member	George Heufelder	Present
Ex-officio member	Paul Niedzwiecki	Present

Staff Present:

Andrew Gottlieb	Executive Director
Gail Hanley	Cape Cod Commission

1. Minutes of October 19, 2016

Curt Felix moved to approve the minutes of October 19, 2016. Stephen Mealy seconded the motion. With nine members voting a vote called on the motion to approve the minutes passed with 8 votes in favor and one abstention.

2. Board Member Reports on Town Water Resource Activities

- **Town of Falmouth** – Susan Moran: Nothing new to report.
- **Town of Truro** – Patricia Pajaron: They continue discussions on their Plan and they are looking at phasing out cesspools and hope to be done in five years.
- **Town of Harwich** – Larry Ballantine: They are starting discussions in preparation of their town warrant; they are still trying to work with Chatham on the IMA; they continue to have discussions and are working with Cold Brook for possible

mitigation, they have been working with the conservation commission and are moving ahead on that; they tried getting funding for algae blooms.

- **Town of Yarmouth** – Jeff Colby: They have a draft total maximum daily load (TMDL) report out for Bass and Parker Rivers and also one in Dennis and a joint meeting has been scheduled; Yarmouth is in the process of updating its comprehensive wastewater management plan (CWMP); they are looking at Bass River Golf Course and have applied for a CPR grant for the same.

- **Town of Mashpee** – Tom Fudala: Oyster season is opening and their plan is going into effect; they continue to work on the collection system for two private plants.

- **Town of Wellfleet** – Curt Felix: They are still trying to evaluate the norovirus outbreak, Wellfleet is still closed for another week and the Department of Environmental Protection (DEP) is still evaluating the cause of the outbreak; on the wastewater side they are looking to get on the spring Town Meeting warrant, they are looking at how to institutionalize the function of wastewater in town, how to manage and implement under one set of management in town, looking to create a line item to go into the enterprise line and this is all in play with the new town administrator.

- **Town of Barnstable** – Jessica Rapp Grasseti: They are looking into a commercial grant for aquaculture as they are looking to expand for commercial.

Daniel Santos, Director of Barnstable Public Works, said regarding Barnstable's CWMP and Section 208 Plan the Town Council established a Resource Advisory Committee in town; they are working to fill in data gaps for the MEP Report and the harbor; they have an aggressive schedule and they continue to work with Mashpee and Sandwich on the watershed-based permit.

- **Town of Bourne** – Stephen Mealy: They are still waiting to hear about two grants the town has applied for; Town Meeting passed the school and police station override, the police station is where the plant will be placed and the plant and station will go forward; Town Meeting also passed a plastic bag ban effective in 2018.

- **Town of Chatham** – Florence Seldin: Connection to the main pipe is waiting to go through; Muddy Creek is beautiful.

- **Town of Brewster** – Ryan Bennett: Their watershed report looks good; the Town is going forward with the Board of Health's *Pond Nutrient Regulation* and storm water regulation.

Nancy Ellis Ice, Brewster Health Director, discussed the *Pond Nutrient Regulation* and said the Board of Health will be meeting before Christmas on the regulation. Ryan Bennett said the Town has been working on public information; people have been worried about the cost and effectiveness and the Town is re-strategizing on that.

- **Town of Orleans** – Sims McGrath: October 24, 2016 Town meeting approved the Town's wastewater effort for the \$3.28 million item that was on the ballot, Town meeting was well attended and this item received a substantial level of support and vote.

3. Discussion on Cape Cod Commission regulatory approach to Comprehensive Wastewater Management Plan (CWMP) review. This item was not taken up.

4. Discussion of pilot project assessing alternative Title 5 system by County Health Department

George Heufelder, Barnstable County Department of Health and Environment, said he has stepped down from his position as Director of the County's Health Department and has been assigned to the Massachusetts Alternative Septic System Test Center (MASSTC). He explained the system as a modification of a standard Title 5 denitrification system and said they have installed three at the MASSTC. He said the system has to be proven in the real world by installing the system at residential homes and they are proposing doing that and the question is how to incorporate it into the state code. He said they have set out a good plan to get data from these installations. He addressed and discussed questions raised by CCWPC Board Members at their October 19, 2016 meeting regarding Habitat for Humanity homes as possible test sites; geographic distribution across the Cape to capture different soil types; and selection of criteria. Mr. Heufelder said there will be 22 sites to review over a two-year period for collecting data; they will be launching a website that will bring in research from across the country; the focus will be on the most inexpensive and easiest way to do it and still have it work and the installation cost to the homeowner would be approximately \$4,000.

Mr. Heufelder was asked about the depth to the system and said it's an ultra-shallow distribution. Florence Seldin inquired about a split leach field and Mr. Heufelder said the installation is one half sawdust and one half without. He said if there is a Title 5 in place they would keep the system should the test fail then they could go back to the existing Title 5 system. Ms. Seldin asked how this would be getting out to the public. Mr. Heufelder said the County is doing this with SNEP and the Buzzards Bay Coalition and the Coalition has already identified people interested in participating. He said he would be meeting with all Boards of Health who are interested in having their towns participate. Curt Felix asked about the risk over the years. Mr. Heufelder said the biggest risk would be that 5-6 years later nitrate comes through; he said they want to minimize the risk to homeowners. Mr. Felix asked if year round homeowners would be better than seasonal. Mr. Heufelder said he is not sure but they do need to know the seasonal piece; they will do six seasonal and six year-round. Mr. Felix asked what would we see as DEP's acceptance. Mr. Heufelder said it could be added to the code; if the data produced and written specifications show good results from the system perhaps it could be added to the code. Susan Moran inquired about the types of wood used for sawdust. Mr. Heufelder said they have not seen a difference in the wood whether that happens over time he is not sure. He said they are looking to see what is best as they will have to come up with specifications. Florence Seldin inquired about a timeline for the installations. Mr. Heufelder said this fall and winter they will go through permitting and then following that they will be talking to Boards of Health. Andrew Gottlieb asked how is the duration of effectiveness figured and how many years to run before they see results. Mr. Heufelder said it's a calculation and they will run bench tests similar to what Stony Brook and the University of Rhode Island have done. He said the period to see results will be three years with very stable data; he said the pilots will be tested for a long time. Curt Felix asked if any thought has been given to working with Silent Spring for emergent contaminations. Mr. Heufelder said that study has been published showing that 99% of pharmaceuticals are removed; most compounds are removed. He said they will be working with anyone who does that and said Stony Brook has a nationally renowned individual who works on pharmaceuticals.

4. Review and approval of Mashpee municipal support request

Andrew Gottlieb recused himself from this agenda item and left the meeting room.

Tom Fudala, Mashpee Town Planner and Mashpee CCWPC representative, referred to a letter to the CCWPC from Rodney Collins, Mashpee Town Manager, regarding a request for funding support in the amount of \$12,000. Mr. Fudala said the Mashpee Board of Selectmen would like Mashpee's Comprehensive Wastewater Management Plan (CWMP) double checked by a third party. He said the funding requested would enable the Town to hire outside consulting support to assist the Town. He said they need to figure out financing and they are looking for expertise on how to do that from outside consulting support.

Stephen Mealy asked if this could be used as a template for other towns. Chair Sims McGrath said it won't provide a template as all municipalities have their own considerations. Mr. Fudala said the process might be an example that could be used. Florence Seldin asked if any matching funds would be provided by the Town. Mr. Fudala said there is Town funding that is a "slush fund" that can be used. He said the point is to hire an outside view and perspective. Ms. Seldin referred to the \$12,000 request and asked if the Town has someone in mind or is the amount just a figure out there. Chair McGrath said perhaps someone in the process has determined that is a reasonable amount; perhaps the Town has received guidance on this. Mr. Fudala said if the \$12,000 is not enough the Town has money. Larry Ballantine said he supports this and said Harwich is in the same situation looking for a third party for an independent view.

Susan Moran moved the Collaborative approve the Mashpee municipal request of \$12,000 for the purpose of the Town to hire an outside consultant to: (1) review and validate assumptions regarding the implementation of the Mashpee CWMP; (2) synchronize the project scope and phasing with the financing required; and (3) develop possible funding approaches. She further moved that copies of any result deliverables, including a Report, that may include identification of Outreach, Peer Review and Strategic Implementation be provided to the Collaborative. Curt Felix seconded the motion.

Tom Fudala said the Mashpee CWMP is a plan with five years of phasing. Ryan Bennett said the request is worth supporting with a deliverable.

A vote called on the motion to approve the Mashpee municipal request of \$12,000 was approved and a passed with a unanimous vote.

Andrew Gottlieb returned to the meeting.

6. Executive Director's Report

Andrew Gottlieb provided a report on the following:

- He sent a letter on storm water to MassDOT and is waiting to hear on that.
- He said regarding the budget he has been talking to the County Administrator about retaining some encumbrances and rolling them over to the next FY2019 budget. He said he will work out the mechanics of retention and will have alternative funding.
- He has had municipal support discussions.
- He said the CCWPC will meet as scheduled in December but he may need to move the date based on budget discussions with the County.

7. Adjourn

The meeting adjourned at 10:25 a.m.

MATERIALS USED/PRESENTED AT THE NOVEMBER 9 2016 CCWPC MEETING:

- Handout material: November 9, 2016 CCWPC Meeting Agenda.
- Handout material: Draft Minutes of the October 19, 2016 CCWPC meeting.
- Handout material: Proposal to test a non-proprietary means for removing nitrogen from onsite septic systems—response to considerations presented by the CCWPC Governing Board prepared by George Heufelder.
- Handout material: Flier by Barnstable County Department of Health and Environment "Experimental Leachfields for Nitrogen Removal—a Homeowner's Guide" prepared by George Heufelder.
- Handout material: Figure D: Control STU/Sample access points for soil moisture and gas sampling port array prepared by George Heufelder.
- Letter from Rodney Collins, Mashpee Town Manager, to the CCWPC requesting municipal support funding.



Proposal to Test a Non-Proprietary Means for Removing Nitrogen from Onsite Septic Systems

Response to considerations presented by the Governing Board regarding the above.

Presented by Andrew Gottlieb in an email to George Heufelder and dated October 26, 2016.

“Using Habitat for Humanity homes as possible test sites.”

There is no inherent reason not to allow the use of this Pilot Technology in HH housing. I have been in discussion with the HH Board of Directors in the past regarding composting toilets. Their main concern at this point was the operation and maintenance requirements. These systems will require an annual maintenance for the low pressure distribution system.

“geographic distribution across cape to capture different soil types and to foster local familiarity with systems is desirable”

The only limit to the distribution is the location of candidates willing to have this system placed on their properties. There are some risks (outlined in the attached homeowner’ guide). Regarding soil types, again depending on availability of the candidates, there are no restrictions. We are presently working on the physical requirements for a site which can best facilitate a timely approval by the local boards of health and DEP.

“they would like to see some selection criteria to discuss at the next meeting”

Criteria for the selection of sites falls into two categories – availability of willing participants and physical limitations of the site.

Participant Limitations include:

- Desire and ability to assume some risk
- Ability to sign waivers necessary to install, sample and maintain system

Site limitations include:

- Space – ideally the space to fit a 1.5 times sized leachfield is desirable for reasons mentioned in the homeowner’s guide attached.
- Distance to groundwater must be at least eight or nine feet. This is because the “bottom of the system” which sets the required vertical offset must be conservatively set at the bottom of the sand/sawdust layer (~ 44 inches below grade). As the experiments proceed, data will be developed to justify a lesser vertical setback, but I believe that DEP will view this as presented above since there is a precedent with other technologies.



Experimental leachfields for nitrogen removal – a homeowner’s guide

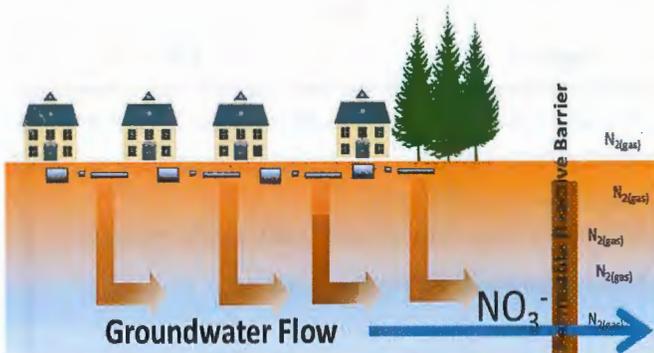
If you are reading this, you may be considering participation in a program that subsidizes the installation of a different type of soil absorption system (or leachfield) that purportedly removes nitrogen from wastewater as the septic tank effluent percolates through it (a process called denitrification).

Under a grant from EPA, Barnstable County will be allowed to subsidize and install a number of these experimental systems at homes throughout Southern New England. A likely question by anyone considering this might be “How do these systems differ from a standard leachfield?” and “What risk do I as the homeowner take on by installing this system?”

This flyer attempts to answer some of these questions, but in the final analysis, in the majority of instance there will be some risk. What follows is information by which you can make a decision regarding whether the potential benefits outweighed those potential risks.

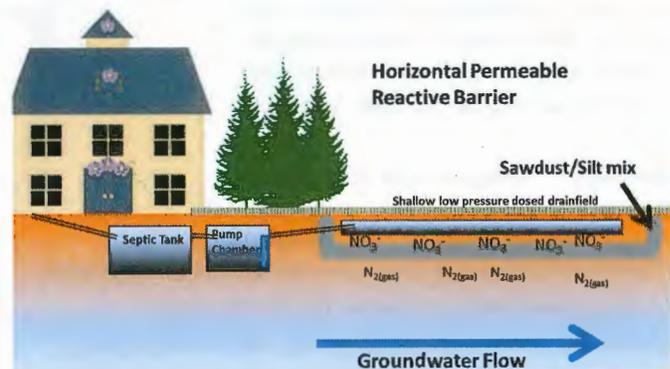
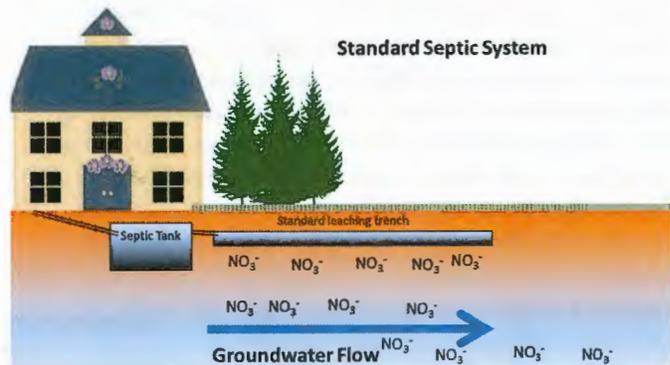
Background

Over the past five years researchers in various locations around the country have been investigating whether incorporating sawdust in various configurations while constructing a leachfield can enhance nitrogen removal by supplying this carbon source to support denitrification. These investigations follow upon more-demonstrated techniques for using woodchips or sawdust for denitrification. For example, the Nitrex™ system, a proprietary in-tank system, uses woodchips contained in a tank and held in an anoxic condition following advanced treatment, thereby removing a high percentage of nitrate from wastewater. Vertical reactive barriers (alternately called permeable reactive barriers or PRBs—illustrated below) have been used to mitigate nitrate by placing a column of woodchips as a permeable barrier that extends beneath the water table down-gradient to a groundwater plume containing nitrate. This causes a reduction of nitrate to harmless nitrogen



gas as the plume passes through the barrier. After an extensive review of all the information that is available our staff sought to adapt these techniques to Cape Cod’s unique environment. There were some fundamental changes that were necessary as revealed by a series of soil column experiments (small simulated leachfields); however, these modifications seemed feasible.

Three different designs of leachfield that incorporate sawdust have been placed at MASSTC and are currently being tested on a weekly basis. One design mimics experiments conducted in the early 90’s by University of Waterloo Professor Will Robertson. This design, illustrated below and contracted with a standard septic system, introduces the same basic principle as the vertical barrier (PRB) previously discussed, but places the barrier in a horizontal configuration directly below the leaching component to intercept the nitrate-laden percolate.



If you are considering participation in this program, you probably have many questions. What follows is an attempt to answer the most commonly asked questions.

Question. What are the major differences between a standard septic system and this alternative septic system?

Answer. The major components of a standard septic system include a septic tank (1500 gallon) and a gravity fed leachfield (≈600 sq. ft.). The alternative system has one added component which is a pump chamber (1000 gallon) and a timed-dose electrical panel.

Question. Besides components, what are the other differences between a standard system and this alternative?

Answer. A standard system generally requires a deep excavation (>5ft) for the leachfield. In the simplest of these experimental systems the wastewater is distributed in a shallow soil elevation (<8" below the surface). This in itself may be found to account for significant removal of nitrogen and phosphorus. Underneath the distribution network, there is 18 inches of sand, beneath which is placed a layer of sand and sawdust mixed at approximately a 60% sand to 40% by-volume. Not all potential designs can be described in detail here, but these are the general "layers" comprising this system.

Question. How much electricity does the system use?

Answer. Assuming that the system will dose 10 times per day and run three minutes per dose and a 1kW pump and 18 cents/kWh (all very conservative assumptions), the cost of operation would be less than \$40/year.

Question. Are there any other costs associated with maintaining the system that are beyond that of a "standard" system?

Answer. Septic tank effluent is distributed to the leachfield using a low pressure distribution system which requires an annual maintenance visit/check. This may also require sampling to verify that the system is still working to remove nitrogen. An approximate costs for these systems' maintenance visit and monitoring is \$250/year. During the first two years of operation, the costs of monthly monitoring is supported under the grant.

Question. About how much does this system costs compared to a standard "Title 5" system.

Answer. This depends on the situation, however the materials cost difference is estimated at \$6,000 which includes the pump chamber and electrical panel (and installation) sand and sawdust purchase (no installation).

Question. Is there a subsidy for installing this system under the grant?

Answer. Yes, under the grant, up to \$10,000 of allowable design and construction money will be reimbursed to all participants who present the receipts for work.

Question. What happens if the system fails to remove nitrogen to any degree.

Answer. Since we will not be installing these systems in any areas presently regulated for nitrogen, if the system fails to

remove nitrogen, it should continue to hydraulically perform. Given the conservative nature of the designs, it is not expected to fail hydraulically, however if it does, the owner will be responsible for having a leachfield that complies with regulations which in some instances (see below) will mean additional costs.

Question: Is there anything a homeowner can do to minimize the risk?

Answer: Presently, we are proposing two main means of installing these systems. In the ideal situation we will install a fully-sized "standard" low pressure dosed leachfield and a half sized leachfield which is experimental (amended with lignocellulose—see Figure A below). In this instance, if the experimental leachfield experiences any hydraulic difficulties, we could merely discontinue its use by turning a few valves and a fully sized "normal" leachfield would be available for use, incurring no inconvenience to the homeowner.

If a prospective participant was willing to sign a waiver, then we would split a standard leachfield in half, widening the area between the halves and using one side of the leachfield as a standard and control system and the other as the test of the technology (See Figure B below). In situation "B" the homeowner may have to replace that portion of the leachfield that is experimental. In this latter scenario, the homeowner is assuming the risk and there is no subsidy for the replacement of the experimental portion of the system.

Remember: This system, like any septic system, requires that the owners take standard precautions regarding excessive flow due to leaks in the plumbing or allowing toxic chemicals to go down the drain. These may not only affect the nitrogen performance but may also results in an expensive repair bill.

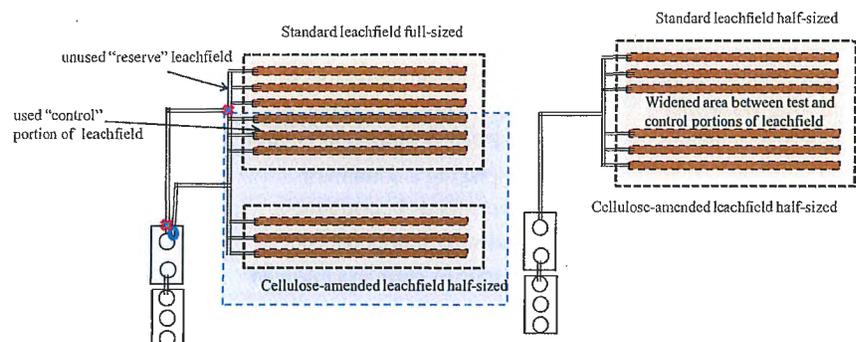


Figure A

Figure B

For more information on this project and the various research efforts, contact:

George Heufelder, M.S., R.S.
Barnstable County Department of Health and Environment

Email: gheufelder@barnstablecounty.org

Web: www.barnstablecountyhealth.org

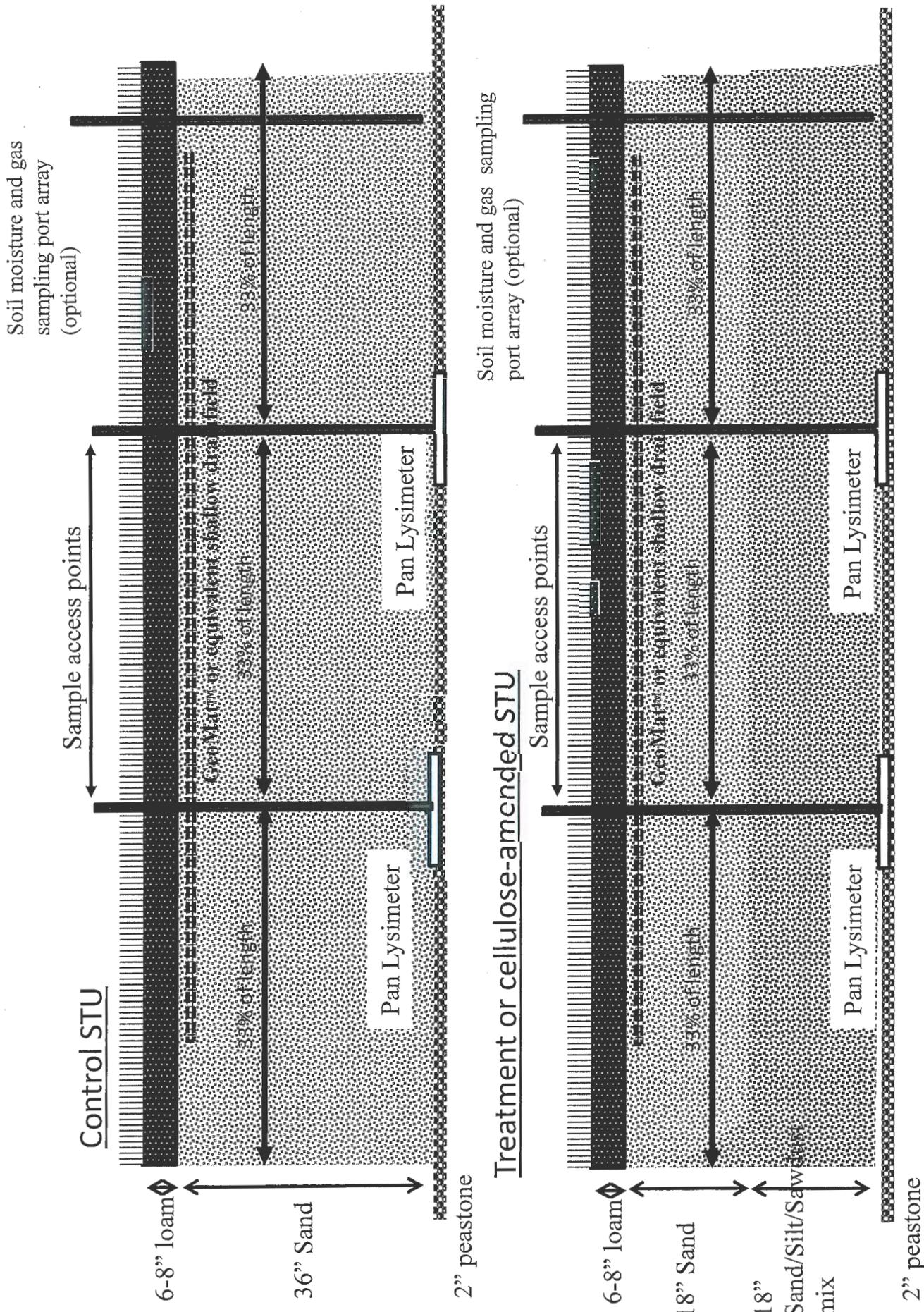


Figure D

"Preserving public trust, providing professional services"

Rodney C. Collins
Town Manager
508-539-1401
rccollins@mashpeema.gov



Office of the Town Manager
Mashpee Town Hall
16 Great Neck Road North
Mashpee, MA 02649

November 3, 2016

Chairman Sims McGrath
Cape Cod Water Protection Collaborative
Barnstable County Superior Courthouse
Post Office Box 427
Barnstable, Massachusetts 02630

RE: Request for funding support

Dear Chairman McGrath:

I am writing to request a grant of support to the Town of Mashpee in the amount not to exceed twelve thousand dollars (\$12,000) to enable the Town to hire outside consulting support toward operationalizing its CWMP. The Town has adopted CWMP but needs a third party to review and validate some of the assumptions regarding implementation, to synchronize the project scope and phasing with the financing required in order to develop a funding approach. The Town will contract appropriate independent specialists to perform this work and will seek reimbursement from the County and requests a project period not to go beyond December 31, 2017.

The Mashpee representative to the Collaborative, Tom Fudala, will be able to address any questions that you might have about this request. We will share our findings with the Collaborative and feel that this work may serve as a template for other towns to follow when they reach the point of shifting from planning to implementation.

I thank you for your consideration in this matter.

Sincerely,

RODNEY C. COLLINS
Town Manager

Cc. F. Thomas Fudala