



Town of Falmouth

OFFICE OF SELECTMEN & ADMINISTRATOR

59 TOWN HALL SQUARE, FALMOUTH, MASSACHUSETTS 02540
TELEPHONE (508) 495-7320
FAX (508) 457-2573

September 25, 2007

Mr. Andrew Gottlieb, Interim Executive Director
Cape Cod Water Protection Collaborative
Superior Courthouse
P.O. Box 427
Barnstable, MA 02630

RE: Town of Falmouth Grant Application for Shared Watershed of
Waquoit Bay, and Groundwater Modeling Project to
Support Falmouth and Mashpee CWMP Projects

Dear Mr. Gottlieb:

Enclosed please find the completed Grant Application for the proposed groundwater modeling project to support the Town of Falmouth and Town of Mashpee Comprehensive Wastewater Management Planning (CWMP) Projects.

The Selectmen of both Towns are very interested in this project and grant opportunity. It could provide a great benefit to the successful completion of our two projects.

Please contact me or Mr. Raymond Jack, Falmouth DPW Director if you have any questions about this application.

Sincerely yours,

Town of Falmouth


Robert L. Whritenour, Jr.
Town Manager

cc: Joyce Mason, Mashpee Town Manager
Raymond Jack, Falmouth DPW Director

**GRANT APPLICATION TO THE
SHARED WATERSHEDS, SHARED RESPONSIBILITIES
GRANT PROGRAM FOR BARNSTABLE COUNTY**

A. GENERAL INFORMATION

- 1. Project Applicant:** Town of Falmouth
59 Town Hall Square
Falmouth, MA 02540
Attn: Robert L. Whritenour, Jr., Town Manager
- 2. Project Name:** Groundwater Modeling to Evaluate a Wastewater Management Alternative for the Shared Waquoit Bay Watershed
- 3. Project Summary:**

This project will evaluate a shared wastewater management alternative for the Towns of Falmouth and Mashpee for the Waquoit Bay Watershed as illustrated in Figure App-1. The focus of the evaluation will be groundwater modeling (using the USGS model) to evaluate the resultant nitrogen loading to the bay after sewerage the required areas of the watershed, treating the wastewater to enhanced nitrogen removal (ENR) standards (3 mg/L total nitrogen on average), and recharging the treated water back to the watershed.

Both Towns are currently completing Comprehensive Wastewater Management Planning (CWMP) projects for this area and neither Town has budgeted this level of groundwater modeling that is now required by MassDEP to gain approval for a CWMP. This funding and evaluation is needed to fill a data gap for both Towns.

The Project will:

- Utilize the USGS regional groundwater model to track the recharged treated water to the Bay.
- Prepare a Plan of Study for the modeling work and gain approval for the calibration and modeling techniques from USGS, MassDEP, and CCC staff.

- Complete the modeling, and report the findings in a technical memorandum to USGS, MassDEP, and CCC staff.
- Summarize the project in a Guidance Document and Case Study Report that can be used as a model for other towns on Cape Cod with similar upcoming evaluations.

The Project objectives are:

- Coordinate approval of the technical modeling details with the preparation of a Plan of Study (Work Plan) and a Work Plan review meeting with USGS, MassDEP, and CCC staff.
- Complete the modeling and demonstrate how the wastewater management alternatives will meet the TMDLs and wastewater nitrogen removal goals.
- Provide a Guidance Document and Case Study Report to other Cape Cod towns.

4. Requested Funds: \$34,275

B. DETAILED PROJECT INFORMATION

1. Project Objectives: See the objectives listed above.

2. Detailed Project Description:

The Waquoit Bay Watershed is shared by the Towns of Mashpee and Falmouth, and both Towns are currently involved in Comprehensive Wastewater Management Planning (CWMP) Projects to meet the nitrogen Total Maximum Daily Loadings (TMDLs) for their south coast estuaries. Waquoit Bay is the estuary that straddles the two Towns, and the watershed to Waquoit Bay is part of both of their CWMP planning areas.

There are two main components to the Waquoit Bay Watershed as illustrated on Figure App-1:

- Waquoit-East Watershed comprised of the Quashnet River, Hamblin Pond, Little River, Jehu Pond and Great River Subwatersheds.
- Waquoit-West Watershed comprised of the Eel Pond, Childs River, Moonakiss River, and Waquoit Bay Proper Subwatersheds.

The estimated wastewater nitrogen removal percentages have been estimated for these areas as illustrated on App-2. These values were recommended by MEP for the Waquoit-East Watershed as part of the TMDL development. The percentages used for the Waquoit-West Watershed are based on the MEP percentages for the Bournes Pond and Great Pond TMDLs (2 large coastal ponds with similar patterns of surrounding land use). These estimated wastewater nitrogen removals are for the existing nitrogen discharges and indicate the need for wastewater collection, advanced nitrogen removal, and careful recharge of the treated water to take advantage of natural attenuation of the remaining nitrogen in the treated water.

The two Towns are currently evaluating sewer extensions to these areas with subsequent wastewater treatment and recharge at the Falmouth Country Club site.

Both the Mashpee and Falmouth CWMP projects have completed preliminary groundwater modeling evaluations by the United States Geologic Survey (USGS). An example of the USGS model output for this site is attached in Figure App-3. The Towns now need more detailed groundwater modeling to provide an accurate nitrogen allocation for this wastewater management alternative.

Project Scope:

- S1. Identify the needed sewer service area and wastewater flows for the Waquoit Bay Watershed to meet the estimated wastewater nitrogen removals as indicated by the TMDLs. (This information has been developed by the Towns' CWMP Projects.)
- S2. Identify potential treated water recharge sites at the Falmouth Country Club site where the treated water will be recharged back to the groundwater system. (This information has been developed by the Falmouth CWMP Project.)
- S3. Utilize the existing USGS regional groundwater model updated for more site specific conditions (including smaller grid sizing) to model the fate and transport of the treated water through the estuaries to Nantucket and Vineyard Sounds. This task will have the following subtasks.

- S3.1 Review calibration settings of the latest version of the model and opportunities to calibrate it to a more detailed data set of monitoring well data, grid size, and coastline features.
 - S3.2 Prepare a Plan of Study (Work Plan) of the proposed model calibration and planned model runs, and meet with staff from USGS, MassDEP, and CCC to review the planned use of the regional model.
 - S3.3 Complete the model calibration and model runs.
 - S3.4 Summarize the model calibration, model output, and model findings in a technical memorandum to MassDEP, USGS, and CCC.
- S4. Evaluate the modeled nitrogen loading that returns to Waquoit Bay (after nitrogen attenuation) and identify if additional portions of the watershed need to be sewered to meet the TMDLs. If so, rerun the model with additional sewered (and recharged) flow to demonstrate that the alternative meets the TMDL.
- S5. Summarize the findings in a report. The report will be formatted as a Guidance Document and Case Study Report to allow the towns on Cape Cod to understand methods of fine tuning the USGS regional model for more detailed conditions and a finer grid size as typically required by MassDEP for all CWMP projects.
- S6. Present the findings of the project to the Cape Cod Water Protection Collaborative and to other groups as needed for the CWMP projects in Falmouth and Mashpee (3 presentations).
- S7. Incorporate the findings in the CWMP projects of the two Towns.
- S8. Coordinate, convene, and attend up to eight (8) meetings with Town committees, Town staff, and Boards of Selectmen to complete the inter-municipal cooperation for this project.

3. Description of How the Project Meets the Eligibility Criteria:

This project meets the following eligibility criteria:

- a. It will provide detailed understanding and accounting of nitrogen loading to the Waquoit Bay for the shared wastewater management alternatives.
- b. It will provide detailed understanding of this recommended shared wastewater management alternative and the resultant nitrogen loadings.
- c. The Towns CWMP projects will integrate the information developed by this project to evaluate the merits and costs of this and all the other management scenarios being developed by the Towns. (This work is part of the two CWMP projects.)
- d. The Towns CWMP projects will integrate the information developed by this project to evaluate the options of cost apportionment between the two Towns. (This work is part of the two CWMP projects.)
- e. The Towns CWMP projects will integrate the information developed by this project to evaluate the alternatives for burden sharing between the two Towns including the siting of the WWTF and recharge facilities at the Falmouth Country Club site in Falmouth. (This work is part of the two CWMP projects.)
- f. This project will provide the technical evaluations needed for CWMP approval of this innovative approach to municipal cooperation between Mashpee and Falmouth.

4. Project Timeline:

The timing of this grant program is excellent for the two CWMP projects that are just now completing Alternative Screening Analysis Reports. They need this technical groundwater modeling evaluation to complete their detailed evaluation reports. Both projects are scheduled to be complete by the end of 2008. The proposed timeline for this project is:

- November 15, 2007: Expected grant award.
- December 15, 2007: Work Agreements signed by the Town of Falmouth, Barnstable County, and consultants.
- January 2, 2007: Plan of Study submitted to USGS, MassDEP, and CCC for review.
- January 15, 2007: Meet with USGS, MassDEP, and CCC staff to approve the Plan of Study (Work Plan).

- April 15, 2008: Complete groundwater model and submit the technical memorandum to USGS, MassDEP, and CCC.
- June 1, 2008: Complete the Guidance Document and Case Study Report.
- June 30, 2008: Complete the project with the presentation to the Water Protection Collaborative.

5. Inter-Municipal Cooperation Planned for this Project:

Letters of support from the Towns of Falmouth and Mashpee Selectmen for this project are contained in Attachment A.

Both Mashpee and Falmouth are currently coordinating their efforts through staff meetings and use of the same wastewater engineering consultant (Stearns & Wheeler) for completion of their CWMP projects.

The Towns are using the following committees to manage the CWMP projects in their Towns:

- Falmouth Nutrient Management Group comprised of Town staff and volunteers.
- Mashpee Sewer Commission comprised of three (3) elected commissioners.
- Mashpee CWMP Citizens Advisory Committee comprised of Town staff and volunteers.

The Town of Falmouth DPW will manage this grant funded project and will coordinate with these committees as well as the two Town Managers and the two Boards of Selectmen to complete the inter-municipal cooperation for this project.

6. Detailed Project Budget:

The project budget is summarized below for the project scope detailed earlier.

PROJECT BUDGET			
SCOPE NUMBER	SCOPE TASK	ESTIMATED BUDGET	
		IN KIND⁽¹⁾	CONSULTANT
S1	Sewer service area and wastewater flow identification	\$0 ⁽²⁾	\$0 ⁽²⁾
S2	Recharge site identification	\$0 ⁽²⁾	\$0 ⁽²⁾
S3	Groundwater modeling		
S3.1	Model review	\$100	\$6,200
S3.2	Plant of Study preparation meeting and approval	\$200	\$6,500
S3.3	Modeling	\$200	\$10,100
S3.4	Technical memorandum development	\$400	\$7,800
S4	Watershed load evaluation and demonstration of TMDL compliance	\$400	\$2,400
S5	Guidance Document and Case Study Report preparation	\$400	\$5,400
S6	Three (3) project presentations	\$400	\$1,200
S7	Inter-Municipal Meetings (8) and Cooperation	\$800	\$3,200
Subtotals		\$2,900	\$42,800
TOTAL		\$45,700	
Notes:			
1. In kind participation (\$20/hr volunteer & actual rate for Town staff)			
2. This task and cost is already budgeted in the CWMP project for Falmouth and/or Mashpee.			

The Total Project Cost is \$45,700 as detailed above with a Grant Request of \$34,275 based on a 75% funding formula. The Town of Falmouth's share will be \$11,425 based on a 25% local share, as estimated below:

- In Kind service of \$2,900 as detailed above from Falmouth & Mashpee.
- Cash amount of at least \$8,525 from Falmouth. Falmouth will make up in cash any In-Kind services short fall.

7. Description of How the Funding will Improve Water Quality:

The funding will provide a key wastewater planning evaluation required by MassDEP to determine the feasibility of the recharge site and the resultant nitrogen loading to the estuary from the recharge site. This evaluation will allow the Waquoit Bay Watershed to obtain an approved CWMP to meet the TMDL. With the approved CWMP, implementation of the new wastewater facilities will begin and the water quality will improve.

8. Description of How this Project Fits into an Overall Approach to Reduce Nitrogen Loading:

This project will provide a key evaluation (required by MassDEP) that will become part of the CWMP for Mashpee as well as for Falmouth. It will become an integral part of the approved plans.

9. Description of Probable Success:

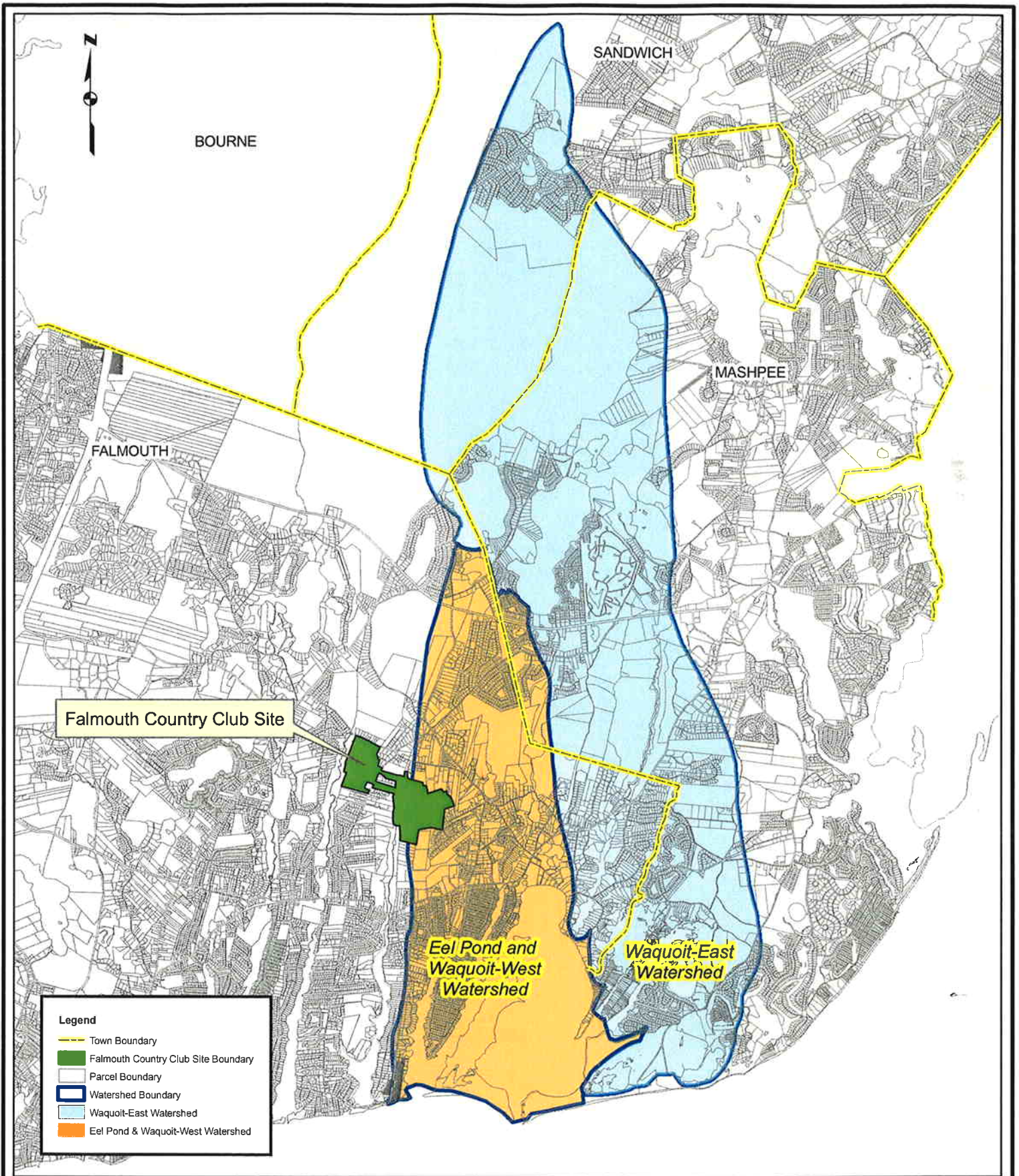
This evaluation is needed now and the timing is excellent for both CWMP projects. The consultant that we plan to use has recently completed a similar groundwater modeling evaluation for the Town of Chatham and the completion of their CWMP. We have the staff, consultants, and Town funding in place to complete a successful project.

10. Plan to Report the Findings of this Project:

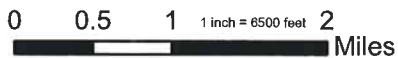
As detailed in the scope and budget, we will:

- Prepare a Plan of Study to gain consensus with the USGS, MassDEP, and CCC staff on the planned modeling procedures.
- Prepare a technical memorandum to the USGS, MassDEP, and CCC staff to inform them of the technical findings. This technical memorandum will also become part of each Town's CWMP.
- Prepare a Guidance Document and Case Study Report on this project and groundwater modeling to assist other Towns on Cape Cod that will need to complete similar modeling activities.
- Provide PowerPoint presentations to the Collaborative and to the two Town CWMP project committees.

Figures



Data Source: MassGIS/Town of Falmouth



Stearns & Wheler, LLC
Environmental Engineers and Scientists

HYANNIS, MASSACHUSETTS

Phone 781.421.5677
Web www.stearnswheler.com

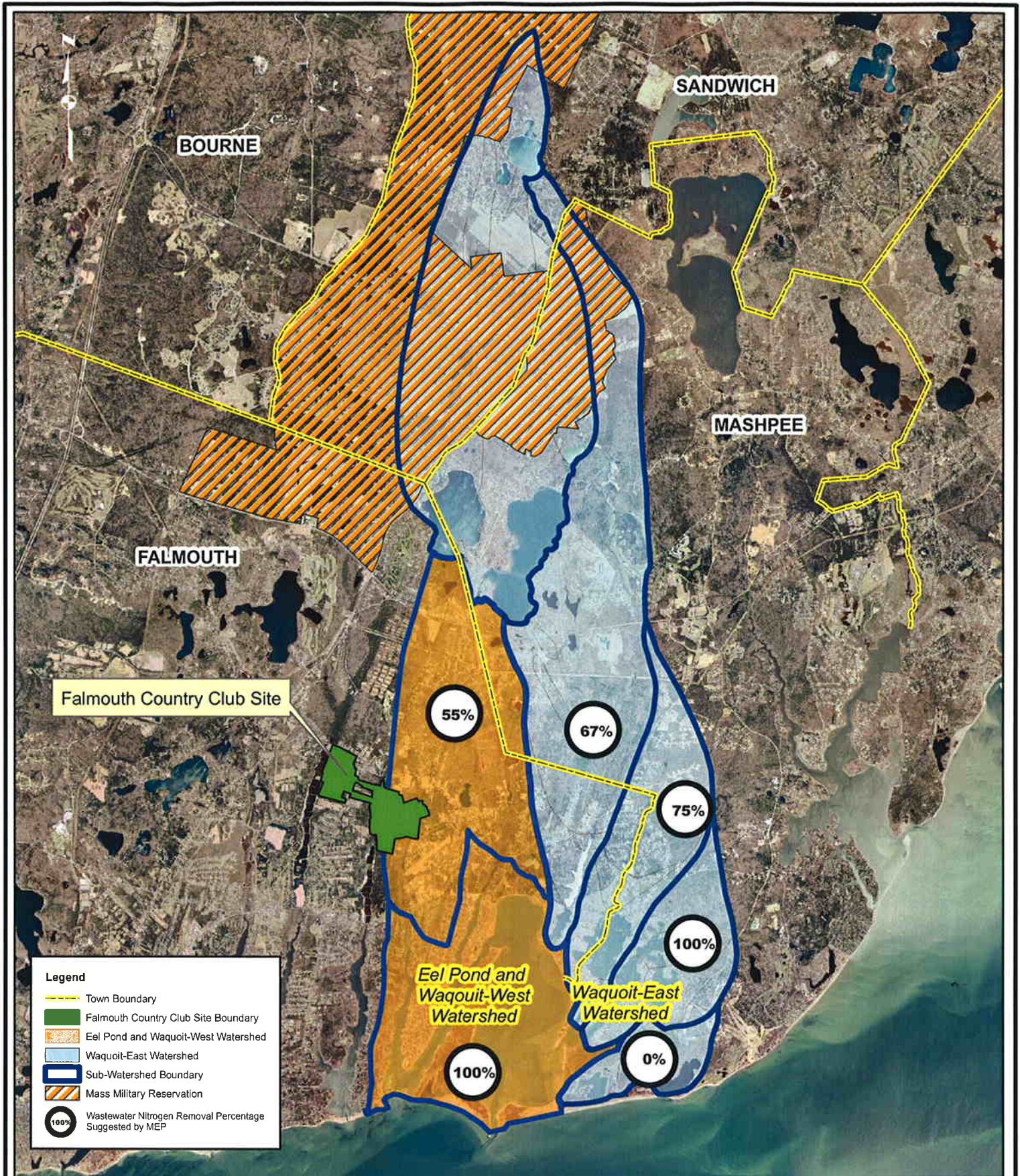
DATE: 8/31/07

TOWN OF FALMOUTH, MASSACHUSETTS
CWMP

LOCATION MAP

FIGURE APP-1

GIS File Location: J:\GIS\GIS Project Folder\
Job#70000\71045 Falmouth\
Figures\71045FAPP-1.mxd



Data Source: MassGIS/Town of Falmouth



Stearns & Wheeler, LLC
Environmental Engineers and Scientists

HYANNIS, MASSACHUSETTS

Phone: 203.632.2630
Web: www.stearnswh.com

DATE: 8/31/07

TOWN OF FALMOUTH, MASSACHUSETTS
CWMP

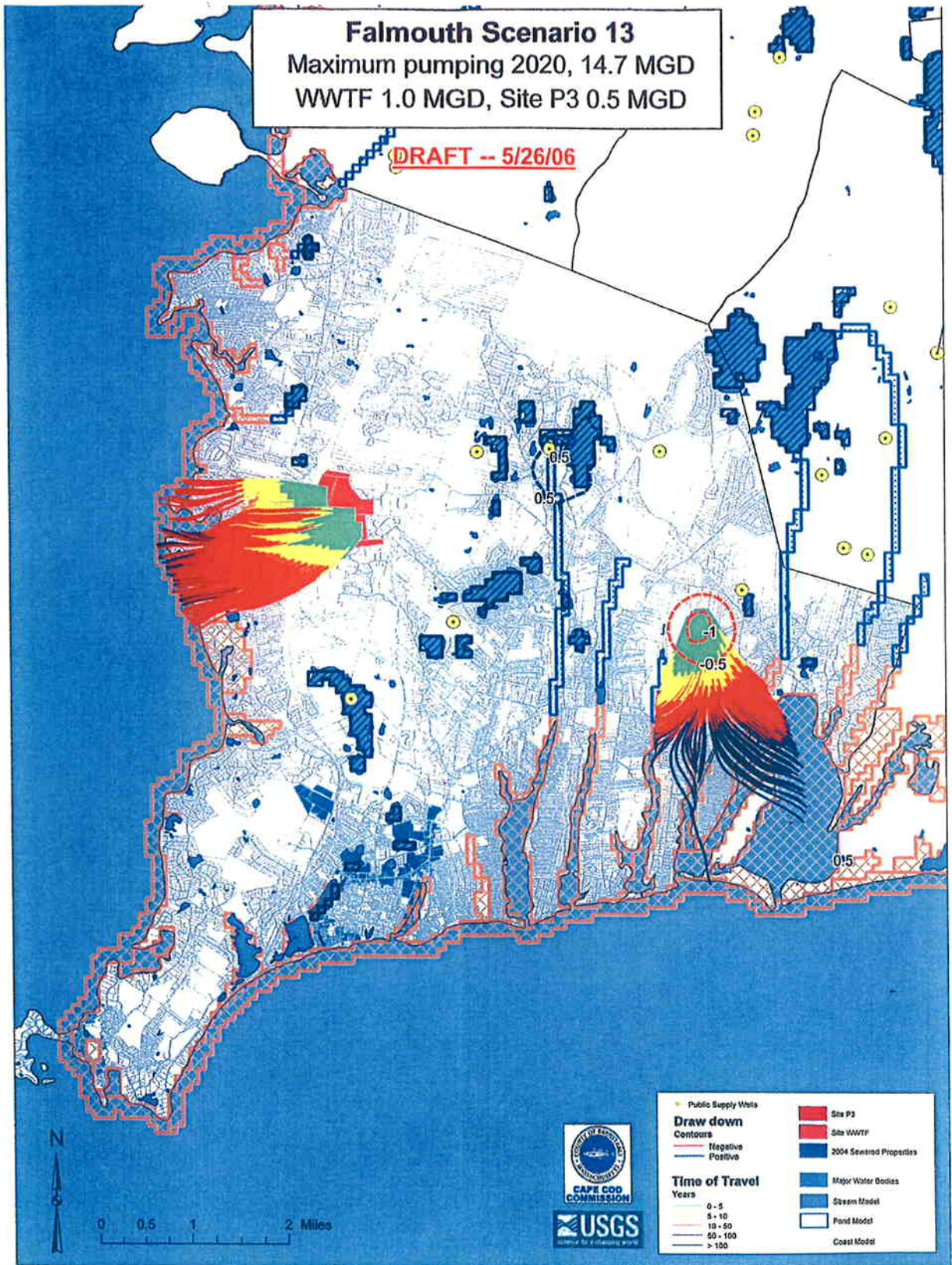
ESTIMATED PERCENT WASTEWATER
NITROGEN REMOVALS

FIGURE APP-2

GIS File Location: J:\GIS\GIS Project Folder\Job#70000\71045
Falmouth\Figures\71045FAPP-2.mxd

Falmouth Scenario 13
 Maximum pumping 2020, 14.7 MGD
 WWTF 1.0 MGD, Site P3 0.5 MGD

DRAFT -- 5/26/06



Stearns & Wheeler, LLC
 Environmental Engineers and Scientists

HYANNIS, MASSACHUSETTS

Phone: 508.262.2630
 www.stearnswheler.com

TOWN OF FALMOUTH, MASSACHUSETTS
 CWMP

USGS MODEL OUTPUT

FIGURE APP-3

Attachment A
Letters of Support



Town of Falmouth

OFFICE OF SELECTMEN & ADMINISTRATOR

59 TOWN HALL SQUARE, FALMOUTH, MASSACHUSETTS 02540
TELEPHONE (508) 495-7320
FAX (508) 457-2573

September 21, 2007

Mr. Andrew Gottlieb, Interim Executive Director
Cape Cod Water Protection Collaborative
Superior Courthouse
P.O. Box 427
Barnstable, MA 02630

RE: Waquoit Bay Shared Watershed
Grant Application
Letter of Support

Dear Mr. Gottlieb:

Thank you very much for your letter dated July 27, 2007 describing the Shared Watersheds, Shared Responsibilities Grant Program and asking if the Town of Falmouth has a shared watershed and is interested in participating in the program.

The Town of Falmouth does share the Waquoit Bay Watershed with the Town of Mashpee and both of our Towns are interested in participating in this program. Both Falmouth and Mashpee are currently completing Comprehensive Wastewater Management Planning (CWMP) Projects, and both project planning areas include the Waquoit Bay Watershed. We are working with the same engineering consultant (Stearns & Wheler, LLC) so that we can develop the plan as efficiently as possible.

After discussions with representatives for the Town of Mashpee, we will work cooperatively on the groundwater modeling project for the shared watershed as proposed for grant funding. The Town of Falmouth is the Project Applicant and the Town of Mashpee will collaborate and support us.

We plan to complete our CWMP project at the end of 2008 and the timing of this grant program will assist us greatly in meeting our goal.

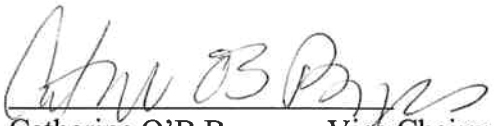
Thank you and the entire Collaborative for assisting us in this effort.

Please contact Robert L. Whritenour, Jr., Falmouth Town Manager if you have any questions about the proposed project or grant application.

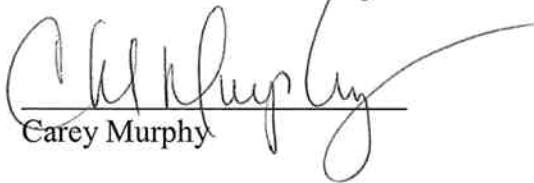
Very sincerely yours,

Town of Falmouth
Board of Selectmen

Kevin E. Murphy, Chairman



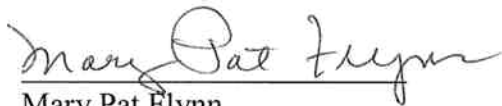
Catherine O'B Bumpus, Vice Chairman



Carey Murphy



Ahmed Mustafa



Mary Pat Flynn



Town of Mashpee

Office of Selectmen

16 Great Neck Road North
Mashpee, Massachusetts 02649
Telephone - (508) 539-1400
Fax - (508) 539-1403

September 24, 2007

Mr. Andrew Gottlieb, Interim Executive Director
Cape Cod Water Protection Collaborative
Superior Courthouse
P.O. Box 427
Barnstable, MA 02630

RE: Waquoit Bay Shared Watershed
Grant Application
Letter of Support

Dear Mr. Gottlieb:

Thank you very much for your letter dated July 27, 2007 describing the Shared Watersheds, Shared Responsibilities Grant Program and asking if the Town of Mashpee has a shared watershed and is interested in participating in the program.

The Town of Mashpee does share the Waquoit Bay Watershed with the Town of Falmouth and both of our Towns are interested in participating in this program. Both Falmouth and Mashpee are currently completing Comprehensive Wastewater Management Planning (CWMP) Projects, and both project planning areas include the Waquoit Bay Watershed. We are working with the same engineering consultant (Stearns & Wheler, LLC) so that we can develop the plan as efficiently as possible.

After discussions with representatives for the Town of Falmouth, we will work cooperatively on the groundwater modeling project for the shared watershed as proposed for grant funding. The Town of Falmouth is the Project Applicant and the Town of Mashpee will collaborate and support the Town of Falmouth.

We plan to complete our CWMP project at the end of 2008 and the timing of this grant program will assist us greatly in meeting our goal.

Thank you and the entire Collaborative for assisting us in this effort.

Please contact Joyce M. Mason, Mashpee Town Manager if you have any questions about the proposed project or grant application.

Sincerely,

Mashpee Board of Selectmen

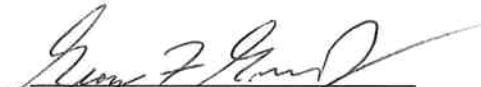


Teresa M. Cook, Chairman



John J. Cahalane, Vice Chairman

Don D. Myers



George F. Green, Jr.



Wayne E. Taylor

MASHPEE

SEWER COMMISSION

16 GREAT NECK ROAD NORTH
MASHPEE, MA 02649
PHONE: (508)539-1400 X521
FAX: (508)539-0954

September 18, 2007

Mr. Andrew Gottlieb, Interim Executive Director
Cape Cod Water Protection Collaborative
Superior Courthouse
P.O. Box 427
Barnstable, MA 02630

RE: Waquoit Bay Shared Watershed
Grant Application
Letter of Support

Dear Mr. Gottlieb:

The Town of Mashpee shares the Waquoit Bay Watershed with the Town of Falmouth. Both Falmouth and Mashpee are currently completing Comprehensive Wastewater Management Planning (CWMP) Projects, and both project planning areas include the Waquoit Bay Watershed. We are working with the same engineering consultant (Stearns & Wheeler, LLC) so that we can develop the plan as efficiently as possible.

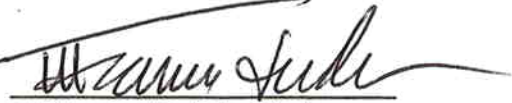
After discussions with representatives for the Town of Falmouth, we will work cooperatively on the groundwater modeling project for the shared watershed as proposed for grant funding by the Town of Falmouth. The Town of Falmouth is the Project Applicant and the Town of Mashpee will collaborate and support the Town of Falmouth.

We plan to complete our CWMP during 2008 and the timing of this grant program will assist us greatly in meeting our goal.

Thank you and the entire Collaborative for assisting us in this effort.

Very sincerely yours,

Town of Mashpee
Sewer Commission



F. Thomas Fudala, Chairman



Donald Desmarais

Matthew Berrelli