TOWN OF DUXBURY

DEPARTMENT OF PUBLIC WORKS
TOWN OFFICES
878 TREMONT STREET
DUXBURY, MASSACHUSETTS 02332

1034 MAY - 1

THOMAS E. DALEY, P.E.
Director of Public Works

Telephone (781) 934-1112
(781) 934-6586
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4/27/06

United States Environmental Protection Agency
Water Technical Unit
P.O. Box 8127
Boston, MA 02114

Massachusetts Dept. of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, MA 01608

Re: Annual NPDES General Permit for MS4's Report
Permit Number: MA041034/MaDEP Transmittal Number: W114295

To Whom It May Concern:

I hereby am filing the above referenced report on behalf of the Town of Duxbury, MA. This report is structured per the General Permit requirement, Part II F (see attachment "A").

a) The following is a self-assessment review of compliance with the permit conditions. To assist I have attached the Town of Duxbury's Implementation Schedule (attachment "B") and our Program Summary (attachments "C").

1. Public Education

1A. Drainage Posters in Schools and Public Buildings
Completed in April of 2004 (4/28/04 report).

1B. Stencil Catchbasins
In 2005, a Boy Scout came forward and received approval from the Scouting Council to install markers adjacent to our catchbasins that say "Don't pollute. Flows to Waterways" for his Eagle Scout project. Due to weather conditions in the Fall and Winter, the Scout was delayed but has begun the project as of this writing. To date, I estimate he has installed several hundred markers in areas along the Duxbury Bay. He is going to continue each weekend until he uses all of the markers that were purchased (500). See attachments "D", "E" and "F".

1C. Pamphlets in Water Bills
In May and October of 2005, pamphlets (see attachment "G") were inserted into our water bills to approximately 5,500 customers.

1D. Educational Material on Web-Site
In the Fall of 2005 the Duxbury Bay Commission posted the Duxbury Bay Management plan on the Town web-site. The Planning Dept. has posted their Rules's & Reg.'s, including Zoning Bylaws on the Town's web-site. All of the above items contain stormwater information and regulations. The Conservation Commission's page contains links to EOEA, Coastal Zone Management, the Mass. DEP, USEPA, Dept. of Fish, Wildlife and Environmental Law Enforcement. The Conservation Commission web-site contains their Bylaws, Regulations, forms, policies, etc. The Harbormaster's web-site contains links to the Mass. Environmental Police, US Coast Guard and other entities. The Harbormaster's web-site contains the MGL, Chapter 90B (Motorboat Laws), Rules and Reg.'s for Duxbury Waterways, Duxbury Beach Rules and Reg.'s and the Duxbury Beach Dog Rules. All of which in some way have to do with water quality. The Board of Health's web-site posts the water quality testing results for the beaches and any relevant closings.

1E. Educate Community Groups
The Town of Duxbury Conservation Agent, Joe Grady is participating in and is on the steering committee for the Watershed Action Plan for the south coastal watershed, being funded by the EOEA. This group has held educational workshops for the public, they are working on proposed bylaws, regulations and other public education and public participation projects.

2. Public Participation

2A. Stencil Catchbasins
See 1B. above.

2B. Planning Board and Planning Director work on water quality goals
Every year the Planning Director and Planning Board meet to review the Subdivision Rules & Regulations including stormwater quality issues. This year they added via zoning bylaw the requirement for review of projects by the Duxbury Bay Commission. The Planning Board also added language into the Subdivision Rules & Reg.'s, site plan review requirements and Planning Board Special Permit requirements the need to adhere to the NPDES.

2C. Paint Day Collections
The D.P.W. has hosted Paint Day Collections on every 3rd Saturday of the month from April to October, 2005 and have resumed in April of 2006.

2D. Open Space & Rec. Committee

The Open Space & Rec. Committee meet regularly and have currently been working on maintaining open space areas which preserves water quality, maintains watersheds and promotes interest in preserving Duxbury's open space areas. They sponsor Earth Day, trail days and other pertinent events. They are also currently planning on updating and rewriting the Duxbury Open Space Plan.

2E Community Preservation Committee

The CPC meets regularly and is purchasing through Town Meeting additional agricultural (60 acres) land in the South River Watershed. Previous funds appropriated have now been used to finalize the purchases of the Jaycox Tree Farm and Cushing property.

3. Illicit Discharge Detection and Elimination

3A. Map Drainage System

Although not due until 2007, the Town has began initial plan preparation with consultants to create a drainage map layer for our GIS system. At the time of this writing, the Town has received a grant from Coastal Zone Management to study outfalls coming from the Bay Rd. area and flowing into the Kingston Bay. The Town has contracted with a consultant to track down all of the outfalls and connecting watersheds. As part of this work a drainage map of this area will be corrected.

3B. Coord. with the Div. of Marine Fisheries on Testing Bay Outfalls

The Conservation Agent continues to coordinate with the Div. of Marine Fisheries to perform annual water quality testing in the Duxbury and Kingston Bays. Attachments "H" and "I" are the reports for this last year.

3C. Investigate Pollution Hot Spots as needed via Test Results

The Div. of Marine Fisheries notified the Board of Health in 2005 about three potential locations of illicit discharges in the Powder Point Area. As a result a pipe coming from roof drains was removed, a failed septic system is in the process of being upgraded and an individual who was living in a cabin without any facilities has been evicted. Attachment "I" talks about a couple of outfalls that the Conservation Agent has investigated and has determined that they are of no issue. Also see 3A. above.

3D. Stencil Catchbasins

See 1B. above.

3E. Paint Day Collections
The D.P.W. has hosted Paint Day Collections on every 3rd Saturday of the month from April to October, 2005 and have resumed in April of 2006.

4. Construction Site Runoff Control

4A. Proposed Zoning Changes re: drainage quality to Town Mtg.
Completed in March of 2003 (4/28/04 report).

4B. Proposed Conservation Commission Bylaw Changes to Town Mtg.
Completed in March of 2003 (4/28/04 report).

4C. Projects Reviewed by Development Review Team (DRT)
The DRT meets very regularly and always discusses stormwater issues. A representative is in attendance from each Town Dept.

4D. Review and Update Subdivision Rules & Reg.'s re: drainage BMP's.
Completed in November of 2004 (4/27/05 report).

4E. Enforce Approvals by Regulatory Authorities
Enforcement is an on-going process by all permitting authorities. Checks and balances are in the system such as as-built plans, certificates of compliance, occupancy permits, bonds, etc.

5. Post Construction Runoff Control

5A. Review BMP Operation Manuals
It is standard operating procedure for the Conservation Agent and Commission to review applicants Stormwater Operation and Maintenance Plans.

5B. DRT review of BMP Operation Manuals
It is standard operating procedure for the DRT to require and review applicants Stormwater Operation and Maintenance Plans.

5C. Maintain BMP's of Projects Accepted by the Town
As soon as a project (usually a street) is accepted it is added to the street sweeping, catchbasin cleaning, BMP monitoring (typically detention ponds) lists.

5D. Require Annual Maintenance / Inspection reports for regulated projects
It is standard operating procedure for all regulatory authorities to request Maintenance / Inspection reports for regulated projects.

5E. Bylaw to Town Meeting
The Town of Duxbury along with the Town's of Plymouth and Marshfield received a grant in 2004 to hire a consultant and to create a model drainage bylaw. The committee of three Town's and the consultant have met many times. Currently there is a proposed draft bylaw awaiting Town Meeting action.

5. Post Construction Runoff Control Extras

5G. Revised Conservation Rules and Regulations
In March of 2006 after many months of work the Conservation Commission adopted new Rules and Regulations.

6. Municipal Good Housekeeping

6A.& 6B. **(beyond NPDES permit requirement)** Snug Harbor Drainage

The Town of Duxbury received a grant from Coastal Zone Management to install stormwater management facilities in the Snug Harbor area. The Town contributed about $50,000 of in-kind money and services. The contract was executed and construction was completed in June of 2005.

The goal of the project was to mitigate stormwater from municipal roadways that was currently impacting the receiving water of Snug Harbor and threatening commercial and recreational shellfish beds as well as aquaculture resources. The project was a priority site for the Shellfish Clean Water Initiative and the engineering design was part of a stormwater retrofit demonstration project by Coastal Zone Management.

The project employed stormwater Best Management Practices (BMP's) and the location within Duxbury Bay is listed on the Division of Marine Fisheries FY 2005 Priority Areas list. The plans were developed by a multi-stakeholder-working group consisting of officials from the Town of Duxbury, Coastal Zone Management, Massachusetts Bays Program, Natural Resource Conservation Service and neighboring property owners.

6D. Sweep Streets
We swept the Town's streets between March and November of 2005. We began sweeping again in March of 2006. There is an on-going as needed sweeping process throughout the year. In 2005, the Town Meeting funded $120,000 and we purchased a new street sweeper to keep up this valuable program.

6E. Clean Catchbasins

This past year our catchbasin cleaning operation has suffered significantly. The catchbasin cleaner has a cracked frame and is not road worthy. We are currently looking at replacing the truck as quickly as possible and also other cleaning alternatives.

6F. Staff Training

Initially completed and noted in an addendum to the 4/27/05 report. However, please note that in the past year the Planning Board, Planning Director and Conservation Agent have attended a workshop hosted by the Noth and South River Watershed Association to train them on low impact developments. The Planning Director also regularly attends planning workshops on stormwater quality issues.

b) BMP Appropriateness Assessment

We are pleased with the BMP's selected and their results. Street sweeping and catchbasin cleaning are a staple of a good program. Duxbury has had and continues to improve our regulatory authority to ensure no adverse affects on the environment. Duxbury has adopted the CPA and is very proactive at buying and maintaining open space. Duxbury has a very involved and interested group of volunteers on its committees. We also have close relationships with the relevant state authorities. Duxbury has very successful Paint Day, Hazardous Material and Recycling Programs. The public is well educated and open to new ideas. Our increased public education efforts have received positive comments.

c) Progress Towards Measurable Goals Assessment

I think we are making great progress. We have put out public awareness information and have spoken to local groups. We have implemented more environmental regulations. Our Paint Day and Hazardous Waste Day Collections are a continued success. The Division of Marine Fisheries continues to test Duxbury Bay. Our DRT continues to support the Local Boards with the regulation of proposed projects.

d) Test Results

Attachments "H" and "I" are our results from the Division of Marine Fisheries &Wildlife and local testing.

e) Next Reporting Cycle

Our on-going activities shall remain for the next cycle. The Waterhed Action Plan will continue to be worked on. Our catchbasin stenciling will be complete. We are already ahead on our drainage mapping.

f) Changes to BMP's and Goals

No changes have been discussed or are proposed at this time.

g) Reliance on Other Entities

The Town relies significantly on the Division of Marine Fisheries &Wildlife for the testing they do in Duxbury Bay.

I hope the above information is informative. Please do not hesitate to call if you have any questions.

Sincerely,

Thomas E. Daley, P.E.
D.P.W. Director

Cc: Town Manager
Operations Manager
Conservation Agent
Planning Director
Director of Inspectional Services
Health Agent

E. Record Keeping

1. All records required by this permit must be kept for a period of at least five years. Records include information used in the development of the storm water management program, any monitoring, copies of reports, and all data used in the development of the notice of intent.

2. Records need to be submitted only when specifically requested by the permitting authority.

3. The permittee must make the records relating to this permit available to the public, including the storm water management program. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests.

F. Reporting

1. The permittee must submit an annual report. The in itial report is due one year from the effective date of this permit and annually thereafter. The reports s hould contain information regarding activities of the previous calendar year. Reports should be submitted to both EPA and MA DEP at the following addresses:

United States Environmental Protection Agency
Water Technical Unit
P.O. Box 8127
Boston, MA 02114

and

Massachusetts Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, Massachusetts 01608

2. The following information must be contained in the annual report:

(a) A self assessment review of compliance with the permit conditions.

(b) An assessment of the appropriateness of the selected BMPs.

(c) An assessment of the progress towards achieving the measurable goals.

(d) A summary of results of any information that has been collected and analyzed. This includes any type of data.

(e) A discussion of activities for the next reporting cycle.

(f) A discussion of any changes in identified BMPs or measurable goals.

(g) Reference any reliance on another entity for achieving any measurable goal.

A

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Watershed Management

BRP WM 08A NPDES Stormwater General Permit Notice of Intent
for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s)

F. Example Storm Water Management Program TIME FRAMES

Transmittal Number 114295

Facility ID (if known)

	PERMIT YEAR ONE				PERMIT YEAR TWO				PERMIT YEAR THREE				PERMIT YEAR FOUR				PERMIT YEAR FIVE				
BMP ID #	Spring 03	Summer 03	Fall 03	Winter 03-04	Spring 04	Summer 04	Fall 04	Winter 04-05	Spring 05	Summer 05	Fall 05	Winter 05-06	Spring 06	Summer 06	Fall 06	Winter 06-07	Spring 07	Summer 07	Fall 07	Winter 07-08	Next Permit
1A			X																		
1B					X																
1C									X												
1D											X										
1E		X				X				X				X				X			
2A					X																
2B																					
2C																					
2D																					
2E																					
3A																					
3B	X																				
3C																					
3D					X																
3E																					
3F													X								
4A	X																				
4B	X																				
4C																					
4D								X													
4E																X					
5A																					
5B																					
5C																					
5D																					
5E											X										
6A																					
6B		X																			
6C																					
6D																	X				
6E																					
6F															X						

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Watershed Management

BRP WM 08A NPDES Stormwater General Permit

Notice of Intent for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s)

114295
Transmittal Number

Facility ID (if known)

D. Stormwater Management Program Summary

1. Public Education:

BMP ID #	Specify Best Management Practice	Responsible Dept./Person Name	Specify Measurable Goal
1A	Put up posters in schools and Town buildings.	DPW Dir. / School Business Mgr.	Install posters in public buildings
1B	Stencil catchbasins	DPW Dir. / citizen groups	Stencil every catchbasin leading to waters of the U.S.
1C	Pamphlets in water bills	DPW Dir. / Water Supt.	Circulate info to 5,500 +/- customers
1D	Educational mat'l on web-site	DPW Dir. / Dept. Web Mgr.	Provide on-line education
1E	Educate Commmunity Groups, ie., Garden Club	Conservation Agent	Conduct one seminar / year

2. Public Participation:

BMP ID #	Specify Best Management Practice	Responsible Dept./Person Name	Specify Measurable Goal
2A	Stencil catchbasins	DPW Dir. / citizen groups	Stencil every catchbasin leading to waters of the U.S.
2B	Comp. Plan, Zoning Bylaw Implementation Committee	Planning Bd. / Planning Dir.	Maintain committee and work on water quality goals
2C	Paint Day Collections	DPW Dir. / Operations Manager	Hold 4 paint disposal days / yr.
2D	Open Space & Rec. Comm.	Board of Selectmen / Town Mgr.	Maintain committee and work on water quality goals
2E	Community Preservation Comm.	Board of Selectmen / Town Mgr.	Maintain committee and work on water quality goals

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D. Stormwater Management Program Summary (Cont.)

3. Illicit Discharge Detection and Elimination:

3A BMP ID #		
Map drainage system Specify Best Management Practice	DPW Dir. / GIS Comm. Responsible Dept./Person Name	Know approx. location of all outlets leading to waters of US
3B BMP ID #		
Coord. w/ Div. Marine Fish. on testing Dux. Bay outfalls	Con. Agent / BOH Agent Responsible Dept./Person Name	Maintain testing of Dux. Bay Specify Measurable Goal
3C BMP ID #		
Investigate pollution hot spots as needed via test results	Con. Agent / BOH Agent/ DPW Dir.	Find any hot spots found leading to waters of US.
3D BMP ID #		
Catchbasin stenciling Specify Best Management Practice	DPW Dir. / Citizen Groups Responsible Dept./Person Name	Stencil every catchbasin leading to waters of the U.S.
3E BMP ID #		
Paint Day Collections Specify Best Management Practice	DPW Dir. / Operations Mgr. Responsible Dept./Person Name	Hold 4 paint disposal days / yr. Specify Measurable Goal
3F – Illicit discharge Regulation	DPW Dir./ Concom&BOH Agent	Bring regulation forward to Regulatory authority

4. Construction Site Runoff Control:

4A BMP ID #		
Prop. Zoning changes re: drainage quality to Town Mtg.	Comp. Plan, Zoning Bylaw Implementation Committee	Put forth article to Town Mtg. Specify Measurable Goal
4B BMP ID #		
Prop. changes re: drainage to Conservation bylaw Town Mtg.	Cons. Comm. / Agent Responsible Dept./Person Name	Put forth article to Town Mtg. Specify Measurable Goal
4C BMP ID #		
Projects reviewed by DRT (Development Review Team)	Planning Dir. / Dept Heads Responsible Dept./Person Name	Provide comments to reg. auth. on all regulated projects.
4D BMP ID #		
Review & update Subd. Rules & Reg.'s re: drainage BMP's	Planning Dir. / DPW Dir/ Planning Board	Review & update as needed biannually
4E BMP ID #		
Enforce all approvals by Regulatory Authorities	Plng Dir. / BOH Agt / Concom Agt / ISD Dir. / DPW Dir.	Projects not signed off on unless properly constructed.

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Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Watershed Management

BRP WM 08A NPDES Stormwater General Permit

Notice of Intent for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s)

114295
Transmittal Number

Facility ID (if known)

D. Stormwater Management Program Summary (Cont.)

5. Post Construction Runoff Control:

5A BMP ID #		
Review BMP Operations manuals as part of Concom	Conservation Agent / Cons. Comm.	All regulated projects have adequate O & M plan.
5B BMP ID #		
Require & review BMP Oper. manuals re: DRT reviews	Planning Dir. / Dept Heads Responsible Dept./Person Name	All regulated projects have adequate O & M plan.
5C BMP ID #		
Maintain drainage BMP's on projects taken over by Town.	DPW Dir. / Operations Mgr. Responsible Dept./Person Name	Maintain functioning of BMP's Specify Measurable Goal
5D BMP ID #		
Req. annual maint./ insp. reports from regulated projects	Plng Dir. / BOH Agt / Concom Agt / ISD Dir.	Implement requirement Specify Measurable Goal
5E BMP ID #		
Submit bylaw to Town Mtg. re: BMP's for projects > 1 acre	Plng Dir. / BOH Agt / Concom Agt / ISD Dir. / DPW Dir.	Put forth article to Town Mtg. Specify Measurable Goal

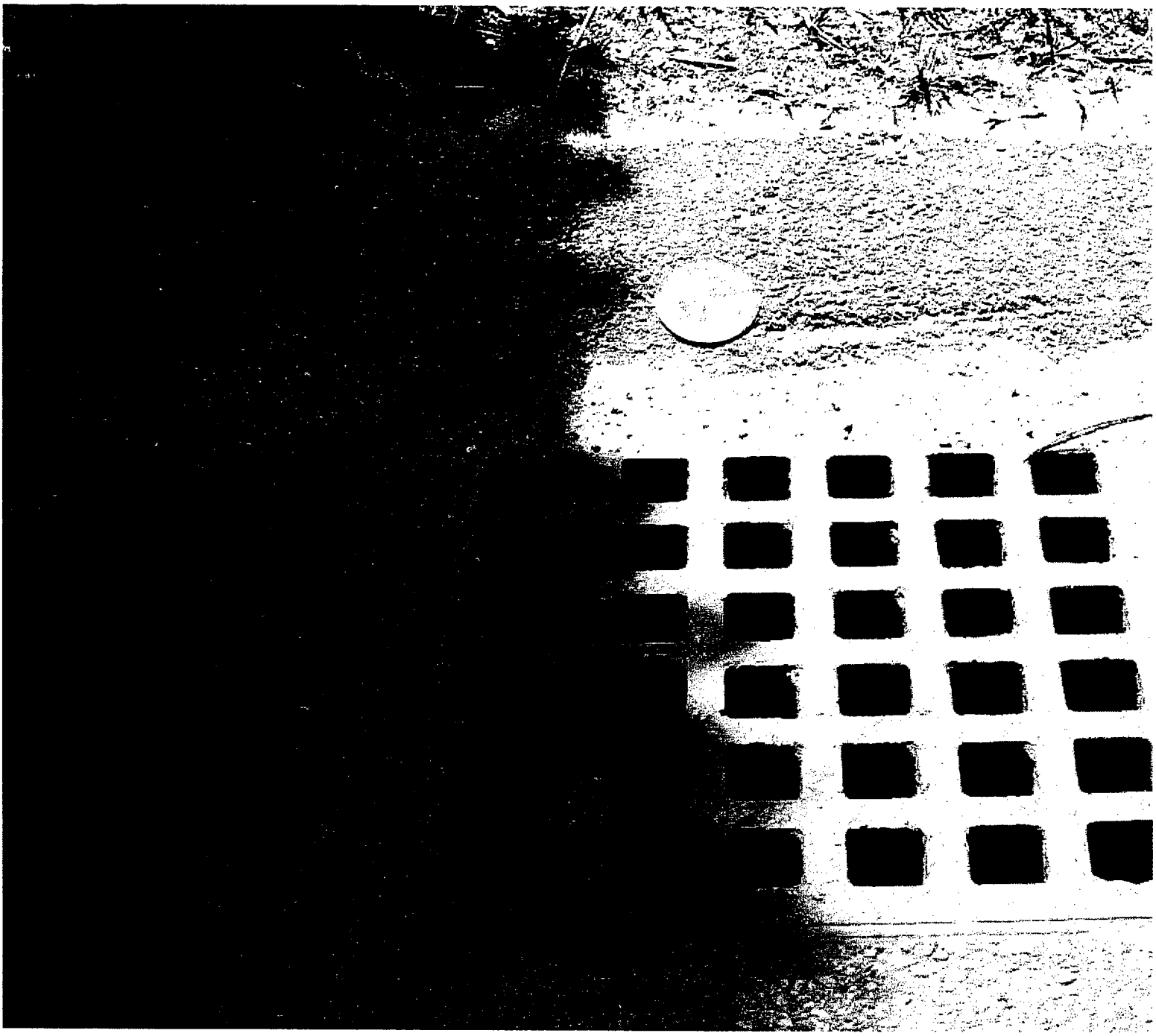
6. Municipal Good Housekeeping:

6A BMP ID #		
Coord. w/ CZM to finalize dsgn on Snug Harbor BMP project	Concom Agent / DPW Dir. Responsible Dept./Person Name	Obtain final design plans. Specify Measurable Goal
6B BMP ID #		
Solicit grant from CZM to construct Snug Harbor project	Concom Agent Responsible Dept./Person Name	File for grant. Specify Measurable Goal
6C BMP ID #		
Implement Maintenance Sched. for Town owned BMP's	DPW Dir. Responsible Dept./Person Name	Distribution of schedule Specify Measurable Goal
6D BMP ID #		
Sweep Streets Specify Best Management Practice	DPW Dir. / Operations Mgr. Responsible Dept./Person Name	Sweep all streets that outfall to waters of the US annually.
6E BMP ID #		
Clean catchbasins Specify Best Management Practice	DPW Dir. / Operations Mgr. Responsible Dept./Person Name	Clean all CB's that outfall to waters of the US annually
6F – Staff training	DPW Dir.	Conduct class for all DPW re: NPDES and illicit discharges

"C-3"

D

"E"



"F"

HELP KEEP OUR WATERS CLEAN!!!

Water pollution can occur when water runs over land or through the ground, picks up contaminants and deposits them in a stream, river, lake, bay or even in the groundwater.

This is one of the largest sources of water pollution!!!

It's called "nonpoint source water pollution" or "polluted runoff".

How can you help:

1) Place sprinklers so that water goes only on the lawn, instead of watering the street or sidewalk. Water during the cool parts of the day, such as early morning. Saves water too!

2) Slow down runoff by diverting it off of pavement and into grassy, planted areas.

3) Gutters and down spouts should drain onto vegetated or gravel seepage areas – not directly onto paved surfaces. Splash blocks can help prevent erosion.

4) Use natural alternatives to chemical fertilizers and pesticides. Do not apply fertilizers or pesticides prior to or during heavy rains due to the likelihood of runoff. Wastes money also!

5) Maintain your septic system. Failed systems release bacteria and excessive nutrients into the groundwater and nearby surface waters.

6) Dispose of Hazardous Waste properly. Septic systems are not made to tolerate chemicals, so don't flush them down the drain.

7) NEVER pour chemicals onto the ground (soils can't purify them).

8) Use low-phosphate or phosphate-free detergents and water-based products whenever possible.

9) Use a Pooper Scooper. The bacteria from animal waste, if left in the road, readily pollutes stormwater.

10) Never put oil or chemicals in a storm drain. **1 quart of oil pollutes 2 million gallons of drinking water!!!**

Triennial Report for Duxbury Bay (CCB45)
In the Towns of Duxbury and Plymouth

Date: December 31, 2006
By: Neil Churchill
Date of Last Sanitary Survey: December 16, 1996
Date of Last Re-evaluation or Triennial: January 5, 2003

RESPONSES TO RECOMMENDATIONS OF LAST REPORT

1. No change in classification areas. *Done.*

AREA DESCRIPTION

DUXBURY BAY
CCB45

The waters, flats and all tributaries of Duxbury Bay in the Towns of Duxbury and Plymouth, north of a line drawn from the southern tip of Goose Point in the Town of Duxbury to the southwest tip of Saquish Head in the Town of Plymouth; south of a line drawn across the mouths of the Bluefish River and Back River in the Town of Duxbury (4619 acres Figure #1).

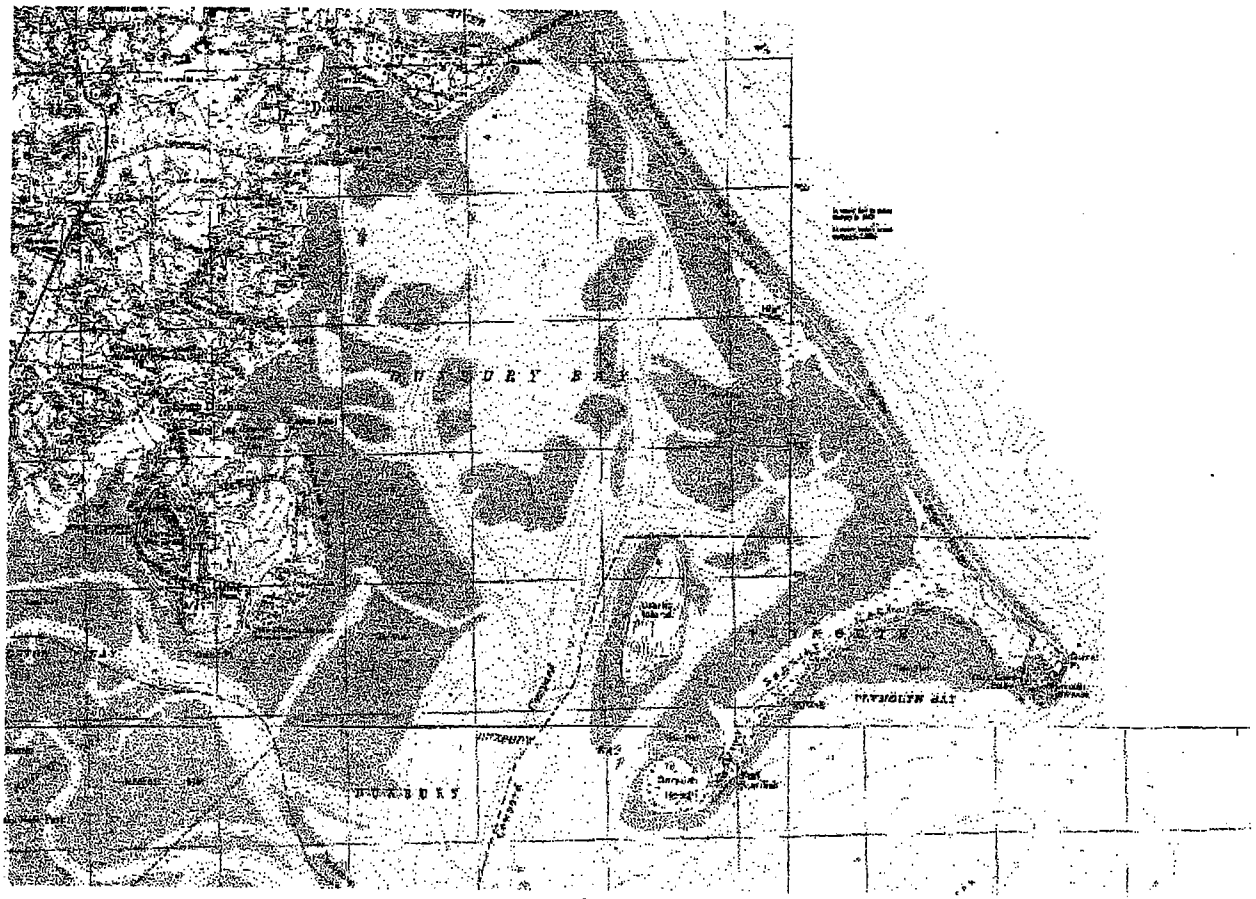


Figure #1

H-1

AREA CLASSIFICATIONS
CLASSIFICATION: CONDITIONALLY APPROVED
STATUS: OPENED TO SHELLFISHING
[OCT 1 TO MAY 31]
[ALL DATES INCLUSIVE]

Eagle Nest Bay
CCB45.2

"The waters and flats of that portion of Eagle Nest Bay in the Town of Duxbury westerly of a line drawn from Hardin Hill Road Landing to Eagle Nest Point and easterly of a line drawn across the Cove from the end of the O'Neil dock to the end of the Nichols dock on the opposite shore."

PROHIBITED
STATUS: CLOSED TO SHELLFISHING

Eagle Nest Bay
CCB45.1

"The waters and flats of that portion of Eagle's Nest Bay and Eagle Nest Cove in the Town of Duxbury southwest of a line drawn across the Cove from the end of the O'Neil dock to the end of the Nichols dock on the opposite shore."

PROHIBITED
STATUS: CLOSED TO SHELLFISHING

Duxbury Marine
CCB45.3

"The waters and flats of that portion of Duxbury Bay in the Town of Duxbury west of a line drawn from of the end of Duxbury Marine Pier to Bayside Point."

CLASSIFICATION: APPROVED
STATUS: OPENED TO SHELLFISHING

CCB45.0

The waters, flats and all tributaries of Duxbury Bay in the Towns of Duxbury and Plymouth, north of a line drawn from the southern tip of Goose Point in the Town of Duxbury to the southwest tip of Saquish Head in the Town of Plymouth; south of a line drawn across the mouths of the Bluefish River and Back River in the Town of Duxbury and west of a line drawn from of the end of Duxbury Marine Pier to Bayside Point and easterly of a line drawn from Hardin Hill Road Landing to Eagle Nest Point and westerly of a line drawn across the Cove from the end of the O'Neil dock to the end of the Nichols dock on the opposite shore."

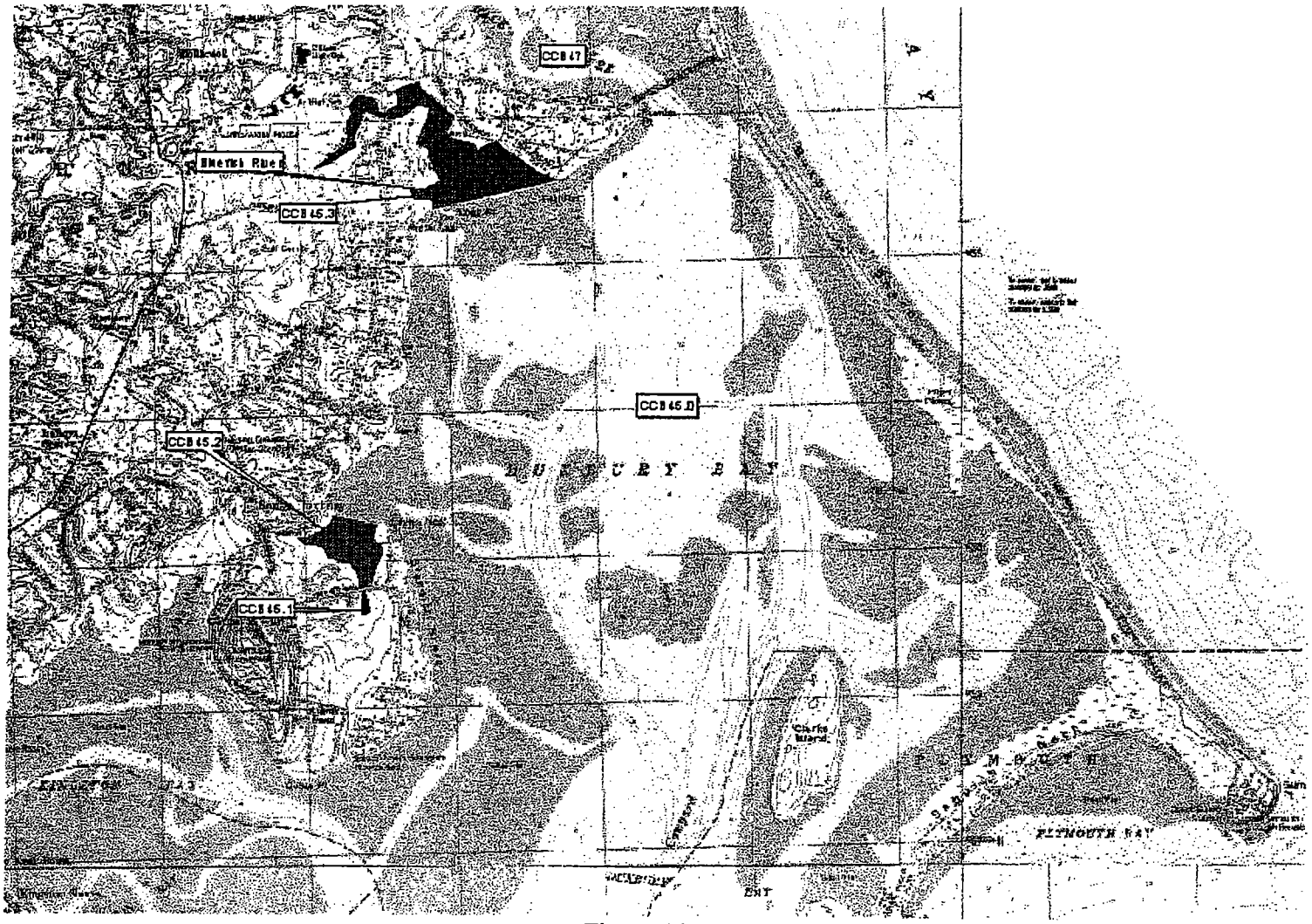


Figure #2
PREDOMINANT LAND USE

Duxbury Bay, located in the Towns of Duxbury and Plymouth, is the northernmost of the three bays within the Plymouth Harbor, Kingston Bay, Duxbury Bay complex (Figure 2). Three tidal rivers enter the bay. The largest is the four hundred acre Back River (CCB47 classified as Approved/Open) at the northern end of the bay. Back River is not a true river system but is actually part of the bay which has been segregated by the Powder Point Bridge. Back River serves as the drainage area from the Duxbury Marsh.

The other two rivers, the Bluefish River and Eagle Nest Creek, are quite small in comparison to the Back River. The Bluefish River (CCB46), located in the northwest section of the bay, has multiple growing area classifications. The portion of the river abutting Duxbury Bay is classified as "Conditionally Approved" with an open status from November 1st to April 30th. Eagle Nests Creek (CCB45.1) enters the bay in the southwest portion of the growing area. The creek is currently classified as "Prohibited" and is separated from Duxbury Bay by the seasonally classified Eagles Nest Bay (CCB45.2).

The eastern shoreline of the bay is a barrier beach used by the Town of Duxbury as a recreation and conservation area. There are no dwellings on the Duxbury portion of the beach. Saquish Neck and Saquish Head, at the southern end of the barrier beach in the Town of Plymouth, are large summer colonies. Most of these houses are located on the south facing beach and face towards Plymouth Harbor (CCB42) growing area; however, about fifty houses

border the Duxbury Bay growing area. The buildings are built along the shorefront and tend to be located close to the mean high water mark.

Clarks Island, situated in the Town of Plymouth, is a relatively large island in the southeast portion of the bay west of Saquish Neck. The island has more than a dozen houses, several of which serve as year round dwellings. These houses are on large lots and are situated away from the shore.

The western shoreline of the bay is a combination of seasonal and year round dwellings. The northwest portion of the bay is the focus of Duxbury's village and boating activity. The town's boat ramp, Harbormaster Office and mooring fields are located in this portion of the bay known as Snug Harbor. This is also the locus of Bayside Marine, the Duxbury Yacht Club and the Duxbury Maritime School.

Dwellings along the shore south of Snug Harbor to Standish Shores at situated on large lots and are placed well upland of the mean high water mark. According to the Board of Health most of these houses have Title V septic systems.

SHELLFISH RESOURCES

Soft shelled clams (Mya arenaria) and razor clams (Ensis directus) can now be found in commercial quantities on the large intertidal flats along most of the shoreline throughout the bay. Quahogs (Mercenaria mercenaria) are also found in the deeper waters and on many of the numerous tidal flats throughout the bay. Bay scallops (Argopecten irradians) have also been found on these flats.

As of this date there are 23 shellfish aquaculture lease sites in operation in the bay raising american oysters (Crassostera virginica) on a total of 57 acres. .

SUMMARY OF SHORELINE SURVEY

The shoreline survey was conducted of November 22 and 23, 2005 by Jake Emerson of the Duxbury Harbor master office and author. Pollution sources (PS) #6 and #8 (pipes at Bayside Marina) could not be located; the marina owners reported that they were removed when the marina area was rebuilt. PS#11 (pipes north of Winsor Wharf) could not be located. PS#25 (pipes at Massasoit Road) the one 6" steel and the one 6" clay pipes were removed and a new 6" blue PVC pipe was installed. Two new potential new sources were located north of Hardin Hill Road. An address for the residence could not be located, (See Figures 3 and 4).

Figure #3

Figure #4

The information on the two sources was turned over the town Conservation commission agent. There was no flow from the two pipes. At the Battelle laboratory dock a four inch gray PVC pipe was found flowing at the top of the seawall. It was determine to be the overflow pipe from the Battelle salt water pumps. The second smaller pipe is as drainpipe from the concrete parking pad next to the dock. (See Figure #5)

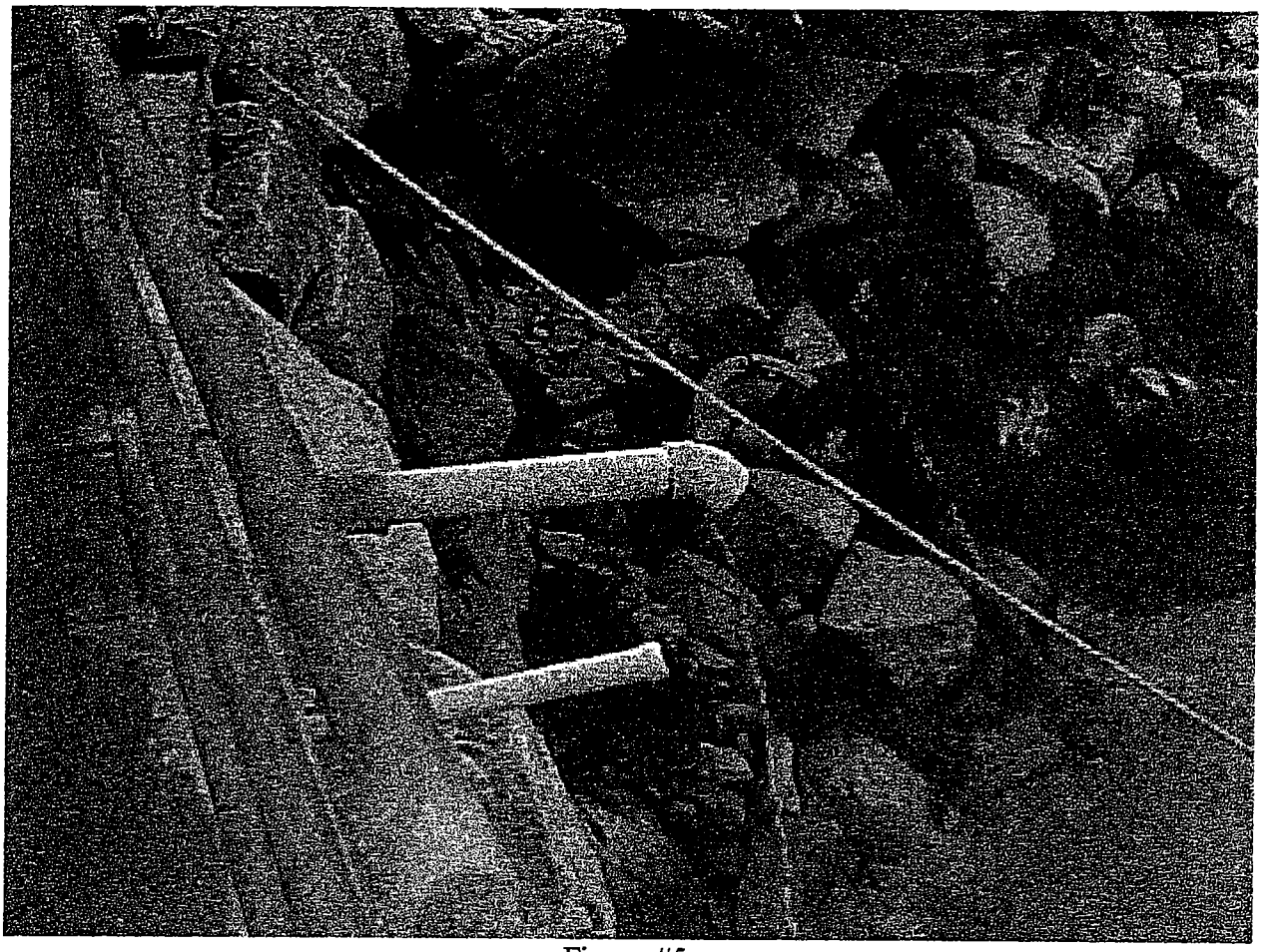


Figure #5

Table #1

Pollution source samples were taken on November 22 following a two inch rain fall.

PS ID	Location	Fecal Count	Salinity
7	Marsh north of Bayside Marina	>1,000	0
10	Battelle Labs Seawater Discharge	<10	28
	Runoff from marsh behind Battelle Labs	100	4
21	100 yards south of Bradford St	>1,000	0
22	Storm drain north of Samoset Rd	860	0
23	Samoset Rd	710	0
	Shipyard Lane Runoff	110	0
	Pipe at Battelle Labs boat dock	<10	28
26	Water St	180	0
	Pipe at PS26	30	0

Table #2

Pollution source samples were taken on November 30 following an one inch rain fall.

PS ID	Location	Fecal Count	Salinity
7	Marsh north of Bayside Marina	500	Not readable

21	100 yards south of Bradford St	400	0
23	Samoset Rd	900	0
25	Massasoit Road	1300	0
	Spring next to PS#25 – pipe in seawall	<10	0
26	Water St	100	0

Table #3
Samples taken on November 30 within 10 and 50 feet of pollution sources.

Location	Fecal Count	Salinity
Within 10 feet of PS#21	>50	29
Within 50 feet of PS#21	>50	28
Within 10 feet of PS#23	>50	29
Within 50 feet of PS#23	>50	29
Within 10 feet of PS#25	14	29
Within 50 feet pf PS#25	>50	29
Within 10 feet of PS#26	6	28
Within 50 feet of PS#26	4	28

METEOROLOGIC AND HYDROGRAPHIC INFLUENCES

The area experiences semi-diurnal tides with a range of eight to twelve feet. A study conducted by Boston University estimated that Duxbury Bay has a tidal exchange of nearly 70 percent on each tide. Water depths range from inter-tidal on the bay's many flats to a maximum low tide depth of twenty-five feet at the main channel.

Rain events and storm water runoff are beginning to impact part of the bay which is along the south-eastern edge of Goose Point in the areas of PS#21 through PS#24. An inactive classification station at this location will be re-activated to monitor the water quality for this area.

Those areas which are affected by rainfall, Bayside Marine and Eagles Nest Creek, are currently classified as "Prohibited". The rest of the bay appears not to be effected by rainfall at the moment.

The season of the year appears to have an effect of the water quality in Eagles Nest Bay. This area is currently classified as "Conditionally Approved" with a closed status during the summer months. Harvest is allowed from October until June each year. The cause of the seasonal poor water quality in the creek is unknown.

ANALYSIS OF WATER QUALITY

A. Methods:

Procedures and methods relative to sampling, transport and analysis of water shellfish samples are outlined in the NSSP Model Ordinance. Water samples were collected in sterile Nalgene bottles and transported in temperature controlled carriers to the Division laboratory at the Pocasset office. Water samples were analyzed using the A-1 modified MPN procedure.

Surface water temperatures were recorded using pocket thermometers with surface salinities being recorded at the Division laboratory using refractometers.

B. Sampling Rationale:

The sampling criterion for this area is to sample under adverse (i.e. after rainfall, during the ebbing tide) conditions. The area has eleven classification stations and a classification station was re-activated on 12/15/05 near Goose Point. (See Figure #6)

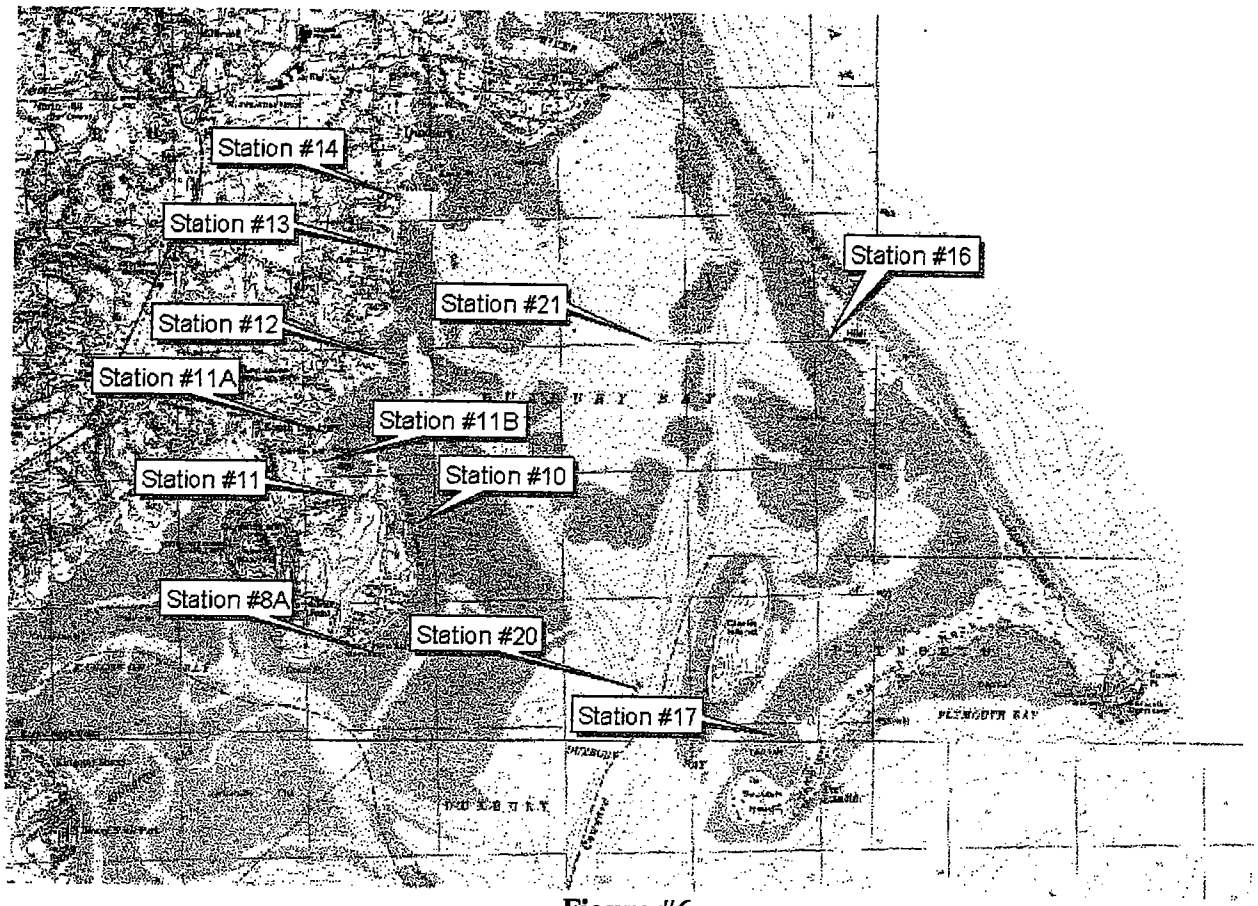


Figure #6

ANALYSIS OF WATER QUALITY
Table #4
Sampling of CCB45.0 under all weather conditions and year-round

Station #	Location	Geo. Mean	%Var	N
10	Bradford Street	3..7	0.0	15
11A	Hardin Hill	3.0	6.6	15
12	Shipyard Lane	4.3	6.6	15
13	Map	3.5	0.0	15
14	Duxbury Yacht Club	5.0	6.6	15
16	High Pines	2.0	0.0	15
17	Saquish Head Cove	2.3	0.0	15

20	Cow yard Buoy #6	2.1	0.0	15
21	Middle of the Bay	2.5	0.0	15

Table #5
Sampling of CCB45.2 under all weather conditions
CLASSIFICATION: CONDITIONALLY APPROVED
STATUS: OPEN TO SHELLFISHING
[October 1 TO May 31]
[ALL DATES INCLUSIVE]

Station #	Location	Geo. Mean	%Var	N
11B	Eagle Nest Cove Pier	3.6	0.0	15

Table #6
Sampling of CCB45.1 under all weather conditions
PROHIBITED
STATUS: CLOSED TO SHELLFISHING

Station #	Location	Geo. Mean	%Var	N
11	Eagle Nest Creek	6.1	6.6	15

DISCUSSION/CONCLUSIONS

The classification stations both in the approved and conditionally sections of CCB45 show good to excellent water quality. All classification stations in the approved area meet the NSSP requirements for approved classification. The conditionally approved area meets the NSSP requirements for during the open season. The results for the rainfall testing show a potential problem along the southeast section of Goose Point. Over the next 12 months the pollution sources and the waters adjacent to the sources will sampled after rain events. And if necessary, this section will be placed under closed to shellfishing.

RECOMMENDATIONS

1. No change in classification or status of the area.

2. Sampling of pollution sources 21 through 24 after rain events.

ANNUAL REVIEW OF THE CONDITIONALLY AREA KINGSTON BAY, CENTER CCB43.4 IN KINGSTON BAY IN THE TOWNS OF DUXBURY AND KINGSTON

Date: August 31, 2005
By: Neil Churchill
Date of Last Sanitary Survey: July 19, 2002 and August 19, 2002
Date of Last Annual Report: August 31, 2004
Responses to Recommendations of report:

1) Continue sampling the conditional area when open to shellfishing. *Done*

2) Continue to collect and analyze winter data to determine if a year round rainfall conditional or winter seasonal may be possible. *Still working on it.*

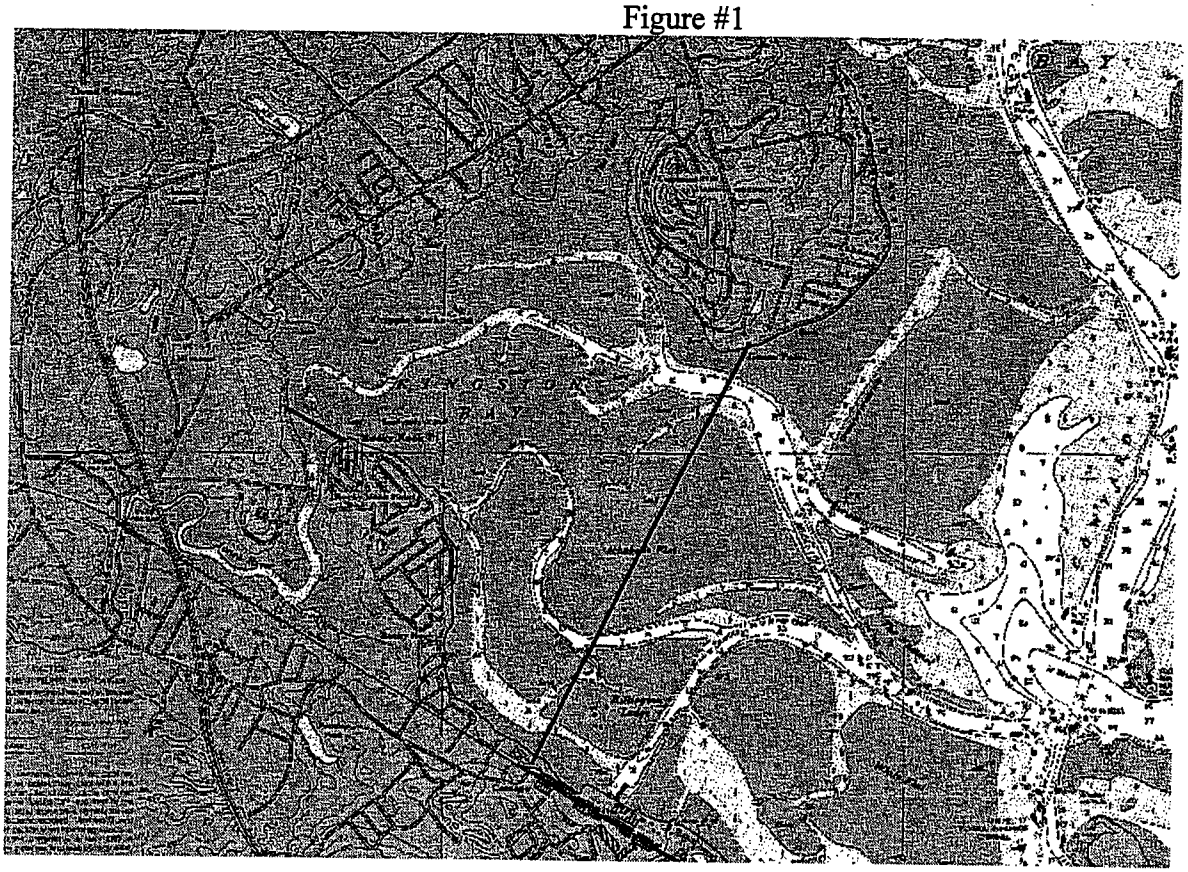
Current Status of Area: Approved/Conditionally Approved/Prohibited

AREA DESCRIPTION

Kingston Bay
CCB43

"The waters, flats and all tributaries of Kingston Bay in the Towns of Duxbury and Kingston, north of a line drawn from the Kingston/ Plymouth town marker at Boundary Lane to the southern tip of Goose Point in the Town of Duxbury and easterly of a line drawn across the entrance of the Jones River (CCB:44)." (1,252 acres).

Figure #1



I-1

STATUS OF SUB AREAS (Figure 1)
CLASSIFICATION: CONDITIONALLY APPROVED
STATUS: OPENED TO SHELLFISHING
(Rainfall Amounts 0.3" or Less)
(April 1 - October 31)
(All Dates Inclusive)

Kingston Bay, Center
CCB43.3

"The waters and flats and all tributaries of that portion of Kingston Bay in the Towns of Duxbury and Kingston, westerly of a line drawn from the Kingston/ Plymouth town marker at Boundary Lane to the stone pier at Howland Landing in the Town of Duxbury, easterly of a line drawn from the "NO SHELLFISHING" sign at #56 Shore Road (The Gazebo) in the Town of Kingston to Cripple Rocks (largest rock) to the "NO SHELLFISHING" sign on the beach at #5 Surfside West in the Town of Duxbury, northeasterly of a line drawn from the "NO SHELLFISHING" sign on the beach at the Gray's Beach Bath House to the "NO SHELLFISHING" buoy in the Gray's Beach Channel to the "NO SHELLFISHING" sign at Boundary Lane in the Town of Kingston."

CLASSIFICATION: APPROVED
STATUS: OPEN TO SHELLFISHING

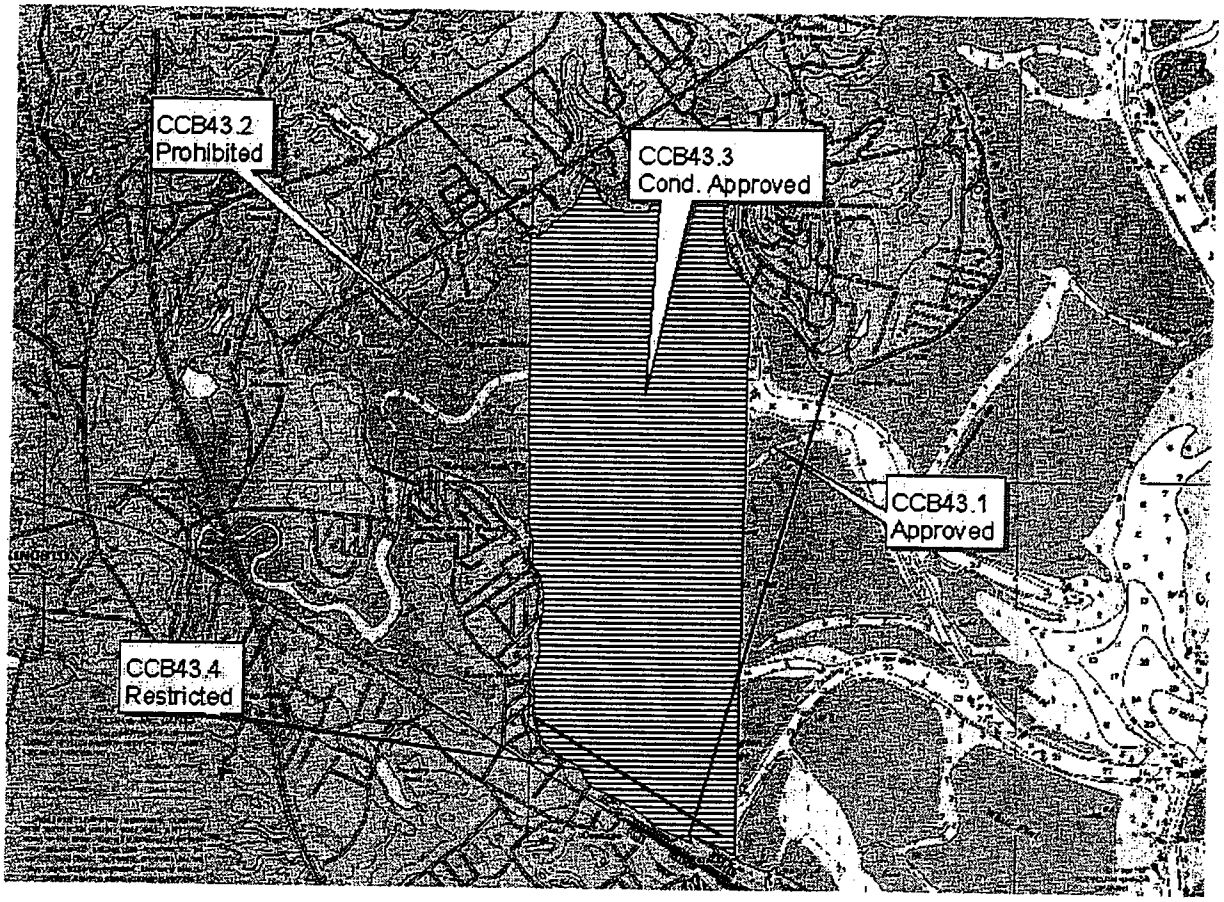
Ichabods Flats
CCB43.1

"The waters and flats of that portion of Kingston Bay in the Towns of Kingston and Duxbury easterly a line drawn from the Kingston/Plymouth town boundary marker at Boundary Lane to the "NO SHELLFISHING" sign at the end of Santelli Pier (146 Crescent Street) in the Town of Duxbury, northeasterly of a line drawn from the end of Cordage Pier to Delano's Pier, and westerly of a line drawn from the Kingston/Plymouth town boundary marker at Boundary Lane to Goose Point in the Town of Duxbury."

CLASSIFICATION: RESTRICTED
STATUS: OPEN TO RELAYING OF SHELLFISH

GRAY'S BEACH
CCB: 43.4

"The waters, flats and all tributaries of that portion of Kingston Bay and Plymouth Harbor in the Towns of Kingston and Plymouth southwesterly of a line drawn from the end of Cordage Pier in the Town of Plymouth to Delano's Pier in the Town of Kingston."



PREDOMINANT LAND USE

Kingston Bay, located in the Towns of Kingston and Duxbury is the westernmost of the three bays within the Plymouth Harbor, Kingston Bay, Duxbury Bay estuary. A single river and several smaller creeks enter the bay. The Jones River (CCB44) is located at the northwest end of the bay. The entire river has been classified as "Prohibited" with a closed harvest status since 1925.

The northern and eastern periphery of the bay is in the Town of Duxbury. Houses along the eastern shore are generally built on sloping parcels. The house lots also tend to be relatively large and well set back from the water. The dwellings along the northern side of the bay are built in clusters along the marsh or filled tidelands and are located much closer to the high water mark. Several of the houses are occasionally inundated during the unusually high moon tides.

The western shoreline of the bay in the Town of Kingston is varied. The houses are a combination of seasonal and year round dwellings. The homes north of Rocky Nook Point are tightly packed on very small lots and are close to the water. Houses south of the Point are somewhat larger and are set back from the water by the streets and a steep bank. The southern portion of the Kingston shoreline includes a scattering of dwellings, the Town Beach and undeveloped marsh.

The Kingston town boat ramp and Harbormaster Office is located at the mouth of the Jones River. Moorings are scattered along most of the Kingston shoreline. The single mooring field and boat ramp on the Duxbury side of the bay is located off Howland Landing in the northeast portion of the area.

SUMMARY OF SHORELINE SURVEY

The shoreline portion of the annual evaluation was conducted by the author on August 9, 2005 and a number of pollution sources were sampled on these dates. On the Kingston side pollution source number 1 (Boundary Lane pipe) was tested with a salinity of zero and a fecal coliform result of less than ten. The flow was estimated to be 0.5 gallons per minute. Therefore this location is not a problem. PS#5 (creek at Gray's Beach) was tested with a salinity of zero and a fecal coliform result of 130. The flow was measured at approximately two gallons per minute. Due to the fact that the stream discharges into a restricted area and the flow is low this location is not a problem.

A new storm drain was located next to 58 Boundary Street, on the Kingston side; the flow was tested with a salinity of zero and a fecal coliform result of less than ten. The flow was estimated at 0.2 gallons per minute. Therefore this location is not a problem. No additional potential/actual pollution sources were noted on the Kingston side.

On the Duxbury side, Island Creek (PS#33) and Landing Road Creek (PS#34), where the creeks pass under Bay Road were sampled with a result of 310 fecal coliform and with a flow estimated at 2 gallons per minute

Knook Creek (PS#36) was tested where it passes under Bay Road with a result of 350 fecal coliform and with a flow estimated that 3 gallons per minute.

Knookend Creek (PS#47) was tested where it passes under Bay Road with a result of 310 fecal coliform and with a flow estimated that 1.5 gallons per minute

The mouths of the three creeks could not be sampled on August 9, due to very low tide conditions and mud bottom.

No additional potential/actual pollution sources were noted on the Duxbury side

At 159 Bay Road (PS#49) the house has a tight tank. A house at 18 Midway Road (PS#53) in Duxbury (a failed septic system) was upgraded to a Title V system. There are no agricultural operations along the shoreline and no marina's/mooring areas in the conditional area. The drainage ditches do not represent an actual pollution source.

SHELLFISH RESOURCES

Soft shelled clams (*Mya arenaria*) are located along the inter-tidal flats on the Duxbury and Kingston sides of the bay. Clams (*Mya arenaria*) and razor clams (*Ensis directus*) can be found in commercial quantities on the large intertidal area along the Duxbury side of the bay. Quahogs (*Mercenaria mercenaria*) are also found in the deeper waters and on many of the numerous tidal flats. Interestingly, bay scallops (*Argopecten irradians*) have also been found on these flats.

METEOROLOGIC AND HYDROGRAPHIC INFLUENCES

Classification and pollution sampling were conducted during various hydrographic and meteorologic conditions to assess the possible impact of rain events, tidal stages and currents on the water quality of the bay. The shoreline survey was conducted at high tide to see how close the water came to houses along the shore and at low tide to assess flows from the rivers, streams and the abutting growing areas.

The area experiences semi-diurnal tides with a mean range of approximately 10.5 feet. Tidal exchange is through Plymouth Harbor and the mile wide opening between Saquish Head and Plymouth Beach. Like Duxbury Bay and Plymouth Harbor, large flats are exposed in Kingston Bay at low tide restricting the water to shallow guzzles and channels.

Tidal currents range from weak to a maximum velocity of more than two knots at the mouth of the Jones River and in the channels at low tide. Water depths range from inter-tidal on the bay's many flats to a maximum low tide depth of twenty feet in the channel between Ichabod Flat and Billington Ledge.

Rain events and the associated storm water runoff appear to adversely impact the bay's water quality; therefore a rainfall conditional with a rainfall event of over 0.3 inches closes the area.

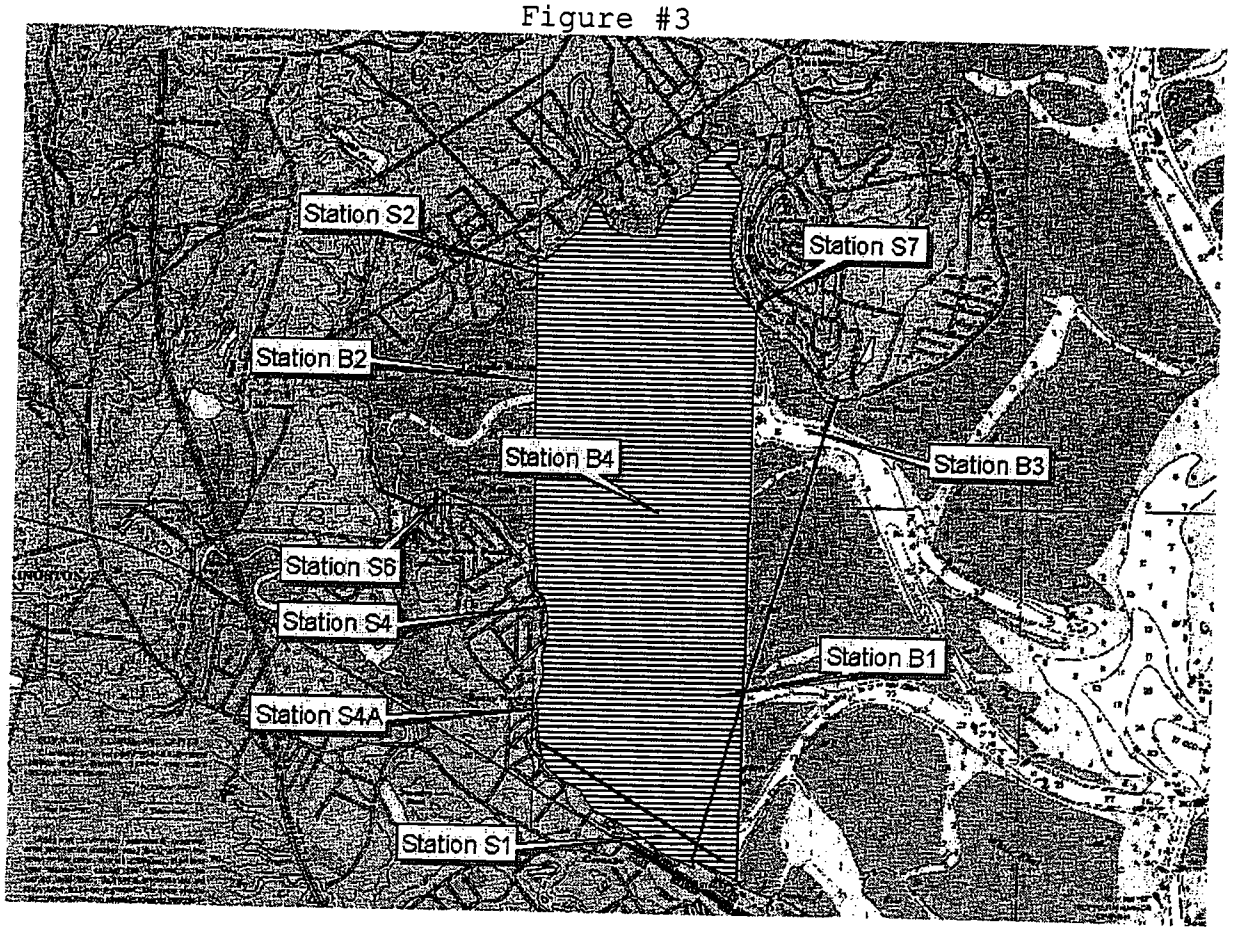
The Jones River and several of the creeks, most notably Grey's Brook, as well as several of the storm drains act as a major conduit for fecal contamination of the bay.

The season of the year also appears to have a significant influence on water quality. During the winter period large numbers of waterfowl raft in the area.

CLASSIFICATION SAMPLING DATA
TABLE 1

STATION #	LOCATION	GEO. MEAN	VAR.	# SAMPLES
S1	Boundary Lane	4.6	6.6	15
S4A	Delano Pier	2.9	0.0	15
S7	Howland Landing	4.0	0.0	15
B3	Goose Point Channel	2.5	0.0	15
B4	Middle of Bay	3.5	10.0	20
S4	Association Beach	3.9	6.6	15
S2	Landing Rock	2.9	0.0	15
B2	Cripple Rocks	4.5	6.6	15
S6	Cobb Ave	8.8	33.3	15
B1	Two Rocks	2.7	0.0	15

Figure #3



ADDRESSING THE ITEMS IN THE M.O.U.

a) The town has complied with the conditions in the M.O.U.

b) The six stations in the conditionally approved classification area meet the criteria for a. conditional rainfall classification.

DISCUSSIONS/CONCLUSIONS

The conditional area shoreline remains unchanged since the 2002 sanitary survey of the area. Results from the above table conclude that the conditionally approved area meets the requirements for the direct harvest of shellfish from (April 1 - October 31). Samples are to be collected during the winter (December 1 - March 14) to determine a potential classification change during that time of the year. Stations S1 and S6 are in a prohibited area. The high counts at classification station B4 on August 9th and 25th of 2004 were determined to be caused by the illegal dumping of fish racks at the location. This causes the amassing of sea birds to feed on the fish racks and then the fouling of the location. The local shellfish constable has discovered this practice and the problem has been corrected.

The creeks (PS# 33, 34, 36 and 47) along the northern border of Kingston Bay in the Town of Duxbury, will be classified as prohibited at the mouth of each creek due to the high fecal counts.

RECOMMENDATIONS

1) Continue sampling the conditional area when open to shellfishing.

2) Continue to collect and analyze winter data to determine if a year round rainfall conditional or winter seasonal may be possible.

3) The following areas will be reclassified to Prohibited

CLASSIFICATION: PROHIBITED
STATUS: CLOSED TO TAKING OF ALL OF SHELLFISH

Island Creek
CCB43.5

"The waters, flats and all tributaries of that portion of Island Creek in the Town of Duxbury north of a line drawn across the mouth of Island Creek."

Landing Road Creek
CCB43.6

The waters, flats and all tributaries of that portion of Landing Road Creek in the Town of Duxbury north of a line drawn across the mouth of Landing Road Creek."

Knook Creek
CCB43.7

The waters, flats and all tributaries of that portion of Knook Creek in the Town of Duxbury north of a line drawn across the mouth of Knook Creek."

Knookend Creek
CCB43.8

The waters, flats and all tributaries of that portion of Knookend Creek in the Town of Duxbury north of a line drawn across the mouth of Knookend Creek."