Municipality/Organization: **City of Salem, Massachusetts**

EPA NPDES Permit Number: **MA041219**

2005 JUN -4 A 12: 20

MaDEP Transmittal Number: **W-040844**

Annual Report Number & Reporting Period: **No. 1: March 03-March 04**

NPDES PII Small MS4 General Permit Annual Report

Part I. General Information

Contact Person: Bruce D. Thibodeau Title: Director of Public Services

Telephone #: (978) 745 – 9595 ext. 321 Email: BruceThibodeau@Salem.com

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature:

Printed Name: Stanley J. Usovicz, Jr.

Title: Mayor

Date: 4/28/04

Part II. Self-Assessment

The City of Salem, Massachusetts has completed the required self-assessment and has determined that our municipality is in compliance with all permit conditions, except for the following provisions:

Part I.B.2(e): The City's permit eligibility with regard to the Endangered Species Act was pending at the time of our NOI submission. The US Department of the Interior Fish and Wildlife Service has since provided written determination (attached letter dated 8/28/03) that no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area.

Part I.B.2(g): The City's permit eligibility with regard to the National Historic Preservation Act was pending at the time of our NOI submission. During Year 1, a letter was sent to the local Historic Commission requesting assistance in determining if any historic properties are known to be within the path or immediate area of any of the City's existing stormwater discharges and if so, whether or not the stormwater discharge has the potential to adversely impact the historic property. As of this date, this remains a pending issue.

Part III. Summary of Minimum Control Measures

1. Public Education and Outreach

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 1 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 2
1	Website	Dept. of Public Services**	Maintain and update website (provided funding is available).	Maintained and updated website.**	Continue to maintain and update website (provided funding is available).
Revised	** *Assistance provided by Salem Sound Coastwatch*				
2	Informational brochures	Dept. of Public Services**	Provide and maintain brochures at SSCW office. Distribute brochures at public events (provided funding is available).	Provided and maintained brochures at SSCW office, and distributed brochures at public events including the Annual Meeting held in November 2003.**	Continue to provide and maintain brochures at SSCW office and to distribute brochures at public events (provided funding is available).
Revised					
3	Newsletter	Dept. of Public Services**	Provide and maintain newsletters at SSCW office. Mail newsletter to dues paying SSCW members and others on a quarterly basis (provided funding is available).	Provided and maintained newsletter at SSCW office, and distributed newsletter on a quarterly basis.**	Continue to provide and maintain newsletter at SSCW office and to distribute newsletter on a quarterly basis (provided funding is available).
Revised					
4	Public event displays	Dept. of Public Services**	Post display annually at the Maritime Festival, and other public events if possible (provided funding is available).	A display was posted at the annual Maritime Festival held in July 2003.**	Continue to post display annually at the Maritime Festival and other public events, if possible (provided funding is available).
Revised					

5 Revised	Local newspaper articles	Dept. of Public Services**	One article per year.	An article was published in Salem News on July 13, 2003 which discussed the cooperation between SSCW's testing and outreach program and the City's stormwater management efforts.**	Continue with the goal to publish one newspaper article per year (provided funding is available).
6	Training of volunteers	Dept. of Public Services**	Annually (provided funding is available).	Conducted a workshop in December 2003 on marine invasive species, including training of volunteers on species identification.**	Continue annual training of volunteers (provided funding is available).
7	Publish results of water quality monitoring	Dept. of Public Services**	Year 1 – Publish upon receipt of results. Years 2 through 5 – Based on available funding.	Results of water quality monitoring performed during Permit Year 1 are published in SSCW's website (www.salemsound.org).**	Continue to publish results (provided funding is available for sampling).

1a. Additions

2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 1 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 2
8	Water quality monitoring program	Dept. of Public Services**	Annually (provided funding is available).	Under SSCW's Clean Beaches and Streams Program, collected samples from prioritized sites and performed testing every two weeks during summer 2003.**	Continue program (provided funding is available).
Revised					
9	Beach cleanup program	Dept. of Public Services**	Conduct once per year, each summer (provided funding is available).	Under SSCW's Beach Buddy Program, marine debris and trash were removed from coastal recreational areas.**	Continue program (provided funding is available).
Revised					
10	Storm drain stenciling	Dept. of Public Services**; Salem State College	Evaluate once per year. Perform stenciling (provided funding is available).	A volunteer group performed stenciling in parts of the City.**	Continue to evaluate and perform stenciling (provided funding is available).
Revised					
Revised					
Revised					

2a. Additions

3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 1 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 2
11	Develop GIS database of the drainage system	Dept. of Public Services	Pending EOEA funding approval, begin digital mapping.	Performed field investigations to locate approximately 3,350 drainage structures and to establish connectivity between structures; performed office work on preparation of the connectivity maps.	Continue with efforts to map up to an additional 450 structures and complete GIS mapping as part of the City's goal to create a stormwater Drainage Map and GIS database for selected areas of the City.
Revised					
12	Salem Sound Shoreline Survey (Project No. 2002-01/604)	Health Dept.	Obtain copies of the quarterly progress reports, as well as other information pertinent to Salem.	The Salem Sound Shoreline Survey was initiated during Year 1 and the first quarterly report was issued in April 2004 to the responsible party. As one of the Municipal Partners included in the Watershed, the City of Salem expects to obtain the project progress and results during the three Watershed Team Meetings required in the scope of work for the Salem Sound Shoreline Survey.	Continue to receive progress reports and results of all project work related to Salem.
Revised					
13	Visually inspect outfalls for dry weather flows	Dept. of Public Services**	Inspect a representative number of outfalls annually (provided funding is available).	Performed a visual inspection of a representative number of outfalls during dry weather period.**	Continue to inspect a representative number of outfalls annually (provided funding is available).
Revised					
14	Conduct water quality sampling at stormwater outfalls.	Dept. of Public Services**	Year 1 – Publish results of sampling. Years 2 through 5 – Perform additional sampling (provided funding is available).	SSCW performed sampling every two weeks at various outfalls during the course of the summer of 2003. Results are published in SSCW's website (www.salemsound.org).** The City also performed separate sampling at outfalls located along Juniper Beach and Palmer Cove.	Perform additional sampling and publish results (provided funding is available).
Revised					

15	Conduct water quality sampling at beaches	Health Dept.	Perform weekly beach sampling during summer months in accordance with DEP criteria.	Weekly beach sampling was performed at 14 locations during the period extending from June 11, 2003 to August 27, 2003. Results are published in the MA DPH website.	Continue to perform weekly sampling during summer months in accordance with DEP criteria.
Revised					
16	Develop storm water ordinance	Dept. of Public Services	Year 1 – Review existing bylaws and regulations; Year 2 – Propose changes; Year 3 – Implement changes, subject to City approval.	Submitted to Massachusetts CZM a grant application entitled "City of Salem Watershed Protection Policy" requesting grant funds to develop a stormwater ordinance (Watershed Protection Policy). The City is currently waiting for a response from MCZM.	Initiate development of a stormwater ordinance (Watershed Protection Policy) provided funding is available.
Revised					

3a. Additions

29	Perform study to identify contamination source(s)	Dept. of Public Services	Year 1 – Submit grant application to MCZM; Year 2 – Initiate study (provided funding is available).	Submitted to MCZM a grant application entitled "Willows Park Land Survey" requesting grant funds to study the Willows Park area and to determine the source(s) of bacterial contamination of neighboring beaches. The City is currently waiting for a response from MCZM. Submitted to MCZM a grant application entitled "Juniper Beach Study" requesting grant funds to identify the source(s) of the high contamination levels at the Juniper Beach outfall. The City is currently waiting for a response from MCZM.	Initiate study or studies (provided funding is available).

4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 1 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 2
17	Develop an ordinance requiring developers to prepare an Erosion & Sedimentation Control Plan for all sites disturbing more than 1-acre	Dept. of Public Services; Planning Board; Conservation Commission	Year 1 – Review existing bylaws & regulations; Year 2 – Propose changes; Year 3 – Implement changes, subject to City approval	As referenced in BMP ID#16, submitted to MCZA a grant application for funds to develop a Watershed Protection Policy (WPP). To facilitate development of the WPP, existing bylaws and regulations will be reviewed and language will be proposed requiring control of construction site runoff.	Review existing bylaws and regulations; propose changes and initiate development of a Watershed Protection Policy (provided funding is available).
Revised					
18	Periodically check erosion control measures and construction material management on site inspections	Dept. of Public Services; Planning Board; Conservation Commission	Monitor and track violations	Monitored sites to inspect erosion control measures and construction material management.	Continue to monitor and track violations.
Revised					
Revised					

4a. Additions

5. Post-Construction Stormwater Management in New Development and Redevelopment

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 1 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 2
19	Develop an ordinance requiring storm water controls for all new and redevelopment projects disturbing more than 1-acre	Dept. of Public Services; Planning Board; Conservation Commission	Year 1 – Review existing bylaws & regulations; Year 2 – Propose changes; Year 3 – Implement changes, subject to City approval	As referenced in BMP ID#16, submitted to MCZA a grant application for funds to develop a Watershed Protection Policy (WPP). To facilitate development of the WPP, existing bylaws and regulations will be reviewed and language will be proposed requiring control of post-construction site runoff.	See BMP ID#17.
Revised					
Revised					
Revised					

5a. Additions

6. Pollution Prevention and Good Housekeeping in Municipal Operations

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 1 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 2
20	Street sweeping	Dept. of Public Services	Sweep streets between April & November (provided funding is available).	Completed annual sweeping program.	Continue program (provided funding is available).
Revised					
21	Clean Sweep Program	Dept. of Public Services	Conduct sidewalk cleanup program each year for 1 week in May (provided funding is available).	Completed annual sweeping program.	Continue program (provided funding is available).
Revised					
22	Catch basin cleaning	Dept. of Public Services	Inspect problem areas annually, and clean as needed (provided funding is available).	Completed inspection of problem areas and performed catch basin cleaning as needed.	Continue annual inspection of problem areas and cleaning as needed (provided funding is available).
Revised					
23	Trash collection program	Health Dept.; Dept. of Public Services	Weekly curbside pickup (provided funding is available).	Completed weekly curbside trash collection program.	Continue program (provided funding is available).
Revised					
24	Recycling program	Dept. of Public Services	Bi-weekly curbside pickup (provided funding is available)	Completed bi-weekly curbside recycling program.	Continue program (provided funding is available).
Revised					

25	Yard waste program	Dept. of Public Services	Curbside pickup several times per year (provided funding is available). Allow residents to drop off yard waste at City's transfer station year round.	Completed yard waste collection program.	Continue program (provided funding is available).
26	Household hazardous waste program	Health Dept.	Hold twice over the 5-year permit term (provided funding is available).	No action was scheduled for Permit Year 1.	Household hazardous waste collection program is scheduled for June 2004 (provided funding is available).
Revised					
27	Animal control program	Police Dept. Animal Control Officer	Track the number of animals collected (provided funding is available).	Completed tracking of animals collected.	Continue program (provided funding is available).
Revised					
28	Beach Cleanup Program	Parks & Recreations Dept.	Clean beaches every week between May and September (provided funding is available).	Beaches were cleaned in the Spring of 2003.	Continue to clean the beaches in the spring of each year (provided funding is available).
Revised					

6a. Additions

7. BMPs for Meeting Total Maximum Daily Load (TMDL) Waste Load Allocations (WLA) *<<if applicable>>*

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 1 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 2
Revised					
Revised					
Revised					
Revised					
Revised					
Revised					

7a. Additions

7b. WLA Assessment

Part IV. Summary of Information Collected and Analyzed

* A summary of water quality monitoring results is attached. The summary, prepared by Salem Sound Coastwatch, includes the results from monitoring by Salem Sound Coastwatch (BMP #14) and from the City of Salem Board of Health (BMP #15).

* Based upon Board of Health data, there were a total of 36 beach closings in 2003.

Part V. Program Outputs & Accomplishments (OPTIONAL)

Programmatic

Stormwater management position created/staffed	(y/n)	
Annual program budget/expenditures	($)	

Education, Involvement, and Training

Estimated number of residents reached by education program(s)	(# or %)	
Stormwater management committee established	(y/n)	
Stream teams established or supported	(# or y/n)	
Shoreline clean-up participation or quantity of shoreline miles cleaned	(y/n or mi.)	
Household Hazardous Waste Collection Days		
▪ days sponsored	(#)	
▪ community participation	(%)	
▪ material collected	(tons or gal)	

School curricula implemented	(y/n)	

Legal/Regulatory

	In Place Prior to Phase II	Under Review	Drafted	Adopted
Regulatory Mechanism Status (indicate with "**X**")				
▪ Illicit Discharge Detection & Elimination				
▪ Erosion & Sediment Control				
▪ Post-Development Stormwater Management				
Accompanying Regulation Status (indicate with "**X**")				
▪ Illicit Discharge Detection & Elimination				
▪ Erosion & Sediment Control				
▪ Post-Development Stormwater Management				

Mapping and Illicit Discharges

Outfall mapping complete	(%)	
Estimated or actual number of outfalls	(#)	
System-Wide mapping complete	(%)	
Mapping method(s)		
▪ Paper/Mylar	(%)	
▪ CADD	(%)	
▪ GIS	(%)	
Outfalls inspected/screened	(# or %)	
Illicit discharges identified	(#)	
Illicit connections removed	(#) (est. gpd)	
% of population on sewer	(%)	
% of population on septic systems	(%)	

Construction

Number of construction starts (>1-acre)	(#)	
Estimated percentage of construction starts adequately regulated for erosion and sediment control	(%)	
Site inspections completed	(# or %)	
Tickets/Stop work orders issued	(# or %)	
Fines collected	(# and $)	
Complaints/concerns received from public	(#)	

Post-Development Stormwater Management

Estimated percentage of development/redevelopment projects adequately regulated for post-construction stormwater control	(%)	
Site inspections completed	(# or %)	
Estimated volume of stormwater recharged	(gpy)	

Operations and Maintenance

Average frequency of catch basin cleaning (non-commercial/non-arterial streets)	(times/yr)	
Average frequency of catch basin cleaning (commercial/arterial or other critical streets)	(times/yr)	
Total number of structures cleaned	(#)	
Storm drain cleaned	(LF or mi.)	
Qty. of screenings/debris removed from storm sewer infrastructure	(lbs. or tons)	
Disposal or use of sweepings (landfill, POTW, compost, recycle for sand, beneficial use, etc.)		
Cost of screenings disposal	($)	

Average frequency of street sweeping (non-commercial/non-arterial streets)	(times/yr)	
Average frequency of street sweeping (commercial/arterial or other critical streets)	(times/yr)	
Qty. of sand/debris collected by sweeping	(lbs. or tons)	
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.)	(location)	
Cost of sweepings disposal	($)	
Vacuum street sweepers purchased/leased	(#)	
Vacuum street sweepers specified in contracts	(y/n)	

Reduction in application on public land of: ("N/A" = never used; "100%" = elimination)		
▪ Fertilizers	(lbs. or %)	
▪ Herbicides	(lbs. or %)	
▪ Pesticides	(lbs. or %)	

Anti-/De-Icing products and ratios	% NaCl % $CaCl_2$ % $MgCl_2$ % CMA % Kac % KCl % Sand	
Pre-wetting techniques utilized	(y/n)	
Manual control spreaders used	(y/n)	
Automatic or Zero-velocity spreaders used	(y/n)	
Estimated net reduction in typical year salt application	(lbs. or %)	
Salt pile(s) covered in storage shed(s)	(y/n)	
Storage shed(s) in design or under construction	(y/n)	

ATTACHMENTS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087

August 28, 2003

Reference:	Project	Location
	NPDES stormwater general permit	Swansea, MA
	NPDES stormwater general permit	Salem, MA

Robert B. Adams
Metcalf & Eddy, Inc.
30 Harvard Mill Square
Wakefield, MA 01880-5371

Dear Mr. Adams:

This responds to your recent correspondence requesting information on the presence of federally-listed and/or proposed endangered or threatened species in relation to the proposed activity(ies) referenced above.

Based on information currently available to us, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required.

This concludes our review of listed species and critical habitat in the project location(s) and environs referenced above. No further Endangered Species Act coordination of this type is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Thank you for your coordination. Please contact us at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Michael J. Amaral

Michael J. Amaral
Endangered Species Specialist
New England Field Office

SALEM SOUND COASTWATCH

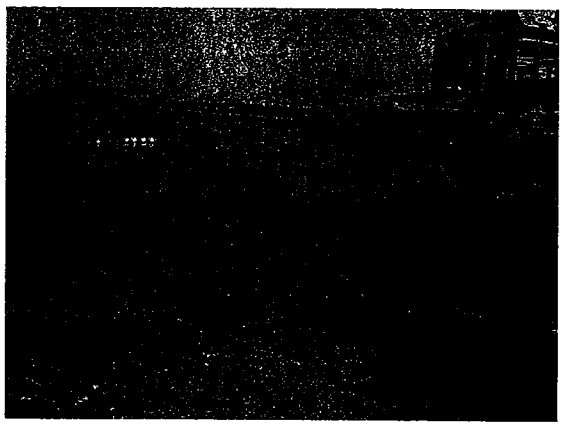
Committed to enhancing and protecting the environmental quality of Salem Sound and its watershed

Clean Beaches and Streams Program
Summary Report, Summer 2003

The following report is a summary of results from water quality testing that has occurred over the past summer by Salem Sound Coastwatch's Clean Beaches and Streams Program and by Salem Sound municipalities. The data is displayed in two tables below: Table 1.0 shows water testing conducted at public bathing beaches by the Salem Sound municipalities, including Beverly, Danvers, Manchester, Marblehead and Salem. Table 2.0 displays results of tests performed by Salem Sound Coastwatch at coastal outfall pipes and streams.

Approach and Methods

While the cities test bathing waters at public beaches, Salem Sound Coastwatch focuses on storm water outfall pipes, many of which are located on bathing beaches and near boating areas. Salem Sound's tests are conducted at the source of runoff, therefore the bacterial counts tend to be much higher than those taken from the water in the middle of a bathing beach. Nonetheless, these results indicate that contaminants are making their way into our area waters.



A stormwater outfall pipe at Juniper Beach in Salem, one of the many sites monitored within the Clean Beaches & Streams Program.

After conducting studies over the past several years, the EPA has concluded that the indicator organism showing the best correlation with adverse health effects in marine waters was Enterococci, and thus has mandated that all states use this standard by April of 2004. All of the Salem Sound communities are already using Enterococci as the indicator organism for marine water testing. Salem Sound Coastwatch tested for both fecal coliform and Enterococci this summer; therefore both are included in this report.

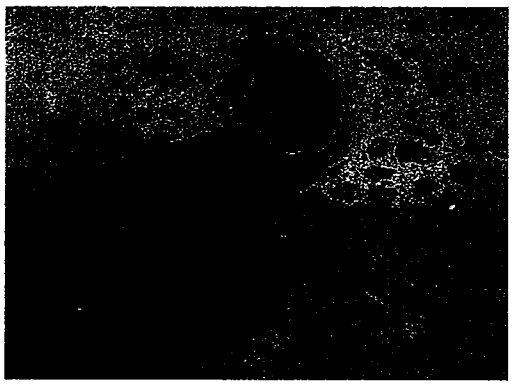
The numbers shown in Table 1.0 represent the "geometric mean" of test results collected over the summer. This is a statistical averaging method used to even out the average when dealing with a wide range of numbers. Massachusetts state sanitary code (105 CMR 445.000) mandates that "the geometric mean of the most recent five (5) Enterococci levels within the same bathing season shall not exceed 35 colonies per 100ml."

The Salem Sound municipalities tested bathing waters at least once a week, more frequently if Enterococci levels were shown to be high. Beach closings depended on either a single test reporting high bacterial levels or the geometric mean exceeding 35 per 100ml. However, tests conducted on days where there was precipitation in any amount were not included in the calculations for geometric mean. Rain can affect bacterial counts because of flushing of contaminants from storm drains, runoff from impervious surfaces and other sources of non-point pollution, resulting in temporarily elevated bacteria counts compared to typical dry weather conditions.

Therefore, Table 1.0 below displays two different calculations of the geometric mean: the first includes the results of all tests taken throughout the summer, whereas the second set excludes test results from days with precipitation. The purpose of showing both sets of numbers is to give a more complete picture of the health of a particular beach.

Definition of Dry vs. Wet Conditions

Within this sampling protocols represented within this report, Salem Sound Coastwatch defines "dry" conditions vs. "wet" differently than the municipalities. Under Salem Sound Coastwatch's definition, dry conditions are those as having less than .2" of precipitation the day of sampling or less than .5" within the three days preceding sampling. Wet conditions are defined as more than .2" precipitation the day of sampling or more than .5" within three days preceding sampling. The municipalities define wet conditions, or a "storm" event, as any occurrence of precipitation during the sampling or within the 24 hours preceding the sampling.



Dry weather drainage from the pipe at Brackenberry Beach, Beverly, taking the form of a small stream running across the beach.

During the summer of 2003, all of Salem Sound Coastwatch's water quality testing happened to take place during dry weather conditions. If wet conditions had occurred for the designated test dates, testing would have been conducted as in dry weather.

Salem Sound Coastwatch Test Results

Table 2.0 below shows the results of samples taken by Salem Sound Coastwatch over the course of the summer. Samples were taken every 2 weeks at low tide.

Since there were too few samples to calculate a meaningful geometric mean, each test result for both fecal coliform and Enterococci is included in the table. Those values that are higher than EPA standards (EPA-823-R-03-008) are indicated in bold: fecal coliform >200 CFU/mL or Enterococci >104 CFU/100mL.

For Additional Information

For additional information about Salem Sound Coastwatch's Clean Beaches & Streams Program, including information on how you can get involved as a volunteer in this environmental monitoring program, please check out SSCW's website: www.salemsound.org, call Salem Sound Coastwatch at 978-741-7900, or email rob.gough@salemsound.org.

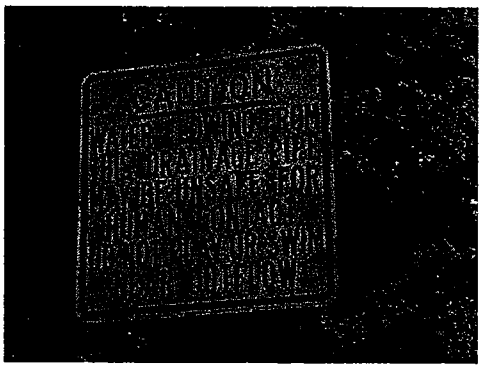


Table 1.0. Salem Sound Bathing Beaches: Tested by local Boards of Health
Figures listed in this table are the geometric mean of available results of water quality testing over the summer for each municipality. Numbers higher than 351 are indicated in bold.

City	Enterococci (including rain events)	Enterococci (excluding rain events)
Beverly		
Brackenbury Beach	26	10
Dane St. Bathhouse	**54**	32
Dane St. Jetty	19	29
Dane St. (mid-beach)	**49**	**39**
Goat Hill	32	**37**
Independence Park	21	17
Lynch Park	14	14
Mingo Beach	18	8
Ober Park	**40**	**41**
Rice Beach	15	12
Sandy Point	28	21
West Beach	10	5
Woodbury Beach	16	12
Danvers		
Sandy Beach East	**40**	21
Sandy Beach West	**61**	**36**
Manchester		
Black Beach	9	7
Magnolia Beach	11	10
Manchester Bath and Tennis	6	4
Singing Beach	7	7
Singing Beach (right of pkg. lot)	7	7
Tucks Point Beach	21	22
West Manchester Beach	15	13
White Beach	6	6

(Continued below)

City	Enterococci (including rain events)	Enterococci (excluding rain events)
Marblehead		
Crocker Park	15	12
Devereaux Beach	9	6
Gas House Beach	21	31
Grace Oliver Beach	29	23
Stramski Beach	35	31
Village Beach	15	18
Salem		
Collins Cove	22	21
Dead Horse Beach	34	24
Forest River Point	20	30
Juniper Point	30	18
Mackey Beach	**37**	**45**
Naumkeag	24	23
Ocean Ave. Beach	**41**	32
Osgood Beach	**37**	**56**
Pickman Park	**56**	**44**
Pioneer	14	14
Steps Beach	**45**	29
Willow Ave.	23	23
Willows Pier	**41**	28
Winter Island	13	11

[1]Massachusetts state sanitary code (105 CMR 445.000) mandates that "the geometric mean of the most recent five (5) Enterococci levels within the same bathing season shall not exceed 35 colonies per 100ml."

Table 2.0. Salem Sound Coastwatch—Outfall Pipes and Streams
NOTE: Salem Sound Coastwatch site numbers are shown in parentheses.

Beverly	Indicator*	6/17	7/1	7/15	7/29	8/12	8/26
Brackenbury Beach	FC	100	100	**700**	ns	**1,600**	**1,900**
SW storm drain on beach (222)	Ent	<100	100	**400**	ns	**200**	**300**
Brackenbury Beach	FC	2,700	2,400	1,700	11,700	1,400	1,900
Stream from cement culvert (213)	Ent	400	500	1,400	5,700	200	200
Dane St. Beach	FC	<100	100	**500**	**500**	**700**	**11,000**
Northern storm drain (322)	Ent	<100	<100	**600**	<100	100	**400**
Dane St Beach	FC	100	400	400	2,100	<100	300
Lawrence St. brook at beach (321)	Ent	400	200	100	100	<100	<100
Mingo Beach	FC	ns	100	**400**	ns	**600**	ns
Storm drain on beach (212)	Ent	ns	<100	100	ns	<100	ns
Rice Beach	FC	700	600	800	6,000	2,600	ns
Stream draining across beach (214)	Ent	500	1,100	1,000	500	100	ns
Danvers							
Eden Glen Ave.	FC	100	**9,500**	**3,400**	**4,400**	**300**	**1,400**
Storm drain (491b)	Ent	<100	**300**	**200**	<100	**200**	100
Waters River at Route 35 (403)	FC	100	200	400	400	1,200	ns
	Ent	100	<100	400	<100	200	ns
Manchester							
Bennett's Brook at Bennett St.	FC	<100	**500**	**1,100**	ns	**900**	**4,400**
(149)	Ent	<100	<100	**400**	ns	100	**200**
Sawmill Brook	FC	100	<100	200	100	<100	ns
Storm drain at high school (127)	Ent	300	<100	100	<100	<100	ns
Marblehead							
Riverhead Beach	FC	**1,200**	**2,400**	**500**	**900**	**1,100**	**4,300**
Storm drain at boat landing (701)	Ent	**1,500**	**200**	**500**	100	**600**	**300**
Stramski Beach	FC	100	400	700	1,200	800	1,800
Stream draining across beach (722)	Ent	300	100	400	200	700	200
Salem							
Juniper Beach	FC	**27,000**	**640,000**	**970,000**	**1,300,000**	**290,000**	**26,000**
Storm drain on beach (620)	Ent	**700**	**36,000**	**37,000**	**26,000**	**2,900**	**12,000**
Juniper Cove	FC	ns	ns	200	ns	ns	6,500
Storm drain on Steps Beach (625)	Ent	ns	ns	<100	ns	ns	<100
Palmer Cove	FC	ns	ns	ns	**3,700**	**6,700**	ns
Storm drain at Shetland Park (629)	Ent	ns	ns	ns	100	**200**	ns
Palmer Cove	FC	1,000	100,000	9,000	33,000	68,000	ns
Storm drain near playground (631)	Ent	800	400	200	<100	100	ns
Pickman Park	FC	<100	**400**	**12,000**	ns	ns	ns
Pickman River at low tide (646)	Ent	<100	<100	100	ns	ns	ns
North River	FC	400	5,900	400	200	<100	ns
Culvert-Harmony Grove Rd (600)	Ent	<100	<100	100	<100	<100	ns
North River-at Route 114 (501)	FC	**31,000**	**2,100**	**5,600**	**33,000**	**8,200**	**34,000**
	Ent	**400**	**200**	**600**	**400**	100	**400**
Willow Ave. Beach	FC	100	400	<100	ns	ns	ns
Storm drain on beach (642)	Ent	<100	<400	<100	ns	ns	ns

***FC = Fecal coliform**
Ent = Enterococci

Numbers in bold exceed standards as specified by the EPA (EPA-823-R-03-008): Fecal coliform >200 CFU/100mL, Enterococci >104 CFU/100mL

Salem Sound Coastwatch *Clean Beaches and Streams*

Water Monitoring Results Summer 2004

Date of Sample Collection: 6/8/04 **Report Issue Date: 6/10/04**

Samples Collected by Salem Sound Coastwatch staff and volunteers: Mary Reilly (SS-MR), Barbara Warren (SS-BW), Gary Moore (SS-GM), Joan McIntyre (SS-JM), Skip Caudill (SS-SC), Cindy Keegan (SS-CK)

Weather Rating: Dry

Low Tide: 10:25am

Salem Sound Coastwatch's Clean Beaches and Streams Program is an ongoing water quality monitoring program that collects data from prioritized, potential pollution sources/sites along Salem Sound's coastline, including outfall pipes, culverts, and small streams. Sites may change throughout the season. For more information contact Barbara Warren or Mary Reilly at 978-741-7900. Testing conducted specifically for water quality at bathing beaches is performed by each city/town Board of Health.

Salem Sound Coastwatch Sampling Sites by Community	Site Number	Time of Sampling	Flow	Sample Collected by	Fecal coliform per 100 mL	Enterococci per 100 mL	Lab
Marblehead							
Stramski Beach-Stream draining across beach	722	8:55	T	SS-JM	ns	**300**	BIO
Stramski Way-near pkg lot after playground	722a	9:05	F	SS-JM	ns	<100	BIO
Stramski Way-near field	722b	10:30	F	SS-MR	ns	**200**	BIO
Hawthorne Rd.-end of street	750a	10:20	F	SS-MR	ns	100	BIO
Hawthorne Pond	750b	9:45	F	SS-MR	ns	<100	BIO
Beverly							
Dane St. Beach-Northern storm drain at beach	322	8:55	T	SS-MR	ns	<100	BIO
Lawrence Street brook at beach	321	9:00	F	SS-MR	ns	<100	BIO
Rice Beach-Stream draining across beach	214	9:43	T	SS-CK	ns	**200**	BIO
Brackenberry Beach-Stream draining across beach	213	9:07	F	SS-CK	ns	100	BIO
Northern storm drain at beach	213a	9:17	T	SS-CK	ns	100	BIO
Danvers							
Danvers Sites-TBD							
Salem							
Juniper Beach-storm drain on beach	620	9:20	F	SS-BW	**60,000**	**600**	BIO
Palmer Cove-storm drain at Shetland Park	629	10:55	F	SS-MR	ns	**2,100**	BIO
Palmer Cove-storm drain below Palmer Cove Playground	631	10:45	F	SS-MR	ns	<100	BIO
Willows Pier	546	9:10	N	SS-BW/SS-GM	ns	ns	ns
North River-south side, capped outfall	557	8:20	F	SS-BW/SS-GM	ns	<100	BIO
North River-north side, open culvert	537	8:35	F	SS-BW/SS-GM	ns	**400**	BIO
Manchester							
Bennett's Brook (at Bennett Street)	149	9:15	T	SS-SC	ns	<100	BIO
Quality Assurance/Quality Control							
Duplicate Sample collected	631-dupe	10:45	F	SS-MR	ns	<100	BIO
Blank sample	ns	ns	ns	ns	ns	ns	ns

***Numbers in bold exceed Class A, B and C standards as specified by the EPA (EPA-823-R-03-008):**

fecal coliform > 200 CFU/100mL, Enterococci > 104 CFU/100mL

Notes: ns = no sample collected na = parameter not analyzed

Weather ratings:

Dry - Less than 0.2" the day of sampling or less than 0.5" within three days preceding sampling

Wet - More than 0.2" the day of sampling or more than 0.5" within three days preceding sampling

Lab abbreviations: Bio = Biomarine, Inc. in Gloucester (membrane filtration method 9222d)

Flow ratings:

N = no water

S = some water which is stagnant

T = trickling flow

F = significant flow

Table 2.0. Salem Sound Coastwatch—Outfall Pipes and Streams
NOTE: Salem Sound Coastwatch site numbers are shown in parentheses.

Beverly	**Indicator***	**6/17**	**7/1**	**7/15**	**7/29**	**8/12**	**8/26**
Brackenbury Beach	FC	100	100	700	ns	1,600	1,900
SW storm drain on beach (222)	Ent	<100	100	400	ns	200	300
Brackenbury Beach	FC	2,700	2,400	1,700	1,700	1,400	1,900
Stream from cement culvert (213)	Ent	400	500	1,400	700	200	200
Dane St. Beach	FC	<100	100	500	500	700	11,000
Northern storm drain (322)	Ent	<100	<100	600	<100	100	400
Dane St. Beach	FC	100	400	400	<100	<100	300
Lawrence St. brook at beach (321)	Ent	400	200	<100	<100	<100	<100
Mingo Beach	FC	ns	100	400	ns	600	ns
Storm drain on beach (212)	Ent	ns	<100	100	ns	<100	ns
Rice Beach	FC	700	600	800	6,000	2,600	ns
Stream draining across beach (214)	Ent	500	1,100	1,000	300	100	ns
Danvers							
Eden Glen Ave.	FC	100	9,500	3,400	4,400	300	1,400
Storm drain (491b)	Ent	<100	300	200	<100	200	100
Waters River at Route 35 (403)	FC	100	200	400	400	1,200	ns
	Ent	100	<100	400	<100	200	ns
Manchester							
Bennett's Brook at Bennett St.	FC	<100	500	1,100	ns	900	4,400
(149)	Ent	<100	<100	400	ns	100	200
Sawmill Brook	FC	100	<100	200	100	<100	ns
Storm drain at high school (127)	Ent	300	<100	100	<100	<100	ns
Marblehead							
Riverhead Beach	FC	1,200	2,400	500	900	1,100	4,300
Storm drain at boat landing (701)	Ent	1,500	200	500	100	600	300
Stramski Beach	FC	100	400	700	1,200	800	1,800
Stream draining across beach (722)	Ent	300	100	400	200	700	200
Salem							
Juniper Beach	FC	27,000	640,000	970,000	1,300,000	290,000	26,000
Storm drain on beach (620)	Ent	700	36,000	37,000	26,000	2,900	12,000
Juniper Cove	FC	ns	ns	200	ns	ns	6,500
Storm drain on Steps Beach (625)	Ent	ns	ns	<100	ns	ns	<100
Palmer Cove	FC	ns	ns	ns	3,700	6,700	ns
Storm drain at Shetland Park (629)	Ent	ns	ns	ns	100	200	ns
Palmer Cove	FC	1,000	100,000	9,000	3,000	68,000	ns
Storm drain near playground (631)	Ent	800	400	200	<100	100	ns
Pickman Park	FC	<100	400	12,000	ns	ns	ns
Pickman River at low tide (646)	Ent	<100	<100	100	ns	ns	ns
North River	FC	400	5,900	400	200	<100	ns
Culvert-Harmony Grove Rd (500)	Ent	<100	<100	100	<100	<100	ns
North River-at Route 114 (501)	FC	31,000	2,100	5,600	33,000	8,200	34,000
	Ent	400	200	600	400	100	400
Willow Ave. Beach	FC	100	400	<100	ns	ns	ns
Storm drain on beach (642)	Ent	<100	<100	<100	ns	ns	ns

***FC = Fecal coliform** **Numbers in bold exceed standards as specified by the EPA (EPA-823-R-03-008):**
Ent = Enterococci **Fecal coliform >200 CFU/100mL, Enterococci >104 CFU/100mL**