



**GROWING AREA WA  
Towns of South Berwick, Eliot and Kittery**

**ANNUAL REVIEW for 2006**

**Final Report Date: 6/8/07**

**LAURA LIVINGSTON**

**APPROVAL**

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\_\_\_\_\_ Date: \_\_\_\_\_  
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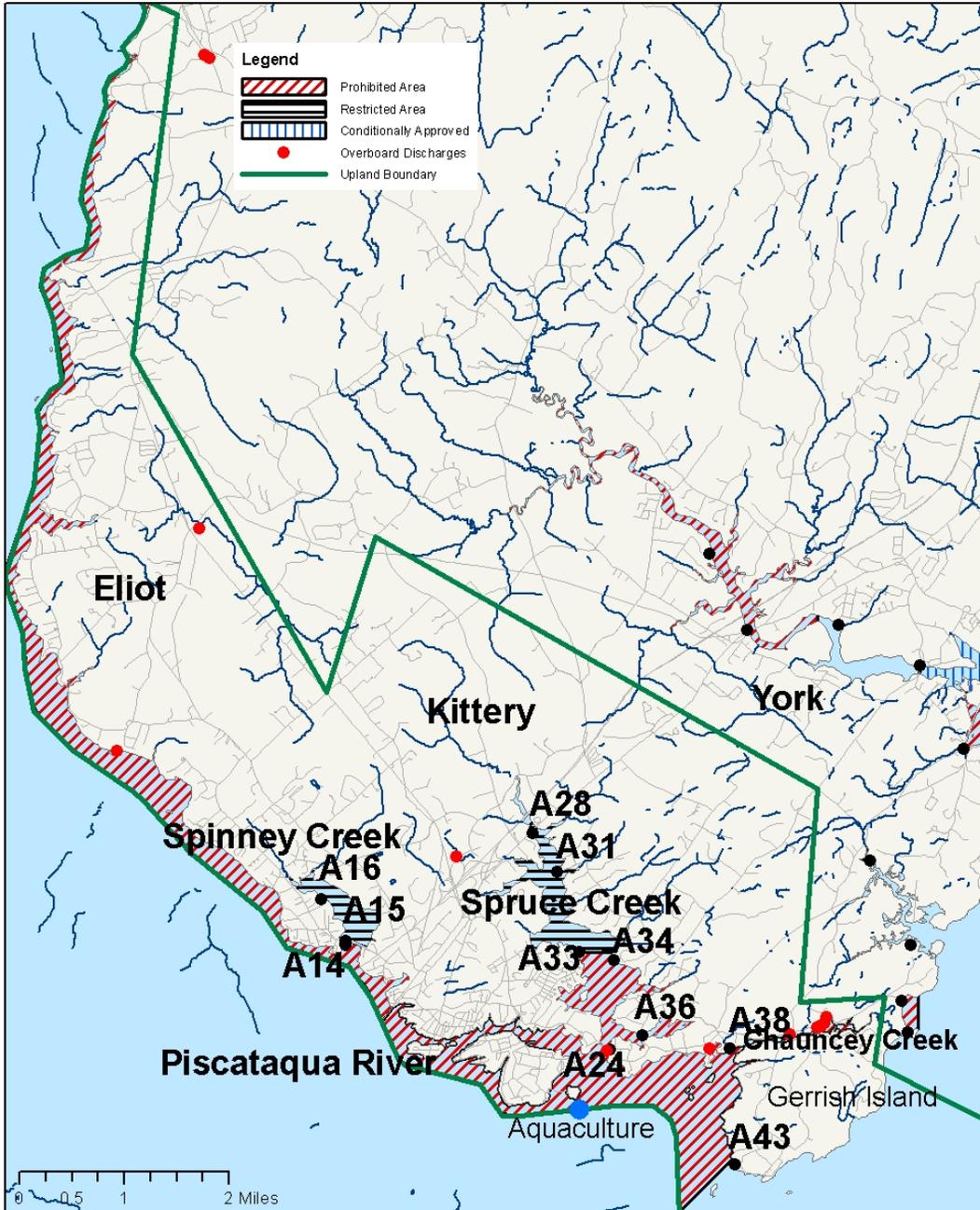


# Maine Department of Marine Resources

## Growing Area WA



12/26/06





## Executive Summary

Growing area WA includes the area from the Maine/New Hampshire border, Piscataqua River to Sisters Point, Kittery, including the Isle of Shoals. A complete boundary description can be found below. Sampling stations WA 29.1, 30, 32, 35 were deactivated on 12/5/05.; no new stations were created. No overboard discharges were removed in 2006, and no classification changes are required at this time.

The New Hampshire Department of Environmental Services (NH DES) will be working with the Environmental Protection Agency (US EPA), the Massachusetts Division of Marine Fisheries (MA DMF) and the United States Food and Drug Administration (USFDA) doing a dye study of the Kittery Waste Water Treatment Facility (WWTF) in the spring of 2007. The goal of this study would be to develop sufficient hydrographic data on the fate and transport of Kittery WWTF effluent in the Piscataqua River and adjacent waters. Ultimately the NH DES and the DMR would use the results of the study to classify the river for shellfish harvesting, per National Shellfish Sanitation Program guidelines.

NH DES released a final report of the Dover, NH dye study report on January 11, 2006. A copy of the report is in the central files.<sup>1</sup>

## Boundary Description

Growing Area WA lies inside of a line along the Maine/New Hampshire border, extending east offshore along the shellfish management zone lines and up the Piscataqua River to the base of the Salmon Falls River dam, then east to the intersection of Liberty Street and Vine Street, then south to the intersection of Dover Road and Harold L. Dow Highway, then south to the intersection of Harold L. Dow Highway and Beech Road, then northeast to the intersection of Goodwin Road and Frost Hill Road, then southeast to the intersection of Payne Road and Bartlett Road, then south to the intersection of Brave Boat Harbor Road and Cutts Island Road, then east to the intersection of Thaxter Lane and Seapoint Road, then south to the intersection of Goodwin Road and Tower Road and east along the shellfish management zone line offshore.



## Current Classification(s)

Shellfish growing area WA has areas classified as:

Approved:

Gerrish Island, Kittery (1 station)

Restricted:

Spruce Creek, Kittery (2 stations)

Spinney Creek, Elliot and Kittery (3 stations)

Prohibited:

Piscataqua River, Kittery, Elliot and South Berwick (5 stations)

## Legal Notices

Visit the DMR website to view Legal Notices:

DMR Regulation 95.10A, Closed Area No. 1, Piscataqua River, Kittery, Elliot, South Berwick and  
DMR Regulation 95.10H, Closed Area No. 1-B, Jaffrey Point, NH. to Brave Boat Harbor, York.

[http://www.maine.gov/dmr/rm/public\\_health/closures/closedarea.htm](http://www.maine.gov/dmr/rm/public_health/closures/closedarea.htm)

## Current Management plan(s)

There are no conditional areas in Growing Area WA.

## Review of Water Quality

### Transitioning to Membrane Filtration for Seawater and Pollution Source Samples

The Maine Department of Marine Resources has chosen to switch to a fecal coliform method that was approved for use in the National Shellfish Sanitation Program (NSSP) at the Interstate Shellfish Sanitation Conference (ISSC) in 2003. This method is the Membrane Filtration (MF) for Fecal Coliforms using mTEC agar with a two hour resuscitation step. The geometric mean and the 90<sup>th</sup> percentile are calculated on 30 pieces of data extending over a five year period.

During the transition from MPN to MF, we will be accumulating MF data points. The statistical calculations will be a combination of MPN and MF data points. The United States Food and Drug Administration (FDA) has determined that the best way to handle the data is to



perform the calculations as always for the data set, but to compare the data set to a hybrid weighted 90<sup>th</sup> percentile. This hybrid standard is calculated by weighting the relative contributions of each method to the database. This will mean that as the number of MPN data points reduce and the number of MF data points increase the 90<sup>th</sup> percentile standard that the sample site is compared to will change over time.

Once all 30 pieces of data are analyzed using MF, the 90<sup>th</sup> percentile for approved classification will not exceed 31 and for restricted (for depuration) will not exceed 163. The geomean approved standard of 14 fecal coliforms per 100 ml and geomean restricted standard of 88 fecal coliforms per 100 ml will remain the same for both methods.

Reports that display 90<sup>th</sup> percentiles will show the number of pieces of data derived from MF analysis and will show the appropriate 90<sup>th</sup> percentile standard for that MPN/MF combination for approved and restricted classifications. It must be remembered that this weighted standard is only used for data sets encompassing data from the two different test methods, MF and MPN (3 tube/3 dilution). If decisions are to be made on a single test result analyzed by the MF method or a multiple number of test results all exclusively analyzed by the MF method, the 90<sup>th</sup> percentile standard is 31 fecal coliforms per 100 ml.

This was the first year the water quality program documented in the database the inability to collect a sample based on the following parameters: if the tide stage was too low to collect the sample, there was a safety issue with collecting the sample, the location was inaccessible and "other" which usually was accompanied by a comment on the data sheet. Stations that were unable to be sampled due to any of these parameters show 999 in the salinity column and have no data recorded in any of the columns but the time is recorded so the actual tide stage can be computed. Stations that were missed due to the above parameters were required to be made up to assure that each station would receive the required six samples during the sampling season.

Table 1 displays the geomeans and P90s for all the active stations in growing area WA. The data represents the evaluation of the 30 most recent data points collected between 2001 and 2006 throughout the year. A key to the water quality table headers can be found in Attachment B at the end of this document. Water quality meets approved standards at Station WA 43.0 and restricted standards at restricted stations, WA 15, 16, 28, 31, and 33.

**Table 1 Geomean and P90 Year Round**

MAINE DEPARTMENT OF MARINE RESOURCES					AS OF DECEMBER 26, 2006					
Fecal Coliform Geometric Mean and Percent Variability										
For the Years 2001 Through 2006 - (01/01 - 12/31)										
Status = Open and Closed Stations										
Strategy = Random Only										
Excludes Flood Data										
Samples Limited to Latest 30										
Salinity >= 0 ‰										

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WA014.00	P	30	2	6.9	0.44	93	25.2	48	288
WA015.00	R	30	2	8.0	0.69	460	61.5	48	288
WA016.00	R	30	2	7.6	0.75	1100	68.0	48	288
WA024.00	P	30	2	6.5	0.41	93	21.7	48	288



WA028.00	R	30	2	19.9	0.68	460	149.1	48	288
WA031.00	R	30	2	9.5	0.59	460	54.7	48	288
WA033.00	R	30	2	8.6	0.57	460	46.1	48	288
WA034.00	P	30	2	5.4	0.34	27	14.8	48	288
WA036.00	P	30	2	5.2	0.37	43	15.6	48	288
WA038.00	P	30	2	6.7	0.53	460	31.8	48	288
WA043.00	A	30	2	7.5	0.53	93	36.4	48	288

Stations that were active at the beginning of the year were sampled six times in 2006, as displayed in Table 2.

**Table 2 Sample Collection Results for 2006**

MAINE DEPARTMENT OF MARINE RESOURCES													As of: December 26, 2006		
Tabulated Station Data for Area(s): WA - WA															
For the Years 2006 Through 2006 - (01/01 - 12/31)															
Excludes flood data															
Status = Open and Closed Stations															
Strategy = Random Only															
Station	Date	Collector	Tide	Temp	Weather	Sal	Strat	ADV	Stat	CL	FECOL	AlCOL	MFCOL	WIND	
WA014.00	01/10/06	LL	E	1	C	30	R	-	C	P		<3.0	-	CL	
WA014.00	02/13/06	JB	F	2	C	25	R	M	C	P		43	-	CL	
WA014.00	04/19/06	KSC	F	10	P	25	R	-	C	P		3.6	-	N	
WA014.00	07/05/06	JB	LE	12	O	28	R	B	C	P		23	-	W	
WA014.00	09/19/06	KSC	HF	17	O	30	R	-	C	P		-	4	SW	
WA014.00	12/11/06	FP	E	5	O	28	R	-	C	P		-	14	CL	
WA015.00	01/30/06	LL	H	0	R	2	R	-	O	R		240	-	-	
WA015.00	02/13/06	JB	F	0	C	15	R	-	O	R		<3.0	-	CL	
WA015.00	04/19/06	KSC	F	12	P	25	R	-	O	R		9.1	-	NE	
WA015.00	07/05/06	JB	LE	21	O	24	R	-	O	R		3.6	-	W	
WA015.00	09/19/06	KSC	HF	20	O	29	R	-	O	R		-	2	SW	
WA015.00	12/11/06	FP	E	6	O	24	R	-	O	R		-	<2.0	CL	
WA016.00	01/30/06	LL	HE	0	R	1	R	-	O	R		240	-	-	
WA016.00	02/13/06	JB	HF	2	C	15	R	-	O	R		<3.0	-	CL	
WA016.00	04/19/06	KSC	F	12	P	25	R	-	O	R		3.6	-	N	
WA016.00	07/05/06	JB	LE	22	O	24	R	-	O	R		3.6	-	W	
WA016.00	09/19/06	KSC	HF	21	O	29	R	-	O	R		-	<2.0	NW	
WA016.00	12/11/06	FP	E	3	O	24	R	-	O	R		-	2	CL	
WA024.00	01/10/06	LL	E	1	C	25	R	-	C	P		9.1	-	CL	
WA024.00	02/13/06	JB	HE	1	C	26	R	-	C	P		3.6	-	W	
WA024.00	04/19/06	KSC	L	8	P	30	R	-	C	P		<3.0	-	N	
WA024.00	07/05/06	JB	L	15	O	28	R	-	C	P		23	-	W	
WA024.00	09/19/06	KSC	H	16	O	31	R	-	C	P		-	<2.0	W	
WA024.00	12/11/06	FP	L	5	O	26	R	P	C	P		-	18	CL	
WA028.00	01/10/06	LL	E	1	C	24	R	-	O	R		23	-	CL	
WA028.00	02/13/06	JB	H	2	C	26	R	-	O	R		<3.0	-	W	
WA028.00	04/19/06	KSC	LE	9	P	26	R	-	O	R		240	-	N	
WA028.00	07/05/06	JB	LF		O	999	R	-	O	R		-	-	-	
WA028.00	08/08/06	LL	HE	19	C	28	R	-	O	R		15	-	W	
WA028.00	09/19/06	KSC	HF	19	O	30	R	-	O	R		-	22	NW	
WA028.00	12/11/06	FP	F		O	24	R	-	O	R		-	16	CL	
WA031.00	01/10/06	LL	E	1	C	25	R	-	O	R		<3.0	-	CL	
WA031.00	02/13/06	JB	H	1	C	26	R	-	O	R		<3.0	-	W	
WA031.00	04/19/06	KSC	LE		P	999	R	-	O	R		-	-	N	
WA031.00	04/19/06	LL	F	10	C	28	R	-	O	R		<3.0	-	N	
WA031.00	07/05/06	JB	LF	18	O	28	R	-	O	R		3.6	-	W	
WA031.00	09/19/06	KSC	H	19	O	30	R	-	O	R		-	112	W	
WA031.00	12/11/06	FP	LE	4	O	24	R	P	O	R		-	4	CL	
WA033.00	01/10/06	LL	E	2	C	25	R	-	C	P		3.6	-	CL	
WA033.00	02/13/06	JB	HE	1	C	25	R	-	C	P		<3.0	-	CL	
WA033.00	04/19/06	KSC	LE		P	28	R	-	C	P		3	-	N	
WA033.00	07/05/06	JB	L	16	O	28	R	-	C	P		7.3	-	W	



WA033.00	09/19/06	FGA	H	15	O	30	R	-	C	P	-	10	SW
WA033.00	12/11/06	FP	F		O	26	R	-	C	P	-	20	CL
WA034.00	01/10/06	LL	E	2	C	25	R	-	C	P	<3.0	-	CL
WA034.00	02/13/06	JB	H	2	C	25	R	-	C	P	<3.0	-	W
WA034.00	04/19/06	KSC	LE		P	999	R	-	C	P	-	-	-
WA034.00	04/19/06	LL	F	10	C	28	R	-	C	P	<3.0	-	N
WA034.00	07/05/06	JB	LF		O	999	R	-	C	P	-	-	-
WA034.00	08/08/06	LL	HE	18	C	29	R	-	C	P	3.6	-	W
WA034.00	09/19/06	KSC	HF	17	O	30	R	-	C	P	-	<2.0	SW
WA034.00	12/11/06	FP	L	4	O	26	R	P	C	P	-	27	CL
WA036.00	01/10/06	LL	E	2	C	26	R	-	C	P	9.1	-	CL
WA036.00	02/13/06	JB	HE	2	C	25	R	-	C	P	<3.0	-	W
WA036.00	04/19/06	KSC	E	8	P	28	R	-	C	P	<3.0	-	W
WA036.00	07/05/06	JB	LF	14	O	28	R	-	C	P	3.6	-	W
WA036.00	09/19/06	KSC	H	19	O	30	R	-	C	P	-	<2.0	S
WA036.00	12/11/06	FP	L	4	O	25	R	WP	C	P	-	2	CL
WA038.00	01/10/06	LL	E	1	C	25	R	-	C	P	3.6	-	CL
WA038.00	02/13/06	JB	E	2	C	25	R	-	C	P	<3.0	-	CL
WA038.00	04/19/06	KSC	F	9	P	30	R	-	C	P	<3.0	-	E
WA038.00	07/05/06	JB	LF	14	O	28	R	-	C	P	15	-	CL
WA038.00	09/19/06	KSC	F	18	O	30	R	-	C	P	-	<2.0	SW
WA038.00	12/11/06	FP	L	5	O	25	R	P	C	P	-	16	CL
WA043.00	01/10/06	LL	E	1	C	28	R	-	O	A	<3.0	-	SW
WA043.00	02/13/06	JB	E		C	26	R	-	O	A	3.6	-	CL
WA043.00	04/19/06	KSC	LF	8	P	30	R	-	O	A	<3.0	-	N
WA043.00	07/05/06	JB	F	15	O	30	R	-	O	A	3.6	-	CL
WA043.00	09/19/06	KSC	HE	16	O	31	R	-	O	A	-	<2.0	S
WA043.00	12/11/06	FP	L	5	O	28	R	P	O	A	-	12	CL

## Shoreline Survey Activity

Spinney Creek was surveyed in 1997 and Spruce Creek was surveyed in 2002 and 2005. Observations of the area were made during regular random sampling runs, volunteer training and site certifications. No septic changes in the shoreline were observed, no new housing developments or businesses or drainage alterations. MDMR has been running monthly samples collected by the Spruce Creek Association at three sites above the tide gate located at Route 1 on Spruce Creek. The purpose of the study was to see if water quality improved after the tide gate was removed. Since water quality above the tide gate continued to be poor, the sampling lead to finding two properties, along the fresh water portion of Spruce Creek, just west of Rt. 101, with septic problems. One property had a recreational vehicle that had a straight pipe to the creek. The RV has been removed. The other property has a failing septic system. The owners are seeking grant money to fix the system.

Spruce Creek samples collected above tide gate:

Date	Kittery Trading Post	Picot Road	Rt. 101
	A1/MF fecal score	A1/MF fecal score	A1/MF fecal score
4/19/06	43	240	240
5/10/06	1100	460	460
6/12/06	93	93	23
8/8/06	23	240	No sample
10/30/06	620	300	No sample
12/18/06	29	8	24



A questionable septic system located at Crocketts Neck in Spruce Creek was dye tested by MDEP and found to be an inground system and not an overboard discharge. The property next door, at 20 Bond Rd, continues to have an unlicensed overboard discharge. MDEP is following up on this property. Water quality meets approved standards in the south half of Spruce Creek, but there are unresolved issues with the unlicensed discharge and the problem with high fecal levels found in clams in 2005. Admiralty Village has a pump station with an overflow pipe. There is also an Imhoff tank submerged in the creek. Both of these are located near station WA33.

The overboard discharge located on Chickering Creek, near the head of Spruce Creek, and the one at the mouth of Spruce Creek, are on the MDEP OBD priority removal list, but there are no septic alternatives. The discharges are being maintained by the owners and inspected annually by MDEP. The overboard discharge in Eliot and the discharges located in Chauncey Creek are low on the priority list.

## **Aquaculture/Wet Storage Activity**

GreatBay Aquaculture, LLC (GBA) at 153 Gosling Rd, Portsmouth, NH currently discharges approximately 0.045 mgd. The NH DES Wastewater Engineering Bureau reports that if GBA starts growing fish to market size, they would discharge at an average monthly flow of approximately 0.25 mgd, with a maximum daily flow of 0.36 mgd. GBA's permit allows these higher flow rates. GBA discharges to the PSNH Newington Station cooling water discharge canal. Please see the large black dot on the attached map shows their outfall location; Attachment A. page .<sup>2</sup>

The discharge is in a prohibited area (unclassified). When the NH DES completes dye studies on the Kittery WWTF and the Portsmouth WWTF (after a decision on an outfall diffuser is made), the NH DES will continue to recommend that this portion of the river remain prohibited. The NH DES performed analyses on the discharge flows and reports to the DMR that the discharge from this outfall would not likely make it to the nearest areas open for harvest.<sup>3</sup>

NH DES has added GBA to the list of NPDES outfalls they track annually, just to make sure the flow and FC numbers remain in their comfort zone. If area classifications or other circumstances change, NH DES could seek an agreement outside of the NPDES permit until renewal time in five years.<sup>4</sup>

### **Wood Island site**

#### ***PISC WI***

**Original Date:** 5/29/2001 **Effective Date:** 5/29/2001 **Expiration Date:** 5/28/2011

**NOAA Chart:** 13283

**Description:** Southeast of Wood Island Portsmouth Harbor Kittery York County

**Acreage:** 3.76

**Conditions:**

**Transfer/Renewal History:**



**Species Cultivated:** sea urchins green (Strongylocentrotus droebachiensis)

**Cultivation Technique(s):** Bottom

**Hill, Chris**

Chris Hill

425 Newington Road

Newington, NH 03801

207-752-2625 Fax:

<http://www.maine.gov/dmr/aquaculture/leaseinventory2006/documents/PISCWI.pdf>

## **Classification Changes Required**

No classification changes are required at this time.

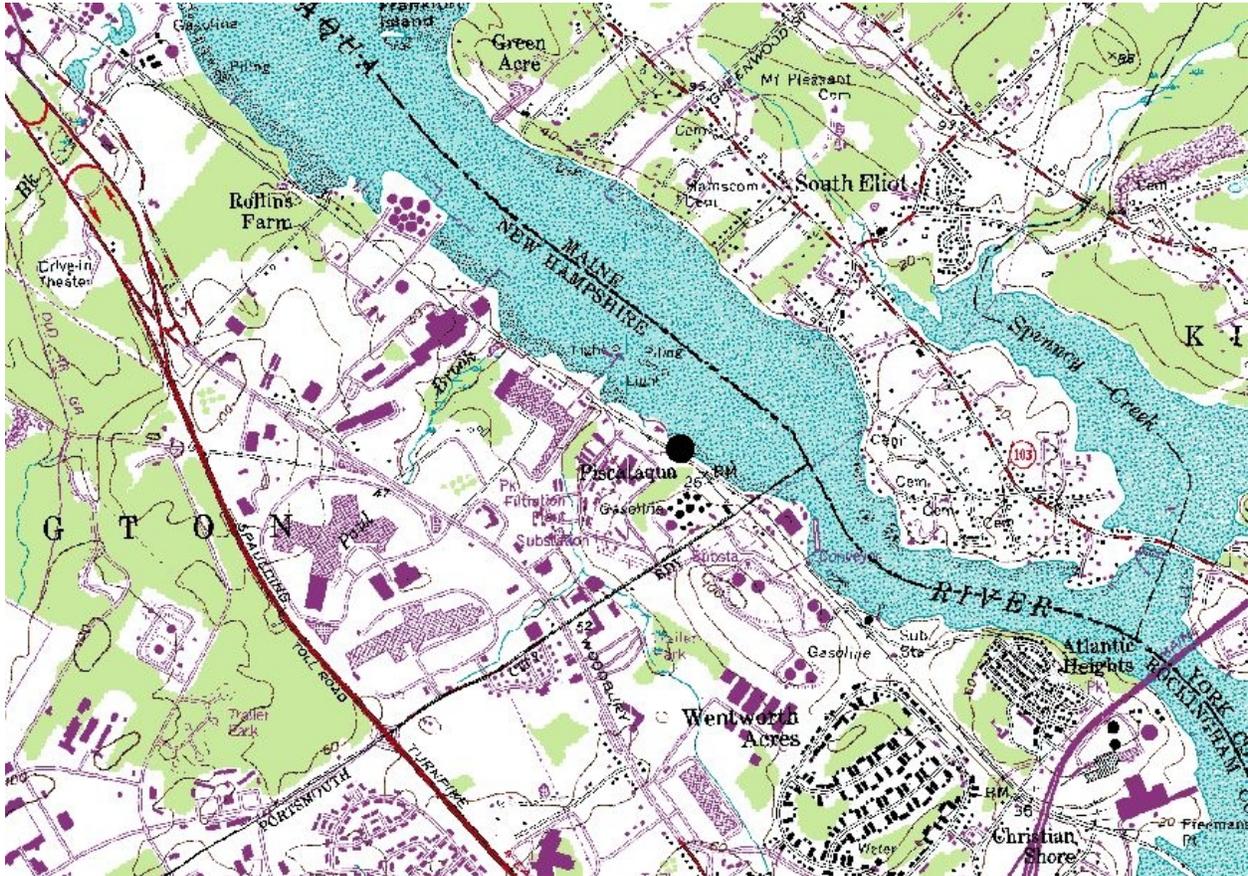
## **Discussion & Summary**

Stations WA 29.1, 30, 32 and 35 were deactivated in 2006, because samples could not be collected at these stations at low tide. There are other stations in the classification areas that can be collected at all tides and provide adequate monitoring of the classified area.

MDEP needs to address the unlicensed overboard discharge in the south end of Spruce Creek, and the north end of Spruce Creek needs an updated survey. No classification changes are required at this time in Growing Area WA.



### Attachment A. Map of Piscataqua River with GreatBay Aquaculture, LLC outfall location<sup>5</sup>



Map provided by New Hampshire Department of Environmental Services



## Attachment B. Key to water quality table headers.

Station = water quality monitoring station

Class = classification assigned to the station; prohibited (P), restricted (R), conditionally restricted (CR), conditionally approved (CA) and approved (A).

Count = the number of samples evaluated for classification, must be a minimum of 30.

MFCNT = the number of samples evaluated with the MTec method (included in the total Count column)

Geo\_Mean = means the antilog (base 10) of the arithmetic mean of the sample result logarithm (base 10).

SDV = standard deviation

Max = maximum score of the 30 data points in the count column

P90 = 90<sup>th</sup> percentile

APPD\_STD = the 90<sup>th</sup> percentile, at or below which the station would meet approved criteria in the absence of pollution sources or poisonous and deleterious substances.

RESTR\_STD = the 90<sup>th</sup> percentile, at or below which the station would meet restricted criteria.



## Bibliography

<sup>1</sup> Nash, Chris. 11 January 2006. Last draft of Dover Dye Study. [email to Fitzpatrick, A.] Accessed 19 February 2007.

<sup>2</sup> Dudley, Dan. 20 March 2006. GreatBay Aquaculture [email to Fitzpatrick, Amy]. Accessed 19 February 2007.

<sup>3</sup> Nash, Chris. 21 March 2006. GreatBay Aquaculture [email to Fitzpatrick, Amy]. Accessed 19 February 2007.

<sup>4</sup> Nash, Chris. 21 March 2006. GreatBay Aquaculture [email to Fitzpatrick, Amy]. Accessed 19 February 2007.

<sup>5</sup> Dudley, Dan. 20 March 2006. GreatBay Aquaculture [email to Fitzpatrick, Amy]. Accessed 19 February 2007