



Rhode Island Department of Environmental Management  
Office of Water Resources – Shellfish Program

# 2015

# Shellfish Program Classification Report



# **Upper Narragansett Bay**

## **Growing Area 1 Triennial Re-Evaluation**

**May 2015**



**Rhode Island  
Department of Environmental Management  
Office of Water Resources  
Shellfish Program**

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## 1.0 Introduction

A triennial re-evaluation shoreline survey of Upper Narragansett Bay was conducted in order to comply with National Shellfish Sanitation Program (NSSP) requirements for shellfish growing area classification. The primary objective of this shoreline survey is to identify and characterize sources of pollution affecting the area and re-evaluate point and non-point sources previously identified during prior surveys.

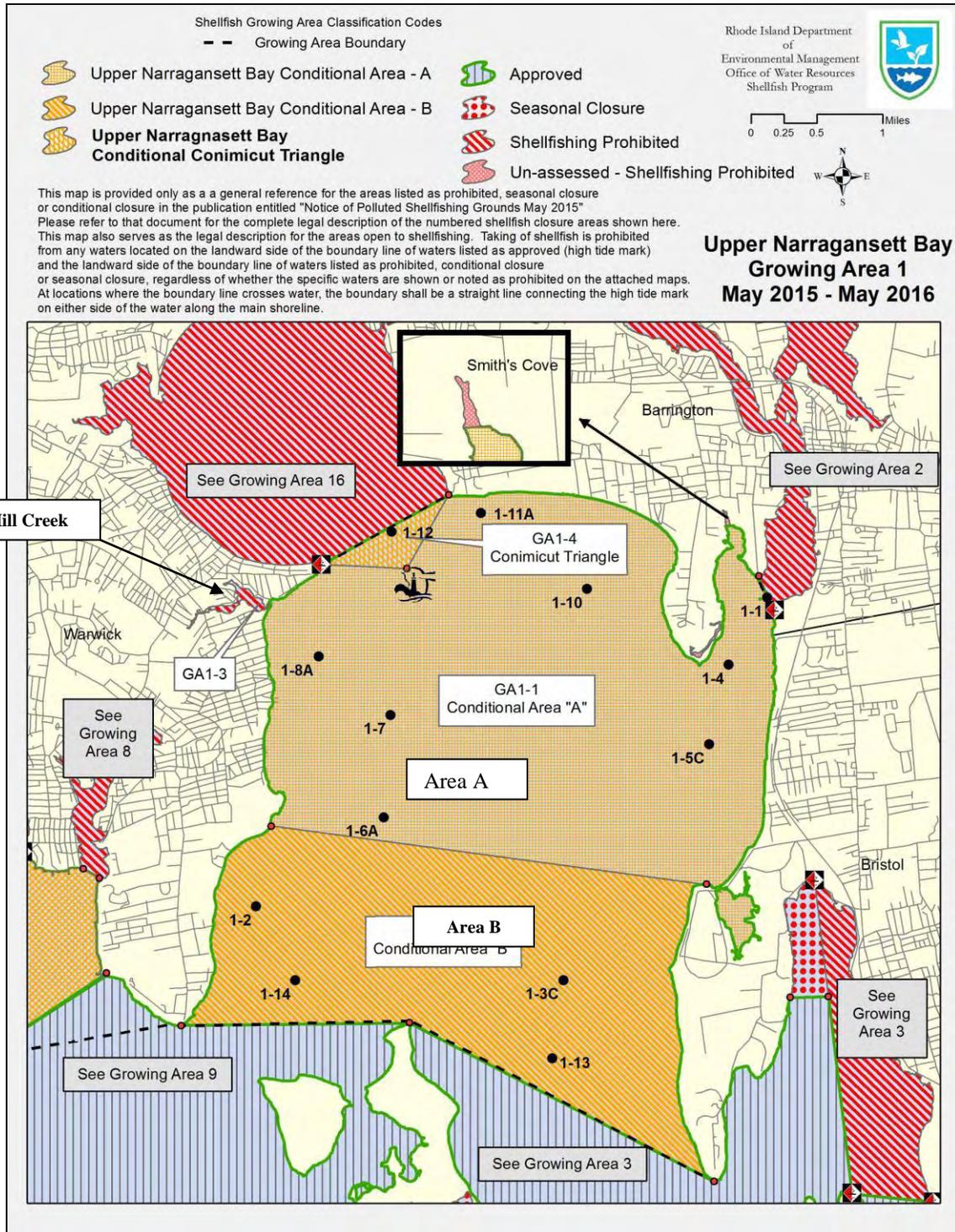
The Upper Narragansett Bay – Growing Area 1 is presently divided into three sections, conditionally approved areas A and B and the Conimicut Triangle (Figure 1.1). There is currently one area; Old Mill Creek closure number GA1-3 that is classified as prohibited to shellfishing. Two other areas east of Rumstick Neck are unassessed, Smith Cove and a smaller inlet to the south and are therefore also prohibited. With the addition of two stations in conditional area “B” in 2010, the total number of monitoring stations within this growing area is thirteen.

A shoreline survey of this growing area was conducted in the spring of 2009. There were a total of seventy-seven (77) actual or potential sources identified during this shoreline survey, excluding marinas. A total of twenty-eight of the seventy-seven sources were not actively flowing at the time of the shoreline survey with the remaining forty-nine having flows warranting sampling. All sources in which flow was observed were sampled.

This shoreline survey was conducted as a triennial re-evaluation of this growing area. As such the survey involved review of previous shoreline surveys, bacteriological sampling of actual pollution sources noted in previous surveys that were found to be equal to or greater than 240 cfu/100ml and identification of any new sources of pollution if applicable. These previously identified pollution sources were re-evaluated to determine their bacteriological impacts on the Upper Narragansett Bay.

In the 2012 Triennial review, thirteen sources that were sampled in 2009 had results that exceeded the recommended follow-up threshold of 240 CFU/100ml and were re-sampled. Four sources sampled in 2012 had results that exceeded the 240 CFU/100ml threshold and were located in Conditional Area “A” and one source was located in area “B”.

**Figure 1 Upper Narragansett Bay – Growing Area 1**



## 2.0 Description of Growing Area

Growing Area 1 consists of approximately 9,668 acres of conditionally approved waters (RIDEM GIS), which encompasses all of the shoreline north of a line that extends from Warwick Point light to Providence Point on Prudence Island to the southern extremity of Popasquash Point in Bristol. It also includes all of the shoreline south of a line from Adams Point in Barrington to Jacobs Point in Warren and south of a line from Conimicut Point in Warwick to Nayatt Point in Barrington.

The area is divided into three areas identified as the “Conimicut Triangle” (582 acres) which currently encompasses an area north of a line from the extension of Ogden Avenue in the Highland Beach area of Warwick to the Conimicut Light and then to the Old Tower at Nayatt Point. Area “A” (5,374 acres) which encompasses the area north of a line from the southeast corner of the Rocky Point pier in Warwick to the southwest corner of the Colt State Park pier in Bristol, south of a line from Adams Point in Barrington to Jacobs Point in Warren and south of the Conimicut Triangle line. Conditional Area “B” (3712 acres) consists of the area north of a line from Warwick Point to Providence Point on Prudence Island, north of a line from Providence Point to the southern extremity of Popasquash Point in Bristol, and south of the line from the southeast corner of Rocky Point pier in Warwick to the southwest corner of the Colt State Park pier in Bristol.

In 2010 the RIDEM shellfish program in cooperation with the Narragansett Bay Commission (NBC) conducted an extensive wet weather sampling program. The report entitled “Upper Narragansett Bay Conditionally Approved Growing Area 1 Closure Criteria Review, April 2011” presents the results of this monitoring and was used to defend amendment of the areas’ closure criteria. Table 1 displays the current precipitation events that trigger the closure of these three areas:

**Table 1 Precipitation Triggers**

<u>AREA</u>	<b>Precipitation Amount</b>				
	<u>0 – 0.49”</u>	<u>0.50– 0.79”</u>	<u>0.80” – 1.49”</u>	<u>1.50” – 2.99”</u>	<u>&gt;3.0”</u>
Conimicut Triangle	Open	7 day Closure	7 day closure	7 day closure	10 day closure
Upper Narragansett Bay Area “A”	Open	Open	7 day closure	7 day closure	10 day closure
Upper Narragansett Bay Area “B”	Open	Open	Open	7 day closure	10 day closure

The precipitation that initiates these shellfishing closures can be in the form of rain and/or snowmelt. All precipitation totals are based on the total accumulation during any consecutive 24-hour period (24 hr total). Closures must be implemented within 12 hours of achieving the trigger precipitation amount for the Conimicut Triangle, Area “A” and Area “B”. The duration of all shellfish closures must be a minimum of 7 full days (10 full days for the Conimicut Triangle, “A” and “B” >3.0” rainfall/24 hrs) from the ending time of the precipitation event.

The Narragansett Bay Commission (NBC) as mentioned previously has under taken a multi phased abatement project to eliminate existing combined sewer overflows (CSOs). Phase I was completed in October of 2008 and Phase II was completed in December of 2014. These CSOs have historically impacted the water quality of Narragansett Bay and the elimination of these pollution sources has allowed for increased shellfishing opportunities in this area due to improved water quality. Going forward additional changes to closure criteria may be achievable once sufficient data is collected to quantify water quality improvements due to this construction. Increases to closure criteria rain amount triggers, less length of closure days, 5 versus 7 or reduction in area impacted by rainfall and by-passes are all being considered and analyzed as a result of these treatment improvements. Mother nature dictates the data collection since she controls the amount of rain and timing of rain events needed to compute impacts.

The following information describes the current 2015-2016 physical geography of this growing area.

Area of Upper Narragansett Bay	9,693 acres
Conimicut Triangle	120 acres
Area of Conditional Area A	5,838 acres
Area of Conditional Area B	3,712 acres
Area of Old Mill Creek	23 acres
Longest reach	4.3 miles
Widest reach	3.8 miles
Deepest point	48 feet
Mean depths	
Conditional Area A	13.5 feet
Conditional Area B	21.7 feet

### **3.0 Pollution Source Survey**

Lucinda M. Hannus, Senior Environmental Scientist for the Division of Water Resources reviewed previous sources and their potential impacts for this triennial update.

Five sources were identified in the 2012 shoreline survey as exceeding the 240 FC MPN / 100 ml trigger for re-sampling. The following table illustrates the sources and sampling results

**Table 2      2012 Sources exceeding 240 CFU/100ml**

Source ID	Description	2009 Results	2010 Results	2011 Results	2012 Results	Volume	In stream result
		MPN Fc/100ml	MPN Fc/100ml	MPN Fc/100ml	mTEC Cfu/100ml		mTEC Cfu/100ml
1-003	OUTLET FROM UPSTREAM WETLAND	750	NS	NS	610	.04 cfs	
1-030	18" RCP	430	NS	NS	933	Trickle	
1-040	STREAM	460	NS	NS	754	.02 cfs	
1-075	36" CMP	460	NS	NS	260	0.04 cfs	
1-202	24" RCP	24001	43	4600 93	5800	.25 cfs	2

No sources were resampled in 2015. Sources 1-003, 1-030, 1-040 and 1-075 had fairly low bacteria counts combined with very insignificant flow volumes and were determined to be not impacting the receiving waters based on these conditions. Source 1-202 which did have elevated bacteria counts with a relatively large volume of flow had results of 2 CFU/100ml in the receiving waters immediately in front of this outfall. The in stream bacteria count is well below the shellfish criteria and would indicate that this source is not impacting the receiving waters. If time and staff allow these five sources should be reevaluated in 2016 during open conditions.

#### **4.0 Wastewater Treatment Facilities (WWTF)**

There are currently no wastewater treatment facilities that discharge directly to this growing area, however several existing plants discharge into the Providence and Warren rivers upstream of this area and have a direct impact on the water quality of the upper bay.

On the Providence River three facilities have permitted discharges, the Narragansett Bay Commission's (NBC) Fields Point and Bucklin Point facilities and the city of East Providence's wastewater treatment facility.

The Fields Point facility is permitted to discharge a maximum of 77 million gallons per day (mgd) of flow to secondary treatment. In 2015 average daily flow was 37.9 MGD. The Bucklin Point facility is permitted to discharge 116 MGD (46 MGD for the plant and 70MGD for the wet weather facility) and averaged 17.8 MGD also below permit limits. Neither plant reported any fecal violations in 2015.

The East Providence facility is permitted to discharge 14.2 mgd and the average discharges for 2015 were 4.9 MGD well within permit limits. There was one fecal coliform violation in June of 2015 causing 220,800 gals. Of plant effluent with a fecal coliform bacteria count of 16,000 fc/100ml to discharge to the Providence River due to a disinfection system failure. All of the Upper Bay growing areas were under a ten (10) day closure due to a rain event of greater than 3.0" on 5/31/2015 and remained closed until noon on 6/11/2015.

The Warren wastewater treatment facility discharges to the Warren River which is an upper tributary to this growing area and has a permit limit of 2.01 mgd. In 2015 the monthly average flow was 1.62 MGD within permit limits. Warren's permit has changed and they no longer have a permitted fecal coliform maximum. Reporting criteria has now changed to enterococci. There were six reported enterococci violations from the plant in 2015.

The confluence of the Pawtuxet River and Narragansett Bay is approximately three miles north of this growing area. Three treatment facilities have permitted discharges to the Pawtuxet River, and as a result the Pawtuxet is a source of pollution to Narragansett Bay and this growing area. Cranston, Warwick and West Warwick all operate wastewater treatment facilities that discharge effluent. West Warwick reported 2 fecal coliform violations for 2015. DEM's O & M office is investigating the violations which may be an issue with the UV system at the plant. The city completed a new tertiary treatment system for phosphorous removal in 2015. West Warwick's permitted flow of 10.5 mgd was not exceeded with average flows equal to 4.9 mgd. Cranston had no reported violations for 2015 and average flows were 11.2 mgd almost half of the permitted flow. The city is currently constructing a major upgrade to the plant to add a tertiary treatment system to biological nutrient removal. This upgrade is scheduled to be completed in 2016. Warwick reported a daily max fecal coliform violation on 9/14/2015 of 500 MPN/100mL vs. a permit limit of 400 MPN/100mL. Warwick's permit limit for flow is 7.7 MG average monthly flow. Their actual monthly average flow for 2015 was 4.67mgd

#### **5.0 Water Quality Studies**

The Shellfish Growing Area Monitoring program is part of the state of Rhode Island's agreement with the United States Food and Drug Administration's National Shellfish Sanitation Program (NSSP). The

purpose of this program is to maintain national health standards by regulating the interstate shellfish industry. As part of this agreement, the state of Rhode Island is required to conduct continuous bacteriological monitoring of the shellfish harvesting waters of the state in order to maintain certification of these waters for shellfish harvesting for direct human consumption.

These conditionally approved waters are impacted by point sources, whether they are stormwater outfalls or waste water treatment plant discharges. Any growing area in the conditionally approved classification shall meet the requirements for an approved area classification when the conditionally approved classification is in the open status. In “Approved” waters that are affected by point sources the 90<sup>th</sup> percentile standard is not used, but rather a standard of not more than 10 percent of the samples shall exceed a 49 MPN per 100 ml for a three-tube decimal dilution test and 31 CFU per 100 ml for a MF (mTEC) test. Samples are collected monthly when the areas are open and the most recent 15 samples are evaluated in January upon completion of the annual sampling.

All samples are collected at a depth of 1-2 feet below the water’s surface using 4-ounce nalgene bottles. The samples are then stored in a portable cooler at a temperature of approximately 4° Celsius. Upon completion of the monitoring run, samples are transported to the RIDOH laboratories in Providence for analysis. In July of 2012 the RIDOH converted from the MPN multi tube fermentation process to the mTEC membrane filtration method for analyzing shellfish water samples. The protocol for collecting and storing samples is the same as it is for the MPN 3 tube method, however the mTEC method allows for an extended holding period, 30 hours versus 6 hours. The mTEC membrane filtration method as described in Standard Methods for the Examination of Saltwater and Shellfish is now used to analyze these samples. The data is compiled and reviewed according to NSSP requirements stating that at least the most recent 15 data sets be used. All routine monitoring samples used in the statistical analysis were processed using the mTEC method.

## HIGHLIGHTS

- \* All Stations Open sampled 12X in 2015
- \* Sampled 21X under varying conditions
- \* Statistics represent most recent data >09/08/14 (N=15) for Conimicut Triangle stations
- \* Statistics represent most recent data >10/30/14 (N=15) for “Area A” stations
- \* Statistics represent most recent data >04/24/15 (N=15) for “Area B” stations
- \* All conditionally approved stations in compliance when open
- \* mTEC = 15 (<31 cfu/100ml)
- \* *Data run 4/26/16 by D. Borkman in EXCEL*

## COMMENTARY

The Upper Narragansett Bay (Growing Area 1) was sampled 21 (21) times in 2015 under a variety of conditions with twelve (12) of those occurring when the Triangle, Area A and Area B were all open simultaneously. The additional targeted sampling was completed in order to analyse areas under a variety of rain conditions. All samples in the analysis were collected during dry weather conditions when the areas were "open/approved" for shellfish harvesting. Some samples were also collected in the Conimicut Triangle when it was closed and Area A was open to try to confirm that the Triangle is properly classified. Additional samples were collected at the new stations in area B under wet conditions (>1.5") in an attempt to quantify an upper limit to the rain closure criteria. The statistical evaluation for the Upper Narragansett Bay incorporates the most recent 15 (the minimum number required by NSSP Manual of Operations guidelines for conditionally approved areas) dry weather samples collected for each station in the Conimicut Triangle, Area "A" and "Area" B.

## RECOMMENDATIONS

- \* All conditionally approved stations are in compliance and conformance
- \* All Areas Open Sampled 12X in 2015
- \* Statistics represent most recent data >10/1/13 (N=15) for Conimicut Triangle stations
- \* Statistics represent most recent data >10/15/13 (N=15) for “Area A” stations
- \* Statistics represent most recent data >03/6/14 (N=15) for “Area B” stations
- \* All conditionally approved stations in compliance when open
- \* mTEC = 15 (<31 cfu/100ml)
- \* *Data run 4/26/2016*

**Table 3 2015 Statistical Data Open Conditions**

***RIDEM SHELLFISH GROWING AREA MONITORING RESULTS***

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO MEAN</i>	<i>%&gt;CRITICAL 31</i>
<b>Conimicut Triangle when open</b>				
GA1-12	CA	15	2.7	0.00
<b>Area A when open</b>				
GA1-5C	CA	15	2.7	0.00
GA1-6A	CA	15	2.4	0.00
GA1-7	CA	15	2.5	0.00
GA1-8A	CA	15	2.8	0.00
GA1-10	CA	15	2.2	0.00
GA1-11A	CA	15	2.6	0.00
GA1-12	CA	15	2.7	0.00
GA1-1	CA	15	2.8	0.00
GA1-4	CA	15	2.6	0.00
<b>Area B when open</b>				
GA1-2	CA	15	3.0	6.67
GA1-3C	CA	15	2.3	0.00
<b>New Stations Area B Stations 13, 14 when open</b>				
GA1-13	CA	15	2.2	0.00
GA1-14	CA	15	2.2	0.00

Refer to Figure 1 for the locations of these monitoring sites within the Upper Narragansett Bay Growing Area 1.

## 6.0 Conclusions and Recommendations

The triennial update for the Upper Narragansett Bay Growing Area 1 involved the review of sources identified in the 2012 triennial update. No sampling of these sources was completed in 2015. As indicated in table 2 these sources either exhibit relatively low fecal counts for higher flows or have very low flows for slightly elevated fecal counts and would therefore not be negatively impacting the classification of the growing areas.

Due to the insignificant amount and impact of the sources located and re-sampled during the triennial review no changes are recommended due to identified sources.

The [Rhode Island Sea Grant](#)/Coastal Resources Center facilitated for the state and published the Rhode Island Shellfish Management Plan (SMP). This document provides comprehensive policy guidance regarding management and protection measures for shellfish, such as quahogs and oysters, located in state marine waters. The effort involved multiple state agencies, including the [R.I. Coastal Resources Management Council](#), which manages aquaculture leasing, and the [R.I. Department of Environmental Management](#) (DEM), which manages shellfish in state waters. It also engaged stakeholders in identifying policies and practices to restore shellfish resources and enhance the economic vitality of the shellfishing industry. Project leaders worked with the wild harvest, aquaculture, and restoration communities to define priority areas and have begun to tackle some of these issues. It is important to note that while the term “shellfish” includes numerous species, the SMP addresses gastropods and bivalves, mainly quahogs, bay scallops, whelks, oysters, soft shell clams, and blue mussels.

The Rhode Island Department of Environmental Management Office of Water Resources made a presentation “Water Quality Based Shellfish Closures” to the stakeholders at their meeting in early March of 2013. The presentation was made to inform stakeholders and the public as to the process the department undertakes in making water quality classification decisions for shellfish growing areas. Several questions and concerns put forth at that meeting were taken under consideration by the department. Noon closures/openings were adjusted to be only 7 days in duration. Range markers have been catalogued and posted on the new interactive web map site hosted by RIDEM ( [RIDEM Shellfish Maps](#) ). A new central email contact has been created for the public at [dem.shellfish@dem.ri.gov](mailto:dem.shellfish@dem.ri.gov) and a revamped web page was created to name a few of the upgrades to the program since 2013.

Growing Area 2  
Barrington, Palmer and Warren Rivers  
2015 Annual Update

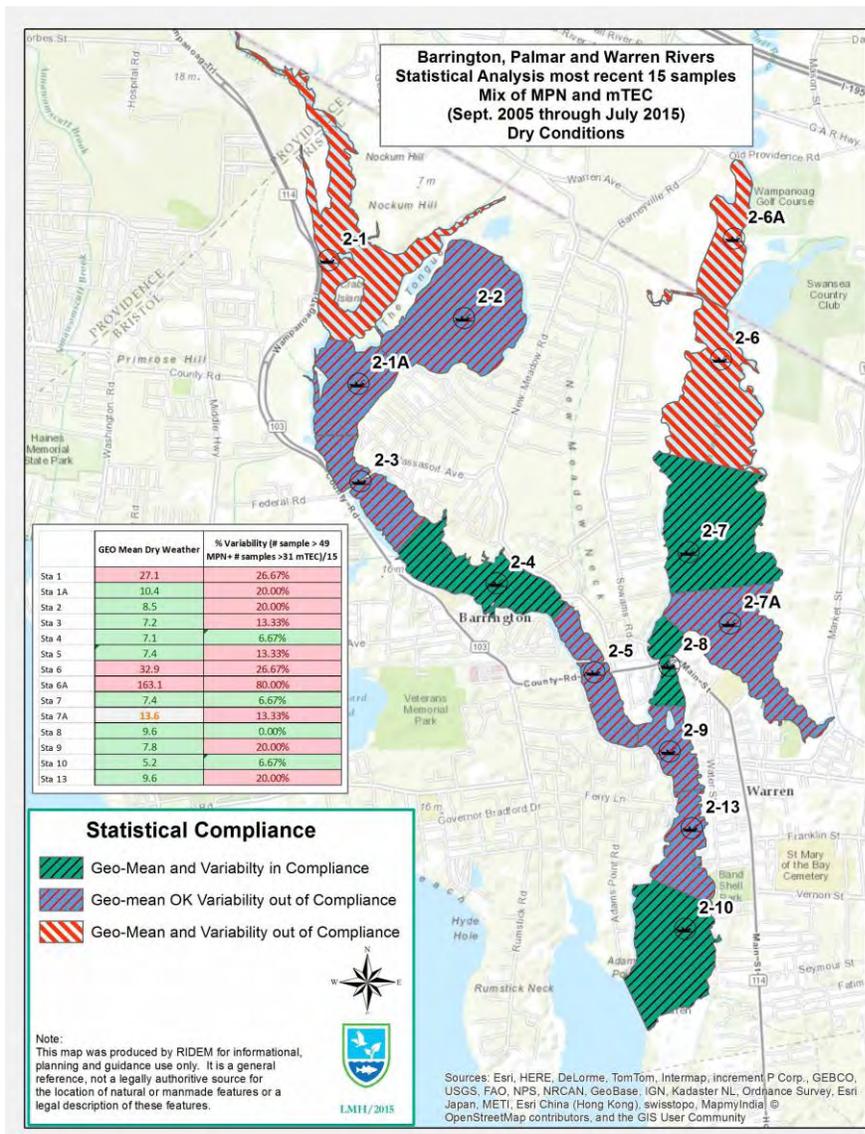
All waters of the Barrington, Palmer and Warren Rivers, Growing Area 2 are currently prohibited to shellfishing. The area was sampled twice in 2015 both during dry weather conditions. Results from existing sampling indicate that the area is out of compliance during wet weather and generally out of compliance during dry weather. The area is therefore correctly classified as prohibited. The monitoring of this area will continue in 2016 as recommended by the TMDL in order to gather a more comprehensive database of water quality under various conditions.

A bi-state monitoring effort of the lower Palmer River watershed in Massachusetts, was begun in 2012 and three dry weather surveys of the entire Palmer River watershed were conducted in 2012 and 2013. More recent sampling led by RIDEM and MADEP has targeted specific areas with elevated bacteria concentrations. This included several canoe trips on the lower Palmer River below Shad Factory Pond and targeted sampling along both the main stem lower Palmer River, Torrey Creek, and Rocky Run. In 2015, multiple samples were taken at different tides at eight stations in this target area. While these monitoring efforts have helped to identify specific reaches of the river and its tributaries associated with elevated bacteria levels, they have not been helpful in identifying specific sources. In December 2015, EPA coordinated a meeting between MADEP, RIDEM, EPA, and MA office of NRCS to update organizations on the project and to plan next steps to identify bacteria sources. The discussion of 2016 field work focused on identifying agriculturally-related source areas of nutrients and bacteria to help target the NWQI outreach efforts. In the Upper reaches of this growing area extensive study and focus has been initiated, and further work by RIDEM in cooperation with EPA and NRCS still needs to be done to address the impacts noted in the bi-state TMDLs with regards to non-point discharges and agricultural BMPs.

The following map is the result of looking at areas within GA-2 that may have the potential for re-classification as conditionally approved, open during dry weather. The most recent (September, 2005 through July 2015, n=15) dry weather results were used to produce these statistics. As shown on the map there is a hopscotch of compliance across the growing area and variability violations in areas downstream of areas that meet both criteria. This would make re-classification problematic at best.

The most southern area of the Warren River around station GA2-10 does indicate a potential for conditionally approved classification based upon water quality results, but the area is impacted by the Warren WWTF outfall and the required dilution safety zone which would prevent the entire area being reclassified from prohibited. The required dilution safety zone as established was determined as a result of an initial phase of a computerized hydrography data logging and charting project completed in 1995. Very little has changed in the plant operations or the hydrography of the receiving waters since that study was completed. The project determined the WWTF effluent path, travel time and dilution by way of studying tracer dye injected into the effluent. From this study a report was prepared and entitled Buffer Zone Study for Effluent Discharges Warren WWTF and is available for review in the program's permanent files. This highly conservative analysis using the Plumes Model used a total flow of 6.001 MGD (current permitted flow is 2.01 MGD), an ambient concentration of 9.7 FC/100ml and a total chlorination failure at the treatment plant. All waters to the north of the plant in the Palmar and Barrington Rivers are currently classified as prohibited due to unacceptable water quality. Water to the south in the Warren River abuts the conditionally approved Growing Area 1. Based on these inputted parameters a closure zone extending in a radius of approximately 2,300 feet from the outfall would be protective in an emergency failure situation. This distance puts this dilution line approximately midway to the south of the river generally opposite Bradford Dr. The existing closure line was

established encompassing all of the required closed safety zone along with additional area of the river to the south to the actual closure line for ease of enforcement and delineation. Further study would be needed to reestablish the actual closure line required if the desire to open a portion of the southern section of the Warren River is sought.



The results of the routine monitoring stations indicate that this growing area is properly classified and therefore no changes to the classification are recommended at this time.

## HIGHLIGHTS

- \* Sampled 2x in 2015 (both during dry weather)
- \* Statistics represent combined wet and dry weather data >09/01/10 (N=15)
- \* Statistics represent dry weather only >8/01/07 (N=15)
- \* Area is presently classified as prohibited
- \* MTEC = 8
- \* Data run 2/10/16

## **COMMENTARY**

The Barrington, Palmer, and Warren Rivers (Growing Area 2) were sampled two times during the 2015 sampling season. Both runs were conducted during dry weather conditions. The sampling boat could not fit under the bridge due to high tide conditions so only 14 samples for stations 6, 6A, 7 and 7A for one run.

The stations located in the Barrington River (Stations 1 – 5), and the Palmer River (Stations 6 – 8), were downgraded from conditionally approved to prohibited about thirteen years ago. The TMDL for the area was completed in 2002 and the recommendations involving the shellfish program call for monitoring the area bimonthly (refer to TMDL).

Results of the limited statistical evaluation for the area, conducted since the completion of the TMDL (>1/1/03), indicate that the area is out of compliance during wet weather and generally out of compliance during dry weather. Additional wet and dry weather data is recommended to better generally characterize the area.

The area is properly classified.

## **RECOMMENDATIONS**

- \* Maintain closure of all the Barrington River and Hundred Acre Cove
- \* Maintain closure of all the Palmer River
- \* Even though area is closed, attempt six systematic random samplings to support TMDL recommendations.

**RIDEM SHELLFISH GROWING AREA MONITORING RESULTS**  
**Wet/Dry Combined**

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>		
			<i>MEAN</i>	<i>%&gt;CRITICAL 31/49</i>	<i>90TH PERC</i>
GA2-1	P	15	36.5	26.67	427.8
GA2-1A	P	15	10.6	20.0	68.7
GA2-2	P	15	5.8	6.67	25.8
GA2-3	P	15	7.0	6.67	23.7
GA2-4	P	15	4.6	0.00	16.5
GA2-5	P	15	5.4	13.33	24.3
GA2-6	P	14	37.2	46.67	229.4
GA2-6A	P	14	196.0	85.71	1315.8
GA2-7	P	14	8.5	7.14	43.2
GA2-7A	P	14	9.4	7.14	46.6
GA2-8	P	15	5.0	0.00	17.1
GA2-9	P	15	5.4	6.67	19.2
GA2-10	P	15	4.0	6.67	15.4
GA2-13	P	15	3.8	6.67	12.5

**Wet = 9      Dry = 6**

**\*values adjusted for mtec**

**2/10/16**

## *Dry Weather Only most recent 15*

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>		
			<i>MEAN</i>	<i>%&gt;CRITICAL 31/49</i>	<i>90TH PERC ()</i>
GA2-1	P	15	27.1	20.0	273.7
GA2-1A	P	15	10.4	20.0	89.0
GA2-2	P	15	8.5	20.0	67.2
GA2-3	P	15	7.2	13.3	37.5
GA2-4	P	15	7.1	6.67	30.2
GA2-5	P	15	7.4	13.3	42.2
GA2-6	P	15	32.9	26.67	254.0
GA2-6A	P	15	163.1	80.0	1530.0
GA2-7	P	15	7.4	6.67	33.3
GA2-7A	P	15	13.3	13.3	85.7
GA2-8	P	15	9.6	0.00	29.5
GA2-9	P	15	7.8	20.0	46.0
GA2-10	P	15	5.2	6.67	24.6
GA2-13	P	15	9.6	20.0	115.1

*\*values adjusted for mtec*

*2/10/16*

The following closure map is for the May 2015 – May 2016 season and also depicts the routine monitoring station locations. No changes to existing prohibited classification recommended.

Shellfish Growing Area Classification Codes

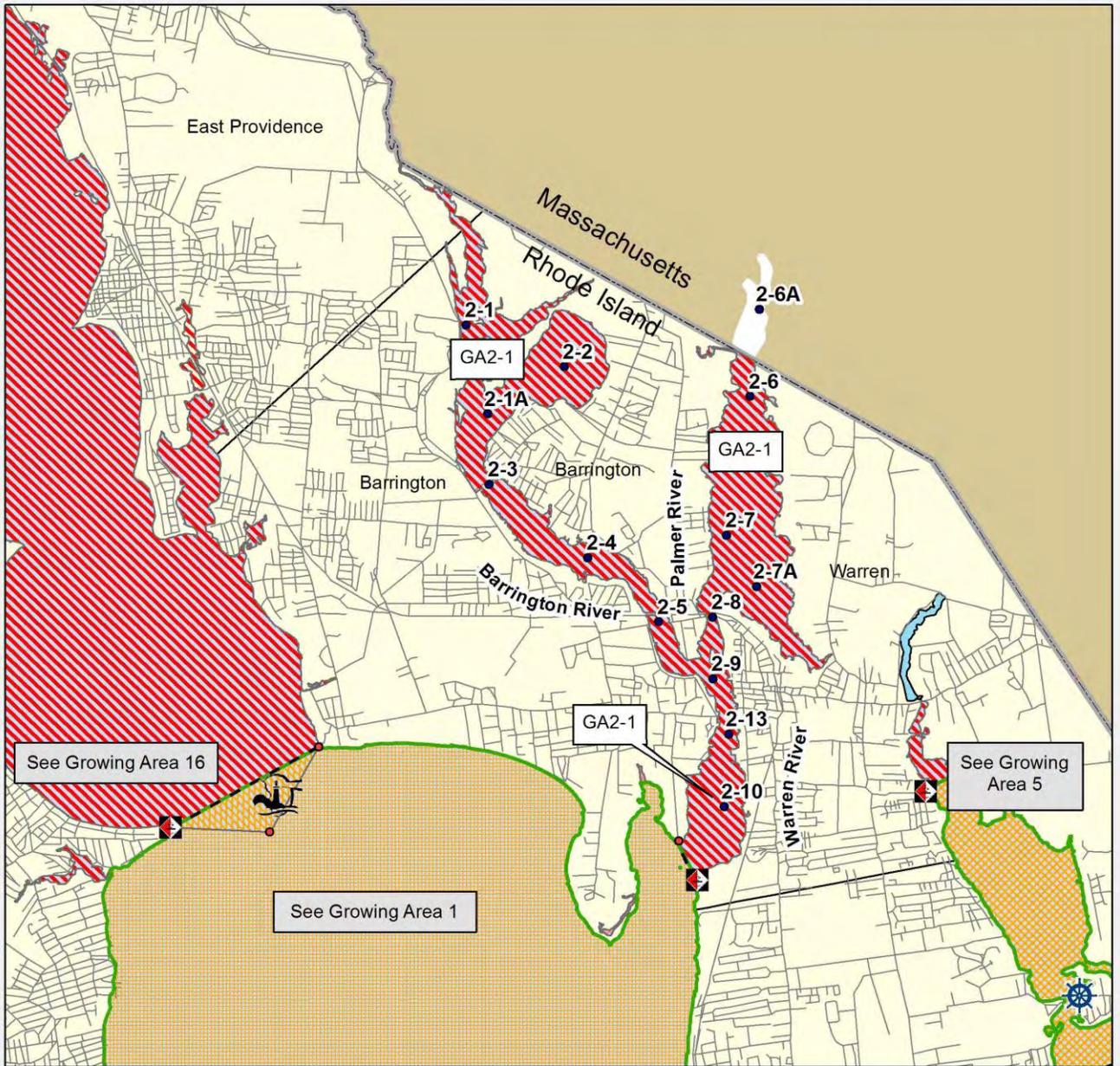
-  Approved
-  Upper Narragansett Bay Conditional Area - A
-  Shellfishing Prohibited
-  Upper Narragansett Bay Conditional Area - Conimicut Triangle
-  Growing Area Boundary

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Shellfish Program



This map is provided only as a general reference for the areas listed as prohibited, seasonal closure or conditional closure in the publication entitled "Notice of Polluted Shellfishing Grounds May 2015". Please refer to that document for the complete legal description of the numbered shellfish closure areas shown here. This map also serves as the legal description for the areas open to shellfishing. Taking of shellfish is prohibited from any waters located on the landward side of the boundary line of waters listed as approved (high tide mark) and the landward side of the boundary line of waters listed as prohibited, conditional closure or seasonal closure, regardless of whether the specific waters are shown or noted as prohibited on the attached maps. At locations where the boundary line crosses water, the boundary shall be a straight line connecting the high tide mark on either side of the water along the main shoreline.

**Barrington, Palmer  
and Warren Rivers  
Growing Area 2  
May 2015 - May 2016**



East Middle Bay  
Growing Area 3  
2015 Annual Update

A 12 year sanitary shoreline survey of the East Middle Bay Growing Area 3 was conducted in 2010. There were a total of sixty-one (61) actual or potential sources identified during this shoreline survey, excluding marinas. A total of forty-five (45) were not actively flowing at the time of the shoreline survey with the remaining sixteen having flows warranting sampling. All sources in which flow was observed were sampled.

Of the forty-five sources exhibiting flows during the 2010 survey only five had bacteria results exceeding the 2400 fc/MPN threshold requiring follow-up sampling for this annual update. Three of the five, 3-201, 3-005 and 3-018 are located in Prohibited areas and were not re-investigated for this update. The other two sources, 3-060 and 3-301 were re-sampled in 2013 and were found to not have any negative impact on the classification of the receiving waters. There were no sources in the watershed sampled for this annual update in 2015.

In June of 2012 the RIDOH converted to the mTEC method to analyze shellfish water samples. During the transition period and until 30 samples using only the mTEC method have been collected the variability component of the NSSP water standard will be weighted to reflect the number of samples from each method. For GA3 21 sets of samples were analyzed using the mTEC method therefore the 90<sup>th</sup> percentile variability must be less than 36 CFU. Refer to RIDEM SOP "Transition to Membrane Filtration (mTEC) for Analysis of Fecal Coliform in Seawater and Pollution Source Samples, August 2012".

The East Middle Bay growing area in Bristol Harbor is impacted by the Town of Bristol WWTF which has an outfall located on the eastern shore of the harbor in Walker's Cove. This treatment plant has issues with infiltration and inflow (I&I) of ground and storm water in the collection system that hydraulically overloads the treatment plant during heavy rain events. The facility is addressing I&I through an ongoing I&I removal program. The facility has also had reoccurring issues with treatment process upsets and disinfection system failures resulting in occasional discharges of elevated levels of fecal coliform to Bristol Harbor. The current closed safety zone has been protective of the harvest area during these events. However, in March of 2015 the facility reported a disinfection failure which necessitated a precautionary emergency closure of the area beyond the closed safety zone. At the onset, complete and accurate data was not available from the plant as to the volume and fecal concentrations so this closure was put into effect until samples of the area could be collected and analyzed. Shellfish staff sampled in the harbor and Hog Island area on March 17, 2015. Results from that sampling indicated that all stations currently classified as approved were well within program compliance. The area reverted back to normal classification conditions at sunrise on March 19, 2015. The Bristol WWTF average monthly flow is 3.0 MGD with a permitted flow of 3.79 MGD. The plant had several fecal coliform violations in 2015. RIDEM's WWTF O&M Program is actively working internally and externally with facility staff to address the violations.

### **HIGHLIGHTS**

- \* Sampled 6x in 2015**
- \* Statistics represent combined wet and dry weather data >01/01/11 (N = 30)**
- \* Statistics represent combined wet and dry weather, open season data >03/14/11 (N = 15) for conditional/seasonally approved Sta.'s 7 and 12**
- \* All approved and conditional/seasonally approved stations in compliance and**

conformance

\* MTEC = 21 (90% = 36 cfu/100ml)

\* *Data run 1/13/16*

### **COMMENTARY**

The East Middle Bay (Growing Area 3) was sampled six times in 2015, complying with the minimum systematic random sampling (SRS) monitoring requirement for approved areas. Sample results are representative of wet and dry weather conditions. The statistical evaluation for the East Middle Bay incorporates the most recent 30 samples collected for the area, the minimum number required for analysis according to SRS guidelines.

Results of the statistical evaluation demonstrate that all approved and conditional/seasonally approved stations are in program compliance. The area is properly classified.

### **RECOMMENDATIONS**

\* No action recommended based on ambient monitoring results

## ***RIDEM SHELLFISH GROWING AREA MONITORING RESULTS***

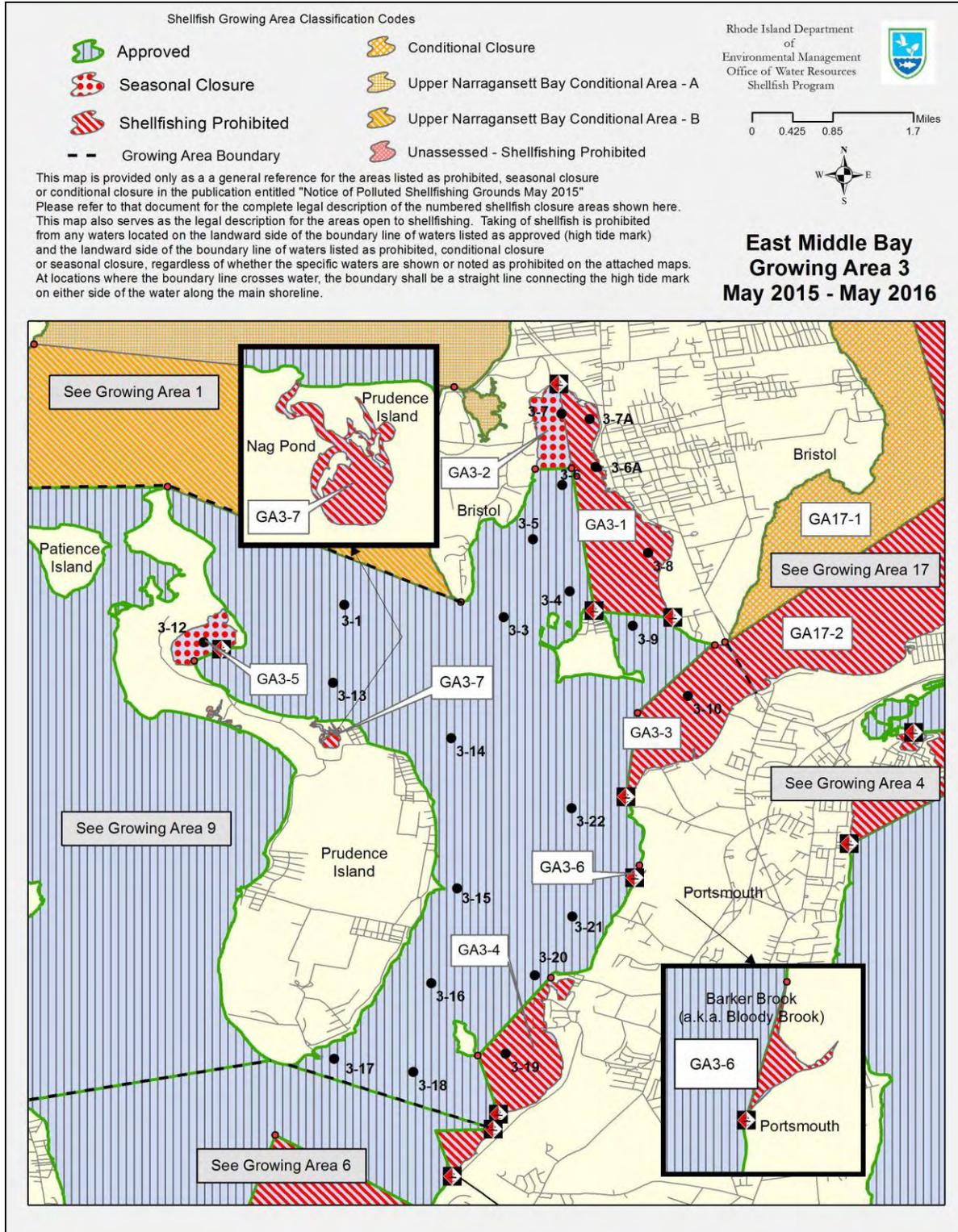
<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO MEAN</i>	<i>90TH PERC(&lt;36)</i>
GA3-1	A	30	2.7	8.6
GA3-3	A	30	2.8	10.3
GA3-4	A	30	2.7	5.9
GA3-5	A	30	2.8	11.1
GA3-6	A	30	3.3	13.5
GA3-6A	P	30	5.1	46.4
GA3-7	SA	30	3.2	20.8
GA3-7A	P	30	6.5	62.7
GA3-8	P	30	7.4	68.7
GA3-9	A	30	3.0	10.1
GA3-10	P	30	2.4	4.2
GA3-12	SA	30	2.8	6.1
GA3-13	A	30	2.3	5.0
GA3-14	A	30	2.3	5.2
GA3-15	A	30	2.4	3.9
GA3-16	A	30	2.4	3.8
GA3-17	A	30	2.2	3.0
GA3-18	A	30	2.4	4.3
GA3-19	P	30	2.2	3.0
GA3-20	A	30	2.3	3.8
GA3-21	A	30	2.3	3.7
GA3-22	A	30	2.4	4.1

### **Most recent seasonal wet/dry combined open season data**

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO MEAN</i>	<i>%&gt;CRITICAL&lt;31</i>
<b>GA3-7 (OPEN)</b>	<b>SA</b>	<b>15</b>	<b>2.3</b>	<b>0.00</b>
<b>GA3-12 (OPEN)</b>	<b>SA</b>	<b>15</b>	<b>3.0</b>	<b>0.00</b>

The results of the routine monitoring stations indicate that this growing area is properly classified and therefore no changes to the classification are recommended at this time. The following map is the closure map for the 2015-2016 season.

The next required survey would be a triennial update to be completed in 2016.



Sakonnet River  
Growing Area 4  
2015 Annual Update

A 12 year sanitary shoreline survey was completed in 2013. There were a total of one hundred and sixty-seven (167) actual or potential sources identified during this shoreline survey, excluding marinas. A total of one-hundred and eight of the one hundred and sixty seven sources were not actively flowing at the time of the shoreline survey with the remaining fifty-nine having flows warranting sampling. All sources in which flow was observed were sampled.

In 2013 fourteen sources had sampling results greater than 240 cfu/100ml. Of those fourteen sources five are located in prohibited areas of the growing area and the remaining eight sources did not have bacteria counts that exceeded 2400 cfu/100ml warranting follow-up sampling for this annual review. One source (2014-4-702), a 4" diameter PVC pipe at the top of the embankment into Nannaquaket Pond did have results greater than 2400 (8000 cfu/100ml) during the initial sampling round. However, follow up sampling of this source resulted in bacteria counts of 15 cfu/100ml in 2013. Additional reconnaissance of the area concluded that the source through this overflow pipe is from a small pond to the rear of a large single family home site and as such does not appear to have a negative impact on the growing area receiving waters. In 2014 this overflow pipe was not flowing as water levels in the small pond were below the invert.

Previous surveys of the Sakonnet River had revealed several sources that had elevated bacteria counts and were put on a "watch list" to re-visit. These thirteen sources as depicted on the map below are discussed in the following paragraphs.

Source 4-540 is a stream from Gardiner Pond at Third Beach in Middletown. Bacteria results were 1100fc/MPN in 2011 and 9300 MPN in 2006. The source was revisited in 2014 and 2015 and as a result of shifting sands and low water elevations no flows were directly reaching the receiving waters and therefore no sample was taken of the stagnant stream.

Source 4-1222 is a small stream that discharges into the southeastern corner of the Island Park cove, or Old Orchard Cove as referred to locally. Previous sampling in 2008 had indicated an elevated bacteria level. Subsequent sampling has this source ranging in bacteria counts between 10 and 2401, with this year's result of 340 cfu/100ml. Flows from this stream have been historically low resulting in no negative impacts to the receiving water. The next triennial survey in 2016 will result in additional sampling of this source.

Sources 4-013, 4-107 and 4-1600 discharge to waters that are classified as prohibited and although sampling results have been elevated, they do not impact the waters beyond the prohibited line. In observing these sources in 2015 they were found to have no flows.

Source 4-263 was not flowing at the time of sampling in 2014. This pvc pipe had previous bacteria counts of 680 cfu/100ml in 2013 with a trickle flow. It would not appear to be impacting the receiving waters but again will be resampled in 2016 as part of the areas triennial update.

Sources 4-619 and 4-621 also had previously elevated bacteria counts. These two sources are storm drains that discharge street runoff from the adjacent Main Road in Tiverton. Sampling during wet weather is warranted to evaluate any potential impacts. Again in 2015 there were no flows from these two sources.

Source 4-708 had previous high fecal counts but flows are impacted by wet weather and the last few years there was no flow at the time of sampling including in 2015.

Source 4-710 is White Wine Brook which enters Nannaquaket Pond from the northeast from a substantial wooded wetland. Initial sampling indicated elevated bacteria counts. Subsequent sampling resulted in counts much lower. Sampling of the small cove at the point of confluence with the pond was also done and results were 650 cfu/100ml during high tide and 13.3 cfu/100ml during low tide. This source needs additional sampling in 2015 to ensure compliance with water quality standards. The two routine monitoring stations (GA4-4 and GA4-21) in the pond indicate compliance with the shellfish standard. In 2015 there were no flows from the stream entering Nannaquaket Pond.

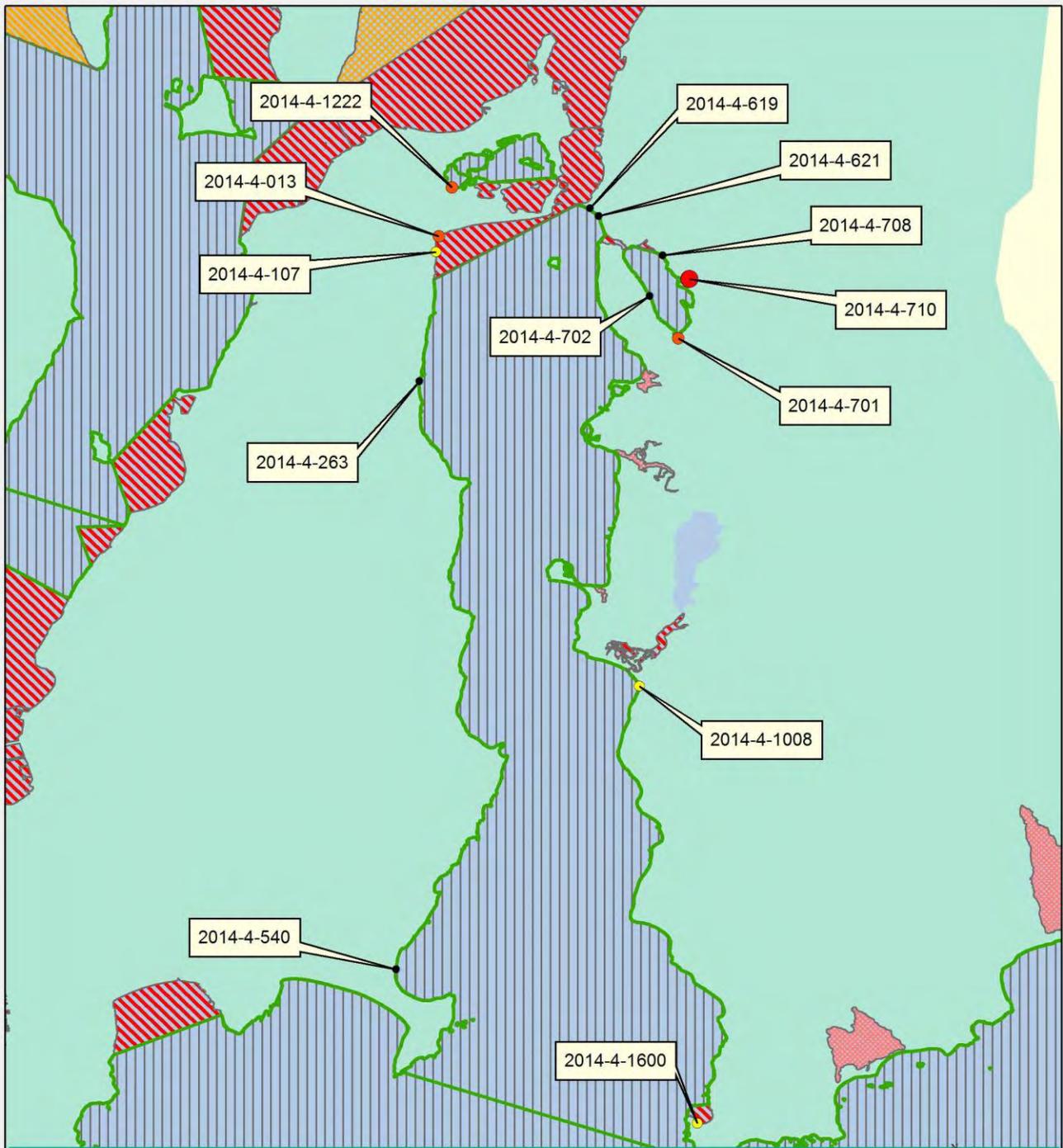
Source 4-701 is the headwaters of Nannaquaket Pond as it exits from a wooded swamp to the south. Results from sampling and the routine monitoring station would indicate this source is not negatively impacting the receiving waters and was not sampled in 2015 as part of this annual update.

Source 4-1008 is from a swale that follows along the edge of Town Road in Little Compton. This has intermittent flows and the most recent sampling in which flows were observed resulted in bacteria counts of 45 cfu/100ml which will not have any significant impact on the large volume of receiving waters in this area of the Sakonnet River. In 2015 there were no flows observed.

Source 4-1600 is a RCP that discharges into Sakonnet Harbor. This area was reclassified as prohibited several years ago due to unacceptable water quality results from the routine monitoring station GA4-11 located in the center of the harbor during open season. It had previously been classified as seasonally approved and closed during the summer months due to the potential influence of the many commercial and recreational boats moored in the harbor. This source was not sampled in 2015 due to the status of the area as being classified as prohibited.

As noted several of these sources warrant follow-ups in 2016 as part of the triennial update.

Sakonnet Harbor which is monitored by station 11 had been classified as seasonally approved, closed from Memorial Day to Columbus Day annually until May of 2012 which point results from routine monitoring that were out of variability compliance resulted in a reclassification of this area to prohibited. Shoreline survey work indicated that there was a failing septic system in the vicinity of a coastal pond that discharged to this harbor area which may have been the cause of these variability issues. OC& I was informed and the system was rebuilt in 2014 by the property owners. Sampling in 2014 and 2015 have the area back in compliance. Prior to re-classifying this area as seasonally approved additional sampling of the outfall and receiving waters were completed in early May of 2016. Results from this sampling are well within program compliance and support the seasonal reclassification recommended in this report.



### Sakonnet River Growing Area 4

### 2014 Sources

Cfu/100ml

- 0
- 1 - 240
- 241 - 2400
- 2401 - 6600

Note:  
This map was produced by RIDEM for informational, planning and guidance use only. It is a general reference, not a legally authoritative source for the location of natural or manmade features or a legal description of these features.

Rhode Island  
Dept. of Environmental Management  
GIS Program



LMH/2015



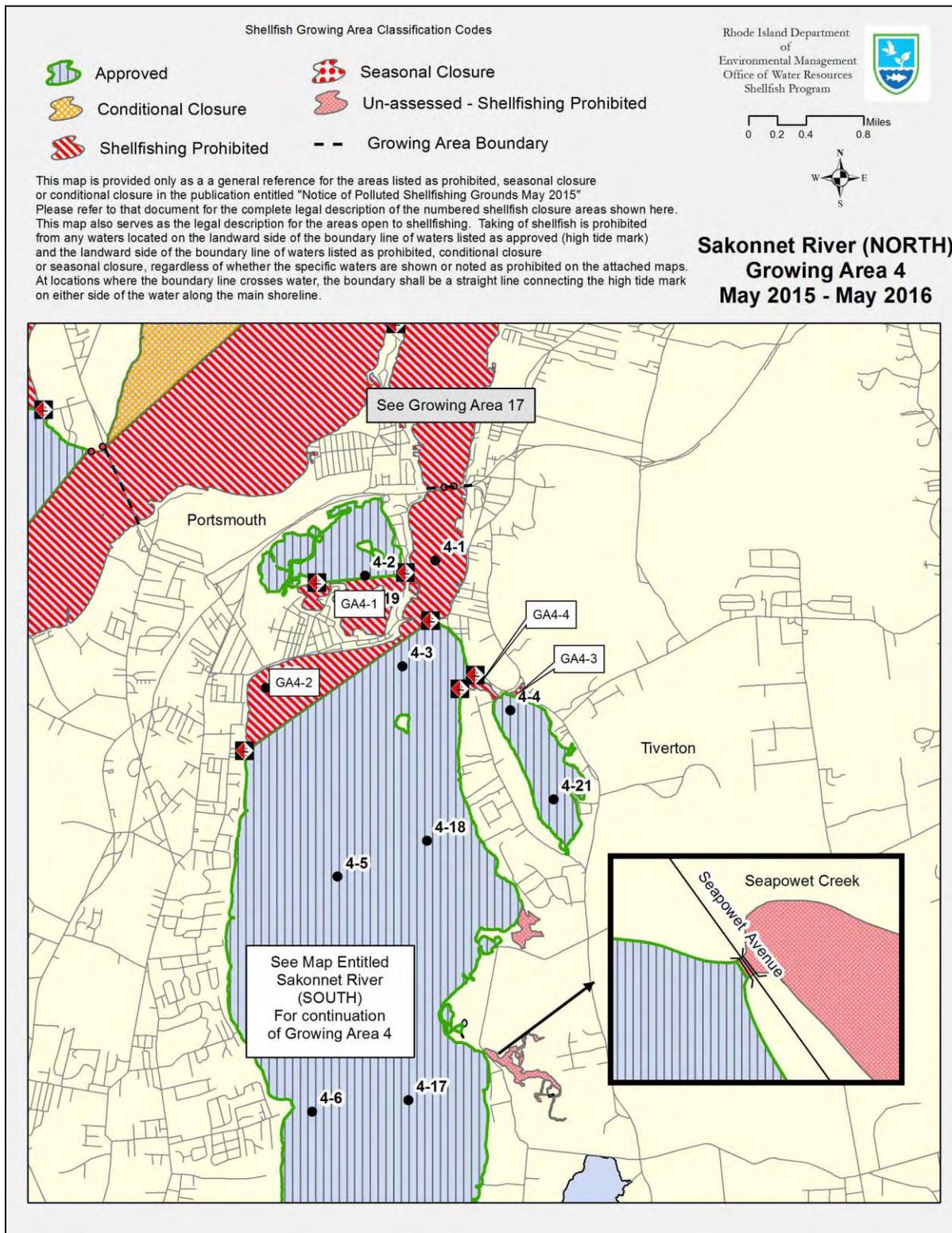
# RIGIS

RI 1999 83026  
RI Board of Governors for Higher Education  
100 English Court

Source ID	Description	Actual	Direct	Previous elevated Results MPN	Other results MPN	2013 Cfu/100ml	2014 Cfu/100ml	2015 Cfu/100ml
2013-4-013	24" Dia RCP at corner Park Ave	A	D			8000	410	NF
2006-4-107	24" dia. RCP at end of ROW corner Atlantic and Tallman	A	D	23000		2220	67	NF
2013-4-263	4" dia black PVC pipe north of Lawrence Lane south of jetty	A	D			680	NF	NS
2013-4-701	Stream at south end of pond at Nannaquaket Road	A	D			400	650	NS
2013-4-710	White Wine Brook at road crossing 24" dia CMP	A	D			1500	6600	NF
	Re-sampled along with in stream in cove						570 / 650 IS	
	Re-sampled along with in stream in cove						18.6 / 13.3 IS	
2013-4-1600	36" dia flared end draining upland pond	A	D			420	10	NS
2013-4-1008	Small stream along south side of Town Road	A	D	15000		NF	45	NF
2009-4-1222	Stream draining upland marsh	A	D	2401	93	10	340	NS
2009-4-540	Stream from uplands wetland	A	D	9300	230	1100 / <3 IS	NF	NF
2009-4-619	12" dia CMP storm drain Grinnell's Beach Tiverton	A	D	4300		NF	NF	NF
2009-4-621	Storm flow from under wall from remains of 18" dia CMP	A	D	43000		NF	NF	NF
2009-4-708	ASSF from road water breaks out at shoreline	A	D	4300		NF	NF	NF

NF-No flow IS-In-stream NS – Not Sampled Prohibited Classification

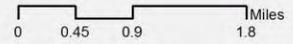
The Sakonnet River Growing Area 4 classification maps are divided into north and south due to the size of the growing area. The following figures detail the current classifications of these waters.



Shellfish Growing Area Classification Codes

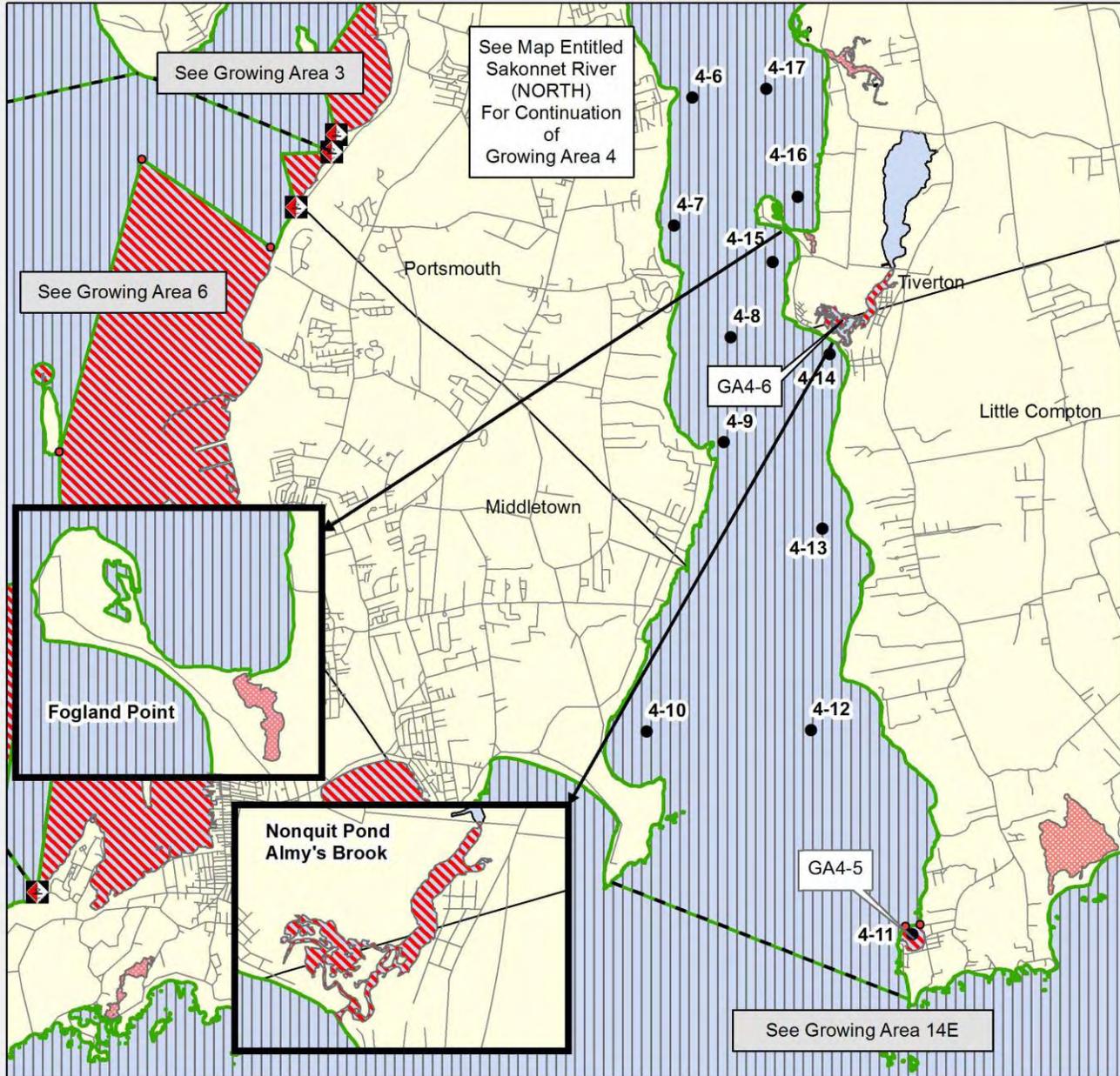
-  Approved
-  Un-assessed - Shellfishing Prohibited
-  Conditional Closure
-  Seasonal Closure
-  Growing Area Boundary
-  Shellfishing Prohibited

Rhode Island Department  
of  
Environmental Management  
Office of Water Resources  
Shellfish Program



This map is provided only as a general reference for the areas listed as prohibited, seasonal closure or conditional closure in the publication entitled "Notice of Polluted Shellfishing Grounds May 2015". Please refer to that document for the complete legal description of the numbered shellfish closure areas shown here. This map also serves as the legal description for the areas open to shellfishing. Taking of shellfish is prohibited from any waters located on the landward side of the boundary line of waters listed as approved (high tide mark) and the landward side of the boundary line of waters listed as prohibited, conditional closure or seasonal closure, regardless of whether the specific waters are shown or noted as prohibited on the attached maps. At locations where the boundary line crosses water, the boundary shall be a straight line connecting the high tide mark on either side of the water along the main shoreline.

**Sakonnet River (SOUTH)  
Growing Area 4  
May 2015 - May 2016**



## **HIGHLIGHTS**

- \* Sampled 6x in 2015
- \* Statistics represent combined wet and dry weather data >01/01/11 (N = 30)
- \* All approved stations in compliance and conformance
- \* MTEC = 21 (90% = 36 cfu/100ml)
- \* Station 11 "open season data" > 3/1/11 (N = 15) in compliance, mtec=13, mpn=2
- \* *Data run 1/14/16*

## **COMMENTARY**

The Sakonnet River (Growing Area 4) was sampled six times during the 2015 sampling season, complying with the minimum SRS monitoring requirement for approved areas. Sample results are representative of wet and dry weather conditions. The statistical evaluation for the Sakonnet River incorporates the most recent 30 samples collected for the area, the minimum number required for analysis according to SRS guidelines.

Station 11 (Sakonnet Harbor), which has been closed to seasonally approved shellfishing for the last several years is once again in program compliance. Results of the statistical evaluation demonstrate that all other approved, stations are in program compliance. The area is properly classified.

## **RECOMMENDATIONS**

- \* Consider reclassifying Sakonnet Harbor to Seasonally Approved.
- \* No action recommended based on ambient monitoring

## **RIDEM SHELLFISH GROWING AREA MONITORING RESULTS**

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>	
			<i>MEAN</i>	<i>90TH PERC (&lt;36)</i>
GA4-1	P	30	2.2	3.3
GA4-2	A	30	2.3	3.7
GA4-3	A	30	2.8	6.3
GA4-4	A	30	5.3	24.2
GA4-5	A	30	2.9	7.0
GA4-6	A	30	2.2	3.1
GA4-7	A	30	2.2	2.8
GA4-8	A	30	2.1	2.8
GA4-9	A	30	2.1	2.7
GA4-10	A	30	2.3	3.9
GA4-11	P	30	3.3	12.3
GA4-12	A	30	2.1	2.9
GA4-13	A	30	2.4	4.8
GA4-14	A	30	2.7	6.5
GA4-15	A	30	2.5	5.5
GA4-16	A	30	2.3	5.4
GA4-17	A	30	2.3	5.1
GA4-18	A	30	2.6	6.2
GA4-19	P	30	3.1	7.4
GA4-20	P	30	2.7	6.2
GA4-21	A	30	3.1	8.1

### **Most recent seasonal (N = 15) open season data**

<i>Station</i>	<i>N</i>	<i>FECAL-GEO</i>	
		<i>MEAN</i>	<i>%&gt;CRITICAL&lt;31 (49)</i>
GA4-11 (open)	15	3.6	6.67

In addition to the reclassification of Sakonnet Harbor, another inquiry from the public was made as to our ability to reduce the prohibited area in the vicinity of the entrance to Nannaquacket Pond, or that area referred to as Quacket River. There exists a small area at the entrance that provides protection in windy conditions that apparently has a shellfish resource worth harvesting (Personnel conversation) and is currently approved for shellfishing. In review, this area has undergone some significant changes to the abutting land uses since the original closure was instituted. The monastery that was located on the southern side of the entrance was torn down and a single family residence was built on the site with the septic system being replaced in 2009 with an advanced treatment FAST system. There are no point sources identified as being located along the northern side of the river. Currently these waters are classified as SB according to the 2010 RIDEM Water Quality Regulations and defined as: Class SB\* - These waters are designated for primary and secondary contact recreational activities; shellfish harvesting for controlled relay and depuration; and fish and wildlife habitat. They shall be suitable for aquacultural uses, navigation, and industrial cooling. These waters shall have good aesthetic value.

\* Certain Class SA, SB and SB1 waterbody segments may have partial use designations assigned to them as noted in rules 8.B(3) below. (b). Concentration of Vessels - These waters are in the vicinity of marinas and/or mooring fields and therefore seasonal shellfishing closures will likely be required as listed in the most recent (revised annually) RIDEM document entitled Shellfish Closure Areas, however, all Class SA criteria must be attained. Adjacent to the bridge over the entrance to Nannaquacket Pond are what is left of a historic fish processing plant and commercial marina. This area is still being used as a commercial fishing facility and fish plant but at a greatly reduced intensity. Water quality sampling is collected in the Sakonnet River, approximately 2500 feet to the west (Sta. GA4-3) and in the pond approximately 1800 feet to the east (GA4-4). Routine monitoring results for both of these stations are in significant compliance with geo-means of 2.8 and 5.3 fecal with the pond having a slightly elevated 90<sup>th</sup> percentile variability at 24.2. Currents through this narrow gap are fairly swift and add to the flushing and turnover of waters between the river and the pond. The following aerial shows the closed area adjacent to the commercial wharf. Until such time as additional information is available as to the decrease in usage of this marina is determined this closed safety zone shall remain in effect with no change.



The next required survey would be a triennial update to be completed in 2016

Kickemuit River  
Growing Area 5  
2015 Annual Update

A 12 year sanitary shoreline survey of the Kickemuit River Growing Area 5 was completed in 2008. A triennial update was completed in 2011.

Only one source sampled as part of the triennial update in 2014 exceeded the 2400 cfu/100ml criteria upon initial sampling with follow-up sampling of 12 cfu/100ml. An additional source (2014-5-013) had slightly elevated bacteria counts when sampled in 2014. Both of these sources were re-sampled in 2015 for this annual update. The following table depicts the results of this sampling effort.

Source ID	2008 Results MPN	Classification of Receiving waters	Additional sampling results 2009 MPN	2011 Results MPN	2012 Results cfu/100ml	2013 Results cfu/100ml	2014 Results cfu/100ml	2015 Results cfu/100ml
5-013	93	Conditional	NS	NS	1670	60	210	8000 Trickle flow 80 (<3 IS)
5-014	110,000	Conditional	<3	23	56	NF	8000 12 (3 IS)	NF

NF – No Flow, NS – No Sample IS – In Stream

Source 5-013 is a broken PVC pipe within the extension of the ROW of Chace Lane in Touisset. Originally identified as a groundwater seep, erosion has exposed this as an actual broken pipe since first discovered. Original sample results in 2015 had results of 8000 cfu/100ml with a trickle flow, re-sampling had results greatly reduced at 80 cfu/100ml with a corresponding instream sample of <3 cfu/100ml. This intermittently elevated source does not appear to be having an impact on the surrounding receiving water but should be monitored in future surveys. Source 5-014 is identified as being seepage under a stone seawall. Initial sampling in 2008 and subsequent follow-up sampling indicates a large fluctuation in bacteria results. In 2015 there was no flow observed from this source. Additional follow-up is scheduled for 2016 along with other sources previously identified as problematic.

A TMDL for Mount Hope Bay and the estuarine portion of the Kickemuit River was approved by the EPA on January 14, 2010. All waterbody segments in the Kickemuit River experience elevated levels of fecal coliform bacteria following rain events, hence the “conditional classification” of this growing area. This TMDL provides a detailed plan for reducing bacterial pollution so that the Kickemuit River can meet numeric water quality targets for all designated uses affected by bacteria pollution: shellfishing and primary and secondary contact recreational use under all weather conditions.

In 2013 the mooring fields in the Kickemuit River were classified as seasonally approved, closed during summer months. After further analysis it was determined that these areas are not typical of overnight occupation but rather as “parking lots” for adjacent property owners and therefore not posing the risks associated with transient or overnight mooring fields, these areas were reclassified as Conditionally Approved. This determination is supported by observation of the boats moored in the field, personal conversations with the harbor master and the usage of the Bristol pump out boat by owners. It should also be noted that the entire state is designated a no discharge state and we have a mandatory MSD

inspection program to ensure compliance with requirements. The area is still classified as conditionally approved and beginning in May of 2015 there is also an additional January seasonal closure of the entire growing area.

One area on the shoreline of Touisset however was determined to be a marina under the definition of dockage that is capable of handling ten or more boats. This smaller area at the Narrows now has a seasonal Marina closure associated with it. The seasonal marina closure is defined as waters closed from sunrise the Saturday prior to Memorial Day to sunrise the Tuesday following Columbus Day annually and includes all waters within 25 feet of any in water structure associated with the marina. The calculations to support this closure are available for review in the program's permanent file under Marina Closures, Senn's Marina Kickemuit River.

## **HIGHLIGHTS**

- \* **Sampled 12x in 2015**
- \* **Statistics represent dry weather, approved data >10/01/14 (N = 15)**
- \* **Sta.'s 1, 3, 4, 9, and 10 exceed variability criteria.**
- \* **January 2014 and 2015 data shows elevations for above stations.**
- \* **All other monthly data in significant compliance**
- \* **mTEC=15 (<31 cfu/100ml)**
- \* ***Data run 2/3/16, adjusted for mTEC***

## **COMMENTARY**

The Kickemuit River (Growing Area 5) was sampled twelve times for 2015. All samples were collected during dry weather when the area was "open/approved" for shellfish harvesting. The statistical evaluation for the Kickemuit River incorporates the most recent 15 dry weather samples collected for the area, the minimum number required by NSSP Manual of Operations guidelines for conditionally approved areas.

Results of the statistical evaluation demonstrate that Station's 1, 3, 4, 9, and 10 slightly exceed variability criteria. These data elevations occur in the January 2014 and January 2015 bay runs. A statistical review of the data for the cold weather months seems to indicate that the Kickemuit shows gradually elevating fecal results from October until January, and then a subsequent decrease after that. The data appears to suggest a seasonal impact on the area, peaking around January.

A TMDL study of the area was completed in January 2010.

## **RECOMMENDATIONS**

- \* **Consider closure Growing Area 5 for the month of January**
- \* **No other action recommended based on ambient monitoring results**

## **RIDEM SHELLFISH GROWING AREA MONITORING RESULTS**

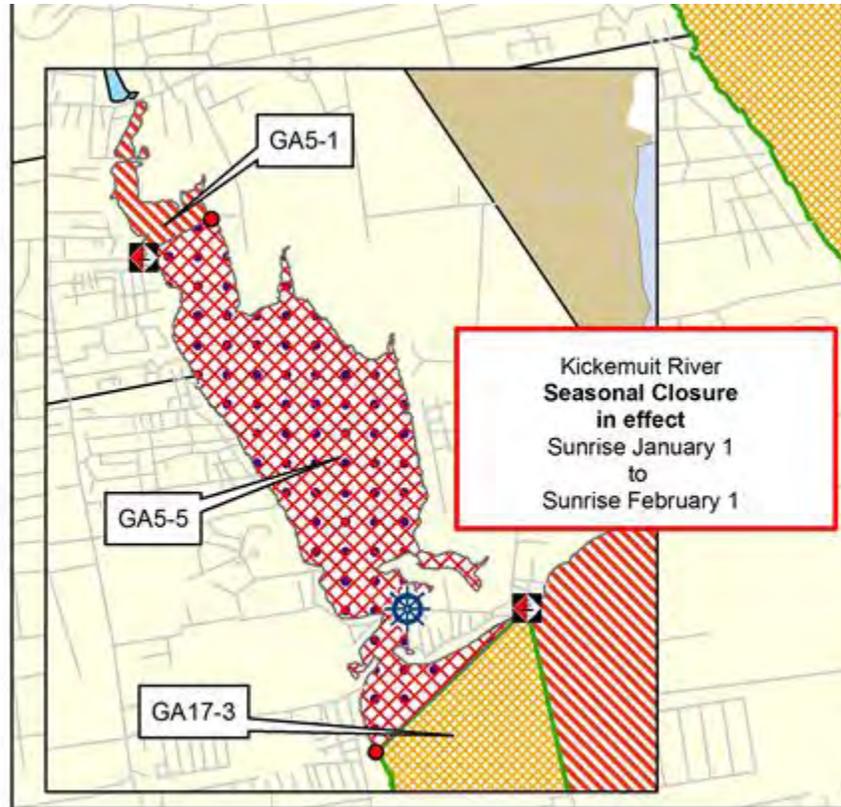
<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>	
			<i>MEAN</i>	<i>% &gt; CRITICAL 31</i>
GA5-1	CA	15	3.6	13.33
GA5-2	CA	15	2.7	0.00
GA5-3	CA	15	4.3	13.33
GA5-4	CA	15	3.1	13.33
GA5-5	CA/SA	15	2.8	0.00
GA5-6	CA/SA	15	2.5	0.00
GA5-7	CA	15	4.4	0.00
GA5-8	P	15	3.8	0.00
GA5-9	CA	15	3.7	13.33
GA5-10	CA	15	4.1	13.33

Variability Data by Month (1/1/2000 – 1/31/2016)

Adjusted for mTEC Less than 10% Mixed

STA	OCT(n=17)	NOV(n=12)	DEC(n=13)	JAN(n=11)	FEB(n=11)	MAR(n=15)
1	0.0	8.33	7.69	27.27	9.09	0.0
2	0.0	8.33	7.69	27.27	0.0	6.67
3	0.0	16.67	7.69	18.18	9.09	0.0
4	0.0	8.33	7.69	18.18	0.0	0.0
5	0.0	8.33	0.0	0.0	0.0	0.0
6	0.0	8.33	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0
8(P)	0.0	16.67	7.69	0.0	12.5	0.0
9	0.0	8.33	0.0	18.18	0.0	0.0
10	0.0	0.0	0.0	18.18	0.0	0.0

Due to the exceedances of the variability criteria for a majority of the stations in the Kickemuit River and the small portion of the growing area in the Mt Hope Bay (Sta.s GA5-1, 2 and 3), during the month of January, a seasonal closure has been instituted for the upcoming year.



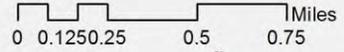
The following figure is the classification map with monitoring stations shown for the 2015-2016 season for Growing Area 5, the Kickemuit River. The 2016 -2017 classification map will be amended to reflect this temporary seasonal change in classification.

An annual review of this growing area is scheduled for 2016.

Shellfish Growing Area Classification Codes

-  Approved
-  Un-assessed - Shellfishing Prohibited
-  Conditional Closure
-  Seasonal Closure
-  Growing Area Boundary
-  Shellfishing Prohibited

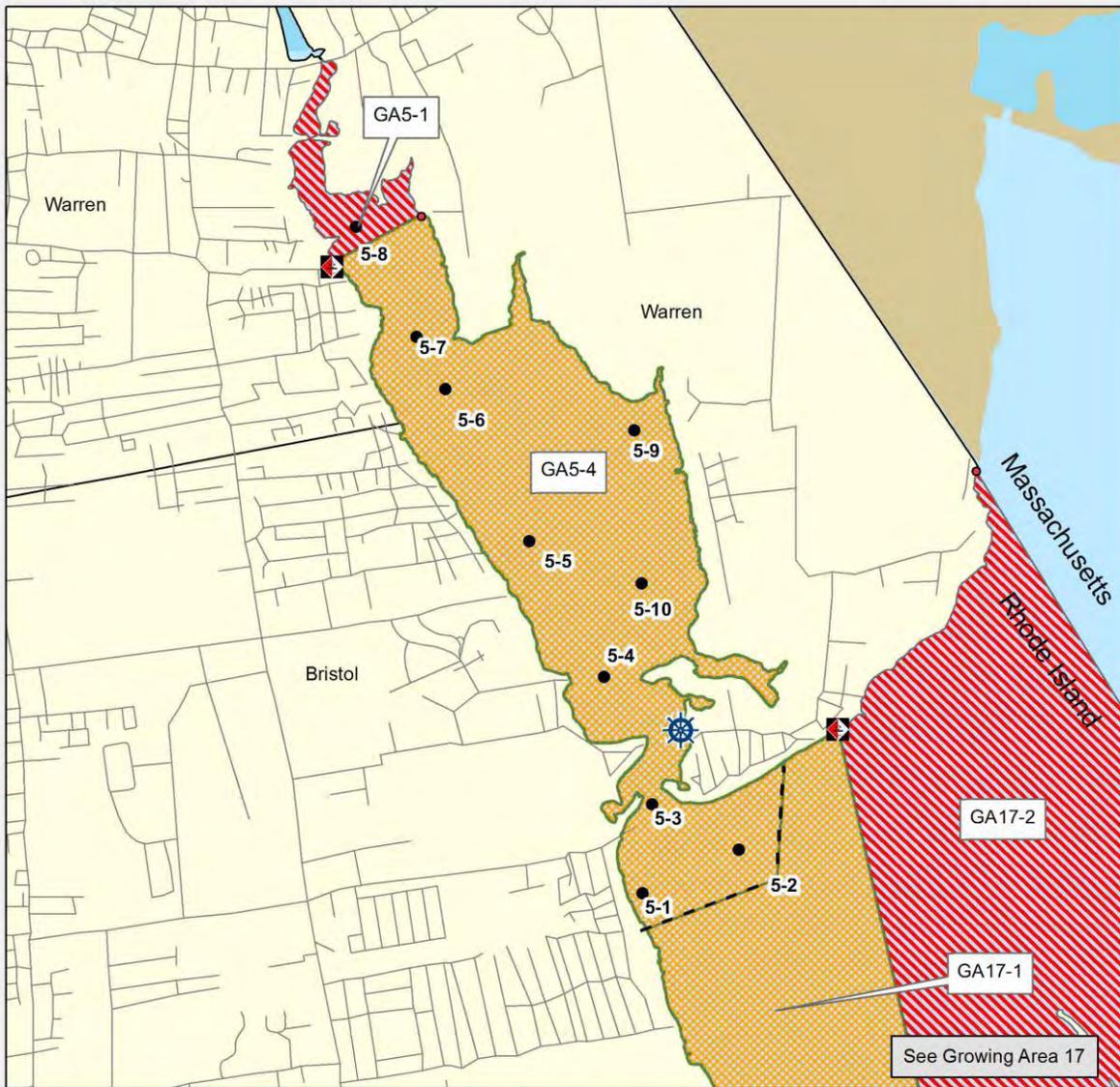
Rhode Island Department  
of  
Environmental Management  
Office of Water Resources  
Shellfish Program



 Marina Facility Seasonal Closure

This map is provided only as a general reference for the areas listed as prohibited, seasonal closure or conditional closure in the publication entitled "Notice of Polluted Shellfishing Grounds May 2015". Please refer to that document for the complete legal description of the numbered shellfish closure areas shown here. This map also serves as the legal description for the areas open to shellfishing. Taking of shellfish is prohibited from any waters located on the landward side of the boundary line of waters listed as approved (high tide mark) and the landward side of the boundary line of waters listed as prohibited, conditional closure or seasonal closure, regardless of whether the specific waters are shown or noted as prohibited on the attached maps. At locations where the boundary line crosses water, the boundary shall be a straight line connecting the high tide mark on either side of the water along the main shoreline.

**Kickemuit River  
Growing Area 5  
May 2015 - May 2016**



**East Passage  
Growing Area 6  
12 Year Sanitary Shoreline Survey  
Calendar Year 2015**



**Rhode Island  
Department of Environmental Management**

**Office of Water Resources**

**Shellfish Program**

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## **Acronyms and Terms**

FDA: Food and Drug Administration

ISSC: Interstate Shellfish Sanitation Conference

MPN: Most Probable Number

NSSP: National Shellfish Sanitation Program

RIDEM: Rhode Island Department of Environmental Management

SGAM: Shellfish Growing Area Monitoring

SSCA: State Shellfish Control Authority

NOAA: National Oceanographic and Atmospheric Administration

## **1.0 Introduction**

A shoreline survey of the East Passage was conducted during the summer of 2015 by staff from RIDEM's Office of Water Resources Shellfish Program with support staff from other Office of Water Resource personnel. The survey involved a shoreline reconnaissance of the study area to locate and catalog pollution sources and collect bacteriological samples from all sources actively flowing into the survey area. Prohibited areas along Newport Harbor, and the area of Coddington Cove in which access is restricted to Navy personnel only were not surveyed. All currently approved areas were surveyed.

The primary objective of the shoreline survey was to identify and characterize any new sources of pollution impacting the growing area, to reevaluate point and non-point sources identified during previous surveys, and to update information regarding the sampling of previously identified sources.

## **2.0 Description of the Growing Area**

Demarcating the East Passage growing area are three large islands: Aquidneck the largest, supports the towns of Newport and Middletown, a place of unusual charm and great historical significance and lies to the east of the passage; Conanicut Island otherwise known as the Town of Jamestown lies to the west, and Prudence Island which marks the northern boundary of the growing area. The southern extent of the growing area is from Fort Wetherill in Jamestown to a point approximately half way along the western shoreline of Newport south of Fort Adams State Park.

The East Passage is a deep gorge that was formed by glacial action, creating depths as deep as 188 feet and relatively shallower depths of 100 feet all the way north to a point about halfway along the Prudence Island shore.

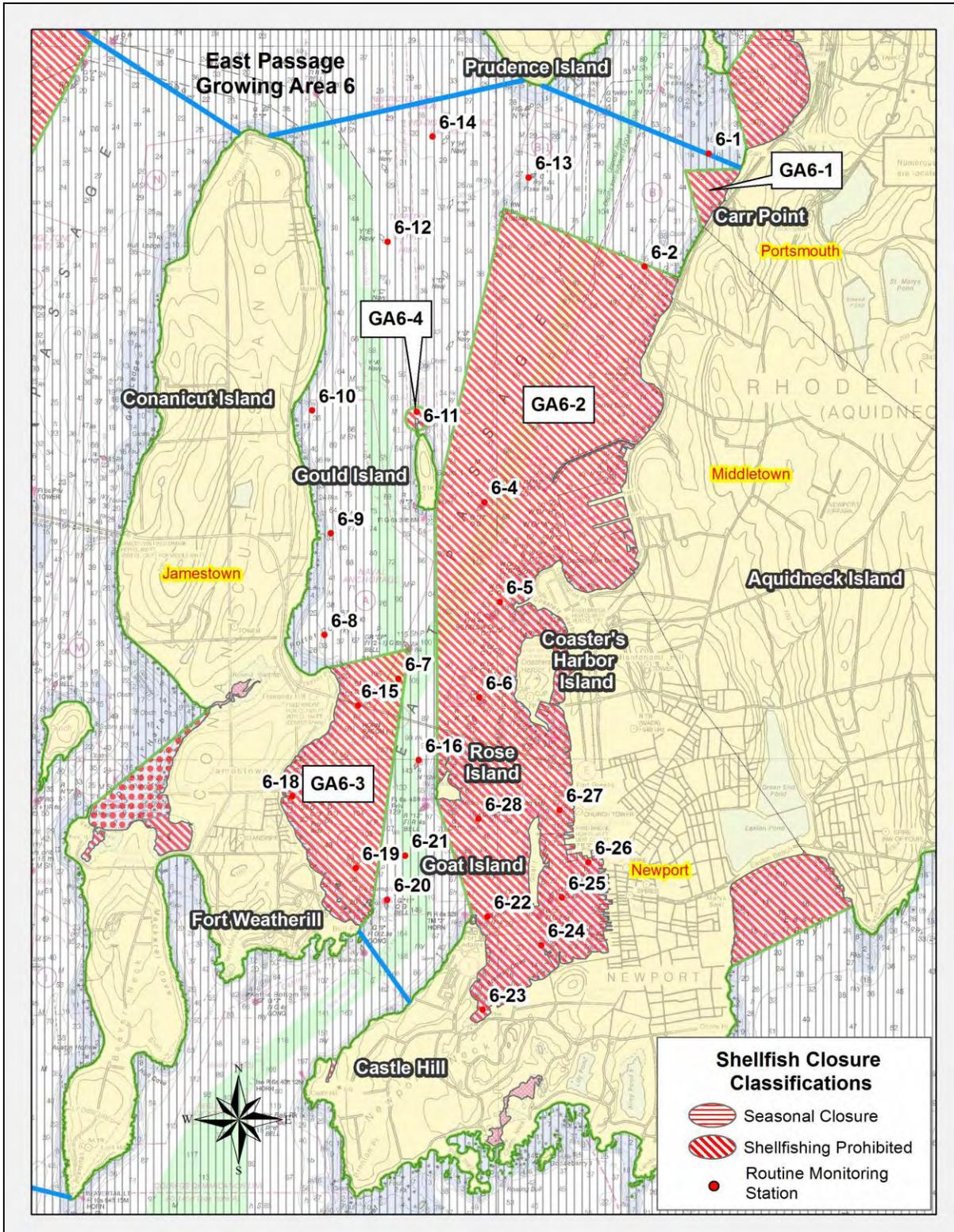
From Fort Adams State Park, you'll see a panoramic view of Newport Harbor and the hundreds of boats moored there, downtown Newport, and the sweeping Newport Bridge to Jamestown. Several small islands, Gould Island off the Jamestown shore, Goat Island and Coaster's Harbor Island off of Newport Harbor and Rose Island are located within the East Passage growing area.

Gould Island and Coaster's Island are Navy facilities with limited or totally restricted access. Goat Island is within the prohibited area of Newport Harbor and Rose Island the majority of which is also within the prohibited classification is home to the Rose Island lighthouse.

## **2.1 Location**

Growing Area 6 is presently comprised of sections classified as either approved or prohibited for shellfishing (Figure 2-1). Four distinct portions of this growing area are prohibited to shellfishing. There is an eight hundred and ten (810) acre section on the eastern side of Jamestown (East Ferry) where shellfishing is prohibited due to the influences of the large number of recreational and commercial boating facilities and the presence of a discharge from the Jamestown Municipal Wastewater Treatment Facility (WWTF). A four thousand eight hundred and twenty-eight (4828) acre portion of the growing area along the western shore of Newport and Middletown that shellfishing is prohibited due to the negative impacts from the dense clusters of recreational boats and the large contingent of commercial fishing vessels within the harbor, as well as from the large fleet of Navy training vessels located at Coddington Cove. In addition the Newport WWTF and several combined sewer overflows (CSOs) discharge into this zone. A sixty-six (66) acre area north of Gould Island is closed to shellfishing due to the influences from prior naval activity on the island and in the surrounding waters. A seventeen (17) acre safety zone closure currently encompasses the shore in Portsmouth at the confluence of an unnamed stream that was used as a discharge point for the Portsmouth Middle School's WWTF.

Figure 2-1 East Passage Growing Area 6



## **2.2 Description of the Area**

### **2.2.1 Physical Description**

Growing area 6 is approximately 11,106 acres (RIDEM-GIS 2007) and encompasses all of the shoreline south of a line extending from Conanicut Point, Jamestown to South Point, Prudence Island, to Carr Point, in Portsmouth. The area also includes the entire shoreline north of a line extending eastward from Bull Point, Jamestown to a point south of Fort Adams, Newport.

The majority of the shoreline can be described as a wide mix of residential, commercial, and relatively un-developed lands. The shoreline of Newport and Middletown are heavily developed with homes ranging in size from small “summer” cottages to stately mansions and large estates. The harbors of both Newport and Jamestown contain a large contingent of fishing vessels, both recreational and commercial. The Newport shoreline includes the harbors of the US Naval Station and War College which occupies a substantial length of the shoreline and includes all of Coastal Harbors Island. Opposite of the heavily developed shorelines in Newport, the northern portion of Jamestown (Conanicut Island) is developed as large lot residential development. The only areas that could be considered vacant or undeveloped would be Bull Point on Jamestown as part of the Fort Wetherill State Park. RIDEM’s Office of Fish and Wildlife have their marine fisheries offices, laboratory, and boat-repair facility housed in refurbished historic military buildings in this southern portion of the growing area in Jamestown.

Municipal sewers service Newport and Jamestown Harbors. The remaining homes and businesses in the growing area rely upon On-Site Wastewater Treatment Systems (OWTSS). Jamestown’s WWTF discharges at Taylor Point located just north of the harbor. Newport’s WWTF discharges into the growing area just south of Coddington Point at the northern reach of the harbor area south of Coddington Cove.

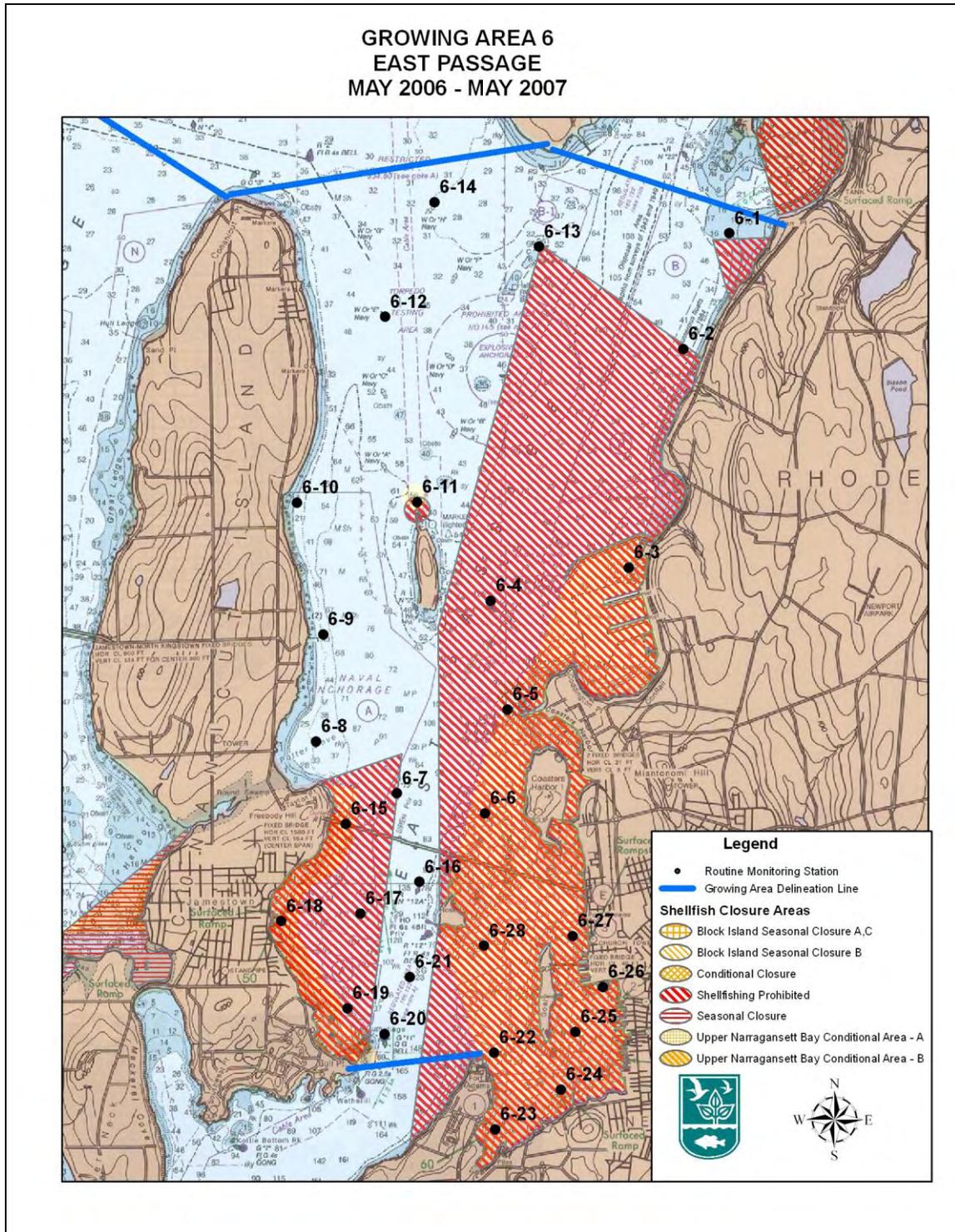
### **2.2.2 Latest Survey**

RIDEM’s Office of Water Resources personnel conducted a shoreline survey in 2006 to assess the relative importance of pollution sources impacting the growing area water quality.

### **2.2.3 Previous Classification Maps**

The 2006 classification map does vary slightly from the current map. The 2006 classification map is shown in Figure 2-2. The most significant change from the 2006 classification is the addition of an upland boundary, or what is referred to as the “Green Line”. This inland limit was established in 2007 to set the approved area classification boundary as the high tide line along the shore. Numerous small embayment’s inland of this line were not represented by offshore sampling stations and were determined to be unassessed in which shellfishing is prohibited. Additionally in 2015 a small area of the lower East Passage off of Fort Adams was re-classified from Prohibited to Approved. The closed safety zone for Newport harbor and the city’s WWTF did not need to extend this far south so a small triangular area south and west of Fort Adams was opened to shellfishing.

Figure 2-2 2006 Shellfish Closure Classification Map



### 2.2.4 Current Classification Map

The most recent (May 2015-May 2016 revised annually) RIDEM document entitled Shellfish Closure Areas documents four prohibited shellfish areas in the East Passage. The legal description of these closure areas are described below, and shown in Figure 2-1.

### Shellfishing Prohibited

#### East Passage and Newport Harbor

- GA6-1 The waters of the East Passage, south of a line from the Rhode Island Department of Environmental Management range marker located approximately 900 feet south of Carr Point to buoy "Gr C" located at Fiske Rock, and north and east of an intersecting line from the Rhode Island Department of Environmental Management range marker located approximately 2,300 feet north of the rock jetty formerly known as the Blue Gold Pier opposite Vigilant Street in Middletown, to nun buoy "22".
- GA6-2 East Passage and Newport Harbor east of a line from the northwest corner of the concrete bulkhead at Fort Adams State Park to the Rose Island light, east of a line from the Rose Island light to the rectangular structure located on the southeast corner of Gould Island, and east of a line to the day marker at Halfway Rock, and south of a line from the day marker on Halfway Rock to the northwest corner of rock jetty formerly known as Blue and Gold Pier, located approximately 800 feet north of Greene Lane in Portsmouth.
- GA6-4 The waters within 500 feet of the firing pier at the U.S. Navy Torpedo Testing Station at the northern end of Gould Island.

#### Jamestown Area

- GA6-3 The waters on the east shore of Jamestown, in the vicinity of East Ferry and Taylor Point, west of a line from Bull Point in Jamestown to the house on the rocks located in The Dumplings to Bell Buoy F1 (2 +1) G6s and south of an intersecting line from the northern most tip of Taylor Point to Bell Buoy F1 (2 +1) G6s.

## **3.0 Pollution Source Survey**

### **3.1 Personnel**

Lucinda Hannus, Senior Environmental Scientist, of the RIDEM Office of Water Resources coordinated and conducted a shoreline reconnaissance of the East Passage with the assistance of other staff members at RIDEM within the Office of Water Resources.

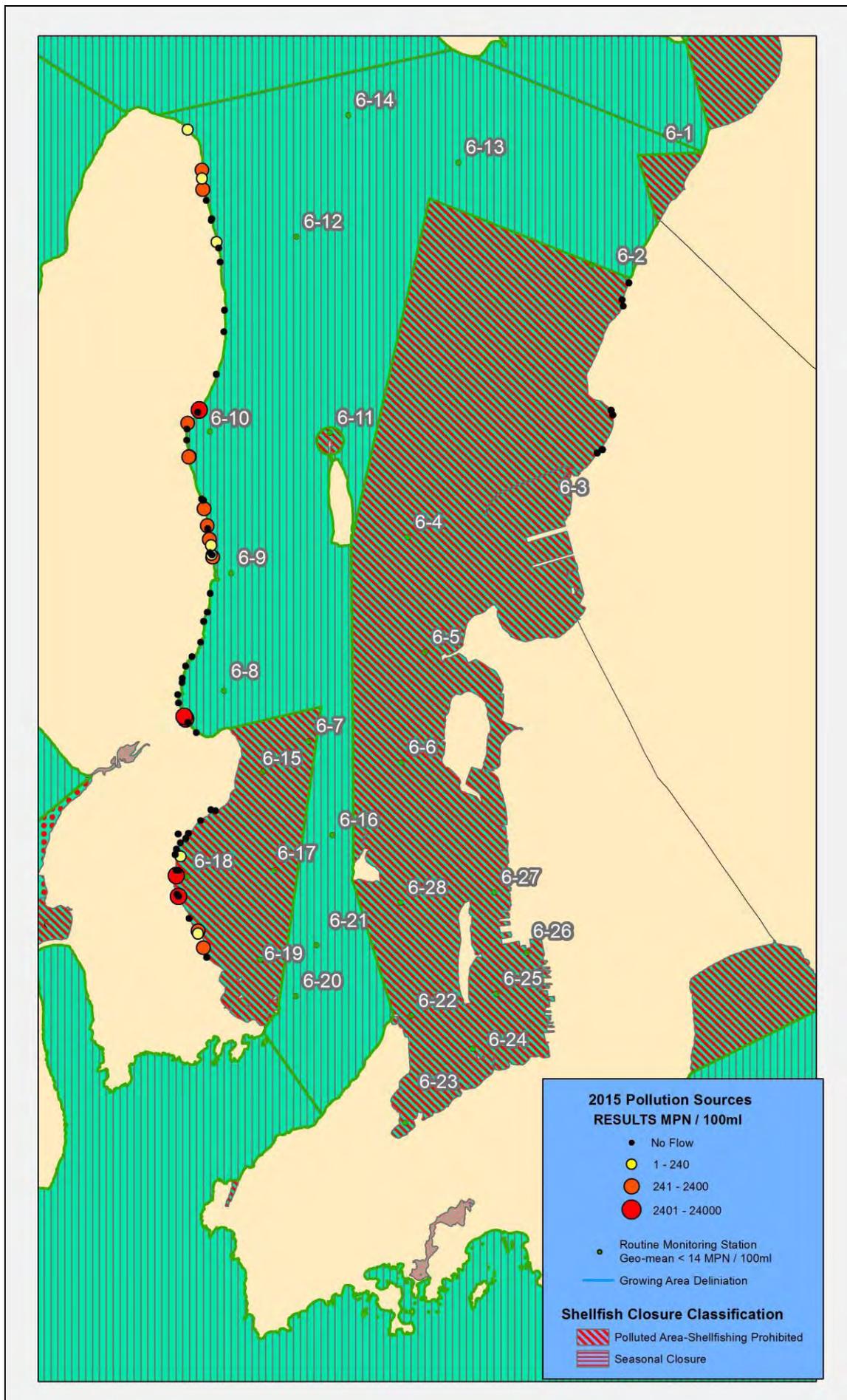
### **3.2 Survey procedures**

Special attention was given to all types of pipes, drainage ditches, culverts, and streams in order to classify them as a direct (discharges directly to the growing area), indirect (does not discharge directly to the growing area but may contribute to pollution), actual (discharging at the time of the survey), or potential (not actively discharging at the time of the survey but considered a possible source of pollution). Bacteriological samples were collected in sterile, four ounce (125mL) Nalgene bottles from all sources that were actively flowing at the time of the field study. Samples were stored in a portable cooler and transported to the Rhode Island Department of Health Laboratory at the end of each field day. The membrane filtration method using mTEC agar method, as described in Standard Methods of Water and Wastewater, was used for analysis.

### **3.3 Summary of Sources and Locations**

There were seventy-two (72) actual or potential sources identified during this shoreline survey, excluding marinas. Fifty-four (54) of the sources were not actively flowing at the time of the shoreline survey with the remaining eighteen (18) having flows warranting sampling. All sources in which flow was observed were sampled. As illustrated in Figure 3-1 all potential or actual sources of pollution within the surveyed areas of the East Passage are located on the map. Table 3-1 is a listing detailing the sources located in the East Passage growing area. Of those sources greater than 2400 CFU/100ml only three (3) are located in approved waters. The other three (3) discharge to prohibited waters and were not re-sampled as part of this survey.

Figure 3-1 2015 Potential & Actual Shoreline Survey Sources



**Table 3-1 Pollution Sources to the East Passage Growing Area 6**

Red highlighted sources > 2400 CFU / 100ML

Source ID	LATITUDE	LONGITUDE	DESCRIPTION	ACTUAL / POTENTIAL	DIRECT / INDIRECT	2006 RESULTS FC/100ml	2015 RESULTS CFU/100ml
2015-6-001	41.54162	-71.36502	Stream north of Wright Lane	A	D	460	800
2015-6-002	41.54274	-71.36365	Small stream thru woods	A	D	11000	0
<b>2015-6-003</b>	<b>41.54297</b>	<b>-71.36346</b>	<b>Stream thru woods</b>	<b>A</b>	<b>D</b>	<b>110000</b>	<b>2700</b>
2015-6-004	41.54659	-71.36115	Area subject to stormflow evidence of significant flows	P	D	0	0
2015-6-005	41.55088	-71.36012	Groundwater seepage from wooded area	P	D	0	0
2015-6-006	41.55305	-71.35999	Stream thru woods	A	D	75	0
2015-6-007	41.55792	-71.36059	Asphalt swale at end of 12" dia concrete drain pipe	P	D	0	0
2015-6-008	41.55936	-71.36082	Grounwater seep midway on beach	A	D	3	0
2015-6-009	41.55996	-71.36106	4" dia PVC pipe thru seawall	A	D	3	9
2015-6-010	41.56216	-71.36176	(2) 4" dia PVC pipes buried in yard discharging to beach	P	D	0	0
2015-6-011	41.56231	-71.36174	Small stream from uplands at Clam Rock	A	D	930	0
2015-6-012	41.56416	-71.36245	Groundwater seep from uplands	A	D	0	0
2015-6-100	41.54101	-71.36511	Small stream from culvert under E. Shore Road at Cranston Co	A	D	430	0
2015-6-101	41.53991	-71.36517	Small stream from underground pipe	A	D	23	0
2015-6-102	41.53825	-71.36486	Small stream over rocks from uplands	A	D	93	1100
2015-6-103	41.53822	-71.36488	Small stream maybe split of source #102 south of #102	A	D	230	800
2015-6-104	41.53397	-71.36313	4" PVC pipe along concrete steps discharging into large cont	A	D	3	0
2015-6-105	41.53382	-71.36294	Small stream thru woods from uplands	A	D	93	0
2015-6-106	41.53295	-71.36284	Very small stream from upland woods heavy iron bacteria	A	D	43	1430
2015-6-107	41.53127	-71.36239	Small stream thru woods	A	D	23000	662
2015-6-108	41.53097	-71.36234	Groundwater/ very small stream from uplands	A	D	12000	0
2015-6-109	41.52988	-71.36212	Groundwater seepage fades out above tide line	A	I	0	685
2015-6-110	41.52929	-71.36191	Stream from uplands also heavy sepage along embankment	A	D	43	92
2015-6-111	41.52854	-71.36202	Dry streambed with small amount of flow	A	D	230	0
2015-6-112	41.52831	-71.36177	Stream from uplands thru woods	A	D	3	0
2015-6-113	41.5244	-71.36201	4" PVC pipe thru seawall	P	D	0	0
2015-6-200	41.52158	-71.36292	24" RCP outfall south of Dacatur Ave	P	D	0	0
2015-6-201	41.51945	-71.3633	12" dia clay pipe under concrete	P	D	0	0
2015-6-202	41.518	-71.36447	ASSF evidence of flows	P	D	0	0
2015-6-203	41.51705	-71.36533	24" dia RCP outfall below sand level	P	D	0	0
2015-6-204	41.51582	-71.36577	4" PVC pipe in concrete retaining wall	P	D	0	0
2015-6-205	41.51537	-71.36582	18" dia RCP outfall	P	D	0	0
2015-6-206	41.51417	-71.36642	4' X 10' culvert outfall north of Newport Bridge	P	D	0	0

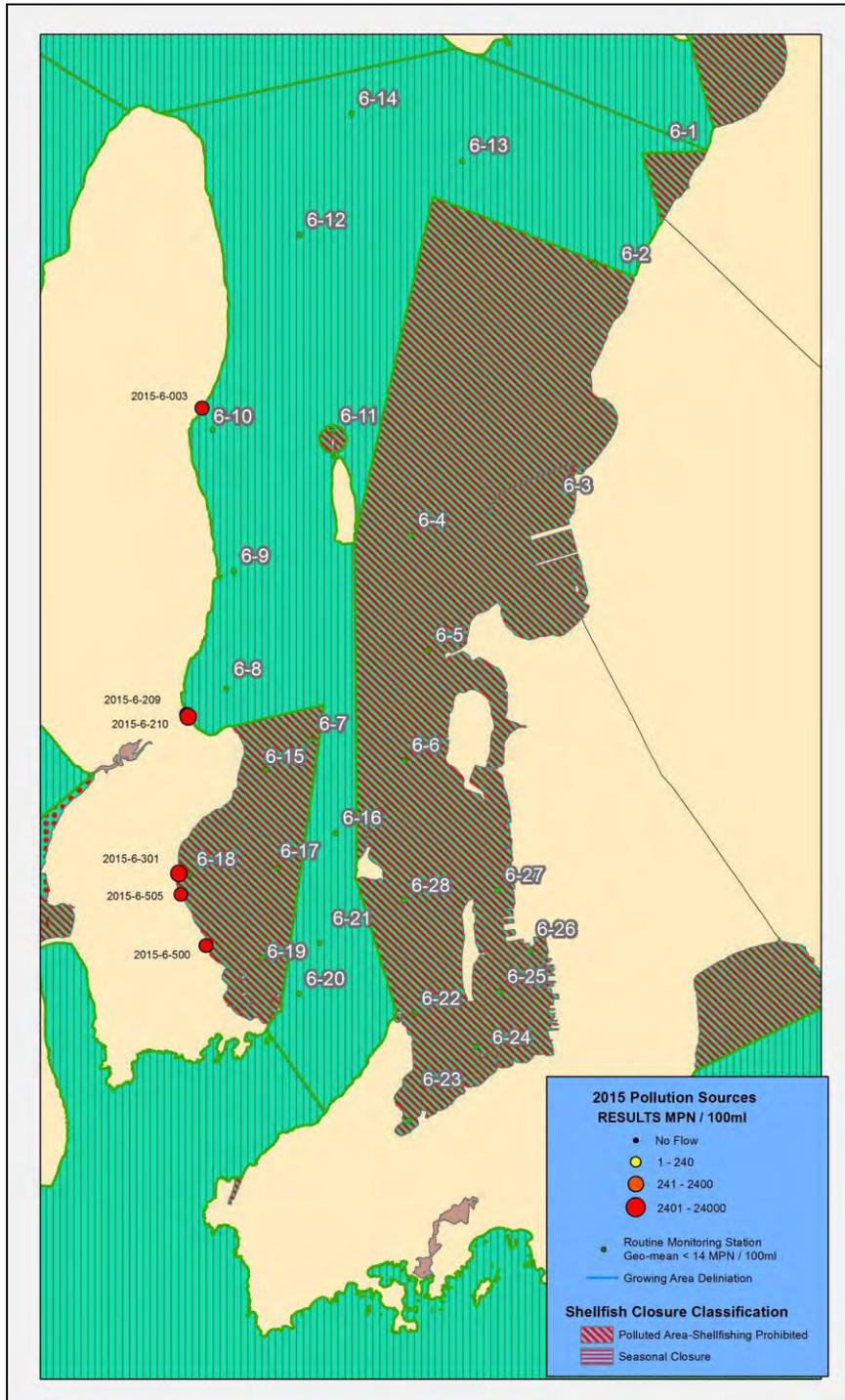
Source ID	LATITUDE	LONGITUDE	DESCRIPTION	ACTUAL / POTENTIAL	DIRECT / INDIRECT	2006 RESULTS FC/100ml	2015 RESULTS CFU/100ml
2015-6-207	41.51417	-71.36642	24" dia RCP north of #206 in wing wall - seepage	A	D	230	0
2015-6-208	41.51332	-71.36635	3' dia flared end RCP	P	D	0	0
<b>2015-6-209</b>	<b>41.51197</b>	<b>-71.36557</b>	<b>Outfall from retention pond at base of Newport Bridge can't</b>	<b>P</b>	<b>D</b>	<b>0</b>	<b>2600</b>
<b>2015-6-210</b>	<b>41.51173</b>	<b>-71.36533</b>	<b>Stone headwall w/ standing water most likely from retention</b>	<b>A</b>	<b>D</b>	<b>11000</b>	<b>8000</b>
2015-6-211	41.51135	-71.36508	18" dia RCP outfall at toll plaza stagnant pool	A	D	1500	0
2015-6-212	41.5103	-71.36392	Dried stream bed from marsh	P	D	0	0
2015-6-213	41.5024	-71.36133	(2) 6" steel pipe, (1) 1 1/2" green pvc in seawall	A	D	0	0
2015-6-300	41.49633	-71.3663	12" X 12" Rect. Hole in concrete seawall in ctr. of Jamestown	P	D	0	0
<b>2015-6-301</b>	<b>41.49587</b>	<b>-71.36665</b>	<b>24" dia CMP storm drain at corner of concrete seawall</b>	<b>P</b>	<b>D</b>	<b>0</b>	<b>7700</b>
2015-6-302	41.49397	-71.36655	18" dia RCP storm drain south of Jamestown harbor	P	D	0	0
2015-6-303	41.49378	-71.36635	12-18" dia steel pipe have buried full of stones	P	D	430	0
2015-6-304	41.49798	-71.3668	30" dia RCP south of harbor	A	D	0	0
2015-6-305	41.49852	-71.36662	12" dia RCP storm drain in seawall along Bay View Ave	P	D	0	0
2015-6-306	41.49917	-71.36608	12" dia RCP storm drain in seawall north of #305	P	D	0	0
2015-6-307	41.49958	-71.36538	12" dia RCP in seawall north of #306	P	D	0	0
2015-6-308	41.49965	-71.36533	12" dia RCP in seawall north of #307	P	D	0	0
2015-6-309	41.50012	-71.365	12" dia clay pipe at base of seawall north of #308	P	D	0	0
2015-6-310	41.48998	-71.36372	4" dia PVC pipe in seawall north of Grumbles Point	A	D	3	3
2015-6-311	41.49025	-71.36373	8" dia clay/iron pipe put in water took sample from drip	A	D	4	2120
2015-6-312	41.4915	-71.36493	Groundwater seep several area	A	D	43	0
2015-6-313	41.48755	-71.36257	Stream from upland marsh crosses road at beach	A	D	230	0
2015-6-400	41.53855	-71.30962	5' dia RCP 3/4 buried in sand	A	D	1500	0
2015-6-401	41.5389	-71.30893	12" corrugated plastic stormdrain	P	D	0	0
2015-6-402	41.5389	-71.30894	24" dia RCP stormdrain under #401	P	D	0	0
2015-6-403	41.54238	-71.3075	42" X 42" concrete box culvert	A	I/D	430	0
2015-6-404	41.54239	-71.30752	Large flock of seagulls	A	D	0	0
2015-6-405	41.54285	-71.30772	Stream from culvert under railroad tracks	A	D	430	0
2015-6-406	41.5534	-71.30605	Stream from under railroad bridge splits into 2	A	D	150	0
2015-6-407	41.55403	-71.30622	Dry streambed under railroad bridge	P	D	0	0
2015-6-408	41.55575	-71.30527	6" dia steel pipe out of side of hill	P	D	0	0
<b>2015-6-500</b>	<b>41.48854</b>	<b>-71.363027</b>	<b>24" Dia RCP before broken seawall</b>	<b>A</b>	<b>D</b>		<b>2400</b>
2015-6-501	41.52249	-71.362413	8" Black PVC in concrete form	P	D		0
<b>2015-6-505</b>	<b>41.49372</b>	<b>-71.366364</b>	<b>Unknown source</b>	<b>A</b>	<b>D</b>		<b>4600</b>

Source ID	LATITUDE	LONGITUDE	DESCRIPTION	ACTUAL / POTENTIAL	DIRECT / INDIRECT	2006 RESULTS FC/100ml	2015 RESULTS CFU/100ml
2015-6-600	41.50006	-71.36639	24" dia RCP semi buried in sand	P	D	0	0
2015-6-601	41.50139	-71.36333	24" dia CPP storm drain	P	D	0	0
2015-6-602	41.49639	-71.36667	4" dia clay pipe at top of sea wall	P	D	0	0
2015-6-603	41.49778	-71.36611	4" dia PVC pipe	P	D	0	3
2015-6-605	41.5025	-71.36194	4" dia PVC pipe under dock	P	D	0	0
2015-6-606	41.52806	-71.36167	Multiple GW seeps	A	D	0	1720
2015-6-700	41.52828	-71.36181	GW seep from rocks	A	D		93
2015-6-800	41.56642	-71.363046	4" PVC pipe in retaining wall	A	I		93
2015-6-850	41.56528	-71.362929	GW Seep @ brick abutment north of Broad St	A	I	300	300
2015-6-852	41.56724	-71.363026	Large stream north of Broad St	A	D		560
2015-6-900	41.57132	-71.364976	4" PVC @ top of embankment	A	D		10

### 3.3.1 Locations of Major Sources

Figure 3-2 is a detailed map of the sources in the East Passage that exceeded the 2400 CFU/100ml standard operating procedure minimum criteria for follow-up sampling.

Figure 3-2 Sources Requiring Follow-up



**Figure 3-3 2015 Source greater than 2400 CFU/100ml**

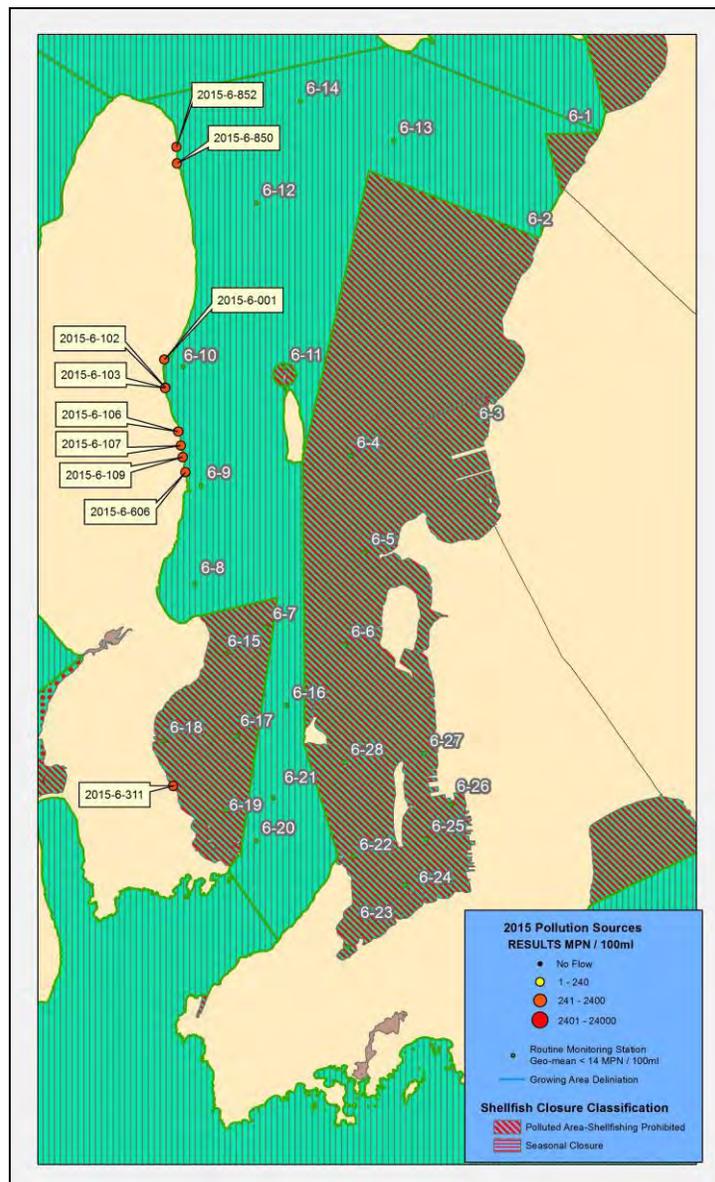
SOURCE ID	LATITUDE	LONGITUDE	DESCRIPTION of SOURCE	ACTUAL / POTENTIAL	DIRECT/ INDIRECT	2012 Results	Volume	2015 Results	Volume	Re-sample 2015
2015-6-210	41.51173	-71.36533	Stone headwall w/ standing water most likely from retention pond	A	D	11000	.03 cfs	8000	.04 cfs	NF
2015-6-301	41.49587	-71.36665	24" dia CMP storm drain at corner of concrete seawall	P	D	0		7700	.02 cfs	Prohibited Not Resampled
2015-6-505	41.493724	-71.366364	Unknown source	A	D	0		4600	.02 cfs	Prohibited Not Resampled
2015-6-003	41.54297	-71.36346	Stream thru woods	A	D	110000	Trickle	2700	Trickle	NF
2015-6-209	41.51197	-71.36557	Outfall from retention pond at base of Newport Bridge	P	D	0		2600	.03 cfs	NF
2015-6-500	41.488541	-71.363027	24" Dia RCP before broken seawall	A	D	0		2400	Trickle	Prohibited Not Resampled

Only sources 2015-6-210, 003 and 209 are in approved areas. Re-sampling efforts indicate that there were no flows from these sources upon return in October for follow-up. They should be reevaluated as part of the 2016 annual update

### 3.4 Identification and Evaluation of Pollution Sources

In addition to the five sources that exceeded 2400 CFU/100ml during the initial survey and were re-evaluated there were ten (10) Sources that exceeded 240 CFU/100ml. The following is the evaluation of those sources and their potential for impacting the water quality of the receiving waters in Growing Area 6. Source 2015-6-311 discharges to a prohibited area of the East Passage and is not evaluated as to its potential impacts to water quality.

Figure 3-4 2015 Source Greater Than 240 CFU/100ml



**Table 2 2015 Source Greater Than 240 CFU/100ml**

Source ID	LATITUDE	LONGITUDE	DESCRIPTION	ACTUAL / POTENTIAL	DIRECT / INDIRECT	2006 RESULTS FC/100ml	2015 RESULTS CFU/100ml
2015-6-001	41.54162	-71.36502	Stream north of Wright Lane	A	D	460	800
2015-6-102	41.53825	-71.36486	Small stream over rocks from uplands	A	D	93	1100
2015-6-103	41.53822	-71.36488	Small stream maybe split of source #102 south of #102	A	D	230	800
2015-6-106	41.53295	-71.36284	Very small stream from upland woods heavy iron bacteria	A	D	43	1430
2015-6-107	41.53127	-71.36239	Small stream thru woods	A	D	23000	662
2015-6-109	41.52988	-71.36212	Groundwater seepage fades out above tide line	A	I	0	685
2015-6-311	41.49025	-71.36373	8" dia clay/iron pipe put in water took sample from drip	A	D	4	2120
2015-6-606	41.52806	-71.36167	Multiple GW seeps	A	D	0	1720
2015-6-850	41.56528	-71.362929	GW Seep @ brick abutment north of Broad St	A	I	300	300
2015-6-852	41.56724	-71.363026	Large stream north of Broad St	A	D		560

Source 2015-6-001 is a small stream that emanates from an upstream wetlands thru a culvert under E. Shore Rd. Initially during the survey in July this source had bacteria counts of 800 CFU/100ml and a volume of flow of 1.06 cfs. This stream due to the larger flow volume was re-inspected in October. On the 23<sup>rd</sup> a sample with results of 677 CFU/100 ml and a flow rate of 0.03 cfs were measured. In addition a sample of the receiving waters in front of this stream was also taken. Results were 320 CFU/100ml. General observations at the time were there were numerous marine birds in the general area of this stream and a kayaker was unloading gear from his kayak at this popular launch site.



Impacts from this stream are calculated in the following analysis and are used to support a closure area for this point source.

$$(\text{Flow gpm} * \text{FC} * 407520 (\text{Constant}) / 7.48 = \text{FC load/day}) / \text{depth} = \text{dilution area}$$

$$\text{Dilution water Required} = (\text{Load/Day}) / 14 * 283$$

$$\text{Radius of half circle Sq root of } 2 * \text{area} / 3.14159 = \text{foot radius}$$

NOAA Chart MLLW depth = 7' plus 5' tidal range = 9.5 average depth								
	GPM Flow	FC	Avg. Depth	Max Depth	FC Load/day	Dilution Water cf	Surface Area	Radius half circle ft.
2015	475.76	800	9.5	17	20736012321	5233723.45	550918.26	592.22
2015	13.5	677	9.5		497931689.8	125676.85	13229.14	91.77
2016	381.5	6	9.5		124707657.8	31475.94	3313.26	45.93
							189153.55	243.31

Based on these calculations a closure in Cranston Cove is recommended. Final configuration of the closure will include all the dilution area (189,153 sq. ft. average) needed along with consideration of geographic boundaries and enforceable lines.

Source 2015-6-102 is a small stream with bacteria counts of 1100 CFU/100ml and an estimated volume of flow of .035 cfs. This stream flows through an empty lot and originates from a large wooded area to the west. There would not appear to be any anthropogenic sources influencing this source and therefore not having a negative impact on the receiving waters.



Source 2015-6-103 is located just south of the above source and most likely is a split of the # 102 stream. Counts were similar at 800 CFU/100ml.

Source 2015 6-106, 107 and 109 are small streams through the woods from the rear of very large acreage residential lots. Bacteria counts for 6-106 were 1430 CFU/100ml very low flows that faded out into the sand prior to reaching the high tide line. This source would not appear to be impacting the receiving waters.

2015-6-106



2015-6-107



Source 2015-6-107 is a small 2” dia. pvc pipe again at the rear of a very large residential lot south of the source mentioned above. Bacteria counts were 662 CFU/100ml with again very low flows that did not reach the receiving waters and therefore not impacting water quality.

Source 2015-6-109 (No picture available) is another stream south of the above two source with similar conditions. Bacteria counts were 685 CFU/100ml and again faded into the sand above the high tide mark. The following photograph locates all three sources and the landward upstream conditions of these large residential lots.



Source 2015-6-606 were multiple groundwater seeps flowing over a rock faced wall. Each of the streams were only a drip with bacteria counts of 1720 CFU/100ml. Although the bacteria count was slightly elevated the volume of these drips and the fact they were not reaching the receiving waters would indicate that they are not having a negative impact on water quality.



Sources 2015-6-850 and 852 are at the northern end of Jamestown. Source 6-850 is a ground water seep at a brick abutment north of Broad Street. The bacteria count was 300 CFU but volume of flow was only a drip. This would indicate there are not impacts to the receiving waters by this insignificant source. Source 6-852 was a larger stream again north of Broad Street. Bacteria counts were 560 CFU/100ml and volume of flow was 0.4 cfs. This upland landuse is sparsley populated with a very large wooded area surrounding the source of this stream. Due to the lack of anthropegenic source it would not appear that this source is having a negative impact to water quality.



No sources other than the one stream at Cranston Cove appear to be impacting the high volume of receiving waters on the east side of Jamestown. Two routine stations, GA6-10 and GA6-9 are just offshore of these sources and sampling results are both well within program compliance with geo-means of 2.2 and 2.0 respectively. There are not violations of the variability criteria for either station.

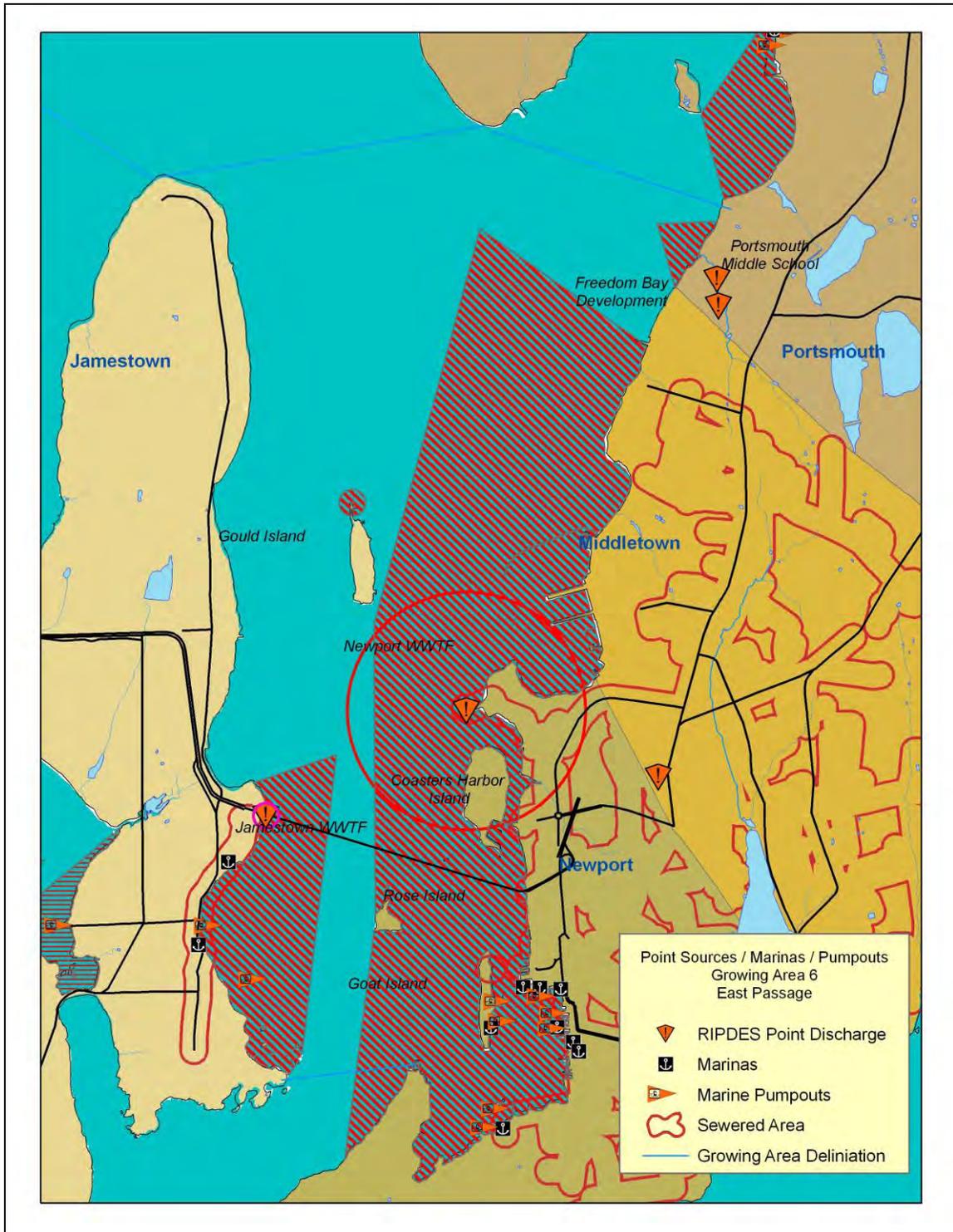
### 3.4.1 Domestic Wastes / Industrial Wastes

Public sewers service the majority of the Newport shoreline and a small portion of the Jamestown harbor area. All other areas of the watershed are serviced by individual sewage disposal systems (ISDSs). There are currently five RIPDES permits that discharge into the growing area (Figure 3-3). Two are the municipal WWTFs from Newport and Jamestown. Another of the permitted discharges, Portsmouth Middle School Permit # RI0100242 has been eliminated. One discharge identified, as a Newport Creamery restaurant is a non-sanitary water release pipe located on West Main Road in Middletown almost a mile away from the shoreline. The final permit RI 0020346 is a minor sanitary discharge from the Freedom Bay Development's Adult Assisted Living Facility on West Main Road in the Town of Portsmouth. This development is permitted to discharge a monthly average flow of 0.07 mgd with a max effluent fecal concentration of 200 MPN /100ml into Lawton Brook. Currently this facility is not utilizing their WWTF due to insufficient flows and is pumping and hauling wastewater to the Newport WWTF. However upon occupation of additional units at the facility and sufficient increases in flow the facility will begin to utilize the on-site treatment plant to process wastewater and discharges to Mother of Hope Brook will resume. Mother of Hope Brook discharges to the East Passage just south of Carr Point near the northern extent of the growing area. This is the prohibited area identified as #35 on the May 2006 – May, 2007 Shellfish Closure Areas map of Narragansett Bay and will be protective of the area influenced by this outfall.

The City of Newport's WWTF 2015 performance data report indicates that there was several minor BOD and TSS permit violations and a flow exceedance of 13.6 mgd in March. The average fecal values reported were 3.365 MPPN/100ml well below permit limits. The treatment facility is currently under plans to increase the volume of wastewater they will be treating. As of June 1, 2015 the permitted flow has increased to 16.0 mgd for a monthly average. In 2015 they reported an average flow of 7.54 mgd. They will be increasing their permitted flows by approximately 10% and will be completing major upgrades to their equipment. These upgrades include, new grit removal equipment, a new primary clarifier, reconfiguration of the aeration basins, larger chlorine contact tanks and other processing upgrades along with other system improvements to remove/reduce CSOs. The plant is under a judicial consent agreement to complete these improvements by 2019 with the CSO system work to be completed by 2032.

The Town of Jamestown WWTF reported a permitted flow violation of 0.911 mgd in March of 2015 as their only reported violation. The plant has a permitted flow of 0.73 mgd and an average reported flow of 0.3 mgd. Average fecal values were reported as 1.39 MPN/100 ml well below permit levels.

Figure 3-5 RIPDES Discharges and Marinas



A detailed plume model was utilized to determine the necessary safety zone due to a failure at the Newport WWTF. These calculations take in to consideration an accurate analysis of all the pertinent factors such as tides, currents, die off, etc. that effect the dilution of discharges from the WWTF outfall. Refer to the growing area file for these documents. In addition to the model plume analysis routine monitoring results from stations that are located outside of the existing safety zone, GA6-16, 21, and 20 are all in statistical compliance.

Jamestown's WWTF is currently permitted to discharge a flow of 0.73 mgd with their actual monthly flow averaging 0.3 mgd well below the permitted flow. There was one reported violations of the flow maximum in March where the average monthly flow was 0.911 MGD. The 2015 average monthly fecal coliform concentrations were reported as 1.39 MPN / 100 ml again substantially below the permitted concentration of 200 MPN /100ml. The following dilution water is required to dissipate this discharge.

$$(0.73 \text{ mgd}) * (1,000,000) / (24 \text{ hr/day}) * (60 \text{ min/hr}) = 507 \text{ gpm}$$

### **FECAL COLIFORM LOAD PER DAY EGUALS:**

$$(507 \text{ gpm}) * (1.39 \text{ MPN/100ml}) * (407250) / 7.48 = 3.83 \text{ E } 7 \text{ FC/Day}$$

Dilution water required:

$$3.83 \text{ E } 7 \text{ FC/Day} / (14 \text{ fc/100ml goal}) * (248) = 11.051 \text{ ft}^3$$

Referring to the NOAA navigational charts at the point of discharge the average depth at the discharge point is 69 feet.

Therefore the surface area needed is:

$$32,990 \text{ ft}^3 / 69 \text{ feet} = 478 \text{ Ft}^2$$

The resultant required safety zone distance from the bulkhead to dilute the average discharge is 478 ft. The actual safety zone in which shellfishing is prohibited is over one thousand feet from the face of the bulkhead providing ample dilution water.

In an emergency situation in which some type of treatment failure or bypass occurs, WWTF plant officials are required to notify our O&M (Operations and Maintenance) division within 24 hours of awareness of said failure. The plant is required to either notify by telephone either on duty staff during normal working hours or RIDEM's enforcement division dispatch personnel at our emergency hotline. O&M staff immediately notifies shellfish staff during working hours and action is taken as needed to institute an emergency closure. Should a failure be reported during off hours O&M staff gather information at the start of the work day and relay specifics to shellfish staff. Weekend/holiday failures are noted by shellfish staff as part of the routine on-call coverage. Evaluation of the failure and resultant emergency closures are instituted as soon as possible following notification. This notification includes a press release to local news outlets, posting on our website and the recording of said closure on our shellfish conditional area telephone hot line. Additional notice as necessary may also be given to officials representing the commercial harvesters via telephone. The shellfish program maintains a permanent file of all emergency closures and refers to historic data to assist in the determination of the duration and extent of these emergency closure zones.

### **3.4.2 Stormwater**

Although stormwater is attributable to closures of shellfishing waters, the stormwater runoff from this growing area's watershed does not appear to have a significant or accountable effect on the water quality except in the areas of Newport's combined sewer overflows (CSOs). The CSOs that discharge into this growing area are located on Wellington Avenue and Washington Street in Newport Harbor into prohibited portions of the growing area.

Samples for the routine monitoring protocol are taken randomly and would be representative of the water quality under all conditions, favorable or adverse. Since the statistical evaluation of the routine monitoring results indicates that all stations significantly comply with the water quality criteria there is no indication that this area is classified incorrectly or is impacted by random weather events.

### **3.4.3 Marinas**

Currently there are over thirty marinas located in the growing area with over 1500 documented slips and moorings between the harbors of Newport and Jamestown. Areas where shellfishing is prohibited year round encompass these marinas (Fig 3-4).

Rhode Island coastal waters including all the waters of growing area 6, East Passage are federally designated as "No Discharge" mandating that the discharge of *treated* and *untreated* boat sewage is prohibited (not including greywater or sink water) in these designated areas. RIDEM also has a mandatory MSD inspection program in force to ensure compliance with no discharge. Both marina areas currently have two pump out facilities each. The calculations, using the FDA VIMs model (10% occupancy, 50% discharging) to support these closures are available for review in the program's permanent file under Marina Closures.

### **3.4.4 Agricultural Waste**

Currently there is only about 10 % of the land use that are agricultural lands within the watershed to growing area 6. The vast majority of the watershed is classified as urban/built land.

### **3.4.5 Wildlife**

There are some open, undeveloped wetlands on the northern shores of Jamestown, but no other large areas of undeveloped land within the watershed to Growing Area 6. Other than the observance of a large flock of Canada Geese at the retention pond at the base of the Newport Bridge on Jamestown, no appreciable numbers of waterfowl or wildlife were observed during the numerous days of shoreline surveying.

## **4.0 Hydrographic and Meteorological Characteristics**

### **4.1 Tides**

Tides in Rhode Island are semi-diurnal. This means that the tides have a period or cycle of approximately one-half of a tidal day (12.84 hrs.), characterized by two similar high waters and two similar low waters each tidal day. The tidal current is said to be semi-diurnal when there are two flood and two ebb periods each day. A semi diurnal constituent has two maxima and two minima each constituent day.

The shoreline survey was scheduled to coincide with ebb and/or low tide, which represents the most opportune time for observing stormwater outfalls that may otherwise be hidden by tidal water, and sampling streams and pipes that may otherwise be receiving tidal waters.

### **4.2 Rainfall**

In Rhode Island there are normally no seasonal patterns in the frequency and amounts of precipitation during the year, however two major storm patterns exist. Storms that occur between October and May are primarily extratropical cyclones. The most famous are the "nor-easters:" low-pressure systems that typically develop off the

North and South Carolina coasts and move northeast along the Atlantic seaboard, occasionally colliding with colder and drier air (from Canada) in the New England region. This results in the development of heavy rain and/or snow. These storms are more widespread in their range. The second type of storm, occurring between June and October, are primarily tropical cyclones. The biggest storms are hurricanes, which have hit Rhode Island 71 times during the last 350 years. In the summer, most precipitation results from thunderstorms and smaller convective systems. These typically produce short-duration high-intensity precipitation events, and are more localized than nor-easters.

Growing area response to these precipitation events varies according to storm duration, storm intensity, and watershed characteristics such as land use, vegetative cover, and soil characteristics. Changes in land use and vegetative cover are typically accompanied by increases in impervious areas. Of particular concern for the growing area is the close proximity of impervious surfaces to stream channels. This allows for the rapid and efficient transport of runoff of concomitant pollutants including fecal coliform bacteria to river and stream channels that ultimately drain to the growing area.

The shoreline survey dates for the East Passage were July 28<sup>th</sup>, and 29<sup>th</sup>, and August 12<sup>th</sup> and 13<sup>th</sup> and October 23<sup>rd</sup>. The following rainfall data was observed at the NOAA weather station in Taunton, MA located to the north of the growing area. The days of actual surveying are highlighted in yellow.

**Table 3 Rainfall Data July 2015**

Date	Temperature				Precipitation
	Maximum	Minimum	Average	Departure	
2015-07-01	80	65	72.5	2.3	0.60
2015-07-02	82	56	69.0	-1.4	0.00
2015-07-03	82	54	68.0	-2.6	0.00
2015-07-04	76	52	64.0	-6.7	T
2015-07-05	86	50	68.0	-2.9	0.00
2015-07-06	87	57	72.0	0.9	0.00
2015-07-07	85	60	72.5	1.3	0.01
2015-07-08	90	71	80.5	9.2	1.16
2015-07-09	79	64	71.5	0.0	T
2015-07-10	83	59	71.0	-0.6	0.32
2015-07-11	89	55	72.0	0.3	0.00
2015-07-12	89	60	74.5	2.7	0.00
2015-07-13	86	61	73.5	1.6	0.00
2015-07-14	83	60	71.5	-0.4	0.33
2015-07-15	87	68	77.5	5.5	0.07
2015-07-16	76	52	64.0	-8.0	0.00
2015-07-17	81	49	65.0	-7.1	0.00
2015-07-18	80	67	73.5	1.4	0.02
2015-07-19	90	73	81.5	9.4	0.00
2015-07-20	94	69	81.5	9.4	0.00
2015-07-21	89	67	78.0	5.9	T
2015-07-22	85	59	72.0	-0.1	0.00
2015-07-23	84	54	69.0	-3.1	T
2015-07-24	82	53	67.5	-4.6	0.01

Date	Temperature				Precipitation
	Maximum	Minimum	Average	Departure	
2015-07-25	74	52	63.0	-9.1	0.00
2015-07-26	80	56	68.0	-4.0	T
2015-07-27	81	68	74.5	2.5	0.52
2015-07-28	88	64	76.0	4.1	0.14
2015-07-29	91	61	76.0	4.1	0.00
2015-07-30	87	73	80.0	8.2	0.04
2015-07-31	89	58	73.5	1.8	0.00
<b>Sum</b>	2615	1867	-	-	3.22
<b>Average</b>	84.4	60.2	72.3	0.7	-
<b>Normal</b>	82.8	60.5	71.6	-	3.75

**Table 4 Rainfall Data August 2015**

Date	Temperature				Precipitation
	Maximum	Minimum	Average	Departure	
2015-08-01	89	57	73.0	1.3	0.02
2015-08-02	87	55	71.0	-0.6	0.00
2015-08-03	88	62	75.0	3.5	0.00
2015-08-04	86	64	75.0	3.6	0.71
2015-08-05	87	58	72.5	1.2	0.00
2015-08-06	83	52	67.5	-3.7	0.00
2015-08-07	82	53	67.5	-3.6	0.00
2015-08-08	80	52	66.0	-5.0	0.00
2015-08-09	74	52	63.0	-7.9	T
2015-08-10	82	50	66.0	-4.7	0.00
2015-08-11	72	62	67.0	-3.6	0.85
2015-08-12	86	61	73.5	3.0	0.00
2015-08-13	85	56	70.5	0.1	0.00
2015-08-14	85	53	69.0	-1.2	0.00
2015-08-15	89	59	74.0	3.9	0.02
2015-08-16	91	65	78.0	8.1	0.00
2015-08-17	93	63	78.0	8.2	T
2015-08-18	93	64	78.5	8.9	0.00
2015-08-19	88	66	77.0	7.5	0.00
2015-08-20	87	67	77.0	7.7	0.00
2015-08-21	86	72	79.0	9.9	0.34
2015-08-22	77	67	72.0	3.0	0.00
2015-08-23	82	68	75.0	6.2	0.00
2015-08-24	86	69	77.5	8.9	T
2015-08-25	89	63	76.0	7.6	0.07
2015-08-26	86	59	72.5	4.3	0.54
2015-08-27	83	55	69.0	1.0	0.00
2015-08-28	82	51	66.5	-1.3	0.00
2015-08-29	82	51	66.5	-1.1	0.00
2015-08-30	89	59	74.0	6.6	T
2015-08-31	87	65	76.0	8.9	0.00
<b>Sum</b>	2636	1850	-	-	2.55
<b>Average</b>	85.0	59.7	72.4	2.6	-
<b>Normal</b>	81.0	58.5	69.8	-	4.08

Table 5

October 2015 Rainfall Data

Date	Temperature				Precipitation
	Maximum	Minimum	Average	Departure	
2015-10-01	60	52	56.0	-0.5	0.16
2015-10-02	54	50	52.0	-4.1	0.57
2015-10-03	55	51	53.0	-2.7	0.10
2015-10-04	60	46	53.0	-2.3	0.00
2015-10-05	62	44	53.0	-1.9	0.00
2015-10-06	71	37	54.0	-0.5	0.00
2015-10-07	73	41	57.0	2.9	0.00
2015-10-08	68	40	54.0	0.2	0.00
2015-10-09	71	42	56.5	3.1	0.39
2015-10-10	64	38	51.0	-2.0	0.00
2015-10-11	67	37	52.0	-0.7	0.00
2015-10-12	76	43	59.5	7.2	0.00
2015-10-13	74	49	61.5	9.5	0.26
2015-10-14	70	46	58.0	6.4	0.00
2015-10-15	63	34	48.5	-2.8	0.00
2015-10-16	65	35	50.0	-1.0	T
2015-10-17	58	31	44.5	-6.1	0.00
2015-10-18	49	24	36.5	-13.8	0.00
2015-10-19	50	20	35.0	-15.0	0.00
2015-10-20	69	50	59.5	9.8	T
2015-10-21	71	49	60.0	10.6	0.02
2015-10-22	73	50	61.5	12.4	0.00
2015-10-23	61	38	49.5	0.7	0.00
2015-10-24	52	41	46.5	-2.1	0.00
2015-10-25	64	45	54.5	6.2	0.01
2015-10-26	57	28	42.5	-5.5	0.00
2015-10-27	60	25	42.5	-5.2	0.00
2015-10-28	67	29	48.0	0.5	0.45
2015-10-29	74	57	65.5	18.3	1.12
2015-10-30	63	35	49.0	2.0	0.00
2015-10-31	55	25	40.0	-6.7	0.00
<b>Sum</b>	1976	1232	-	-	3.08
<b>Average</b>	63.7	39.7	51.7	0.5	-
<b>Normal</b>	62.7	39.7	51.2	-	4.29

The surveys conducted in July were considered wet weather 1-2 day(s) after 0.68" (.52 + .14) of rain. Surveying therefore was completed within 1-2 days of a rain event of greater than .5". The surveys completed on the 12<sup>th</sup> and 13<sup>th</sup> of August would also be considered wet weather because of a rain event measured at 0.85" the day before surveying started. The survey on October 23<sup>rd</sup> was completed during dry conditions, greater than 7 days since any rain event greater than 0.5".

### **4.3 Winds/Climate**

Rhode Island's climate may be summarized as having an equitable distribution of precipitation throughout the four seasons, large ranges of temperature, both daily and annually, great differences in the same season of different years and considerable diversity of the weather over short periods of time, or as we say in New England, if you don't like the current weather wait a minute it will change. These varying conditions are greatly influenced across the state by the nearness to Narragansett Bay or the Atlantic Ocean and by elevation and nature of the local terrain. Day to day variety is the norm with no particular regular or persistent rhythm to the changes in weather other than a tendency to a roughly twice-weekly alternation from fair weather to cloudy or stormy weather.

Weather averages in Rhode Island are not very useful for important planning purposes due to the large variety of weather patterns. However, the following averages can be used for general understanding of the areas climate.

The mean annual temperature ranges from 48° F to 51 ° F with the higher mean temperature more representative of the areas of Narragansett Bay. The average daily minimum temperature in January and February is 25 ° F in coastal sections.

Precipitation is evenly distributed throughout the year, with annual averages of 42 to 46 inches with the southeastern bay areas tending to be more like 40 inches. Average yearly snowfall along the shoreline is about 20 inches and the region is known to have years in which snowfall totals can be significantly less than average because of milder winters. Total precipitation however averages around 3 to 3.5 inches per month regardless of season with the lesser amounts in the period between May and July.

### **4.4 River Discharges**

There is one named stream, Mother of Hope Brook, and three unnamed streams that discharge directly to the East Passage Growing Area. The Mother of Hope Brook was not sampled during the survey due to access issues and was not a priority due to the closure associated with the potential WWTF discharge mentioned previously. Sampling should be re-visited during the 2016 annual follow-up to ascertain the status of this source. The most northern of the three un-named streams is a small stream identified as source # 2006-6-406. This stream discharges to a prohibited area. Source # 2006-6-400 is the small un-named stream about midway along the shoreline of Newport also discharging to a prohibited area. The furthest south stream discharges to Newport Harbor near Coasters Harbor Island on navy land. There are no routine monitoring stations within the immediate vicinity of any of these fresh water sources.

## **5.0 Water Quality Studies**

### **5.1 Overview**

The RIDEM Shellfish Program participates in the Shellfish Growing Area Monitoring (SGAM) program, which is the result of an agreement between the State of Rhode Island and the Food and Drug Administration (FDA), and managed by the National Shellfish Sanitation Program (NSSP). The purpose of these programs is to maintain national health standards by regulating the interstate shellfishing industry. The NSSP is designed to oversee the shellfish producing states' management programs and to enforce and maintain an industry standard. As part of this agreement, the state of Rhode Island is required to conduct continuous bacteriological monitoring of shellfish harvesting waters for direct human consumption in order to maintain certification.

Water samples are collected at twenty-eight (28) monitoring stations throughout the growing area (Figure 2-1). Eighteen of these stations are in prohibited areas while the other ten are in the approved portions of the growing area.

Samples are collected 1-2 feet below the water surface (using 4 ounce sterile Nalgene bottles) after which they are stored in a cooler packed with ice. They are then transported to the Rhode Island Department of Health Laboratories for analysis. The membrane filtration method using mTEC agar is used to analyse samples. The results are sent to the RIDEM Shellfish Program at which time they are reviewed and incorporated into a database. A summary report is written and recommendations regarding the classification of the growing area are made on a yearly basis. The 2015 report is incorporated into this report in the following section. Routine monitoring data is also part of this report and is shown in Table 6.

## **5.2 RIDEM Shellfish Program Monitoring**

### **5.2.1 2015 Annual Report of Statistical Evaluations and Comments**

#### **GROWING AREA 6 - EAST PASSAGE**

##### **HIGHLIGHTS**

- \* **Sampled 6x in 2015**
- \* **Statistics represent combined wet and dry weather data >01/01/11 (N = 30)**
- \* **All approved stations in compliance and conformance**
- \* **MTEC = 21 (90% = 36 cfu/100ml)**
- \* ***Data run 1/15/16***

##### **COMMENTARY**

The East Passage (Growing Area 6) was sampled six times in 2015, complying with the minimum SRS monitoring requirement for approved areas. Sample results are representative of wet and dry weather conditions. The statistical evaluation for the East Passage incorporates the most recent 30 samples collected for the area, the minimum number required for analysis according to SRS guidelines.

Results of the statistical evaluation demonstrate that all approved stations are in program compliance. The area is properly classified.

##### **RECOMMENDATIONS**

- \* **No action recommended based on ambient monitoring results**

Routine Monitoring Station Statistical Analysis

Table 6 Monitoring Results Reported January 11, 2007

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>	
			<i>MEAN</i>	<i>90TH PERC (&lt;36)</i>
GA6-1	A	30	2.1	2.8
GA6-2	P	30	2.3	4.3
GA6-4	P	30	2.0	2.4
GA6-5	P	30	2.5	5.4
GA6-6	P	30	2.4	4.3
GA6-7	P	30	2.0	2.4
GA6-8	A	30	2.2	3.3
GA6-9	A	30	2.0	2.0
GA6-10	A	30	2.2	3.5
GA6-11	P	30	2.0	2.4
GA6-12	A	30	2.2	3.4
GA6-13	A	30	2.2	3.4
GA6-14	A	30	2.1	2.7
GA6-15	P	30	2.1	2.6
GA6-16	A	29	2.3	3.4
GA6-17	P	30	2.1	2.5
GA6-18	P	30	2.2	3.2
GA6-19	P	30	2.2	3.0
GA6-20	A	30	2.1	2.6
GA6-21	A	30	2.4	3.4
GA6-22	P	30	2.6	5.1
GA6-23	P	30	2.2	3.3
GA6-24	P	30	2.6	6.4
GA6-25	P	30	5.1	24.1
GA6-26	P	30	6.4	21.8
GA6-27	P	30	2.4	4.5
GA6-28	P	30	2.2	3.4

### **5.3 Sampling Plan and Justification**

Growing Area 6 is an approved and or prohibited growing area. Therefore, the RIDEM Shellfish Program monitors Growing Area 6 in accordance with the guidelines set forth in the NSSP Manual of Operations for systematic random sampling. Water quality monitoring stations within the growing area are sampled six times per year and are statistically evaluated utilizing the most recent thirty samples (N=30). This represents the most recent 5-years of collected data. The geomean and 90<sup>th</sup> percentile values are used for statistical evaluation.

A random sampling plan for the growing area is scheduled yearly, with a statistically representative cross section of all meteorological, hydrographic, and/or other pollution events that may affect water quality and subsequent shellfish contamination. The growing area is normally monitored every two months throughout the year. A reasonable attempt is made to collect samples on the pre-established days.

It should be noted that routine station GA6-3 is located in Coddington Cove off the Navy base in Newport. The Navy has severely limited access to this station due to security concerns and is currently not being sampled.

### **5.4 RIDEM TMDL Studies**

There are currently no TMDL studies underway by RIDEM's Office of Water Resources within the East Passage Growing Area.

## **6.0 Interpretation of Data**

### **6.1 Effects of Meteorological and Hydrographic Conditions**

A more extensive investigation would be required to link meteorological and hydrographic conditions to bacterial loading. Based on the statistical results from routine monitoring under all weather and hydrographic conditions there does not appear to be a direct link between an increase in bacteria loadings and meteorological events within this growing area in areas other than those currently closed to shellfishing.

### **6.2 Recommendations**

#### **6.2.1 Monitoring Schedule**

The current monitoring schedule is adequate for maintaining correct classification.

#### **6.2.2 Comments**

Water quality statistical evaluations indicate that the area conforms to the NSSP requirements as an approved growing area during all types of weather periods except for the area of Cranston Cove in Jamestown impacted by the stream. A closure of that area is recommended beginning in May of 2016. There are no other recommendations for changes in classification at this time.

### 6.2.3 Legal Descriptions

#### Prohibited shellfish closure areas are described below:

##### Growing Area 6 – East Passage

- GA6-1 The waters of the East Passage, south of a line from the Rhode Island Department of Environmental Management range marker located approximately 900 feet south of Carr Point to buoy “Gr C” located at Fiske Rock, and north and east of an intersecting line from the Rhode Island Department of Environmental Management range marker located approximately 2,300 feet north of the rock jetty formerly known as the Blue Gold Pier opposite Vigilant Street in Middletown, to nun buoy “22”.
- GA6-2 East Passage and Newport Harbor east of a line from the northwest corner of the concrete bulkhead at Fort Adams State Park to the Rose Island light, east of a line from the Rose Island light to the rectangular structure located on the southeast corner of Gould Island, and east of a line to the day marker at Halfway Rock, and south of a line from the day marker on Halfway Rock to the northwest corner of rock jetty formerly known as Blue and Gold Pier, located approximately 800 feet north of Greene Lane in Portsmouth.

##### Jamestown Area

- GA6-3 The waters on the east shore of Jamestown, in the vicinity of East Ferry and Taylor Point, west of a line from Bull Point in Jamestown to the house on the rocks located in The Dumplings to Bell Buoy F1 (2 +1) G6s and south of an intersecting line from the northern most tip of Taylor Point to Bell Buoy F1 (2 +1) G6s.

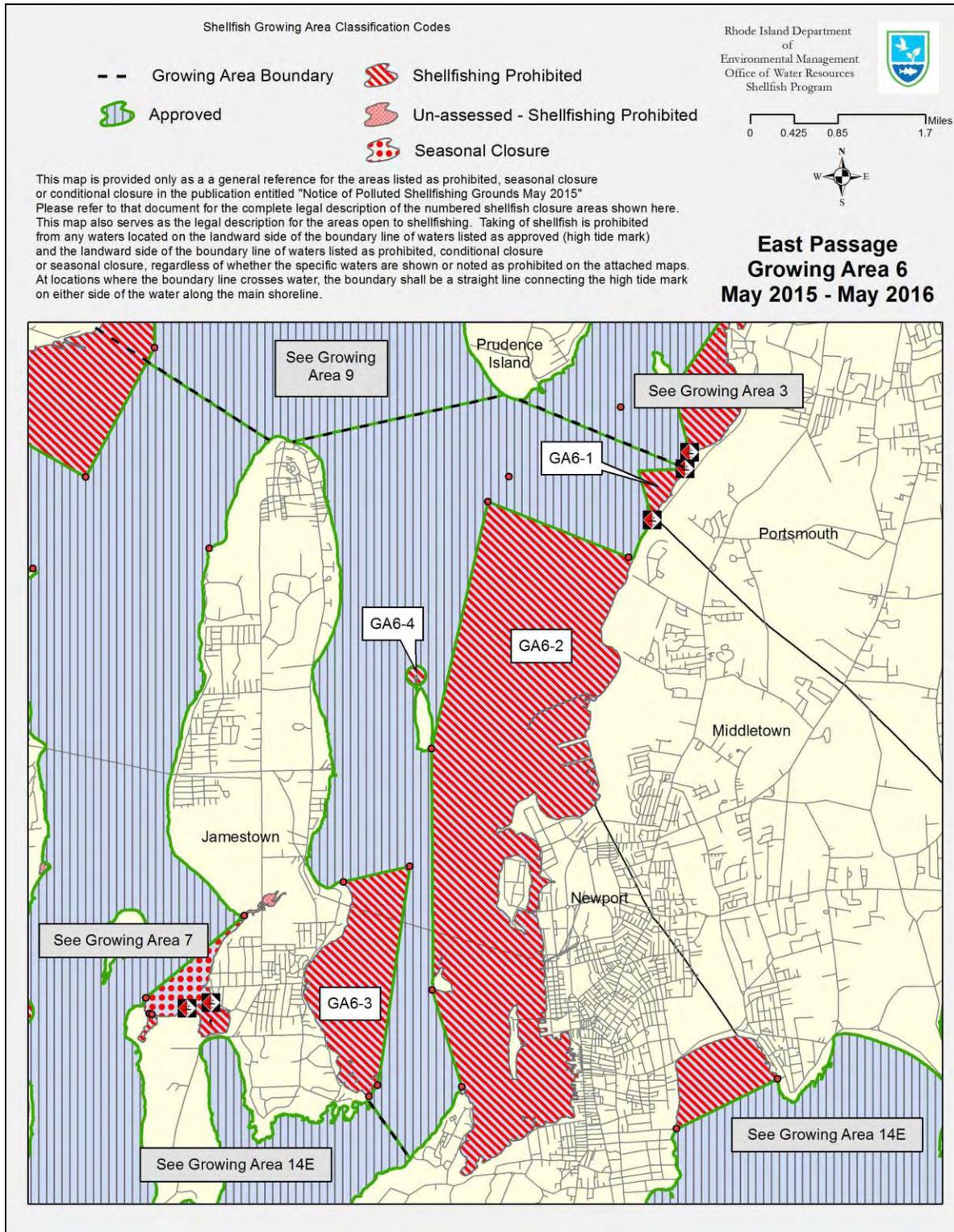
##### East Passage and Newport Harbor

- GA6-4 The waters within 500 feet of the firing pier at the U.S. Navy Torpedo Testing Station at the northern end of Gould Island.

##### East Passage Cranston Cove

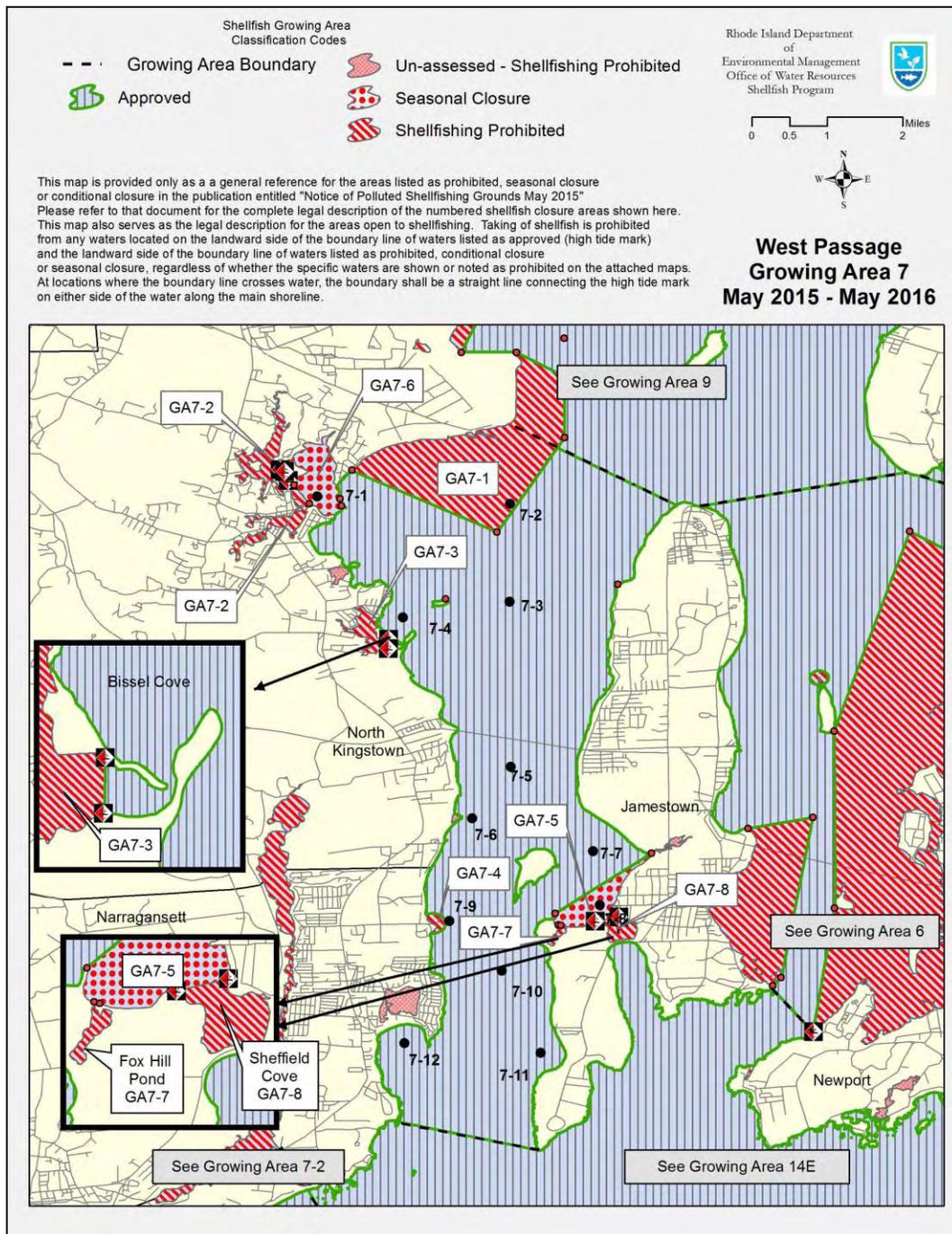
- GA6-5 The waters of Cranston Cove on the eastern shoreline in Jamestown, south and west of a line from the most southeastern in water structure of CRMC dock # 771 located offshore of 530 East Shore Road, to the most northeastern in water structure of CRMC dock # 1924 located offshore of 486 East Shore Road, including all waters bounded by said docks to the north and south.

**Figure 6-1 2015-2016 Growing Area 6 Classification Map**



# West Passage Growing Area 7 2015 Annual Update

A shoreline survey of the West Passage Growing Area 7 was conducted in 2005. A total of 105 sources were identified during this shoreline survey, excluding marinas. A total of thirty-seven of the one hundred and five sources were not actively flowing at the time of the shoreline survey with the remaining 68 having flows warranting sampling. All sources in which flow was observed were sampled. A triennial update was completed in 2011, fourteen sources were sampled. Of those fourteen only 1 exhibited elevated bacteria counts that required follow-up sampling in 2015 for this annual review.



Source ID	Description	Actual	Direct	2005 Results Fc/MPN FLOW	2006 Results Fc/MPN	2007 Results Fc/MPN	2009 Results Fc/MPN	2010 Results Fc/MPN	2011 Results Fc/MPN	2012 Results CFU/100 ml	2013 Results CFU/100 ml	2014 Results cfu/100 ml	2015 Results cfu/100 ml
2005-7-118	2 1/2" dia PVC pipe in seawall Griffith Road north of stream	A	D	>/=24000 3 SEC 125 ML	NF	NS	930	NF	2300	8000	420 .001 cfs	8000 NF	NF

NF – No Flow NS – No Sample

As noted above the results from sampling for source 7-118 were 8000 cfu/100ml in 2012 and greatly reduced when sampled in 2013. They again were high in 2014 but then subsequent follow-up sampling found no flows in September of 2014. Again in 2015 there were no flows found emanating from this small 2 1/2" diameter pipe located at the base of a concrete seawall. At times this source is buried and other times exposed. The flows from this pipe have never been more than a mere trickle and because of these low flows (.001 cfs) and the fact that they filter through the sand along the shoreline prior to reaching the water, this source does not appear to have an impact on the quality of the West Passage receiving waters. This source should be re-inspected and sampled and upland reconnaissance completed if warranted.

In January of 2016 a meeting was held in which RIDEM OWR, representatives of the Town of Jamestown and their consultant ESS Group met to discuss the ongoing investigation of water quality impairments in Sheffield Cove that resulted in the down classification of this area to shellfishing prohibited in 2009/2010. The town has received a NEIPWC non-point source grant to design and implement bio-retention and an innovative sand filter design in the Sheffield Cove watershed in order to abate dry weather and stormwater-related bacteria. Following construction of these BMPs the town has indicated a commitment to conduct additional water quality monitoring in the support of upgrading the classification of this valuable local shellfish area. Extensive dry and wet weather sampling will be needed to support this reclassification.

In addition to the point sources identified and evaluated from the shoreline survey, there are five marinas in Wickford Harbor and three identified in the Dutch Harbor area within the West Passage growing area. Each marina along with the associated mooring fields were analyzed for boater discharge impacts. Wickford Harbor has a prohibited zone encompassing the marina proper and a seasonal closure encompassing the mooring fields. Dutch Harbor is a seasonal marina and a seasonal closure encompasses the three marinas and their associated mooring fields. Calculations verifying sufficient dilution waters using the FDA approved VIMS model (10% occupancy, 50% discharge) are available to review in the program's permanent files. See Marina Calculations for each facility. Additionally all RI coastal waters are designated as no discharge zones, and the RIDEM enforces compliance with these restrictions through a decal system for MSDs and by providing ample pump out facilities for all boaters. There are two fixed pumpout facilities within Wickford Harbor and one fixed and one mobile boat pumpout in Dutch Harbor.

No changes to the classification of the West Passage growing area are recommended. A complete shoreline survey is scheduled for 2016.

## HIGHLIGHTS

- \* Sampled 6x in 2015
- \* Statistics represent combined wet and dry weather data >01/01/11 (N = 30)
- \* Statistics represent combined wet and dry weather, open season data >1/01/12 (N=15) for conditional/seasonally approved Sta.'s 1 and 8
- \* All approved and conditional/seasonally approved stations in compliance and conformance
- \* MTEC = 21 (90% = 36 cfu/100ml)
- \* Data run 1/19/16

## COMMENTARY

The West Passage (Growing Area 7) was sampled seven times in 2015, complying with the minimum SRS monitoring requirement for approved areas. Sample results are representative of wet and dry weather conditions. The statistical evaluation for the West Passage incorporates the most recent 30 samples collected for the area, the minimum number required for analysis according to SRS guidelines.

Results of the statistical evaluation demonstrate that all approved and conditional/seasonally approved stations are in program compliance. The area is properly classified.

## RECOMMENDATIONS

- \* No action recommended based on ambient monitoring results

### *RIDEM SHELLFISH GROWING AREA MONITORING RESULTS*

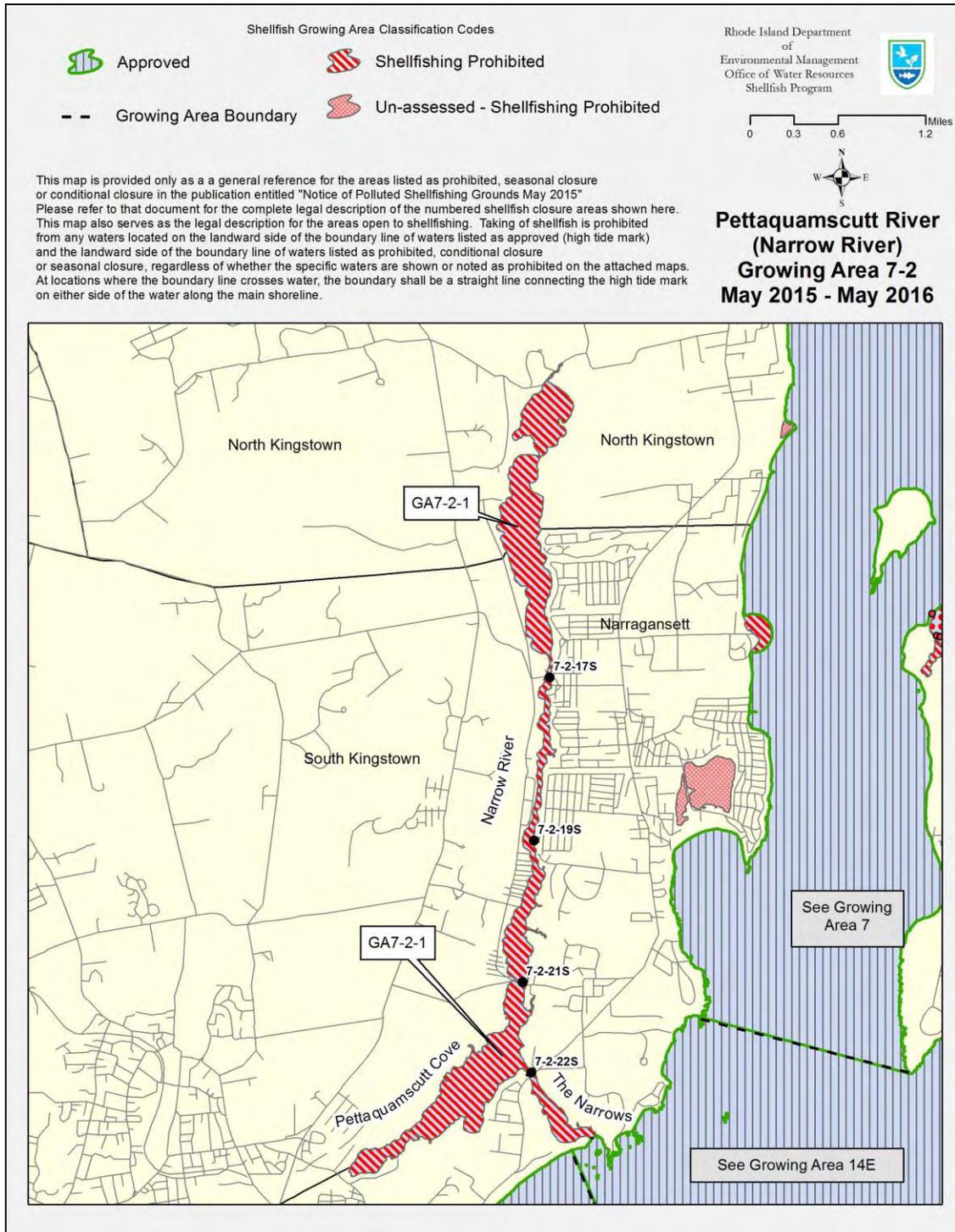
<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>	
			<i>MEAN</i>	<i>90TH PERC (&lt;36)</i>
GA7-1	SA	30	5.0	27.1
GA7-2	P	30	2.1	2.6
GA7-3	A	30	2.2	3.4
GA7-4	A	30	3.2	9.0
GA7-5	A	30	2.1	2.6
GA7-6	A	30	2.3	4.9
GA7-7	A	30	2.2	3.4
GA7-8	SA	30	2.5	5.1
GA7-9	P	30	2.0	2.0
GA7-10	A	30	2.0	2.0
GA7-11	A	29	2.1	2.9
GA7-12	A	29	2.5	7.8

## Most recent seasonal wet/dry combined open season data

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>	
			<i>MEAN</i>	<i>%&gt;CRITICAL&lt;31</i>
GA7-1 (OPEN)	SA	15	2.8	0.00
GA7-8 (OPEN)	SA	15	2.3	0.00

## Growing Area 7-2 Narrow (Pettaquamscutt) River 2015 Annual Update

All waters of the Narrow River, Growing Area 7-2 are currently prohibited to shellfishing. The area was sampled twice in 2015. The following map shows the sampling station locations and the current classification of this growing area. Results from the statistical evaluation of all stations exceed the shellfish standard during both wet and dry conditions, therefore the area is properly classified as prohibited as detailed in the following statistical evaluation summary.



## **HIGHLIGHTS**

- \* Sampled 2x in 2015
- \* Statistics represent wet and dry weather data >06/01/11 (N = 15) (W=8; D=7)
- \* Dry weather statistics data > 9/1/08 (N = 15)
- \* All stations out of compliance under all conditions
- \* Area is prohibited
- \* mTEC = 10 for wet and dry data
- \* mTEC = 5 for dry only data
- \* *Data run 1/22/16*

## **COMMENTARY**

The Pettaquamscutt River (Growing Area 7-2) was sampled two times in 2015. Since the area is classified as prohibited, there is no minimum sampling requirement. The area has been closed to shellfish harvesting for direct human consumption since 1985 due to unpredictable and elevated fecal coliform levels. This area is unique from other growing areas because it is sampled exclusively from shore-accessed stations, mostly from bridges spanning the River. The statistical evaluation for the Pettaquamscutt River incorporates the most recent 15 samples. No NSSP compliance guidelines exist for statistically evaluating prohibited areas. The TMDL for the area was completed in 2002. The recommendations call for additional monitoring to be conducted by NRPA volunteers through the URI Watershed Watch program.

Results of the statistical evaluation demonstrate that all stations exceed shellfish harvesting criteria during combined wet and dry weather. The dry weather only data also exceeds harvesting criteria. The area is properly classified as prohibited.

## **RECOMMENDATIONS**

- \* No action recommended

# RIDEM SHELLFISH GROWING AREA MONITORING RESULTS

COMBINED WET AND DRY DATA

<i>Station Name Status</i>	<i>N</i>	<i>FECAL-GEO</i>		
		<i>MEAN</i>	<i>% &gt; CRITICAL 49 (or 31 mtec)</i>	
GA72-17S P	15	28.0	46.67	
GA72-19S P	15	43.5	60.00	
GA72-21S P	15	23.6	46.67	
GA72-22S P	15	17.5	26.67	

DRY WEATHER ONLY

<i>Station Name Status</i>	<i>N</i>	<i>FECAL-GEO</i>		
		<i>MEAN</i>	<i>% &gt; CRITICAL 49 (or 31 mtec)</i>	
GA72-17S P	15	19.9	33.33	
GA72-19S P	15	31.1	40.00	
GA72-21S P	15	10.5	20.00	
GA72-22S P	15	14.9	20.00	

Results adjusted for MPN/MTEC blended conversion

Greenwich Bay  
Growing Area 8  
2015 Annual Update

A shoreline survey of the Greenwich Bay Growing Area 8 was conducted in 2005. A total of 161 potential or actual sources were identified during this shoreline survey. Ninety of these sources had flows while the remaining 71 were not flowing at the time of the survey. Six of these sources had results greater than 2400 MPN /100 ml however they were all located in prohibited sections of the growing area and therefore do not warrant follow-up as per the standard operating procedures. A triennial update was completed in 2014. No source was identified that exceeded the 2400 MPN/100 ml criteria for follow-up sampling but several sources that had previously elevated counts were re-sampled to ensure they are not currently impacting the receiving waters. All other sources that exceeded the follow-up threshold are located in prohibited areas and were not re-sampled as part of this review.

The three sources previously identified in 2014 as needing to be re-visited to ensure no dry weather impacts were re-sampled in 2015 with the following results.

Source ID	Description	2005 Results	2006 Results	2008 Results	2009 Results	2010 Results	2011 Results	2015 Results cfu/100 ml	Add. 2015 Results cfu/100 ml
2005-8-1-121	18" dia hole in seawall 171 Charlotte Rd and Collins St	1600		4300 1100 IS<3E IS<3W	230 IS 23 E IS 15 W	4300 IS 4600E IS 750W	4 IS E & W NF	5 IS 10	NS
2005-8-7-702	24" CMP	2200	11	430			43	50	NS
2005-8-7-708	wetland drainage	430	46	93			430	6100	NF <3 IS

Source 8-1-121 had a very low bacteria count and does not appear to be having any negative impact on the growing area during open conditions. Source 8-7-702 had slightly elevated bacteria counts in the more recent sampling but not at a level that would be of concern. Source 8-7-708 had elevated bacteria counts during the initial sampling which followed two rain events of 0.16" and 0.36" less than five days prior to sampling. The follow-up sampling was completed on 11-9-2015 which had an extended dry antecedent period in which no flows were observed from the source and an instream sample in front of the discharge had very low bacteria counts (<3). It would appear that this source is wet weather driven and would indicate that it is a contributing source to the bay that causes impacts during wet weather and being operated on a conditionally approved basis and closing in the event of a 0.5" rain storm.

As part of the department's goal to investigate the potential for re-opening valuable harvest areas, a survey of the Buttonwoods Cove embayment was completed in 2015. An inventory of sources from previous surveys was compiled and the entire accessible shoreline was surveyed on October 13<sup>th</sup> and 14<sup>th</sup> of 2015. The conditions at the time of the survey were four days after a rain event of 0.39" and then a smaller rain event on the 13<sup>th</sup> of 0.29". The following graphic displays the results from this sampling effort and is an indication of the variability and exceedances of water quality standards that would not support re-classification of these waters at this time. As resources allow additional surveys and sampling should be repeated to gather additional data for analysis.



## **HIGHLIGHTS**

- \* **Sampled 12X in 2015**
- \* **Statistics represent most recent dry weather data (N = 15) > 10/01/2014**
- \* **Statistics include three sample runs collected in December 2014 and 2015**
- \* **When December data blended into statistics, area is in compliance**
- \* **December only data 2000 – 2015 still out**
- \* **mTEC = 15**
- \* ***Data run 2/24/16***

## **COMMENTARY**

**Greenwich Bay (Growing Area 8) was sampled twelve times in 2015. The statistical evaluations for Greenwich Bay incorporate the most recent 15 dry weather samples collected for the area when open/approved for shellfish harvesting, which is the minimum number required by NSSP Manual of Operations guidelines for conditionally approved areas.**

**All the stations in Greenwich Bay have shown show significant elevations in both geometric means and variability criteria in the month of December prior to 2014, enough to knock many conditionally approved stations out of compliance. The most recent December 2014 and 2015 results look improved (see raw data), but many stations still exceed acceptable criteria for the month. Based on these results, we should consider keeping the December closure in effect for another season.**

**All conditionally approved stations in compliance for January through November.**

## **RECOMENDATIONS**

- \* **No action recommended**

## **RIDEM SHELLFISH GROWING AREA MONITORING RESULTS**

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>	
			<i>MEAN</i>	<i>%&gt;CRITICAL (31)</i>
GA8-1	P	13	5.7	7.7
GA8-2	P	15	5.7	13.33
GA8-3	P	15	3.1	0.00
GA8-4	CA	15	4.3	6.67
GA8-5	CA	15	4.1	0.00
GA8-6	P	15	3.7	6.67
GA8-7	P	15	4.0	0.00
GA8-8	P	15	6.6	20.00
GA8-10	P	15	16.9	33.33
GA8-12	CA	15	2.4	0.00
GA8-13	CA	15	3.2	6.67
GA8-15	CA	15	3.0	0.00
GA8-17	CA	15	2.4	0.00
GA8-18	CA	15	2.7	0.00
GA8-21	P	15	4.2	6.67
GA8-22	P	15	8.6	20.00
GA8-23	P	14	8.7	20.00
GA8-25	P	13	3.3	7.7
GA8-26	P	11	5.8	7.7
GA8-25A	CA	15	3.3	0.00

THIS DATA REPRESENTS THE MOST RECENT N = 15 DRY WEATHER DATA (10/1/14 – 12/31/15), DECEMBER INCLUSIVE TO REPRESENT WORST CASE

THIS DATA REPRESENT ALL DECEMBER ONLY DATA FROM 2000 THROUGH 2015

## ***RIDEM SHELLFISH GROWING AREA MONITORING RESULTS***

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO MEAN</i>	<i>%&gt;CRITICAL (31/49)</i>
GA8-1	P	12	9.7	8.33
GA8-2	P	13	11.0	23.08
GA8-3	P	14	15.7	14.29
GA8-4	CA	14	14.2	14.29
GA8-5	CA	14	20.9	21.43
GA8-6	P	14	25.3	21.43
GA8-7	P	14	65.9	42.86
GA8-8	P	14	91.2	71.43
GA8-10	P	13	88.5	69.23
GA8-12	CA	14	14.0	21.43
GA8-13	CA	14	23.1	35.71
GA8-15	CA	14	5.2	7.14
GA8-17	CA	14	9.4	7.14
GA8-18	CA	14	11.5	7.14
GA8-21	P	13	14.8	15.38
GA8-22	P	12	22.1	25.00
GA8-23	P	12	18.0	16.67
GA8-25	P	11	14.4	9.09
GA8-26	P	9	47.4	44.44
GA8-25A	CA	10	14.3	20.00

Shellfish Growing Area Classification Codes

-  Approved
-  Shellfishing Prohibited
-  Growing Area Boundary
-  Conditional Closure
-  Greenwich Bay Seasonal Closure

Rhode Island Department  
of  
Environmental Management  
Office of Water Resources  
Shellfish Program

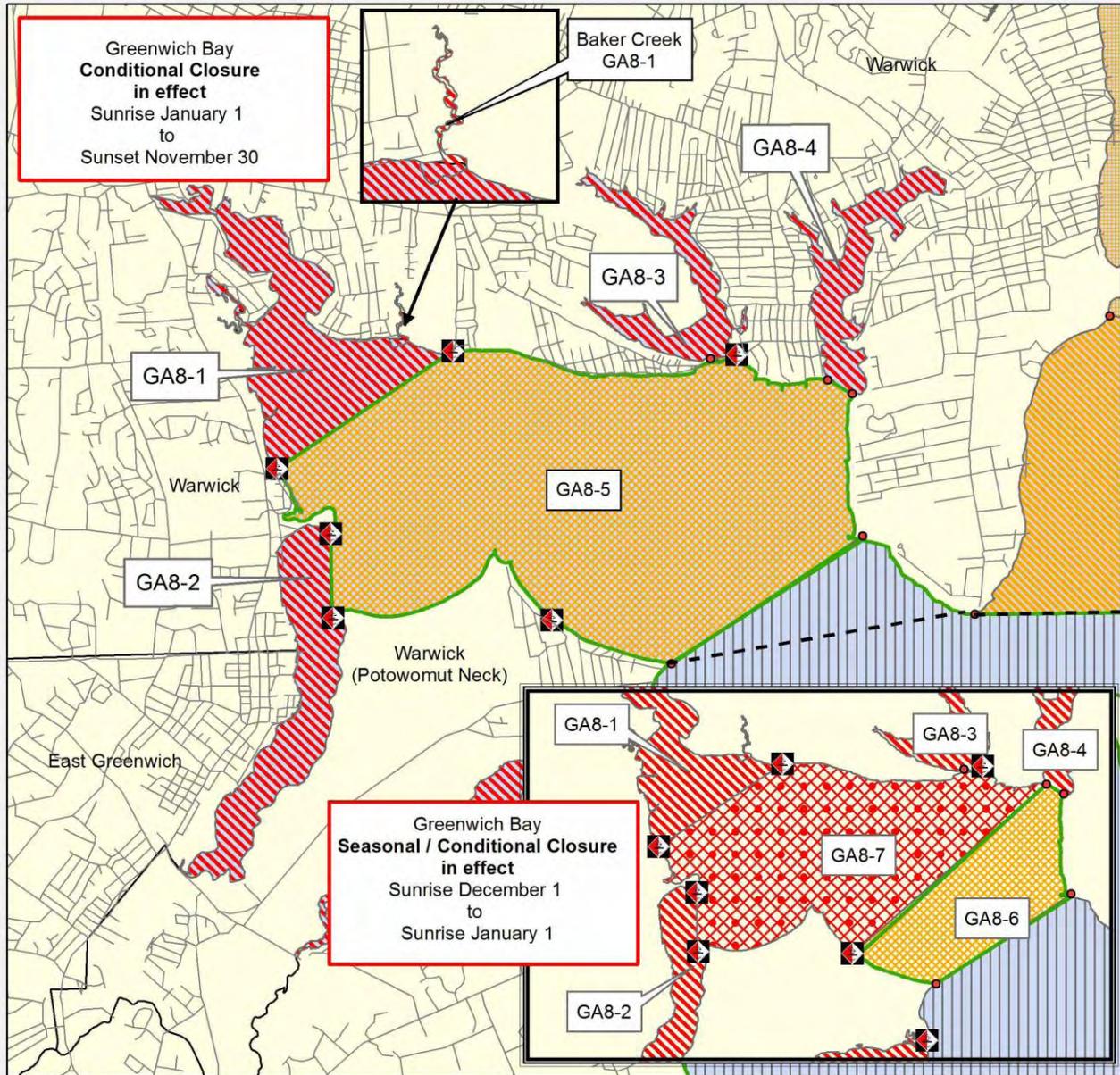


0 0.125 0.25 0.5 Miles



This map is provided only as a general reference for the areas listed as prohibited, seasonal closure or conditional closure in the publication entitled "Notice of Polluted Shellfishing Grounds May 2015". Please refer to that document for the complete legal description of the numbered shellfish closure areas shown here. This map also serves as the legal description for the areas open to shellfishing. Taking of shellfish is prohibited from any waters located on the landward side of the boundary line of waters listed as approved (high tide mark) and the landward side of the boundary line of waters listed as prohibited, conditional closure or seasonal closure, regardless of whether the specific waters are shown or noted as prohibited on the attached maps. At locations where the boundary line crosses water, the boundary shall be a straight line connecting the high tide mark on either side of the water along the main shoreline.

**Greenwich Bay  
Growing Area 8  
May 2015 - May 2016**



The next scheduled survey would be an annual update to be completed in 2016.

West Middle Bay  
Growing Area 9  
2015 Annual Update

A shoreline survey of the West Middle Bay Growing Area 9 was conducted in 2007 and a triennial update was completed in 2013. There were no sources identified for follow-up sampling as part of this annual report.

The results of the routine monitoring stations indicate that this growing area is properly classified and therefore no changes to the classification are recommended at this time.

The next required survey would therefore be a triennial update to be completed in 2016. The following are highlights and evaluations of the annual statistical results for the West Middle Bay growing area.

### **HIGHLIGHTS**

- \* **Sampled 6x in 2015**
- \* **Statistics represent combined wet and dry weather data >01/01/11 (N = 30)**
- \* **Station 13 (Upper Potowomut River), still exceeding variability criteria**
- \* **All other approved stations in compliance and conformance**
- \* **MTEC = 21 (90% = 36 cfu/100ml)**
- \* *Data run 1/25/16*

### **COMMENTARY**

The West Middle Bay (Growing Area 9) was sampled six times in 2015, complying with the minimum SRS monitoring requirement for approved areas. Sample results are representative of wet and dry weather conditions. The statistical evaluation for the West Middle Bay incorporates the most recent 30 samples collected for the area, the minimum number required for analysis according to SRS guidelines.

Station 13 was established in the Upper Potowomut River eight years ago in order to determine whether that portion of the river is suitable for approved shellfish harvesting. Sampling of this station indicated that it was out of compliance and as a result, the line was moved further out towards the approved waters. Results of the 2015 composite sampling (N = 30) Station 13 exceeds the 90<sup>th</sup> percentile variability criteria. The Upper Potowomut was closed seven years ago and should remain closed.

Results of the statistical evaluation demonstrate that all approved stations are in program compliance. The area is properly classified.

### **RECOMMENDATIONS**

- \* **Maintain closure of Upper Potowomut River**
- \* **No other action recommended based on ambient monitoring results**

# **RIDEM SHELLFISH GROWING AREA MONITORING RESULTS**

<b>Station Name</b>	<b>Status</b>	<b>N</b>	<b>FECAL-GEO MEAN</b>	<b>90TH PERC (&lt;36)</b>
GA9-1	P	30	2.3	4.7
GA9-2	A	30	2.2	3.2
GA9-3	P	29	3.7	13.4
GA9-4	A	30	2.3	3.4
GA9-5	A	30	4.4	15.2
GA9-6	A	30	2.3	3.5
GA9-7	A	30	2.2	3.4
GA9-8	A	30	2.1	2.6
GA9-9	A	30	2.1	3.0
GA9-10	A	30	2.4	4.3
GA9-11	A	30	2.0	2.0
GA9-12	A	30	2.1	2.6
GA9-13	P	30	9.0	91.3

# Growing Area 9 West Middle Bay

## Shellfish Growing Area Classification Codes

-  Approved
-  Conditional Closure
-  Upper Narragansett Bay Conditional Area - A
-  Upper Narragansett Bay Conditional Area - B
-  Growing Area Boundary
-  Seasonal Closure
-  Shellfishing Prohibited
-  Un-assessed - Shellfishing Prohibited

Rhode Island Department  
of  
Environmental Management  
Office of Water Resources  
Shellfish Program

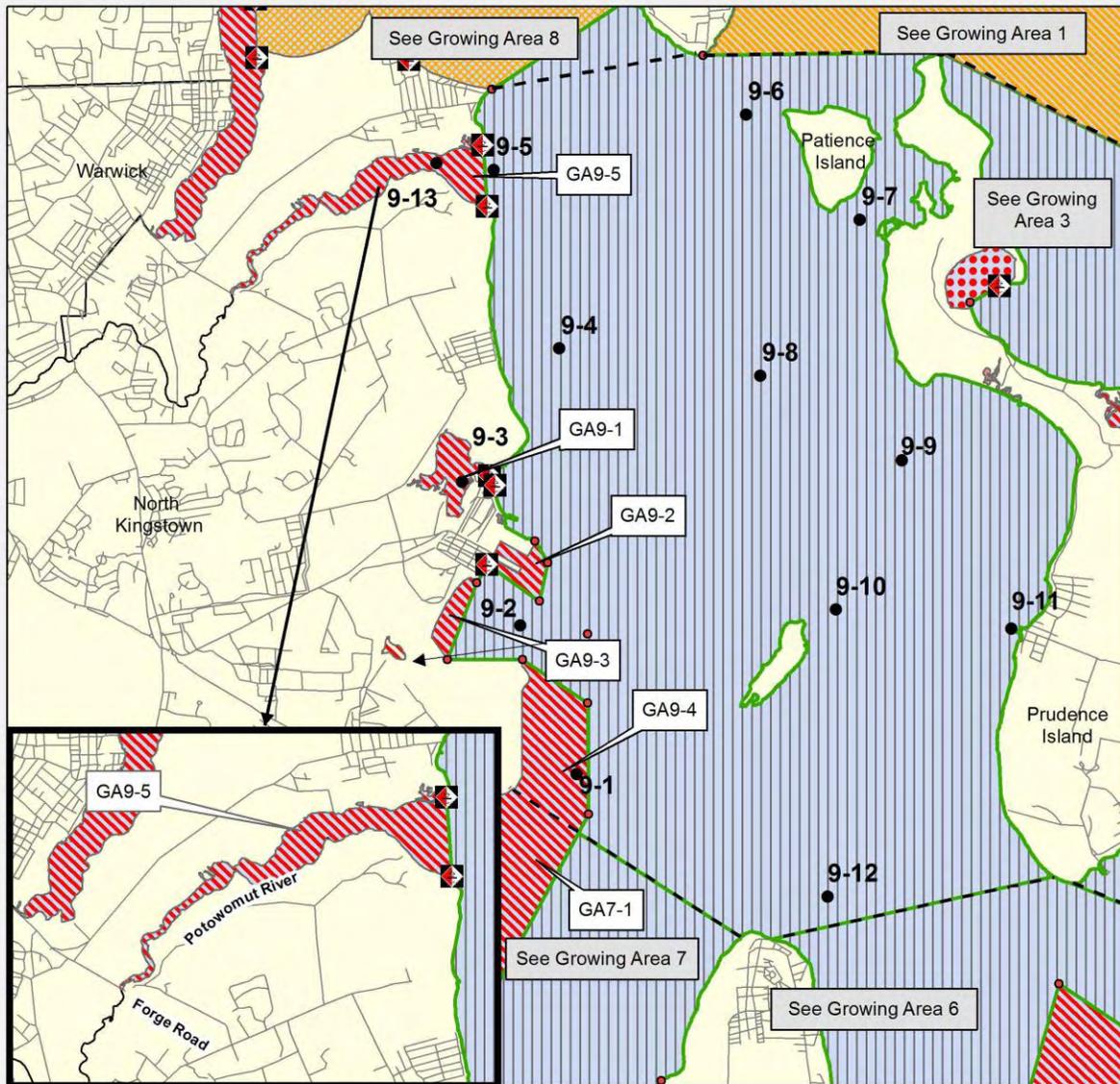


0 0.35 0.7 1.4 Miles



This map is provided only as a general reference for the areas listed as prohibited, seasonal closure or conditional closure in the publication entitled "Notice of Polluted Shellfishing Grounds May 2015". Please refer to that document for the complete legal description of the numbered shellfish closure areas shown here. This map also serves as the legal description for the areas open to shellfishing. Taking of shellfish is prohibited from any waters located on the landward side of the boundary line of waters listed as approved (high tide mark) and the landward side of the boundary line of waters listed as prohibited, conditional closure or seasonal closure, regardless of whether the specific waters are shown or noted as prohibited on the attached maps. At locations where the boundary line crosses water, the boundary shall be a straight line connecting the high tide mark on either side of the water along the main shoreline.

## West Middle Bay Growing Area 9 May 2015 - May 2016



Point Judith Pond / Potters Pond  
Growing Area 10  
2015 Annual Update

A 12 year sanitary shoreline survey of the Point Judith Pond / Potters Pond Growing Area 10 was conducted in 2011. There were a total of ninety-seven (97) actual or potential sources identified during this shoreline survey, excluding marinas. A total of forty-seven (47) were not actively flowing at the time of the shoreline survey with the remaining fifty having flows warranting sampling. All sources in which flow was observed were sampled. Only five sources in open areas identified in previous surveys exceeded the 2400 MPN threshold requiring follow-up sampling in 2012. In 2015 sources were re-sampled with results listed in the following table.

2012-10-011 is a RCP outfall located on Harbor Island adjacent to the Harbor Island Assoc. marina. There is 25' marina radius closure associated with these docks that is in effect from Memorial Day to Columbus Day. It appears that this is a wet weather source as there were no flows observed on several sampling runs. Routine monitoring station GA10-10 representing the receiving waters is located just offshore of this source and does not indicate that this source is causing a negative impact. Current year geo-means and variability 90<sup>th</sup> percentile are 3.2 cfu/100ml and 9.9 respectively. Point Judith Pond is currently closed during rainfall events exceeding 5" due to results from wet weather sampling that indicate violations of water quality criteria under these conditions.

Source 2012-10-018 is a stormdrain outfall on Great Island. It too was not flowing or was only a drip. Previous sampling did not indicate that this source was causing any negative impacts to the receiving waters. Most likely waters dripping from this tide gated outfall during dry weather are the result of flooding during periods of high tide.

Sources 10-021 and 10-022 are the tidal channels connecting Pt Judith Pond with the Galilee saltmarsh to the south of the Escape Road. Both sample results were very low indicating that this is not impacting the popular recreational shellfishing area in the pond.

Source 10-023 is a small stream which was not flowing during this year's sampling event. Source 10-024 is the storm drain discharging at the end of Carter Lane. Although the bacteria counts were slightly elevated the flow was only a trickle.

Source 2012-10-025 are two small PVC pipes buried in the hillside above the pond. For this year's sampling run both pipes were buried under grass clippings and were not flowing. These pipes do not directly discharge into the pond rather they are into the embankment approximately 15 ft above it. Currently property owners are dumping landscape debris and lawn clippings over the top of these pipes in essence, burying them and making it difficult to locate and also dispersing any flows.

Sample 10-026 is taken instream of Rye Cove with results well in compliance with the shellfish water quality standard.

Source 10-057 and 10-058 are small streams draining the cove near Jerry Cove Road and an upland wetland, again with acceptable water quality for a source.

Source ID	Description	Actual/ Potential	Direct/ Indirect	2011 Results Fc/100ml	2012 Results Fc/100ml	2013 Results cfu/100ml	2014 Results cfu/100ml	2015 Results cfu/100ml
10-011	RCP outfall Harbor Island at E. Cedar	A	D	4300 NF	NF Wet weather source	NS	NF	NS
10-018	Stormdrain outfall Great Island Starfish Dr	A	D	43000 430 43 IS	NF (drip)	NS	230	NS
10-022E	East outlet of Galilee Marsh	A	D	75	NS	NS	NS	12
10-021W	West outlet of Galilee Marsh	A	D	430	NS	NS	NS	15
10-023	Stream crossing Cove Farm Rd	P	D	1100	NS	NS	NS	NF
10-024	RCP flared end outfall at Carver Lane	A	D	430	NS	NS	232	1830 Trickle
10-025	(2) 2" PVC pipes at Carver Lane	A	D	24000 93 4300 IS	1500 Trickle, only 1 pipe flowing	NF	NF	NF
10-026(A)	In stream sample Rye Cove	In stream	In stream	NS	930 1500 93	NS	NS	7
10-057	Stream draining cove near Jerry Cove Rd	A	D	1100	NS	NS	NS	22 5 IS 16 IS
10-058	Small stream draining upland wetland	A	D	750	NS	NS	NS	208
10-062	36" dia. Flared end outfall at Pond View Ave	A	I/D	46000 43 9 IS	4600 Can't measure fades out prior to tide line  240 IS in front of outfall	113	615	21 IS
10-200	Culvert crossing Kenyon Farm Rd	A	I/D	4600 93	750 Can't measure from roadway, drains into small tidal creek into cove.	250	250	NS

IS – In stream sample NS – Not sampled NF – No Flow Source

Source 2012-10-062 is a flared end outfall at the extension of Pond View Ave. Again this appears to be a wet weather source or may be intercepting small amounts of groundwater. Previous sampling in 2011 indicated elevated bacteria counts, but follow-up sampling results were greatly reduced. In 2012 this source had slightly elevated bacteria counts with in-stream results of 240 fc/100ml. An attempt was made to re-sample this source but there were no flows at the time of inspection. The source opens to daylight approximately 30 feet above the high tide line and flows were not reaching the pond but rather were dispersing into the rock sea wall and embankment. This source was re-inspected on October 2, 2012 and the source had no flows. An extensive study and sampling analysis is included in the 2011 shoreline survey report. This source was re-sampled as part of the 2013 and 2014 annual update with reduced bacteria results. In 2015 the source could not be located and instream sampling directly in front of the outfall had results of 21 cfu/100ml.

Source 10-200 results were from the culvert under Kenyon Farm Rd that drains a small upland pond. The culvert is approximately 270 feet from the confluence with the edge of Pt Judith Pond. Access to this location is limited across private property and therefore sampled at the road culvert. Upland of the source pond is a large wooded wetland with no anthropogenic sources. Results from sampling in 2013 and 2014 indicated reduced bacteria levels. In 2015 heavy vegetation including large amounts of poison ivy and a minimal flow from the pond made sampling this source impossible. Based on historic sampling it would appear that this source is not having a negative impact on the receiving waters.

Pt Judith Pond is home to a large sampling of commercial and residential marinas. Closure areas have been established historically for all the large commercial marinas in the northern end of the pond along with in the southern channels. Additional seasonal closures surrounding the smaller “marinas” were established in 2011 to be protective of those areas while in use by boaters. All waters of Pt. Judith Pond and Potters Pond are classified as no discharge and boaters must comply with the MSD inspection program.

The following is the current classification map with the locations of routine monitoring stations for this growing area.

Shellfish Growing Area Classification Codes

- - Growing Area Boundary
-  Approved
-  Shellfishing Prohibited
-  Un-assessed - Shellfishing Prohibited
-  Marina Facility Seasonal Closure

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Office of Water Resources  
Shellfish Program

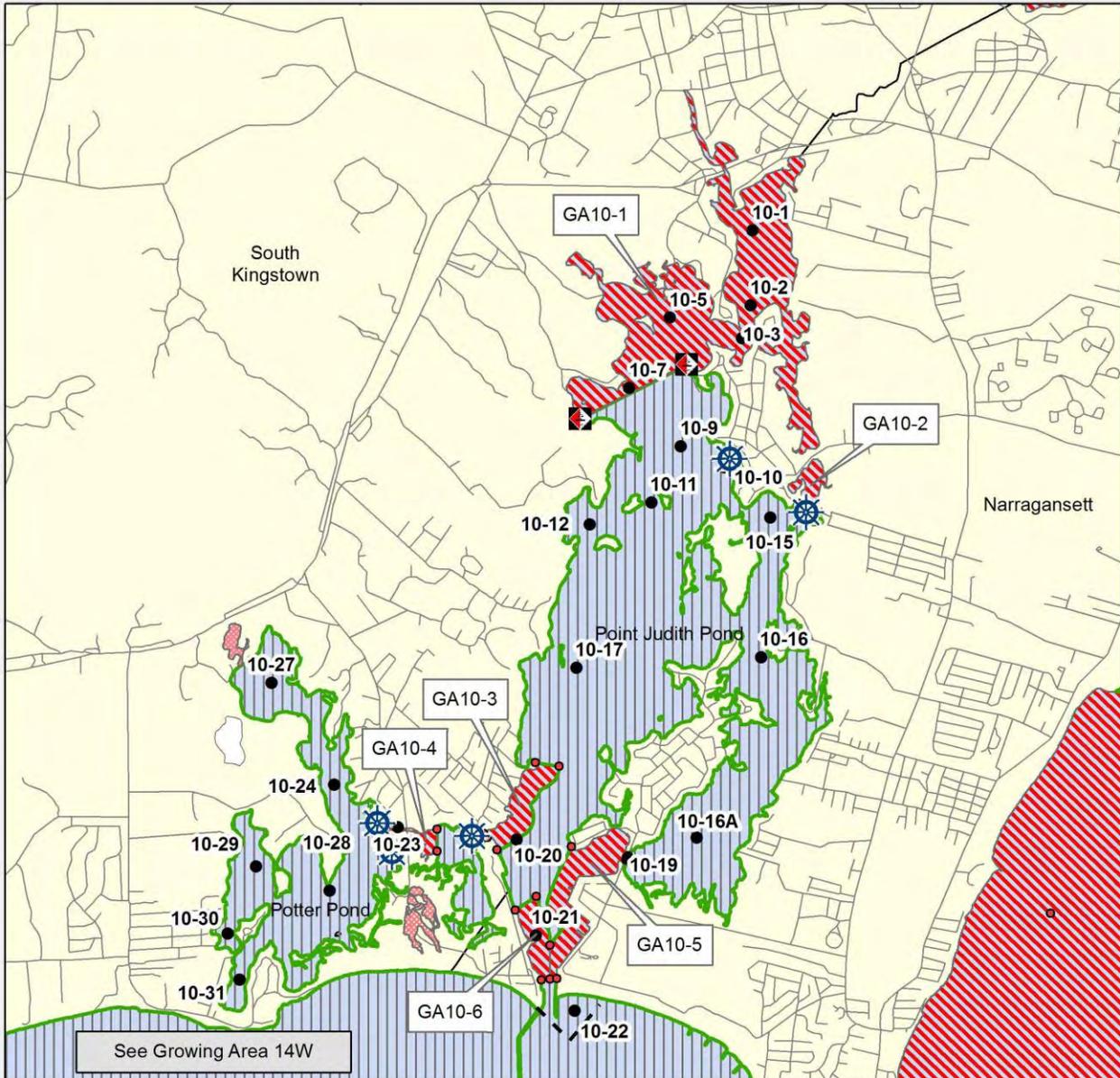


0 0.25 0.5 1 Miles



**Point Judith and  
Potter Ponds  
Growing Area 10  
May 2015 - May 2016**

This map is provided only as a general reference for the areas listed as prohibited, seasonal closure or conditional closure in the publication entitled "Notice of Polluted Shellfishing Grounds May 2015". Please refer to that document for the complete legal description of the numbered shellfish closure areas shown here. This map also serves as the legal description for the areas open to shellfishing. Taking of shellfish is prohibited from any waters located on the landward side of the boundary line of waters listed as approved (high tide mark) and the landward side of the boundary line of waters listed as prohibited, conditional closure or seasonal closure, regardless of whether the specific waters are shown or noted as prohibited on the attached maps. At locations where the boundary line crosses water, the boundary shall be a straight line connecting the high tide mark on either side of the water along the main shoreline.



The results from the routine monitoring stations indicate that this growing area is properly classified and therefore no changes to the classification are recommended at this time. The following are the highlights and annual statistical evaluation of the routine monitoring results.

## HIGHLIGHTS

- \* Sampled 6x in 2015
- \* Statistics represent combined wet and dry weather data >01/01/11(N = 30)
- \* All approved stations in compliance and conformance
- \* MTEC = 22 (90% = 35 cfu/100ml)
- \* *Data run 1/27/16*

## COMMENTARY

Pt. Judith Pond and Potter Pond (Growing Area 10) were sampled six times in 2015, complying with the minimum SRS monitoring requirement for approved areas. Sample results are representative of wet and dry weather conditions. The statistical evaluation for Pt. Judith Pond and Potter Pond incorporates the most recent 30 samples collected for the area, the minimum number required for analysis according to SRS guidelines.

Results of the statistical evaluation demonstrate that all approved stations are in program compliance. A review of the shellfish data in past years had demonstrated that Station 7 and the stations located north of it in the Upper Pond (presently classified as prohibited) are adversely influenced by wet weather. A TMDL study of the area was completed in June 2008.

All approved stations are in program compliance.

## RECOMMENDATIONS

- \* No other action recommended based on ambient monitoring results

## **RIDEM SHELLFISH GROWING AREA MONITORING RESULTS**

<b>Station Name</b>	<b>Status</b>	<b>N</b>	<b>FECAL-GEO</b>	
			<b>MEAN</b>	<b>90TH PERC (&lt;35)</b>
GA10-1	P	30	37.9	326.7
GA10-2	P	30	27.2	228.7
GA10-3	P	30	16.1	121.7
GA10-5	P	30	8.7	51.0
GA10-7	P	30	6.0	31.2
GA10-9	A	30	4.9	23.5
GA10-10	A	30	3.2	9.9
GA10-11	A	30	3.8	14.5
GA10-12	A	30	3.5	9.6
GA10-15	A	30	3.7	11.2
GA10-16	A	29	2.7	6.5
GA10-16A	A	30	6.2	29.6
GA10-17	A	30	3.3	9.1
GA10-19	P	30	7.2	36.7
GA10-20	P	30	3.9	12.1
GA10-21	P	30	3.9	12.6
GA10-22	A	29	2.7	5.3
GA10-23	P	30	3.2	7.9
GA10-24	A	30	5.2	19.5
GA10-27	A	30	2.8	5.5
GA10-28	A	30	2.5	5.0
GA10-29	A	30	2.7	5.6
GA10-30	A	30	3.7	13.4
GA10-31	A	30	2.7	5.7

An annual update is scheduled for 2016.

**Ninigret Pond and Green Hill Pond  
Growing Area 11 NG  
Triennial Re-Evaluation  
For Calendar Year 2015**



RI Seagrass South Shore Project

**Rhode Island  
Department of Environmental Management  
Office of Water Resources  
Shellfish Program**

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## **1.0 Introduction**

A triennial re-evaluation shoreline survey of the Ninigret Pond and Green Hill Pond shellfish growing area was conducted in order to comply with National Shellfish Sanitation Program (NSSP) requirements for shellfish growing area classification. The primary objective of this shoreline survey is to identify and characterize sources of pollution affecting the area and re-evaluate point and non-point sources previously identified during prior surveys.

The Ninigret Pond and Green Hill Pond - Growing Area 11NG is presently divided into two sections, shellfishing prohibited and open. The entire Green Hill Pond and the easterly section of Ninigret Pond adjacent to Green Hill Pond are presently prohibited to shellfishing due to elevated bacteria counts in routine monitoring station samples. There are twenty-three routine monitoring stations that represent the growing area.

A shoreline survey of this growing area was conducted in the spring of 2002. A total of seven actual or potential sources were identified during the shoreline survey. All seven sources were sampled in 2002, only two of which had bacteria counts that exceeded the 240 MPN benchmark warranting follow-up sampling. The two sources identified as #1, Factory Brook and #4 an RCP outfall into Allen Cove both discharge into the prohibited area of Green Hill Pond.

This shoreline survey was conducted as a triennial re-evaluation of this growing area. As such the survey involved review of previous shoreline surveys, bacteriological sampling of actual pollution sources noted in previous surveys that were found to be equal to or greater than 240 fc/100ml and identification of any new sources of pollution if applicable. Since none of the sources identified in the 2002 survey that exceeded the 240 MPN benchmark were located in any “open for shellfishing waters”, no follow-up sampling was warranted for this area for this triennial update.

## **2.0 Description of Growing Area**

Ninigret and Green Hill Ponds are located along the southern shoreline of Rhode Island in the towns of South Kingstown and Charlestown. These two ponds are in the center of the Salt Pond Region, which consists of a series of shallow coastal lagoons separated from the ocean by barrier beaches.

Green Hill Pond is approximately 430 acres in size with an average depth of 2.5’ and a tidal range of only 1.5” (RIGIS, RI Seagrant). Ninigret Pond encompasses an area of approximately 1666 acres with an average depth of 4.3’ and a tidal range of 5.4” (RIGIS, RI Seagrant).

Green Hill Pond lies to the east of Ninigret Pond with a physical connection between the two that consists of a narrow channel under Charlestown Beach Road. Ninigret Pond has a constructed narrow breachway that connects to the ocean and provides the tidal inputs for both Ninigret and Green Hill Ponds.

The Charlestown, South Kingston towns of Rhode Island are popular summer destinations for vacationers and seasonal residents. More recently, the favorable living conditions have encouraged transformation of summer cottages to year round residences and a significant increase in the number of new residences built in these coastal communities. There are no public sewers available, and all residences rely upon On-site Wastewater Treatment Systems (OWTSs) for treatment of wastewater. There has been a heightened awareness of the impacts of densely populated areas that have numerous outdated and poorly functioning septic systems that lie adjacent or in the watershed of these two ponds. The Town of Charlestown has completed an on-site wastewater management plan addressing new construction and the proper maintenance of septic systems

especially in sensitive resource areas such as Ninigret Pond. The Town of South Kingstown has also adopted a wastewater management plan that establishes special requirements for septic systems sited in the vicinity of waterbodies

The Town of Charlestown has adopted minimum standards for onsite wastewater treatments systems (OWTS) pursuant to RIDEM's new rules adopted January 2008. In summary cesspools are not an approved method of wastewater disposal and all existing cesspools are to be considered substandard and removed within approximately five years. The town has been able to remove all the cesspools within the Ninigret and Green Hill Pond watershed (Personnel communication March, 2016). Additionally, in the Salt Pond (Green Hill and Ninigret Ponds) critical resource area nitrogen reducing technology shall be required, and additional horizontal and vertical setbacks have been established.

The Town of South Kingstown is offering a low interest loan program for the repair or replacement of onsite wastewater systems and cesspools. This program is administered by the Rhode Island Housing and Mortgage Finance Corporation in partnership with the Rhode Island Clean Water Finance Agency and the State Department of Environmental Management. The program goal is to safeguard public health and protect and improve ground and surface water resources by ensuring the proper functioning and maintenance of all septic systems in South Kingstown. Although presently there is no one person assigned to onsite waste water management it is fair to say, however, that there are very few remaining cesspools in the South Kingstown portion of the watershed (Personnel communication March, 2016).

Freshwater inputs to the pond consist of; groundwater, several freshwater streams and direct precipitation and associated stormwater runoff. Teal Brook and Factory Brook both enter the prohibited area of Green Hill Pond in the upper northeast reach. Documented exceedances of bacterial water quality standards are evidenced by the placing of these two water bodies on the State's 303(d) list of impaired waters. RIDEM Office of Water Resources has produced a TMDL (Total Maximum Daily Load) that has been approved by EPA in early 2006. This report was developed to address the bacteriological impairments to these two freshwater streams and the downstream shellfishing waters of Green Hill and Ninigret Ponds. As stated in the TMDL document a small number of pipes, or channelized conveyances were identified as potential or actual pollution sources to both the ponds themselves and to the freshwater streams flowing into the growing area. Although the report also identifies failing septic systems as a source of pollution, the majority of the sources that cause these water quality impairments are from indiscreet, non-point sources that reach the ponds either by groundwater or from stormwater runoff.

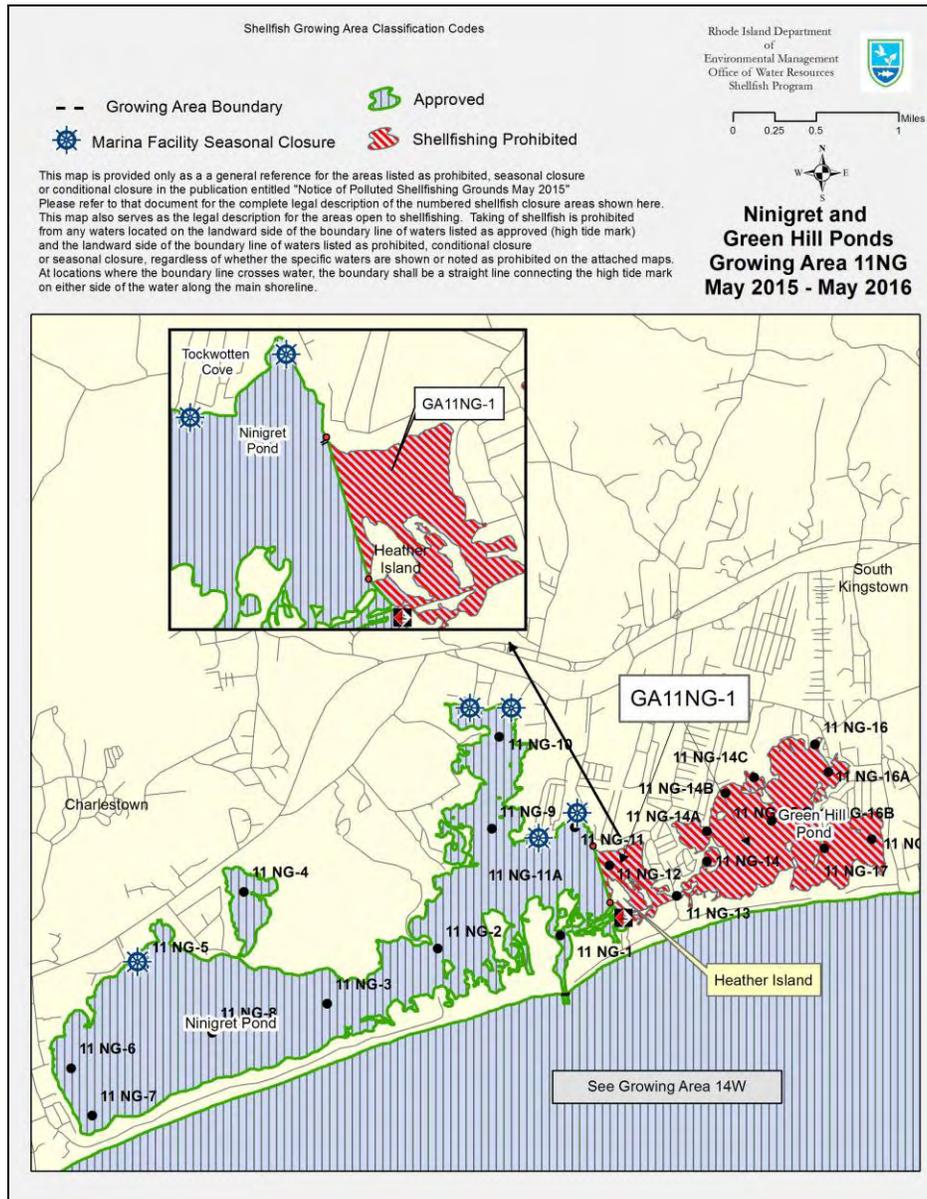
In addition to inputs from septic systems and freshwater inputs, poor flushing due to the restricted channel between the two ponds limits the exchange of pond water with clean seawater, allowing pollutants to accumulate in Green Hill Pond whereas Ninigret Pond's breachway allows for a larger exchange between the pond and the waters of Block Island sound.

Figure 2-1 is a map of the growing area with the closed area of Green Hill and Ninigret Ponds delineated, and the locations of the routine monitoring stations.

### **3.0 Pollution Source Surveys**

Lucinda M. Hannus, Sr. Environmental Scientist for the Division of Water Resources conducted the review of previous surveys for this triennial update. No sampling was completed in 2015 as part of this triennial reevaluation due to the fact that previous sampling of pollution sources resulted in no samples exceeding the 240 MPN benchmark or the sources were located in prohibited areas as established in the shellfish program's standard operating procedures.

**Figure 3-1 Green Hill and Ninigret Ponds**



The two major sources identified in the Office of Water Resource’s TMDL report; Teal Brook and Factory Pond Brook discharge into the prohibited portion of Green Hill Pond and therefore did not warrant follow-up sampling for this triennial review.

**4.0 Mooring Fields and Marinas**

There are eleven recreational boating facilities, marinas or dockage areas located in Ninigret and Green Hill Ponds. Two are located in the prohibited Green Hill Pond and four others are located within the prohibited areas of Ninigret Pond. The remaining five located in approved waters are listed in the following table.

**Table 4-1 Ninigret Pond Marinas**

<b>Marina Facility Name (As Currently Known)</b>	<b>Number of Boats</b>	<b>Town</b>	<b>Latitude</b>	<b>Longitude</b>
Lavins	70	Charlestown	41° 21.51'	-71° 41.31'
Ocean House Marina	95	Charlestown	41° 22.85'	-71° 38.70'
Fort Neck Association	25 (est.)	Charlestown	41° 22.85'	-71° 38.99'
Tockwotten Cove Assn	25 (est.)	Charlestown	41° 22.30'	-71° 38.24'
Pond Shore	15 (est.)	Charlestown	41° 22.17'	-71° 38.51'

Due to the nature of the marinas and the size and type, small day fishing and recreational boats that dock at these marinas the sanitary shoreline survey does not recommend any change in the classification of the marina area, however in 2010 the shellfish program established a Seasonal Marina Closure area described as that area within 25 feet of any in water structure for docking vessels. These five are considered to be sufficient in size and activity to warrant a seasonal closure. Ocean House operates a dock side marine pump out facility.

### **5.0 Wastewater Treatment Facilities (WWTF)**

There are no wastewater treatment facilities (WWTF), or any permitted RI Pollution Discharge Elimination (RIPDES) discharges that discharge to either pond.

### **6.0 Water Quality Studies**

The Shellfish Growing Area Monitoring program is part of the state of Rhode Island's agreement with the United States Food and Drug Administration's National Shellfish Sanitation Program (NSSP). The purpose of this program is to maintain national health standards by regulating the interstate shellfish industry. As part of this agreement, the state of Rhode Island is required to conduct continuous bacteriological monitoring of the shellfish harvesting waters of the state in order to maintain certification of these waters for shellfish harvesting for direct human consumption.

Growing Area 11NG is an approved area, and is monitored on a systematically random sampling regime. Sampling runs are conducted six times per year typically more often in the spring, summer and fall. Harsher weather and ice conditions would prevent access to many of the sampling stations in the winter. Water samples are collected at twenty-three (24) monitoring stations throughout the growing area (Figure 2-1). Ten stations are in Green Hill Pond, one in the channel connecting the two ponds and the remaining thirteen are in Ninigret Pond.

All samples are collected at a depth of 1-2 feet below the water's surface using 4-ounce nalgene bottles. The samples are then stored in a portable cooler at a temperature of approximately 4° Celsius. Upon completion of the monitoring run, samples are transported to the RIDOH laboratories in Providence for analysis. The membrane filtration using mTEC method as described in Standard Methods for the Examination of Water and Wastewater is used to analyze the samples. The data is compiled and reviewed according to NSSP requirements stating that at least the most recent 30 data sets be used. Table 6-1 demonstrates the areas ability to conform to NSSP statistical criteria for all approved stations as reported January 26, 2016.

**Table 6-1 Statistical Analysis of Routine Monitoring Results**

***RIDEM SHELLFISH GROWING AREA MONITORING RESULTS***

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>	
			<i>MEAN</i>	<i>90TH PERC (&lt;35)</i>
GA11NG-1	A	30	2.6	5.0
GA11NG-2	A	30	2.8	7.2
GA11NG-3	A	30	2.7	6.7
GA11NG-4	A	30	4.9	23.2
GA11NG-5	A	30	2.6	5.9
GA11NG-6	A	30	2.9	7.1
GA11NG-7	A	30	2.8	7.7
GA11NG-8	A	30	2.6	5.1
GA11NG-9	A	31	4.5	16.6
GA11NG-10	A	31	4.2	15.6
GA11NG-11	A	31	4.8	22.7
GA11NG-12	P	30	7.5	45.5
GA11NG-13	P	30	8.0	47.0
GA11NG-14	P	29	11.6	131.0
GA11NG-14A	P	29	8.2	44.4
GA11NG-14B	P	29	6.4	50.8
GA11NG-15	P	29	5.6	34.3
GA11NG-16	P	29	11.4	113.0
GA11NG-16A	P	29	13.1	116.2
GA11NG-16B	P	29	7.7	45.9
GA11NG-17	P	29	6.9	51.0
GA11NG-18	P	28	4.4	19.7
GA11NG-14C	P	29	24.0	230.5

## **GROWING AREA 11 - NINIGRET POND AND GREEN HILL POND**

### **HIGHLIGHTS**

- \* **Sampled 6x in 2015**
- \* **Statistics represent combined wet and dry weather data >01/01/11 (N = 30)**
- \* **All approved stations in compliance and conformance**
- \* **MTEC = 22 (90% = 35 cfu/100ml)**
- \* ***Data run 1/26/16***

### **COMMENTARY**

**Ninigret Pond and Green Hill Pond (Growing Area 11NG) were sampled six times in 2015 (Growing Area 11NG), complying with the minimum SRS monitoring requirement for approved areas. Sample results are representative of wet and dry weather conditions. The statistical evaluation for Ninigret Pond and Green Hill Pond incorporates the most recent 30 samples collected for the area, the minimum number required for analysis according to SRS guidelines.**

**The TMDL for Green Hill Pond and the eastern portion of Ninigret Pond was approved in February 2006. All approved stations are in program compliance. The area is properly classified.**

### **RECOMMENDATIONS**

- \* **No action recommended based on ambient monitoring results**

## **7.0 Conclusions and Recommendations**

The triennial update did not include follow-up sampling of previously identified sources due to relatively low bacteria counts in the results from previous sampling, or the elevated samples were located in prohibited areas.

Due to the insignificant amount and impact of the sources identified in previous surveys, or their location in prohibited waters and the water quality statistical evaluation of the growing area no changes in growing area classification are recommended at this time.

The results of this review, combined with previous water quality statistical evaluations of the routine monitoring results, indicate that the survey area conforms to all requirements set forth by the NSSP and is appropriately classified. No changes for reclassification are recommended at this time.

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**Quonochontaug and Winnapaug Pond  
Growing Area 11 QW  
Triennial Re-Evaluation  
Calendar Year 2015**



Google Earth

**Rhode Island  
Department of Environmental Management  
Office of Water Resources  
Shellfish Program**



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## **1.0 Introduction**

A triennial re-evaluation shoreline survey of the Quonochontaug Pond and Winnapaug Pond shellfish growing area was conducted in order to comply with National Shellfish Sanitation Program (NSSP) requirements for shellfish growing area classification. The primary objective of this shoreline survey is to identify and characterize sources of pollution affecting the area and re-evaluate point and non-point sources previously identified during prior surveys.

The Quonochontaug Pond and Winnapaug Pond - Growing Area 11QW is presently entirely open to shellfishing except for a small tidal pond to the northeast of the Weekapaug Breachway (Prohibited area GA11QW-1). There are 17 routine monitoring stations located throughout the growing area, nine in Winnapaug Pond and eight in Quonochontaug Pond.

A shoreline survey of this growing area was conducted in the summer of 2012. There were a total of twenty-six (26) actual or potential sources, seventeen in Quonochontaug Pond and nine in Winnapaug Pond identified during this shoreline survey, excluding marinas. All sources with flows were sampled in 2012. Three sources identified in that survey and one source previously identified exceeded the 240 MPN/100 ml threshold.

## **2.0 Description of Growing Area**

Quonochontaug Pond and Winnapaug Pond are included in Growing Area 11QW, which are part of the series of coastal ponds located in the towns of Charlestown and Westerly. These are productive marine embayments separated from the ocean by barrier beaches.

Winnapaug is the most westerly pond in the series and Quonochontaug lies just to the east of Winnapaug. Both ponds have a constructed breachway providing tidal exchange with the ocean. There is no surface connection between the two ponds. Quonochontaug Pond has a surface area of approximately 770 acres and an average depth of approximately 5.9 feet whereas Winnapaug has a surface area of 468 acres and an average depth of 4.9 feet.

## **3.0 Pollution Source Surveys**

Lucinda M. Hannus, Sr. Environmental Scientist for the Division of Water Resources conducted the review of previous surveys for this triennial update.

Table 3.1 exhibits the results from sampling conducted of the sources identified in the 2012 shoreline survey review as potentially problematic sources. Figure 3.2 is a map of the two ponds indicating the locations of these identified sources and their relationship to the area's routine monitoring stations.

**Table 3-1 Pollution Source Sampling Results**

Source ID	Description	Previous Results fc/100ml	2005 Results fc/100ml	2006 Results fc/100ml	2007 Results fc/100ml	2008 Results fc/100ml	2009 Results fc/100ml	2010 Results fc/100ml	2011 Results fc/100ml	2012 Results cfu/100ml
Q5	Outlet of tidal stream west side of cove	930			930	43	23	NS	43	0
Q6	Stream at end of ROW Warren Road	2400	4600	43	NS	23	230	240	43	460
Q9	Stream at culvert crossing Haversham Road	460	240	430	NS	23			23	132
W11A	Culvert at Weekapaug Breachway	2400	11000	240	NS	240			23	60
W40	Stream/swale at detention pond									3400 5400
W41	Detention pond outfall									333 5700 238

No sources were resampled in 2015 as part of this triennial update but will be re-sampled in 2016. Source W40 is a small stream that originates from a swale that is adjacent to a stormwater detention basin opposite Misquamicut State Beach. Source W41 is the outfall from this detention basin. Results were 3400 CFUs/100ml in 2012. This source was reinvestigated in 2013. At numerous times the basin was inspected and cleanup work had not been completed. It is still unknown what the status of this basin and drainage system is.

A new in pond station 11QW-36 has been established just off shore of these outfalls and has been sampled 21 times since its establishment as a routine monitoring station. The geo-mean for these samples is 2.3 and the 90<sup>th</sup> % is 3.7 with no samples greater than 4 cfu/100ml. The new station located offshore of the discharge will continue to be monitored and wet weather sampling of the basin will also begin once confirmation is received that it is back to full operational condition per their water quality certificate.

Figure 3-1 Sources to Growing Area 11QW - Quonochontaug Pond



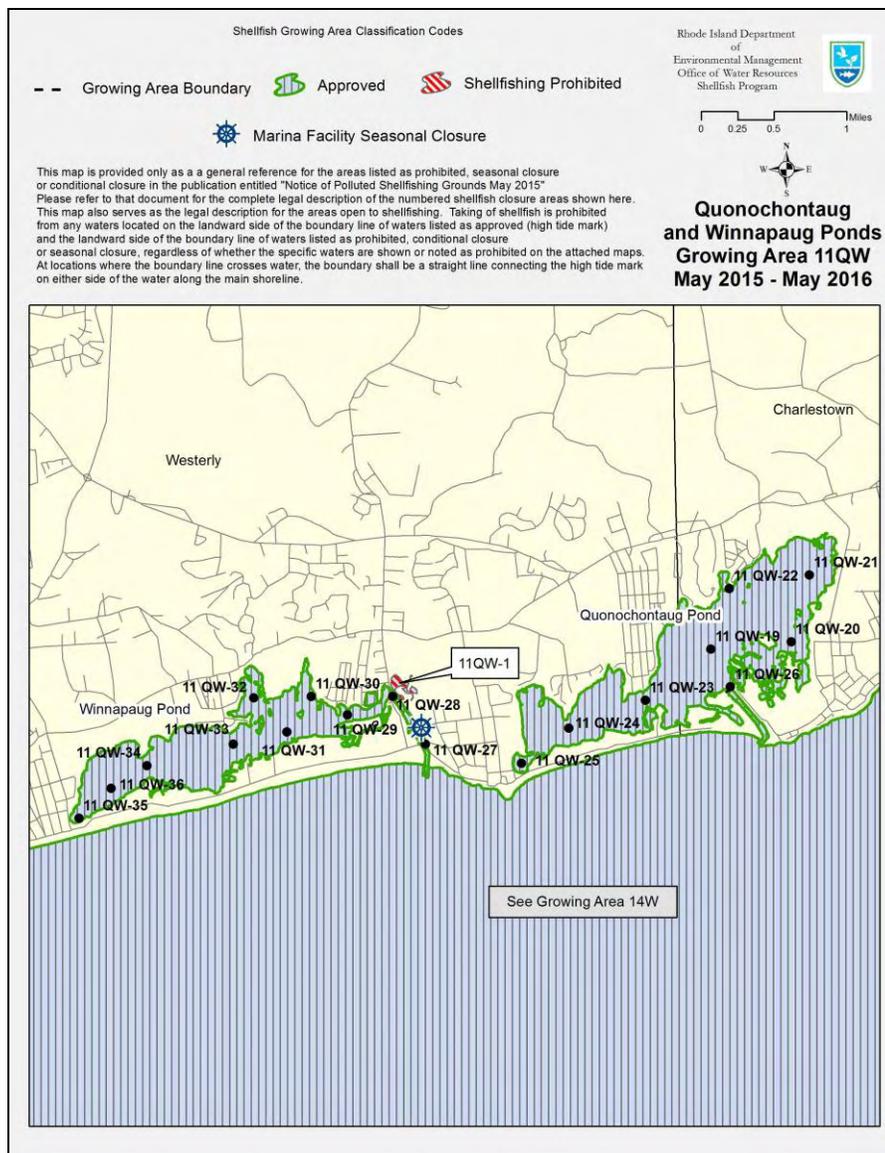
Figure 3-2 Sources to Growing Area 11QW – Winnapaug Pond



## 4.0 Mooring Fields and Marinas

Winnapaug Pond has one unnamed marina operated by the Weekapaug Fire District and located along Weekapaug Road in the breachway. There are approximately thirty, twenty-foot long docks along the road with no pump out facilities. By observation the boats tied up here are small ocean going fishing vessels under 25' in length which typically do not contain marine sanitation devices (MSDs). However, in 2010 the shellfish program established a Seasonal Marina Closure area described as that area within 25 feet of any in water structure for docking vessels. This marina falls under this restricted classification as indicated with a boat wheel  symbol.

Figure 4-1 Current Classification Map



Quonochontaug Pond has one small marina called the Weekapaug Yacht Club. The yacht club is home to a small sailing club with on land storage of small sunfishes and other sailboats. There are also approximately 40 moorings offshore in the southeast cove of Quonochontaug Pond suitable to moor small fishing or sailing vessels under 25 feet in length, again these boats typically do not have marine sanitation devices. Station GA11QW-25 is located in this cove and had been out of compliance for a time period causing re-classification of these waters to prohibited. However analysis of 2014 routine monitoring data indicated that this station had returned to within program compliance and the area was re-opened to shellfishing. The analysis for this year's results continues this compliance with water quality standards.

## **5.0 Wastewater Treatment Facilities (WWTF)**

There are no wastewater treatment facilities (WWTF), or any permitted RI Pollution Discharge Elimination (RIPDES) discharges that discharge to either pond.

In 2008 a stormwater detention pond was constructed at the westerly end of Winnapaug Pond to handle stormwater from the adjacent neighborhood. This basin has previously been indicated as a potential pollution source to the pond and a concern as to the impacts of stormwater discharged during wet weather. Hurricane Sandy in 2010 and lack of maintenance by the Town of Westerly have rendered this stormwater system mostly inoperable and is no longer discharging to the pond. We will continue to sample adjacent to the discharge, newly established station 11QW-36, and will monitor the rehabilitation of the stormwater system during shoreline survey events.

## **6.0 Water Quality Studies**

The Shellfish Growing Area Monitoring program is part of the state of Rhode Island's agreement with the United States Food and Drug Administration's National Shellfish Sanitation Program (NSSP). The purpose of this program is to maintain national health standards by regulating the interstate shellfish industry. As part of this agreement, the state of Rhode Island is required to conduct continuous bacteriological monitoring of the shellfish harvesting waters of the state in order to maintain certification of these waters for shellfish harvesting for direct human consumption.

Growing Area 11QW is an approved area, and is monitored on a systematically random sampling regime. Sampling runs are conducted six times per year typically more often in the spring, summer and fall. Harsher weather and ice conditions would prevent access to many of the sampling stations in the winter. Water samples are collected at seventeen (17) monitoring stations throughout the growing area (Figure 4-1). Nine stations are in Winnapaug Pond and eight are in Quonochontaug Pond.

All samples are collected at a depth of 1-2 feet below the water's surface using 4-ounce nalgene bottles. The samples are then stored in a portable cooler at a temperature of approximately 4° Celsius. Upon completion of the monitoring run, samples are transported to the RIDOH laboratories in Providence for analysis. The membrane filtration method using mTEC agar as described in Standard Methods for the Examination of Water and Wastewater is used to analyze the samples. The data is compiled and reviewed according to NSSP requirements stating that at least the most recent 30 data sets be used. The statistical analysis for this growing area completed January 29, 2016 is appended to this report.

Table 6-1 Annual Statistical Analysis Results

**RIDEM SHELLFISH GROWING AREA MONITORING RESULTS**

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>	
			<i>MEAN</i>	<i>90TH PERC (&lt;38)</i>
GA11QW-19	A	29	2.4	4.2
GA11QW-20	A	30	2.3	3.9
GA11QW-21	A	30	2.8	6.5
GA11QW-22	A	30	3.0	8.2
GA11QW-23	A	30	2.8	6.8
GA11QW-24	A	30	2.4	4.0
GA11QW-25	p	30	4.6	17.6
GA11QW-26	A	30	2.4	3.9
GA11QW-27	A	30	3.2	8.3
GA11QW-28	A	30	3.6	10.9
GA11QW-29	A	30	2.5	5.5
GA11QW-30	A	30	4.7	15.8
GA11QW-31	A	30	3.2	8.7
GA11QW-32	A	30	4.2	10.4
GA11QW-33	A	30	2.8	5.7
GA11QW-34	A	30	2.5	4.3
GA11QW-35	A	30	3.9	12.1
GA11QW-36	A	21	2.3	3.7

**HIGHLIGHTS**

- \* **Sampled 6x in 2015**
- \* **Statistics represent combined wet and dry weather data >01/01/11 (N = 30)**
- \* **All approved stations in compliance and conformance**
- \* **MTEC = 23 (90% = 34 cfu/100ml)**
- \* **Data run 1/29/16**

## **COMMENTARY**

Quonochontaug Pond and Winnapaug Pond (Growing Area 11) were sampled six times in 2015, complying with the minimum SRS monitoring requirement for approved areas. Sample results are representative of wet and dry weather conditions. The statistical evaluation for Quonochontaug Pond and Winnapaug Pond incorporates the most recent 30 samples collected for the area, the minimum number required for analysis according to SRS guidelines.

The results of the statistical evaluation demonstrate that all approved stations are in program compliance.

## **RECOMMENDATIONS**

**\* No action recommended based on ambient monitoring results**

### **7.0 Conclusions and Recommendations**

Due to the insignificant impact of the sources identified in previous surveys and the water quality statistical evaluation of the growing area no changes in growing area classification are recommended at this time.

The results of this review, combined with previous water quality statistical evaluations of the routine monitoring station results, indicate that the survey area conforms to all requirements set forth by the NSSP and is appropriately classified. No changes for reclassification are recommended at this time.

## Growing Area 12 Pawcatuck River - Little Narragansett Bay 2015 Annual Update

All waters of the Little Narragansett Bay, Growing Area 12 are currently prohibited to shellfishing. A TMDL study of Little Narragansett Bay was approved by EPA in December of 2010. The recommended implementation activities for the study area focus on stormwater, wastewater, and waterfowl management. As part of that ongoing effort sampling has been conducted in the past several years by TMDL staff in partnership with the Save the Bay Pond Watchers. This has allowed for more frequent sampling as a Save the Bay boat is readily available in the Westerly area, along with the additional manpower to operate the boat and facilitate TMDL staff sampling has resulted in sampling of this growing area five times per year for the past several years. This current data is more representative of the conditions in the bay versus historic sampling that had been sporadic due to limited resources and the prohibited classification as a low priority to sample. As part of the department's on-going efforts to pursue re-classification of areas that may support direct shellfish harvesting an analysis of this growing area was investigating using this more recent data. The following two graphics depict the results from this sampling, the first results under dry conditions, and the second under all conditions for the southernmost three stations. Routine station 12-11 is already located in approved waters and results from sampling currently support that classification. Using the most recent 30 samples (Figure 1) under all conditions it appears that stations 12-9, 12-10, 12-11 (already in approved waters) and 12-14 are in program compliance. However using more recent 15 data sets (Figure 2) there are violations of the water quality criteria at station GA12-10 in the middle of the bay.

**Figure 1** Most recent 30 sample results

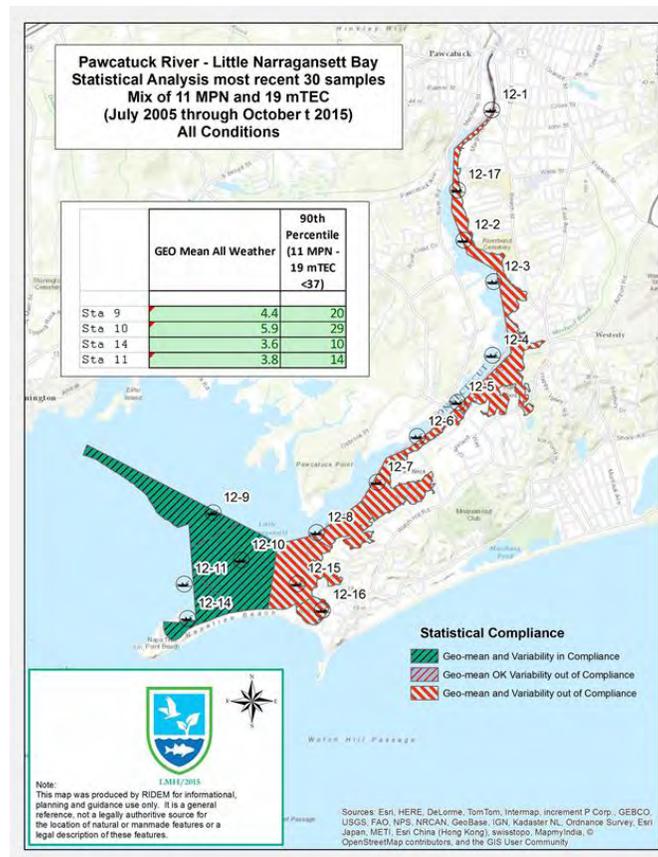
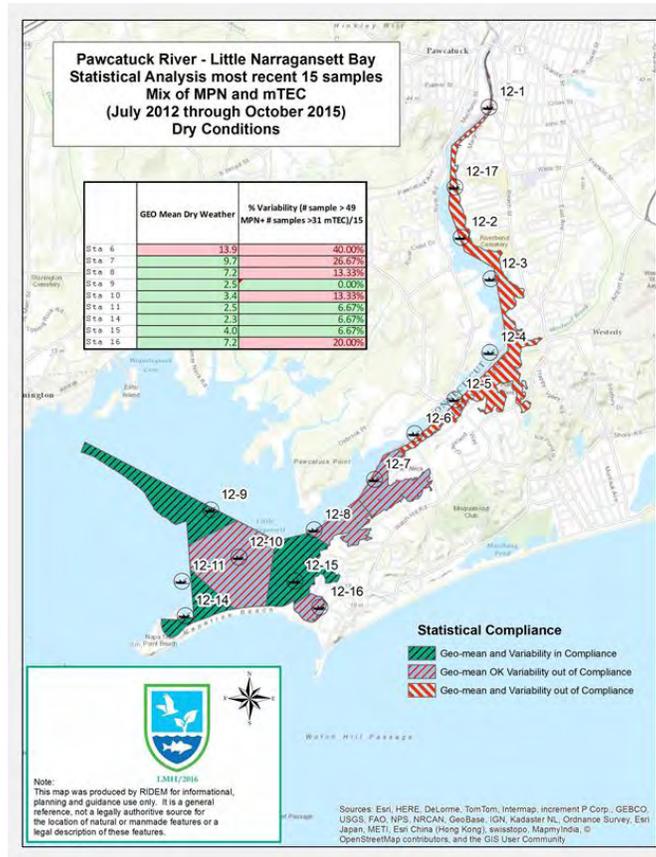


Figure 2 Most recent 15 sample results



## HIGHLIGHTS

- \* Sampled 5x in 2015
- \* Statistics represent combined wet and dry weather data >10/01/13 (N=15)
- \* Statistics represent combined wet and dry weather data >09/01/06 (N=30)
- \* Area is prohibited
- \* MTEC = 15 for N=15, MTEC =19 for N = 30
- \* *Data run 2/1/16*

## COMMENTARY

Little Narragansett Bay (Growing Area 12) was sampled five times in 2015. Since the area is classified as prohibited, there is no minimum sampling requirement. The area has been closed to shellfish harvesting for direct human consumption for the last 20 years due to unpredictable and elevated fecal coliform levels. A TMDL study of Little Narragansett Bay was completed on December 1, 2010.

At the present time the area is properly classified as prohibited.

## RECOMMENDATIONS

- \* Continue monitoring area
- \* No action recommended

## **RIDEM SHELLFISH GROWING AREA MONITORING RESULTS**

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO MEAN</i>	<i>% &gt; critical 31</i>
GA12-1	P	15	152.0	100.00
GA12-2	P	15	67.3	86.67
GA12-3	P	15	75.3	80.00
GA12-4	P	15	25.0	33.33
GA12-5	P	15	26.5	46.67
GA12-6	P	15	11.5	33.33
GA12-7	P	15	8.8	26.67
GA12-8	P	15	7.0	20.00
GA12-9	P	15	2.8	0.00
GA12-10	P	15	3.9	13.33
GA12-11	PA	15	3.1	6.67
GA12-14	P	15	3.2	6.67
GA12-15	P	15	3.8	6.67
GA12-16	P	15	5.9	20.00
GA12-17	P	15	43.7	66.67

*Values adjusted for mtec = 31*

**RIDEM SHELLFISH GROWING AREA MONITORING RESULTS**

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO MEAN</i>	<i>90<sup>th</sup> PERC (&lt;37)</i>
GA12-1	P	30	223.1	1009.7
GA12-2	P	30	169.5	1341.0
GA12-3	P	30	166.6	1539.1
GA12-4	P	30	56.1	646.9
GA12-5	P	30	50.8	483.4
GA12-6	P	30	32.8	559.9
GA12-7	P	30	20.8	259.1
GA12-8	P	30	14.0	101.1
GA12-9	P	30	4.0	17.1
GA12-10	P	30	5.9	29.2
GA12-11	P	30	3.9	14.2
GA12-14	P	30	3.6	10.2
GA12-15	P	30	5.9	35.8
GA12-16	P	30	12.6	97.4
GA12-17	P	30	87.9	483.4

**Values adjusted for mtec = 37**

The following is the 2015-2016 classification map. There is no scheduled shoreline survey due to the prohibited classification of this growing area. Sampling shall continue as resources allow.

Shellfish Growing Area Classification Codes

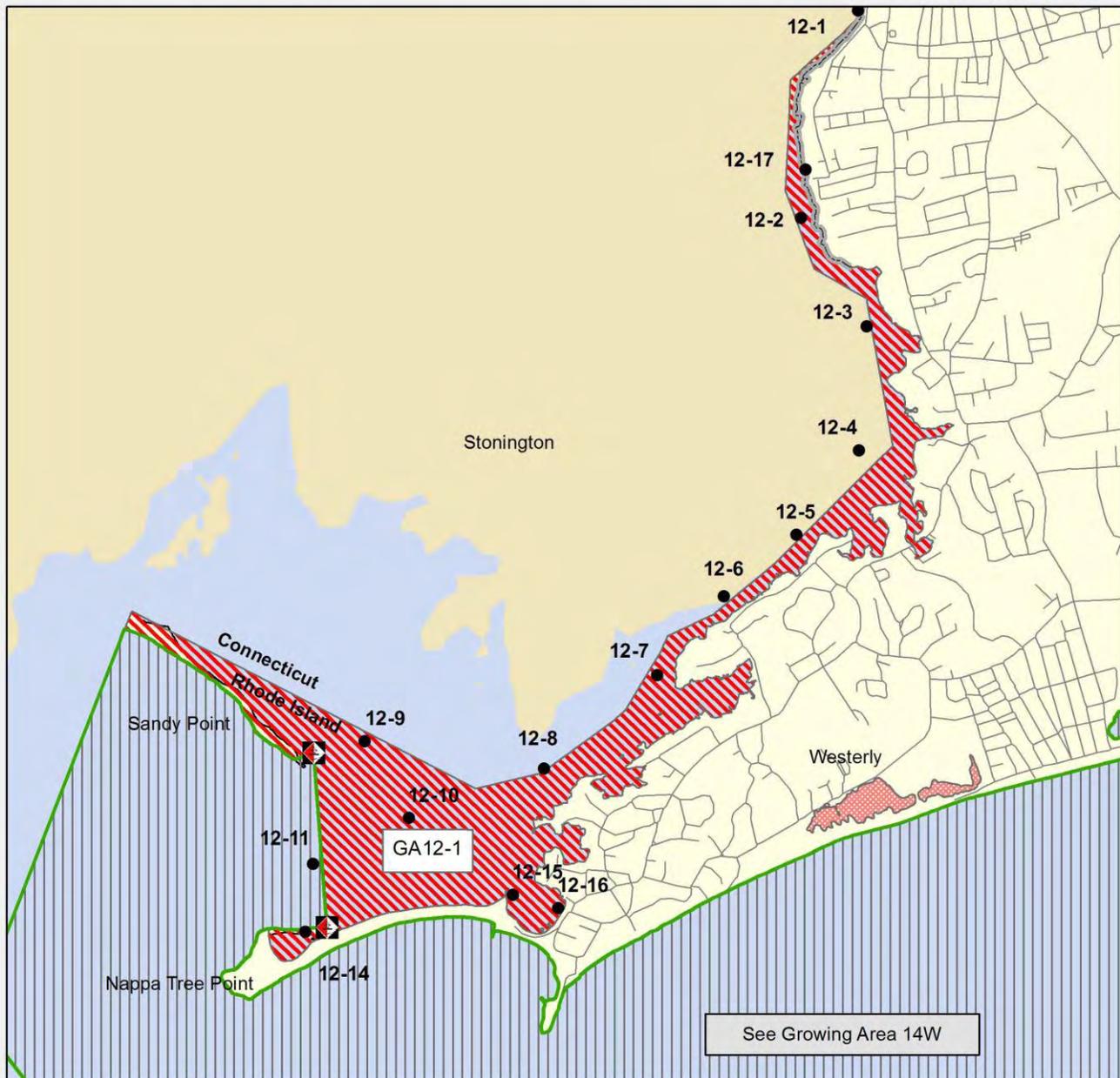
- - Growing Area Boundary
-  Shellfishing Prohibited
-  Approved
-  Un-assessed - Shellfishing Prohibited

Rhode Island Department  
of  
Environmental Management  
Office of Water Resources  
Shellfish Program



This map is provided only as a general reference for the areas listed as prohibited, seasonal closure or conditional closure in the publication entitled "Notice of Polluted Shellfishing Grounds May 2015". Please refer to that document for the complete legal description of the numbered shellfish closure areas shown here. This map also serves as the legal description for the areas open to shellfishing. Taking of shellfish is prohibited from any waters located on the landward side of the boundary line of waters listed as approved (high tide mark) and the landward side of the boundary line of waters listed as prohibited, conditional closure or seasonal closure, regardless of whether the specific waters are shown or noted as prohibited on the attached maps. At locations where the boundary line crosses water, the boundary shall be a straight line connecting the high tide mark on either side of the water along the main shoreline.

**Little  
Narragansett Bay  
Growing Area 12  
May 2015 - May 2016**



**Growing Area 13**  
**Great Salt Pond**  
**Triennial Update**  
**2015**



**Rhode Island Department of Environmental Management**  
**Office of Water Resources**  
**Shellfish Program**

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## 1.0 Introduction

A triennial re-evaluation shoreline survey of the Block Island growing area was conducted in order to comply with National Shellfish Sanitation Program (NSSP) requirements for shellfish growing area classification. The primary objective of this shoreline survey is to identify and characterize sources of pollution affecting the area and re-evaluate point and non-point sources previously identified during prior surveys. This triennial update of Area 13, Great Salt Pond (Figure 2-1) was conducted in the summer of 2015. The survey involved follow-up sampling of previously identified sources that resulted in fecal coliform counts exceeding 240 MPN / 100ml. These sources were evaluated to determine the bacteriological impact into the growing area.

A shoreline survey of Great Salt Pond, Harbor Pond and Trims Pond (Growing Area 13) was conducted in 2006. Follow-up monitoring for selected sources with elevated fecal coliform loadings was in the spring of 2007. The survey involved a shoreline reconnaissance of the study area to locate and catalog pollution sources and collect bacteriological samples from all sources actively flowing into the study area. All locations within the growing area were surveyed. Subsequent follow-up sampling of identified sources has been ongoing since the 2006 survey.

Of the eight sources that were identified three of which were re-sampled as part of this triennial up-date. An additional source previously identified as being problematic source is 2009-13-010 which is the outfall into Cormorant Cove. This source is now sampled on a monthly basis as part of the routing monitoring runs. Results from that sampling in Cormorant Cove are presented and discussed in this report. These stations are identified as GA13-15, 16, and 17.

## Description of Growing Area

Great Salt Pond is located in Washington County, in the Town of New Shoreham, on Block Island. Great Salt Pond is the southernmost waterbody in Rhode Island, located 12 miles off the Rhode Island coastline. It is located in the Block Island Watershed. The growing area includes Trims Pond and Harbor Pond.

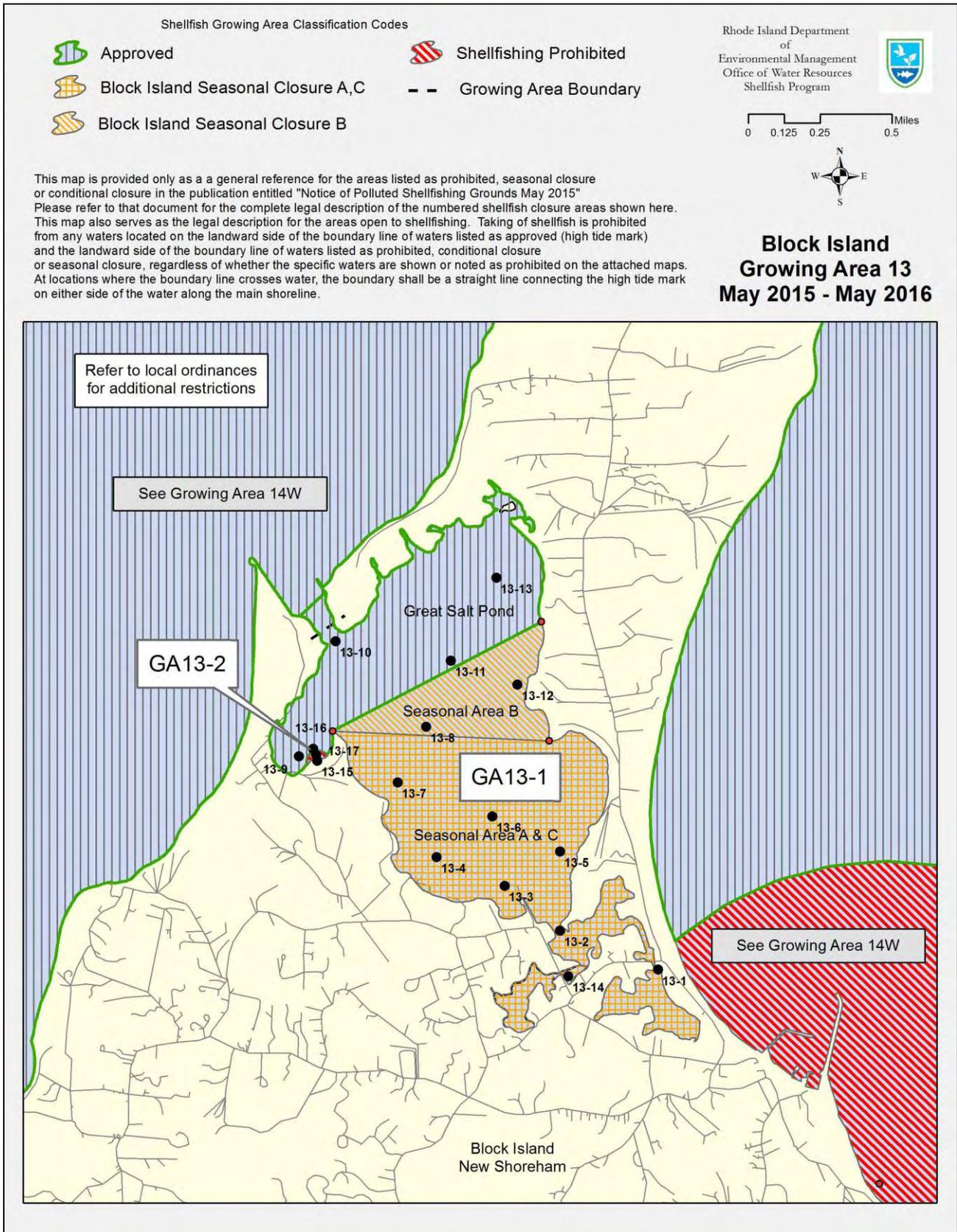
Growing Area 13 is presently comprised of sections classified as approved, seasonally approved and prohibited for shellfishing, specifically an area surrounding the outfall into Cormorant Cove (Figure 2-1).

## Hydrographic Characteristics

Total area of the Block Island Growing Area 13	Approximately 685 Acres
Widest Reach	Approximately 1 1/4 miles
Deepest Point	55 feet
Average Depth	18 - 20 feet

The Great Salt Pond in the town of New Shoreham nearly bisects Block Island along a generally east-west axis. The pond is open to Block Island Sound at the northerly end and terminates at the south end with two small embayments, Trims Pond and Harbor Pond. During the summer months the population of people and boats explodes on the island and the protected waters of Great Salt Pond and is a haven to transient and local boaters alike due to its numerous moorings and marinas. As such, several seasonal closures of the pond go into effect beginning on Memorial Day weekend and expanding mid summer to encompass the majority of the pond, the pond reopens to shellfishing the Tuesday after Columbus Day. There is a small prohibited area surrounding the outfall at Cormorant Cove that remains closed year round and will remain closed until sufficient sampling of the outfall and the surrounding receiving waters has been completed in order to properly classify these waters.

**Figure 1-1 GA13 Sampling Stations**



## 2.0 Pollution Source Surveys

### Survey Procedures

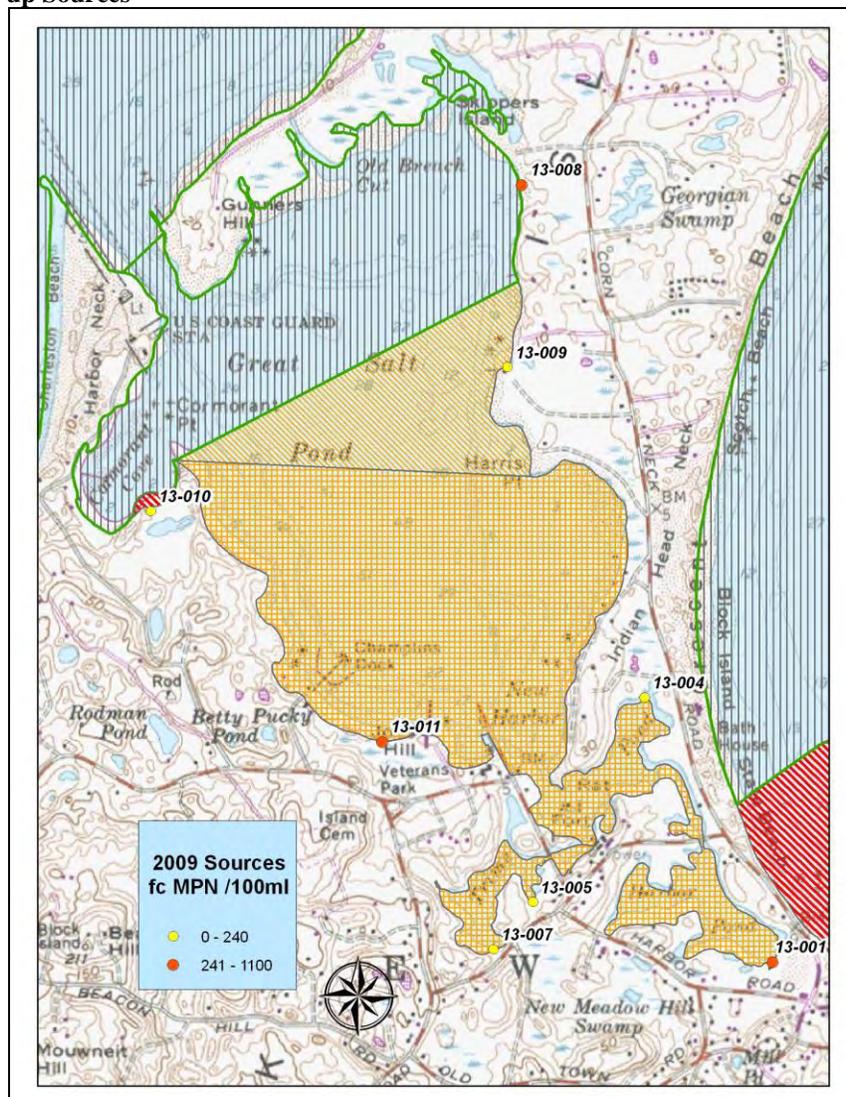
Lucinda Hannus, Senior Environmental Scientist from the Department of Environmental Management Division of Water Resources conducted the review for the triennial update.

This review involved follow-up sampling on all previously identified sources in which bacterial results from sampling exceeded the 240 MPN/100 ml threshold as established in the shellfish programs standard operating procedures. Sterile 4 ounce nalgene bottles were used to collect samples and then stored in a portable cooler (4° C) during field surveys. At the completion of the field day, samples were transported to the Rhode Island Department of Health Laboratories for analysis. The SM48 mTEC method as described in Standard Methods for the Examination of Water and Wastewater was used to analyze all samples.

### Identification and Evaluation of Pollution Sources

Follow-up bacteriological samples were taken of all previously identified sources from creeks, streams, pipes/culverts or groundwater seeps that resulted in bacteria counts that exceeded 240 MPN/100ml. In 2015, three sources warranted follow-up sampling. They are identified and described in Table 2-1. Figure 2-1 is a map depicting the location of all previously identified problematic sources within the growing area.

Figure 2-1 2009 Follow-up Sources



**Table 2-1 2015 Follow-up Sampling results**

Source ID	Description	Actual	Direct	2006 Results	2006 Flows	2009 Results	2009 Flow	2011 Results	2012 Results	2013 Results	2014 Results	2015 Results
2006-13-001	Tributary Upper Harbor Pond	A	D	430		1,100	Low	NS	525	8000	NF	1801 Steady
2006-13-004	Tributary into Trim Pond	A	D	931	Steady Stream	15	High		167			NS
2006-13-005	Upper Trim Tributary	A	D	430		NF	NF		NF			NS
2006-13-007	Trim Pond Tributary	A	D	1100		NF	NF		8000	8000	NF	867 Trickle
2006-13-008	Great Salt Pond Andy's Way seep. Green growth.	A	D	2100	trickle	460	Low	NS	NF	NS	NS	NS
2006-13-009	Great Salt Pond. Wetlands pond drainage.	A	D	2300		36	Moderate		NF		23	NS
2006-13-010	Cormorant Cove outfall. Drains wetland complex.	A	D	9300		See Discussion	See Discussion		See Discussion			See Discussion
2006-13-011	West of harbor mast shack. Wetland drain.	A	D	1500		1,100	Low	7	818	654	245	590 Small Steady

Two of the sources sampled 13-001 and 13-011 exhibited slightly elevated bacteria counts but were both less than the 2400 fc MPN/100 ml criteria requiring additional investigation or follow-up sampling. Both were recorded as having low volumes of flow. The following figure indicates the size of flow described by the sampler as “low”. The two sources also discharge to the seasonally closed area of Great Salt Pond. Due to this low flow and relatively low bacteria counts it would appear that these sources do not have a negative impact on this growing area.

**Figure 2-2      2009-13-011**



Source 2006-13-007 is tributary to Trims Pond located in the most southeast corner of the pond. This tributary again had a “trickle” flow at the time of sampling which would not be a true indication of its contribution to the pond. Previous results from sampling have fluctuate from a low of 867 cfu/100ml to a high of 8000 cfu/100ml. This tributary is into the seasonally closed portion of Trims Pond and due to its low flows it would not appear that it is causing a negative impact to the receiving waters.

**Figure 2-3      Source 2012-13-007**



### **3.0 Mooring Fields and Marinas**

Several commercial docks/marinas are located in the southern end of Great Salt Pond, which primarily serves a transient fleet of summer boats. The Pond presently contains approximately 270 moorings, with slip space available for approximately 550 boats. During peak summer weekend conditions, including slip space, moorings, and transient boats that anchor in the Pond, up to 2,000 boats have been noted by the local harbormaster. Great Salt Pond is a federally designated “No Discharge Zone” and no vessels with marine heads may discharge their wastes overboard. There are currently no stationary pump-out facilities available within the Great Salt Pond. The Town of New Shoreham operates four (4) pump out boats and maintains a fixed station in Old Harbor.

### **4.0 Wastewater**

Sources of domestic wastes that may convey fecal coliform bacteria to the growing area include dry wells, cesspools, and on-site wastewater treatment systems (OWTS). The method of transport of pollutants is normally through the groundwater, either to the growing area itself or to a tributary that ultimately drains to the growing area. Although less common, fecal coliform bacteria can also be transported via surface seepage or by illegal pipes.

In New Shoreham, eighty-five percent of year-round residents and 54% of the summer population are estimated to use on-site wastewater disposal systems. Most of the existing residential and commercial development in the growing area’s watershed are unsewered and therefore rely upon OWTS for sewage disposal.

Block Island is a popular eco-tourism destination and the strength of the local economy depends on the health of the water resources and the island’s unique natural areas. The town recognizes that appropriate on-site wastewater treatment is essential in preventing pathogens and nutrients from harming the potable water supply and maintaining the abundant recreational and commercial fish and shellfish resources along with other recreational activities such as boating and swimming. To this end the town maintains a comprehensive Wastewater Management Program (WMP) in which all OWTS in New Shoreham are to be properly operated, regularly inspected, and routinely maintained to prevent malfunctioning systems and to serve, where appropriate, as an alternative to municipal sewer systems. The town currently employs a manager and inspector to monitor and implement the WMP.

## **Hurricane Sandy October 28 and 29<sup>th</sup> 2012**

At the end of October in 2012 the east coast was struck by what is now being called “Super Storm Sandy”. A tropical hurricane that caused significant damage along coastal areas as it traveled along the east coast. The town of New Shoreham reported several roads were severely damaged and inundated with sand along the eastern side of the island which took the brunt of the waves and winds. At the time town officials did not report any waste water infrastructure damage. However, in November, town officials reported a sewer main overflow in the vicinity of Harbor Pond. The blockage was apparently caused by storm debris (sand and rocks) in the gravity main that runs in Ocean Avenue. The Block Island Harbormaster closed the pond to shellfishing. Following NSSP regulations, in the event of an emergency closure due to the occurrence of raw or untreated sewage discharge from a community collection system a growing area temporarily placed in the closed status can not reopen until sufficient time has elapsed following the emergency situation and the analytical sample results shall not exceed background levels or 50 male-specific coli phage per 100 grams from shellfish samples collected no sooner than 7 days after the contamination has ceased. Water samples were collected along with a series of meat samples and were sent to RIDOH for analysis. As there was no established “background levels” available the maximum 50 msc/100 grams was used to determine opening conditions. The pond was re-opened to shellfishing sunrise Saturday, December 29<sup>th</sup> following acceptable levels from shellfish samples. A second small overflow event was reported on December 30<sup>th</sup> and the pond was closed and remained closed until January 12<sup>th</sup>, 2013. The program’s emergency closure file contains the results from sampling during these two emergency closures. All repairs to infrastructure have now been completed.

### **5.0 Water Quality Studies**

The RIDEM Shellfish Program participates in the Shellfish Growing Area Monitoring (SGAM) program, which is the result of an agreement between the State of Rhode Island and the Food and Drug Administration (FDA), and managed by the National Shellfish Sanitation Program (NSSP). The purpose of these programs is to maintain national health standards by regulating the interstate shellfishing industry. The NSSP is designed to oversee the shellfish producing states’ management programs and to enforce and maintain an industry standard. As part of this agreement, the State of Rhode Island is required to conduct continuous bacteriological monitoring of shellfish harvesting waters for direct human consumption in order to maintain certification.

Personnel from the New Shoreham Harbor Master’s office collect the routine samples for the shellfish program. This is a unique situation in the state due to the remoteness of the island. Sampling personnel follow the same collection methods as shellfish program personnel. Water samples are collected at fourteen (14) routine monitoring stations throughout the growing area, along with three additional stations in the Cormorant Cove special study area. Tens stations are located in Great Salt Pond; one routine station is located in Cormorant Cove, one at the outfall of Harbor Pond into Trims Pond; one in Trims Pond and one at the outfall of Trims Pond into Great Salt Pond. See Figure 2-1 for a map of these locations.

Samples are collected 1-2 feet below the water surface (using 4 ounce sterile Nalgene bottles) after which they are stored in a cooler packed with ice. They are then transported to Rhode Island Department of Health for analysis. The membrane filtration, also known as the mTEC technique,

is used to analyze the samples. Depending on the time of year, the Office of Water Resources shellfish program personnel coordinate to pick up samples with the Harbor master's office from either the ferry dock in Pt. Judith or the state airport in Westerly for delivery to the RIDOH. The results are sent to RIDEM Shellfish Program at which time they are reviewed and incorporated into the master database. A summary report is written and recommendations regarding the classification of the growing area are made on a yearly basis. These highlights and conclusions and the results of the statistical evaluation are incorporated into this document.

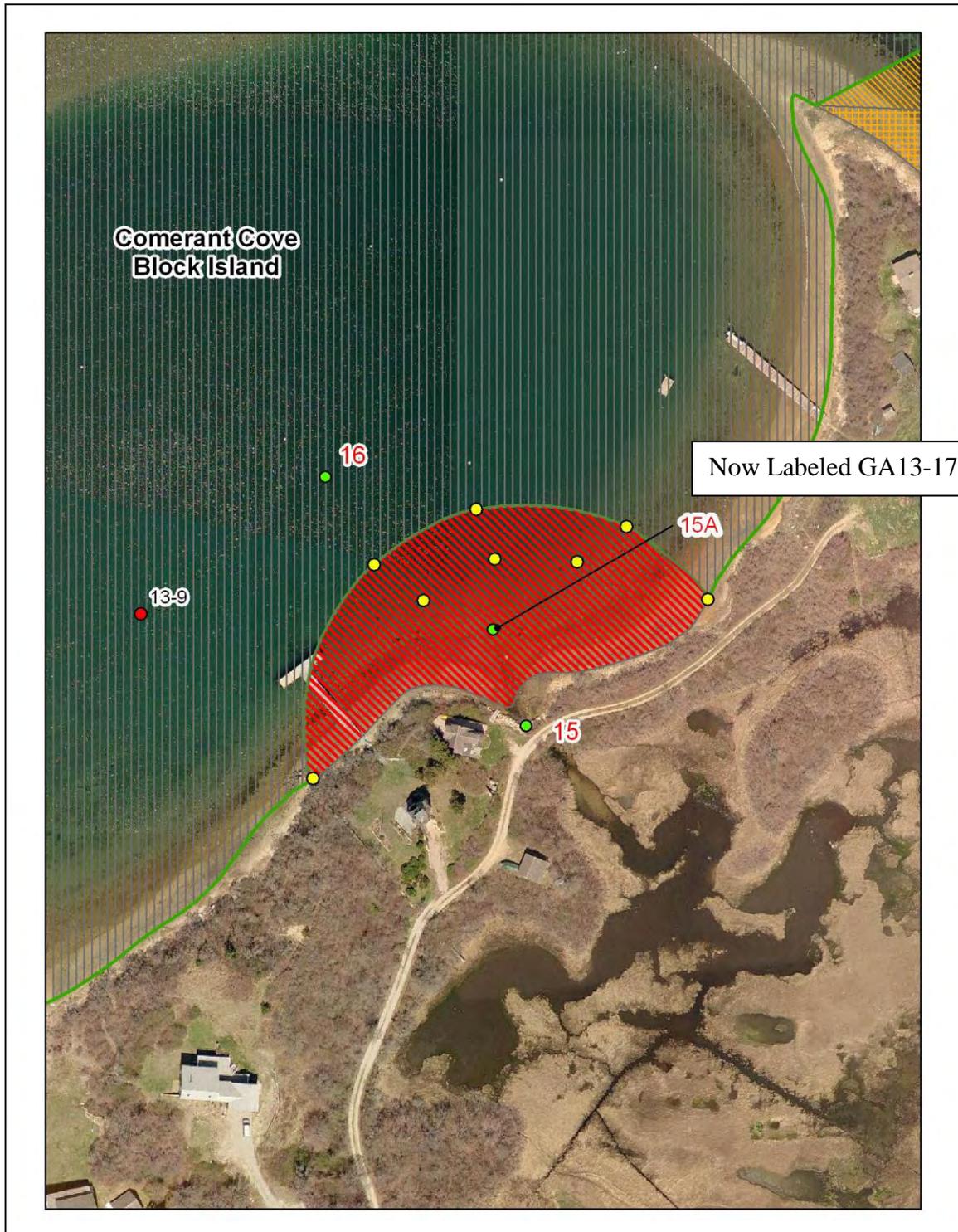
### **Cormorant Cove**

In addition to the routine monitoring station 13-9 located approximately mid-cove, RIDEM has established three (3) additional stations to monitor the water quality of the outfall and receiving waters adjacent to the source identified as 13-010 (Fig. 2-1 or 5-1). In 2007 sampling from this outfall had significantly elevated bacteria counts, i.e. 9,300 and >24,000 MPN from two sampling events. In 2008 the University of Rhode Island Watershed Watch (URIWW) program sampled this outfall that identified as: "BI Tributary #3", five times between June and October. Results from their sampling had bacteria results that ranged in value from a low of 293 cfu/100ml to a high of 580 cfu/100ml. Based on these elevated results a small closure encompassing this outfall and nearby receiving waters was instituted. The following figure 5-1 is an aerial indicating the closure line, location of the outfall and the additional sampling stations now routinely collected by the harbor master's office as part of their routine monthly sampling of the pond. Table 5-1 is the recorded results and the calculated geo-means from that sampling.

Table 5-1 Cormorant Cove Sampling Results

Date	Sta. 15	Sta. 16	Sta. 17	Method
9/10/2013	126	2	2	mTEC
10/17/2013	2	9	2	mTEC
11/21/2013	2	2	2	mTEC
12/17/2013	4	4	10	mTEC
1/15/2014	2	2	2	mTEC
2/12/2014	2	2	2	mTEC
3/19/2014	2	2	2	mTEC
4/23/2024	2	2	2	mTEC
5/20/2014	2	2	2	mTEC
6/11/2014	2	2	2	mTEC
7/23/2014	2	2	2	mTEC
8/12/2014	2	2	2	mTEC
9/11/2014	2	2	2	mTEC
10/31/2014	2	2	2	mTEC
12/5/2014	2	4	4	mTEC
12/22/2014	6	4	2	mTEC
1/15/2015	2	8	4	mTEC
3/11/2015	2	2	2	mTEC
4/15/2015	2	2	2	mTEC
4/29/2015	2	2	2	mTEC
5/14/2015	2	7	2	mTEC
6/22/2015	2	2	2	mTEC
7/16/2015	2	16	14	mTEC
8/18/2015	12	2	2	mTEC
9/15/2015	2	2	2	mTEC
10/21/2015	2	2	2	mTEC
11/17/2015	2	2	8	mTEC
12/15/2015	2	2	2	mTEC
1/26/2016	2	8	5	mTEC
2/17/2016	8	4	2	mTEC
Geo-mean (n=30)	2.7	2.8	2.5	
90 <sup>TH</sup> Percentile	8.1	6.1	5.1	
% > 31	3.33	0.00	0.00	

Figure 5-1 Cormorant Cove Sampling Stations and Closure Line



## **6.0 Conclusions and Recommendations**

The triennial update of the Great Salt Pond, Block Island (Growing Area 13) reevaluated several point sources in the study area. However, none of the sources appear to have any impact on the high quality ambient waters. It would appear that based on the most recent sampling results that the Cormorant Cove closure area could be reclassified as approved.

Due to the insignificant amount and impact of the other sources reevaluated during the triennial update of the growing area, and the water quality statistical evaluation, no other changes in growing area classification are recommended. The results of this update, combined with previous water quality statistical evaluations of the Great Salt Pond growing area, indicate that the survey area conforms to all requirements set forth by the National Shellfish Sanitation Program (NSSP) and is properly classified. No other changes for reclassification are recommended at this time.

### **HIGHLIGHTS**

- \* Sampled 12x in 2015**
- \* Statistics represent all combined wet and dry weather data >7/01/13 (N=30) for approved Sta.'s 9, 10, 11, 13 and 16**
- \* Statistics represent combined wet and dry weather, open season data >2/01/14 (N=15) for conditional/seasonally approved Sta.'s 1-7 and 14**
- \* Statistics represent combined wet and dry weather, open season data >04/01/14 (N=15) for conditional/seasonally approved Sta.'s 8 and 12**
- \* All approved and seasonally approved stations in compliance and conformance**
- \* MTEC = 15 (90% = 31cfu/100ml)**
- \* Data run 2/09/16**

### **COMMENTARY**

**Block Island's Great Salt Pond (Growing Area 13) was sampled twelve times in 2015, complying with the monthly minimum monitoring requirement for conditional/seasonally approved areas. The Town of New Shoreham, Harbormaster's Office, collected all samples through cooperative agreement with this office. Sample results are representative of wet and dry weather conditions. The statistical evaluation for the Great Salt Pond incorporates the most recent 15 combined wet and dry weather, open season samples collected for the area, the minimum number required by NSSP Manual of Operations guidelines for conditional/seasonally approved areas. The statistical evaluation for the four permanently approved stations incorporate the most recent 15 and 30 combined wet and dry weather samples collected for the area.**

**All approved and conditional/seasonally approved stations are in program compliance. The area is properly classified.**

### **RECOMMENDATIONS**

- \* No action recommended**

## **RIDEM SHELLFISH GROWING AREA MONITORING RESULTS**

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>	
			<i>MEAN</i>	<i>90TH PERC (&lt;31)</i>
GA13-9	A	30	2.8	8.6
GA13-10	A	30	2.3	3.3
GA13-11	A	30	2.3	3.6
GA13-13	A	30	2.2	3.6
GA13-16	A	28	2.6	5.4

**N = 30 ALL SEASONS DATA STA 9, 10, 11, 13, 16 7/1/12-12/31/14 MTEC=30. Sta. GA13-16 is only 28 since it is a new station and insufficient data collected to date.**

**The following stations are conditional/seasonally approved or prohibited and results are for reference only and not for compliance**

GA13-1	SA	30	4.8	19.0
GA13-2	SA	30	4.0	17.2
GA13-3	SA	30	4.2	29.3
GA13-4	SA	30	4.0	21.3
GA13-5	SA	30	3.1	8.4
GA13-6	SA	30	2.8	6.7
GA13-7	SA	30	3.0	10.6
GA13-8	SA	30	2.5	4.5
GA13-12	SA	30	2.3	3.9
GA13-14	SA	30	5.5	18.5
GA13-17	P	30	2.5	5.0

Open season data >02/01/14 (N=15) for conditional/seasonally approved Sta.'s 1-7 and 14

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>	
			<i>MEAN</i>	<i>%&gt;CRITICAL 31</i>
GA13-1	SA	15	3.3	0.00
GA13-2	SA	15	2.4	0.00
GA13-3	SA	15	2.3	0.00
GA13-4	SA	15	2.3	0.00
GA13-5	SA	15	2.6	0.00
GA13-6	SA	15	2.1	0.00
GA13-7	SA	15	2.0	0.00
GA13-14	SA	15	3.8	0.00

Open season data >04/01/14 (N=15) for conditional/seasonally approved Sta.'s 8 and 12

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>	
			<i>MEAN</i>	<i>%&gt;CRITICAL 31</i>
GA13-8	SA	15	2.4	0.00
GA13-12	SA	15	2.0	0.00

**Offshore**  
**Growing Area 14East and 14West**  
**Including Offshore Block Island**  
**Triennial Update**  
**2015**



**Rhode Island**  
**Department of Environmental Management**  
**Office of Water Resources**  
**Shellfish Program**

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## **1.0 Introduction**

A triennial re-evaluation shoreline survey of the “Offshore” growing area was conducted in order to comply with National Shellfish Sanitation Program (NSSP) requirements for shellfish growing area classification. The primary objective of this shoreline survey is to identify and characterize sources of pollution affecting the area and re-evaluate point and non-point sources previously identified during prior surveys. This triennial update of Area 14E and 14W (Figure 1-1) was conducted during the summer of 2015. The survey involved follow-up sampling of previously identified sources that resulted in fecal coliform counts exceeding 240 MPN / 100ml. These sources were evaluated to determine the bacteriological impact into the growing area.

The survey area encompasses all of the shoreline south of a line from the Massachusetts state line in Westport to the tip of Napatree Point in Westerly, and includes the offshore waters surrounding Block Island.

## **2.0 Description of Growing Area**

The Offshore growing area is within Block Island and Rhode Island Sounds. The sounds are a strait in the open Atlantic Ocean, approximately ten miles wide, separating Block Island from the mainland coast of Rhode Island. Geographically, it is the eastward extension of Long Island Sound and the westward extension of Buzzards Bay.

The shoreline of the growing area ranges from miles of open beach from Westerly to the causeway at Point Judith to rocky, steep cliffs that are predominate on Block Island and the shoreline to the east of Pt. Judith to the state line in Little Compton.

The towns of Westerly, Charlestown, South Kingstown, Narragansett, Jamestown, Newport, Middletown, and Little Compton form the boundary of this growing area along with the exterior shoreline of the Town of New Shoreham on Block Island.

Growing area 14W is approximately 54,962 acres and additionally includes the offshore Block Island growing area of approximately 62,633 acres for a total of 117,595 acres. The easterly portion of the growing area designated GA-14E is approximately 83,512 acres of offshore waters. The offshore growing area is considered remote and is monitored following the guidance of the NSSP manual for remote areas. Routine sampling is conducted twice a year either by Office of Water Resources Shellfish Program personnel or the New Shoreham Harbor Masters Office.

Figure 2-1 Offshore Growing Area 14E and 14W including Block Island Offshore



### **3.0 Pollution Source Surveys**

There were one hundred and sixty-three (163) actual or potential sources identified during the 12-yr sanitary shoreline survey completed in 2006, excluding marinas. A total of ninety of the one hundred and sixty-three sources were not actively flowing at the time of the shoreline survey with the remaining seventy-three having flows warranting sampling. All sources in which flow was observed were sampled. Of the seventy-three flowing sources sampled, thirty-four had results greater than 240 MPN. Thirteen of those were located in prohibited waters within the growing area and were not re-sampled as part of this triennial update. Source 14W-302 is the potential discharge from Cards Pond a small pond located above the high water mark along Moonstone Beach in South Kingstown. This source is not an actual but a potential source to the growing area and was not resampled as part of this triennial update.

Two of those sources re-sampled in 2014 had results exceeding the 2400 MPN threshold for follow-up sampling. Source 14E-412 is a small stream located north of the Coast Guard Station at Castle Hill in Newport. This stream is very difficult to access from land so an instream sample was taken in front of the source in 2015. The receiving waters in front of the stream had a bacteria count of <3 cfu/100ml, well within water quality criteria.

Source 14E-717 is a large oval RCP located just north of the Ruggles and Marine Ave access to the Cliff Walk. This source has exhibited elevated bacteria counts during previous surveys, but during sampling in 2015 no flow was emanating from this pipe as has been the case for the last two years.

Other previously sampled sources with elevated bacteria counts were either insignificant due to flows or location or were not flowing at the time of sampling in 2012 and were not followed up for this triennial review.

Source 14W-1301 is a small groundwater stream at Mohegan Bluff, although the bacteria counts from sampling were relatively high at 4000 cfu/100ml the flow was just a trickle and faded out way above the high tide line and was not impacting the receiving waters.

**Table 3-1 2015 Follow-up Source Sampling Results**

Source ID	Description	Actual	Direct	2006 Results	2009 Results	Additional 2009 Results	2012 Results CFUs	2013 Results CFUs	2014 Results CFUs	2015 Results CFUs
2006-14W-001	Weekapaug Breachway	A	D	2401	<3		3	NS	<2	
2006-14W-100	Stream north of Weekapaug Breachway south of point	A	D	2100	11,000	2300	NF	NS	NS	
2006-14W-300	Stream from upland pond north of Green Hill beach club	A	D	4300	NF		NF	NS	8000 1.06 cfs	
2006-14W-301	24" dia RCP flared	A	D	4300	NF		NF	NS	NS	
2006-14W-500	Coastal pond outlet between Sand Hill Cove beach and east wall	A	D	930	<3		NF	NS	NS	
2006-14W-1301	Groundwater flow from bluff	A	D	11000	930		623 Trickle	NS	22	4000 trickle
2006-14W-1303	Flow from bluffs wetland above, dry conditions	A	D	1200	230		NS	NS	NS	
2006-14W-1304	From stream near houses in between bluffs dry conditions	A	D	750	750		NS	NS	NS	
2006-14E-102	6" dia CI pipe next to # 101 Camp Varnum Pipe buried can not locate	A	D	4300	640		NS	NS	NF	
2006-14E-410	12" dia corrugated PVC	A	D	390	93		NF	NS	NS	
2006-14E-412	Stream <b>Does not reach shoreline</b>	A	D	460	NO SAMPLE		4900	NS	5600 Trickle	<3 In stream
2006-14E-602	18" dia RCP top of cliff	A	D	240	240		258	NS	NS	
2006-14E-606	36" dia CMP submerged in sand	A	D	460	240		93	NS	NS	
2006-14E-612	18" square concrete in low retaining wall	A	D	460	93		930	NS	NS	
2006-14E-613	18" square concrete in low retaining wall	A	D	1500	75		93	NS	NS	
2006-14E-616	14" dia RCP	A	D	430	11,000	12/1/2009 9 616S <3	43	NS	NS	
2006-14E-627	Stream Almy Pond outlet at Baileys Beach	A	D	290	240		150	NS	NS	
2006-14E-706	6" dia CI pipe	A	D	460	15		NF	NS	NS	
2006-14E-717	5' wide x 3' tall oval concrete pipe	A	D	4600	430		9300 Trickle  8000 In stream 3	NS	NF	NF
2006-14E-720	Double 6" dia metal pipes	A	D	750	2900		NF	NS	NS	

#### 4.0 Mooring Fields and Marinas

There are no marinas located in the Offshore Growing Area except the Old Harbor area on Block Island. This harbor is encompassed by the closed safety zone associated with the New Shoreham WWTF discharge. Additionally, Rhode Island coastal waters are federally designated as “No Discharge” mandating that the discharge of *treated* and *untreated* boat sewage is prohibited (not including greywater or sink water) in these designated areas. These designated areas encompass the entire offshore growing area. There is one pump out facility located in Old Harbor on Block Island.

#### 5.0 Wastewater Treatment Facilities (WWTF)

Public sewers service a small portion of the growing area watershed in Newport, Middletown, Narragansett, and Block Island. All other areas of the watershed are serviced by On-site Waste Water Treatment Systems (OWTSs). There are currently five RIPDES (see figure 2-1) permits that discharge into the growing area. Two of these permitted discharges are non-sanitary water release pipes that do not have a negative impact on the classification of the offshore growing area. The other three are permitted discharges from municipal wastewater treatment facilities (WWTF) in South Kingstown, Narragansett and New Shoreham (Block Island). Currently closed safety zones exist that surround these offshore discharges.

##### Treatment Plant Performance for 2015

South Kingstown            Average Fecal Count: 8.17 MPN

Violations: Enterococci – July 1, 2015, Daily Max of 24,000,000 MPN (permit of 276 MPN)

Enterococci – July 2015, Monthly Max of 39 MPN (permit of 35 MPN)

Enterococci – October 27, 2015 Monthly Max of 24,000,000 MPN (permit of 276 MPN)

Average Flow: 2.39 MGD

Permitted Flow: 5.0 mgd

Narragansett

Average Fecal Count: 1.96 MPN

Average Flow: 0.59 MGD

Violations: None

Permitted Flow: 1.4 mgd

New Shoreham

Average Fecal Count: 2.15 MPN

Average Flow: 0.25 MGD

Violations: None

Permitted Flow: 0.50 mgd

## 6.0 Water Quality Studies

The RIDEM Shellfish Program participates in the Shellfish Growing Area Monitoring (SGAM) program, which is the result of an agreement between the State of Rhode Island and the Food and Drug Administration (FDA), and managed by the National Shellfish Sanitation Program (NSSP). The purpose of these programs is to maintain national health standards by regulating the interstate shellfishing industry. The NSSP is designed to oversee the shellfish producing states' management programs and to enforce and maintain an industry standard. As part of this agreement, the state of Rhode Island is required to conduct continuous bacteriological monitoring of shellfish harvesting waters for direct human consumption in order to maintain certification.

The offshore growing area is classified as a “remote” area. Remote status requires that the area be sampled twice a year. Water samples are collected at fifteen (15) monitoring stations along the southern shore of the main land of Rhode Island dispersed throughout the growing area (Figure 2-1). Only one of these stations is located in a prohibited area. There are six (6) stations (Figure 2-1) within the Offshore Block Island growing area, one of which is located in the prohibited area of the safety zone surrounding the New Shoreham WWTF.

RIDEM personnel from the water resources division in co-operation with personnel from Enforcement’s Marine division sample the offshore waters south of the mainland. Personnel from the Town of New Shoreham’s (Block Island) Harbormasters Office collect the offshore Block Island samples. Samples are collected 1-2 feet below the water surface (using 4 ounce sterile Nalgene bottles) after which they are stored in a cooler packed with ice. They are then transported to the Rhode Island Department of Health Laboratories for analysis. The membrane filtration technique, also known as the mTEC technique, is used to analyze the samples. The results are sent to the RIDEM Shellfish Program at which time they are reviewed and incorporated into a database. A summary report is written and recommendations regarding the classification of the growing area are made on a yearly basis. The 2015 report with recommendations and the statistical evaluations from the routine monitoring data are in the following sections. Due to staffing limitations the remote areas along the mainland shore were only sampled once for calendar year 2015, the Block Island offshore waters were sampled twice in 2015.

## 7.0 Conclusions and Recommendations

### **HIGHLIGHTS**

- \* **Sampled 1X for 2015 season, Sta.’s 1-15, 22**
- \* **Sampled 2X for 2015 season, Sta.’s 16-21**
- \* **Statistics represent all combined data >10/26/2000**
- \* **Area considered remote**
- \* **MTEC = 5 (90% = 45 cfu/100ml)**
- \* **Data run 2/9/16**

## **COMMENTARY**

In order to comply with NSSP Manual of Operations requirements regarding approved areas, a semi-annual sampling schedule was initiated in 1994 to monitor the offshore waters that are permanently open to shellfish harvesting. These offshore stations (Growing Area 14) are considered "remote". They have been determined to be physically distant enough from land to not be adversely influenced by any land based point and/or non-point sources. According to NSSP Manual of Operations guidelines, remote areas are required to be sampled only twice a year. Stations 1 – 15 and 22, located along the south shore from the Connecticut border to the Massachusetts border, were sampled 1x for 2015 by DEM staff, falling short by one sampling run with Manual of Operations guidelines for remote areas, due to a staffing shortage.

Stations 16 – 21, located around the perimeter of Block Island, were sampled 2x in 2015 by the Town of New Shoreham Harbor Masters Office, complying with minimum sampling requirements. The statistical evaluation for Growing Area 14 represents all data collected for the area, but is presently incomplete and requires more data to comply with statistical requirements.

Results of the statistical evaluation, albeit incomplete for Block Island offshore, demonstrate that the area is in program compliance. The area is properly classified.

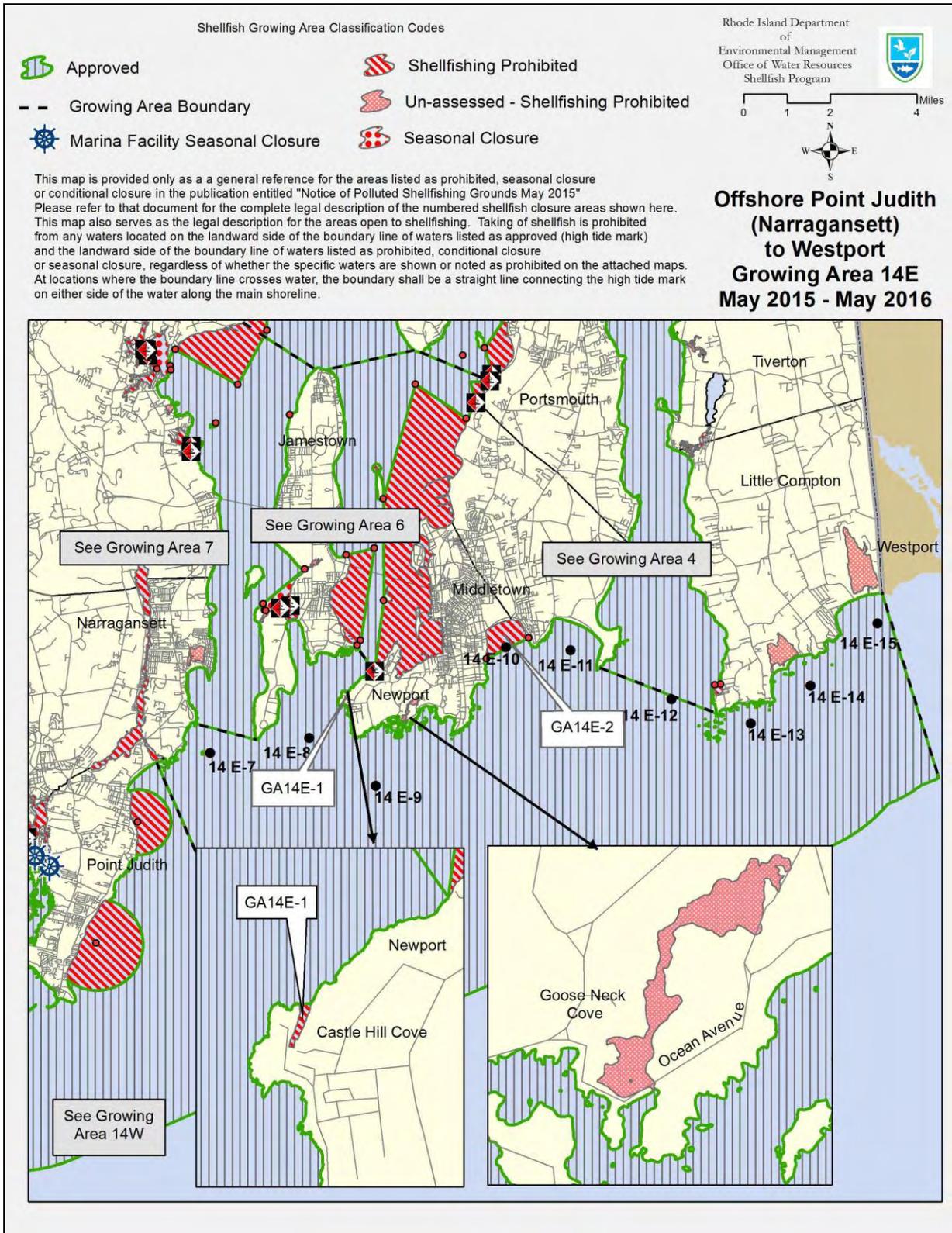
## **RECOMMENDATIONS**

\* No action recommended based on ambient monitoring results

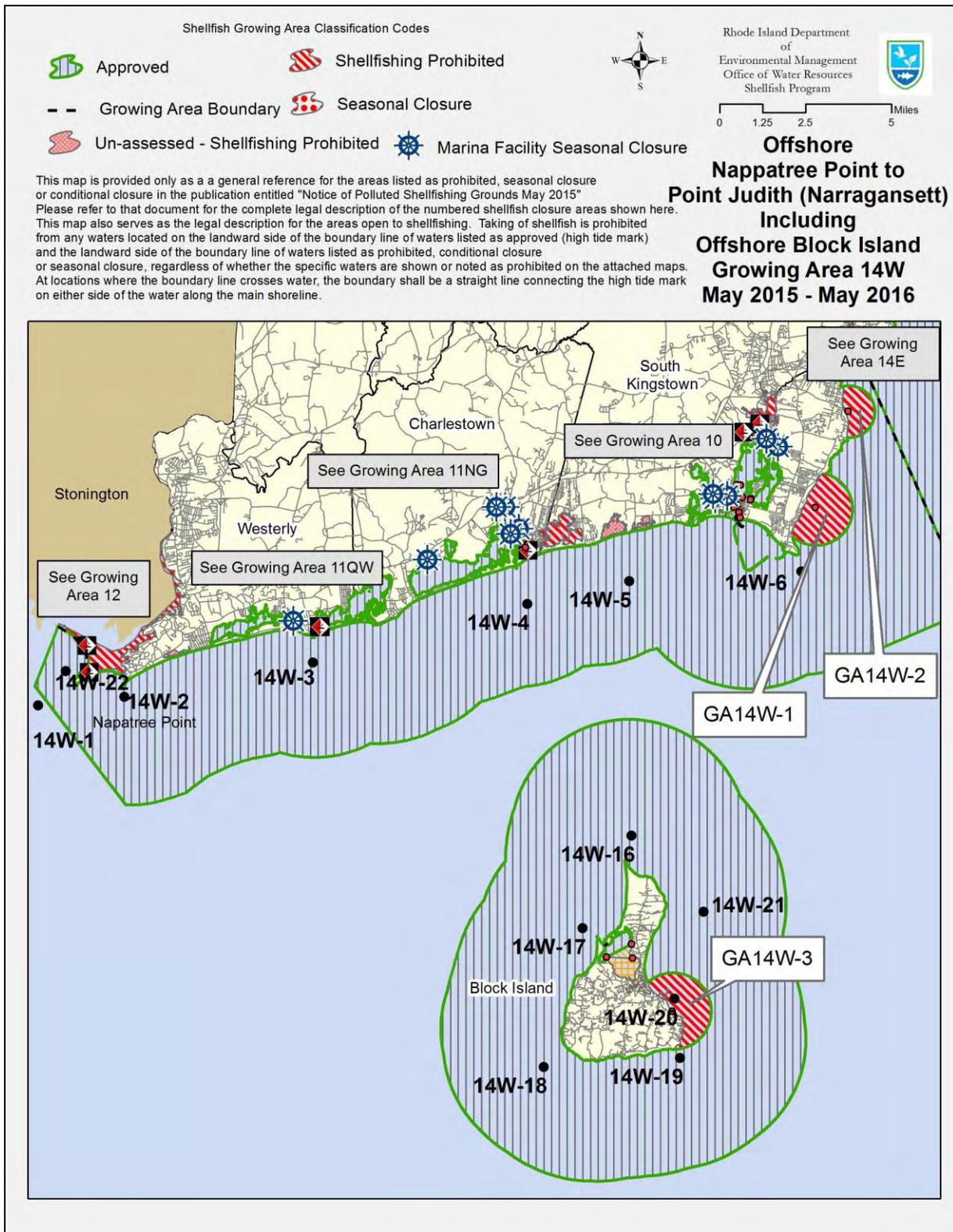
## **RIDEM SHELLFISH GROWING AREA MONITORING RESULTS**

<i>Station Name</i>	<i>Status</i>	<i>N</i>	<i>FECAL-GEO</i>	
			<i>MEAN</i>	<i>90TH PERC (&lt;45)</i>
GA14-1	A	30	2.1	2.5
GA14-2	A	30	2.4	4.7
GA14-3	A	30	2.0	2.4
GA14-4	A	30	2.1	2.6
GA14-5	A	30	2.0	2.4
GA14-6	A	30	2.3	4.3
GA14-7	A	29	2.6	6.8
GA14-8	A	30	2.4	4.5
GA14-9	A	30	2.1	3.0
GA14-10	P	30	2.8	8.8
GA14-11	A	30	2.2	3.2
GA14-12	A	30	2.0	2.4
GA14-13	A	30	2.4	5.8
GA14-14	A	30	2.1	3.0
GA14-15	A	30	2.2	3.2
GA14-16	A	31	2.0	2.0
GA14-17	A	31	2.0	2.4
GA14-18	A	31	2.0	2.0
GA14-19	A	31	2.2	3.9
GA14-22	A	17	2.7	4.9
GA14-20	P	31	2.4	6.5
GA14-21	A	31	2.0	2.0

**Figure 7-1 2015 -2016 Offshore GA 14E Classification map**



**Figure 7-2 2015 -2016 Offshore GA14W Classification Map**



Growing Area 15  
Seekonk River  
2015 Annual Update

All waters of the Seekonk River, Growing Area 15 are currently prohibited to shellfishing. The area was not sampled in 2015. The area has always been closed to shellfish harvesting because of consistently elevated bacteriological levels, and the area's juxtaposition to a large urban environment. The area is properly classified as prohibited.

**HIGHLIGHTS**

- \* **Sampled 0x in 2015**
- \* **Area is prohibited**

**COMMENTARY**

The Shellfish Program was not able to sample the Seekonk River (Growing Area 15) in 2015. Since the area is classified as prohibited, there is no minimum sampling requirement. The area has always been closed to shellfish harvesting because of consistently elevated bacteriological levels, and the area's juxtaposition to a large urban environment. The Seekonk River is considered a lower priority growing area, because of its prohibited status presently, to be sampled only as extra time and resources (i.e. staff) allow.

The area is properly classified as prohibited.

**RECOMMENDATIONS**

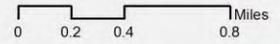
- \* **No action recommended**

Shellfish Growing Area Classification Codes

 Shellfishing Prohibited

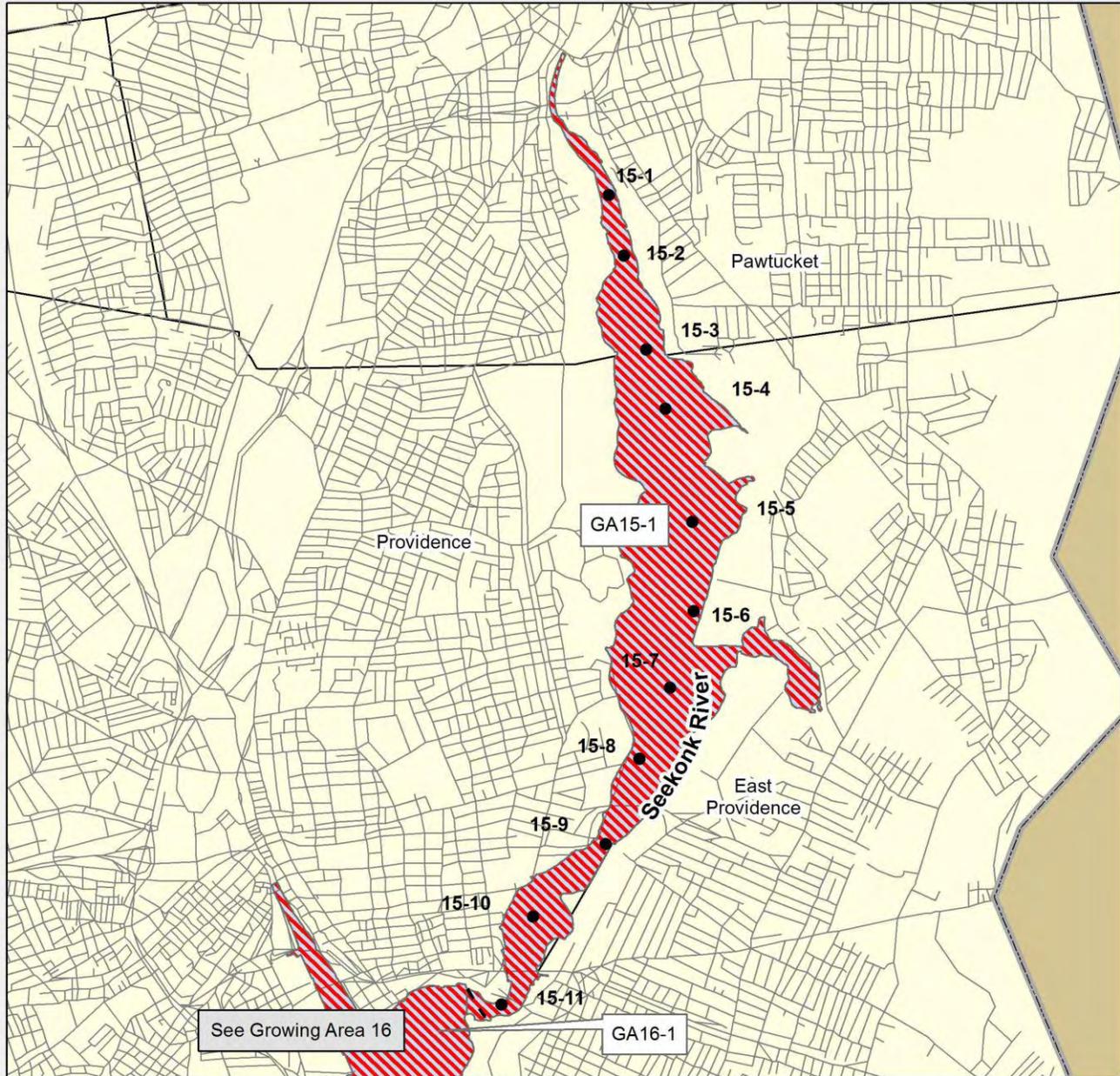
- - Growing Area Boundary

Rhode Island Department  
of  
Environmental Management  
Office of Water Resources  
Shellfish Program



This map is provided only as a general reference for the areas listed as prohibited, seasonal closure or conditional closure in the publication entitled "Notice of Polluted Shellfishing Grounds May 2015". Please refer to that document for the complete legal description of the numbered shellfish closure areas shown here. This map also serves as the legal description for the areas open to shellfishing. Taking of shellfish is prohibited from any waters located on the landward side of the boundary line of waters listed as approved (high tide mark) and the landward side of the boundary line of waters listed as prohibited, conditional closure or seasonal closure, regardless of whether the specific waters are shown or noted as prohibited on the attached maps. At locations where the boundary line crosses water, the boundary shall be a straight line connecting the high tide mark on either side of the water along the main shoreline.

**Seekonk River  
Growing Area 15  
May 2015 - May 2016**



Growing Area 16  
Providence River  
2015 Annual Update

All waters of the Providence River, Growing Area 16 are currently prohibited to shellfishing. The area has always been closed to shellfish harvesting because of consistently elevated bacteriological levels, and the area's juxtaposition to a large urban environment. Two major wastewater treatment facilities discharge directly to the Providence River along with flows from upstream tributaries that are impacted by either additional wastewater treatment facilities or combined sewer overflows. Currently the entire area is properly classified as prohibited. The Providence River and its tributaries have a direct impact on the conditionally operated Upper Narragansett Bay Growing Area 1.

In order to assess the area for use as a controlled relay area a shoreline survey of the lower reaches of the Providence River south of Gaspee and Bullocks Points was completed in 2009. Of the total thirty-two sources identified in the 2009 survey none of the sources exceeded the 2400 fc/MPN criteria which would normally determine the need for follow-up sampling. Only five sources were equal to or exceeded the 240 fc/MPN criteria and following further investigation it was determined that they do not have a negative impact on the area for its limited use as a relay area by the department's Division of Fish and Wildlife under the current restrictions and standard operating procedures for relaying and depuration.

Currently in a cooperative effort between RIDEM, the Narragansett Bay Commission, the shellfish industry and the RIDOH, shellfish prior to being harvested from this limited relay area are sampled to establish baseline contamination levels. The shellstock is then harvested and transplanted to the previously established approved spawning/management areas in which they are unavailable for re-harvest for a minimum of six – twelve months. Prior to the opening of these management areas to the harvest of the relayed stock, they are re-sampled to insure the depuration period has been sufficient to decrease previous contamination levels to acceptable standards. The program has successfully replenished depleted areas of the bay and provides a bountiful winter harvest.

Extensive wet weather sampling of the Providence River was completed in 2010 to assist in the analysis of its impacts to the water quality of the Upper Narragansett Bay Growing Area 1. A detailed report entitled "Upper Bay GA1 Closure Criteria Analysis" is available for review in the programs permanent files.

As part of the programs routine monitoring of the Upper Narragansett Bay growing area 1 sampling runs stations 16-2, 16-3, 16-4 and 16-20 are now routinely monitored along the same schedule as the Upper Bay in addition to targeted wet weather sampling. This initiative is in support of the potential for re-classification of the lower portions of the Providence River and the so called Conimicut Triangle area of GA-1 as the water quality improvements are realized from the completion of the Phase II of upgrades to the Fields Point WWTF and the capture and treatment of additional combined sewer overflows (CSOs). Beginning in March of 2015 wet weather sampling runs were initiated under certain rainfall and bypass conditions resulting in early openings of portions of the Upper Bay.

## **HIGHLIGHTS**

- \* Station GA16-2, 3, 4 and 20 collected along with Upper Bay samples
- \* Sampled 22x in 2015 under a variety of conditions
- \* Area is prohibited

## **COMMENTARY**

The Shellfish Program sampled selected stations in the lower portion of the Providence River (Growing Area 16) twenty-two (22) times in 2015, under a variety of conditions. The area has undergone an intensive monitoring effort by both this office and the Narragansett Bay Commission in order to evaluate the Providence River and Upper Narragansett Bay water quality as a result of the operation of the NBC Wet Weather Tunnel. The results for that monitoring effort are stored separately from the strictly Shellfish database because of the need to segregate the data for various reasons. (See documentation for Providence River post-storm supplemental monitoring and targeted wet weather event monitoring).

It was decided to add Stations 2, 4, 3 and 20 in the Providence River to the Upper Bay monthly monitoring runs in 2014 to see what sort of bacteriological background we are seeing in the lower portion of the Providence River north of Conimicut Point should the area ever be considered for shellfish management purposes or reclassification as a conditionally approved area.

## **RECOMMENDATIONS**

- \* Continue monitoring at Station 2, 3, 4, 20 to gather sufficient data n=30 to support re-classification.
- \* No action recommended for this year

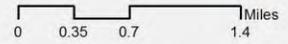
**RIDEM Routine Monitoring Results all mTEC  
Most Recent n=15 Dry Conditions  
(Includes GA1-12)**

Date of Sampling	Days after - X" Rain	GA1-12	GA16-20	GA16-2	GA16-3	GA16-4
09/08/14	1 - 0.37"	2	9	16	2	18
10/10/14	8 - 0.93"	2	2	2	2	4
10/30/14	8 - 0.86"	2	2	6	4	2
12/04/14	8 - 1.57"	11	16	2	2	14
01/14/15	2 - 0.36"	8	2	2	2	2
03/24/15	3 - 0.18"	2	2	2	4	4
04/13/15	18 - 0.81"	2	2	2	2	2
05/06/15	15 - 1.03"	2	2	6	2	8
05/21/15	30 - 1.03"	4	10	2	4	4
07/22/15	8 - 0.42"	2	2	2	4	2
07/31/15	4 - 0.44"	4	2	2	6	14
08/19/15	8 - 0.99"	2	2	2	2	2
09/22/15	10 - 1"	2	2	2	4	8
10/15/15	2 - 0.29"	2	2	2	2	4
11/10/15	12 - 1.49"	2	2	2	2	6
	Geo Mean	2.70	2.83	2.66	2.71	4.67
	Variability % > 31	0.00%	0.00%	0.00%	0.00%	0.00%

Shellfish Growing Area Classification Codes

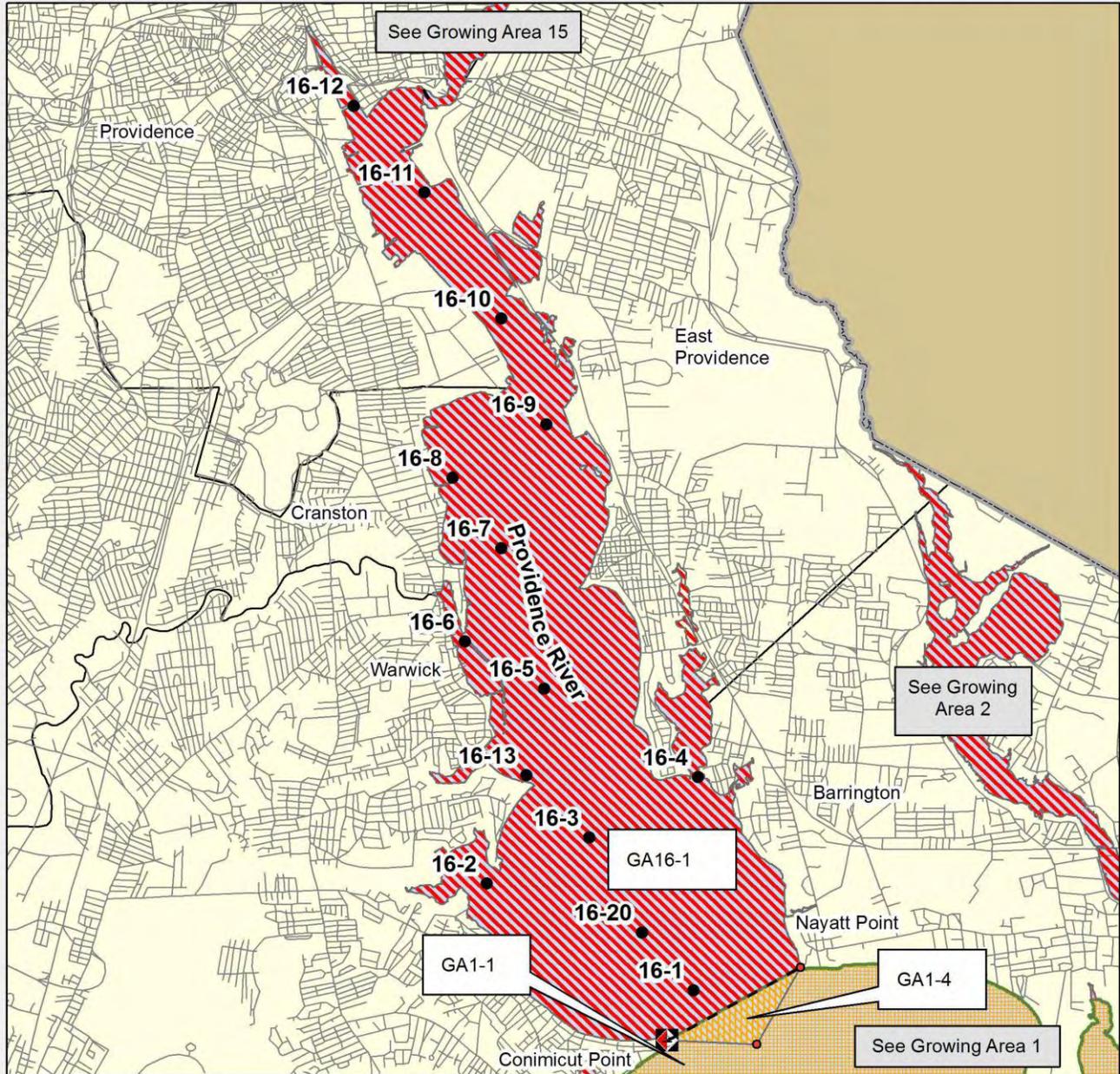
- Growing Area Boundary
-  Conditional Closure
-  Shellfishing Prohibited

Rhode Island Department  
of  
Environmental Management  
Office of Water Resources  
Shellfish Program



This map is provided only as a general reference for the areas listed as prohibited, seasonal closure or conditional closure in the publication entitled "Notice of Polluted Shellfishing Grounds May 2015". Please refer to that document for the complete legal description of the numbered shellfish closure areas shown here. This map also serves as the legal description for the areas open to shellfishing. Taking of shellfish is prohibited from any waters located on the landward side of the boundary line of waters listed as approved (high tide mark) and the landward side of the boundary line of waters listed as prohibited, conditional closure or seasonal closure, regardless of whether the specific waters are shown or noted as prohibited on the attached maps. At locations where the boundary line crosses water, the boundary shall be a straight line connecting the high tide mark on either side of the water along the main shoreline.

**Providence River  
Growing Area 16  
May 2015 - May 2016**



Mount Hope Bay  
Growing Area 17  
2015 Annual Update

A shoreline survey of the Mount Hope Bay Growing Area 17 was conducted in 2014. This shoreline survey identified fifty-six (56) actual and potential pollution sources to this growing area. Twenty two of the sources were actively flowing at the time of the survey of which twenty sources have the potential to impact the conditionally approved area. However, none of the results from sampling exceeding 240 cfu/100ml. The highest result was 93 cfu/100ml with the majority of results in the single digit category. Therefore no samples of sources were collected for this annual update.

A TMDL for Mount Hope Bay and the Kickemuit River was approved by the EPA on January 14, 2010. All waterbody segments in Mount Hope Bay experience elevated levels of fecal coliform bacteria following rain events, hence the “conditional classification” of this growing area. This TMDL provides a detailed plan for reducing bacterial pollution so that the Rhode Island portion of Mount Hope Bay can meet numeric water quality targets for all designated uses affected by bacteria pollution: shellfishing and primary and secondary contact recreational use under all weather conditions.

In the fall of 2013 FDA with support from RIDEM, Massachusetts Marine Fisheries, EPA, and CRMC a hydrologic dye study was conducted of the area of Mt Hope Bay impacted by effluent from the Fall River Treatment plant. Although the final report is not yet available FDA has advised both RI and Massachusetts that under routine operations the classifications as prohibited adjacent to the treatment plant as currently delineated is sufficient to provide the recommended 1000:1 dilution. All marinas located within Mt Hope Bay are within this closed safety zone requiring no additional closure for potential marina discharges.

### **HIGHLIGHTS**

- \* **Sampled 12x in 2015**
- \* **Statistics represent dry weather, approved data >10/01/14 (N = 15)**
- \* **All conditionally approved stations are in compliance and conformance**
- \* **mTEC=15 (<31 cfu/100ml)**
- \* **Data run 2/10/16**

### **COMMENTARY**

**Mt. Hope Bay (Growing Area 17) was sampled twelve times for 2015. All samples were collected during dry weather conditions when the area was “open/approved” for shellfish harvesting. The statistical evaluation for Mt. Hope Bay incorporates the most recent 15 dry weather samples collected for the area, the minimum number required by NSSP Manual of Operations guidelines for conditionally approved areas.**

**Results of the statistical evaluation demonstrate that all conditionally approved stations may or may not be in compliance with NSSP guidelines.**

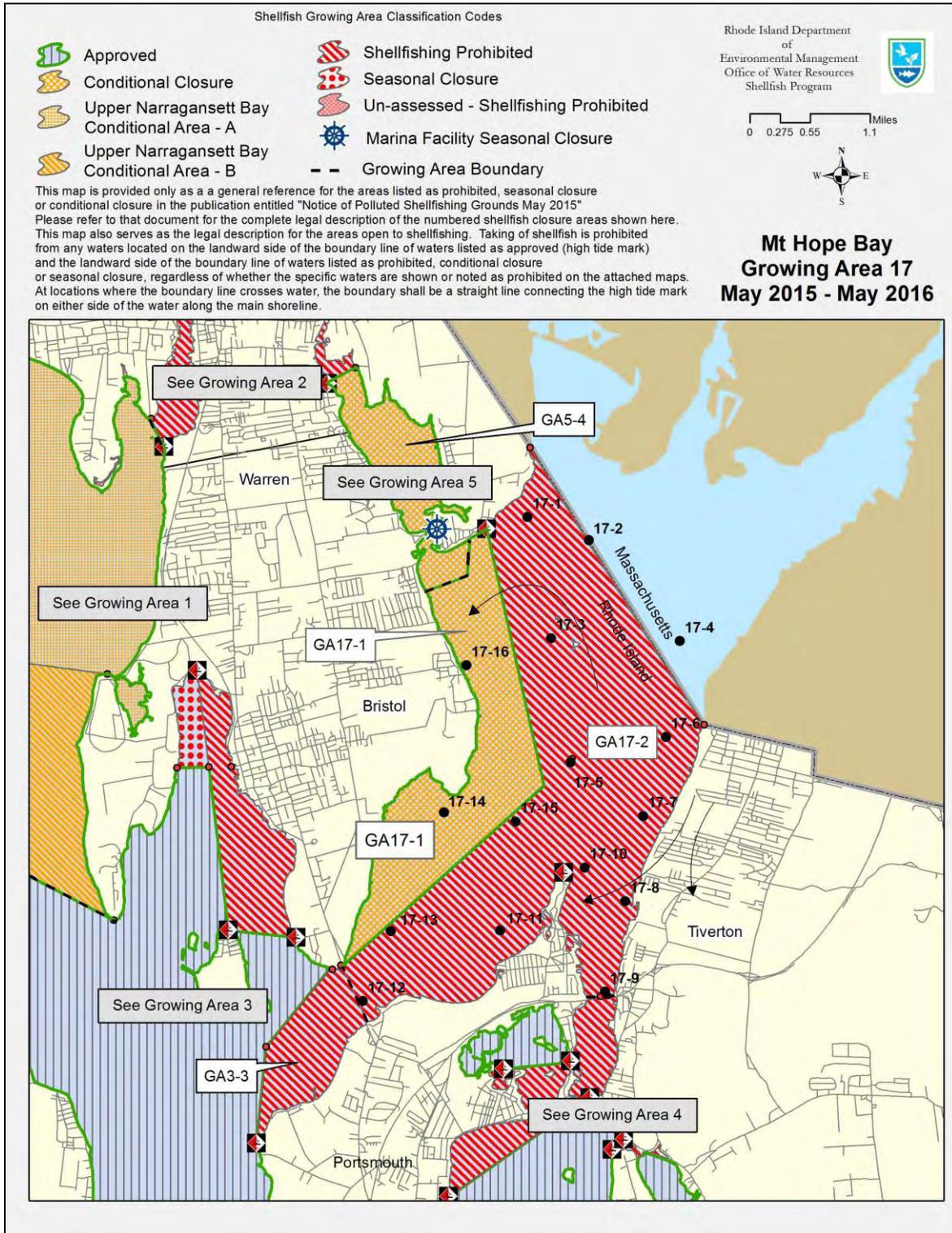
### **RECOMMENDATIONS**

- \***All conditionally approved stations in compliance.**

## ***RIDEM SHELLFISH GROWING AREA MONITORING RESULTS***

<b><i>Station Name</i></b>	<b><i>Status</i></b>	<b><i>N</i></b>	<b><i>FECAL-GEO MEAN</i></b>	<b><i>%&gt;CRITICAL 31</i></b>
GA17-1	P	15	2.9	0.00
GA17-2	P	15	2.9	0.00
GA17-3	P	15	7.5	6.67
GA17-4	P	15	2.7	0.00
GA17-5	P	15	3.0	0.00
GA17-6	P	15	2.9	0.00
GA17-7	P	15	2.8	0.00
GA17-8	P	15	2.8	0.00
GA17-9	P	15	2.6	0.00
GA17-10	P	15	2.4	0.00
GA17-11	P	15	2.7	0.00
GA17-12	P	15	2.1	0.00
GA17-13	P	15	4.0	6.67
GA17-14	CA	15	3.0	0.00
GA17-15	P	15	2.3	0.00
GA17-16	CA	15	3.4	0.00

# 2015 – 2016 Shellfish Classification Map Mt Hope Bay GA 17



The next required survey would be an annual update scheduled for 2016.