Reappraisal Report for Shellfish Growing Area BB4
(Little Sheepshead Creek to Westecunk Creek)

March 2014

State of New Jersey
Chris Christie, Governor
Kim Guadagno, Lt. Governor

NJ Department of Environmental Protection
Bob Martin, Commissioner

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(Little Sheepshead Creek to Westecunk Creek)

New Jersey Department of Environmental Protection
Water Resources Management

Water Monitoring and Standards

Bureau of Marine Water Monitoring
Bruce Friedman, Bureau Chief

March 2014

2009 - 2013

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Cover Photo – Bond Life Saving Station, Holgate, NJ

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EXECUTIVE SUMMARY

Shellfish Growing Area BB4 consists of all the back bay waters that extend six miles from Little Sheepshead Creek in the southerly sector of Little Egg Harbor to an area just south of Westecunk Creek in the northern sector, and east from those locations to Long Beach Island. In total, there are 13,698 shellfish growing water acres in BB4.

The current acreage by classification equates to 12,781 *Approved*, 595 *Seasonal* (Nov – Apr), 172 *Special Restricted,* and 150 *Prohibited*. The BB4 classification chart (i.e., chart 10) with these acreages can also be reviewed in the 2012 Shellfish Growing Water Classification Charts.

In this Reappraisal, a shellfish growing water classification downgrade from *Special Restricted* to *Prohibited* has been proposed for a 23.4 acre section of Tuckerton Creek. The downgrade was based on continually unacceptable bacteriological results observed within the data for the downgrade sector of the creek.

The downgrade area and other classifications for BB4 can be seen in the map (above right). Post downgrade, acreage by classification for this shellfish growing area will equate to 12,781 *Approved*, 595 *Seasonal* (Nov – Apr), 149 *Special Restricted*, and 173 *Prohibited*. This revision in BB4 classifications can also be reviewed in the Shellfish Growing Water Classification Charts section (see *www.state.nj.us/dep/wms/bmw*) or by hard copy in the 2014 Shellfish Growing Water Classification Charts.

Shellfish Growing Area BB4 does not have influences on water quality related to direct discharge from treatment facilities. As such, BB4 is sampled utilizing the Systematic Random Sampling (SRS) strategy.

There is potential for inputs that might emanate from streams, creeks, lagoon/bayfront properties, marinas, or storm water outfalls located within the waters of BB4. Water Monitoring and Standards/Bureau of Marine Water Monitoring (WM&S/BMWM) maintain a continuing monitoring effort throughout these and all State shellfish growing waters to ensure public health with regard to water quality impact or potential for impact.

The monitoring program for shellfish growing waters provided by WM&S/BMWM in conjunction with National Shellfish Sanitation Program (NSSP) criteria provides the basis for designating shellfish growing water classifications in the State. For this reappraisal, the monitoring results for
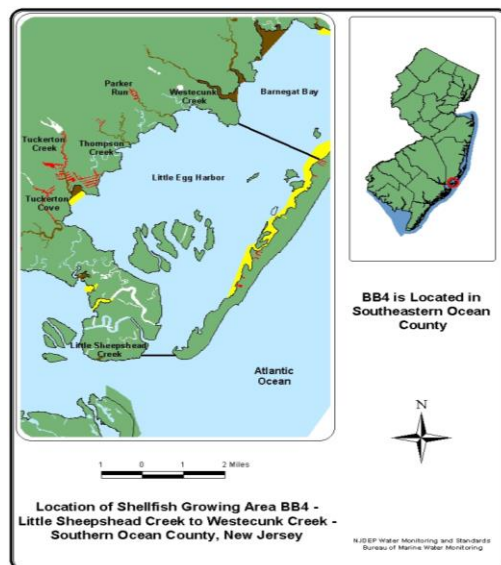
station samples collected between January 2009 and October 2013, comply with NSSP criteria, providing acceptable data for shellfish growing water quality, with the exception of the results related to the downgrade noted on the previous page. In all other cases, classifications are appropriately designated for the waters in which BB4 stations are located.

GROWING AREA PROFILE

LOCATION AND DESCRIPTION

This Reappraisal covers the shellfish growing waters of Little Egg Harbor (BB4 – shown to the right). BB4 extends along six miles of back bay waters encompassing the entire area from Little Sheepshead Creek in the southwest, eastward to the southerly extent of Forsythe National Wildlife Refuge on Long Beach Island, then northeast to Beach Haven Terrace, and west across the bay toward an area just south of Westecunk Creek (Please Note: all references to "miles" in this report are in Nautical Measure, whereby, one Nautical Mile equates to 6,086 feet).

Most of the BB4 shellfish growing waters are classified as *Approved.* Smaller sections of *Seasonally Approved, Special Restricted*, and *Prohibited* waters are found within the western and eastern sectors of the growing area.

BB4 is Located in Southeastern Ocean County

Location of Shellfish Growing Area BB4 -
Little Sheepshead Creek to Westecunk Creek -
Southern Ocean County, New Jersey

NJDEP Water Monitoring and Standards
Bureau of Marine Water Monitoring

A number of water sources are contained in BB4, aside from Little Egg Harbor Bay. These would include Little Sheepshead Creek, Big Sheepshead Creek, Jimmies Creek, Little Thorofare, Big Thorofare, Tuckerton Creek, Jeremy Creek, Thompson Creek, Jesses Creek, and Parker Run. These water sources feed into the Little Egg Harbor embayment. Most of these creeks, thorofares or runs are classified as *Special Restricted* or *Prohibited* depending on water quality, or the presence of nearby infrastructure such as lagoon/bayfront communities and marinas that have potential to provide adverse inputs to waterways. In some cases, *Seasonally Approved* classifications are designated at the mouths of these waterways. Tuckerton Creek's, Tuckerton Cove provides an example of this.

Little Egg Harbor and a portion of Great Bay, located southwest of BB4 are often considered to be the southerly portion of what many consider, Barnegat Bay. Together, the waters of these areas eventually flow toward the Atlantic Ocean by way of the Little Egg or Beach Haven Inlet.

There is a mixture of year round and seasonal communities that surround shellfish growing area BB4. With seasonal expansions in population, this area experiences greater population density during late spring, summer, and early fall. Although much of the area surrounding BB4 is not heavily populated, there has been residential development and redevelopment within the towns that comprise the eastern and western shoreline since the last report was written in 2011. Commercial development within this growing area is extremely limited.

GROWING AREA CLASSIFICATION SUMMARY

There was a Reappraisal completed for Shellfish Growing Area BB4 in 2011, which was revised in 2012. The last sanitary survey for this area was compiled in 2005 and finalized in 2009. In the period between those two reports, there was a Reappraisal written in 2008. In the 2008 Reappraisal, a downgrade of 23.19 acres of *Special Restricted* waters to *Prohibited* was presented for a portion of Tuckerton Creek, due to water quality. This current Reappraisal or the Reappraisal for 2014, adds an additional 23.4 acre downgrade of *Special Restricted* waters to *Prohibited* in Tuckerton Creek. Again, as in 2008, this downgrade is proposed for degrading bacteriological results, presenting a water quality/classification issue. Going forward, this additional downgrade finalizes a change in classification for the entire length of Tuckerton Creek from *Special Restricted* to *Prohibited*.

Current Classification for Shellfish Growing Area BB4 - Little Sheepshead Creek to Westecunk Creek - Southern Ocean County, New Jersey

Shellfish Growing Water Classifications by Percentage and Acreage – Shellfish Growing Area BB4

23.4 Acre Section of Tuckerton Creek to be Downgraded from Special Restricted to Prohibited - Shellfish Growing Area BB4 - Little Sheepshead Creek to Westecunk Creek - Southern Ocean County, New Jersey

Shellfish Growing Water Classifications by Percentage and Acreage after Downgrade - Shellfish Growing Area BB4

BB4 has an area of 13,698 acres. Current acreage by growing water classification follows: *Approved* – 12,781, *Seasonal* (Nov-Apr) - 595, *Special Restricted* – 172, and *Prohibited* - 150. Following the downgrade proposed in this Reappraisal, BB4 classification acreage will change to: *Approved* – 12,781, *Seasonal* (Nov-Apr) – 595, *Special Restricted* – 149, and *Prohibited* - 173. Current and proposed classifications along with growing water acreage and percentages are shown on the previous page. As noted in the Executive Summary, BB4 classifications can also be reviewed in the State of New Jersey Shellfish Growing Water Classification Charts section of the WM&S/BMWM website (see *www.state.nj.us/dep/wms/bmw*).

EVALUATION OF BIOLOGICAL RESOURCES

There are a large number of plants and animals that comprise the Barnegat Bay Estuary, and its component section, Little Egg Harbor or BB4. They provide us with a very unique estuarine community. As a result, there is a conservative balance between the species (plant, animal, and human) that live and interact within and about this estuarine system.

For the regional area known as Barnegat Bay, the blue crab (Callinectes sapidus) and the hard clam (Mercenaria mercenaria) represent today's most important shellfish species from a recreational and commercial standpoint. For the purpose of this report, the focus is predominately placed on the hard clam bi-valve.
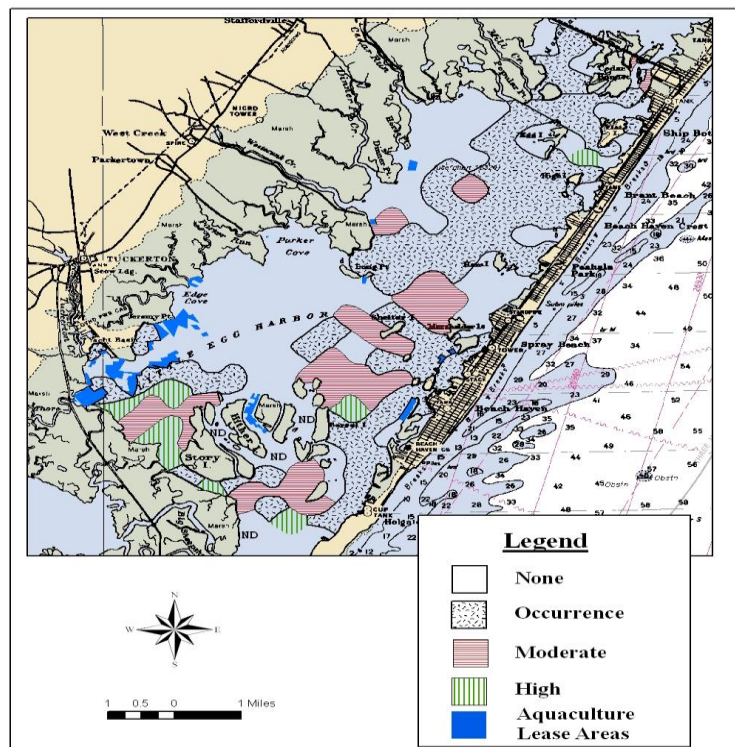
Historically, baymen working the *Approved* and *Seasonally Approved* sections of this shellfish growing area have harvested hard clams (Mercenaria mercenaria) and soft shelled clams (Mya arenaria). However, the dominant molluscan shellfish species in this area is the hard clam, as minimal numbers of soft shelled clams are present today. (Celestino, 2011) provided the NJDEP Fish and Wildlife hard clam survey map for a portion of shellfish growing area BB4, shown above.

Approximately 98% of BB4 shellfish growing waters are currently classified as *Approved* or *Seasonally Approved* for the harvest of shellfish. There are no quotas set for the harvest of hard clams in *Approved* and *Seasonally Approved* waters. However, areas designated as *Seasonally Approved* can only be harvested during winter months. The specific months during which a *Seasonally Approved* area can be harvested are November through April (six months) or January through April (four months) depending on the variation of water quality within these time frames. At present, there are no waters in BB4 classified as Seasonal (Jan – Apr).

With 98 % of the water's contained in BB4 classified as *Approved* or *Seasonally Approved*, there are substantial amounts of waters currently available for the harvesting of shellfish. This makes the Barnegat Bay Estuary, which contains the waters of BB4 or Little Egg Harbor, a very valuable ecological, biological, recreational, and commercial resource. Due to its natural and economic value, the Barnegat Bay was made a part of the National Estuary Program in July of 1995 by the USEPA.

SHORELINE SURVEY: EVALUATION OF POTENTIAL POLLUTION SOURCES

Shoreline surveys or site specific tours of areas nearby or abutting shellfish growing waters can provide insight as to the location and nature of land use, surface water discharges, marinas, unpermitted discharges, and stormwater inputs. Shoreline surveys of BB4 were conducted on 08/20/13, 09/10/13 and 09/13/13. The following sections detail information derived collectively from those surveys (also see – p. 15, Bacteriological Quality, Compliance with NSSP SRS *Special Restricted* Criteria), and relevant information from surveys preceding those dates.

LAND USE

Urban environments, comprised of numerous municipalities are interspersed and make up the primary development in the area surrounding BB4. The communities along the shore to the east and those immediately to the west are primarily using city water and sewer, although there are communities further inland utilizing septic and well systems.

There is little agriculture connected with the lands abutting BB4. The vegetative communities comprising the ecosystems of BB4 are generally composed of either wetland or pineland forest species. The figures below show the land use, vegetation, and municipalities that surround this shellfish growing area.

Coastal Land Use Patterns for Shellfish Growing Area BB4 - Little Sheepshead Creek to Westecunk Creek - Southern Ocean County, New Jersey

Coastal Municipalities for Shellfish Growing Area BB4 - Little Sheepshead Creek to Westecunk Creek - Southern Ocean County, New Jersey
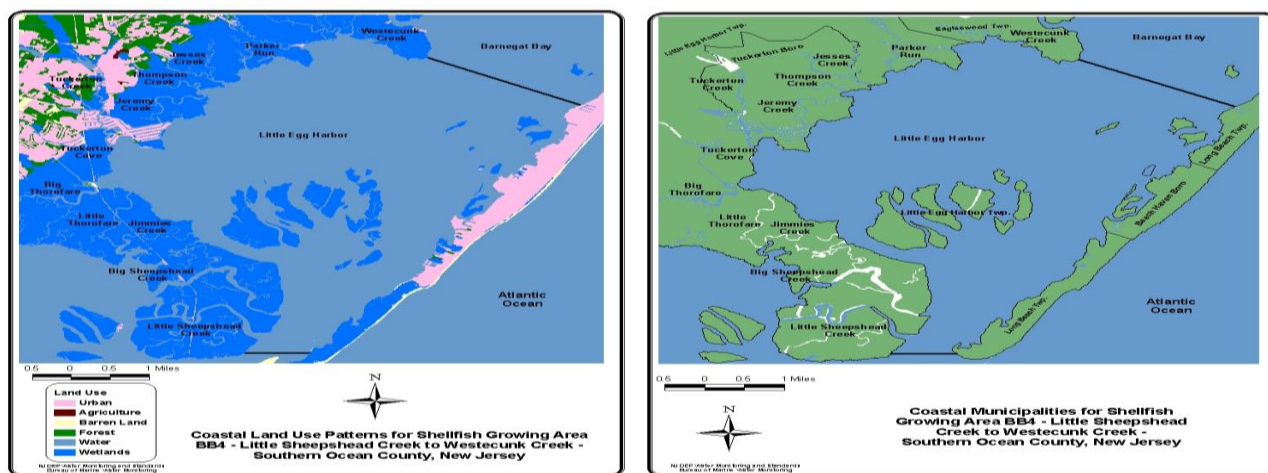
The mainland side of the bay has large areas of wetlands, which become forested lands further inland. Many of the wetlands make up protected lands for the Edwin B, Forsythe National Wildlife

Refuge and the Great Bay Wildlife Management Area. Generally, the barrier islands that make up the eastern side of BB4 have sporadic areas of wetlands located in or alongside the bay.

Projects bordering on eco-sensitive areas (e.g., salt marshes) are required by local, state, and federal regulations to utilize specific set backs and buffers as a means of protecting flora and fauna specific to wetland, riparian, or estuarine locations.

The majority of urban developed areas along the bay contain bayfront or lagoonfront communities. Lagoonfront communities consist of dredged canals/lagoons running through residential communities. Lagoon and bayfront communities are frequently the choice for recreational boaters, as these types of developments provide access to the bay for boat traffic.

SURFACE WATER DISCHARGES

There are no direct discharges from factories, wastewater treatment facilities, or generating stations in Shellfish Growing Area BB4. Although some near by residences utilize septic systems, wastewater from communities and businesses in this area is generally treated at the Ocean County Utilities Authority - Southern Water Pollution Control Facility. Treated effluent is then discharged into the ocean east of 5th Street in Ship Bottom. The ocean location for this discharge or the outfall is some distance from the bayside location of growing area BB4. As a result, it would have no impact on the waters classified for this site.

MARINAS

Marina facilities have the potential to affect the suitability of shellfish growing areas for the harvest of shellfish. This potential evolves from the concern over public health and safety in relation to the biological and chemical contamination that may be associated with marina facilities.

There are 48 marinas in Shellfish Growing Area BB4. All marina facilities for this growing area are shown and represented in the figure and table shown on the following pages. Generally, these marinas are spread along much of the eastern side of the BB4 shoreline (west side of Long Beach Island), and throughout Tuckerton Creek. The majority of the marinas are located in or near developed urban areas. Frequently, the marinas situated in this shellfish growing area are located outside lagoon and bayfront communities, or within BB4 cove areas and creeks.

The waters enclosed by marinas are classified as *Prohibited*. Depending on the size of the marina and water quality, the waters immediately adjacent to each marina may be classified as *Prohibited*, *Special Restricted,* or *Seasonally Approved* (no harvest during summer months when the marina is active).

Marina buffer zones for State waters were calculated using the NJ Marina Buffer Equation or the Virginia Model (i.e., computer model developed by the State of Virginia). Both equations are approved by the US Food and Drug Administration. For more information on marinas and marina buffers, see the Shellfish Growing Area Report Guidance Document.

Location of Marinas and Marina Buffers for Shellfish Growing Area BB4 - Little Sheepshead Creek to Westecunk Creek - Southern Ocean County, New Jersey
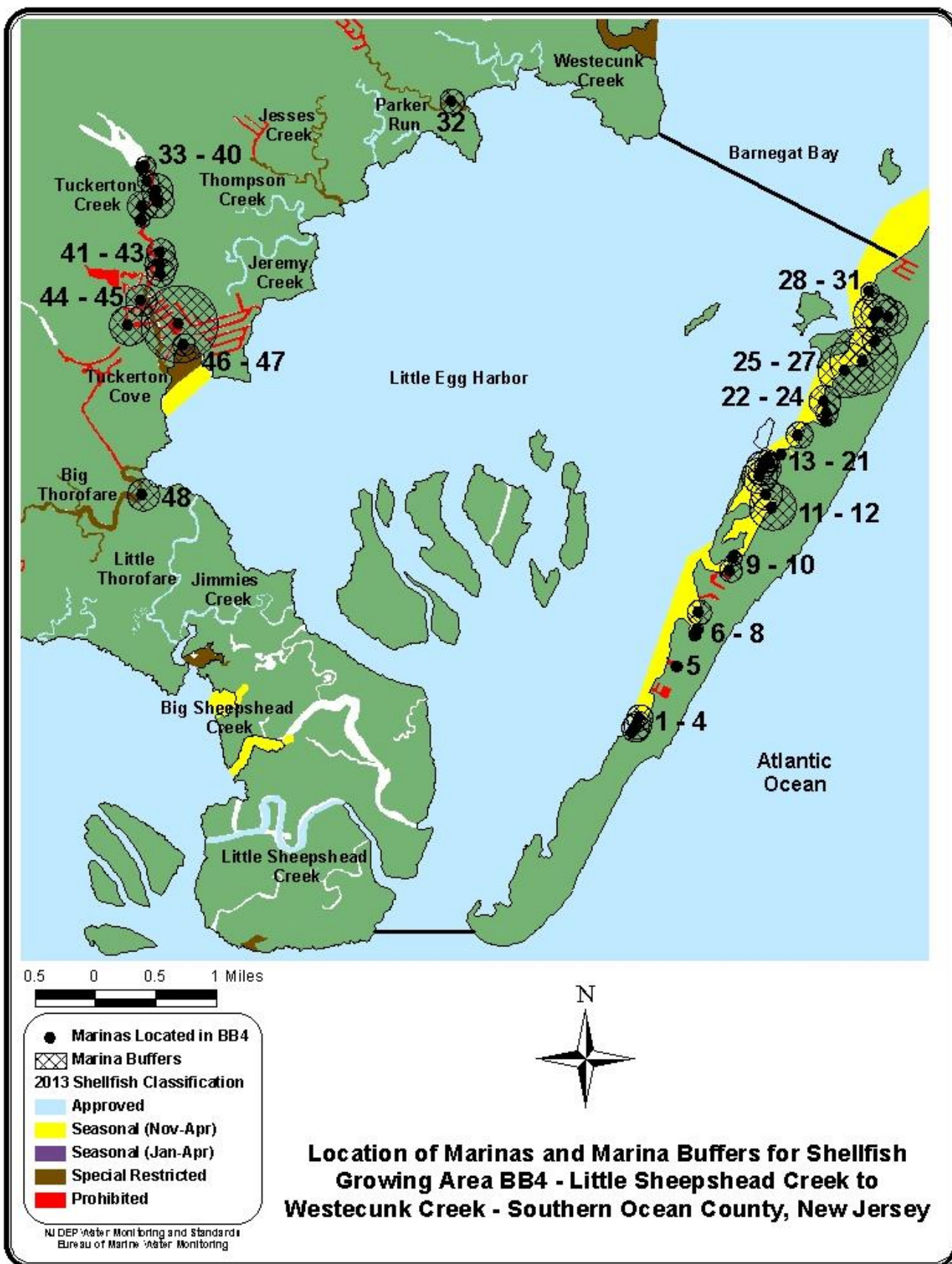
Marina Map Key									
Map ID	Name	Location	# of Slips	Slips > 24 ft	slips < 24 ft	Depth (ft)	Buffer (radius, ft)	VA Model	Onsite Pumpout
1	Woehrs Marine Dock	Little Egg Harbor	55	30	25	5	18.00	Yes	-
2	Farrenys Boat Basin	Little Egg Harbor	30	20	10	5	602.00	-	-
3	Lindys Trailer Park	Little Egg Harbor	30	20	10	5	602.00	-	-
4	BB4 Condo 2	Little Egg Harbor	20	20	0	5	567.00	-	-
5	Holgate Marina	Little Egg Harbor	150	80	70	4	206.00	Yes	-
6	BB4 Private Property 2	Little Egg Harbor	10	0	10	4	228.00	-	-
7	BB4 Private Property 1	Little Egg Harbor	10	0	10	4	228.00	-	-
8	South Gate Marina	Little Egg Harbor	27	10	17	4	538.00	-	-
9	Mordecai Boat Basin	Liberty Thorofare	30	10	20	5	494.00	-	-
10	Sams Cotovs Dock	Liberty Thorofare	10	5	5	5	318.00	-	-
11	Little Egg Yacht Club	Liberty Thorofare	80	60	20	5	1023.00	-	-
12	BB4 Condo 4	Liberty Thorofare	30	30	0	5	694.00	-	-
13	BB4 Condo 3	Little Egg Harbor	38	38	0	5	781.00	-	-
14	BB4 Condo 5	Little Egg Harbor	17	17	0	5	522.00	-	-
15	Beach Haven Yacht Club & Marina	Little Egg Harbor	36	36	0	5	760.00	-	-
16	BB4 Condo 6	Little Egg Harbor	12	12	0	5	439.00	-	-
17	Black Whale Cruises Dock	Little Egg Harbor	10	10	0	5	401.00	-	-
18	Pollys Dock Rowboat	Little Egg Harbor	10	10	0	5	401.00	-	-
19	Beach Haven Municipal Slips	Little Egg Harbor	11	11	0	5	420.00	-	-
20	Morrisons Beach Haven Marina	Little Egg Harbor	136	100	36	5	111.00	Yes	-
21	Harborview Club & Marina Condo	Little Egg Harbor	24	20	4	5	581.00	-	-
22	Shelter Harbor Marina Condo	Little Egg Harbor	205	190	15	7	229.00	Yes	-
23	Garabos Marina	Little Egg Harbor	30	20	0	7	479.00	-	-
24	Eastern Marine	Little Egg Harbor	40	35	5	6	697.00	-	-
25	Sportmans Marina	Little Egg Harbor	70	50	20	3	1215.00	-	-
26	Spray Beach Yacht Club	Little Egg Harbor	130	100	30	4	1471.00	-	-
27	Bay Haven Marina	Little Egg Harbor	30	20	10	5	602.00	-	-
28	BB4 Condo 1	Little Egg Harbor	58	58	0	5	965.00	-	-
29	Southwicks Marina	Little Egg Harbor	45	40	5	5	814.00	-	Yes
30	Escape Harbor Marina	Little Egg Harbor	66	40	26	6	791.00	-	-
31	BB4 Unknown 1	Little Egg Harbor	10	10	0	5	401.00	-	-
32	BB4 Unknown 2	Parker Run	50	50	0	5	537.00	Yes	-
33	Stewart Marine	Tuckerton Creek	15	15	0	6	434.00	-	-
34	BB4 Unknown 4	Tuckerton Creek	5	5	0	6	250.00	-	-
35	Tuckerton Seaport	Tuckerton Creek	17	17	0	5	458.00	-	-
36	Tuckerton Municipal Docks	Tuckerton Creek	32	32	0	5	690.00	-	-
37	Phil Keeney & Sons	Tuckerton Creek	10	10	0	9	304.00	-	-
38	G.E.B. Marina/Dockside Café	Tuckerton Creek	53	25	28	5	693.00	-	-
39	Skinners Marina	Tuckerton Creek	65	35	30	8	655.00	-	-
40	BB4 Unknown 3	Tuckerton Creek	10	10	0	8	317.00	-	-
41	Cedar Cove Marina	Tuckerton Creek	62	32	30	8	617.00	-	-
42	Tuckerton Marine Servicenter	Tuckerton Creek	55	25	30	5	712.00	-	Yes
43	Maritime Marine	Tuckerton Creek	40	20	20	5	624.00	-	-
44	Schimpf's Marina	Tuckerton Creek	76	40	36	8	683.00	-	-
45	Total Marine Inc.	Tuckerton Creek	80	60	20	7	865.00	-	-
46	Shelter Cove Marina	Tuckerton Creek	176	176	0	5	1681.00	-	Yes
47	Originally Bills Marina	Tuckerton Creek	12	12	0	4	491.00	-	-
48	First Bridge Marina & Kayaks	Big Thorofare	38	19	19	4	693.00	-	-

SPILLS, UNPERMITTED DISCHARGES, AND CLOSURES

In addition to Hurricane Irene (August 2011) and Superstorm Sandy (October 2012), which brought about the interim closure of all State shellfish growing waters as a precaution for public health and safety, there was one spill or unpermitted discharge that resulted in the closure of waters in shellfish growing area BB4. That spill was the result of a broken force main in one of the Ocean County Utility Authority's pump stations located on Green Street in Tuckerton. A 44.84 acre shellfish growing water closure resulted in the *Seasonal* (Nov. – Apr.) waters of Tuckerton Cove. The closure was the result of a 75,000 – 100,000 gallon raw sewage release, which produced FC bacteriological inputs to the water body. The closure was instituted on 11/15/11 and lifted on 11/21/11.

Leaks or spills that do take place within New Jersey's shellfish growing waters are often the result of a variety of circumstances such as boats sinking, issues with sewage treatment plants such as pump station failure, broken sewer lines, sewer line back up, manhole overflow, broken pipes in commercial or residential locations, improper run off from commercial or residential locations, construction, and road runoff.

Often, the spills or unpermitted discharges noted in the above paragraph have limited impact on the chemical or bacteriological water quality in a shellfish growing area like BB4. Generally, the spills and discharges are rather small, and their distance to these shellfish growing waters is such that impact is reduced from dilution, percolation, and absorption. From the perspective of this report, which is generally founded on bacteriological results for fecal coliform, WM&S/BMWM sample locations for BB4 generally show relatively good water quality.

STORM WATER DISCHARGES

Environmental pressures on shellfish beds in New Jersey can originate in materials that enter growing waters via stormwater. These materials include bacteria, as well as other waste that enters the stormwater collection system or waterways of a shellfish growing area from runoff.

Deriving information on the location and nature of stormwater inputs is partially accomplished by conducting shoreline surveys of shellfish growing area waterways, contributing waterways (e.g., rivers, creeks, etc.), and nearby communities. Shoreline surveys of the back bay, its contributing waterways (e.g., streams, creeks, runs, etc.), and nearby communities for this shellfish growing area have provided evidence of two ways that storm runoff enters the estuarine waters of BB4.

Stormwater delivered to these shellfish growing waters can be derived from non-directed runoff/input. Stormwaters also arrive by more specific means of drainage such as outfalls.

For BB4, non-directed runoff/input flows over land into streams, creeks, marina basins, and lagoon/bayfront community areas. Non-directed runoff then can occur in both developed community locations and more natural environs.

Stormwater outfalls are generally found near more developed areas. Examples of such locations would include lagoon/bayfront communities or marina basins that are found within the shellfish growing area. Most stormwater outfalls for BB4 are concentrated in Tuckerton Creek (western side of the bay), and Beach Haven (eastern side of the bay).

Stormwater can especially impact lagoon communities and marina basins where pollutants can be concentrated for some time depending on rain, wind, and tide. Numerous stormwater outfalls can be found in lagoonfront communities. The pollutants that gather in lagoon communities and the basins of marinas are often more prevalent during summer when populations and utilization increase.

Lagoons, like marina basins are always classified as *Prohibited* waters. Further, the water's outside most lagoons have been classified as *Seasonally Approved* or *Special Restricted*, which provide additional buffers.

The eventual conveyance of pollutants from stormwater drains can be concentrated too. Pollutants within these systems have often been held for some time before receiving enough water to flush or purge the infrastructure.

Inputs found in stormwater such as petrochemicals, cleaning materials, paints, wood preservatives, animal waste or remains, and fertilizers come from a variety of sources. These sources again include lagoon/bayfront communities, marinas, creeks, streams, and rivers. Sources can also include boats, cars, birds, and domesticated/non-domesticated animals. The locations of stormwater outfalls for Shellfish Growing Area BB4 are shown to the right.

Indirect Discharges (i.e., Stormwater Outfalls) for Shellfish Growing Area BB4 - Little Sheepshead Creek to Westecunk Creek - Southern Ocean County, New Jersey
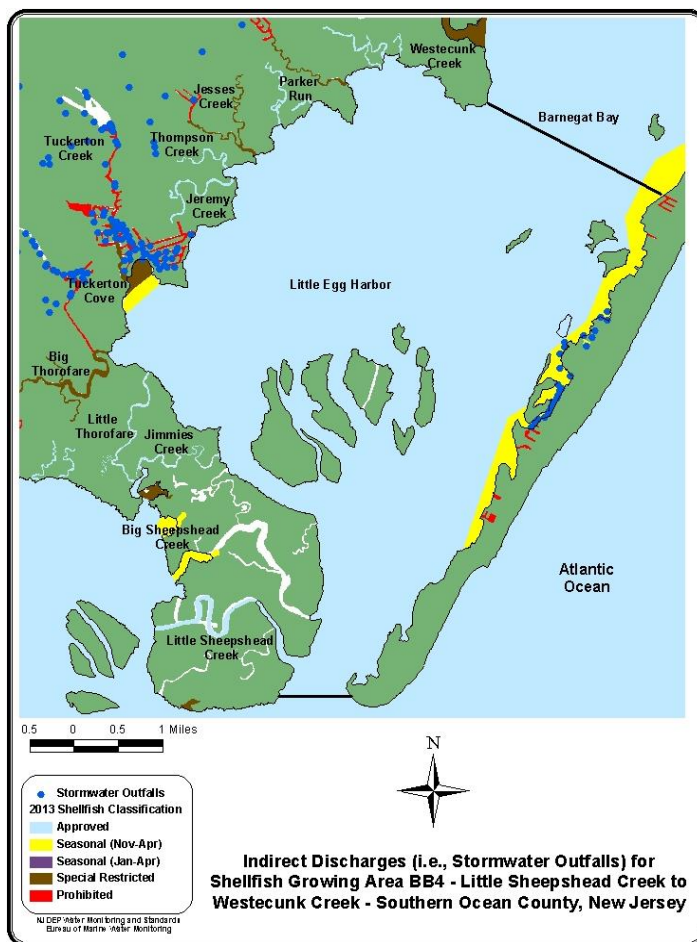
WATER QUALITIES STUDIES

SAMPLING STRATEGY

Shellfish growing area BB4 was sampled using the Systematic Random Sampling (SRS) strategy. Utilization of the SRS strategy requires using a minimum of the most recent thirty samples collected for each sampling station, which brought about an analysis of data from January 2009 to October 2013.

With the SRS strategy, the 30 sample composite of data is supported by a minimum requirement of six samples per year. The SRS strategy is frequently used in areas where precipitation, seasonality, or tide play important roles. New Jersey commonly uses SRS strategy for back bay waters.

Each shellfish producing state is directed to adopt either the total coliform or fecal coliform criterion to classify its waters. The criteria were developed to ensure that shellfish harvested from designated waters would be free of pathogenic (disease-producing) bacteria. Combinations of these criterion may also be used. While New Jersey had been using fecal coliform analysis (direct 3-tube, A-1) and criteria for its ocean waters and total coliform analysis (3-tube, 3-dilution) and criteria for its back bay

areas, BMWM/WM&S switched all State shellfish growing areas over to the criteria for fecal coliform in February, 2012, and the method for analysis changed as well.

BMWM/WM&S now use mTEC agar plating to facilitate the fecal coliform bacteriological analysis for samples taken within New Jersey shellfish growing areas, and had been acquiring adjunct mTEC data for its growing areas for some time in order to statistically facilitate the transition to mTEC. Statistical facilitation, in the case of Shellfish Growing Area BB4 refers to converting past, 3-tube TC data to 3-tube FC data, then combining that data in a conversion process with current mTEC data in order to obtain statistically valid measurements during the transition.
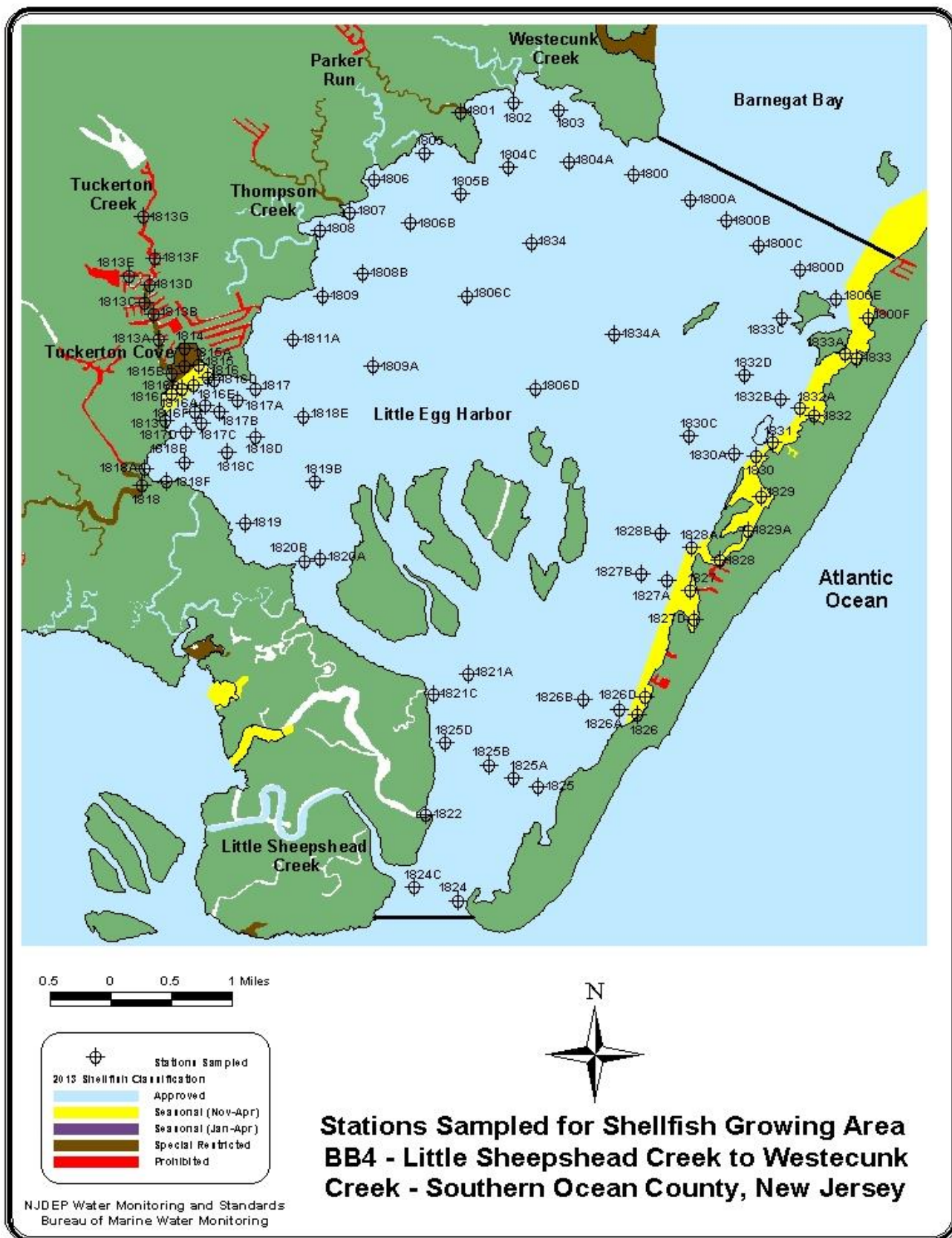
Each classification criterion is composed of a measure of the statistical 'central tendency' (geometric mean) and the relative variability of the data set. For the Systematic Random Sampling (SRS) strategy, variability is expressed utilizing the estimated 90th percentile. An area to be approved under the Seasonal classification must be sampled and meet the criterion during the time of year that it is approved for the harvest of shellfish. The table below shows the statistical criteria for the SRS strategy.

Statistical Criteria for SRS Strategy					
	Total Coliform Criteria		Fecal Coliform Criteria		
	Geometric mean (MPN/100 mL)	Maximum 90th percentile (MPN/100 mL)	Geometric mean (MPN/100 mL)	Maximum 90th percentile (MPN/100 mL)	
Approved Water Classification	70	330	14	49 w/ direct 3-tube, A1	31 w/ mTEC Agar
Special Restricted Water Classification	700	3300	88	300 w/direct 3-tube, A1	163 w/ mTEC Agar

Data management and analysis was accomplished using database applications developed for the Bureau. Mapping of pollution data was performed with the Geographic Information System (GIS: ARCMAP).

The results for this Reappraisal were compiled from Assignments 121, 131, and 132. A review of the records suggests that 3,127 water samples were collected from 94 surface stations between 2009 and 2013 and analyzed using the combination of analyses described in this section. The BB4 shellfish growing water monitoring stations can be seen on the following page. Additional information on lab methodology and sampling strategy can be found in the Shellfish Growing Area Report Guidance Document.

Water sampling was performed in accordance with the Field Sampling Procedures Manual (NJDEP, 2005). Water quality sampling, analysis, and shoreline/watershed surveys were conducted in accordance with the NSSP Guide for the Control of Molluscan Shellfish, 2011.
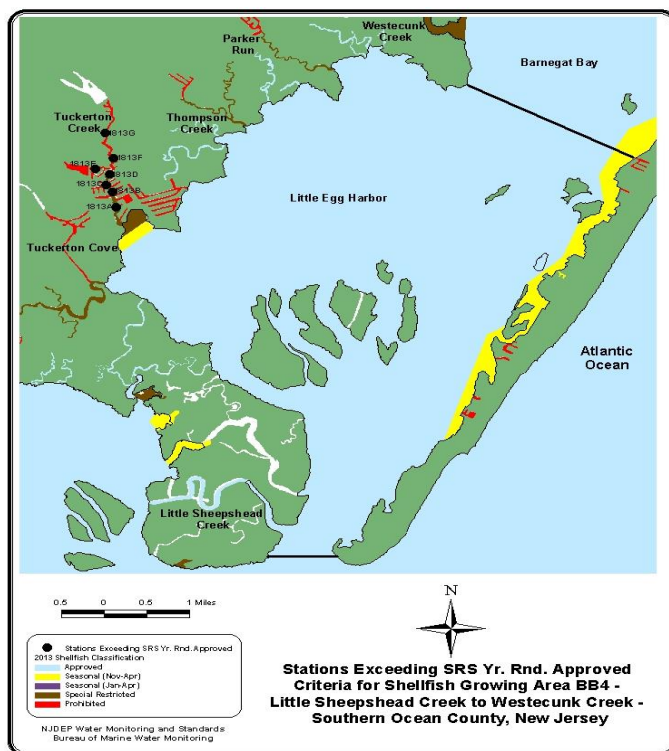
Stations Sampled for Shellfish Growing Area
BB4 - Little Sheepshead Creek to Westecunk
Creek - Southern Ocean County, New Jersey

NJDEP Water Monitoring and Standards
Bureau of Marine Water Monitoring

BACTERIOLOGICAL QUALITY

Compliance with NSSP SRS Approved Criteria

The map to the right shows seven stations [1813A – (SR), 1813B – (SR), 1813C – (SR), 1813D – (P), 1813E – (P), 1813F – (P), 1813G – (P)] that do not meet SRS year round criteria for *Approved* water - FC. The SRS criterion for *Approved* waters suggests the geometric mean for shall not exceed 14 MPN/ 100 mL, which remains the same with the statistical combinations used in this report.

According to NSSP criteria, FC analysis provides that the estimated 90th percentile shall be no greater than 49 MPN/100 mL. With the combinations of data used in this report (i.e., three – tube, three – dilution for TC and mTEC for FC), the statistical criteria now provides that the estimated 90th percentile shall be no greater than 40 MPN/100 mL w/ 32 samples for *Approved* waters.

Stations Exceeding SRS Yr. Rnd. Approved Criteria for Shellfish Growing Area BB4 - Little Sheepshead Creek to Westecunk Creek - Southern Ocean County, New Jersey

Three of these stations [1813A – (SR), 1813B – (SR), 1813C – (SR)] are located in *Special Restricted* waters (shown as SR), and four stations [1813D – (P), 1813E – (P), 1813F – (P), 1813G – (P)] are situated in *Prohibited* waters (shown as P). The stations are located in Tuckerton Creek or near Tuckerton Creek. All but one of these stations [1813A – (SR)] exceeded the yr. rnd. criteria for geo-mean (*Approved* waters), and all of the stations exceeded the estimated 90th percentile criteria for *Approved* waters.

Whether failing with the geo-mean or failing with the estimated 90th percentile, or both, all of these stations failed to meet the *Approved* criteria for water classification by missing just one of the criteria. Again, these stations are located in *Special Restricted* or *Prohibited* waters so their having exceeded *Approved* water criteria does not imminently suggest a need for classification review. However, *Special Restricted* station 1813C did exceed the NSSP-SRS criteria for its classification, and this will be additionally discussed in the section(s) that follow. Although the remaining six stations statistically exceeded the criteria for yr. rnd. *Approved* waters, their geo-means and estimated 90th percentiles were acceptable regarding their current classifications (*Special Restricted* or *Prohibited*).
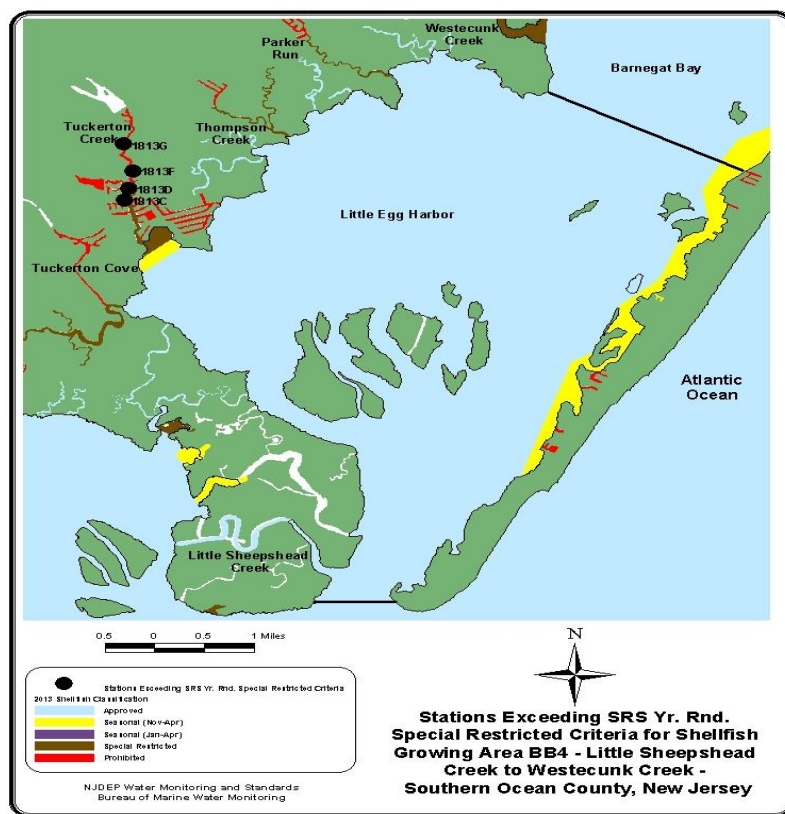
The highest year rnd. geometric mean for FC for any of these stations was 47.9 MPN/100 mL (station 1813F – located in *Prohibited* waters). The higher est. 90th percentiles for FC were represented for stations 1813C, 1813F, and 1813G. Those estimated 90th percentiles were 293.8,

328.8 and 269.4 MPN/100 mL, respectively. Stations 1813F and 1813G are stations located in *Prohibited* waters. Station 1813C, located in *Special Restricted* waters is of greater concern, as its estimated 90th percentile exceeded NSSP-SRS criteria for *Special Restricted* waters, as previously noted.

Compliance with NSSP SRS Special Restricted Criteria

Four stations exceeded NSSP - SRS yr. rnd. *Special Restricted* criteria for FC. Those stations were [1813C – (SR), 1813D – (P), 1813F – (P), and 1813G – (P) – see map to right]. Three of these stations were in *Prohibited* waters, represented by (P), and one station, 1813C – (SR) was a *Special Restricted* station, shown as (SR).

These stations had geo-means that were acceptable or did not exceed *Special Restricted* criteria with the highest of those geo-means reported at 47.9 MPN/100 mL. In all cases, the estimated 90th percentiles exceeded yr. rnd. *Special Restricted* criteria. For stations 1813C – (SR), 1813D – (P), 1813F – (P) and 1813G – (P), the estimated 90th percentiles were 293.8, 233.5, 328.8, and 269.4, respectively.

Stations Exceeding SRS Yr. Rnd. Special Restricted Criteria for Shellfish Growing Area BB4 - Little Sheepshead Creek to Westecunk Creek - Southern Ocean County, New Jersey

Year round NSSP and SRS FC criteria for a station located in *Special Restricted* waters suggests the geo-mean should be no higher than 88 MPN/100 mL, and the estimated 90th percentile should not exceed 300 MPN/100 mL w/ 30 or more samples. With the combinations of data used in this report (i.e., three – tube, three – dilution for TC and mTEC for FC), the statistical criteria now provides that the geo-mean remains the same at 88 MPN/100 mL, and the estimated 90th percentile is to be no greater than 230 MPN/100 mL w/ 32 samples for *Special Restricted* waters.

As stations 1813D – (P), 1813F – (P), and 1813G – (P) are located in *Prohibited* waters, there is no consideration needed for classification review due to their having exceeded *Special Restricted* criteria. *Special Restricted* station 1813C had a geo-mean of 37.8 MPN/100 mL (acceptable for *Special Restricted* criteria) and, an estimated 90th percentile of 293.8 MPN/100 mL (exceeds SRS year rnd. criteria for *Special Restricted* waters).

A large spike appears in the raw data on July 9th 2010 for one of the 32 samples gathered for review. This spike was noted at 785.6 MPN/100 mL. This helped to push the estimated 90th percentile up for station 1813C along with other higher FC levels noted in the data.

Although it is difficult to say, ongoing re-construction of the sewerage infrastructure along Green Street where station 1813C – (SR) is located may have contributed to higher spikes in the raw data at the time the above noted spike occurred. Additionally, there are many boats throughout Tuckerton Creek, and it is possible, occasional improper discharges are taking place.

Continued evaluation and monitoring have been ongoing for the waters of Tuckerton Creek for some time now. Continued spikes in the data for a number of stations have kept occurring, though.

Many shoreline surveys have been conducted which have pointed to a number of potential contributing factors. As suggested above, there are numerous boats and marinas along the creek, which present a nearly contiguous marina basin like condition along many portions of the creek. Also, there are numerous stormwater outfalls draining into Tuckerton Creek, allowing for additionally compromising bacteriological inputs that could be derived from runoff. In addition, there are, as discussed earlier, occasional occurrences of bacteriological inputs occurring from infrastructural issues related to the sewerage infrastructure, and the pumping station located along Green Street (see the previous section on Spills, Unpermitted Discharges, and Closures).

A shoreline survey was conducted along Tuckerton Creek on August 20th2013. This survey was specifically oriented to the eastern and western shorelines closest to station 1813C – (SR), as that station had estimated 90th percentile exceedances for its *Special Restricted* classification. On the day the survey was conducted, post "Sandy" construction was noted on both sides of the creek (on Marlin Rd. and Boom Way). This construction was apparent in housing, stormwater, and sewerage infrastructure. Pictures were taken of the area (see shoreline survey field notes and pictures folder for this report).

Reconstruction within the area provided no standout considerations for concern on the day of the shoreline survey but it was interesting to note that a stormwater outfall was observed near the location of station 1813C. Follow up sampling (09/10/13 and 09/13/13) and mTEC analysis was performed for this outfall and the waters near the station during dry and wet conditions. Those results follow:

mTEC dry weather sample result 09/10/13– five plus days dry – SWO 130 CFU's/100 mL

mTEC dry weather sample result 09/10/13– five plus days dry – near sample station 1813C – 470 CFU's/100 mL

mTEC wet weather sample result 09/13/13– 3 hrs. after rainfall (1/2") – SWO 2,700 CFU's/100 mL

mTEC wet weather sample result 09/13/13– 3 hrs. after rainfall (1/2") – near sample station 1813C – 300 CFU's/100 mL

The two sampling events for the outfall and station location produced results that were fairly high for both wet and dry conditions. The wet sample date was of greater interest though, as it produced the highest numbers overall.
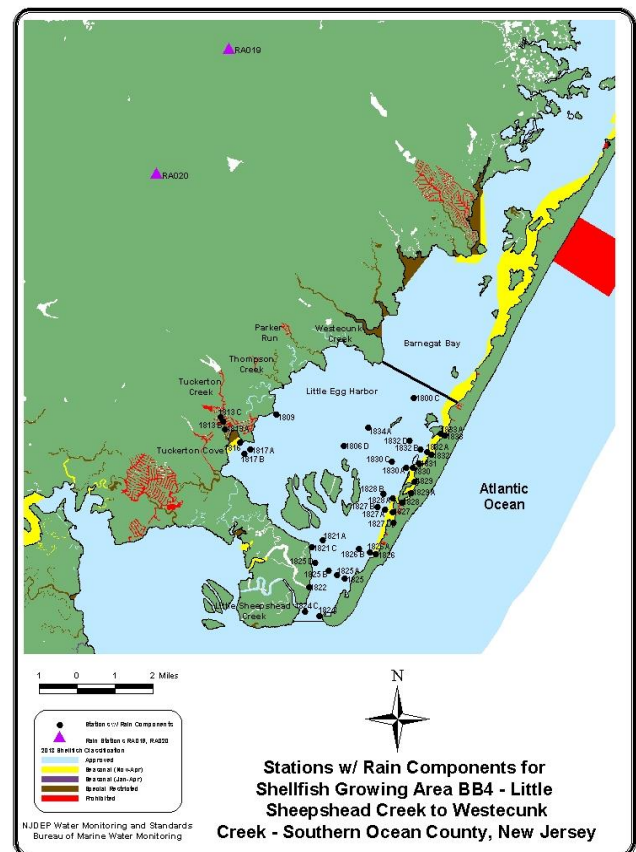
As noted previously, there was a previous downgrade initiated for Tuckerton Creek in the 2008 Reappraisal for BB4, when about half of the creek or 23.19 acres were downgraded from *Special Restricted* to *Prohibited* due to high FC counts. As ongoing results in other areas within the creek continue to show spikes in the data, or higher FC counts, it has become obvious that a number of bacteriological issues remain in Tuckerton Creek. With that, this Reappraisal proposes to additionally downgrade the creeks remaining 23.4 acres of *Special Restricted* waters to *Prohibited*, based on water quality, due to higher FC counts.

Rainfall Effects

Precipitation patterns in the coastal areas of New Jersey are typical of the Mid-Atlantic coastal region. Summer storms are localized and often associated with thunder and lightening activity. Winter storms are frequently associated with northeasters. Hurricanes can occur during the summer and early fall. Additional information on annual storm averages, duration, intensity, and event volume is provided in the Shellfish Growing Area Report Guidance Document.

The reporting period for this Reappraisal encompasses the time frames when Hurricane Irene, and Superstorm Sandy took place (08/2011 and 10/2012, respectively). In addition, 2013 proved to be a year of substantial rainfall for the State. From a bacteriological standpoint, the rainfall accumulations seen during these storm events or this past year did not drastically affect the bacterial data for this reporting period. The locations where higher or lower bacteriological results would be expected in the growing area, seemed fairly replicative in regard to previous reporting time frames, geometric means, and estimated 90th percentiles relating to FC. Some short term effects were obvious though with regard to storms and FC counts shown in the data.

Superstorm Sandy had a greater effect on viral counts within these waters due to precipitation, subsequent runoff, flooding, and infrastructural damage to stormwater and wastewater systems. These impacts caused some waters within shellfish growing area BB4 to remain closed through mid-April 2013 for viral counts in shellfish tissue.

Stations w/ Rain Components for Shellfish Growing Area BB4 - Little Sheepshead Creek to Westecunk Creek - Southern Ocean County, New Jersey

Classification of State waters is generally associated with ongoing bacteriological results as opposed to occasional viral influence, although viral influence can certainly cause a State to close waters, as noted above. In the case of "Sandy", bacterial levels generally went down fairly quickly within the shellfish and surrounding waters of Shellfish Growing Area BB4. Following Sandy,

water temperatures remained above 50 degrees Fahrenheit for short while. This duration of time, allowed for bacterial die off, and gave shellfish enough time to purge the bacteriological effects of the storm, as bi-valves are more actively pumping at temperatures that are 50 degrees Fahrenheit or greater.

Once water temperatures dropped below 50 degrees, shellfish were less active and pumping was minimalized. As the duration of time before water temperature drop was fairly short, our monitoring and analysis suggested shellfish require longer periods of pumping to purge viruses from their tissue and gut. With this, WM&S/BMWM found that viral retention by shellfish in BB4 and other State waters remained evident for some time in various bi-valves such as the eastern oyster and the hard clam, after Sandy.

Precipitation data for BB4 was provided by the National Oceanic and Atmospheric Administration (NOAA) with WM&S'/BMWM's use of stations RA019 and RA020.

Based on Wet/Dry statistics, there were 41 sampling stations (see map previous page) that showed a rainfall component in relation to statistical changes noted in water quality for this shellfish growing area. Twenty-four of those stations were in *Approved* waters, 14 were in Seasonal (Nov - Apr) waters, and three were in *Special Restricted* waters.

Rainfall components must register a t-statistical probability less than 0.05. The Wet/Dry Statistics were calculated based on an impact time of 48 hours prior to the day of sampling and a wet/dry cutoff of 0.25 inches of rain, as these criteria produced the most results for impact.

Rain component stations were found in Tuckerton Creek and Cove and were predominant along and off the western side of LBI. All rain component stations but one (1800C), had higher geometric means during wet conditions as opposed to dry.

The highest geo-means (those above 14 MPN/100 mL) for rain component stations in the wet/dry data sheets were found for three stations [1813A – (SR), 1813B – (SR) and 1813C – (SR)] with 9 wet counts. All of these stations were in waters classified as *Special Restricted* (SR). Geo-means with nine samples in the wet/dry data sheets were 35.6, 71.2 and 95.8 MPN/100 mL for 1813A – (SR), 1813B – (SR), and 1813C – (SR), respectively.

In the Statistical Summary all stations w/ rain components were within *Approved* criteria except the *Special Restricted* stations 1813A – (SR), 1813B – (SR), and 1813C – (SR). The highest year round geometric mean recorded for any of the rain component stations was 37.8 MPN/100mL (station 1813C), which was acceptable for its classification, and no rain component station exceeded for geo-mean in the year round stats w/ regard to their classification.

The highest estimated 90th percentile for stations w/ rain components was 293.8 MPN/100 mL (again, station 1813C), which with the statistical combination used in this report, exceeds the limit of 230 MPN/100 mL for the *Special Restricted* classification and 32 samples. No other rain component stations in the year round statistical summary exceeded the criteria for their classification for estimated 90th percentile.

As noted in previous sections, *Special Restricted* station 1813C exceeded its estimated 90th percentile with other statistical analyses. The rainfall data presented in this section proves no exception, as the estimated 90th percentile should be no higher than 230 MPN/100 mL, when considering the statistical analysis used in this report and 32 samples. With this, the water quality in this shellfish growing area report suggests that impact occurred from rainfall. For station 1813C, higher counts were noted in the data preceding Hurricane Irene and Superstorm Sandy, although precipitation events do have impact on this station and others in Tuckerton Creek, as can be seen from the data. Again, a downgrade has been proposed in this Reappraisal within Tuckerton Creek and the area encompassing station 1813C.

Seasonal Effects

Many urban developed lands in this area experience significant seasonal fluctuations in population. During the summer months, increased population can result in increased impacts to the waters of BB4. However, impacts to back bay waters are not necessarily isolated as warmer month occurrences. Various circumstances such as storm activity can create impact during the winter. When impacts are observed as seasonally specific, monitoring programs are arranged to provide the best seasonally designed monitoring. All three assignments (121, 131, and 132) for shellfish growing area BB4 are sampled with *Seasonal* priorities by design.

Stations with seasonal components (statistical variability in bacteriological counts due to season), registering t-probabilities less than 0.05 are shown in the map to the right.
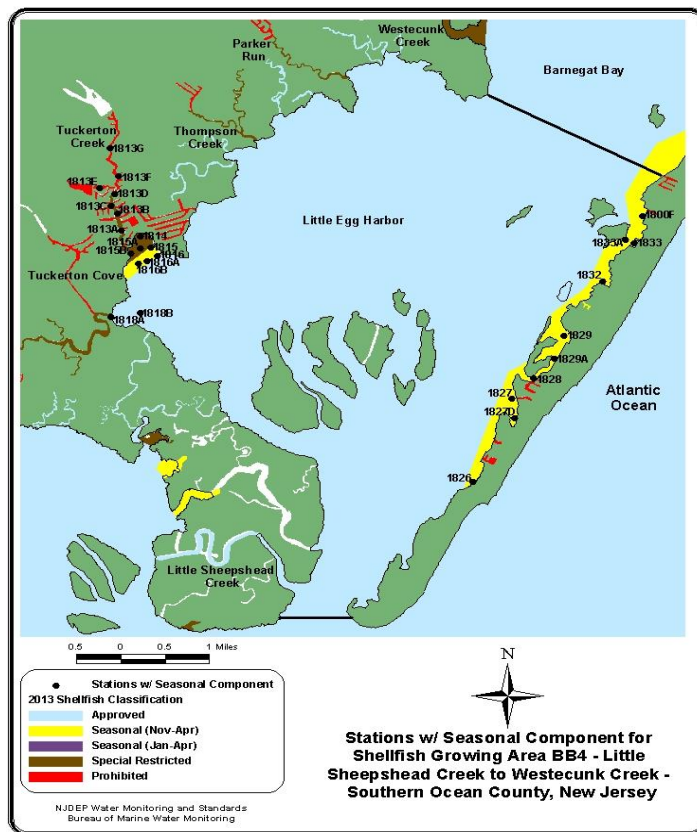
Twenty-six stations showed a seasonal component. Two stations were in *Approved* waters, 14 stations were located in *Seasonal* – (Nov – Apr) waters, six stations were in *Special Restricted* waters, and four stations were in *Prohibited* waters. These stations were predominately located along the Long Beach Island shoreline (bayside) and within Tuckerton Creek and Tuckerton Cove. All of these stations had higher geometric means during the summer.

When reviewing the seasonal statistics, which were represented by 12 to 14 samples for each station during the summer, all but seven stations with seasonal components had geo-means that were within SRS criteria for *Approved* waters. For the stations within SRS *Approved* criteria in the seasonal statistics, the highest geo-mean in the seasonal statistics was reported at 8.80 MPN/100 mL.

SRS *Approved* criteria for FC suggests that geo-means should not exceed 14 MPN/100 mL. Estimated 90th percentiles for FC *Approved* waters, with regard to the combined analysis used in this report should be no higher than 40 MPN/100 mL with 32 samples.

The seven stations with geo-means exceeding *Approved* criteria in the seasonal statistics [1813A – (SR), 1813B – (SR), 1813C – (SR), 1813D – (P), 1813E – (P), 1813F – (P), and 1813G – (P)], were in *Special Restricted* or *Prohibited* waters with the highest geo-means in the seasonal stats for *Special Restricted* stations at 91.7 and 113.5 MPN/100 mL (stations 1813B and 1813C, respectively) with 14 samples.

From the yr. rnd. Statistical Summary, all of the seasonal component stations but six *Special Restricted* or *Prohibited* stations [1813B – (SR), 1813C – (SR), 1813D – (P), 1813E – (P), 1813F – (P), and 1813G – (P)] were within the confines of *Approved* water classification on a year round basis w/ 31 – 36 samples. Of those six, all were within the criteria for their current classification with the exception of 1813C – (SR).

As noted previously, 1813C – (SR) had a geo-mean of 37.8 MPN/100 mL (acceptable for *Special Restricted* criteria) and an estimated 90th percentile of 293.8 MPN/100 mL (exceeds SRS year rnd. criteria for *Special Restricted* waters). Again, the FC criteria for *Special Restricted* waters with regard to the statistical combination used in this report suggests that the year round geo-mean should not exceed 88 MPN/100 mL, and estimated 90th percentiles should be no higher than 230 MPN/100 mL with 32 samples.

This higher estimated 90th percentile was the result of an MPN value of 785.6 MPN/100 mL that came from sampling on 07/09/10 and some other higher FC levels noted in the data. Impact was noted from seasonality. And, a downgrade is planned for the area encompassing station 1813C.

RELATED STUDIES

Nutrients

WM&S/BMWM perform additional water quality studies related to the bacteriological monitoring program. Nutrient monitoring and the collection of nutrient data as part of the NJ Coastal Monitoring Network is an example of one of those studies.

Nutrient stations are sampled on a quarterly basis. There are approximately 250 nutrient sampling stations within the coastal and inner coastal waters of New Jersey. Twenty-four of those stations are located within the ocean waters off the New Jersey coast. The 226 remaining nutrient stations are spread throughout the back bay waters of the State. WM&S/BMWM compile the results of nutrient levels from such stations and then prepares a separate report.

Nutrient Station Sampled for Shellfish Growing Area BB4 - Little Sheepshead Creek to Westecunk Creek - Southern Ocean County, New Jersey
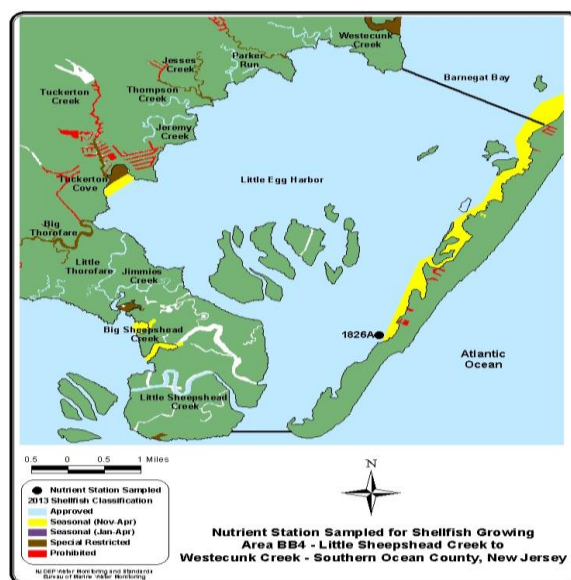
Shellfish growing area BB4 has the following nutrient sampling station: 1826A. The location for this station is shown in the map on the previous page.
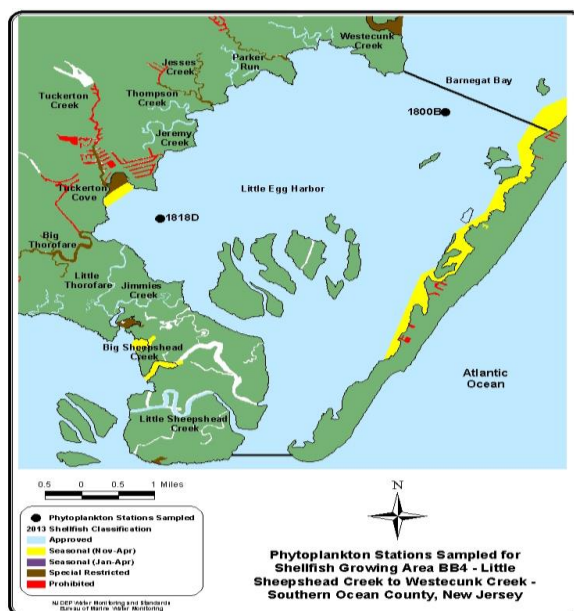
Chlorophyll data are also contained within the nutrient data. As such, WM&S'/BMWM is able to maintain a quarterly picture of algal activity within State waters. This chlorophyll data also proves to be useful as adjunct information to the Bureau's phytoplankton monitoring program. Further information on nutrients within State waters is available at *www.state.nj.us/dep/wms/bmw* in sections such as those referring to Estuarine and Coastal Water Quality.

Phytoplankton Monitoring

In the WM&S/BMWM phytoplankton monitoring program, data are collected from samples, which are gathered bi-weekly from May through August (Memorial Day through Labor Day). The data are evaluated by WM&S/BMWM in order to determine the presence of marine biotoxins in accordance with NSSP requirements. Reports denoted as Summary of Phytoplankton Blooms have been compiled and are available electronically at *www.state.nj.us/dep/wms/bmw*.

There are 16 phytoplankton stations within the waters of New Jersey. Of those 16, four are located off the coast from the southerly portion of Sandy Hook down to Cape May. The other 12 phytoplankton stations are situated within New Jersey's back bay waters.

Phytoplankton Stations Sampled for Shellfish Growing Area BB4 - Little Sheepshead Creek to Westecunk Creek - Southern Ocean County, New Jersey

Stations 1800B and 1818D are phytoplankton stations in shellfish growing area BB4. Their locations can be observed in the map above. Current research (again see *www.state.nj.us/dep/wms/bmw*) suggests that populations of phytoplankton are generally found in low concentrations in these waters.

During this reporting period, the toxic species *Dinophysis acuminata* was detected from Manahawkin Bay to Little Egg Harbor in bloom concentrations (360 - 480 cells/mL). If concentrated by filter feeders like shellfish, *Dinophysis accuminata* can cause diarrhetic shellfish poisoning. This bloom was extremely short in duration, and shellfish showed little to no toxicity with regard to the limited life of the bloom. A review of reports for over 12 years will show that this bloom occurrence represents something unusual, as toxic species have been rarely seen during that time frame for these waters (BB4).
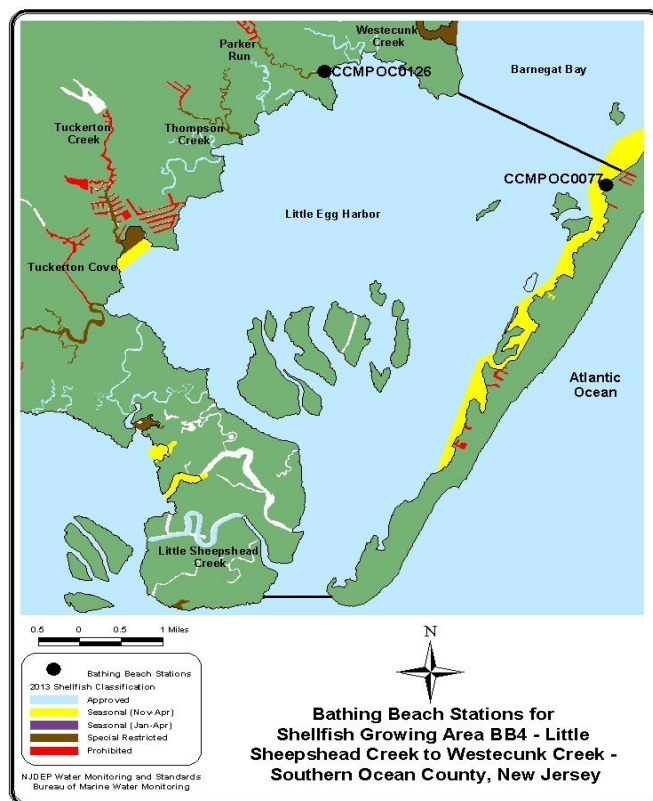
There are occasional occurrences of algal blooms in all back bay waters in New Jersey, and these can occur throughout the year. The warmer months of spring and summer provide a very common period for algal growth, though.

It is more frequently the discoloration of the water from algal blooms that causes issues along New Jersey's coastal waters rather than the toxicity of the phytoplankton. For example, brown tides resulting from one of New Jersey's more frequent algal blooms can be spotted in back bay waters, inlets, and occasionally the ocean, near inlet passageways. This generally occurs during May and June. However, aside from the bloom causing discoloration of the water, there are no known threats to human health from brown tides. For this reason, they are not considered in classifying waters for shellfish harvest.

Cooperative Coastal Monitoring

WM&S/BMWM also oversee the Cooperative Coastal Monitoring Program (CCMP). CCMP involves coastal water quality assessments and pollutant source investigation. There are two components to this program. These are recreational water quality monitoring at New Jersey bathing beaches and aerial surveillance of State coastal waters.

Water quality monitoring for the bathing beach component is administered by NJDEP, the Department of Health, and local environmental health agencies interacting within their regions of coastal New Jersey. The local health agencies collect water samples each week at 175 ocean and 43 bay monitoring stations from mid-May through mid-September. Samples are taken on Monday and continued sampling through the week is performed as required. Samples are analyzed for enterococci bacteria concentrations at these monitored stations.

Bathing Beach Stations for Shellfish Growing Area BB4 - Little Sheepshead Creek to Westecunk Creek - Southern Ocean County, New Jersey

Enterococci are used as a fecal coliform indicator in marine recreational waters (US EPA, 1986). The acceptable rate for the "steady state geometric mean indicator density" for enterococci in the waters of marine bathing beaches is 35 MPN/100 mL or less, and 104 enterococci/100 mL is also considered acceptable as a one time exposure (Cabelli, 1983).

BB4 has two bathing beach stations (CCMPOC0126 and CCMPOC0077) as shown in the map to the above right. Data for these stations is available at http://www.njbeaches.org.

The other component of the CCMP program, aerial surveillance, is conducted six days a week, weather permitting, during May - September. Having this component provides an evaluative tool to aerially observe coastal water quality, conditions, and potential pollution issues.

Flight paths are coordinated to observe the eastern coastal and inter-coastal waters of the State during the week. The aerial component of the CCMP program works in conjunction with the United

States Army Corps of Engineers. It is part of the NY/NJ Harbor Estuary Program Floatables Action Plan. If floating solid waste and debris are spotted by aerial surveillance, the Army Corps attempts to respond with water-skimming vessels.

CONCLUSIONS

Based on the water quality data for BB4 from January 01, 2009 through October 08, 2013, a section of the shellfish growing waters within the Tuckerton Creek area did not meet NSSP criteria for their current classification (*Special Restricted*). This Reappraisal proposes that section be downgraded to *Prohibited*, as shown on the map following the Recommendations section.

Impacts from rain and seasonality were present, and related components were discussed within the content of this report. Aside from Hurricane Irene (August 2011) and Superstorm Sandy (October 2012), rain impacts were fairly minimized within shellfish growing area BB4. The waters of Little Egg Harbor, the primary component of BB4, provide substantial dilution, as do the numerous water sources that feed into shellfish growing BB4. *Seasonal* impact during the summer was noted in the data to reflect a greater influence on data summaries with respect to geometric means and estimated 90th percentiles. Again, as in previous sections, seasonal components were most apparent in Tuckerton Creek and on the western side of Long Beach Island.

For the purpose of public health and safety, the sampling strategy and classification for most back bay waters is primarily based on inputs from water sources such as creeks and rivers, along with discharge from stormwater outfalls, marinas, and lagoon/bayfront sections that exist within New Jersey's intercoastal waters.

With BB4, there are potential contributors to coliform bacteria such as inputs from creeks, stormwater outfalls, marinas, and lagoon/bayfront properties. These potential pollutant contributors provide the primary reason for utilization of SRS Sampling Strategy. Further, such influences often dictate the degree to which portions of a shellfish growing area must be classified. Buffers of *Seasonal*, *Special Restricted,* or *Prohibited* waters are very useful as protective zones in areas with the above influences. And, buffers are also commonly found in areas that are more densely populated.

Evaluating the monitoring data for shellfish growing areas in regard to the maintenance of appropriate classifications is a routine and primary part of the WM&S/BMWM duties for the State. From a bacteriological standpoint, water quality can improve or degrade based on numerous factors such as development, weather patterns, hydrographics, and seasonal use. For this reason, shellfish growing water classifications do not remain static. Upgrades or downgrades do occur as the result of this review process. In the case of Shellfish Growing Area BB4, this report and the data referenced in the report suggests classifications are appropriately designated for all waters except the Tuckerton Creek area, where a downgrade from *Special Restricted* to *Prohibited* has been proposed.

RECOMMENDATIONS

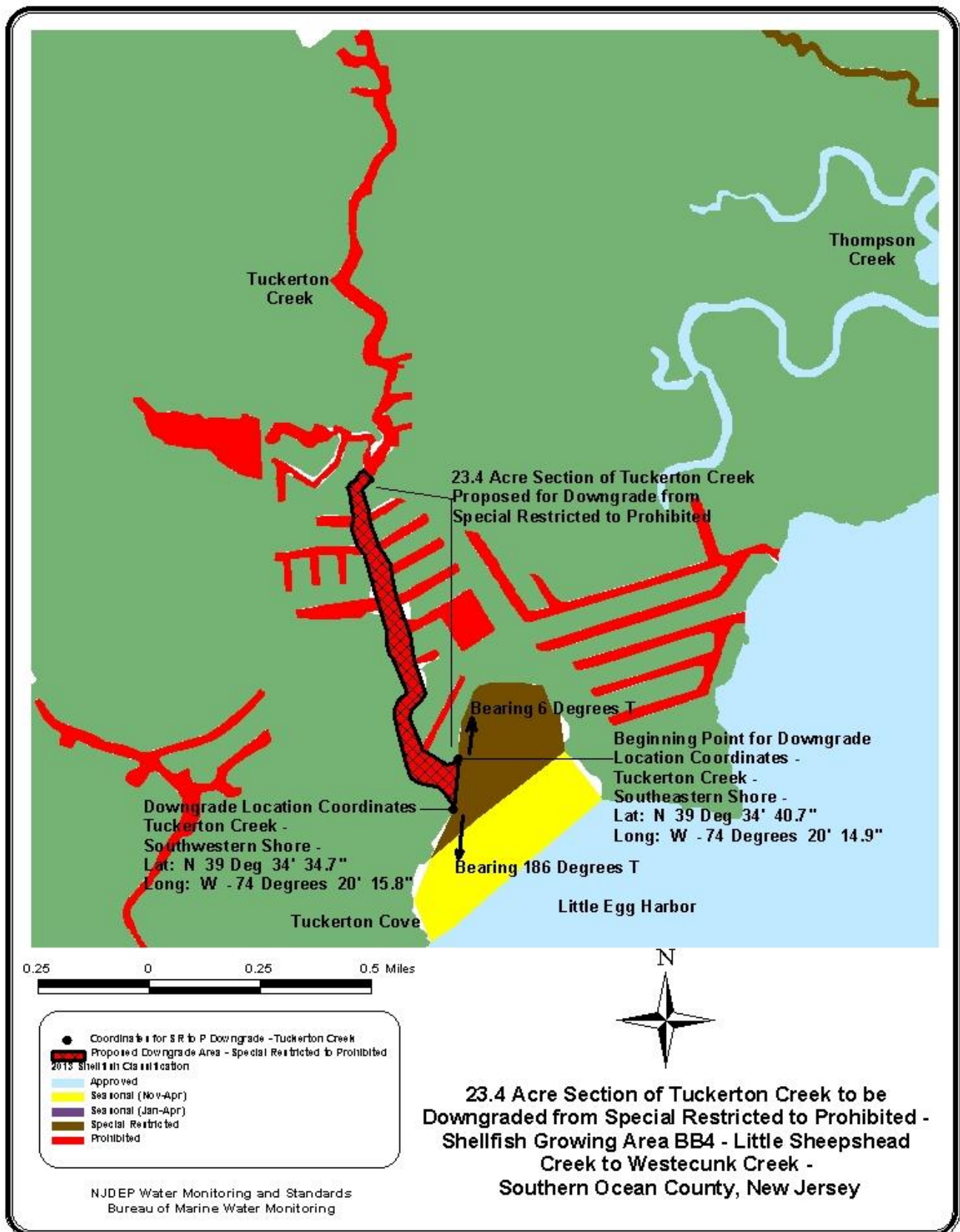**Recommended Classification Change**

A portion of *Special Restricted* waters in Tuckerton Creek, and more specifically, a 23.4 acre section, north of the base of Tuckerton Cove are recommended for reclassification to *Prohibited*. This reclassification represents a down grade based on water quality. There was an exceedance of NSSP fecal coliform criteria for *Special Restricted* waters.
The specific recommendations for this down grade follow:

23.4 acres are recommended for reclassification from *Special Restricted* to *Prohibited*. *Special Restricted* acres for BB4 will then decrease to 149, as opposed to the former 172, and *Prohibited* acreage for BB4 should increase to 173 from the previous amount of 150 acres. The growing water section recommended for classification change can be seen in the figure on the next page.

For this down grade, two sections of The New Jersey Administrative Code relating to shellfish growing water classification were rewritten. Those sections pertained to the *Special Restricted* and *Prohibited* waters of the Tuckerton area (7:12 - 3.2 and 7:12 - 2.1, respectively).

The amendments for *Special Restricted* and *Prohibited* waters are presented in the Legal Description for Recommended Change section that follows the map for downgrade shown on the next page.

23.4 Acre Section of Tuckerton Creek
Proposed for Downgrade from
Special Restricted to Prohibited

Bearing 6 Degrees T

Beginning Point for Downgrade
Location Coordinates -
Tuckerton Creek -
Southeastern Shore -
Lat: N 39 Deg 34' 40.7"
Long: W -74 Degrees 20' 14.9"

Downgrade Location Coordinates -
Tuckerton Creek -
Southwestern Shore -
Lat: N 39 Deg 34' 34.7"
Long: W -74 Degrees 20' 15.8"

Bearing 186 Degrees T

Tuckerton Cove

Little Egg Harbor

Tuckerton
Creek

Thompson
Creek

0.25   0   0.25   0.5 Miles

N

Coordinates for S R to P Downgrade - Tuckerton Creek
Proposed Downgrade Area - Special Restricted to Prohibited
2013 Shellfish Classification
Approved
Seasonal (Nov-Apr)
Seasonal (Jan-Apr)
Special Restricted
Prohibited

23.4 Acre Section of Tuckerton Creek to be
Downgraded from Special Restricted to Prohibited -
Shellfish Growing Area BB4 - Little Sheepshead
Creek to Westecunk Creek -
Southern Ocean County, New Jersey

NJDEP Water Monitoring and Standards
Bureau of Marine Water Monitoring

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Legal Description for Recommended Change

§ 7:12-3.2   Shellfish growing waters that are classified as Special Restricted

 (a) The following shellfish growing waters are classified as Special Restricted:

18. Tuckerton area (Note: Portions are also designated as Prohibited or Seasonal. See N.J.A.C. 7:12-2 and 4): The waters of Tuckerton Cove [and Tuckerton Creek] and tributaries thereof between a location on Gaunt Point that is west of Little Egg Harbor Boulevard and situated on the eastern bank of Tuckerton Cove with coordinates of latitude 39 degrees 34 minutes 41.7 seconds N., and longitude 74 degrees 19 minutes 58.8 seconds W., and then bearing 230 degrees T for 0.34 nautical miles to a point on the west bank of Tuckerton Cove with coordinates of latitude 39 degrees 34 minutes 28.8 seconds N., and longitude 74 degrees 20 minutes 19.3 seconds W., then in a [northern] northeasterly direction [proceeding up Tuckerton Creek] along the western side of Tuckerton Cove for [0.88] 0.11 nautical miles to a point on the western shoreline with coordinates of latitude 39 degrees [35] 34 minutes [15.6] 34.7 seconds N., and longitude 74 degrees 20 minutes [29.4] 15.8 seconds W., then bearing [135] 6 degrees T for [0.03] 0.10 nautical miles to a point on the eastern bank of Tuckerton Cove [Creek just north of Bass Road] ,southeast of Parker Rd. with coordinates of latitude 39 degrees [35] 34 minutes [14.5] 40.7 seconds N., and longitude 74 degrees 20 minutes [28] 14.9 seconds W., then continuing [southbound] northeast, west, then southeast along the Tuckerton Cove shoreline to the point of origin and terminating.

§ 7:12-2.1   Shellfish growing water classification—Prohibited

 (a) The following shellfish growing waters are classified Prohibited:

8. Tuckerton area (Note: A Portion of Tuckerton Cove is also designated as Seasonal or Special Restricted. See N.J.A.C. 7:12-4 and 7:12-3. A Portion of Tuckerton Creek is also designated as Special Restricted. See N.J.A.C. 7:12-3): The waters of Tuckerton Creek and tributaries north of a line beginning at a point on the southeastern bank of Tuckerton Creek [just north of Bass Rd. with coordinates of latitude 39 degrees 35 minutes 14.5 seconds N., and longitude 74 degrees 20 minutes 28 seconds W., and then bearing 315 degrees T for 0.03 nautical miles to a point on the western side of Tuckerton Creek with coordinates of latitude 39 degrees 35 minutes 15.6 seconds N., and longitude 74 degrees 20 minutes 29.4 seconds W] ,southeast of Parker Rd. with coordinates of latitude 39 degrees 34 minutes 40.7 seconds N., and longitude 74 degrees 20 minutes 14.9 seconds W., and then bearing 186 degrees T for 0.10 nautical miles to a point on the southwestern bank of Tuckerton Creek with coordinates of latitude 39 degrees 34 minutes 34.7 seconds N., and longitude 74 degrees 20 minutes 15.8 seconds W.

Recommended Changes in Monitoring Schedule

The portional *Prohibited* downgrade presented in this report, now places all waters of Tuckerton Creek as *Prohibited* in classification with the exception of the mouth of the creek. This downgrade was the result of water quality, as was the previous downgrade presented for Tuckerton Creek in the Reappraisal written for BB4 in 2008. However, the growing numbers of boats docked along the creek, along with the many marinas and lagoons attenuated to the creek, in concert, provide sufficient cause for an administrative downgrade to have been put into place. As such, it is unlikely that the waters of Tuckerton Creek will be upgraded at any point in the near future.

As Tuckerton Creek will likely remain *Prohibited* in classification for some time, if not permanently, the resources and time previously spent on sampling and analyzing stations in that location will be utilized for other aspects of the WM&S/BMWM sampling and monitoring program. With that, the SRS sampling strategy will remain in place for BB4 along with the monitoring stations presented in the current WM&S/BMWM sampling schedule shown in the 2013 Marine Water Sampling Assignments guide, with the exception of the following station deactivation changes:

1)   From Assignment 132: Deactivate surface station 1813A, bottle 29.

2)   From Assignment 132: Deactivate surface station 1813B, bottle 30.

3)   From Assignment 132: Deactivate surface station 1813C, bottle 31.

4)   From Assignment 132: Deactivate surface station 1813D, bottle 32.

5)   From Assignment 132: Deactivate surface station 1813E, bottle 33.

6)   From Assignment 132: Deactivate surface station 1813F, bottle 34.

7)   From Assignment 132: Deactivate surface station 1813G, bottle 35.

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SUPPORTING DOCUMENTATION

Data Sheets - Reappraisal Report for Shellfish Growing Area BB4 (Little Sheepshead Creek to Westecunk Creek), March 2014 (see the Shellfish Growing Area Reports section at *www.state.nj.us/dep/wms/bmw*).

Shoreline survey field notes and pictures - Reappraisal Report for Shellfish Growing Area BB4 (Little Sheepshead Creek to Westecunk Creek), March 2014 (see the Shellfish Growing Area Reports section at *www.state.nj.us/dep/wms/bmw*).