GROWING AREA WU

St. George River

St. George, Thomaston, Cushing

Sanitary Survey Report

2008-2019

Final

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Executive Summary

This is a Sanitary Survey Report for Growing Area WU in compliance with the requirements of the 2017 Model Ordinance and the National Shellfish Sanitation Program. The last Sanitary Survey was written in 2007. The next Sanitary Survey will be written in 2031. Triennials were written in 2010, 2013 and 2016. The next Triennial will be written in 2022.

There are no areas being considered for upgrade in 2020. One station (WU045.80) was downgraded to Restricted after the 2019 review year. Two stations were deactivated (WU013.80 and WU014.50) in 2019 due to redundancy and one Investigative station (WU017.80) reached its 30 count and was changed to an active water quality station.

There were 554 properties visited during shoreline survey operations throughout the survey period. Access or landowner permission was denied at three properties. Fourteen new actual or potential pollution sources were identified during the review period resulting in two Prohibited areas.

Description of Growing Area

Shellfish growing area WU encompasses approximately 92 square miles and includes shore frontage in the towns of Cushing (pop. 1,494), Warren (pop. 4,751), Thomaston (pop. 2,781), South Thomaston (pop. 1,558), and St George (pop. 2,591). The St. George River is an important resource area for commercial shellfish harvesting in the state of Maine. The resources in area WU are managed by a five-town management group which includes diggers from the towns of Cushing, Warren, Thomaston, South Thomaston and St George. The entire harvestable shore frontage in each of these towns is available to each of the licensed diggers from any of the five towns.

There are nine shellfish Limited Purpose Aquaculture Permits (LPAs) and one Kelp LPA. There are not currently any active shellfish leases in the Growing Area but there are three active marine algae leases.

There are two treatment facilities that discharge into the prohibited area that abuts the conditionally restricted area. The Warren Sanitary District serves approximately 950 residents (250 connections) within the village of Warren. Approximately 72% of the total sanitary wastewater influent flowing to this facility originates at the State of Maine Department of Corrections Minimum- and Maximum-Security Prison Facility and the Maine Correctional Institute. The Thomaston Treatment Facility serves a population of approximately 2,700 citizens. The Thomaston and Warren waterfront areas are the only portions of this growing area that are served by municipal treatment.

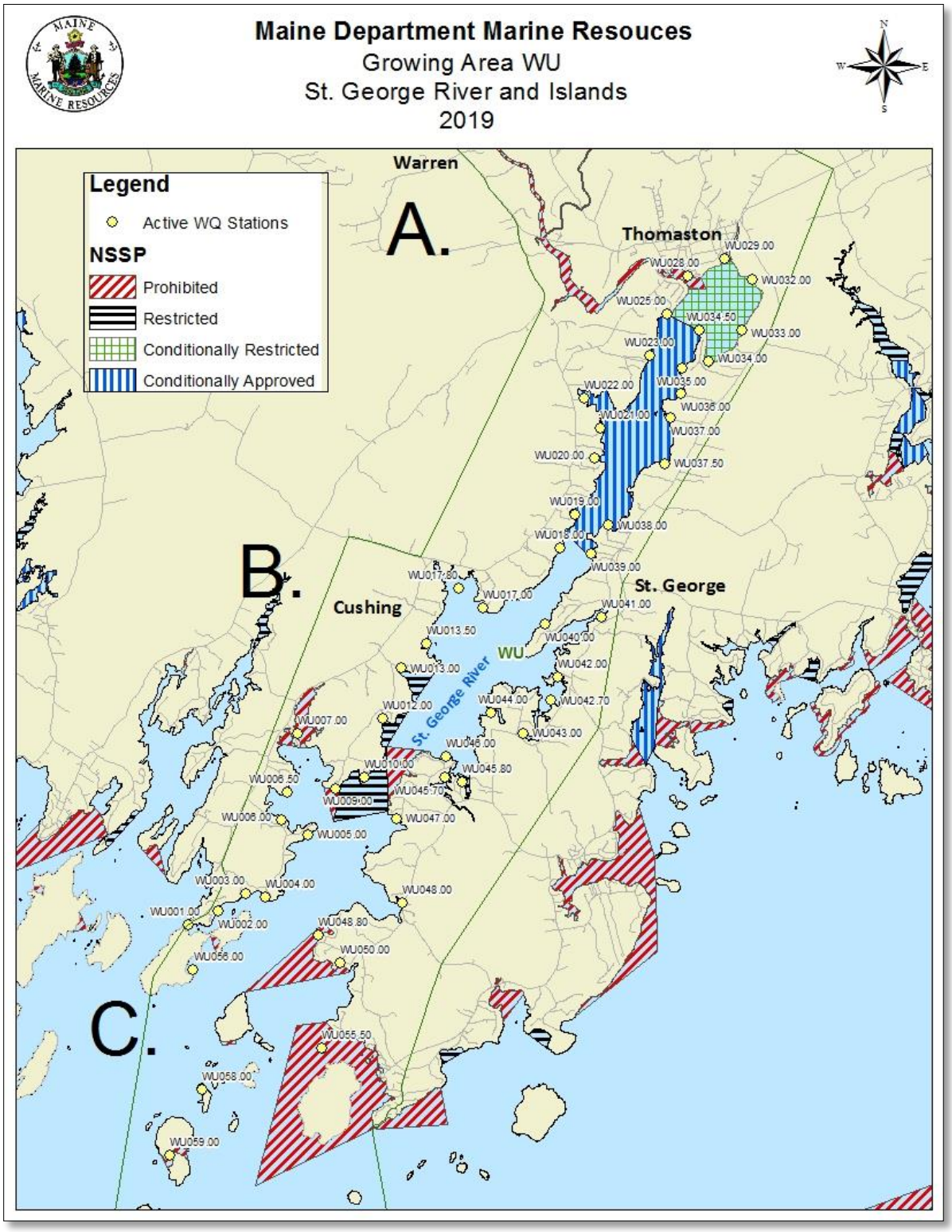
Except for the immediate waterfront section of Thomaston, the St George River is very rural. There is an increase in the population in the summer time with many seasonal houses and cottages along the river. There are no cities or large towns that are considered “summer destinations” though. Development

along the shore consists of private dwellings with some farm land for grazing animals. There are multiple subdivisions in this Growing Area. The dwellings at Hospital Point, South Thomaston and Watts Point, St George developments utilize raised-bed in-ground systems. The dwellings in the Atticus Hill subdivision are connected to the municipal treatment lines from the Thomaston Treatment Facility. Most private dwellings that are not part of an established subdivision use in-ground systems and there are still a small number of outhouses that serve small, seasonal camps along the shore.

The upper portion of shellfish growing area WU (Thomaston to Bradford Point, Cushing) has been broken down into three shellfish classification regions. The uppermost portion along the Thomaston and Warren waterfronts is classified as Prohibited. This area includes Mill River, the Oyster River and the uppermost reaches of the St George River. Abutting this prohibited area is a conditionally restricted area. The conditionally restricted area contains 432 acres of mudflat and is only available for depuration harvesting. This area is conditional on the operations of both the Thomaston Treatment Facility and the Warren Sanitary District. Just south of the conditionally restricted area is a large area that is classified as conditionally approved based on seasonal tide, performance of the wastewater treatment plants, and seasonal rainfall ($\geq$ 1 inches in 24 hours). The conditionally approved area contains over 1100 acres. South of Bradford Point, the lower half of the river contains several smaller flats that are classified as Restricted, Approved, and Prohibited for shellfish harvest.

Below is the map with Pollution Area boundaries and growing area boundaries (Figure 1). Closures within the growing area can be found in legal notices in DMR central files on the DMR website.

FIGURE 1.GROWING AREA WU OVERVIEW MAP WITH ACTIVE WATER STATIONS.



History of Growing Area Classification

Reclassification addendums to the Sanitary Survey report are in the DMR central files.

Pollution Sources Survey

Summary of Sources and Location

The growing area shoreline is divided into 2-mile segments that are identified using unique Growing Area Shoreline Survey Identification (GASSID) numbers. All properties and potential pollution sources within 250 feet of the shoreline are identified and inspected. The inspection includes a property description, physical address, location of the septic system and any other relevant potential or actual pollution sources. A GPS point to identify the source location(s) and the data are entered electronically in the field and stored in DMR central files.

Below is the map with Growing Area boundaries and Pollution Areas (Figures 2-4). Closures within the Growing Area can be found in Legal Notices in DMR central files on the DMR website.

FIGURE 2.GROWING AREA WU, SUBSET A., POLLUTION AREA 27

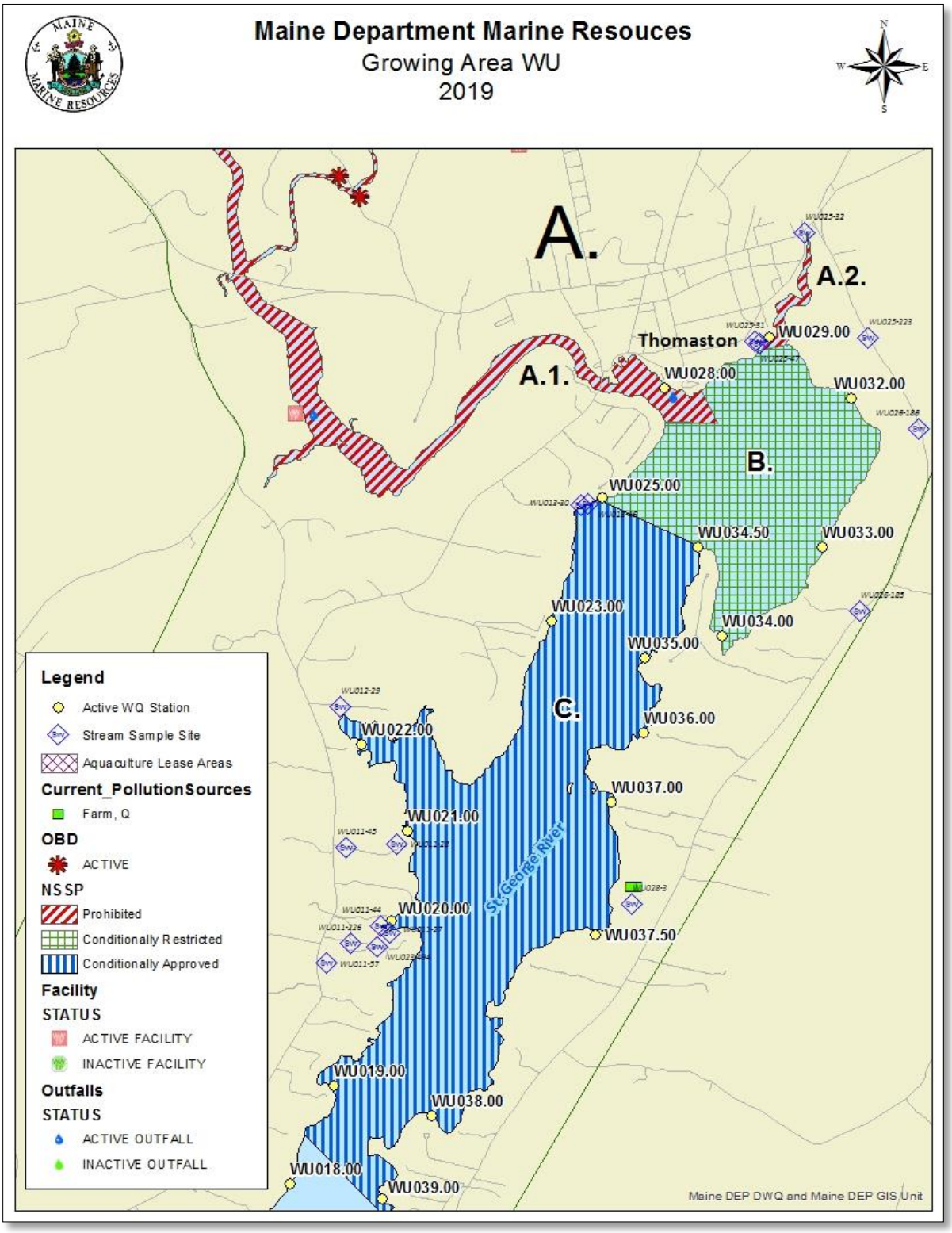


FIGURE 3.GROWING AREA WU, SUBSET B., POLLUTION AREA 27-B

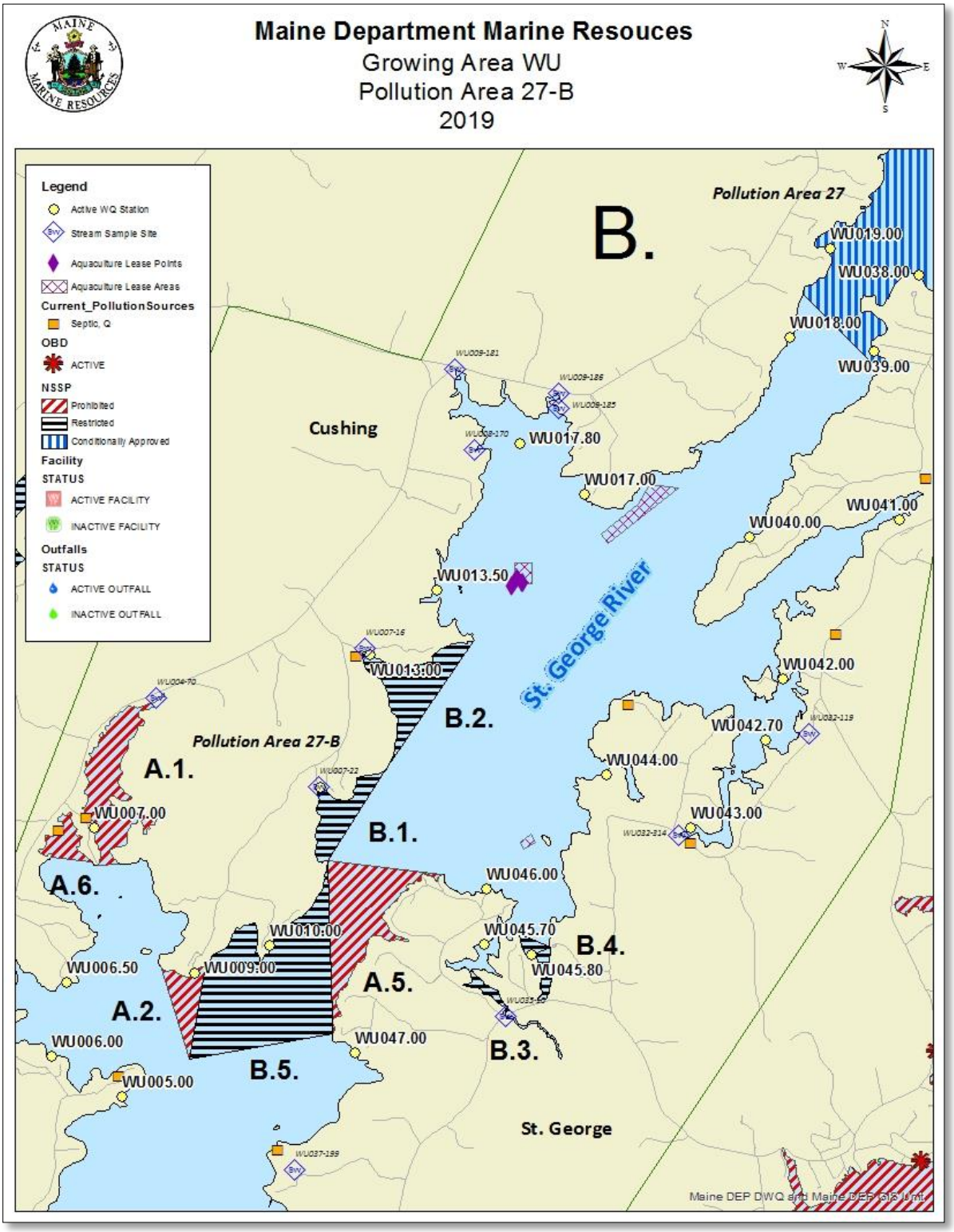
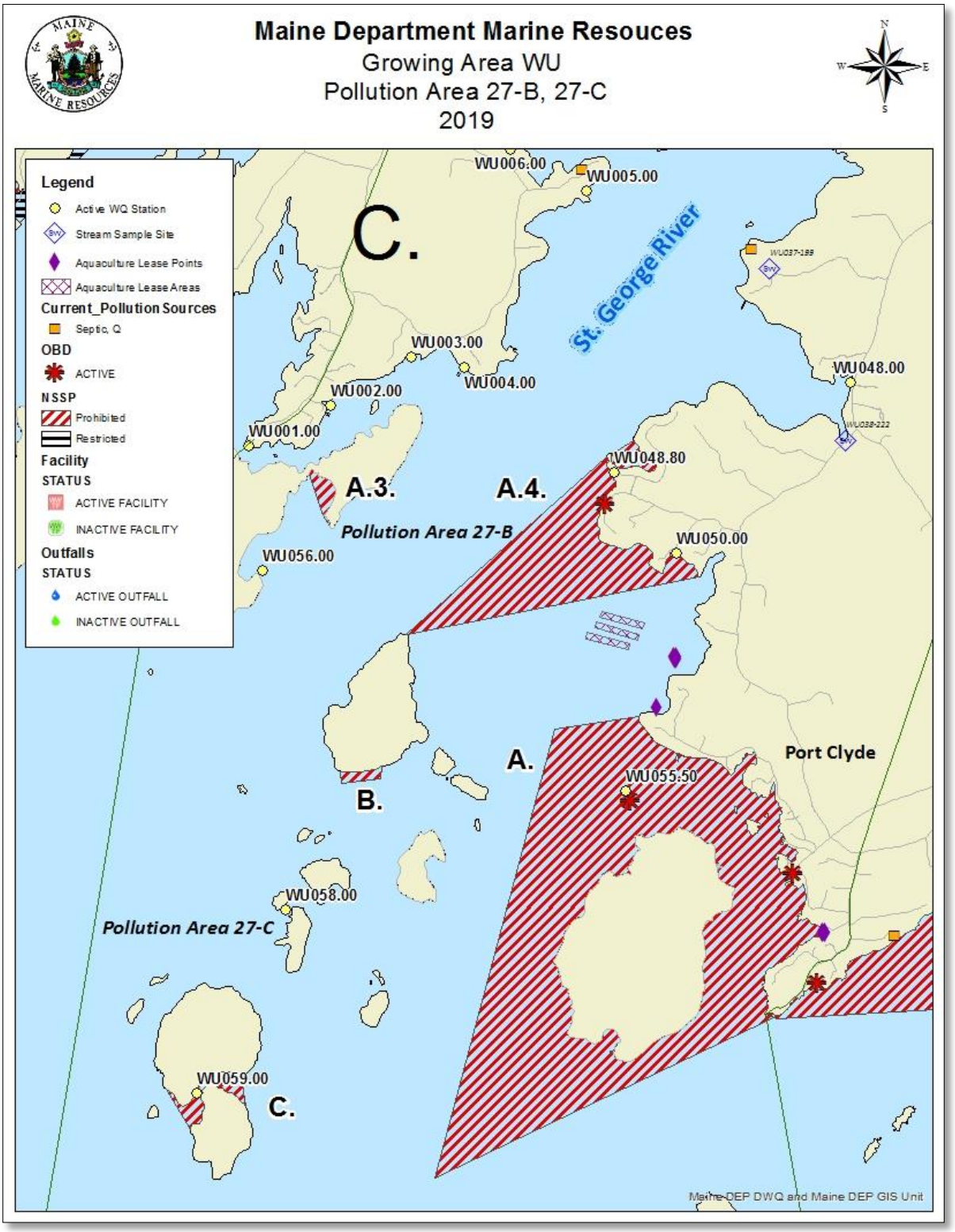


FIGURE 4.GROWING AREA WU, SUBSET C., POLLUTION AREA 27-B, 27-C



State and Federal Licensed Waste Discharge Permits

Overboard Discharges

There are five overboard discharges (OBDs) that discharge their treated effluent into the waters of Growing Area WU. Two OBDs discharge into the Oyster River, two OBDs discharge into the waters around the entrance of the St. George River and one OBD discharges into Port Clyde Harbor. No OBDs were reported removed within the growing area during 2019. A total of eight OBDs were reported removed during the 12-year review period.

An overboard discharge is the discharge of wastewater from residential, commercial, and publicly owned facilities to Maine's streams, rivers lakes, and the ocean. Commercial and residential discharges of sanitary waste have been regulated since the mid-1970's when most direct discharges of untreated waste were banned. Between 1974 and 1987 most of the "straight pipes" were connected to publicly-owned treatment works or replaced with standard septic systems. Overboard discharge treatment systems were installed for those facilities that were unable to connect to publicly-owned treatment works or unable to install a septic system because of poor soil conditions or small lot sizes.

All overboard discharge systems include a process to clarify the wastewater and disinfect it prior to discharge. There are two general types of treatment systems; mechanical package plants and sand filters. Sand filter systems consist of a septic tank and a sand filter. In such systems, the wastewater is first directed to a holding tank where the wastewater solids are settled out and undergo partial microbial digestion. The partially treated wastewater then flows from the tank into a sand filter, consisting of distribution pipes, layers of stone and filter sand, and collection pipes within a plastic liner. The wastewater is biologically treated as it filters down through the sand and is then collected and discharged to a disinfection unit. Mechanical package plants consist of a tank, where waste is mechanically broken up, mixed and aerated; mechanical systems require electric power, and must have an operating alarm on a separate electrical circuit that will activate if the treatment unit malfunctions due to a power failure. The aerated treated wastewater is held in a calm condition for a time, allowing for solids to settle and for the waste to be partially digested by naturally occurring bacteria. The clarified water from the tank is then pumped off the top into a disinfection unit. There are two types of disinfection units, UV and chlorinators (most common). In a chlorinator, the treated water contacts chlorine tablets and remains in a tank for at least 20 minutes where bacteria and other pathogens are killed. The treated and disinfected water is discharged from the disinfection unit to below the low water mark of the receiving waterbody (the ocean, a river, or a stream) via an outfall pipe.

OBDs are licensed and inspected by the Maine Department of Environmental Protection. At each inspection, DEP looks for tags on each treatment unit identifying the service contractor and the last date of service. If an OBD is not properly maintained, or if the OBD malfunctions, it has the potential to directly discharge untreated wastewater to the shore; therefore, preventative closures are implemented

surrounding every OBD located in growing area WJ (Table 1). The size of each closure is determined based on a dilution, using the permitted flow rate of the OBD (in gallons per day, GPD), and the depth of the receiving water that each OBD discharges to; the fecal concentration used for this dilution calculation is $1.4X10^5$ FC /100 ml. Single OBD systems associated with more than one residence will have multiple permit IDs. All current closures are of adequate size to protect public health.

TABLE 1. OVERBOARD DISCHARGES (OBDS). LIST OF FEDERAL AND STATE PERMITTED OBDS IN GROWING AREA WU.

Pollution Area	DEP Permit ID	TOWN	FLOW (GPD)	Receiving Water Body	Impact	Depth of Receiving Water (ft)	Required Closure (acres)	Actual Closure (acres)
27 (A.1.)	2153	Thomaston	600	Oyster River	Direct	17	1.1	301
27 (A.1.)	2286	Thomaston	300	Oyster River	Direct	17	0.6	301
27B (A.4.)	2700	St George	300	Mouth of St George River	Direct	15	0.6	219
27C (A.)	7163	St George	50	Mouth of St George River	Direct	15	0.1	893
27C (A.)	6683	St George	300	Port Clyde Harbor	Direct	17	0.6	893

National Pollutant Discharge Elimination System (NPDES)

TABLE 2. NPDES PERMITS ASSOCIATED WITH WASTE WATER TREATMENT FACILITIES LOCATED IN GROWING AREA WU.

Pollution Area	Permit ID	TOWN	Receiving Water Body	Facility	Type
27 (A.1)	ME0100668	Thomaston	St. George River	Thomaston WWTP	WWTP Outfall
27 (A.1)	ME0102253	Warren	St. George River	Warren WWTP	WWTP Outfall
27 (A.1)	MEU508214	Warren	Groundwater	Maine Water Company	Subsurface Wastewater

There are two wastewater treatment facilities in growing area WU. Both facilities discharge into a prohibited area that is determined by a dilution calculation. One facility only discharges into the waters of the growing area for three months in the winter each year.

Both facilities have been operating very effectively with only one recent system malfunction: In August of 2017 street construction in Thomaston caused a blockage in a sewer line. This blockage resulted in sewage backing up into the basement of a local residence and entering the storm-water system through another drain in the basement. The result was a multi-day closure of the St. George conditional areas while the problem was investigated. This was not a bypass event, but the result was similar, partially treated sewage entering the storm water system. A full report is available in the DMR Central Files.

Thomaston Pollution Control Department:

The Thomaston Treatment Facility serves a population of approximately 2,700 citizens. The collection system consists of 13 miles of pipe; five pump stations and no CSOs. The municipal sewer collection system delivers the sewerage to the Ship Street pump station by gravity. The Ship Street pump station consists of a mechanical bar screen and an auxiliary manual bar screen, two influent pumps and a flow meter. Effluent from the Ship Street pump station is pumped to the treatment lagoons, with a total capacity of 21 million gallons, and a storage lagoon with a maximum liquid level depth of 20 feet and a capacity of 36 million gallons. Aeration is provided to the treatment lagoons via three blowers, air distribution piping and 98 fine-bubble tubular membrane diffuser assemblies. The lagoons were designed for an average daily influent flow of 427,000 gallons per day (GPD) and an influent BOD of 885 lbs/day. At an influent rate of 427,000 GPD, the 36-million-gallon storage lagoon provides for 84 days of storage. During the months of January, February and March, the effluent from the lagoons is disinfected with sodium hypochlorite and flows by gravity through 7,100 linear feet of pipe to the St George River where it is discharged via the outfall pipe at the former Thomaston Treatment Facility. During the period from April 15 through October 31 of each year, Thomaston is authorized to dispose of wastewater by spray irrigation on approximately 52 acres of a 300-acre site consisting of five spray irrigation fields of approximately 10 acres each. The effluent is land applied by a spray irrigation system consisting of two 75 horsepower pumps, approximately 26,000 linear feet of distribution piping, and 130 + spray nozzles. Each spray nozzle can deliver a 150-foot diameter spray pattern. The effluent is applied to one field at a time with each field being used one day each week. The waste water is applied at a maximum rate of three inches per week per site. The spray irrigation fields are six hundred feet from the shores of the banks of the Oyster River (northwest of Thomaston waterfront) and more than 3.5 miles from the conditionally restricted area in the upper portion of the river. When the facility is not permitted to use spray irrigation, wastewater is stored in the lagoons.

The Thomaston Treatment facility, WWTP MEPDES permit issued 2018, allows for an average daily flow of 0.9 MGD. It serves a population of approximately 2,700 citizens. During the months of January, February and March, the effluent from the lagoons is disinfected and flows by gravity to the St George River where it is discharged via the outfall pipe at the former Thomaston Treatment Facility. During the period from April 15 through October 31 of each year, Thomaston is authorized to dispose of wastewater by spray irrigation on approximately 52 acres of a 300-acre site. The spray irrigation fields are six hundred feet from the shores of the banks of the Oyster River (northwest of Thomaston waterfront) and more than 3.5 miles from the Conditionally Restricted area in the upper portion of the river. When the facility is not permitted to use spray irrigation, wastewater is stored in the lagoons.

A dilution calculation for the Thomaston Treatment Facility was done based on a reported flow rate of 350,000 gallons per day (average wet weather flow), with a bacteria concentration of 230 fecal coliform colonies/100ml (the most elevated fecal score received at the facility during effluent testing in 2004 and 2005), and an average depth of receiving water of eleven feet. The calculation determined that the required closure size for fecal coliform to be diluted don to an approved concentration of 14 FCU /100ml

is 2. 9 acres. The required closure size for viral dilution during the discharge period is 179 acres. There is currently a closure zone of over 525 acres surrounding the plant's outfall during the discharge period.

Warren Sanitary District:

The Warren Sanitary District serves approximately 950 residents (250 connections) within the village of Warren. Approximately 72% of the total sanitary wastewater influent flows to the facility originate at the State of Maine Department of Corrections Minimum and Maximum Security Prison Facility and the Maine Correctional Institute. The Warren Sanitary District provides secondary treatment of sanitary wastewater via a four-cell, partial mix, aerated lagoon system.

Wastewater is conveyed to the treatment facility via gravity and force main sewer lines and influent flows from the Bolduc Correctional Facility and Warren Village are measured separately prior to entering Lagoon #1, using influent flow meters. Although any of the four available lagoon cells may be removed from service, flows typically follow the sequential pattern: Lagoon #1 to Lagoon #2 to Lagoon #3 to Lagoon #4. Treated effluent from the lagoons flows by gravity to a dissolved air flotation (DAF) unit for algae removal. A polymer is added to the flow prior to entering the DAF unit to assist in coagulation and flocculation. Floc is skimmed from the surface of the DAF unit to a wet well. The contents of the wet well are periodically (daily basis) pumped back to the head works for additional treatment via the lagoon system. Following the DAF unit, the flow is conveyed to a splitter box located in the disinfection building and evenly distributed to up to four channels equipped with an ultraviolet (UV) disinfection system. The UV system is equipped with an alarm system and automatic shut-off designed to cease discharge upon activation of the alarm. Additionally, the District maintains a secondary UV disinfection system to ensure continued operation and discharge upon failure of the primary system. Final effluent is measured using a Parshall flume installed immediately below the UV system channels. Final effluent is conveyed to the St George River for discharge via an 8-inch diameter outfall pipe. The outfall pipe extends out approximately 120 feet into the tidal river and is submerged to a depth of approximately 20 feet below the surface at mean low water. The outfall includes a diffuser port with four 4-inch diameter outfall ports to enhance mixing with the receiving waters.

Warren's license allows both summer (June 1- September 30) and winter (October 1- May 31) discharge periods. The summer average discharge flow limit is 79,500 gallons per day and the winter average flow limit is 244,200 gallons per day. Wet weather flows are typically not greater than average flow rates.

Dilution calculations were done for both discharge periods based on the summer and winter average discharge flow limits. During the summer discharge period, based on a flow limit of 79,500 GPD, using a fecal load of 140,000 FC colonies/100ml, and an average depth of the receiving waters of five and a half feet, the required closure zone for fecal coliform to be diluted down to 14 FC/100ml of water is 444 acres. The required acreage for 1,000:1 viral dilution to allow for a wastewater treatment plant (WWTP)

conditional area is 44.4 acres. During the winter discharge period, based on a flow limit of 244,200 GPD, using a fecal load of 140,000FC colonies/100ml, and an average depth at the receiving waters of five and a half feet, the required closure zone for fecal coliform to be diluted down to 14 FC/100ml of water is 1,363 acres. The required acreage for 1,000:1 viral dilution to allow for a waste treatment plant conditional area is 136.2 acres.

The size of the prohibited area from the route one bridge to the Conditionally Restricted boundary lines outside of Thomaston's waterfront is 158 acres. The Prohibited area is adequate in size with WWTP conditional areas utilized as part of the management plan. The Conditionally Restricted area is 487 acres and the Conditionally Approved area is 1,114 acres. This management zone is adequate to dilute Warren Sanitary District's discharge and manage for any potential system failures.

When Thomaston Treatment Facility's required dilution closure area is added to Warren's required closure area (winter discharge period) the required Prohibited area is 329 acres. During Thomaston's discharge period, there are more than 600 acres closed to shellfish harvesting.

Residential

All residential pollution sources are reported to the local plumbing inspector (LPI). Once the system has been documented as being fixed, staff members from DMR can re-assess the water quality data and shoreline survey information to determine if the area is safe for shellfish harvest. There are not currently any known outstanding residential pollution sources in the Growing Area. DNA testing done by the local shellfish committee in the upper bay of the St. George River indicated the possible presence of pollution caused by human influence at one site at the mouth of the Mill River. Further investigations are being conducted to determine the source.

Industrial Pollution

There are no major industries along the immediate shore in Shellfish Growing Area WU. Dragon Cement is located nearby the St George River approximately 0.75 miles away. Dragon Cement has no licensed discharges in to the St George River. DEP monitors both the ground water and surface water at several sites around the facility for a variety of inorganic substances. The wastewater from this facility is recycled and used in the processing of the cement. Information on DEP's monitoring of Dragon Cement's groundwater and surface water sites can be found in DMR central files.

Marinas

In the town of Thomaston there is a boatyard that has dock space for approximately 14 forty-foot boats. The boatyard is located, inside the closure zone for both the Thomaston Treatment Facility and the Warren Sanitary District outfalls. The main purpose of the dock space is to "store" the boats while they are being worked on, either until they leave in the springtime or until they are hauled out in the fall. An interview with the manager of the boat yard confirmed that no more than five boats are lived on at any one time. A marina dilution calculation was completed and concluded that a closure of 7.24 acres is

necessary to protect public health from potential discharges from docked boats (based on five boats, each having occupancy of two people living aboard); a closure of 20.28 acres is required if all 14 dock spaces are considered in the calculation. The current closure zone in the immediate Thomaston waterfront area is greater than 50 acres, and therefore is adequate in protecting public health from potential pollution associated with this marina.

Jeff's Marine is also located along the Thomaston waterfront. This facility sells and repairs small marine watercraft (10 – 24 feet) that are not lived aboard. Jeff's Marine has dock space for 10 boats.

Storm Water

Storm water runoff is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground. As the runoff flows over the land or impervious surfaces (paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment or other pollutants that could adversely affect water quality if the runoff is discharged untreated (US EPA 2009). Thus, storm water pollution is caused by the daily activities of people within the watershed. Currently, polluted storm water is the largest source of water quality problems in the United States.

The primary method to control storm water discharges is the use of best management practices (BMPs). In addition, most major storm water discharges are considered point sources and require coverage under a NPDES permit. In 1990, under authority of the Clean Water Act, the U.S. EPA promulgated Phase I of its storm water management program, requiring permitting through the National Pollution Discharge Elimination System (NPDES). The Phase I program covered three categories of discharges: (1) "medium" and "large" Municipal Separate Storm Sewer Systems (MS4s) generally serving populations over 100,000, (2) construction activity disturbing five acres of land or greater, and (3) ten categories of industrial activity. In 1999, US EPA issued Phase II of the storm water management program, expanding the Phase I program to include all urbanized areas and smaller construction sites.

Although it is a federal program, EPA has delegated its authority to the Maine DEP to administer the Phase II Small MS4 General Permit. Under the Small MS4 GP, each municipality must implement the following six Minimum Control Measures: (1) Public education and outreach, (2) Public participation, (3) Illicit discharge detection and elimination, (4) Construction site storm water runoff control, (5) Post-construction storm water management, and (6) Pollution prevention/good housekeeping. The permit requires each city or town to develop a draft Storm Water Management Plan that establishes measurable goals for each of the Minimum Control Measures. The City or Town must document the implementation of the Plan, and provide annual reports to the Maine DEP. Currently the discharge of

storm water from 30 Maine municipalities is regulated under the Phase II Small MS4 General Permit however, no municipalities located within the boundaries of growing area WU fall under these regulations. Additionally, the Maine Storm Water Management Law provides storm water standards for projects located in organized areas that include one acre of more of disturbed area (Maine DEP 2009).

Stormwater enters the upper St George River by way of stormwater drains along the Thomaston waterfront. This area is also Prohibited due to the presence of WWTP discharges and marine facilities. When the new Thomaston Treatment Facility went on line at its new location, new sewer lines were installed at locations in the center of town and the stormwater lines were separated out from the sewer system making them "clean water drains". After the new facility had been operational for three years, it became apparent that wastewater was still entering the river in the vicinity of the Thomaston waterfront. A stormwater study was initiated in 2001 to try to locate the source(s) of the elevated scores. All the sources identified during the storm drain study were fixed by the fall of 2002.

Non-Point Pollution Sources

Non-point source (NPS) pollution is water pollution affecting a water body from diffuse sources, such as polluted runoff from agricultural areas draining into a river, significant rainfall, high river flows or astronomical high tides. Nonpoint source pollution can be contrasted with point source pollution, where discharges occur to a body of water at a sole location, such as discharges from a chemical factory, urban runoff from a roadway storm drain or from ships at sea. NPS may derive from various sources with no specific solution to rectify the problem, making it difficult to regulate. Freshwater streams, drainage from rainstorm runoff and tidal creeks are the major source of non-point discharge into Growing Area WU. A total of 176 valid samples were taken from freshwater streams during the review period.

TABLE 3. STREAM SAMPLES IN GROWING AREA WU 2008-2016; SCORES > 163 CFU/100ML ARE HIGHLIGHTED IN RED.

LOCATION ID	Sample Date	Pollution Type	Raw Score
WU011-28	25-Feb-08	Stream	1.9
WU011-28	19-Mar-08	Stream	12
WU012-29	08-Jun-08	Stream	1.9
WU013-30	08-Jun-08	Stream	1.9
WU013-46	08-Jun-08	Stream	4
WU023-494	08-Jun-08	Stream	8
WU011-44	08-Jun-08	Stream	12
WU011-27	08-Jun-08	Stream	18
WU011-57	08-Jun-08	Stream	18
WU011-28	08-Jun-08	Stream	22

LOCATION ID	Sample Date	Pollution Type	Raw Score
WU011-45	08-Jun-08	Stream	24
WU025-31	08-Jun-08	Stream	30
WU025-47	08-Jun-08	Stream	44
WU025-32	08-Jun-08	Stream	104
WU032-71	24-Aug-08	Stream	44
WU011-28	27-Aug-08	Stream	560
WU004-70	08-Sep-08	Stream	880
WU011-28	17-Sep-08	Stream	72
WU011-28	21-Sep-08	Stream	46
WU032-71	21-Sep-08	Stream	46
WU011-44	21-Sep-08	Stream	58
WU011-27	21-Sep-08	Stream	1100
WU032-119	11-May-09	Stream	1.9
WU032-72	11-May-09	Stream	1.9
WU011-28	15-Jul-09	Stream	180
WU004-70	02-Jun-10	Stream	260
WU004-70	07-Jun-10	Stream	122
WU004-70	29-Jun-10	Stream	200
WU011-28	29-Jun-10	Stream	1380
WU004-70	14-Jul-10	Stream	280
WU011-44	14-Jul-10	Stream	920
WU011-27	14-Jul-10	Stream	1180
WU011-28	14-Jul-10	Stream	1700
WU025-31	14-Jul-10	Stream	1700
WU025-32	14-Jul-10	Stream	1700
WU011-57	14-Jul-10	Stream	1700
WU004-70	03-Aug-10	Stream	18
WU032-71	17-Aug-10	Stream	90
WU025-47	17-Aug-10	Stream	112
WU025-31	17-Aug-10	Stream	1700
WU004-70	20-Sep-10	Stream	44
WU011-28	28-Sep-10	Stream	680
WU004-70	15-Oct-12	Stream	11
WU012-29	30-Sep-14	Stream	25
WU004-70	30-Sep-14	Stream	27
WU011-45	30-Sep-14	Stream	68
WU009-186	30-Sep-14	Stream	80
WU011-27	30-Sep-14	Stream	140
WU011-226	30-Sep-14	Stream	260

LOCATION ID	Sample Date	Pollution Type	Raw Score
WU011-44	30-Sep-14	Stream	340
WU032-71	01-Oct-14	Stream	7.3
WU026-185	01-Oct-14	Stream	8
WU025-223	01-Oct-14	Stream	11
WU025-223	20-Oct-14	Stream	38
WU026-186	20-Oct-14	Stream	72
WU026-185	20-Oct-14	Stream	94
WU032-71	22-Oct-14	Stream	10
WU011-45	22-Oct-14	Stream	280
WU013-30	22-Oct-14	Stream	300
WU012-29	22-Oct-14	Stream	1600
WU026-186	12-Nov-14	Stream	22
WU009-186	12-Nov-14	Stream	27
WU004-70	12-Nov-14	Stream	38
WU011-226	12-Nov-14	Stream	40
WU011-44	12-Nov-14	Stream	50
WU011-27	12-Nov-14	Stream	52
WU035-10	08-Apr-15	Stream	1.9
WU032-72	08-Apr-15	Stream	1.9
WU011-226	08-Apr-15	Stream	1.9
WU028-3	08-Apr-15	Stream	1.9
WU009-186	08-Apr-15	Stream	1.9
WU007-16	08-Apr-15	Stream	1.9
WU007-22	08-Apr-15	Stream	1.9
WU013-30	08-Apr-15	Stream	2
WU038-222	08-Apr-15	Stream	38
WU011-45	08-Apr-15	Stream	400
WU037-199	23-Jun-15	Stream	150
WU032-314	23-Jun-15	Stream	260
WU004-70	24-Jun-15	Stream	34
WU007-22	23-Jul-15	Stream	35
WU013-30	23-Jul-15	Stream	82
WU004-70	23-Jul-15	Stream	90
WU011-45	23-Jul-15	Stream	94
WU011-226	23-Jul-15	Stream	120
WU009-186	23-Jul-15	Stream	136
WU007-16	23-Jul-15	Stream	148
WU035-10	06-Aug-15	Stream	16
WU032-314	06-Aug-15	Stream	35

LOCATION ID	Sample Date	Pollution Type	Raw Score
WU038-222	06-Aug-15	Stream	740
WU028-3	12-Aug-15	Stream	1700
WU011-45	25-Aug-15	Stream	52
WU011-226	25-Aug-15	Stream	136
WU004-70	25-Aug-15	Stream	148
WU007-16	25-Aug-15	Stream	380
WU007-22	25-Aug-15	Stream	740
WU009-185	25-Aug-15	Stream	1100
WU035-10	26-Aug-15	Stream	74
WU028-3	26-Aug-15	Stream	460
WU038-222	26-Aug-15	Stream	480
WU026-186	13-Apr-16	Stream	1.9
WU028-3	13-Apr-16	Stream	1.9
WU025-223	13-Apr-16	Stream	2
WU026-185	13-Apr-16	Stream	10
WU037-199	14-Apr-16	Stream	1.9
WU032-314	14-Apr-16	Stream	1.9
WU035-10	14-Apr-16	Stream	1.9
WU007-16	14-Apr-16	Stream	3.6
WU032-72	14-Apr-16	Stream	5.5
WU007-22	14-Apr-16	Stream	12
WU038-222	14-Apr-16	Stream	22
WU009-186	14-Apr-16	Stream	620
WU013-30	20-Apr-16	Stream	1.9
WU007-22	20-Apr-16	Stream	1.9
WU007-16	20-Apr-16	Stream	1.9
WU011-27	20-Apr-16	Stream	1.9
WU012-29	20-Apr-16	Stream	2
WU004-70	20-Apr-16	Stream	2
WU009-186	20-Apr-16	Stream	4
WU011-45	20-Apr-16	Stream	60
WU032-72	26-Apr-16	Stream	1.9
WU032-314	26-Apr-16	Stream	2
WU026-185	26-May-16	Stream	1.9
WU028-3	26-May-16	Stream	15
WU025-223	26-May-16	Stream	16
WU032-314	23-Jun-16	Stream	1.9
WU007-16	23-Jun-16	Stream	16
WU009-186	23-Jun-16	Stream	72

LOCATION ID	Sample Date	Pollution Type	Raw Score
WU007-22	23-Jun-16	Stream	84
WU032-72	23-Jun-16	Stream	106
WU011-27	23-Jun-16	Stream	120
WU011-45	23-Jun-16	Stream	500
WU012-29	23-Jun-16	Stream	840
WU035-10	05-Sep-16	Stream	1.9
WU032-314	05-Sep-16	Stream	1.9
WU009-186	05-Sep-16	Stream	64
WU007-22	05-Sep-16	Stream	98
WU007-16	05-Sep-16	Stream	260
WU004-70	06-Sep-16	Stream	58
WU038-222	06-Sep-16	Stream	128
WU025-223	12-Sep-16	Stream	110
WU004-70	19-Sep-16	Stream	8
WU009-186	19-Sep-16	Stream	64
WU007-22	19-Sep-16	Stream	460
WU011-27	19-Sep-16	Stream	1480
WU007-16	19-Sep-16	Stream	1700
WU012-29	19-Sep-16	Stream	1700
WU038-222	17-Oct-16	Stream	1.9
WU032-314	17-Oct-16	Stream	1.9
WU035-10	17-Oct-16	Stream	4
WU004-70	16-Nov-16	Stream	16
WU007-22	16-Nov-16	Stream	68
WU013-30	16-Nov-16	Stream	148
WU011-45	16-Nov-16	Stream	360
WU009-186	16-Nov-16	Stream	1220
WU012-29	16-Nov-16	Stream	1440
WU007-16	16-Nov-16	Stream	1700
WU011-27	16-Nov-16	Stream	1700
WU009-186	29-Aug-17	Stream	1.9
WU009-181	29-Aug-17	Stream	2
WU008-170	29-Aug-17	Stream	18.2
WU009-186	10-Oct-17	Stream	660
WU009-181	10-Oct-17	Stream	860
WU038-222	25-Oct-17	Stream	1700
WU009-181	27-Nov-17	Stream	14
WU009-186	27-Nov-17	Stream	16
WU009-181	28-Nov-17	Stream	6

LOCATION ID	Sample Date	Pollution Type	Raw Score
WU007-22	28-Nov-17	Stream	7.3
WU025-223	28-Nov-17	Stream	13
WU009-186	28-Nov-17	Stream	16
WU011-45	28-Nov-17	Stream	25.5
WU008-170	28-Nov-17	Stream	35
WU007-16	28-Nov-17	Stream	56
WU012-29	28-Nov-17	Stream	72
WU038-222	29-Nov-17	Stream	22
WU009-181	01-May-18	Stream	24
WU009-186	01-May-18	Stream	76

Agricultural Activities

Shellfish Growing Area WU has several small animal operations mostly consisting of a few horses, cows, sheep, goats, chickens and ducks. There are no large-scale agricultural activities in the Growing Area. Farms visited were primarily located in Cushing and St. George. Pollution from small agriculture operations can be introduced into the growing area as nonpoint source pollution transported by runoff from large rainfall or snowmelt events. Smaller farms are encouraged to follow best management practices to help avoid effects animal waste and agricultural pollutants can have on water quality. None of these small farms appeared to be directly impacting the growing area during shoreline survey visits.

Domestic Animals and Wildlife Activity

The salt marshes and mudflats of the growing area provide valuable habitat to a variety of wildlife. Commonly observed bird species include a variety of gulls, sea and inland ducks, cormorants, geese, great blue herons, egrets, swans, and others. Mammals living within the growing area include dogs, cats, whitetail deer, muskrat, squirrels, chipmunks, rabbits, moles, mice, bats, shrews, weasels, skunks, raccoons, and others. Maine Inland Fish and Wildlife surveys indicate that migratory waterfowl numbers begin to increase in the early autumn months, and typically peak in late fall or early winter. Although large numbers of birds can, in theory, pose a threat the Growing Area water quality, such occurrences are very difficult to document. DNA testing done by the local shellfish committee in the upper bay of the St. George River indicated the possible presence of pollution caused by bird or mammal of unknown species.

Recreation Areas (beaches, trails, campgrounds, etc.)

The concern for actual or potential pollution from recreational areas is because many of them allow dogs and some have bathroom facilities. Activities at the recreational areas may contribute to water quality problems by placing added pressure on the watershed. For instance, they may contribute to erosion (trails, building footbridges, etc.), dog waste not picked up may accumulate and wash off after rainfall, new trails may be put into areas that didn't have human activity before and they may put added pressure on wildlife to congregate in other places where we may see water quality decline.

Growing Area WU primarily contains the St. George River. Recreational activity increases in the summertime and seasonal properties have the potential to be occupied. There are seven public multi-use preserves managed by the Georges River Land Trust. These preserves are distributed along both the eastern and western shores of the river. Dogs are permitted, if leashed, and owners are advised to clean up after their dogs. These areas have shown no specific impact to water quality.

The St. George River is still a relatively "quiet" and "rural" waterbody. There are no campgrounds or public beaches in the Growing Area. There are also no significant urban centers or cities located within the growing area. Downtown Thomaston and the village of Port Clyde are the only population centers where activities and services such as waterfront dining, public boat launches, and mooring fields are offered. These areas are classified as Prohibited due to the presence of WWTP outfalls, marinas or mooring fields and the presence of overboard discharges.

Hydrographic and Meteorological Assessment

Tides

Area WU is subject to a semidiurnal tidal cycle with two high tides and two low tides per day. In Thomaston, which is in the upper most portion of the study area, the elevation of the mean high tide is 9.4 feet and the mean spring tide is 10.8 feet. Many of the sample stations in the upper portion of the river are not able to be sampled during low tide stages because there is no water at the sample site. Several sites in the lower half of the river also drain out at lower tide stages. The mean tidal range for most of Maine is 9 feet to 13 feet. Unlike areas with small diurnal tides, this extreme volume exchange results in significant bacterial dilutions. Even within a river system like the St. George currents in the area are predominantly driven by the tides.

Growing Area WU and the St. George River have been identified as one of the areas along the coast that show significant impact during spring tides. There is a direct correlation between astronomical high tides, >11 feet, and diminished water quality. Poor water quality in late summer and fall is associated with high tidal water flushing the accumulated fecal waste debris caught in the shore/rack line into adjacent waters. Water quality at stations have shown to be negatively affected by spring tides during October and November. Conditional Area 27, C. closes when tidal height exceeds 11' in the months of October and November. This tidal conditional area is based on water scores from monitoring stations

and will be intermittently checked through the year during tidal events to support this current management plan.

Rainfall

The mean annual precipitation for Growing Area WU is approximately 46 inches. This precipitation is not distributed evenly throughout the year. Spring and fall tend to be the wettest seasons with April and November often seeing the most rainfall. August is typically a dry month in the State of Maine. In the Winter precipitation may fall as snow and can affect spring runoff rates when melting. Flood closures are implemented when areas receive greater than two inches of rainfall in a twenty-four-hour period. Rainfall is monitored by numerous rain gauges located along the entire Maine coast and reported primarily through the Weather Underground website. Some areas of Maine have documented fecal influences resulting from rainfall of greater than one inch in a twenty-four-hour period. These areas are considered rainfall conditional areas and are Conditionally Approved based on the one-inch closure trigger.

Growing Area WU has one Conditional Area based on rainfall. Conditional Area 27, C. closes when an inch or more of rain falls in the growing area within 24 hours. Weather Underground rainfall gauges in the vicinity of the Conditional Area and waterbody are used to monitor and determine precipitation amounts.

In order to investigate how rainfall was impacting water quality for rainfall amounts which do not necessitate an emergency flood closure, a rainfall assessment for stations in growing area WU was completed. For this assessment, the geometric mean and P90 scores were recalculated using only data points which were collected after 0.25 or more inches of cumulative rainfall were recorded 72 hours prior to sample collection (sum of rainfall recorded in the AM on day of sample, day before sample and two days before sample was taken). In this calculation, all data (excluding those samples collected during flood closures) collected between 2004 and 2008 were included, and calculations were limited to those stations that had at least five samples collected under the defined rainfall condition. In completing this assessment, the data collected under dry (<0.25 inches of rainfall in 72 hours) conditions, and thus not affected by run-off, was omitted from the calculation. The results of this calculation showed that the P90 scores for multiple stations increase when looking at this dataset, indicating that multiple stations are impacted by intermittent pollution that occur after rain events

Winds

Migratory weather systems cause winds that frequently change in strength and direction. Gulf of Maine winds are generally westerly, but often take on a northerly component in winter and a southerly one in summer. Strongest winds are generated by lows and cold fronts in fall and winter and by fronts and

thunderstorms during spring and summer. Extreme winds are usually associated with a hurricane or severe nor'easter and can reach 125 knots. In Maine, wind is not a contributor to fecal pollution because marine currents are primarily influenced by the size and duration of the normal tidal cycle.

River Discharge

The St George River is a long and shallow river in the area from the Thomaston waterfront to Fort Point on the St George shore. At low tide this portion of the river becomes a very narrow channel (ranging from 100 – 1000 feet) surrounded on both sides by large mudflat areas. South of Fort Point, the river deepens, and mudflat areas are found mainly at the head of small coves. The upper portion of the river also contains three large drainages which transport fresh water into the river during wet weather months in the spring and fall. The upper most region of the St George River meets the salt water portion of the river at Payson Park (head of tide) in the town of Warren. The Oyster River joins the St George River at the route one bridge at the town line separating the towns of Warren and Thomaston. The Mill River enters the St George River nearby the intersection of route one and route 131 in the town of Thomaston. None of these three upper "river" systems are deep enough to support boats larger than a canoe. At low tide the Mill River and the Oyster River flat out. The small river systems along with several small streams on both shores of the river, do contribute to low salinities during the wet weather months in the spring and fall. Currently, there are no river gauges which monitor river height or flow rates on the St. George River.

Hydrographic Influence

Water movement in Growing Area WU, ST. George River, is predominantly influenced by tides. The area is subject to a semidiurnal tidal cycle with two high tides and two low tides per day. Daily tidal cycle is 12 hours and 25 Mean high tide is a little over nine feet with spring tides potentially exceeding 11 feet. Inland pollution is potentially introduced into upper portions of the river from upland sections of the St. George river as well the Mill river. Water circulation in the upper bay may slow dilution in this area. Other potential influences are heavy rainfall and extreme tidal events that affect not only water height but current velocities.

The Conditionally Approved and Conditionally Restricted portions of the river are adequate to dilute upland pollution introduced into the river as well as any potential failures at the local waste treatment facilities. Fecal coliform DNA testing is currently being conducted by the local shellfish committee to help determine the potential source and distribution of pollution discharging into the upper river.

There are also several smaller creeks, streams and drainages along the mid and southern portions of the river that have a potential to discharge pollution. Water quality monitoring indicates that most of these drainages are not a significant source of pollution. A few drainages have been shown to potentially

impact the immediate water body. Management areas around these drainages are appropriate to dilute potential pollution from these sources.

Water Quality Studies

Map of Sampling Stations

Figures 1-4 in previous sections include the locations of water quality sampling stations.

Most marine fecal pollution of Maine waters comes from non-point sources. DMR uses Systematic Random Sampling (SRS) to monitor this influence and uses a pre-established schedule at an adequate frequency to capture all meteorological, hydrographic and/or other pollution events that trigger non-point pollution contribution. Using SRS will detect intermittent and unfavorable change in water quality and the program accepts the estimated 90th percentile (P90) as the standard to measure variance of a data set.

There are currently 51 active water quality stations in Growing Area WU. There are times when icing, safety concerns or access prevent samples from being collected on scheduled dates. Efforts are made to make up all missed stations following current NSSP guidelines. One station, WU45.80, requires a downgrade in the spring of 2020. All other stations in the Growing Area currently meet their appropriate NSSP classification.

Water Quality Discussion and Classification Determination

All active stations have P90s calculated utilizing a minimum of 30 recent valid samples. Station WU045.80 did not meet Approved standards and has been downgraded to Restricted. Station data was compared between the 2018 and 2019 monitoring years. 50 percent of stations saw an increase in P90 score from 2018 to 2019. Average increase was 3.4 pts. This increase did not threaten the current classification of most stations within the Growing Area as the fluctuations were generally small. Some stations that experienced an increase in P90 score are currently classified as Restricted or Prohibited. 30 percent of stations saw a decrease in P90 score with an average decrease of 4 points. 20 percent of stations saw no net change in P90 score. Because WU45.80 has been reclassified as of the writing of this report, all active stations currently meet NSSP classification standards.

Overall water quality is remaining constant. Incremental annual increases and decreases in calculated P90 score are common and do not necessarily denote a decline in overall water quality. Some areas do show a decline in water quality and may require further management in the future if scores do not increase. Station WU006.00, for example, is approaching the threshold for an Approved classification.

The St. George River Regional Shellfish Committee is working with DMR and actively investigating pollution sources at several sites around the Growing Area that show increased water quality scores.

TABLE 4. P90 CALCULATIONS FOR STATIONS WITH A MINIMUM OF 30 SAMPLES. GEOMEANS AND P90S NOT MEETING CURRENT CLASSIFICATIONS ARE HIGHLIGHTED IN RED.

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WU001.00	A	30	2.8	0.37	88	8.5	5/6/2015
WU002.00	A	30	2	0.09	4	2.6	5/6/2015
WU003.00	A	30	2.8	0.33	20	7.4	5/6/2015
WU004.00	A	30	3	0.37	40	9.3	5/6/2015
WU005.00	A	30	2.5	0.36	76	7.4	5/6/2015
WU006.00	A	30	3.8	0.68	1700	28.5	12/16/2015
WU006.50	A	30	2.7	0.36	54	7.9	1/11/2016
WU013.50	A	30	2.8	0.37	52	8.7	11/4/2015
WU017.00	A	30	2.9	0.31	22	7.6	12/16/2015
WU017.80	A	30	2.2	0.17	13	3.6	9/23/2014
WU018.00	A	30	3.1	0.4	134	10.2	9/1/2015
WU040.00	A	30	3.5	0.48	300	14.8	5/18/2015
WU041.00	A	30	3.3	0.42	70	11.6	5/18/2015
WU042.00	A	30	3.7	0.51	112	17.3	4/1/2015
WU042.70	A	30	3.1	0.51	80	14.3	4/1/2015
WU043.00	A	30	3.4	0.49	58	14.4	6/3/2015
WU044.00	A	30	2.7	0.34	44	7.7	4/1/2015
WU045.70	A	30	2.5	0.27	14	5.7	4/1/2015
WU045.80	A	30	4.5	0.67	1700	32.9	5/18/2015
WU046.00	A	30	2.8	0.35	40	8	4/1/2015
WU047.00	A	30	2.5	0.28	29	5.8	4/1/2015
WU048.00	A	30	4.8	0.56	140	25.6	5/18/2015
WU056.00	A	30	1.9	0.05	4	2.3	7/6/2015
WU058.00	A	30	2.2	0.27	36	5.1	7/6/2015
WU007.00	P	30	3.8	0.48	48	16.1	2/3/2015
WU009.00	P	30	5.5	0.79	1700	57.7	2/3/2015
WU028.00	P	30	4.5	0.52	128	21.1	9/28/2016
WU029.00	P	30	13.7	0.62	280	87.6	9/28/2016
WU048.80	P	30	2.8	0.45	80	10.5	10/14/2014
WU050.00	P	30	3.1	0.48	132	13.1	10/14/2014

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WU055.50	P	30	2	0.11	8	2.8	7/6/2015
WU059.00	P	30	2.2	0.27	46	5.1	7/6/2015
WU010.00	R	30	3.4	0.64	1700	22.8	5/6/2015
WU012.00	R	30	7.3	0.77	980	72.7	10/15/2012
WU013.00	R	30	8.4	0.73	840	73.9	5/6/2015

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WU019.00	CA	50	3	0.3	52	8.2	4/1/2015
WU020.00	CA	50	4	0.6	740	19	4/23/2014
WU021.00	CA	50	3	0.4	88	12	5/6/2015
WU022.00	CA	50	4	0.4	62	14	4/1/2015
WU023.00	CA	50	4	0.4	80	14	4/1/2015
WU025.00	CA	50	4	0.4	58	13	6/10/2015
WU034.50	CA	50	5	0.5	200	21	4/1/2015
WU035.00	CA	50	4	0.4	54	14	1/5/2015
WU036.00	CA	50	5	0.5	58	19	12/3/2014
WU037.00	CA	50	4	0.4	42	11	1/5/2015
WU037.50	CA	50	4	0.6	340	24	4/15/2015
WU038.00	CA	50	3	0.3	36	6.4	1/5/2015
WU039.00	CA	50	3	0.4	56	8.1	4/1/2015

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WU032.00	CR	40	6	0.5	300	28	5/18/2016
WU033.00	CR	40	7	0.6	360	42	4/26/2016
WU034.00	CR	40	9	0.7	920	66	5/18/2016

Emergency Closures: The reports summarizing emergency closures such as flood and biotoxin closures for the entire state are in the DMR central files.

Reclassifications: Reclassification addendums to the sanitary survey report are in the DMR central files.

CAMP Reviews, Inspection Reports, Performance Standards

The St George River conditional area (Area C) is Conditionally Approved based on seasonal tides, seasonal rainfall and WWTP function.

GROWING AREA WU CONDITIONAL AREAS

Tidal height management occurs October and November. These modifications were put into effect on May 15, 2014. Beginning in October, tides greater than 11 feet will initiate a closure. The closure will last for five days from the first day of the tidal event with an option to reopen early through the sampling of specific stations. To reopen early, sampling a minimum of two dedicated stations is required (WU022 and WU037). When possible, all 11 stations within the tidal conditional area should be sampled. It is required to have a set of clean scores to reopen before the end of the five-day mandatory closure.

This area is also managed on seasonal rainfall. A closure will be implemented if ≥1" of rain occurs in 24 hours between May 1st and November 30th. The conditional area remains closed for a minimum of 9 days and will reopen automatically after this time.

This area is also managed on the function of two wastewater treatment plans, one in Thomaston and one in Warren. Should a malfunction occur at either WWTP, this area will close immediately. Marine Patrol and/or local Shellfish Wardens monitor illegal harvesting activity for this area during any closed period. Maine DEP annually confirms all malfunctions and bypasses are reported in accordance with the conditions of the management plan. Thomaston and Warren WWTP personnel adequately reported WWTP malfunctions or bypasses at appropriate times.

The water quality in the Conditionally Approved area (Area C) is monitored by stations WU 19,20,21, 22, 23, 25,34.5, 35, 36, 37, 37.5, 38 and 39. During the 2019 review period this area remained in compliance.

TABLE 5. GEOMEAN AND P90 SCORES, ST GEORGE RIVER, GROWING AREA WU, CONDITIONALLY APPROVED STATIONS IN THE OPEN STATUS FOR THE 2019 REVIEW PERIOD.

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WU019.00	CA	50	3.1	0.32	52	8.2	4/1/2015
WU020.00	CA	50	3.7	0.55	740	19	4/23/2014
WU021.00	CA	50	3.3	0.43	88	12.2	5/6/2015
WU022.00	CA	50	4	0.42	62	13.9	4/1/2015
WU023.00	CA	50	3.8	0.43	80	13.8	4/1/2015
WU025.00	CA	50	3.8	0.39	58	12.5	6/10/2015
WU034.50	CA	50	4.6	0.51	200	21.3	4/1/2015
WU035.00	CA	50	4	0.43	54	14.4	1/5/2015
WU036.00	CA	50	4.8	0.45	58	18.7	12/3/2014
WU037.00	CA	50	3.6	0.37	42	11.1	1/5/2015
WU037.50	CA	50	4.3	0.57	340	23.6	4/15/2015

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WU038.00	CA	50	2.7	0.29	36	6.4	1/5/2015
WU039.00	CA	50	2.7	0.36	56	8.1	4/1/2015

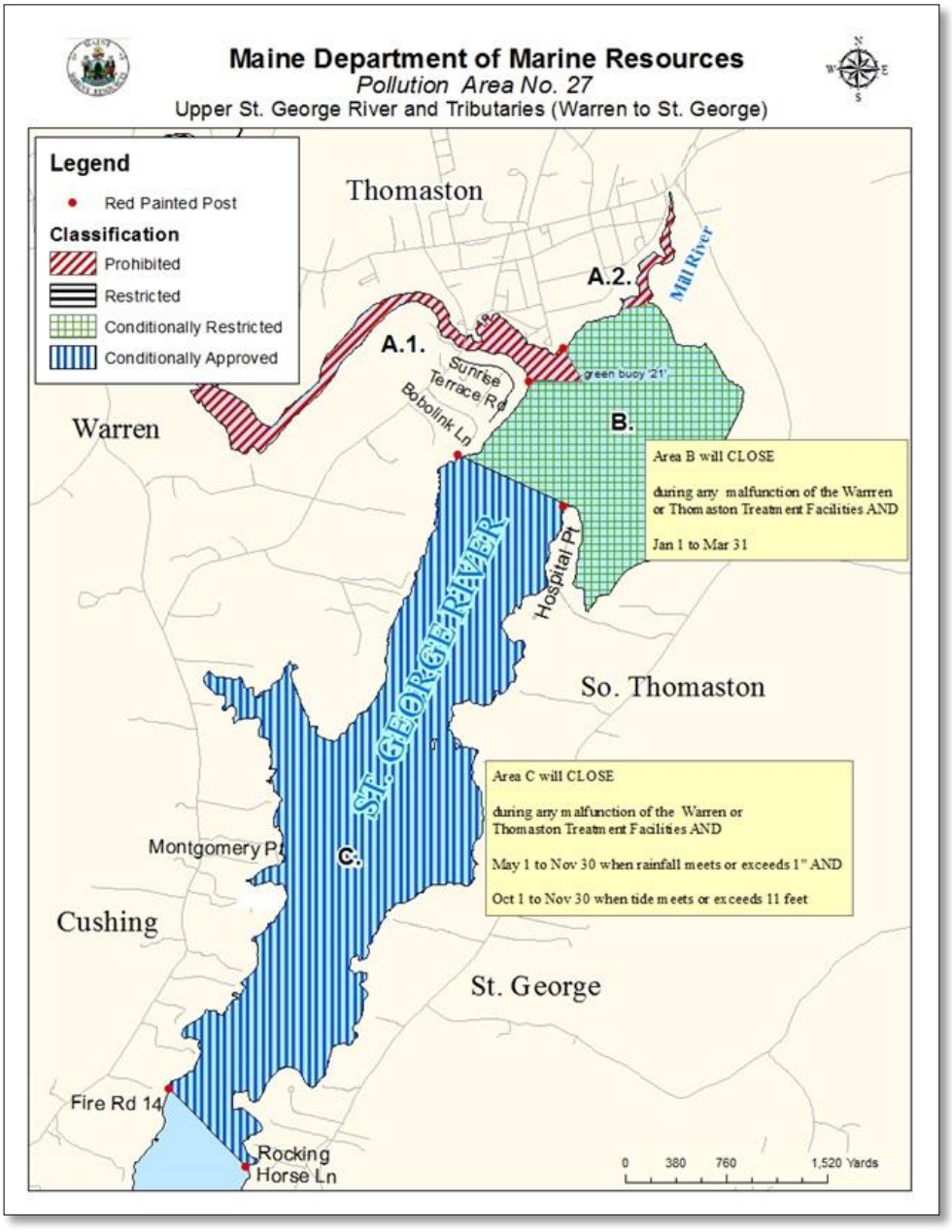
The "Upper Bay" in Growing Area WU is classified as Conditionally Restricted, based on the proper functioning of the Warren Sanitary District and the Thomaston Treatment Facility WWTP operations as well as season. The conditionally restricted area shall be closed during any failure event at either of these facilities. Water quality in this conditional area is currently monitored by stations, WU 32, WU33, WU34. These stations must be sampled monthly when the Conditionally Restricted area is in the open status. If there is a malfunction with either of the WWTPs that warrants a closure, both areas B and C will close.

Maine DEP annually confirms all malfunctions and bypasses are reported in accordance with the conditions of the management plan. Thomaston and Warren WWTP personnel adequately reported WWTP malfunctions or bypasses at appropriate times. During the 2019 review period this area remained in compliance.

TABLE 6. WU, ST GEORGE RIVER "UPPER BAY": SEASONAL CONDITIONALLY RESTRICTED AREA P90 SCORES FOR THE 2019 REVIEW PERIOD.

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WU032.00	CR	40	5.9	0.52	300	28.1	5/18/2016
WU033.00	CR	40	7.3	0.58	360	41.7	4/26/2016
WU034.00	CR	40	9.3	0.66	920	65.9	5/18/2016

FIGURE 5.AREA 27, CONDITIONALLY APPROVED AREA: C., CONDITIONALLY RESTRICTED AREA: B. AREA C. WILL CLOSE MAY 1- NOVEMBER 30TH WHEN RAINFALL MEETS OR EXCEEDS 1" AND OCTOBER 1 TO NOVEMBER 30 WHEN TIDE EXCEEDS 11' AND DURING ANY MALFUNCTION OF THE WARREN OR THOMASTON TREATMENT FACILITIES. AREA B. WILL CLOSE DURING ANY MALFUNCTION OF THE WARREN OR THOMASTON TREATMENT FACILITIES AND JANUARY 1 TO MARCH 31.



Recommendations for Future Work

One station in Growing Area WU required downgrade due to 2019 year-end P90 scores. Station WU045.80 did not meet Approved standards and was downgraded to Restricted in 2020. There are no upgrades planned in the Growing Area in 2020.

The St. George River Regional Shellfish Committee has been working with DMR and UNH to conduct investigations into possible sources of pollution in the Growing area. Investigation are currently focused on pollution sources in the upper bay and will likely continue in 2020.

References

Licensed discharge information, Maine Department of Environmental Protection, Augusta, Maine

National Shellfish Sanitation Program: Guide for the Control of Molluscan Shellfish, 2017 Revision.

United State Census; https://www.census.gov/quickfacts/ME.

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WU Sanitary Survey Report; 2007. DMR central files.

Hydrographic information, NOAA.gov Tides & Currents

Appendix A.

Key to Water Quality Table Headers
Station = water quality monitoring station
Class = classification assigned to the station; Prohibited (P), Restricted (R), Conditionally Restricted (CR), Conditionally Approved (CA) and Approved (A).
Count = the number of samples evaluated for classification, must be a minimum of 30.
GM = means the antilog (base 10) of the arithmetic mean of the sample result logarithm (base 10).
SDV = standard deviation
Max = maximum score of the 30 data points in the count column
P90 = 90th percentile, Approved standard is 31, Restricted standard is 163
Min_Date = oldest date sampled included in the calculations.
X = investigative station