



GROWING AREA WJ

Freeport, Brunswick, and Harpswell

Sanitary Survey Report

2008-2019

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Executive Summary

This is a Sanitary Survey report for Growing Area WJ written in compliance with the requirements of the 2017 Model Ordinance and the National Shellfish Sanitation Program. Triennials were conducted in 2010, 2013, and 2016. The next sanitary survey is due in 2031 and the next triennial is due in 2022. There are no planned upgrades or downgrades for growing area WJ during 2020. There were 980 new pollution source visits. Three problems were found that resulted in one new Prohibited area. The problem forms were filed with the town and none have been resolved yet due to winter weather. These will be investigated in 2020. Access was denied at 23 properties. Overall, water quality has remained consistent. There are no downgrades for 2020 and no planned upgrades.

Description of Growing Area

Growing Area WJ includes the shores, flats, and waters of the towns of Freeport, Brunswick and Harpswell between Staples Point, at the mouth of the Harraseeket River, Freeport to Potts Point at the end of South Harpswell Neck, Harpswell (Figure 1). The upland boundary has been defined as lying inside a line from Staples Point, extending southeast on the east sides of Moshier to Bates Island, and also, extending northwest on Staples Point Road to the intersection of South Freeport Road, then north to the intersection of Old County Road and Route 1, then northeast on Route 1 to the intersection of Upper Mast Landing Road, then southeast to the intersection of Flying Point Road and Lower Flying Point Road, then north to the intersection of Church Street and Pleasant Hill Road, then east to the intersection of Middle Bay Road and Harpswell Neck Road, then south on Harpswell Neck Road to Potts Point, then south to the limits of U.S. jurisdiction.

The towns of Freeport, Brunswick and Harpswell are all located in Cumberland County, approximately 25 miles northeast of the nearest major city of Portland, Maine. Coastal portions of the towns in growing area WJ are situated on the Harraseeket River, Recompense Cove, Brickyard Cove, Goose Cove, Maquoit Bay and Middle Bay.

The shoreline is typical of this part of Maine, with rockbound points and shoreline separating shallow coves and a harbor (Harraseeket River). The muddy and gravel bottoms in these coves frequently provide excellent habitat for soft shell clams and mussels. Within Area WJ, the coves which support significant populations of soft shell clams are the Harraseeket River, Recompense Cove, Brickyard Cove, Goose Cove, Maquoit Bay, Middle Bay, Middle Bay Cove, Wilson Cove, Curtis Cove and Peter Cove. Fresh water influence comes from upland streams; Concord Gully Brook, Frost Gully Brook, Kelsey Brook, Little River, Bunganuc Brook and Miller Creek, and other small seasonal brooks and streams. The Harraseeket River is not a river but an embayment.

The 2018 census indicated the town of Freeport had a population estimate of 8,510 and Brunswick had 20,480. The 2010 census indicated Harpswell had a population estimate of 4,740. Like many coastal



Maine towns, Harpswell's population dramatically increases in the summer months. Freeport is a major tourist destination in Maine, for both natives and out-of-state visitors.

Land use in the study area is dominated by year-round residential properties. Sections of dense shoreline development are punctuated by large tracts of undeveloped land. The heaviest development is found in Freeport along the shores of the Harraseeket River, Frost Gully Brook, and Concord Gully Brook. More residential, suburban neighborhoods are found at the head of Maquoit Bay and Middle Bay. The rest of the area is pastoral farmland with few residential homes, farms, and conservation lands.

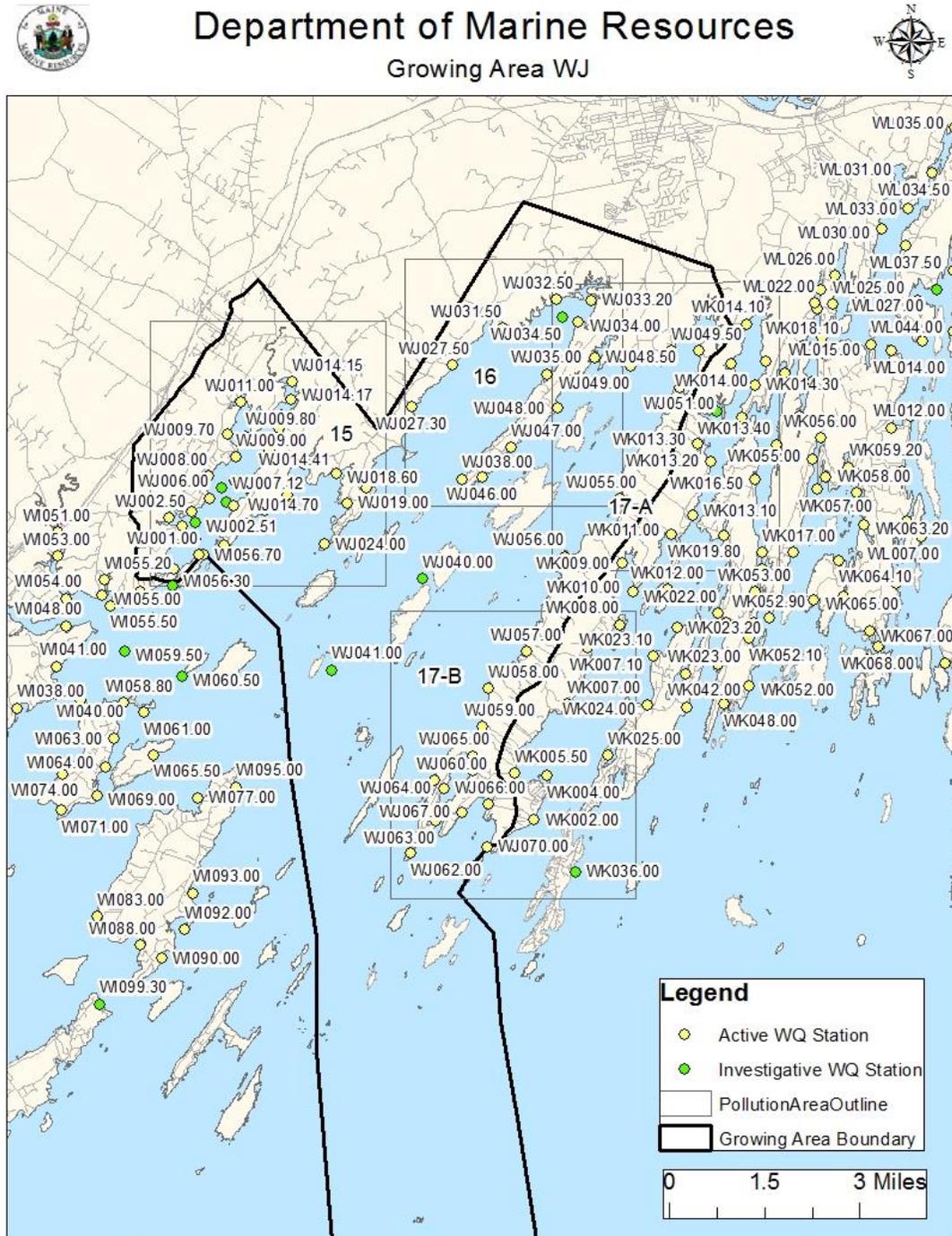
There is one wastewater treatment plant located in growing area WJ in Freeport. The outfall is located in the Harraseeket River by water quality station WJ006.00. There are four overboard discharges in growing area WJ. There were no OBDs reported removed in 2019.

There are nine shellfish aquaculture leases and 97 Limited Purpose Aquaculture permits (LPAs) in this growing area. Activities associated with LPAs, leases, and wet storage facilities are monitored in accordance with the 2017 Model Ordinance.

Below is a map with pollution area boundaries and growing area boundaries. Closures within the growing area can be found in legal notices in DMR central files or on the DMR website.



Figure 1. Growing Area WJ Overview Map.





History of Growing Area Classification

Reclassification addendums to the sanitary survey report can be found 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.



Figure 2. Growing Area WJ, Pollution Map A.

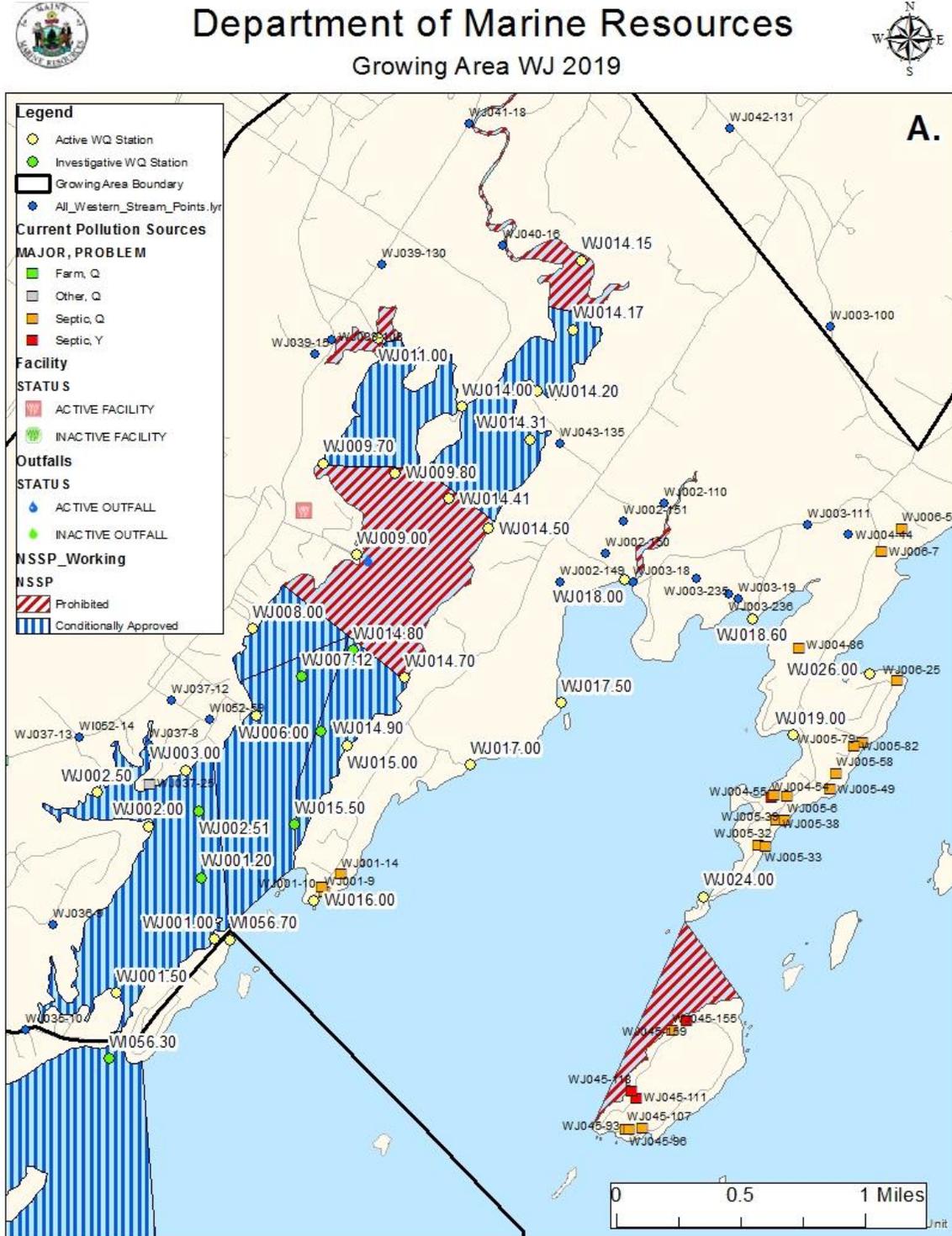




Figure 3. Growing Area WJ, Pollution Map B.

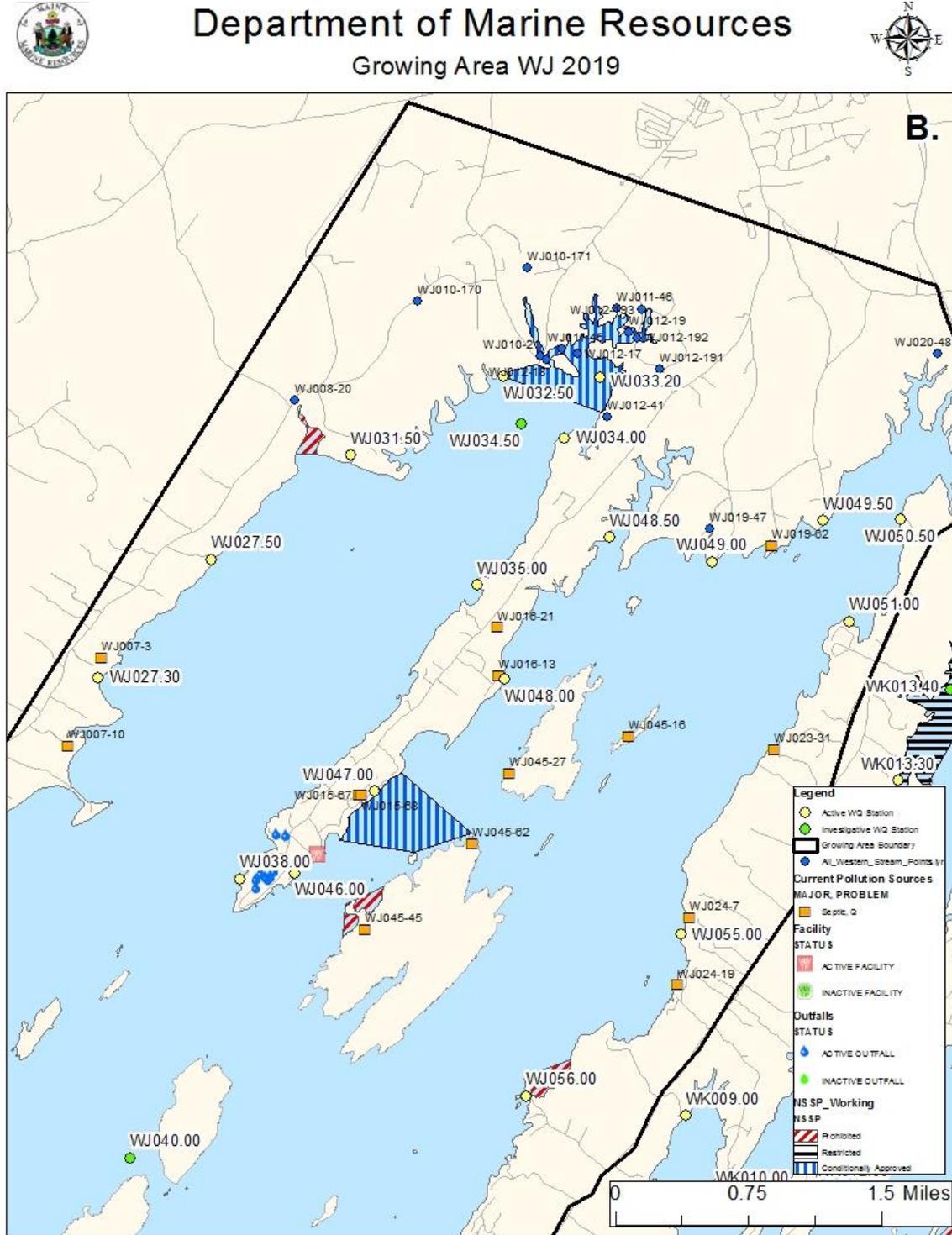
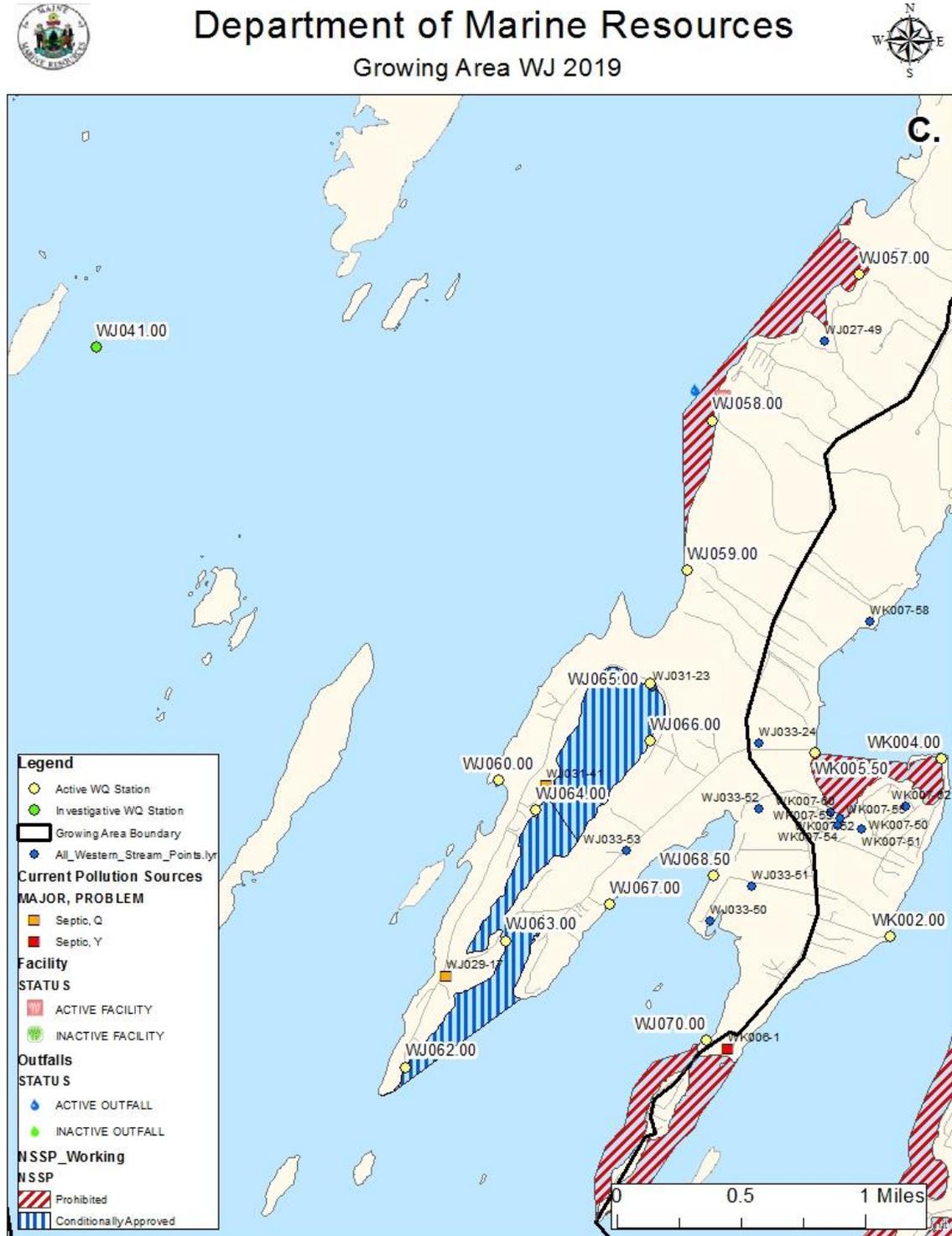




Figure 4. Growing Area WJ, Pollution Map C.





State and Federal Licensed Waste Discharge Permits

Overboard Discharges

There are four overboard discharges (OBDs) that discharge their treated effluent into the waters of Growing Area WJ. All four OBDs discharge into the waters of Potts Harbor, Harpswell (Figure 4 shown above). There have been no OBD removals reported 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 1.4×10^5 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.

Pollution Area	DEP ID	Location	Receiving Waterbody	Flow (GPD)	Acres Needed for Closure	Current Prohibited Acreage
17-B (A.3.)	1406	Harpswell	Potts Harbor	360	0.07	82.3
17-B (A.3.)	1693	Harpswell	Potts Harbor	300	0.07	
17-B (A.3.)	2117	Harpswell	Potts Harbor	300	0.05	
17-B (A.3.)	4895	Harpswell	Potts Harbor	300	0.05	

National Pollutant Discharge Elimination System (NPDES)

Table 2. NPDES Permitted Discharges.

Pollution Area (Section)	Permit ID	Type	Facility	Waterbody
15 (A.1.)	ME0101036	WWTP Outfall	Freeport WWTP	Harraseeket River
16	MEU508015	Subsurface Wastewater	Mere Point	Ground Water
17-B (A.1.)	ME0037141	Hatchery Wastewater	Running Tide Technologies	Middle Bay

There is one wastewater treatment facility in growing area WJ in Freeport. This facility discharges into a prohibited area that was determined by a dye study in 2004. Since 2017, the WWTP inspection reports have been available in DMR central files.

Freeport WWTP

The Freeport WWTP is a secondary treatment plant constructed in 1976, located on the western shore of the Harraseeket River estuary, approximately 1.5 miles (2.4 kilometers) upstream of the estuary’s mouth on Casco Bay. The facility has a design flow of 750,000 gpd. The outfall is a single underground pipe extending out into the Harraseeket River estuary approximately 300 feet (91 meters) ending with three multiple port diffuser forks. There is approximately 10 feet (3 meters) of water over the diffusers at low tide as determined by field crews during a dye study performed in 2004 by using the boat echo sounder.



Disinfection in the chlorine contact chamber is achieved with liquid sodium hypochlorite and sodium bisulfite for dechlorination. Chlorine and dechlorination injection pumps are flow proportioned, automatic with continuous signals from the effluent flow meter. Under normal flow operating condition, the average contact time through the chlorine contact chamber is two hours. The chlorine residual limits in the NPDES permitted discharge is 0.1ppm. Fecal coliform testing on the dechlorinated effluent is performed twice a week on site using the membrane filtration method.

The plant is staffed Monday-Friday, 6am-5pm, and checked every morning for 1-2 hours on the weekends. Plant operators are on-call 24 hrs/day in the event of a problem or alarm at the plant. Alarms are triggered by loss of power, abnormally high flows, and changes in chlorine residual, and are tied into the police station dispatch. The police dispatcher notifies the plant operator on-call.

Storm water has been separated from the sewage collection system through pipe replacement over the years. There is still some infiltration from old clay pipes in town and from sump pumps. There are no combined sewer overflows as well as no bypass capability at the plant. There are ten pump stations in town with no overflow pipes. All pump stations have dual pumps, plus four stations have standby power. All pump stations have telemetry alarms for power failure and high water.

The size of the prohibited and conditionally approved areas in the Harraseeket River were determined by the 2004 Freeport Dye Study. The complete dye study can be found in the central files.

Mere Point

In December 1997, the Town of Brunswick applied to the Department to install, operate and maintain a sub-surface wastewater disposal system serving 34 residential lots, 21 seasonal, 13 year-round, on the Mere Point Peninsula in the Town of Brunswick. The Mere Point Subsurface Waste Water Disposal System is a community system serving a total of 34 residential lots; 21 seasonal and 13 year-round residences in the Mere Point Community. Sanitary waste water is treated by nine subsurface waste water disposal systems. Total system design capacity is 11,000 gallons per day. Wastewater generated prior to that date was treated by individual septic systems that had a history of malfunctions and inadequately treated wastewater disposal.

On August 5, 2013 the DEP renewed MEU508015 which authorized the Town of Brunswick to discharge 11,000 gallons per day of wastewater to the ground water via a community subsurface system (Mere Point Colony Subsurface Wastewater System).

Currently, nine subsurface systems treat the sanitary waste water via 750- to 2,000-gallon septic tanks and nine individual leach fields. Effluent from the septic tanks is conveyed to the subsurface systems via 13 pump stations. In some systems, septic tank effluent is filtered via sand filters and the filtrate is then conveyed to the pump station and leach field. The nine subsurface systems are collectively designed to accommodate a daily maximum total flow of 11,160 gallons. Weekly flow data collected during the summer of 2007 indicated an average daily flow of 4,570 gallons, or 43% of system capacity. A peak daily system flow was estimated to be 6,179 gallons, or 56% of design capacity.



Four of the residential entities discharge to a common pump station which then discharges to a common 8,000-gallon holding tank. The tank is pumped out as needed, typically weekly, and its contents disposed of at the Brunswick Sewer District’s Waste Water Treatment Plant.

The collection system consists of 4-inch and 6-inch ductile iron gravity sewers, pump stations, and 2-inch force mains. The wastewater is collected through the gravity sewers to pump stations where the waste water is pumped to the subsurface disposal systems. There are approximately 1,300 linear feet of ductile iron sewer systems, 5,500 linear feet of force main, 11 duplex pump stations and two simplex pump stations. There are no known combined sewer overflow points in the system. The treatment facility is not authorized to accept septage. “Septage” shall mean any waste; refuse, effluent; sludge or other materials removed from a septic tank, cesspool, vault privy or similar source which concentrates wastes or to which chemicals have been added. The licensee pumps septage from the subsurface system septic tanks if the scum and sludge layers combined are equal to or greater than one-third of the tank volume.

Running Tide Technologies

Running Tide Technologies is permitted to discharge 43,200 gallons per day of wastewater associated with the culture of American oysters. This outfall is located in a prohibited area but is not a public health risk since it does not contain sewage.

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. Table 3 shows all new and pre-existing pollution sources in area WJ that are considered possible discharges into the Growing Area and possibly affect water quality.

Table 3. Growing Area WJ Residential Pollution Sources.

Pollution Area	Location ID	Date Surveyed	Direct or Indirect	Problem	Description	Town
15 (A.6.)	WJ045-118	2019	Indirect	Y	No pit, waste open and exposed, less than ten feet to shore.	Bustins Island, Freeport
15 (A.6.)	WJ045-111	2019	Indirect	Y	Containment box around pit rotted and exposing pit.	Bustins Island, Freeport
15 (A.6.)	WJ045-159	2019	Indirect	Y	No pit. Waste exposed to air.	Bustins Island, Freeport



Industrial Pollution

Commissioned in 1954, the U.S. Navy Fuel Depot operated throughout the Cold War to supply fuel to the Brunswick Naval Air Station. In 1991, the Navy determined that it would be more economical to truck in fuel from Searsport and, on March 31, 1992, officially shut down the facility. The 1995 Defense Authorization Act authorized the conveyance of the property to the Town of Harpswell which renamed it the George J. Mitchell Field.

Mitchell Field is a 119.3-acre coastal site with deep-water pier and dock including 2,630 feet of shoreline on Middle Bay in Harpswell. The site is accessible by road from State-highway 123 (1410 Harpswell Neck Road). On-site there are approximately a dozen buildings of 1950's era vintage and a water storage tank with a 100,000-gallon capacity. Paved roads lead from the highway access point to the waterfront. Approximately 40 acres are heavily wooded, the remainder of the property is open space. The property remains undeveloped and is listed with the Maine DEP as a Formerly Utilized Defense Site (FUD) with the unique identifier of D01ME0498 and a listing number assigned by DEP of REM01490. The DEP Bureau of Remediation and Waste Management has the site listed under the programs; Uncontrolled Sites, Federal Facilities and Brownfields with the status for all three listed as "in review" which means that DEP staff members are currently reviewing information related to ultimate resolution of issues at the site.

The Army Corps of Engineers (ACE) has been authorized by the Department of Defense (DOD) to "reduce, in a timely and cost-effective manner, the risk to human health and the environment resulting from past DOD activities at formerly used properties". Military property closed and transferred prior to 1984 are FUDS. The FUD listing gives the property a "categorical exclusion" from remediation if the site is to be used for such things as a cemetery or Armed Forces recruiting; any other development opportunities on the property must include remediation.

The area is sandy bottomed with ledge and boulders interspersed in the intertidal zone. The area begins at the north end of Curtis Cove and runs to the unnamed point immediately north of the wharf. The Maine DEP conducted toxics monitoring in 1988 on mussels in the area (Figure 5). Maine DEP reported that mussels were rare, possibly because this is a high-energy area exposed to southwest winds and a long-unprotected fetch. The mussels were tested for cadmium, chromium, copper, lead, mercury, nickel, zinc and iron and concentrations were within the normal range.



Figure 5. Maine DEP sample site for metals at decommissioned U.S. Navy Fuel Depot.

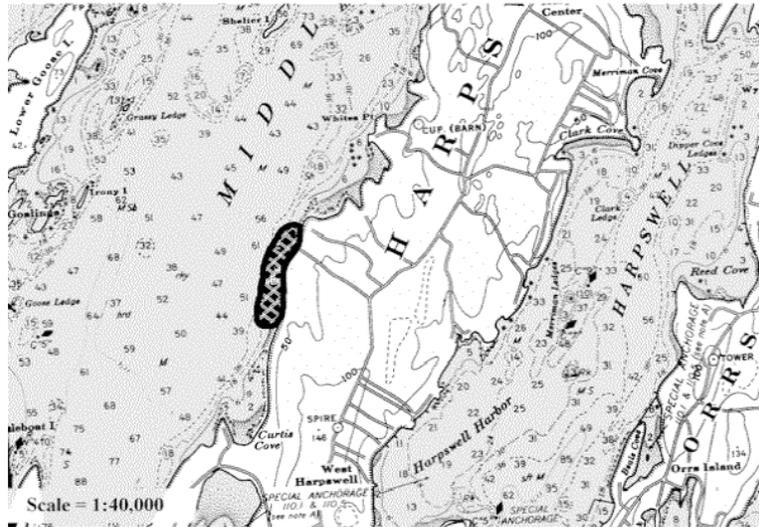


Chart courtesy of Maine DEP

There is a privately-owned airstrip, Farr Field Airport, located just south of Birchmere Lane in South Harpswell on Harpswell Neck on Middle Bay. The runway is 1900 x 100 ft and no other services are offered. There is no fuel, tower or repair facility located at this airstrip.

Marinas

The marina community in Maine only operates for a portion of the year due to adverse winter weather conditions. The management of marinas in Maine allows for shellfish growing areas to be available to harvesters, for at least a portion of the year, to direct market harvest by utilizing conditional area management plans. All four marinas utilize conditional area management plans and are further discussed in the CAMP review section.

Table 4. Growing Area WJ Marinas.

Pollution Area	Name	Town	Waterbody
15 (C.)	Brewer's Marina	Freeport	Harraseeket River
15 (C.)	Strout's Point Wharf	Freeport	Harraseeket River
16 (C.)	Paul's Marina	Brunswick	Merepoint Bay
17-B (B.2.)	Dolphin Marina Services	Harpswell	Basin Cove

There are two No Discharge Areas (NDAs) in Maine; Casco Bay and the Harraseeket River in Freeport. Casco Bay is administered by DEP and the Harraseeket River is administered by the Town of Freeport.



Additional details on both NDAs will be discussed in this section; the Casco Bay NDA under this heading and the Harraseeket River NDA under the Freeport section.

DEP's process for identifying areas and meeting application requirements for requesting the approval of NDAs from the federal EPA was established in Public Law 1999, chapter 655, An Act to Rid Maine's Waters of Ocean Vessel Sewage. The law was effective August 11, 2000. DEP submitted and had EPA accept an application to designate Casco Bay as a NDA which has been in effect since July 2006. The area included in the no discharge designation includes all contiguous waters north and east of Cape Elizabeth Light in Cape Elizabeth, to a point at Bald Point in Phippsburg. The area also includes the navigable reaches of the Fore River, Presumpscot River, Royal River, Cousins River, Harraseeket River, and the New Meadows River. Maquoit Bay, Merepoint Bay and Middle Bay are included in this NDA.

Compliance is normally managed two ways. First, the State, marina operators, local authorities, and environmental groups all work together to educate boaters on the impacts of improperly managed sewage. Cooperation and voluntary compliance are key. Boaters themselves are the best advocates for NDA compliance. Second, the State works with the Coast Guard (who may delegate enforcement authority), State law enforcement, and local harbor masters on local strategies appropriate for the area.

The DEP has been authorized by the U.S. Fish and Wildlife Service to administer the Pump-out Grant Program, part of the recently re-authorized Clean Vessel Act. The purpose of the Clean Vessel Act is to reduce the pollution from recreational vessels by providing a safe and legal method for disposing of human sanitary waste. Improperly disposed waste from malfunctioning or non-existent marine sanitation devices (MSDs) often causes serious water quality problems throughout Maine. Through the Maine Coastal Pump-out Grant Program, DEP hopes to better: define the number of boats with installed MSDs, determine whether the average MSDs are operable and whether they are used; determine why they are not used; and eliminate the barriers to proper MSD use. The goals are to provide adequate holding tank pump-out locations along the entire coast, further improving accessibility to pump-out facilities by locating mobile pump-out vessels in strategic locations along the coast and educating the boating public on the importance of responsible sanitary waste management. There are currently six pump out stations in area WJ; one of the six is a pump out boat which is operated by the Friends of Casco Bay.

Freeport

The Freeport Harbormaster enforces the No Discharge Zone in the Harraseeket River. Any boat owner anchoring in Freeport harbor (Harraseeket River) under the ordinance [Article V. (15)(b)] (b); "must provide a signed consent allowing the Harbormaster, at any time the boat is occupied, to board and inspect any tanks, valves, pumps and lines, including, but not limited to "Y" valves and electric systems such as Electra San, to insure such tanks, valves, systems, etc. are not set in a position that would allow the discharge of sanitary wastes into a Freeport anchorage."

Due to the efforts of the Freeport Harbormaster, the marina conditional area in the Harraseeket River is provided as a security for the potential for contamination from fuel and oil contaminants which may



result from the marina proper. The harbormaster provides any information requested by the department and contacts the department if there are any problems.

From an interview with the harbormaster September 12, 2019, it was determined that the harbormaster manages all of the moorings and slips in the Harraseeket River. There are 350 moorings, 100 of which have heads. Only about four boats are lived on. A marina calculation, which can be found in the central files, shows that 193 acres are needed to dilute the potential pollution from 100 boats with heads. The conditionally approved area around the marina is 195 acres and is closed when the boats are in the water from May 1 through November 30.

The Harraseeket Yacht Club (HYC) has an extensive float and dinghy tie system, a wharf, and a clubhouse. HYC has one guest mooring that will not take a vessel larger than 30ft. Anchoring is not permitted, and moorings can be obtained through Brewer's South Freeport Marine.

Strouts Point Wharf Company is in South Freeport. The company offers full repair services, marine travel lift, dock store/chandlery, overnight dockage, moorings and gas/diesel. The dock system is held in place with a special mooring system and is designed for year-round use, although the Harraseeket River typically freezes during the winter months.

Freeport Town Wharf has limited docking space for day use. They do provide spaces for dinghy tie up for commercial fishermen.

Brewer's South Freeport Marine is a full-service yacht yard with the amenities of a marina. There is a gas/diesel fuel dock and a sewage pump out available. There are on site heads and showers, laundry, ships store, sail loft, and canvas shop. Brewer's is a full-service repair facility for all types of boats. They are equipped with a travel lift, trailer and crane.

Falls Point Marine is at Porter's Landing (also known locally as Dunning Boat Yard) in the northwest corner of the Harraseeket River. Falls Point Marine builds and services custom docks and piers. They have both land and water side crane capabilities. Their crane barge delivers and installs moorings and carries freight to the Casco Bay islands. Falls Point Marine sells, installs and services all types of moorings and has diving services. They do not offer fueling services at the facility.

Dunning's Boat Yard is at the same physical location as Falls Point Marine, but it is a public boat launch only. There are no amenities except for short term parking. Porter's Landing is a public dock which is only available at high tide at the end of Cove Road, Freeport. There is limited short term parking and no other amenities. Winslow Park at Stockbridge Point is a public boat launch which is only available at high tide. There is handicapped access, short term parking, and long-term parking with the permission of the park.



Brunswick

Paul's Marina is located on the east side of Merepoint Neck and provides moorings for a number of recreational and work boats during the summer months. Services provided by the marina include gasoline, marine hardware and supplies, parking, pump-out barge that is emptied by a septage truck, portapotties, snack bar, launching, and electricity and water to the dock. The marina operates from April 15 to October 31. They have about 140 moorings and no slips. They have dockage for dinghies and skiffs, but the depth of water near shore precludes having any large craft at the dock during low tide. Of the 140 boats on moorings, 50 of them have heads. The marina calculation, which can be found in the central files, shows that 72 acres is needed to dilute potential pollution. The conditionally approved area around the marina is 117 acres and is closed when the boats are in the water from April 15 through October 31.

Smith Boatyard is a boat repair facility. They have a launch ramp.

Harpwell

Dolphin Marina is located on the east side of Basin Point. The marina operates from April 15 through October 31. They have 120 moorings and 15 slips and approximately 90 have heads. The marina provides fuel and a portapotty on shore. There is no pump out facility, but boat owners are given information about calling for the Friends of Casco Bay pump out boat. The marina calculation, which can be found in the central files, indicates that 99 acres are needed to dilute potential pollution from 90 boats. The conditionally approved area around the marina is 102 acres.

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 5 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.

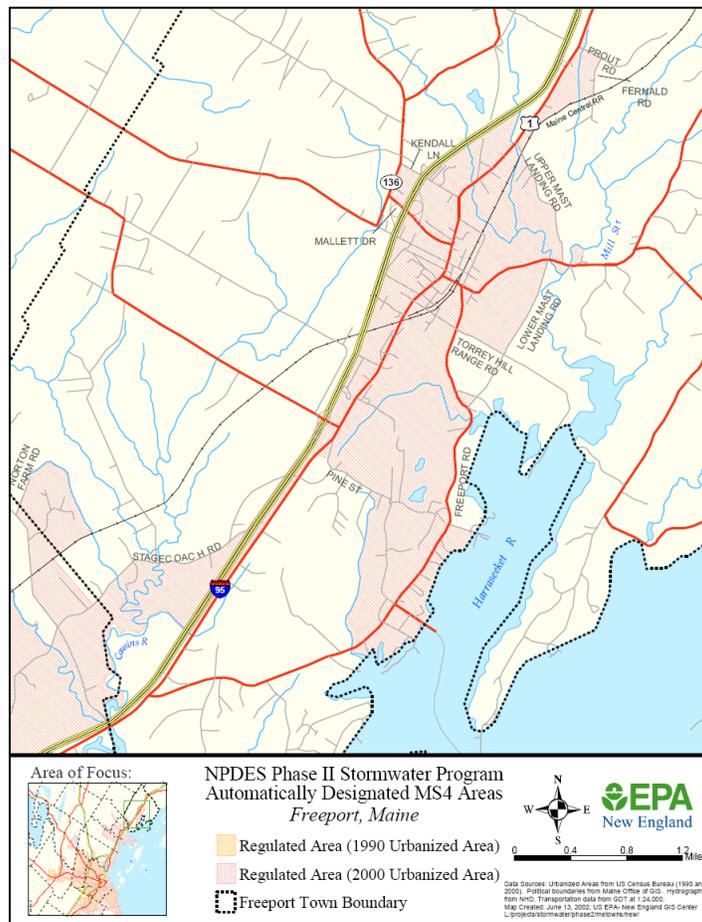
Although it is a federal program, EPA has delegated its authority to the Maine DEP to administer the Phase II Small MS4 General Permit. Under the Small MS4 GP, each municipality must implement the



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. 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).

In Freeport, only the designated “urbanized area” is formally regulated under the Phase II Stormwater program (Figure 6). Permit requirements are only enforceable in the regulated area but are encouraged throughout the entire town.

Figure 6. Freeport NPDES Phase II Stormwater.



Map courtesy of Town of Freeport



The other two towns within the WJ boundary are Brunswick and Harpswell; these towns are not designated under the Phase II Stormwater permit or MS4 regulations. Harpswell has no stormwater collection system. Brunswick has a stormwater collection system and there are two areas of concern within the WJ boundary; four catch basins in the Bunganuc Stream area (Figure 7) and seven catch basins in the Wharton Point area of Maquoit Bay (Figure 8).

Figure 7. Catch Basins in Bunganuc Area of Brunswick.

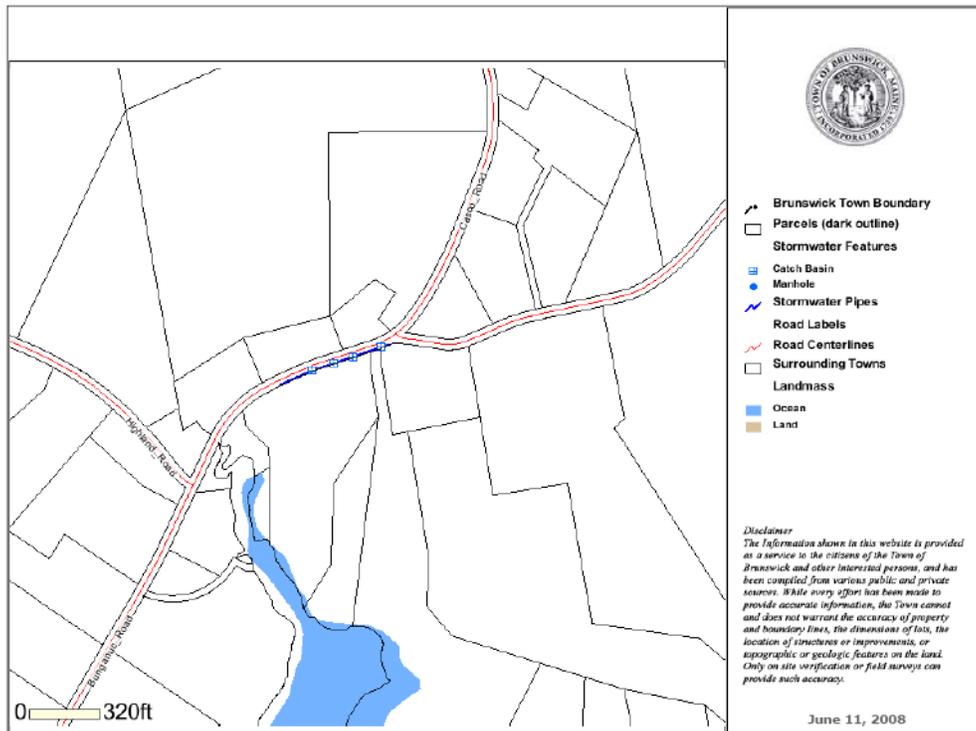
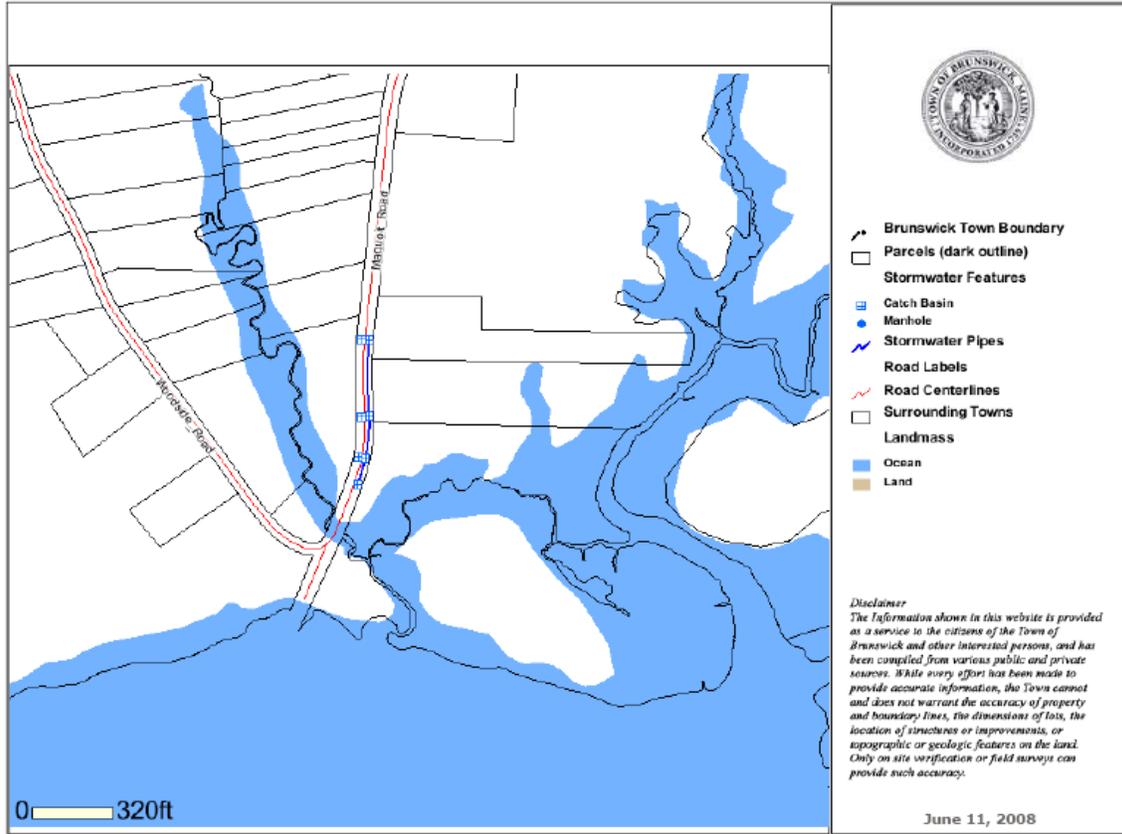




Figure 8. Catch Basins at Wharton Point area of Maquoit Bay, Brunswick.



Figures 7 and 8 courtesy of Town of Brunswick

The Town of Brunswick’s Public Works Engineer reports that the catch basins on Casco Road and on Maquoit Road were put in place to control stormwater runoff. Prior to installation, stormwater runoff was eroding the roads which are relatively flat with steep ditches on each side at the bottom of steep banks. Installing the catch basins and controlling the rate of flow in the area has improved the erosion problem. At both sites, stormwater piping ends in the ditches along the road well away from the shore or any conduit to the shore. The installation has not increased any stormwater in the area but rather has been installed to control the rate of runoff. The catch basins are cleaned out every year in the late spring/early summer time period. Vacuum trucks are used, and the material removed from the catch basins is taken to a landfill or the sewage treatment plant.

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 WJ. Streams associated with consistently high scores are monitored to determine if they affect the water quality of growing area waters. A total of 190 samples were taken from freshwater streams during the review period (Table 5, Figures 2-4).

Table 5. Stream Samples in Growing Area WJ 2008-2019.

Scores > 163 cfu/100ml are highlighted in red.

Pollution Area	Location ID	Sample Date	Score
15	WJ003-18	8/12/2008	>1600
15	WJ002-110	4/8/2009	2
15	WJ003-100	4/8/2009	1.9
15	WJ003-111	4/8/2009	1.9
15	WJ039-108	4/8/2009	100
15	WJ039-130	4/8/2009	12
15	WJ039-15	4/8/2009	8
15	WJ040-16	4/8/2009	8
15	WJ041-17	4/8/2009	1.9
15	WJ042-109	4/8/2009	7.3
15	WJ042-131	4/8/2009	1.9
15	WJ043-135	4/8/2009	1100
17-B	WJ031-23	8/12/2009	90
17-B	WJ033-24	8/12/2009	100
16	WJ008-20	7/7/2010	18
15	WJ003-100	7/14/2010	740
16	WJ008-20	7/14/2010	>1600
15	WJ039-108	7/14/2010	106
15	WJ039-15	7/14/2010	1040
15	WJ040-16	7/14/2010	>1600
15	WJ042-109	7/14/2010	>1600
15	WJ042-131	7/14/2010	>1600
15	WJ003-100	8/4/2010	1.9
16	WJ008-20	8/4/2010	92
15	WJ039-108	8/4/2010	52
15	WJ039-15	8/4/2010	2



Pollution Area	Location ID	Sample Date	Score
15	WJ040-16	8/4/2010	64
15	WJ042-109	8/4/2010	10
15	WJ042-131	8/4/2010	74
15	WJ003-100	8/17/2010	64
16	WJ008-20	8/17/2010	35
15	WJ039-108	8/17/2010	60
15	WJ039-15	8/17/2010	27
15	WJ040-16	8/17/2010	72
15	WJ042-109	8/17/2010	35
15	WJ042-131	8/17/2010	520
15	WJ003-100	9/29/2010	200
16	WJ008-20	9/29/2010	400
16	WJ010-21	10/6/2010	148
16	WJ012-41	10/6/2010	118
15	WJ039-108	4/25/2012	300
15	WJ039-15	4/25/2012	320
15	WJ039-108	6/5/2012	>1600
15	WJ039-15	6/5/2012	360
15	WJ039-130	6/6/2012	160
15	WJ040-16	6/6/2012	68
15	WJ042-109	6/6/2012	60
15	WJ042-131	6/6/2012	200
15	WJ043-135	6/6/2012	11
15	WJ035-10	10/2/2012	132
15	WJ035-10	10/31/2012	22
15	WJ036-9	10/31/2012	29
15	WJ037-8	10/31/2012	156
16	WJ012-17	5/29/2013	620
16	WJ012-17	5/29/2013	33
16	WJ012-18	5/29/2013	340
16	WJ012-18	5/29/2013	26
16	WJ012-19	5/29/2013	580
16	WJ012-19	5/29/2013	2
15	WJ003-235	11/19/2014	82
15	WJ035-10	11/19/2014	18



Pollution Area	Location ID	Sample Date	Score
15	WJ036-9	11/19/2014	11
15	WJ037-13	11/19/2014	24
15	WJ039-108	11/19/2014	84
15	WJ039-130	11/19/2014	29
15	WJ039-15	11/19/2014	2
15	WJ042-109	11/19/2014	84
15	WJ042-131	11/19/2014	680
15	WJ043-135	11/19/2014	4
16	WJ008-20	6/29/2015	940
16	WJ010-170	6/29/2015	58
16	WJ010-171	6/29/2015	60
16	WJ012-191	6/29/2015	102
16	WJ012-192	6/29/2015	220
16	WJ012-193	6/29/2015	118
17-B	WJ033-50	6/29/2015	140
17-B	WJ033-51	6/29/2015	22
17-B	WJ033-52	6/29/2015	100
17-B	WJ033-53	6/29/2015	56
15	WJ003-18	7/7/2015	14
15	WJ035-10	7/7/2015	460
15	WJ036-9	7/7/2015	58
15	WJ037-12	7/7/2015	86
15	WJ037-13	7/7/2015	66
15	WJ039-108	7/7/2015	1.9
15	WJ039-130	7/7/2015	25
15	WJ039-15	7/7/2015	11
15	WJ041-18	7/7/2015	42
15	WJ042-131	7/7/2015	130
15	WJ042-132	7/7/2015	35
15	WJ043-135	7/7/2015	24
15	WJ003-18	7/28/2015	15
16	WJ008-20	7/28/2015	84
16	WJ010-170	7/28/2015	33
16	WJ010-171	7/28/2015	280
16	WJ012-192	7/28/2015	8



Pollution Area	Location ID	Sample Date	Score
16	WJ012-193	7/28/2015	2
15	WJ035-10	7/28/2015	110
15	WJ036-9	7/28/2015	70
15	WJ037-12	7/28/2015	380
15	WJ037-13	7/28/2015	13
15	WJ039-108	7/28/2015	32
15	WJ039-130	7/28/2015	78
15	WJ039-15	7/28/2015	42
15	WJ041-18	7/28/2015	58
15	WJ042-131	7/28/2015	36
15	WJ042-132	7/28/2015	4
15	WJ043-135	7/28/2015	54
17-B	WJ033-50	8/24/2015	240
17-B	WJ033-51	8/24/2015	132
17-B	WJ033-53	8/24/2015	70
17-B	WJ033-50	9/7/2015	3.6
17-B	WJ033-51	9/7/2015	110
17-B	WJ033-52	9/7/2015	1500
15	WJ003-18	9/8/2015	84
16	WJ008-20	9/8/2015	52
16	WJ010-170	9/8/2015	12
16	WJ010-171	9/8/2015	104
16	WJ012-192	9/8/2015	9.1
16	WJ012-193	9/8/2015	12
15	WJ037-12	9/8/2015	360
15	WJ039-108	9/8/2015	48
15	WJ039-130	9/8/2015	56
15	WJ039-15	9/8/2015	120
15	WJ041-18	9/8/2015	116
15	WJ042-131	9/8/2015	120
15	WJ003-18	9/24/2015	8
15	WJ036-9	9/24/2015	76
15	WJ037-13	9/24/2015	20
15	WJ039-108	9/24/2015	9.1
15	WJ039-130	9/24/2015	>1600



Pollution Area	Location ID	Sample Date	Score
15	WJ039-15	9/24/2015	84
15	WJ041-18	9/24/2015	120
15	WJ042-131	9/24/2015	96
15	WJ043-135	9/24/2015	>1600
17-B	WJ033-24	5/5/2016	6
16	WJ008-20	5/7/2018	14
16	WJ012-192	5/7/2018	4
16	WJ018-148	5/7/2018	82
17-A	WJ021-2	5/7/2018	16
17-B	WJ027-51	5/7/2018	12
17-B	WJ033-54	5/7/2018	6
15	WJ035-10	5/7/2018	1.9
15	WJ037-14	5/7/2018	16
15	WJ039-108	5/7/2018	18
15	WJ039-131	5/7/2018	1.9
15	WJ039-15	5/7/2018	4
15	WJ042-131	5/7/2018	6
16	WJ008-20	5/22/2018	24
16	WJ012-192	5/22/2018	2
16	WJ018-148	5/22/2018	122
17-A	WJ021-2	5/22/2018	20
17-B	WJ033-54	5/22/2018	9.1
15	WJ037-14	5/22/2018	9.1
15	WJ039-108	5/22/2018	18
15	WJ039-15	5/22/2018	54
16	WJ008-20	9/19/2018	280
16	WJ012-192	9/19/2018	134
16	WJ018-148	9/19/2018	580
17-A	WJ021-2	9/19/2018	360
17-B	WJ027-51	9/19/2018	280
15	WJ037-14	9/19/2018	500
15	WJ039-108	9/19/2018	94
15	WJ039-131	9/19/2018	64
15	WJ039-15	9/19/2018	560
15	WJ042-131	9/19/2018	96



Pollution Area	Location ID	Sample Date	Score
16	WJ008-20	7/8/2019	180
16	WJ018-148	7/8/2019	90
17-A	WJ021-2	7/8/2019	220
17-B	WJ027-51	7/8/2019	36
15	WJ037-14	7/8/2019	200
15	WJ039-15	7/8/2019	580
16	WJ008-20	9/25/2019	58
16	WJ018-148	9/25/2019	30.9
17-A	WJ021-2	9/25/2019	78
17-B	WJ027-51	9/25/2019	72
15	WJ037-14	9/25/2019	66
15	WJ039-15	9/25/2019	40
16	WJ008-20	10/15/2019	14
16	WJ018-148	10/15/2019	72
17-A	WJ021-2	10/15/2019	54
17-B	WJ027-51	10/15/2019	30
15	WJ037-14	10/15/2019	4
15	WJ039-15	10/15/2019	10
16	WJ008-20	11/20/2019	780
16	WJ018-148	11/20/2019	56
17-A	WJ021-2	11/20/2019	50
17-B	WJ027-51	11/20/2019	16
15	WJ037-14	11/20/2019	760
15	WJ039-15	11/20/2019	1.9

Agricultural Activities

As part of this sanitary survey, agricultural activities and waste were evaluated; activities included animal farms, concentrations of animals at non-commercial farms, slaughterhouses, feed lots, educational facilities, individual property owners' pets, kennels, vegetable and fruit farms, and landscaping businesses. Growing area WJ has miles of pastoral farmland that is used for grazing, hay production and commercial vegetable and farms that provide landscape materials.

The Wolfe Neck Farm, located at the head of Recompense Cove, is a 626-acre educational facility and uses best management practices to prevent animal wastes from running off into the cove. The Wolfe



Neck Farm is one of 150 farms that lease fields to Pineland Farms, who coordinates the production of natural beef and provides educational opportunities. There are varying numbers of cows in the fields, changing weekly, and rotating through the various fields during the summer months. Cows are kept in the barn area on Burnett Road year-round. Water quality in the surrounding cove is monitored by Station WJ 18.

Mitchell Ledge Farm is located about two miles from downtown Freeport and is one of Freeport's largest working farms raising Belted Galloway cattle. The farm is 185 acres of pasture and hay fields, woodlands and stream wetlands. Kelsey Brook flows through the farm. In addition to farming cattle, extensive timber management occurs on the property. Each year sustainable tree harvesting projects take place. The location and activities on the farm would make this a potential indirect source of pollution into the upper Harraseeket River. Water quality in the Harraseeket River is monitored extensively by many stations.

Crystal Spring Farm comprises 322 acres of fields and forest located less than two miles from downtown Brunswick on both sides of Pleasant Hill Road. It is located in the drainage that terminates in Maquoit Bay. It was once a dairy farm and is now a community farm and Katahdin Hairsheep farm (since 2005). There are 2.5 miles of hiking and cross-country ski trails on the property. They do not use pesticides or herbicides on their pastures and utilize rotational grazing techniques. They also use their fields for hay production. The location of the farm would make this a potential indirect source of pollution into Maquoit Bay. Water quality in the head of Maquoit Bay is monitored by four water quality stations.

None of these small farms appear to be directly impacting the growing area according to the 2019 shoreline survey and 2019 water quality results.

Domestic Animals and Wildlife Activity

The Mast Landing Sanctuary is a 167-acre bird and wildlife preserve located in Freeport, near Mill Stream; this facility is owned and managed by the Maine Audubon Society. The property has approximately 1500 feet of shore frontage at the head of the Harraseeket River. The facility is operated year-round, with peak visitor usage in June through September. This area is monitored by Station WJ 14.2.

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.



Wolfe Neck State Park is located on the western side of Recompense Cove. This is a day use park with picnic tables, bathrooms (in ground septic system), and wooded hiking trails. Pets are permitted on leash and waste pickup is requested on signs. The park is home for numerous deer and raccoons and other common Maine wildlife. This area is monitored by Station WJ 17.5. At the head of Recompense Cove, is the Wolfe Neck Farm campground, which has 115 camp sites and three cottages along the shore of the cove. The campground provides outhouses near the sites, and there is also a shower building with flush toilets and laundry facilities located on the Burnett Road. This building has an approved in ground septic system located more than 500 feet from shore. Water quality in the area is monitored by station WJ 18.6.

Skolfield Shores Preserve in Harpswell consists of 19 acres with 4,400 ft. of shorefront overlooking Middle Bay Cove and has trails for public use. Two trail loops wind through forest habitat and provide views of the cove, the saltwater marsh separating Brunswick and Harpswell, and the fields of Merruconeagan Farm; a side trail leads down to the shore. The Harpswell Heritage Land Trust reports that the Preserve contains valuable habitat for many Maine species of birds, fish and trees. The U.S. Fish and Wildlife Service predicts that the preserve provides habitat for 40 of the 64 declining species of migratory birds, anadromous fish and federally endangered or threatened species in the Gulf of Maine including, horseshoe crab, northern harrier, short-eared owl, bald eagle, roseate tern, osprey, American black duck, sanderling and meadowlark. The marshland around the preserve is especially valuable as a feeding and staging area during migration for shore and wading birds. There is public access to marked trails but is only open from dusk to dawn. No motor vehicles or bicycles are allowed. Dogs are allowed on a leash.

The Nature Conservancy owns and manages 143 acres of Upper Goose Island as wildlife habitat. The island is closed to the public from March 15th to August 15th to protect its value as a bird-nesting site.

About three miles off the coast of Harpswell is Eagle Island State Historic Site which receives about 6,000 visitors each season who tour the summer home of North Pole Explorer Admiral Robert Peary. The island is void of any mechanical devices. The island is open daily from June 15 through Labor Day. The island is equipped with a pier and a hiking trail.

Hydrographic and Meteorological Assessment

Tides

Coastal Maine experiences a mixed, semi-diurnal tide, with diurnal inequalities that are more pronounced on spring tides. Except for very few isolated areas with extensive saltwater marshes, tides are not considered to be contributors to fecal contamination. The mean tidal range for Casco Bay is nine feet. Unlike areas with small diurnal tides, this extreme volume exchange results in significant bacterial dilutions. Currents in the area are predominantly driven by the tides.



Rainfall

Precipitation is generally not evenly distributed throughout the year. Spring and fall tend to be the wetter times of the year. Much of the precipitation in the winter comes as snow and may affect runoff rates in spring upon 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. There are two rainfall conditional areas in Growing Area WJ. The Harraseeket River and Maquoit Bay have shown elevated fecal coliform scores after 1" or more rain in a 24 hour period. These areas close for a 14 day period following 1" of rain to allow for proper flushing.

Maine DMR is working collaboratively with the University of Maine on a statewide coastal project determining how various watershed characteristics influence fecal contamination of marine waters during rainfall events. This research clusters watersheds based on similar characteristics then models how rainfall and associated pollution is distributed. The model is being refined to incorporate margin watershed influences.

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

Stream flow in Maine exhibits seasonal variation, with the highest flows occurring in the spring (due to snowmelt, spring rains, and low evapo-transpiration) and the mid-to late fall (due to fall rains and low evapo-transpiration). There are no large river discharges into growing area WJ.

Hydrographic Influence

The Casco Bay Estuary Partnership (CBEP) commissioned a study to model water circulation in Casco Bay. The model, developed by Pearce, Pettigrew and Gong of the University of Maine characterizes what influences Casco Bay hydrodynamics and patterns of water circulation in Casco Bay.

Water circulation in Casco Bay is dominated by tides. The tidal range in Casco Bay is nine feet. Tides are caused by the gravitational effects of the moon and sun on the ocean; other influences are heavy rainfall, low barometric pressure and strong onshore winds which will increase tides. Tide levels fluctuate during the month based on the positions of the sun, moon and earth. These fluctuations and



the speed and direction of the tidal currents constantly change during a tidal cycle. Tidal currents have the greatest energy when water is pushed in and out of bays and channels during the highest and lowest tide levels. Growing area WJ is subject to a semidiurnal tidal cycle with two high tides and two low tides per day. The tidal cycle is 12 hours and 25 minutes long, so that high and low tides are 50 minutes later each day.

The CBEP and a study by True and Manning describe the circulation in Casco Bay as predominantly counterclockwise in direction. The greatest input of ocean water in eastern Casco Bay is through Broad Sound (just east of Great Chebeague Island) where the circulation pushes water into Middle Bay, Maquoit Bay and circulates in a westerly direction down to where it exits Casco Bay through Portland Channel. Broad Sound is the deepest channel in Casco Bay where colder, more saline water enters the inner Bay. When there is no wind and only tidal force on the currents, there is equal input from all channels into the inner bay from Casco Bay. The tidal flow shows minor variation in direction with depth. The True and Manning study further illustrated that circulation of the waters with Casco Bay can be affected by offshore winds, fresh water runoff from the Kennebec/Androscoggin River (especially in the spring) and the Western Maine Coastal Current (WMCC), depending on its location. The water in Middle Bay and Maquoit Bay is piled against the western shore which contributes to a southwesterly flow along the Yarmouth and Falmouth shores.

Water Quality Studies

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 were 58 active water sampling sites in Growing Area WJ and seven investigative stations during the 2019 sampling year. Sampling stations are shown in the overview maps in Figures 2-4. It is recognized that access, icing, and safety considerations prevent some stations from being sampled on scheduled dates. Currently, all stations in Growing Area WJ meet their NSSP classification standards.

Water Quality Discussion and Classification Determination

P90s for all active stations were calculated and all stations meet their classification standards (Table 6).

Table 6. P90 calculations for Approved, Restricted, and Prohibited stations.



Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WJ009.00	P	30	2.6	0.24	8	5.5	8/17/2016
WJ014.15	P	30	6.2	0.65	1040	43.6	6/7/2017
WJ016.00	A	30	2.5	0.27	22	5.6	11/6/2017
WJ017.00	A	30	2.3	0.26	24	5.2	4/14/2015
WJ017.50	A	30	2.3	0.32	94	6.2	4/14/2015
WJ018.00	A	30	3.4	0.4	52	11.4	4/14/2015
WJ018.60	A	30	3	0.41	88	10.3	4/14/2015
WJ019.00	A	30	3.7	0.5	240	16.5	4/14/2015
WJ024.00	A	30	2.9	0.54	1000	14.6	4/14/2015
WJ026.00	A	30	3.4	0.57	1100	18.6	4/14/2015
WJ027.30	A	30	2.2	0.22	16	4.3	4/13/2015
WJ027.50	A	30	2.7	0.37	76	8.4	4/13/2015
WJ031.50	A	30	2.7	0.41	48	9.3	5/26/2015
WJ032.50	A	30	4.1	0.49	80	17.7	8/3/2016
WJ034.00	A	30	2.7	0.34	48	7.4	5/4/2015
WJ035.00	A	30	3	0.43	50	11.1	5/4/2015
WJ038.00	A	30	2.2	0.21	12.7	4.1	3/25/2015
WJ046.00	A	30	2.5	0.38	96	8	4/8/2015
WJ048.00	A	30	2.9	0.38	62	9.3	4/8/2015
WJ048.50	A	30	4.1	0.52	94	19.6	4/8/2015
WJ049.00	A	30	2.4	0.26	16	5.2	4/8/2015
WJ049.50	A	30	2.8	0.35	74	8	4/8/2015
WJ050.50	A	30	2.8	0.36	44	8.2	4/8/2015
WJ051.00	A	30	3.4	0.44	88	12.7	4/28/2015
WJ055.00	A	30	2.1	0.17	12	3.6	4/28/2015
WJ056.00	A	30	2.5	0.33	40	6.9	4/6/2015
WJ057.00	P	30	2.5	0.32	46	6.4	4/6/2015
WJ058.00	P	30	5.8	0.68	400	44.3	4/6/2015
WJ059.00	A	30	2.2	0.18	8	3.9	4/6/2015
WJ060.00	A	30	3	0.44	134	11.5	5/26/2015
WJ067.00	A	30	3.4	0.53	180	16.7	4/6/2015
WJ068.50	A	30	2.8	0.26	14	6.2	4/6/2015
WJ070.00	A	30	2.7	0.3	24	6.7	4/6/2015



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.

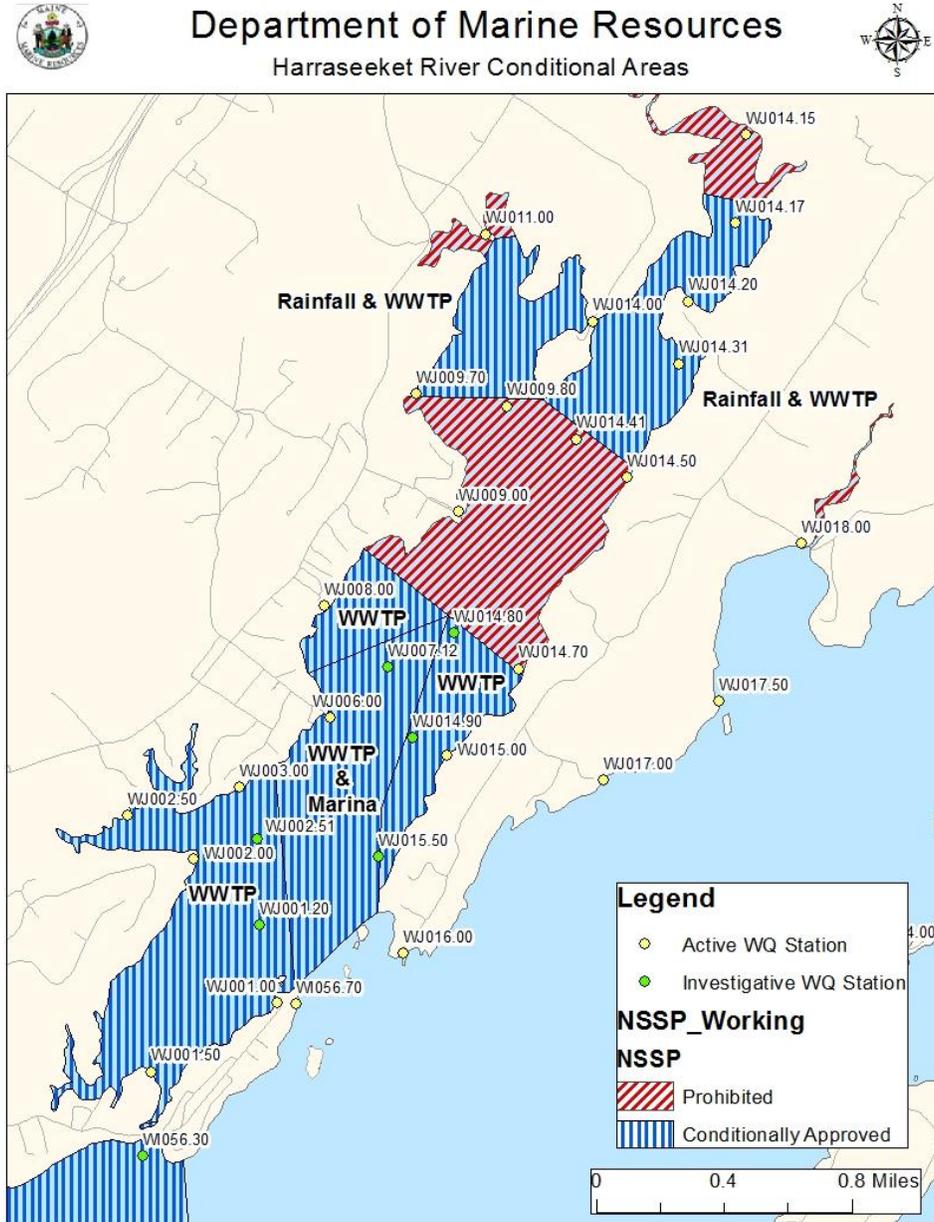
CAMP Reviews, Inspection Reports, and Performance Standards

Harraseeket River WWTP, Rainfall, and Marina Conditional Areas

A portion of the Harraseeket River is classified as Conditionally Approved based on the proper performance of the Freeport Wastewater Treatment Plant. Water quality is monitored by stations WJ 1, 1.5, 2, 2.5, 3, 8, 14.7, and 15. Another portion of the Harraseeket River is classified as Conditionally Approved based on the proper performance of the Freeport WWTP and based on the presence of a marina. This area closes from May 1st through November 30th and is monitored by station WJ 6. The northern conditional area in the Harraseeket River is also based on the proper performance of the Freeport WWTP and rainfall. The area closes if rainfall meets or exceeds 1" in a 24 hour period. This area is monitored by stations WJ 9.7, 9.8, 11, 14, 14.17, 14.2, 14.31, 14.41, and 14.5. There are also six investigative stations, WJ 1.2, 2.51, 7.12, 14.8, 14.9, and 15.5, that monitor the conditional area boundary lines. These stations remain investigative because they cannot always be sampled monthly. They are collected by boat only and during the winter months the Harraseeket River is typically frozen. Maine DEP annually confirms all malfunctions and bypasses are reported in accordance with the conditions of the management plan. Freeport WWTP personnel adequately reported WWTP malfunctions or bypasses at appropriate times. Marine Patrol and/or local Shellfish Wardens monitor illegal harvesting activity in these areas during the closed periods. These conditional areas continue to meet their management plans.



Figure 9. Harraseeket River Conditional Areas.



**Table 7.** P90s for Harraseeket River WWTP Conditional Area; open status.

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WJ001.00	CA	30	2.3	0.24	29	4.7	8/14/2017
WJ001.50	CA	30	2.6	0.37	60	7.8	5/16/2017
WJ002.00	CA	30	2.2	0.26	44	4.9	9/27/2017
WJ002.50	CA	30	2.9	0.44	82	10.9	8/14/2017
WJ003.00	CA	30	2.4	0.37	144	7.5	4/10/2017
WJ008.00	CA	30	2.7	0.3	32	6.6	8/14/2017
WJ014.70	CA	30	2.8	0.33	31	7.4	8/2/2017
WJ015.00	CA	30	2.2	0.22	20	4.4	8/2/2017

Table 8. P90s for Harraseeket River WWTP and Marina Conditional Area; open status.

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WJ006.00	CA	30	2.2	0.21	25	4.1	1/7/2015

Table 9. P90s for Harraseeket River WWTP and Rainfall Conditional Area; open status.

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WJ009.70	CA	30	2.6	0.27	18	5.9	2/22/2017
WJ009.80	CA	30	2.1	0.13	6	3.2	4/27/2016
WJ011.00	CA	30	3.2	0.33	15	8.5	1/25/2017
WJ014.00	CA	30	2.5	0.29	44	6	8/2/2017
WJ014.17	CA	30	3.2	0.33	28	8.5	8/3/2015
WJ014.20	CA	30	4.2	0.45	96	16	10/19/2016
WJ014.31	CA	30	2.5	0.21	9.1	4.5	12/1/2015
WJ014.41	CA	30	2.1	0.12	4	3.1	3/28/2016
WJ014.50	CA	30	2.8	0.35	42	8.1	12/27/2016

**Table 10.** P90s for Harraseeket River Investigative Stations.

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WJ001.20	X	30	2.1	0.23	33	4.4	8/17/2016
WJ002.51	X	30	2	0.12	8	2.9	6/29/2016
WJ007.12	X	30	2.1	0.16	10	3.5	6/29/2016
WJ014.80	X	30	2.3	0.23	14	4.7	6/29/2016
WJ014.90	X	30	2.6	0.27	30	5.8	6/29/2016
WJ015.50	X	30	2.4	0.29	56	5.9	6/29/2016

Maquoit Bay Rainfall Conditional Area

A portion of Maquoit Bay is classified as Conditionally Approved and closes when rainfall meets or exceeds 1" in 24 hours. This area is monitored by station WJ 33.2. Marine Patrol and/or local Shellfish Wardens monitor illegal harvesting activity for this area during the closed period. This conditional area continues to follow the management plan.

Table 11. P90 for Maquoit Bay Rainfall Conditional Area; open status.

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WJ033.20	CA	30	3.7	0.37	24	11.1	4/8/2015

Paul's Marina Conditional Area

A portion of Merepoint Bay is classified as Conditionally Approved based on the presence of a marina with an open status of November 1st through April 14th. This area is monitored by water quality station WJ 47. Marine Patrol and/or local Shellfish Wardens monitor for illegal harvesting activity in this area during the closed period. This marina continues to follow the management plan.

Table 12. P90 for Paul's Marina Conditional Area; open status.

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WJ047.00	CA	30	2.2	0.25	36	4.7	3/12/2014



Dolphin Marina Conditional Area

A portion of Basin Cove is classified as Conditionally Approved based on the presence of a marina with an open status of November 1st through April 14th. This area is monitored by water quality stations WJ 62, WJ 63, and WJ 64. Marine Patrol and/or local Shellfish Wardens monitor for illegal harvesting activity in this area during the closed period. This marina continues to follow the management plan.

Table 13. P90s for Dolphin Marina Conditional Area; open status.

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WJ062.00	CA	30	2	0.08	4	2.5	3/10/2015
WJ063.00	CA	30	1.9	0	2	1.9	3/10/2015
WJ064.00	CA	30	2.6	0.45	320	10.2	3/10/2015

Basin Cove Seasonal Conditional Area

A portion of Basin Cove is classified as Conditionally Approved based on season with an open status of December 1st through April 30th. This conditional area is monitored by stations WJ 65 and WJ 66. Marine Patrol and/or the local Shellfish Warden monitor illegal harvesting activity for this area during the closed period. This seasonal area continues to follow the management plan.

Table 14. P90s for Basin Cove Seasonal Conditional Area; open status.

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WJ065.00	CA	30	2.6	0.39	124	8.5	12/1/2014
WJ066.00	CA	30	2.4	0.28	48	5.5	12/15/2014

Recommendations for Future Work

No stations in Growing Area WJ require a downgrade due to end of year 2019 P90 scores. There are no planned upgrades for Growing Area WJ. Table 15 shows that stations WJ 1.5, 14.2, 14.5, 14.7, and 15 did not reach their required sample while stations WJ 9.7, and 11 met or exceeded their required sample counts although not in the open status due to the reasons stated in the comments section. Frozen conditions in the Harraseeket River during January and February prevented monthly sampling. Four attempts were made in January and February 2019 to collect the monthly samples but were unable to be completed due to ice. All other stations met or exceeded their required sample count.



Table 15. Count table of samples collected in growing area WJ during the 2019 season.

Station	Class	X	C	O	Total	Samples Required	Comments
WJ001.00	CA			12	12	12	
WJ001.20	X	7				6	
WJ001.50	CA			10	10	12	Frozen in January & February
WJ002.00	CA			13	13	12	
WJ002.50	CA			13	13	12	
WJ002.51	X	6				6	
WJ003.00	CA			13	13	12	
WJ006.00	CA		7	6	13	5	
WJ007.12	X	6				6	
WJ008.00	CA			13	13	12	
WJ009.00	P		6		6	6	
WJ009.70	CA		2	11	13	12	Frozen in January
WJ009.80	CA		2	7	9	6	
WJ011.00	CA		2	10	12	12	Frozen in January & February
WJ014.00	CA		2	12	14	12	
WJ014.15	P		10		10	6	
WJ014.17	CA		2	6	8	6	
WJ014.20	CA		2	9	11	12	Frozen Jan & Feb, Rainfall CA closed 10/8-11/10
WJ014.31	CA		2	7	9	6	
WJ014.41	CA		2	7	9	6	
WJ014.50	CA		2	9	11	12	Frozen Jan & Feb, Rainfall CA closed 10/8-11/10
WJ014.70	CA			10	10	12	Frozen January & February
WJ014.80	X	6				6	
WJ014.90	X	6				6	
WJ015.00	CA			11	11	12	Frozen in January
WJ015.50	X	6				6	
WJ016.00	A			13	13	12	
WJ017.00	A			6	6	6	
WJ017.50	A			6	6	6	
WJ018.00	A			6	6	6	
WJ018.60	A			6	6	6	



Station	Class	X	C	O	Total	Samples Required	Comments
WJ019.00	A			6	6	6	
WJ024.00	A			6	6	6	
WJ026.00	A			6	6	6	
WJ027.30	A			6	6	6	
WJ027.50	A			6	6	6	
WJ031.50	A			6	6	6	
WJ032.50	A			7	7	6	
WJ033.20	CA		3	6	9	6	
WJ034.00	A			6	6	6	
WJ034.50	X	6				X	
WJ035.00	A			6	6	6	
WJ038.00	A			6	6	6	
WJ046.00	A			6	6	6	
WJ047.00	CA		6	4	10	3	
WJ048.00	A			6	6	6	
WJ048.50	A			6	6	6	
WJ049.00	A			6	6	6	
WJ049.50	A			6	6	6	
WJ050.50	A			6	6	6	
WJ051.00	A			6	6	6	
WJ055.00	A			6	6	6	
WJ056.00	A			6	6	6	
WJ057.00	P		6		6	6	
WJ058.00	P		6		6	6	
WJ059.00	A			6	6	6	
WJ060.00	A			6	6	6	
WJ062.00	CA		5	5	10	3	
WJ063.00	CA		5	5	10	3	
WJ064.00	CA		5	5	10	3	
WJ065.00	CA		5	6	11	5	
WJ066.00	CA		5	6	11	5	
WJ067.00	A			6	6	6	
WJ068.50	A			5	6	6	Classification change from R to A 04/2019
	R			1			
WJ070.00	A			6	6	6	



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>.

United States Environmental Protection Agency; <https://www.epa.gov/>

WJ Sanitary Survey Report; 2007. DMR central files.

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