

**The Buzzards Bay Stormwater Collaborative
Healthy Communities Grant Water Quality Data Report
September 2018**



<http://stormwater.buzzardsbay.org/>
<http://buzzardsbayaction.org/index.html>

Prepared by the
Buzzards Bay National Estuary Program
2870 Cranberry Highway
East Wareham, MA 02538



Town of Acushnet

Project Overview

The Buzzards Bay Stormwater Collaborative Project was a pilot program of the Buzzards Bay Action Committee (BBAC) to map stormwater collection networks and monitor stormwater discharges that are contributing to shellfish bed closures and other pollution-caused impairments in the Buzzards Bay watershed. Funding for the program was provided by a U.S. EPA Healthy Communities grant program to the BBAC. The elimination of illicit discharges to stormwater networks and the treatment of stormwater discharges conveying non-point sources of pollution will help reduce these impairments, but these actions can only be taken if problem discharges can be identified and prioritized. The Buzzards Bay National Estuary Program (BBNEP) provided planning and technical support for this effort.

The Buzzards Bay Stormwater Collaborative is a regional inter-municipal program that through cost-effectively sharing of resources and expertise has begun the vital first steps of monitoring discharges and mapping stormwater networks. One of the deliverables of this project includes this detailed report which provides critical information to the participating municipalities to make informed decisions about improving water quality of locally impaired waters. More detailed GIS and raw water quality data are available from the BBNEP upon request. The comprehensive summary information in this report includes: water quality data for individual discharge points; prioritization of stormwater discharges based on water quality analysis; identification of potential illicit connections; and specific recommendations for each discharge.

Water quality data was collected from the summer of 2016 through the fall of 2017 by the BBAC Stormwater Collaborative. This final report for each individual town includes all collected stormwater quality data, GIS mapping of stormwater infrastructure, identification of possible illicit connections, and recommendations for municipal stormwater priorities.

Stormwater Mapping Initiative

An important first step to solving local stormwater issues is an understanding of the character and connectivity of the stormwater infrastructure. The water quality at an outfall is an indicator of the health of the catchment in which that outfall services. A catchment can be a very limited area or several hundred acres. Defining that catchment requires the knowledge of the connectivity of the catchbasins, manholes, and pipes that cumulate to the outfall discharge. An issue with water quality isn't necessarily what is happening at that outfall pipe or roadcut but what could be happening hundreds or thousands of feet away.

Recognizing the importance of understanding the relationship of stormwater infrastructure to water quality of Buzzards Bay, the Buzzards Bay National Estuary Program (BBNEP) began mapping a fundamental inventory of catchbasins and outfalls over 20 years ago. The Stormwater Atlas last updated in 2012 allowed for an early start of the stormwater monitoring program. Information from this atlas provided the basis for a strategic monitoring plan, including potential monitoring site locations. Without this information, the start of the monitoring program would have been significantly delayed. At the outset of the project preselected sampling locations were found, evaluated, and documented for the monitoring program by BBNEP staff. This resulted in 250 well established monitoring locations and sampling strategies.

The Atlas also provided a beginning point for a more detailed GIS mapping program. Updating, improving, and expanding the Atlas was a major accomplishment of this project. A systematic approach to GIS data development was used to map stormwater structures and their connectivity. The mapping component of this project began with verification and mapping grade GPS location of existing Atlas features. Many new above ground structures were discovered and added to the Atlas and all structures were more accurately located. This was limited to about 15% for the Town of Acushnet and covered areas where stormwater was sampled. The other four participating towns were covered by GPS mapping for the much of the entire town because sampling occurred throughout.

The next steps in the mapping process, was to scan storm drain plans and geo-reference the plans in GIS. All plans made available to the project from all five towns were scanned. Plans needed to determine stormwater infrastructure connectivity were geo-referenced. The entire towns of Dartmouth and Fairhaven were covered by geo-referenced plans and were provided to the BBNEP. The Town of Mattapoisett had limited plan coverage, but what was available was geo-referenced. The Town of Acushnet was geo-referenced for the project area and the Town of Wareham is still being processed.

Finally stormwater pipes are being added to the GIS database by using the GPS located above ground structures and the below ground connectivity shown in the plans. This has been completed for the towns of Fairhaven and Dartmouth and has been started for the other three participating towns. In limited areas attributes are added to the GIS database from information shown on the plans. Developing the GIS database for all five participating municipalities, as well as other municipalities in the Buzzards Bay watershed, is an ongoing process that will continue depending on available resources. The level of completeness varies with each of the towns and was mostly a function of the amount of infrastructure, quantity and quality of plans, and area covered by the project.

Unfortunately, plans and GPS locations do not always agree. In those cases a field verification of existing conditions is required to resolve questions. This type of field work is labor intensive and involves the assistance of the local department of public works to provide institutional knowledge, open manhole covers, clear catchbasins, and use metal detectors to find structures. A limited amount of this work has been done in each town and will be an ongoing process as mapping and water quality issues are examined.

Summary of Sampling Methods

This project investigated 250 discharge points which included both pipe outfalls and roadcuts. A total of 547 monitoring visits resulted in 657 water quality samples. Water samples were tested for nine different parameters to determine if there are potential illicit connections as well as the presence of water quality issues. Also, 724 'no-flow' / 'no-sample' observations were made and documented for many outfalls. These observations document that some discharges have no dry weather flow. An indication of no dry weather flow is an important characteristic of a discharge and is required as part of the MS4 permitting process. Note that an observation of 'no-flow' does not preclude the possibility of an illicit connection but it might indicate that it is less likely. See table 1 for itemization by town.

Table 1 - Summary of Discharges and Samples

Municipality	Total Number of Discharges	Number of Project Discharges	Number of Stormwater Samples	No-Flow No-Sample Observations
Acushnet	119	15	77	72
Dartmouth	575	47	70	111
Fairhaven	354	65	266	173
Mattapoisett	557	26	106	87
Wareham	930	97	138	281
Total	2535	250	657	724

The water quality data collection consist of three components – field testing, indoor analysis of nitrates and surfactants, and certified laboratory analysis for bacteria. The basic methods and equipment for each component is described below in tables 2, 3, and 4. See QAPP for additional details.

Table 2 - Field Testing

Parameter	Equipment	Operating Range	Resolution	Accuracy
Ammonia	Hach Test Strips	0-6ppm	0.25ppm	+/- one half of a color block
Conductivity	HachPocket Pro, Multi 2	0 to 200 μ S/cm or 2.00-19.9 mS/cm (auto-range)	0.01mS/0.1 μ S/1.0uS (range dependent)	$\pm$ 1.0%
Salinity	HachPocket Pro, Multi 2	0 to 10 ppt	0.01 ppt	$\pm$ 1%
Temperature	HachPocket Pro, Multi 2	0 to 50°C (32 to 122°F)	0.1°C	$\pm$ 0.5°C
pH	HachPocket Pro, Multi 2	0.0-14.0	0.01	0.02

Table 3 – Indoor (in-office) Analysis

Parameter	Equipment	Operating Range	Resolution	Accuracy	Holding Time
Surfactants (detergents as MBAS)	CHEMetrics K-9400 ¹	0-3 ppm	+ 1 color standard increment	+ 30% error	48 hours
Nitrates	LaMotte Nitrate-Nitrogen test kit (3615-01)	0.00 to 1.00 ppm	0.1ppm	0.1ppm	24 hours

Table 4 - Certified Laboratory Analysis

Parameter	Sample Container	Holding Time	Field Processing/	Method	Units
Fecal Coliform	100 ml sterilize polyethylene	6 hours	Collect, label, store on blue ice	Membrane Filtration, wastewater, SM9222D, 21 th Edition 2005	cfu/100ml
Enterococci	100 ml sterilize polyethylene	6 hours	Collect, label, store on blue ice	EPA Office of Water, Method 1600, Membrane Filter Test EPA 821-R-97-004.	cfu/100ml

Relation of Project to MS4 Permit

As noted above, the primary area of focus for the Collaborative was to monitor discharges and map connections of stormwater outfalls that directly discharge into shellfish beds and other impaired coastal waters. Many of these discharges must also be monitored, and their stormwater collection systems mapped, as part of the US Environmental Protection Agency (EPA) Small Municipal Separate Storm Sewer Systems (MS4) permit. For the most part the Collaborative's discharge monitoring program adheres to the EPA MS4 permit monitoring requirements. Therefore, the activities of the Collaborative will partially help the town meet the MS4 permit monitoring requirements, outreach and education efforts, and water quality testing training. The Stormwater Collaborative only monitored and mapped a fraction of each participating town's MS4 discharges and discharge networks through this program. The program directed efforts towards discharges associated with impaired waters that impact shellfish beds. For example, inland discharges affecting fresh-waterbodies and streams (non-shellfish waters) were not monitored under this program, but are required to be considered for the MS4 permit.

Under the MS4 permit program, each municipality must assess discharges to any impaired waters or wetlands from their "Urbanized Area", not just discharges to coastal waters. The new small MS4 permits in Massachusetts became effective on July 1, 2018. This 2016 permit is a continuation your 2003 MS4 permit and may include an expansion of the 2003 Urbanized Area.

Each municipality's first obligations to obtain a new MS4 permit is prepare and submit a Notice of Intent (NOI) by September 29, 2018. The NOI provides an update of the 2003 permit and an outline of future activities within the scope of the 2016 permit requirements. By July 1, 2019, each permittee must develop a Storm Water Management Plan (SWMP) describing in more detail how activities outlined in your NOI will be accomplished. To summarize, the key differences between the Buzzards Bay Stormwater Collaborative Program efforts and your MS4 permit requirements are:

- the activities of the Collaborative were limited to monitoring discharges and mapping discharge networks directly affecting impaired coastal waters. These discharges may or may not be within UAs as defined by EPA;
- EPA's MS4 permit requires that municipalities obtain a permit and evaluate all stormwater discharges serving their Urbanized Area Stormwater collection networks. Discharges to impaired waters outside the Urbanized Area are not included in your 2016 MS4 permit.

Another factor to consider with the MS4 permitting process is the concentration of bacteria when monitoring. Much of the output from this report has been based on bacteria levels chosen for appropriate analysis in the context of this study. These levels are different than Massachusetts Department of Environmental Protection regulatory standards as described in 314 CMR the Massachusetts Surface Water Quality Standards. See table 5 below for some examples of regulatory thresholds for bacteria levels.

Table 5 – Massachusetts Surface Water Quality Standards Summary

Receiving Water Class	Parameter	Standard
Unfiltered WS - A	Fecal coliform [CFU]	< = 20 in six month period
Filtered WS –A & B	Enterococci [CFU]	< = 126 geometric mean
Filtered WS –A & B	E. coli [CFU]	< = 33 in six month period
SA (Shellfish)	Fecal coliform [CFU]	< = 14 geometric mean
SA/SB (Beaches)	Enterococci [CFU]	< = 35 geometric mean
SB (w/ depuration)	Fecal coliform [CFU]	< = 88 geometric mean

Summary Maps

Included in this report are maps of sampling areas throughout the participating municipalities. These maps are intended to be a quick overview of the areas sampled. Discharges must be addressed on an individual basis and the best method for assessing water quality issues is the examination of the data sheet for the discharge. A data sheet for each discharge is also included in this report. Discharges on the map have an outer circle symbol for the Stormwater Classification and an inner dot for the Illicit Discharge Classification. Also shown is the facility ID number for the discharge which can be used to reference the corresponding data sheet. A comprehensive, interactive version of this map is available on line. The process for determining these classifications is based on raw data from the water quality samples and do reflect the best interpretation from the BBNEP in regards to defining thresholds for bacteria and water quality data. If different thresholds were chosen, the maps would be remarkably different. The maps do not stand alone; informed planning decisions need to include analysis of site specific monitoring data. Below is a description of the methods used for the symbols on the maps.

Stormwater Classification:

Criteria: freshwater samples only; samples from flows only; wet weather samples only; and based on maximum observation of bacteria (Fecal coliform [CFU] or Enterococci [CFU]).

Table 6 - Map Legend for Stormwater Classification

Symbol		Bacteria
	High Concern	> 10,000
	Medium Concern	50 – 10,000
	Low Concern	< 50
	Not Determined	No Data

Illicit Discharge Classification:

Criteria: freshwater (non-tidal) samples only; samples from flows only; wet or dry weather samples; and based on maximum observation of bacteria (Fecal coliform [CFU] or Enterococci [CFU]) with number of water quality parameters with maximum observation above threshold. These thresholds are > 0.50 ppm for Ammonia (NH₃), > 0.25 ppm for Surfactants, and > = 0.44 ppm for Nitrate (NO₃).

Table 7 – Map Legend for Illicit Discharge Classification

Symbol		Bacteria		Water Quality Parameter
•	Elevated Potential	> 10,000	and / or	3 above threshold
•	Some Potential	50 – 10,000	and / or	2 above threshold
•	Low Potential	< 50	and	1 or less above threshold
•	Not Determined	No Data		

Discharge Data Sheets

Included in this report are individual data sheets for each discharge studied. These sheets include basic information about the outfall, results of water quality analysis, and some interpretation of the results. A sample data sheet is provided with an explanation of each field. Additional raw data about field conditions, unusual observations, rainfall details, and various notes are all maintained in the water quality database. The information shown on these data sheets provide valuable insight to local stormwater issues and where resources might be allocated to address these issues. See example below.

Stormwater Report for: **AIH1028PI**

in the Town of **Acushnet**

Main St near Shady Tree Lane

Water Body: **Acushnet River** Qualifier: **SFR, CSO**

Urbanized: **Yes** Sewered: **Yes** Class: **SB** Category: **5**

MS4 Ranking: **High Priority Outfall**

Status: **Some Concern Warranted - Continue Monitoring**

DW: Low to Moderate levels of Bact. (4 out of 6). DW Rank: Bact (1), Nitrates(1), Total 2. WW: Moderate Bact levels and elevated Amm, Nitrates, and Surf in WW. WW rank: Bact (1), Amm/Nitrates/Surf (1 ea), Total 4. Recommend: Continue to monitor both DW and WW. If DW, collect sample only if flow is evident, if stagnant (no flow), make a note on data sheet indicating no flow. Investigate for potential ID. Impair: None, discharge into trib of Acu R.

Rating

Wet Weather: **4**

Dry Weather: **2**

2 'No Sample Visits'

11 Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/13/2018

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surfact	Enterococcus	Fecal Coliform
AIH1028PI	6/2/2016	6AC02JUN03-A	pipe	Fresh Water	51 hrs	0 in	6.43	17.9	0.34	0.25	4.40	0.100	3200	5900
AIH1028PI	6/8/2016	6AC08JUN03-A	pipe	Fresh Water	60 hrs	0 in	6.32	19.9	0.32	0.25	4.40	0.000	82	9
AIH1028PI	6/14/2016	6AC14JUN03-A	pipe	Fresh Water	65 hrs	0 in	6.34	20.1	0.25	0.00	4.40	0.000	64	9
AIH1028PI	6/20/2016	6AC20JUN03-S	pipe	Fresh Water	56 hrs	0 in	6.22	21.2	0.24	0.25	4.40	0.100	9	55
AIH1028PI	6/21/2016	6AC21JUN06-A	pipe	Fresh Water	5 hrs	0.73 in	6.30	21.5	0.21	0.00	3.52	0.200	3400	490
AIH1028PI	6/21/2016	6AC21JUN06-A	pipe	Fresh Water	5 hrs	0.73 in	6.29	20.5	0.21	0.25	4.40	0.200	2800	550
AIH1028PI	7/5/2016	6AC05JUL05-A	pipe	Fresh Water	2 hrs	0.61 in	6.49	22.8	0.06	0.00	0.300	7000	7400	
AIH1028PI	6/5/2017	7AC05JUN03-A	pipe	Fresh Water	2 hrs	0.41 in	6.30	16.2	0.31	0.25	4.40	0.100	700	
AIH1028PI	7/11/2017	7AC11JUL02-A-D	pipe	Fresh Water	0 hrs	0.13 in	7.40	23.4	0.00	1.00	4.40	1.000	7100	
AIH1028PI	7/11/2017	7AC11JUL02-A	pipe	Fresh Water	0 hrs	0.13 in	7.90	23.4	0.00	1.00	4.40	1.000	2800	

1. Name of the discharge and associated catchment
2. Town and location of discharge
3. Map showing area near discharge along with facility id numbers for nearby infrastructure

4. MassDEP 2014 Integrated List of Waters (305(b)/303(d)); Name of receiving water body along with Class, Category, and Qualifier of water body
5. Indication if discharge is in a MS4 urbanized area and if the catchment area has sewer service
6. MS4 Ranking for discharge based on permit language; possible ranks include:
 - Not Determined
 - Problem Outfall
 - High Priority Outfall
 - Medium Priority Outfall
 - Low Priority Outfall
 - Excluded Outfall
7. BBNEP summary status; possible status suggestions include:
 - Evaluation Not Complete
 - Requires Additional Monitoring
 - No Apparent Issues – Allocate Resources Elsewhere
 - Some Concern Warranted – Continue Monitoring
 - Some Concern Warranted – Consider Corrective Action
 - Requires Immediate Attention
8. BBNEP specific analysis and recommendation
9. Photograph of discharge point (if available)
10. Rating of discharge based on water quality data (objective determination)
 - Only freshwater (<6 ppt salinity) and flowing waters used for scoring
 - Maximum of observed sample values used for scoring
 - If parameter above threshold, 1 point each for ammonia, nitrate, and surfactants - These thresholds are > 0.50 ppm for Ammonia (NH₃), > 0.25 ppm for Surfactants, and > = 0.44 ppm for Nitrate (NO₃).
 - Bacteria could be either Fecal coliform or Enterococci
 - Bacteria scored between 0 for > 50 CFU, 1 for 50 – 10,000 CFU, and 2 for >10,000 CFU
 - Total scores range between 0 and 5
 - Separate scores for Dry Weather and Wet Weather (>0.02 inches in 4 hours previous to sample)
11. Number of dry weather visits where no flow was observed and thus no samples taken
12. Water quality data:
 - **FacilityID** – facility identifier for location of sample; may vary and be different than discharge ID
 - **SampleDate** - date the water sample was taken
 - **SampleID** – sample identification number used to track internally and at laboratory
 - **Sample Type** - type of sample collected: pipe, stream, surface, or sump
 - **Water Classification** – Fresh Water if <6 ppt salinity else classified as Brackish or Sea Water
 - **Last Rain** – number of hours since last rain and time of sample
 - **12 hr. Rain** – number of inches of rain in previous 12 hours
 - **pH** – sample pH
 - **Temp** – sample temperature in degrees centigrade
 - **Salinity** – sample salinity in parts per thousand
 - **Ammo** – sample ammonia concentration in parts per million

Acushnet Stormwater Report 8/14/2018

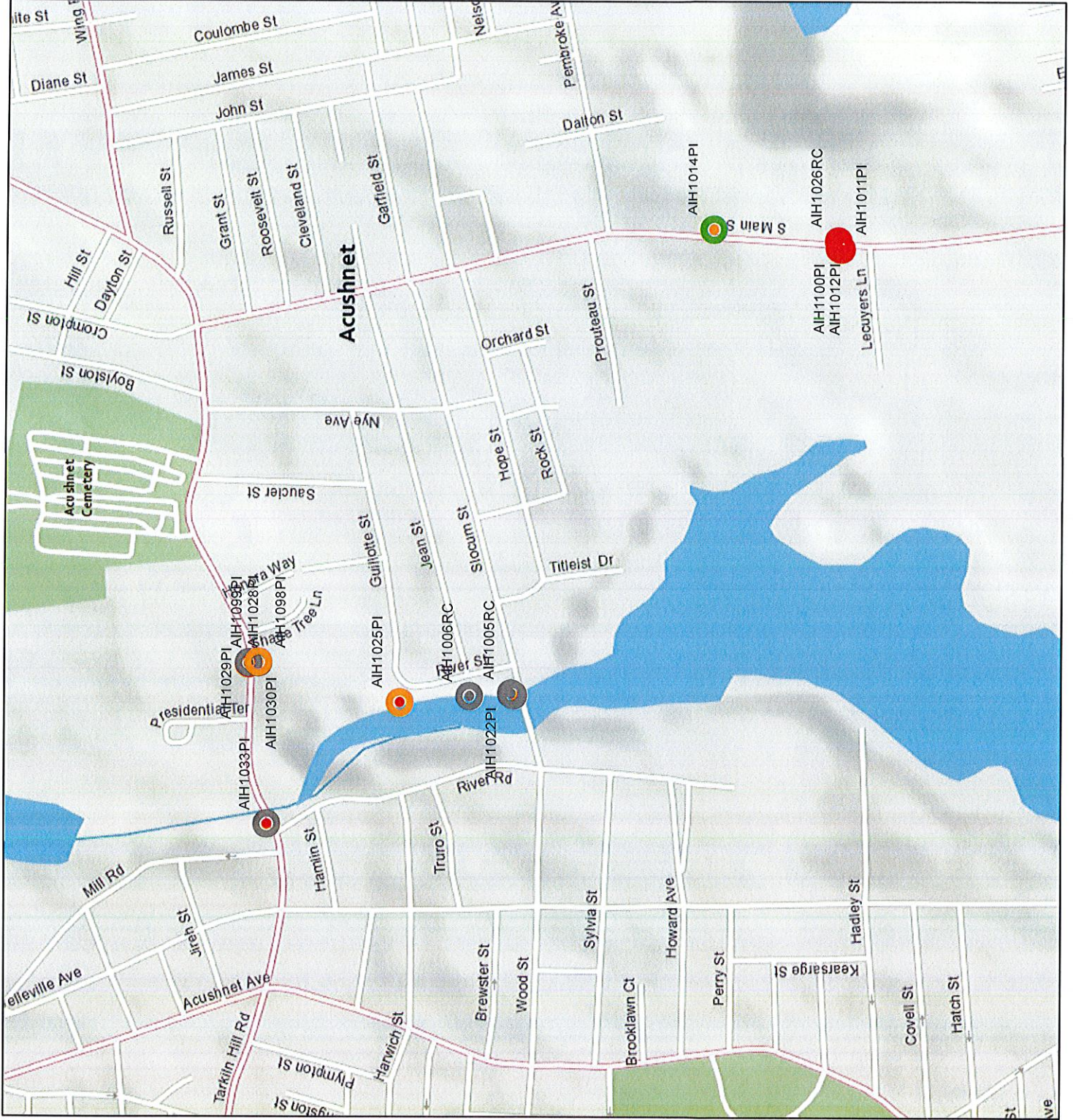


Stormwater Classification

- High Concern
- Medium Concern
- Low Concern
- Not Determined

Illicit Discharge Classification

- Elevated Potential
- Some Potential
- Not Determined



Stormwater Report for: AIH1098PI
in the Town of Acushnet

Main St near Shady Tree Lane

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: Yes Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: Evaluation Not Complete

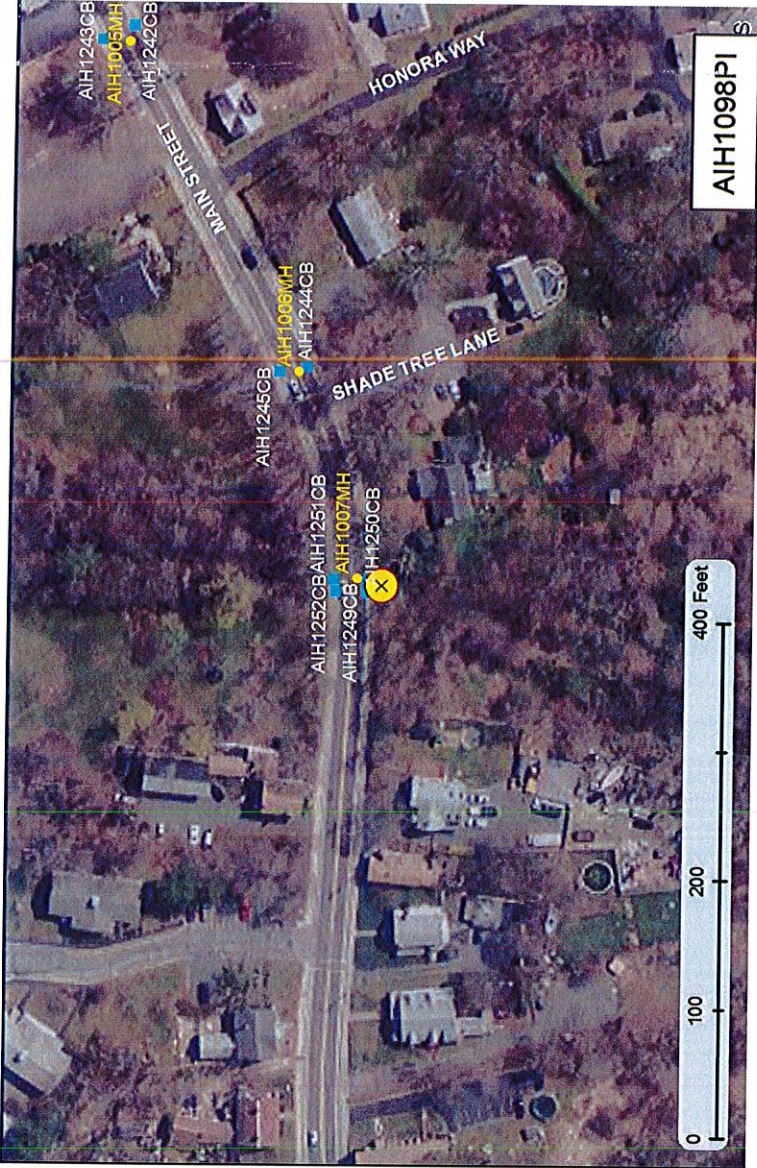
DW: No flow, no issues. WW: no samples collected. Recommend: Monitor in WW. Impair: None, discharge into trib of Acu R.



Rating

Wet Weather: No Data

Dry Weather: 2



		7 'No Sample Visits'		Status and Recommendation based on the opinion of the BBNEP.					Report Created on: 8/17/2018					
FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surfact	Enterococcus	Fecal Coliform
AIH1098PI	6/23/2016	6AC23JUN03-A-	pipe	Fresh Water	52 hrs	0 in	6.31	24.8	0.22	0.00	3.52	0.100	100	27
AIH1098PI	6/23/2016	6AC23JUN03-A	pipe	Fresh Water	52 hrs	0 in	6.30	23.7	0.23	0.25	3.52	0.100	120	36

Stormwater Report for: AIH1099PI
in the Town of Acushnet

Main St near Shady Tree Lane

Water Body: Acushnet River Qualifier: SFR, CSO
Urbanized: Yes Sewered: Yes Class: SB Category: 5
MS4 Ranking: High Priority Outfall

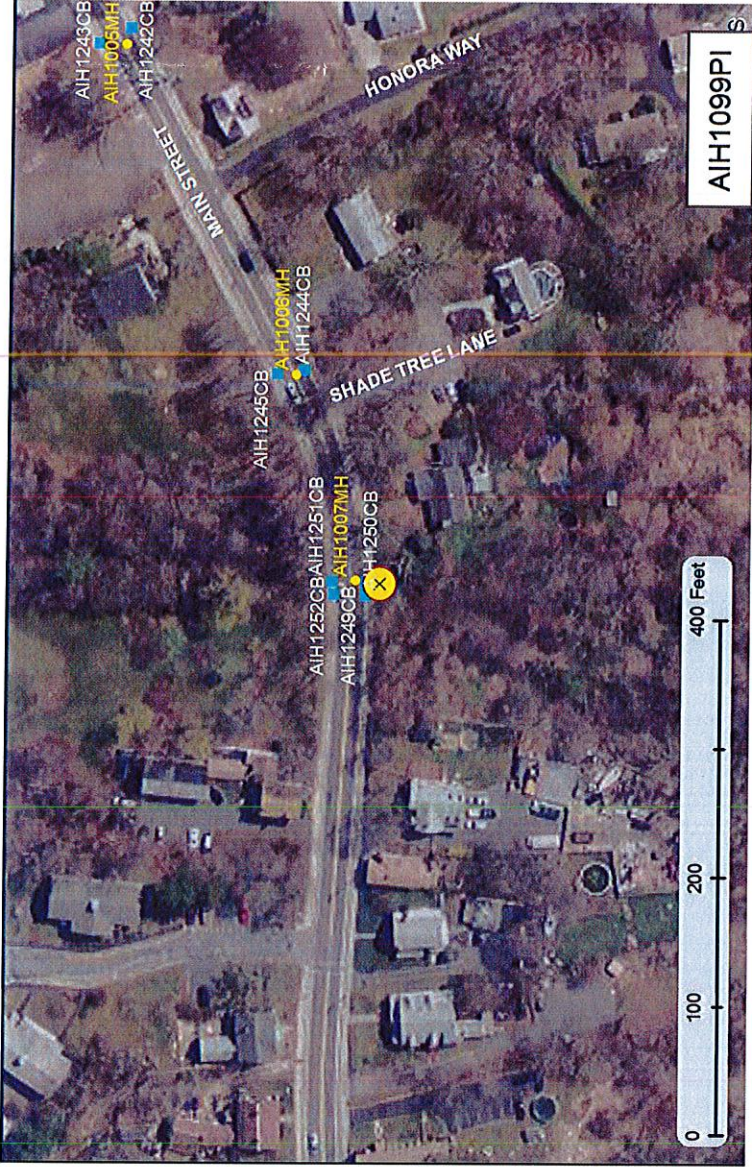
Status: No Apparent Issues - Allocate Resources Elsewhere

Stream samples from culvert. No indication for concern. Impair: None, discharge into trib of Acu R.



Rating
Wet Weather: 2
Dry Weather: 2

3 'No Sample Visits'



		3 'No Sample Visits'		Status and Recommendation based on the opinion of the BBNEP.					Report Created on: 8/17/2018					
FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surfact	Enterococcus	Fecal Coliform
AIH1099PI	7/14/2016	6AC14JUL02-S	stream	Fresh Water	73 hrs	0 in	6.41	23.3	0.20	0.25			280	490
AIH1099PI	8/9/2016	6AC09AUG02-S	stream	Fresh Water	54 hrs	0 in	6.80	26.9	0.15	1.00	0.00	0.200	3600	3000
AIH1099PI	6/5/2017	7AC05JUN04-A	stream	Fresh Water	3 hrs	0.39 in	6.60	16.1	0.13	0.25	4.40	0.100	100	
AIH1099PI	6/20/2017	7AC20JUN01-A	stream	Fresh Water	1 hrs	0.24 in	6.29	19.3	0.59	0.50	4.40	0.100	700	
AIH1099PI	6/20/2017	7AC20JUN01-A	stream	Fresh Water	1 hrs	0.24 in	6.30	19.0	0.58	0.50	4.40	0.100	700	

Stormwater Report for: AIH1028PI
in the Town of Acushnet

Main St near Shady Tree Lane

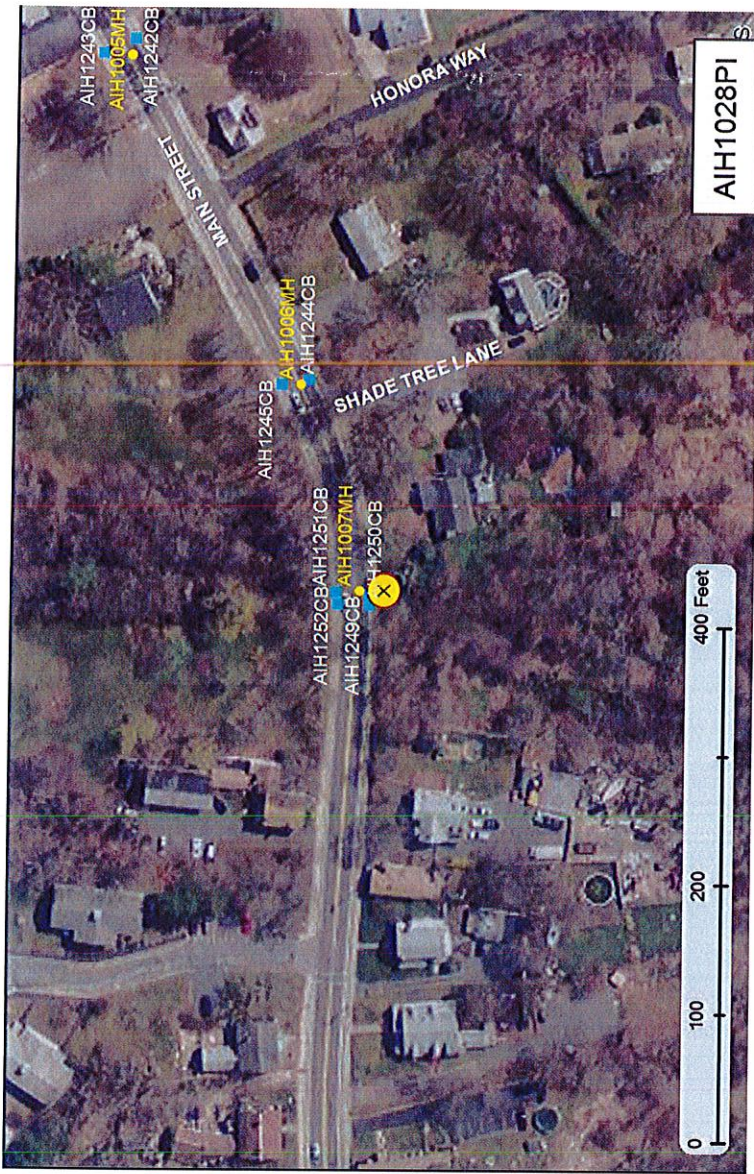
Water Body: Acushnet River Qualifier: SFR, CSO
Urbanized: Yes Sewered: Yes Class: SB Category: 5
MS4 Ranking: High Priority Outfall

Status: Some Concern Warranted - Continue Monitoring

DW: Low to Moderate levels of Bact.
(4 out of 6). DW Rank: Bact (1),
Nitrates(1), Total 2. WW: Moderate
Bact levels and elevated Amm,
Nitrates, and Surf in WW. WW rank:
Bact (1), Amm/Nitrates/Surf (1 ea),
Total 4. Recommend: Continue to
monitor both DW and WW. If DW,
collect sample only if flow is evident, if
stagnant (no flow), make a note on
data sheet indicating no flow.
Investigate for potential ID. Impair:
None, discharge into trib of Acu R.



Rating
Wet Weather: 4
Dry Weather:
2



		2 'No Sample Visits'		Status and Recommendation based on the opinion of the BBNEP.										Report Created on: 8/17/2018	
FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform	
AIH1028PI	6/2/2016	6AC02JUN03-A	pipe	Fresh Water	51 hrs	0 in	6.43	17.9	0.34	0.25	4.40	0.100	3200	5900	
AIH1028PI	6/8/2016	6AC08JUN03-A	pipe	Fresh Water	60 hrs	0 in	6.32	19.9	0.32	0.25	4.40	0.000	82	9	
AIH1028PI	6/14/2016	6AC14JUN03-A	pipe	Fresh Water	65 hrs	0 in	6.34	20.1	0.25	0.00	4.40	0.000	64	9	
AIH1028PI	6/20/2016	6AC20JUN03-S	pipe	Fresh Water	56 hrs	0 in	6.22	21.2	0.24	0.25	4.40	0.100	9	55	
AIH1028PI	6/21/2016	6AC21JUN06-A-	pipe	Fresh Water	5 hrs	0.73 in	6.30	21.5	0.21	0.00	3.52	0.200	3400	490	
AIH1028PI	6/21/2016	6AC21JUN06-A	pipe	Fresh Water	5 hrs	0.73 in	6.29	20.5	0.21	0.25	4.40	0.200	2800	550	
AIH1028PI	7/5/2016	6AC05JUL05-A	pipe	Fresh Water	2 hrs	0.61 in	6.49	22.8	0.06		0.00	0.300	7000	7400	
AIH1028PI	6/5/2017	7AC05JUN03-A	pipe	Fresh Water	2 hrs	0.41 in	6.30	16.2	0.31	0.25	4.40	0.100	700		
AIH1028PI	7/11/2017	7AC11JUL02-A-D	pipe	Fresh Water	0 hrs	0.13 in	7.40	23.4	0.00	1.00	4.40	1.000	7100		
AIH1028PI	7/11/2017	7AC11JUL02-A	pipe	Fresh Water	0 hrs	0.13 in	7.90	23.4	0.00	1.00	4.40	1.000	2800		

Stormwater Report for: AIH1029PI
in the Town of Acushnet

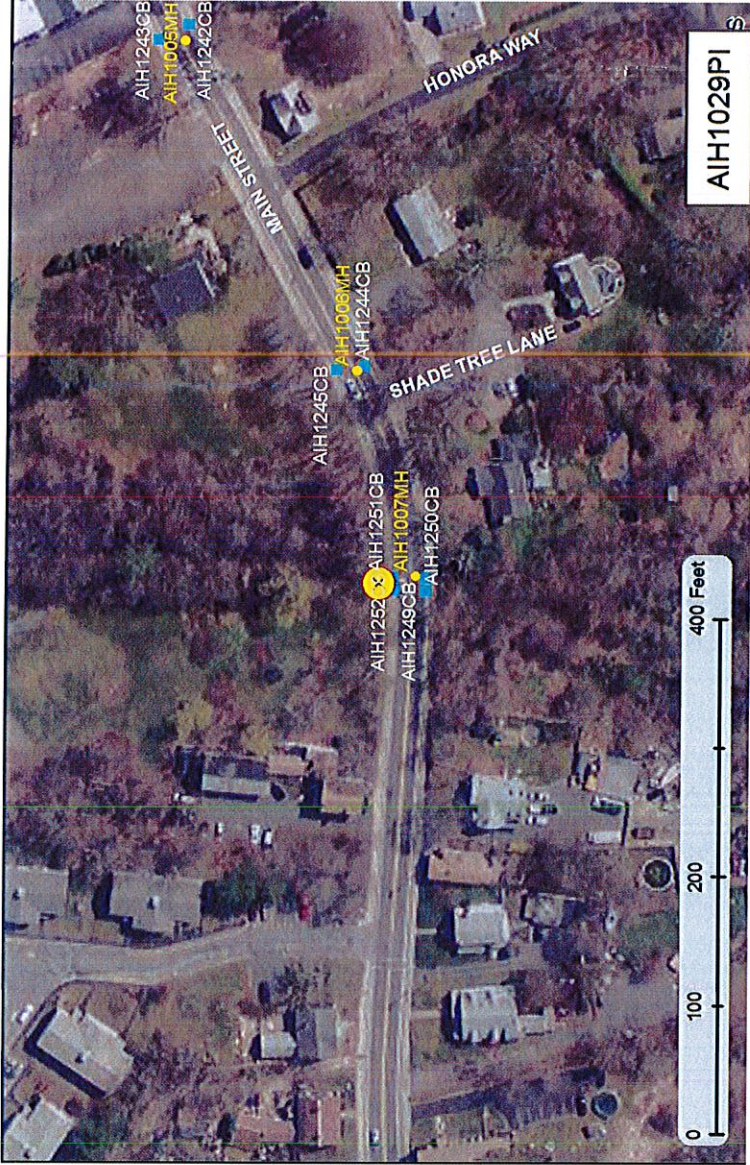
Main St near Shady Tree Lane

Water Body:	Acushnet River	Qualifier:	SFR, CSO
Urbanized:	Yes	Sewered:	Yes
Class:	SB	Category:	5
MS4 Ranking:	High Priority Outfall		
Status:	Requires Additional Monitoring		

DW: No flow, no issues. WW: no samples collected. Recommend: Monitor in WW. Impair: None, discharge into trib of Acu R.



Rating	
Wet Weather:	No Data
Dry Weather:	No Data or No Flow
	8 'No Sample Visits'



Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018

Stormwater Report for: AIH1030PI
in the Town of Acushnet

Main St near Shady Tree Lane

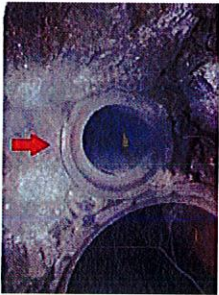
Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: Yes Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: Evaluation Not Complete

DW: No flow, no issues. WW (1 sample) Rank: Bact (2), Amm/Nitrates/Surf (1 ea), Tot 5. Recommend: Continue monitoring for WW. Investigate for potential ID. Impair: None, discharge into trib of Acu R.



Rating

Wet Weather: 5

Dry Weather:

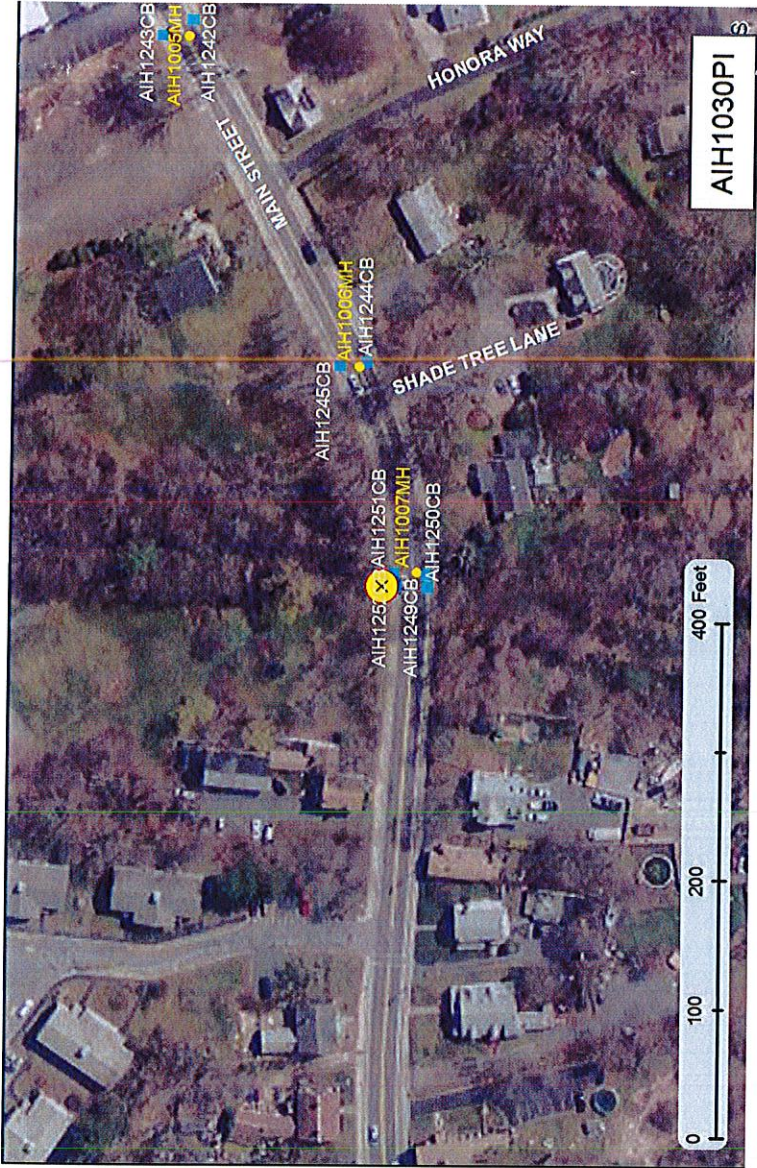
No Data or No Flow

7 'No Sample Visits'

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1030PI	7/11/2017	7AC11JUL01-A	pipe	Fresh Water	0 hrs	0.13 in	6.90	23.9	0.00	1.00	4.40	1.000	44000	

Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018



Stormwater Report for: AIH1033PI
in the Town of Acushnet

Main St opposit River Rd

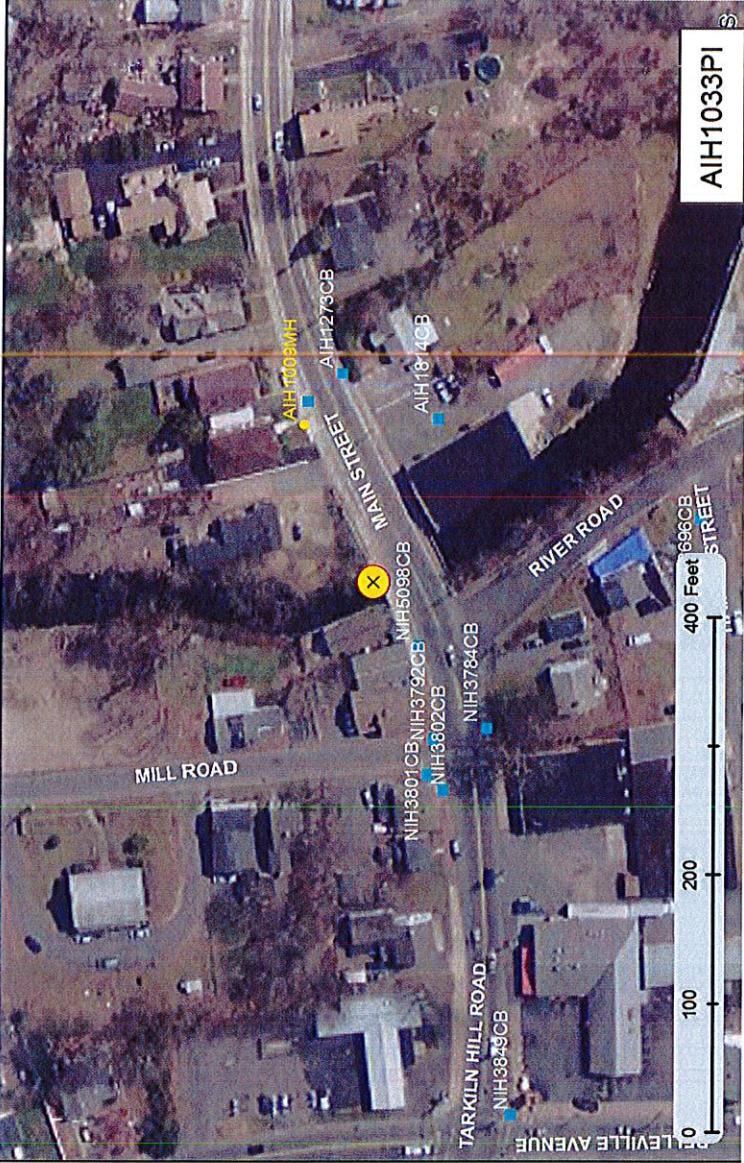
Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: Yes Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: Evaluation Not Complete

DW: High bact count and elevated nitrates during DW (1 out of 9). DW rank: Bact (3), Nitrates (1). Total 4. High DW bact probably an anomaly. WW: no samples collected. Recommend: Monitor in WW. Acu R Impair: Bact, DO, N, OG.



Rating

Wet Weather: No Data

Dry Weather:

3

	8 'No Sample Visits'		Status and Recommendation based on the opinion of the BBNEP.										Report Created on: 8/17/2018	
FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1033PI	9/6/2017	7AC06SEP01-A	pipe	Fresh Water	57 hrs	0 in	7.40	24.8	0.01	0.25	4.40	0.250	17300	

Stormwater Report for: AIH1025PI
in the Town of Acushnet

Guillotte St and River St

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: Yes Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: Some Concern Warranted - Continue Monitoring

DW: High bacteria levels and elevated nitrates (1 out of 6). DW rank: Bact (2) and Nitrates (1), Tot 3. WW: Moderate bact levels and elevated Nitrates and Surf. WW rank: Bact (1), Nitrates/Surf (1 ea), Tot 3. Recommend: Continue monitoring WW. Investigate for potential ID. Acu R Impair: Bact, DO, N, OG.

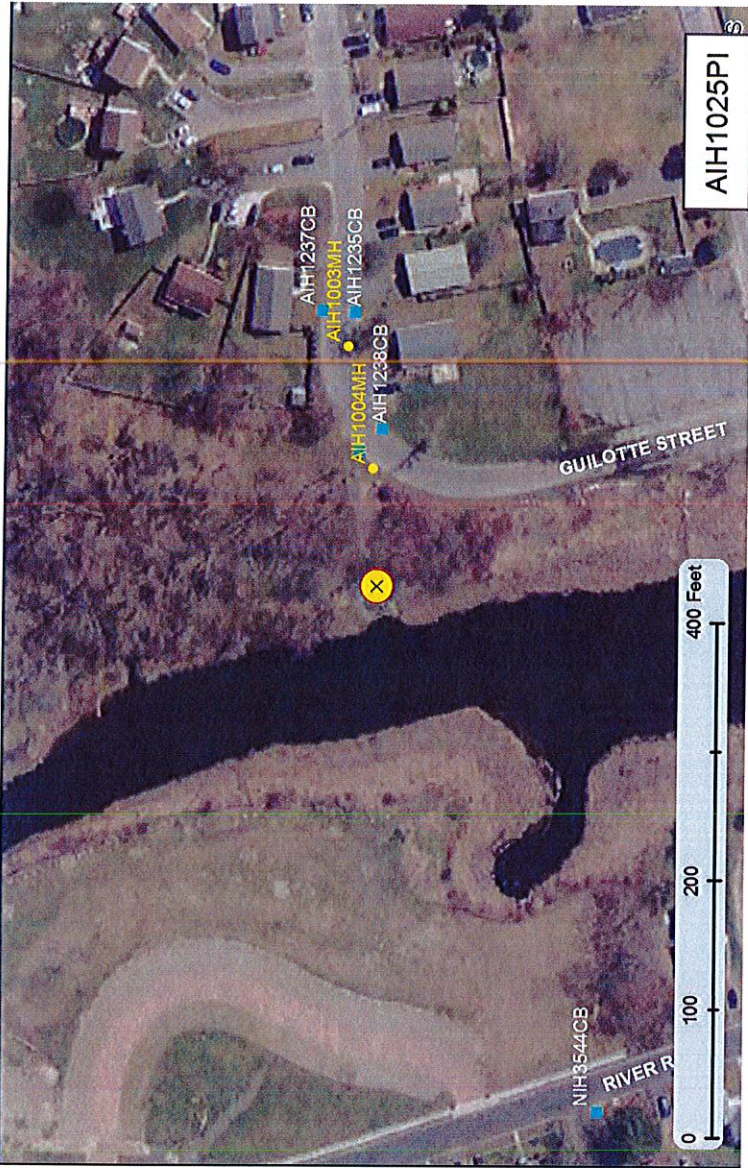
Rating

Wet Weather: 3

Dry Weather: 3

5

No Sample Visits



		5 'No Sample Visits'		Status and Recommendation based on the opinion of the BBNEP.					Report Created on: 8/17/2018					
Facility/ID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1004MH	6/2/2016	6AC02JUN06-S	sump	Fresh Water	52 hrs	0 in	6.47	23.0	0.24	0.00	4.40	0.100	2900	810
AIH1025PI	6/21/2016	6AC21JUN05-A	pipe	Fresh Water	4 hrs	0.73 in	7.28	20.7	0.04	0.25	3.52	0.750	7900	6200
AIH1025PI	7/5/2016	6AC05JUL04-A	pipe	Fresh Water	2 hrs	0.61 in	7.15	23.4	0.01		0.00	0.300	3400	2900
AIH1025PI	6/5/2017	7AC05JUN05-A	pipe	Fresh Water	3 hrs	0.39 in	6.25	16.7	0.20	0.25	4.40	0.100	100	
AIH1025PI	9/6/2017	7AC06SEP03-A-D	pipe	Fresh Water	57 hrs	0 in	7.00	25.5	0.02	0.25	4.40	0.100	13600	
AIH1025PI	9/6/2017	7AC06SEP03-A	pipe	Fresh Water	57 hrs	0 in	7.40	24.9	0.02	0.25	4.40	0.100	12900	

Stormwater Report for: AIH1006RC
in the Town of Acushnet

River St

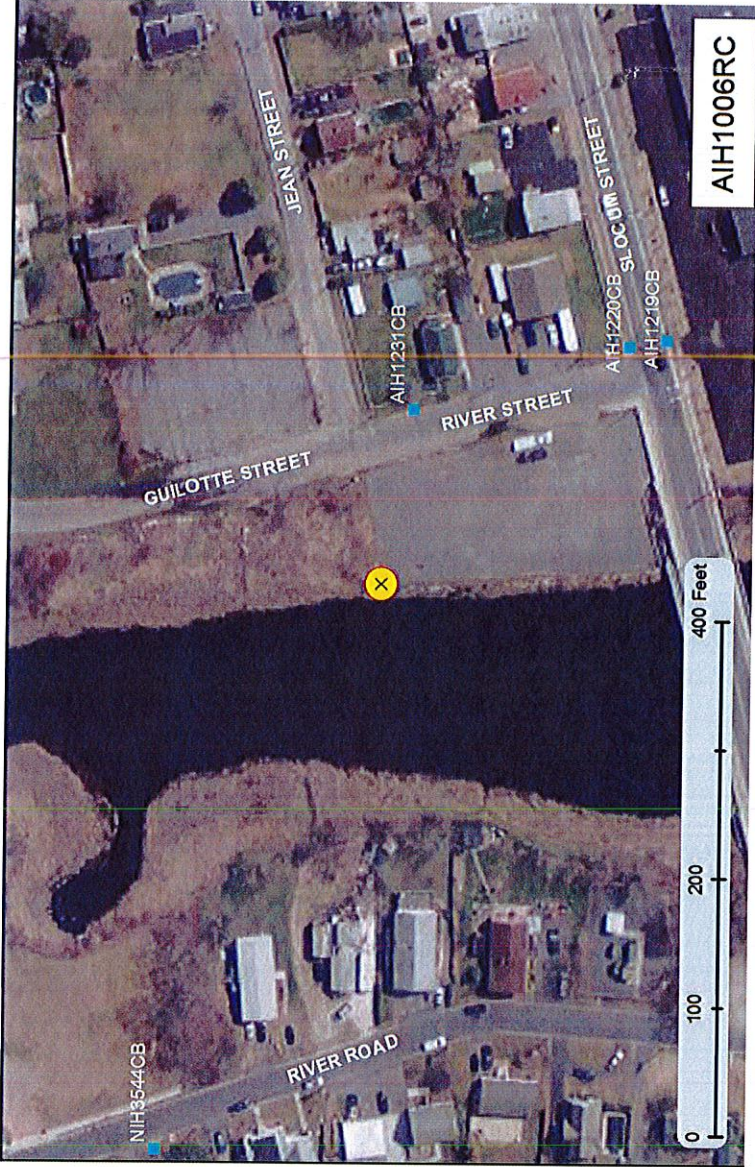
Water Body:	Acushnet River	Qualifier:	SFR, CSO
Urbanized:	Yes	Sewered:	Yes
Class:	SB	Category:	5
MS4 Ranking:	High Priority Outfall		
Status:	Evaluation Not Complete		

DW: No flow, no issues. WW: no samples collected. Recommend: Monitor in WW. Acu R: Impair: Bact, DO, N, OG.



Rating
Wet Weather: No Data
Dry Weather:
No Data or No Flow

4 'No Sample Visits'



Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018

Stormwater Report for: AIH1005RC
in the Town of Acushnet

River St

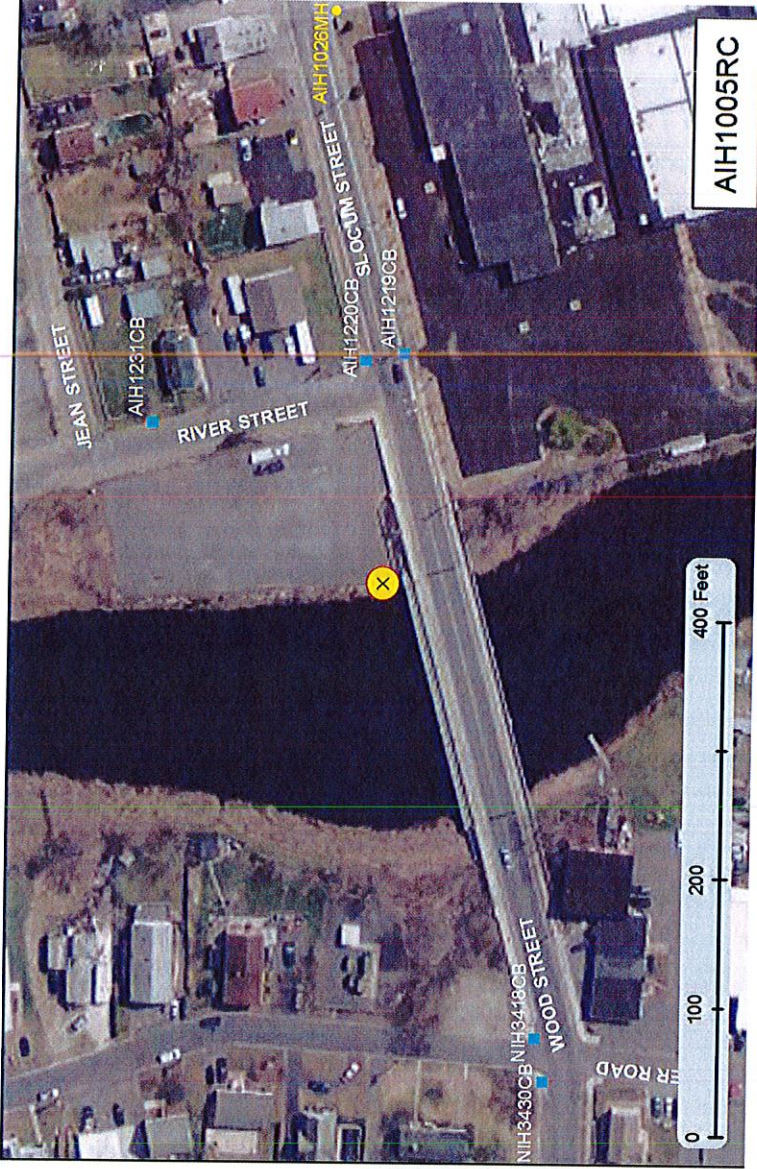
Water Body: Acushnet River Qualifier: SFR, CSO
Urbanized: Yes Sewered: Yes Class: SB Category: 5
MS4 Ranking: High Priority Outfall
Status: Evaluation Not Complete

DW: No flow, no issues. WW: no samples collected. Recommend: Monitor in WW. Acu R: Impair: Bact, DO, N, OG.



Rating
Wet Weather: No Data
Dry Weather: No Data or No Flow

4 'No Sample Visits'



Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018

Stormwater Report for: AIH1022PI
in the Town of Acushnet

Slocum St at bridge

Water Body: Acushnet River Qualifier: SFR, CSO
Urbanized: Yes Sewered: Yes Class: SB Category: 5
MS4 Ranking: High Priority Outfall

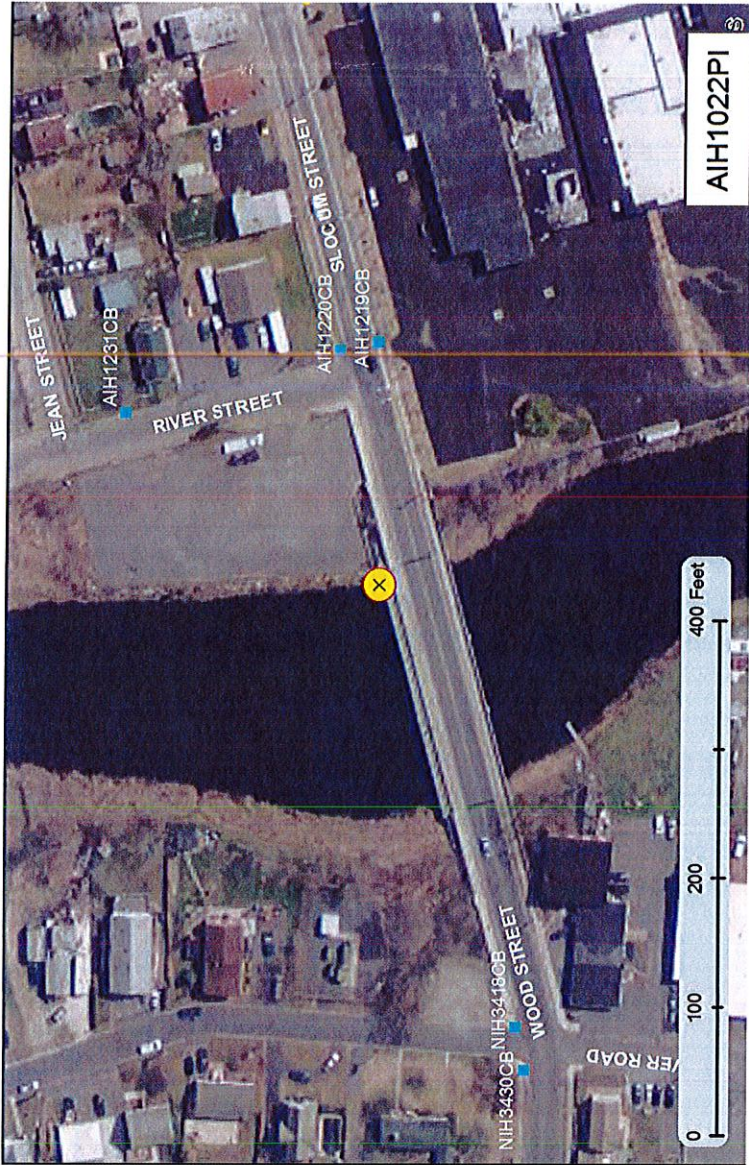
Status: Requires Additional Monitoring

DW: mostly no flow, therefore not an issue. WW: no samples collected.
Recommend: Continue monitoring
WW. Acu R Impair: Bact, DO, N, OG.



Rating
Wet Weather: No Data
Dry Weather: 2

8 'No Sample Visits'



		8. 'No Sample Visits'		Status and Recommendation based on the opinion of the BBNEP.							Report Created on: 8/17/2018			
FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1022PI	9/6/2017	7AC06SEP02-A	pipe	Fresh Water	57 hrs	0 in	7.00	25.1	0.02	0.25	4.40	0.250	9600	

Stormwater Report for: AIH1014PI
in the Town of Acushnet

dirt access road off South Main St

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: Yes Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: No Apparent Issues - Allocate Resources Elsewhere

DW: No flow, no issues. WW (1 sample): Bacteria counts are very low. Recommend: Continue WW monitoring at pipe (not in MH sump). Impair: None, discharge into trib of Acu R.

Rating

Wet Weather: 2

Dry Weather: 1

3 'No Sample Visits'

Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1018MH	6/8/2016	6AC08JUN01-S-D	sump	Fresh Water	59 hrs	0 in				0.50	4.40	0.000	10	10
AIH1018MH	6/8/2016	6AC08JUN01-S	sump	Fresh Water	59 hrs	0 in	7.45	23.8	0.36	0.50	4.40	0.000	10	10
AIH1018MH	6/14/2016	6AC14JUN02-S	sump	Fresh Water	65 hrs	0 in	7.56	20.1	0.11	0.25	3.96	0.000	10	10
AIH1018MH	6/20/2016	6AC20JUN02-S	sump	Fresh Water	55 hrs	0 in	7.73	21.2	0.12	0.25	3.52	0.100	10	10
AIH1014PI	6/21/2016	6AC21JUN04-S	pipe	Fresh Water	4 hrs	0.73 in	7.43	20.6	0.11		2.64	0.150	10	10
AIH1014PI	6/23/2016	6AC23JUN02-S	pipe	Fresh Water	51 hrs	0 in	7.46	24.0	0.11	0.25	3.52	0.000	10	10
AIH1018MH	7/5/2016	6AC05JUL03-S	sump	Fresh Water	1 hrs	0.61 in	7.40	23.7	0.10		1.76	1.000	10	10



Stormwater Report for: AIH1026RC
in the Town of Acushnet

South Main St near quarry

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: No Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: Evaluation Not Complete

No DW observations/samples and 1 WW sample. WW rank (1 Sample): Bact (1) and Nitrates (1), Total 2. Recommend: Continue monitoring for both DW and WW. Impair: None, discharge into trib of Acu R.

Rating

Wet Weather: 3

Dry Weather:

No Data or No Flow

0 'No Sample Visits'



Status and Recommendation based on the opinion of the BBNEP.														Report Created on: 8/17/2018	
		0 'No Sample Visits'													
FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surfact	Enterococcus	Fecal Coliform	
AIH1026RC	7/5/2016	6AC05JUL02-A	surface	Fresh Water	1 hrs	0.61 in	7.77	25.3	0.06	0.25	0.44		4500	19000	

Stormwater Report for: AIH1011PI
in the Town of Acushnet

South Main St

Water Body: Acushnet River Qualifier: SFR, CSO
Urbanized: Yes Sewered: No Class: SB Category: 5
MS4 Ranking: High Priority Outfall

Status: Some Concern Warranted - Consider Corrective Action

DW: mostly no flow, therefore not an issue. WW Rank Bact (2),
Amm/Nitrates/Surf (1 ea), Tot 5.
Recommend: Investigate for potential ID. Acu R: Impair: Bact, DO, N, OG.

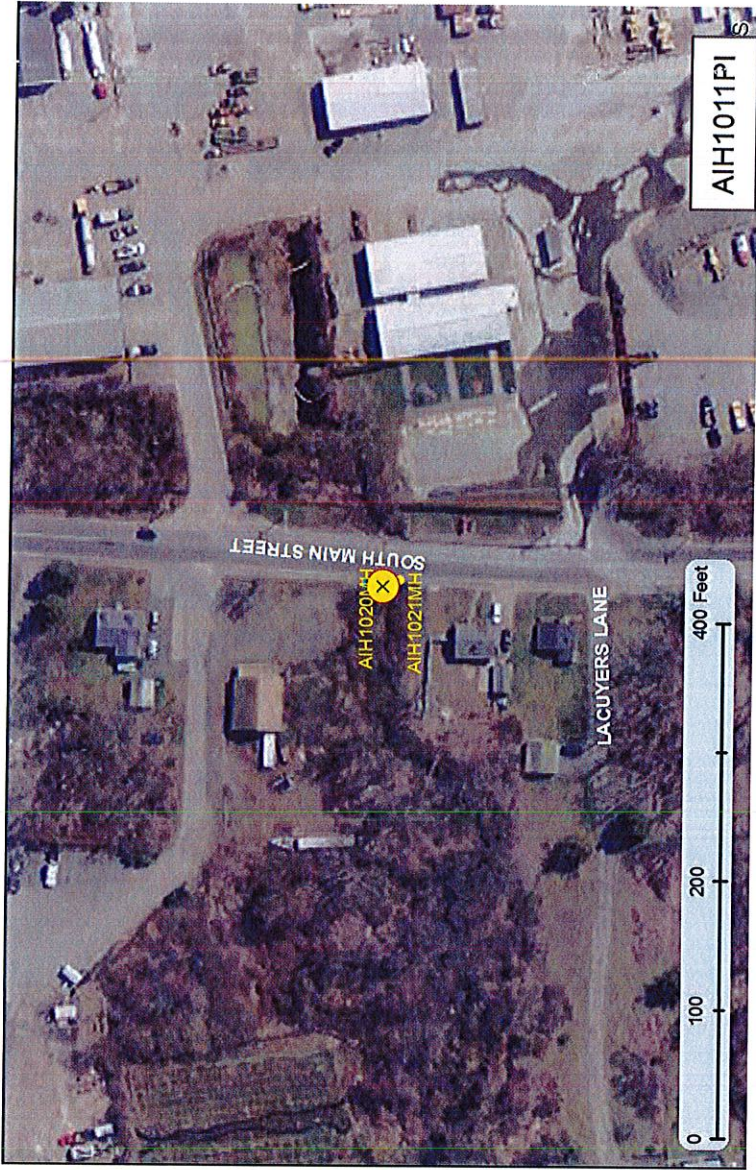
Rating
Wet Weather: 5
Dry Weather: 2

4 'No Sample Visits'

Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1011PI	6/21/2016	6AC21JUN03-A	pipe	Fresh Water	3 hrs	0.73 in	6.89	21.1	0.06	0.00	2.64	0.250	19000	20000
AIH1011PI	6/23/2016	6AC23JUN01-A	pipe	Fresh Water	51 hrs	0 in	7.24	20.9	0.35	0.25	4.40	0.150	660	880
AIH1011PI	7/14/2016	6AC14JUL01-S	stream	Fresh Water	72 hrs	0 in	7.97	24.7	0.55	0.00			1380	1030
AIH1011PI	8/10/2016	6AC10AUG02-A-	pipe	Fresh Water	0 hrs	0.27 in	7.40	24.6	0.04	0.30	1.76	1.000	4100	4900
AIH1011PI	8/10/2016	6AC10AUG02-A	pipe	Fresh Water	0 hrs	0.27 in	7.37	24.7	0.04	0.30	2.64	1.000	2400	9000
AIH1011PI	6/5/2017	7AC05JUN01-A-	pipe	Fresh Water	1 hrs	0.42 in	7.74	15.9	0.56	1.00	4.40	0.250	3900	
AIH1011PI	6/5/2017	7AC05JUN01-A	pipe	Fresh Water	1 hrs	0.42 in	7.79	15.9	0.57	1.00	4.40	0.250	5200	



Stormwater Report for: AIH1012PI
in the Town of Acushnet

South Main St near quarry

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: No Class: SB Category: 5

MS4 Ranking: High Priority Outfall

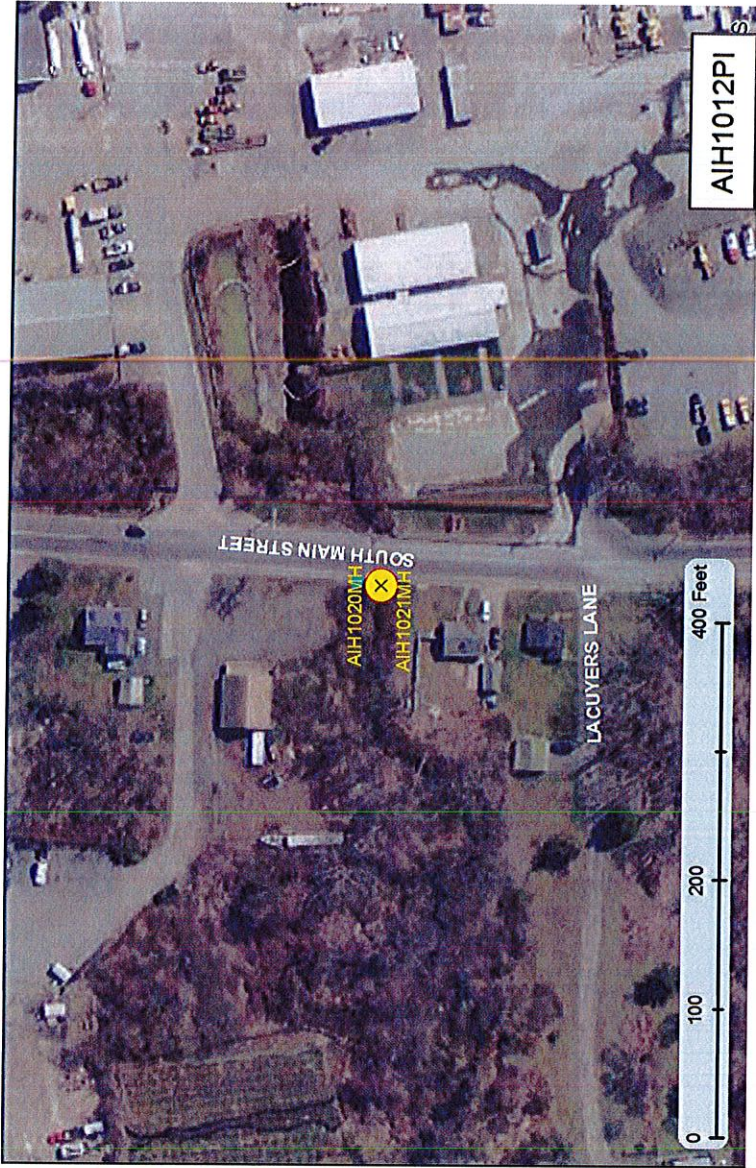
Status: Evaluation Not Complete

DW (from pipe observations): No flow, no issues. WW: Very high bacteria from surface sample. WW rank (1 surface sample), Bact (2), Nitrates (1) Tot. 3. Recommend: Continue monitoring WW from pipe discharge, not stream. Impair: None, discharge into trib of Acu R.

Rating

Wet Weather: 3

Dry Weather: 3



		3' 'No Sample Visits'		Status and Recommendation based on the opinion of the BBNEP.					Report Created on: 8/17/2018					
FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surfact	Enterococcus	Fecal Coliform
AIH1012PI	6/8/2016	6AC08JUN02-A	stream	Fresh Water	60 hrs	0 in	6.85	22.3	0.12	0.25	4.40	0.100	1000	1100
AIH1012PI	6/14/2016	6AC14JUN01-A	stream	Fresh Water	64 hrs	0 in	7.74	20.8	0.27	0.25	4.40	0.000	660	690
AIH1012PI	6/20/2016	6AC20JUN01-A	stream	Fresh Water	55 hrs	0 in	7.65	20.5	0.76	0.25	4.40	0.000	540	1200
AIH1012PI	6/21/2016	6AC21JUN02-A	surface	Fresh Water	2 hrs	0.73 in	8.18	21.5	0.15	0.00	0.44		67000	32000
AIH1012PI	8/9/2016	6AC09AUG01-S-	stream	Fresh Water	54 hrs	0 in	8.02	27.9	0.61	0.25	4.40	0.150	180	920
AIH1012PI	8/9/2016	6AC09AUG01-S	stream	Fresh Water	54 hrs	0 in	7.92	27.0	0.15	0.75	4.40	0.150	200	860
AIH1012PI	8/10/2016	6AC10AUG01-A	stream	Fresh Water	0 hrs	0.26 in	7.62	22.1	0.13	0.25	4.40	0.200	2200	1800
AIH1012PI	6/5/2017	7AC05JUN02-A	stream	Fresh Water	1 hrs	0.42 in	7.29	16.6	0.14	0.50	4.40	0.250	400	

Stormwater Report for: AIH1100PI in the Town of Acushnet

South Main St near quarry

Water Body: Acushnet River

Qualifier: SFR, CSO

Urbanized: Yes

Sewered: No

Class: SB

Category: 5

MS4 Ranking: High Priority Outfall

Status: Some Concern Warranted - Consider Corrective Action

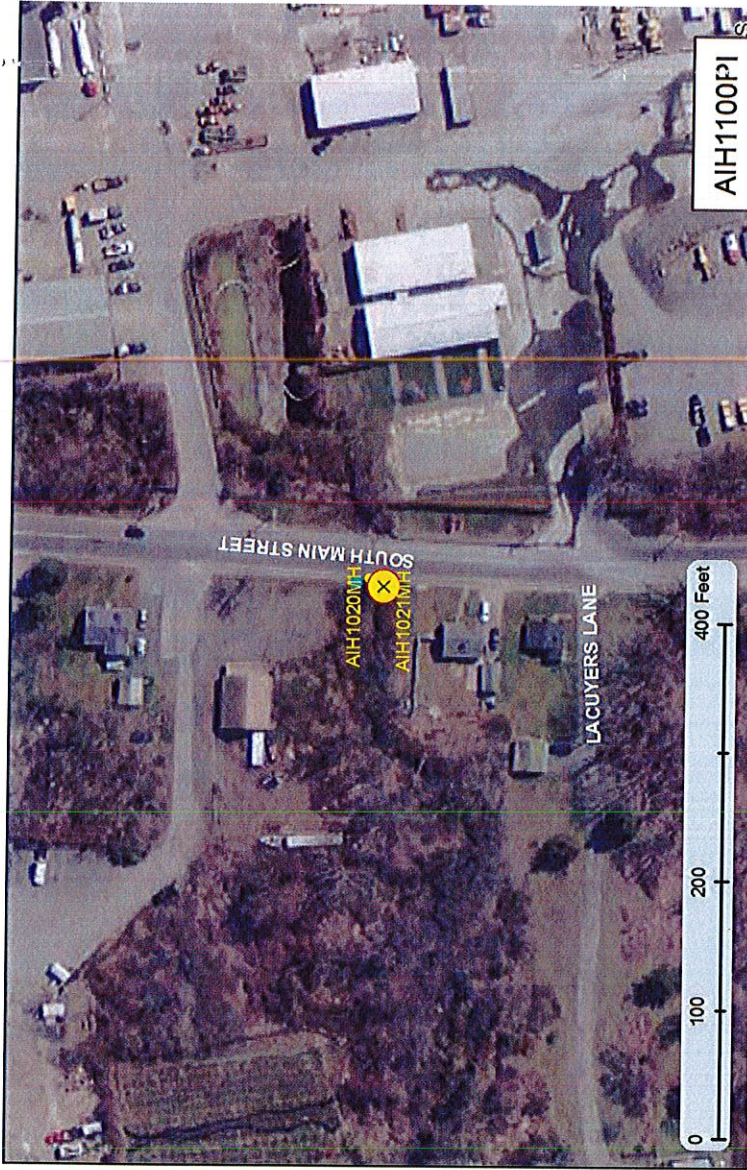
DW: No flow, no issues. WW Rank: Bact(2), Amm/Nitrates/Surf (1 ea), Total 5. Recommend: Investigate for potential ID. Impair: None, discharge into trib of Acu R.

Rating

Wet Weather: 5

Dry Weather:

No Data or No Flow



6 'No Sample Visits'

Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surfact	Enterococcus	Fecal Coliform
AIH1100PI	6/21/2016	6AC21JUN01-A	stream	Fresh Water	2 hrs	0.73 in	7.85	20.1	0.20	0.25	3.52	0.100	8500	16000
AIH1100PI	7/5/2016	6AC05JUL01-B	pipe	Fresh Water	0 hrs	0.61 in	7.15	24.1	0.03	0.25	0.44	0.300	6800	9600
AIH1100PI	7/5/2016	6AC05JUL01-A-D	pipe	Fresh Water	0 hrs	0.61 in	6.49	24.1	0.04	0.30	1.76	0.300		
AIH1100PI	7/5/2016	6AC05JUL01-A-D	pipe	Fresh Water	0 hrs	0.61 in	6.52	24.0	0.04	0.00	1.76	0.300	8700	7900
AIH1100PI	7/5/2016	6AC05JUL01-A	pipe	Fresh Water	0 hrs	0.61 in	6.60	23.9	0.08	0.00	1.76	0.300	9200	7300
AIH1100PI	8/10/2016	6AC10AUG03-A	pipe	Fresh Water	0 hrs	0.27 in	7.06	24.5	0.08	1.00	0.88	0.200	14000	31000

**The Buzzards Bay Stormwater Collaborative
Healthy Communities Grant Water Quality Data Report
September 2018**



<http://stormwater.buzzardsbay.org/>
<http://buzzardsbayaction.org/index.html>

Prepared by the
Buzzards Bay National Estuary Program
2870 Cranberry Highway
East Wareham, MA 02538



Town of Acushnet

Project Overview

The Buzzards Bay Stormwater Collaborative Project was a pilot program of the Buzzards Bay Action Committee (BBAC) to map stormwater collection networks and monitor stormwater discharges that are contributing to shellfish bed closures and other pollution-caused impairments in the Buzzards Bay watershed. Funding for the program was provided by a U.S. EPA Healthy Communities grant program to the BBAC. The elimination of illicit discharges to stormwater networks and the treatment of stormwater discharges conveying non-point sources of pollution will help reduce these impairments, but these actions can only be taken if problem discharges can be identified and prioritized. The Buzzards Bay National Estuary Program (BBNEP) provided planning and technical support for this effort.

The Buzzards Bay Stormwater Collaborative is a regional inter-municipal program that through cost-effectively sharing of resources and expertise has begun the vital first steps of monitoring discharges and mapping stormwater networks. One of the deliverables of this project includes this detailed report which provides critical information to the participating municipalities to make informed decisions about improving water quality of locally impaired waters. More detailed GIS and raw water quality data are available from the BBNEP upon request. The comprehensive summary information in this report includes: water quality data for individual discharge points; prioritization of stormwater discharges based on water quality analysis; identification of potential illicit connections; and specific recommendations for each discharge.

Water quality data was collected from the summer of 2016 through the fall of 2017 by the BBAC Stormwater Collaborative. This final report for each individual town includes all collected stormwater quality data, GIS mapping of stormwater infrastructure, identification of possible illicit connections, and recommendations for municipal stormwater priorities.

Stormwater Mapping Initiative

An important first step to solving local stormwater issues is an understanding of the character and connectivity of the stormwater infrastructure. The water quality at an outfall is an indicator of the health of the catchment in which that outfall services. A catchment can be a very limited area or several hundred acres. Defining that catchment requires the knowledge of the connectivity of the catchbasins, manholes, and pipes that cumulate to the outfall discharge. An issue with water quality isn't necessarily what is happening at that outfall pipe or roadcut but what could be happening hundreds or thousands of feet away.

Recognizing the importance of understanding the relationship of stormwater infrastructure to water quality of Buzzards Bay, the Buzzards Bay National Estuary Program (BBNEP) began mapping a fundamental inventory of catchbasins and outfalls over 20 years ago. The Stormwater Atlas last updated in 2012 allowed for an early start of the stormwater monitoring program. Information from this atlas provided the basis for a strategic monitoring plan, including potential monitoring site locations. Without this information, the start of the monitoring program would have been significantly delayed. At the outset of the project preselected sampling locations were found, evaluated, and documented for the monitoring program by BBNEP staff. This resulted in 250 well established monitoring locations and sampling strategies.

The Atlas also provided a beginning point for a more detailed GIS mapping program. Updating, improving, and expanding the Atlas was a major accomplishment of this project. A systematic approach to GIS data development was used to map stormwater structures and their connectivity. The mapping component of this project began with verification and mapping grade GPS location of existing Atlas features. Many new above ground structures were discovered and added to the Atlas and all structures were more accurately located. This was limited to about 15% for the Town of Acushnet and covered areas where stormwater was sampled. The other four participating towns were covered by GPS mapping for the much of the entire town because sampling occurred throughout.

The next steps in the mapping process, was to scan storm drain plans and geo-reference the plans in GIS. All plans made available to the project from all five towns were scanned. Plans needed to determine stormwater infrastructure connectivity were geo-referenced. The entire towns of Dartmouth and Fairhaven were covered by geo-referenced plans and were provided to the BBNEP. The Town of Mattapoisett had limited plan coverage, but what was available was geo-referenced. The Town of Acushnet was geo-referenced for the project area and the Town of Wareham is still being processed.

Finally stormwater pipes are being added to the GIS database by using the GPS located above ground structures and the below ground connectivity shown in the plans. This has been completed for the towns of Fairhaven and Dartmouth and has been started for the other three participating towns. In limited areas attributes are added to the GIS database from information shown on the plans. Developing the GIS database for all five participating municipalities, as well as other municipalities in the Buzzards Bay watershed, is an ongoing process that will continue depending on available resources. The level of completeness varies with each of the towns and was mostly a function of the amount of infrastructure, quantity and quality of plans, and area covered by the project.

Unfortunately, plans and GPS locations do not always agree. In those cases a field verification of existing conditions is required to resolve questions. This type of field work is labor intensive and involves the assistance of the local department of public works to provide institutional knowledge, open manhole covers, clear catchbasins, and use metal detectors to find structures. A limited amount of this work has been done in each town and will be an ongoing process as mapping and water quality issues are examined.

Summary of Sampling Methods

This project investigated 250 discharge points which included both pipe outfalls and roadcuts. A total of 547 monitoring visits resulted in 657 water quality samples. Water samples were tested for nine different parameters to determine if there are potential illicit connections as well as the presence of water quality issues. Also, 724 'no-flow' / 'no-sample' observations were made and documented for many outfalls. These observations document that some discharges have no dry weather flow. An indication of no dry weather flow is an important characteristic of a discharge and is required as part of the MS4 permitting process. Note that an observation of 'no-flow' does not preclude the possibility of an illicit connection but it might indicate that it is less likely. See table 1 for itemization by town.

Table 1 - Summary of Discharges and Samples

Municipality	Total Number of Discharges	Number of Project Discharges	Number of Stormwater Samples	No-Flow No-Sample Observations
Acushnet	119	15	77	72
Dartmouth	575	47	70	111
Fairhaven	354	65	266	173
Mattapoisett	557	26	106	87
Wareham	930	97	138	281
Total	2535	250	657	724

The water quality data collection consist of three components – field testing, indoor analysis of nitrates and surfactants, and certified laboratory analysis for bacteria. The basic methods and equipment for each component is described below in tables 2, 3, and 4. See QAPP for additional details.

Table 2 - Field Testing

Parameter	Equipment	Operating Range	Resolution	Accuracy
Ammonia	Hach Test Strips	0-6ppm	0.25ppm	+/- one half of a color block
Conductivity	HachPocket Pro, Multi 2	0 to 200 μ S/cm or 2.00-19.9 mS/cm (auto-range)	0.01mS/0.1 μ S/1.0uS (range dependent)	$\pm$ 1.0%
Salinity	HachPocket Pro, Multi 2	0 to 10 ppt	0.01 ppt	$\pm$ 1%
Temperature	HachPocket Pro, Multi 2	0 to 50°C (32 to 122°F)	0.1°C	$\pm$ 0.5°C
pH	HachPocket Pro, Multi 2	0.0-14.0	0.01	0.02

Table 3 – Indoor (in-office) Analysis

Parameter	Equipment	Operating Range	Resolution	Accuracy	Holding Time
Surfactants (detergents as MBAS)	CHEMetrics K-9400 ¹	0-3 ppm	+ 1 color standard increment	+ 30% error	48 hours
Nitrates	LaMotte Nitrate-Nitrogen test kit (3615-01)	0.00 to 1.00 ppm	0.1ppm	0.1ppm	24 hours

Table 4 - Certified Laboratory Analysis

Parameter	Sample Container	Holding Time	Field Processing/	Method	Units
Fecal Coliform	100 ml sterilize polyethylene	6 hours	Collect, label, store on blue ice	Membrane Filtration, wastewater, SM9222D, 21 th Edition 2005	cfu/100ml
Enterococci	100 ml sterilize polyethylene	6 hours	Collect, label, store on blue ice	EPA Office of Water, Method 1600, Membrane Filter Test EPA 821-R-97-004.	cfu/100ml

Relation of Project to MS4 Permit

As noted above, the primary area of focus for the Collaborative was to monitor discharges and map connections of stormwater outfalls that directly discharge into shellfish beds and other impaired coastal waters. Many of these discharges must also be monitored, and their stormwater collection systems mapped, as part of the US Environmental Protection Agency (EPA) Small Municipal Separate Storm Sewer Systems (MS4) permit. For the most part the Collaborative's discharge monitoring program adheres to the EPA MS4 permit monitoring requirements. Therefore, the activities of the Collaborative will partially help the town meet the MS4 permit monitoring requirements, outreach and education efforts, and water quality testing training. The Stormwater Collaborative only monitored and mapped a fraction of each participating town's MS4 discharges and discharge networks through this program. The program directed efforts towards discharges associated with impaired waters that impact shellfish beds. For example, inland discharges affecting fresh-waterbodies and streams (non-shellfish waters) were not monitored under this program, but are required to be considered for the MS4 permit.

Under the MS4 permit program, each municipality must assess discharges to any impaired waters or wetlands from their "Urbanized Area", not just discharges to coastal waters. The new small MS4 permits in Massachusetts became effective on July 1, 2018. This 2016 permit is a continuation your 2003 MS4 permit and may include an expansion of the 2003 Urbanized Area.

Each municipality's first obligations to obtain a new MS4 permit is prepare and submit a Notice of Intent (NOI) by September 29, 2018. The NOI provides an update of the 2003 permit and an outline of future activities within the scope of the 2016 permit requirements. By July 1, 2019, each permittee must develop a Storm Water Management Plan (SWMP) describing in more detail how activities outlined in your NOI will be accomplished. To summarize, the key differences between the Buzzards Bay Stormwater Collaborative Program efforts and your MS4 permit requirements are:

- the activities of the Collaborative were limited to monitoring discharges and mapping discharge networks directly affecting impaired coastal waters. These discharges may or may not be within UAs as defined by EPA;
- EPA's MS4 permit requires that municipalities obtain a permit and evaluate all stormwater discharges serving their Urbanized Area Stormwater collection networks. Discharges to impaired waters outside the Urbanized Area are not included in your 2016 MS4 permit.

Another factor to consider with the MS4 permitting process is the concentration of bacteria when monitoring. Much of the output from this report has been based on bacteria levels chosen for appropriate analysis in the context of this study. These levels are different than Massachusetts Department of Environmental Protection regulatory standards as described in 314 CMR the Massachusetts Surface Water Quality Standards. See table 5 below for some examples of regulatory thresholds for bacteria levels.

Table 5 – Massachusetts Surface Water Quality Standards Summary

Receiving Water Class	Parameter	Standard
Unfiltered WS - A	Fecal coliform [CFU]	< = 20 in six month period
Filtered WS –A & B	Enterococci [CFU]	< = 126 geometric mean
Filtered WS –A & B	E. coli [CFU]	< = 33 in six month period
SA (Shellfish)	Fecal coliform [CFU]	< = 14 geometric mean
SA/SB (Beaches)	Enterococci [CFU]	< = 35 geometric mean
SB (w/ depuration)	Fecal coliform [CFU]	< = 88 geometric mean

Summary Maps

Included in this report are maps of sampling areas throughout the participating municipalities. These maps are intended to be a quick overview of the areas sampled. Discharges must be addressed on an individual basis and the best method for assessing water quality issues is the examination of the data sheet for the discharge. A data sheet for each discharge is also included in this report. Discharges on the map have an outer circle symbol for the Stormwater Classification and an inner dot for the Illicit Discharge Classification. Also shown is the facility ID number for the discharge which can be used to reference the corresponding data sheet. A comprehensive, interactive version of this map is available on line. The process for determining these classifications is based on raw data from the water quality samples and do reflect the best interpretation from the BBNEP in regards to defining thresholds for bacteria and water quality data. If different thresholds were chosen, the maps would be remarkably different. The maps do not stand alone; informed planning decisions need to include analysis of site specific monitoring data. Below is a description of the methods used for the symbols on the maps.

Stormwater Classification:

Criteria: freshwater samples only; samples from flows only; wet weather samples only; and based on maximum observation of bacteria (Fecal coliform [CFU] or Enterococci [CFU]).

Table 6 - Map Legend for Stormwater Classification

Symbol		Bacteria
	High Concern	> 10,000
	Medium Concern	50 – 10,000
	Low Concern	< 50
	Not Determined	No Data

Illicit Discharge Classification:

Criteria: freshwater (non-tidal) samples only; samples from flows only; wet or dry weather samples; and based on maximum observation of bacteria (Fecal coliform [CFU] or Enterococci [CFU]) with number of water quality parameters with maximum observation above threshold. These thresholds are > 0.50 ppm for Ammonia (NH₃), > 0.25 ppm for Surfactants, and > = 0.44 ppm for Nitrate (NO₃).

Symbol		Bacteria		Water Quality Parameter
●	Elevated Potential	> 10,000	and / or	3 above threshold
●	Some Potential	50 – 10,000	and / or	2 above threshold
●	Low Potential	< 50	and	1 or less above threshold
●	Not Determined	No Data		

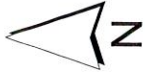
Included in this report are individual data sheets for each discharge studied. These sheets include basic information about the outfall, results of water quality analysis, and some interpretation of the results. A sample data sheet is provided with an explanation of each field. Additional raw data about field conditions, unusual observations, rainfall details, and various notes are all maintained in the water quality database. The information shown on these data sheets provide valuable insight to local stormwater issues and where resources might be allocated to address these issues. See example below.

1. Name of the discharge and associated catchment
2. Town and location of discharge
3. Map showing area near discharge along with facility id numbers for nearby infrastructure

4. MassDEP 2014 Integrated List of Waters (305(b)/303(d)); Name of receiving water body along with Class, Category, and Qualifier of water body
5. Indication if discharge is in a MS4 urbanized area and if the catchment area has sewer service
6. MS4 Ranking for discharge based on permit language; possible ranks include:
 - Not Determined
 - Problem Outfall
 - High Priority Outfall
 - Medium Priority Outfall
 - Low Priority Outfall
 - Excluded Outfall
7. BBNEP summary status; possible status suggestions include:
 - Evaluation Not Complete
 - Requires Additional Monitoring
 - No Apparent Issues – Allocate Resources Elsewhere
 - Some Concern Warranted – Continue Monitoring
 - Some Concern Warranted – Consider Corrective Action
 - Requires Immediate Attention
8. BBNEP specific analysis and recommendation
9. Photograph of discharge point (if available)
10. Rating of discharge based on water quality data (objective determination)
 - Only freshwater (<6 ppt salinity) and flowing waters used for scoring
 - Maximum of observed sample values used for scoring
 - If parameter above threshold, 1 point each for ammonia, nitrate, and surfactants - These thresholds are > 0.50 ppm for Ammonia (NH₃), > 0.25 ppm for Surfactants, and > = 0.44 ppm for Nitrate (NO₃).
 - Bacteria could be either Fecal coliform or Enterococci
 - Bacteria scored between 0 for > 50 CFU, 1 for 50 – 10,000 CFU, and 2 for >10,000 CFU
 - Total scores range between 0 and 5
 - Separate scores for Dry Weather and Wet Weather (>0.02 inches in 4 hours previous to sample)
11. Number of dry weather visits where no flow was observed and thus no samples taken
12. Water quality data:
 - **FacilityID** – facility identifier for location of sample; may vary and be different than discharge ID
 - **SampleDate** - date the water sample was taken
 - **SampleID** – sample identification number used to track internally and at laboratory
 - **Sample Type** - type of sample collected: pipe, stream, surface, or sump
 - **Water Classification** – Fresh Water if <6 ppt salinity else classified as Brackish or Sea Water
 - **Last Rain** – number of hours since last rain and time of sample
 - **12 hr. Rain** – number of inches of rain in previous 12 hours
 - **pH** – sample pH
 - **Temp** – sample temperature in degrees centigrade
 - **Salinity** – sample salinity in parts per thousand
 - **Ammo** – sample ammonia concentration in parts per million

- **Nitrate** – sample nitrate concentration in parts per million
- **Surfact** – sample surfactants concentration in parts per million (detergent indicator)
- **Enterococcus** – laboratory results for enterococcus bacteria colony forming units per 100 ml
- **Fecal Coliform** - laboratory results for fecal coliform bacteria colony forming units per 100 ml

Acushnet Stormwater Report 8/14/2018



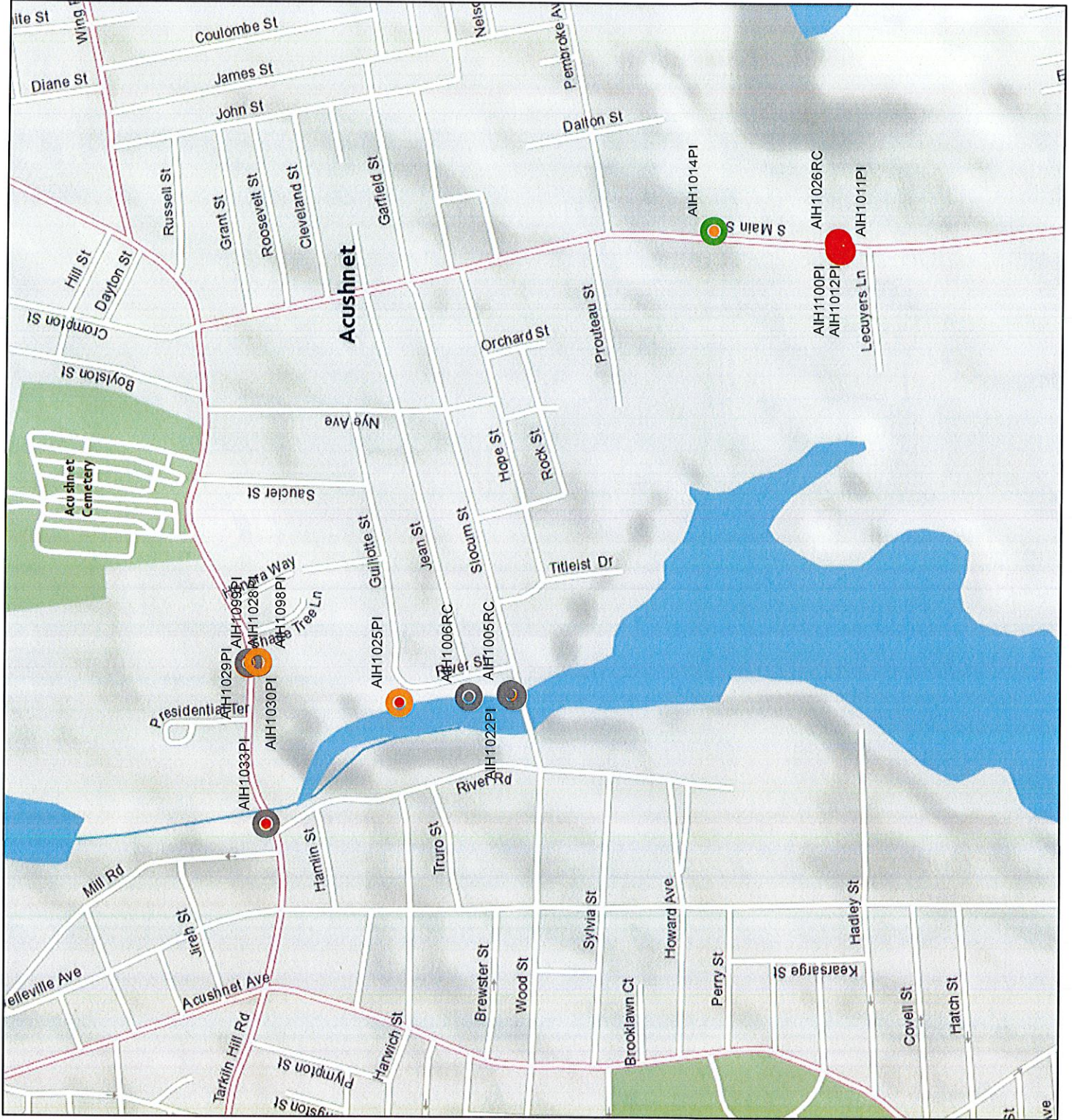
Stormwater Classification

- High Concern
- Medium Concern
- Low Concern
- Not Determined

Illicit Discharge Classification

- Elevated Potential
- Some Potential
- Not Determined

Buzzards Bay



Stormwater Report for: AIH1098PI
in the Town of Acushnet

Main St near Shady Tree Lane

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: Yes Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: Evaluation Not Complete

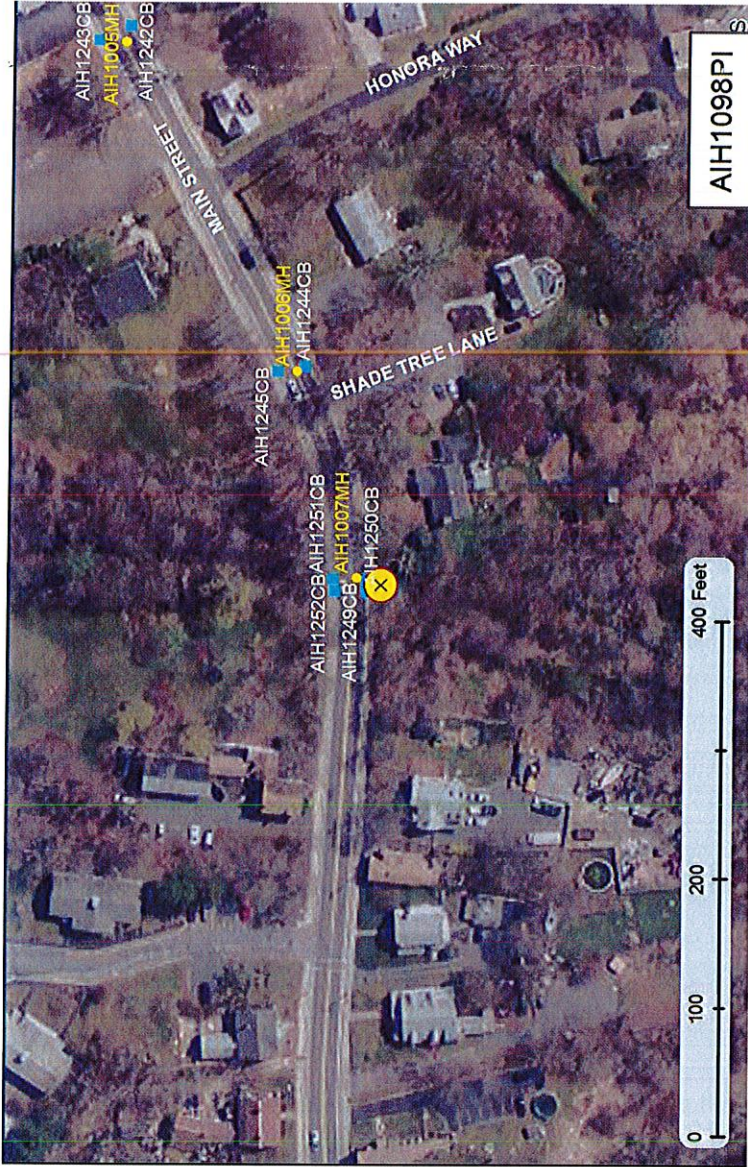
DW: No flow, no issues.WW: no samples collected. Recommend: Monitor in WW. Impair: None, discharge into trib of Acu R.



Rating

Wet Weather: No Data

Dry Weather: 2



		Status and Recommendation based on the opinion of the BBNEP.										Report Created on: 8/17/2018		
7 'No Sample Visits'														
FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surfact	Enterococcus	Fecal Coliform
AIH1098PI	6/23/2016	6AC23JUN03-A-	pipe	Fresh Water	52 hrs	0 in	6.31	24.8	0.22	0.00	3.52	0.100	100	27
AIH1098PI	6/23/2016	6AC23JUN03-A	pipe	Fresh Water	52 hrs	0 in	6.30	23.7	0.23	0.25	3.52	0.100	120	36

Stormwater Report for: AIH1099PI
in the Town of Acushnet

Main St near Shady Tree Lane

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: Yes Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: No Apparent Issues - Allocate Resources Elsewhere

Stream samples from culvert. No indication for concern. Impair: None, discharge into trib of Acu R.



Rating

Wet Weather: 2

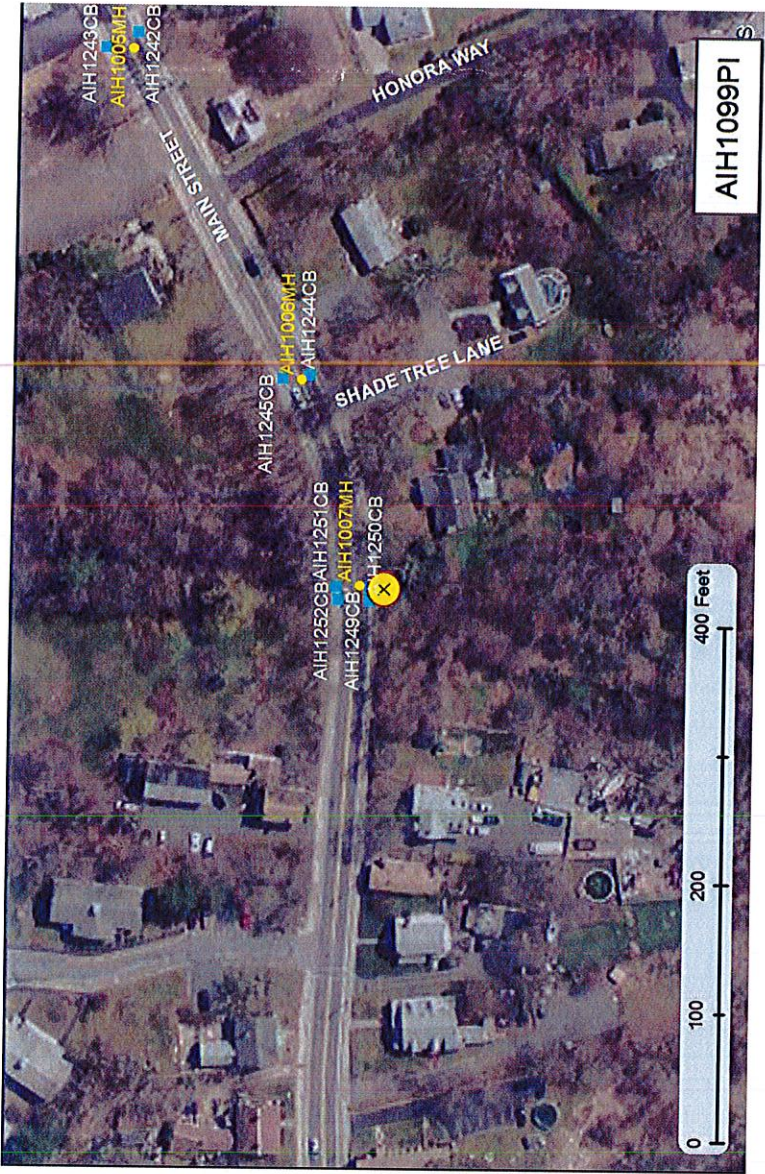
Dry Weather: 2

3 'No Sample Visits'

Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1099PI	7/14/2016	6AC14JUL02-S	stream	Fresh Water	73 hrs	0 in	6.41	23.3	0.20	0.25			280	490
AIH1099PI	8/9/2016	6AC09AUG02-S	stream	Fresh Water	54 hrs	0 in	6.80	26.9	0.15	1.00	0.00	0.200	3600	3000
AIH1099PI	6/5/2017	7AC05JUN04-A	stream	Fresh Water	3 hrs	0.39 in	6.60	16.1	0.13	0.25	4.40	0.100	100	
AIH1099PI	6/20/2017	7AC20JUN01-A-	stream	Fresh Water	1 hrs	0.24 in	6.29	19.3	0.59	0.50	4.40	0.100	700	
AIH1099PI	6/20/2017	7AC20JUN01-A	stream	Fresh Water	1 hrs	0.24 in	6.30	19.0	0.58	0.50	4.40	0.100	700	



Stormwater Report for: AIH1028PI in the Town of Acushnet

Main St near Shady Tree Lane

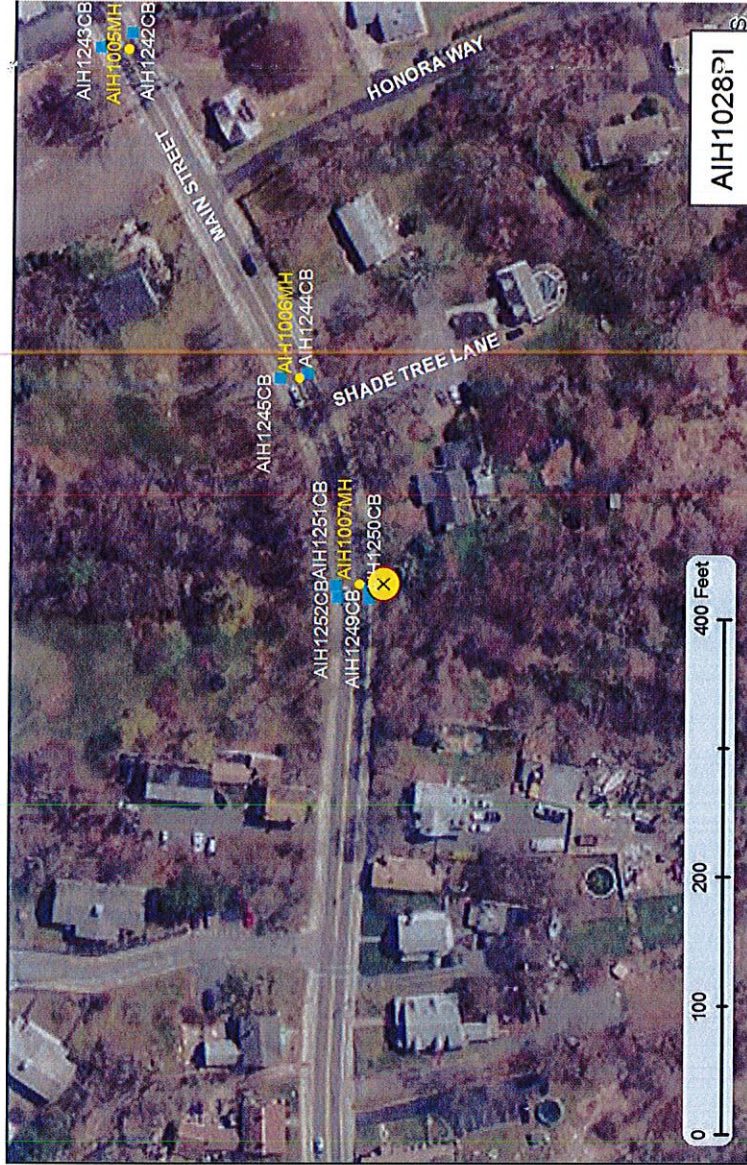
Water Body: Acushnet River Qualifier: SFR, CSO
Urbanized: Yes Sewered: Yes Class: SB Category: 5
MS4 Ranking: High Priority Outfall

Status: Some Concern Warranted - Continue Monitoring

DW: Low to Moderate levels of Bact.
(4 out of 6). DW Rank: Bact (1),
Nitrates(1), Total 2. WW: Moderate
Bact levels and elevated Amm,
Nitrates, and Surf in WW. WW rank:
Bact (1), Amm/Nitrates/Surf (1 ea),
Total 4. Recommend: Continue to
monitor both DW and WW. If DW,
collect sample only if flow is evident, if
stagnant (no flow), make a note on
data sheet indicating no flow.
Investigate for potential ID. Impair:
None, discharge into trib of Acu R.



Rating
Wet Weather: 4
Dry Weather: 2



2 'No Sample Visits'

Status and Recommendation based on the opinion of the BBNRP.

Report Created on: 8/17/2018

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surfact	Enterococcus	Fecal Coliform
AIH1028PI	6/2/2016	6AC02JUN03-A	pipe	Fresh Water	51 hrs	0 in	6.43	17.9	0.34	0.25	4.40	0.100	3200	5900
AIH1028PI	6/8/2016	6AC08JUN03-A	pipe	Fresh Water	60 hrs	0 in	6.32	19.9	0.32	0.25	4.40	0.000	82	9
AIH1028PI	6/14/2016	6AC14JUN03-A	pipe	Fresh Water	65 hrs	0 in	6.34	20.1	0.25	0.00	4.40	0.000	64	9
AIH1028PI	6/20/2016	6AC20JUN03-S	pipe	Fresh Water	56 hrs	0 in	6.22	21.2	0.24	0.25	4.40	0.100	9	55
AIH1028PI	6/21/2016	6AC21JUN06-A-	pipe	Fresh Water	5 hrs	0.73 in	6.30	21.5	0.21	0.00	3.52	0.200	3400	490
AIH1028PI	6/21/2016	6AC21JUN06-A	pipe	Fresh Water	5 hrs	0.73 in	6.29	20.5	0.21	0.25	4.40	0.200	2800	550
AIH1028PI	7/5/2016	6AC05JUL05-A	pipe	Fresh Water	2 hrs	0.61 in	6.49	22.8	0.06		0.00	0.300	7000	7400
AIH1028PI	6/5/2017	7AC05JUN03-A	pipe	Fresh Water	2 hrs	0.41 in	6.30	16.2	0.31	0.25	4.40	0.100	700	
AIH1028PI	7/11/2017	7AC11JUL02-A-D	pipe	Fresh Water	0 hrs	0.13 in	7.40	23.4	0.00	1.00	4.40	1.000	7100	
AIH1028PI	7/11/2017	7AC11JUL02-A	pipe	Fresh Water	0 hrs	0.13 in	7.90	23.4	0.00	1.00	4.40	1.000	2800	

Stormwater Report for: AIH1029PI
in the Town of Acushnet

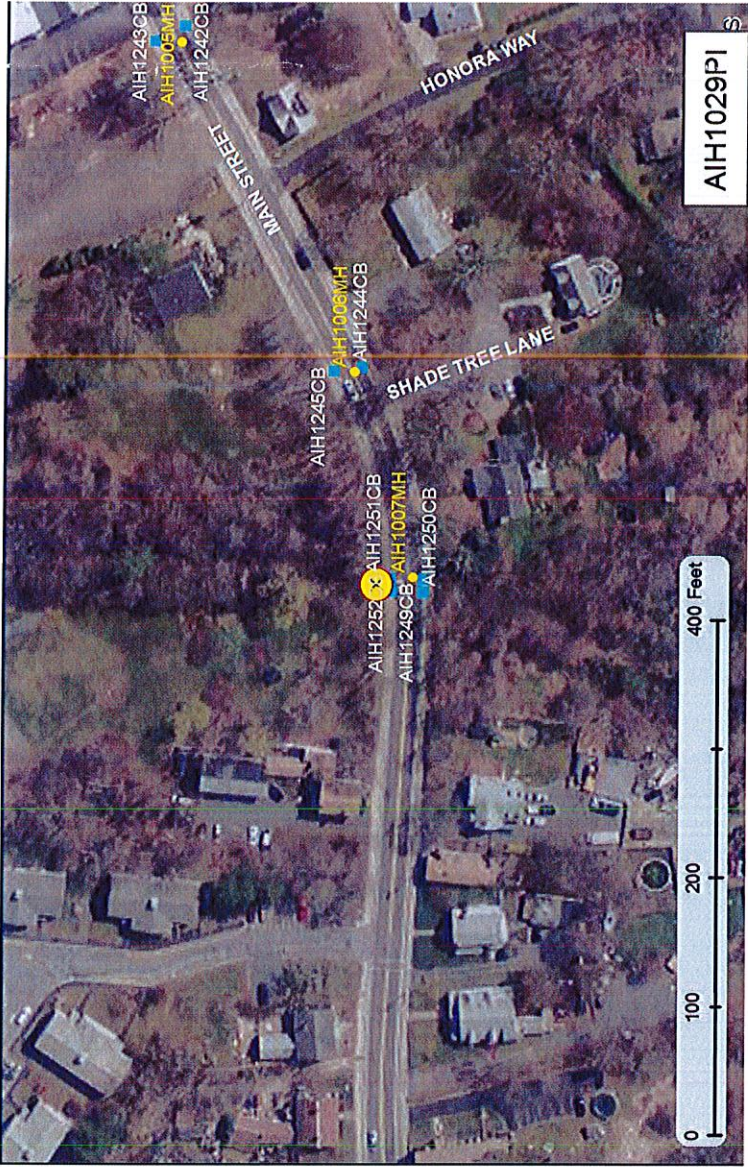
Main St near Shady Tree Lane

Water Body:	Acushnet River	Qualifier:	SFR, CSO
Urbanized:	Yes	Sewered:	Yes
Class:	SB	Category:	5
MS4 Ranking:	High Priority Outfall		
Status:	Requires Additional Monitoring		

DW: No flow, no issues. WW: no samples collected. Recommend: Monitor in WW. Impair: None, discharge into trib of Acu R.



Rating	
Wet Weather:	No Data
Dry Weather:	No Data or No Flow
No Data or No Flow	
8	'No Sample Visits'



Status and Recommendation based on the opinion of the BBNEP. Report Created on: 8/17/2018

Stormwater Report for: AIH1030PI
in the Town of Acushnet

Main St near Shady Tree Lane

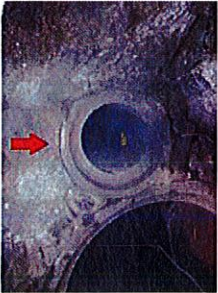
Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: Yes Class: SB Category: 5

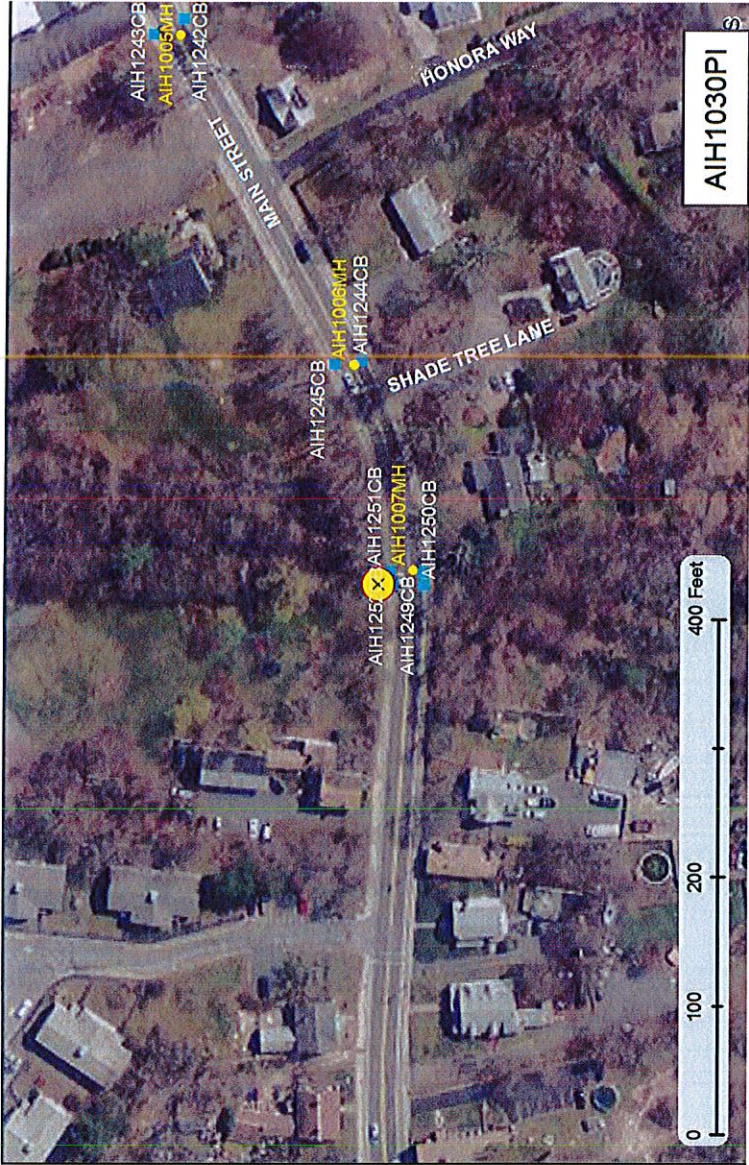
MS4 Ranking: High Priority Outfall

Status: Evaluation Not Complete

DW: No flow, no issues. WW (1 sample) Rank: Bact (2), Amm/Nitrates/Surf (1 ea), Tot 5.
Recommend: Continue monitoring for WW. Investigate for potential ID.
Impair: None, discharge into trib of Acu R.



Rating
Wet Weather: 5
Dry Weather:
No Data or No Flow



Facility/ID		SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1030PI		7/11/2017	7AC11JUL01-A	pipe	Fresh Water	0 hrs	0.13 in	6.90	23.9	0.00	1.00	4.40	1.000	44000	

Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018

Stormwater Report for: AIH1033PI
in the Town of Acushnet

Main St opposit River Rd

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: Yes Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: Evaluation Not Complete

DW: High bact count and elevated nitrates during DW (1 out of 9). DW rank: Bact (3), Nitrates (1). Total 4. High DW bact probably an anomaly. WW: no samples collected. Recommend: Monitor in WW. Acu R Impair: Bact, DO, N, OG.



Rating

Wet Weather: No Data

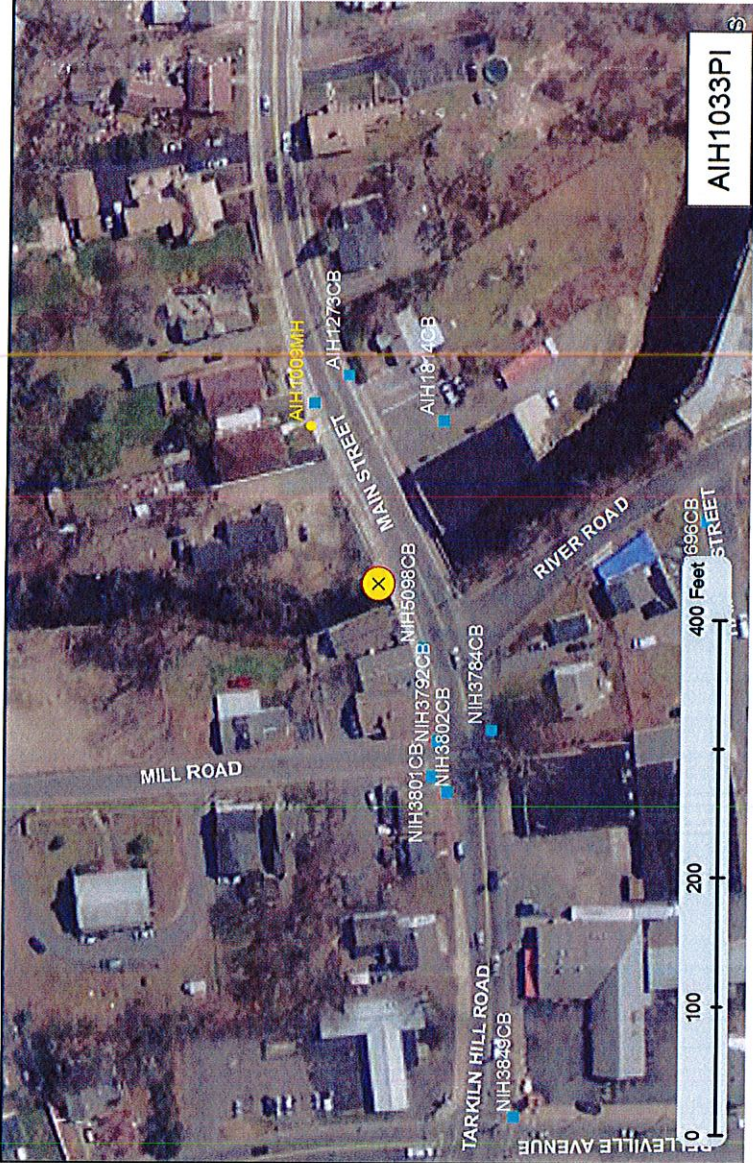
Dry Weather: 3

8 'No Sample Visits'

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1033PI	9/6/2017	7AC06SEP01-A	pipe	Fresh Water	57 hrs	0 in	7.40	24.8	0.01	0.25	4.40	0.250	17300	

Report Created on: 8/17/2018

Status and Recommendation based on the opinion of the BBNEP.



Stormwater Report for: AIH1025PI
in the Town of Acushnet

Guillotte St and River St

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: Yes Class: SB Category: 5

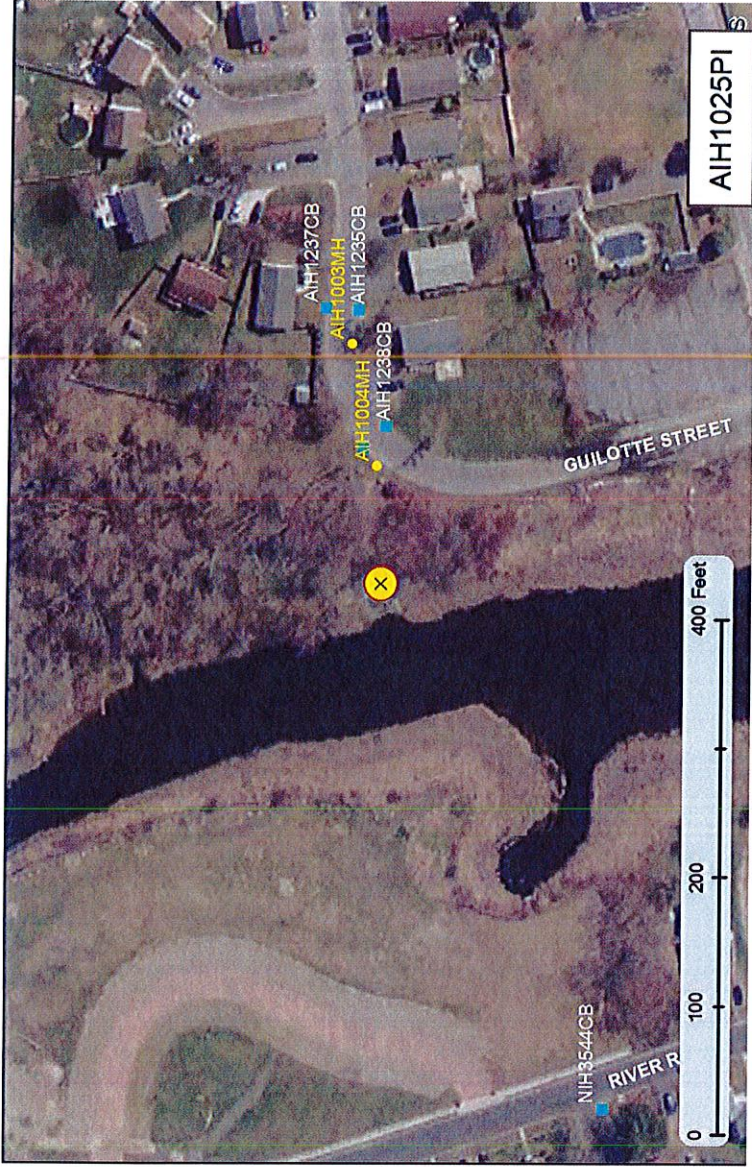
MS4 Ranking: High Priority Outfall

Status: Some Concern Warranted - Continue Monitoring

DW: High bacteria levels and elevated nitrates (1 out of 6). DW rank: Bact (2) and Nitrates (1), Tot 3. WW: Moderate bact levels and elevated Nitrates and Surf. WW rank: Bact (1), Nitrates/Surf (1 ea), Tot 3. Recommend: Continue monitoring WW. Investigate for potential ID. Acu R Impair: Bact, DO, N, OG.



Rating
Wet Weather: 3
Dry Weather: 3



5

'No Sample Visits'

Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1004MH	6/2/2016	6AC02JUN06-S	sump	Fresh Water	52 hrs	0 in	6.47	23.0	0.24	0.00	4.40	0.100	2900	810
AIH1025PI	6/21/2016	6AC21JUN05-A	pipe	Fresh Water	4 hrs	0.73 in	7.28	20.7	0.04	0.25	3.52	0.750	7900	6200
AIH1025PI	7/5/2016	6AC05JUL04-A	pipe	Fresh Water	2 hrs	0.61 in	7.15	23.4	0.01		0.00	0.300	3400	2900
AIH1025PI	6/5/2017	7AC05JUN05-A	pipe	Fresh Water	3 hrs	0.39 in	6.25	16.7	0.20	0.25	4.40	0.100	100	
AIH1025PI	9/6/2017	7AC06SEP03-A-D	pipe	Fresh Water	57 hrs	0 in	7.00	25.5	0.02	0.25	4.40	0.100	13600	
AIH1025PI	9/6/2017	7AC06SEP03-A	pipe	Fresh Water	57 hrs	0 in	7.40	24.9	0.02	0.25	4.40	0.100	12900	

Stormwater Report for: AIH1006RC
in the Town of Acushnet

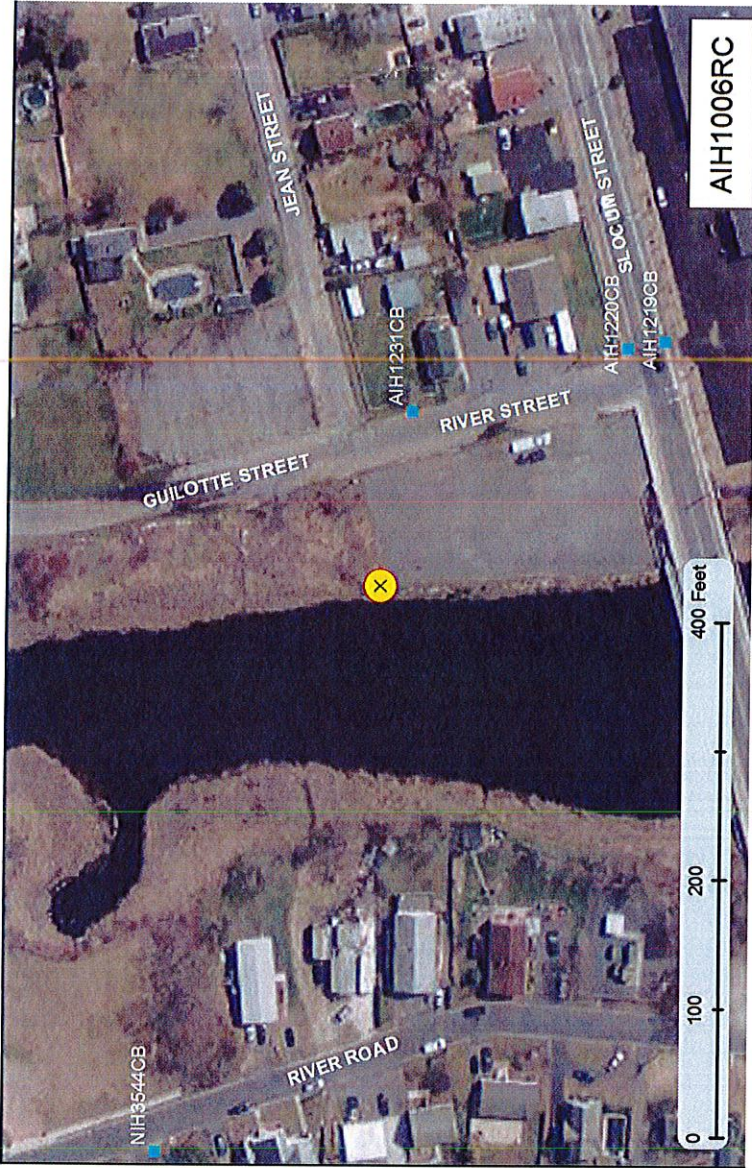
River St

Water Body: Acushnet River Qualifier: SFR, CSO
Urbanized: Yes Sewered: Yes Class: SB Category: 5
MS4 Ranking: High Priority Outfall
Status: Evaluation Not Complete

DW: No flow, no issues. WW: no samples collected. Recommend: Monitor in WW. Acu R: Impair: Bact, DO, N, OG.



Rating
Wet Weather: No Data
Dry Weather:
No Data or No Flow
4 'No Sample Visits'



Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018

Stormwater Report for: AIH1005RC
in the Town of Acushnet

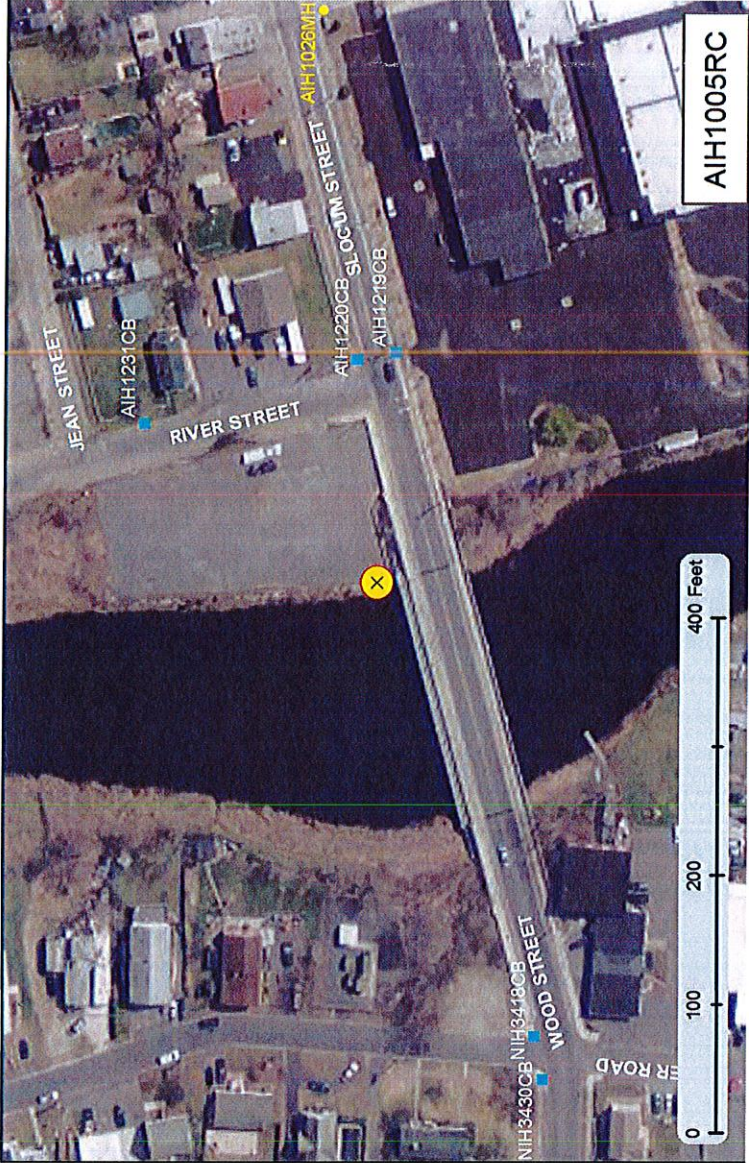
River St

Water Body:	Acushnet River	Qualifier:	SFR, CSO
Urbanized:	Yes	Sewered:	Yes
Class:	SB	Category:	5
MS4 Ranking:	High Priority Outfall		
Status:	Evaluation Not Complete		

DW: No flow, no issues. WW: no samples collected. Recommend: Monitor in WW. Acu R: Impair: Bact, DO, N, OG.



Rating	
Wet Weather:	No Data
Dry Weather:	No Data or No Flow
No Data or No Flow	
4 'No Sample Visits'	



Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018

Stormwater Report for: AIH1022PI
in the Town of Acushnet

Slocum St at bridge

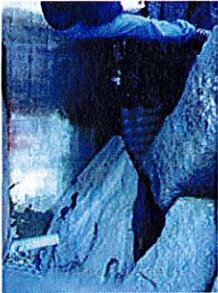
Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: Yes Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: Requires Additional Monitoring

DW: mostly no flow, therefore not an issue. WW: no samples collected.
Recommend: Continue monitoring
WW. Acu R Impair: Bact, DO, N, OG.



Rating

Wet Weather: No Data

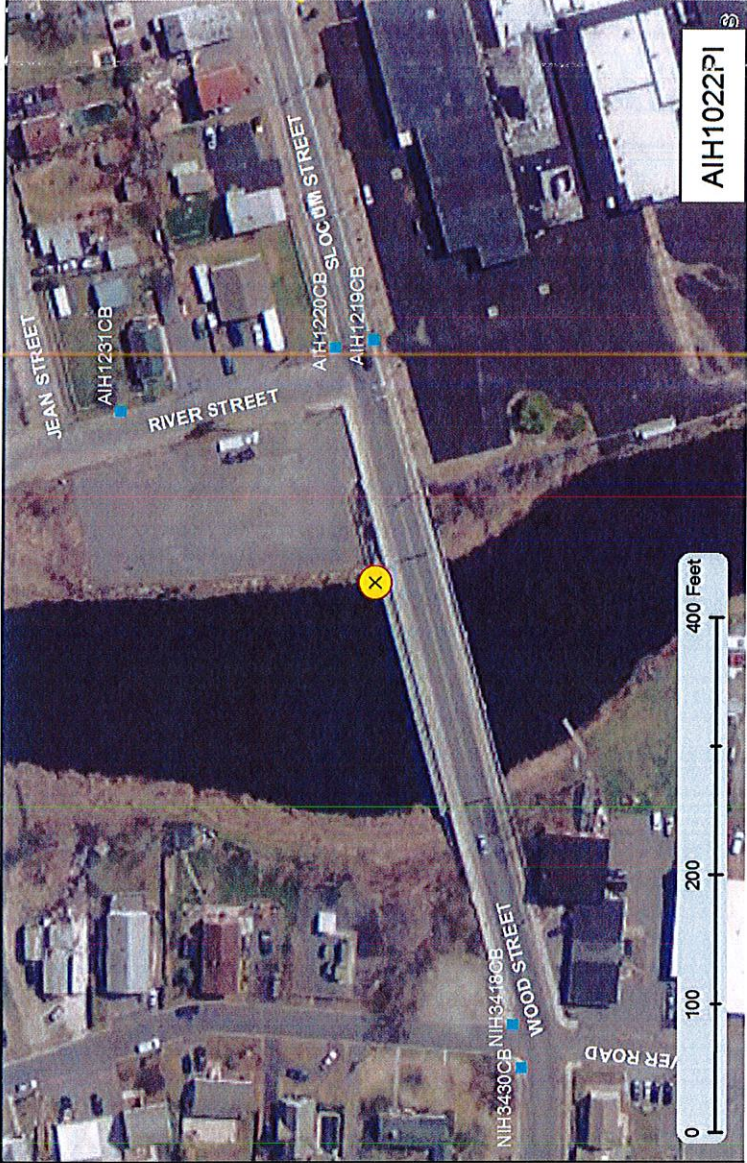
Dry Weather: 2

8 'No Sample Visits'

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1022PI	9/6/2017	7AC06SEP02-A	pipe	Fresh Water	57 hrs	0 in	7.00	25.1	0.02	0.25	4.40	0.250	9600	

Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018



Stormwater Report for: AIH1014PI
in the Town of Acushnet

dirt access road off South Main St

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: Yes Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: No Apparent Issues - Allocate Resources Elsewhere

DW: No flow, no issues. WW (1 sample): Bacteria counts are very low. Recommend: Continue WW monitoring at pipe (not in MH sump). Impair: None, discharge into trib of Acu R.

Rating

Wet Weather: 2

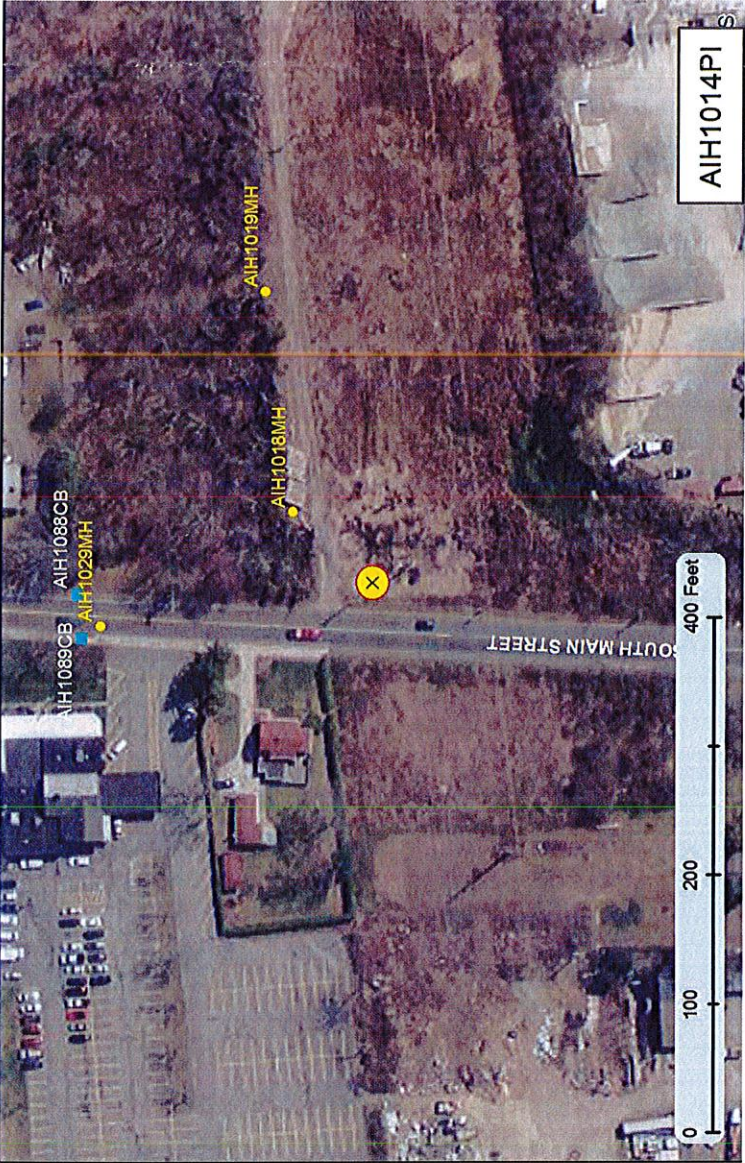
Dry Weather: 1

3 'No Sample Visits'

Status and Recommendation based on the opinion of the BBNEP.

Report Created on: 8/17/2018

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1018MH	6/8/2016	6AC08JUN01-S-D sump		Fresh Water	59 hrs	0 in				0.50	4.40	0.000	10	10
AIH1018MH	6/8/2016	6AC08JUN01-S sump		Fresh Water	59 hrs	0 in	7.45	23.8	0.36	0.50	4.40	0.000	10	10
AIH1018MH	6/14/2016	6AC14JUN02-S sump		Fresh Water	65 hrs	0 in	7.56	20.1	0.11	0.25	3.96	0.000	10	10
AIH1018MH	6/20/2016	6AC20JUN02-S sump		Fresh Water	55 hrs	0 in	7.73	21.2	0.12	0.25	3.52	0.100	10	10
AIH1014PI	6/21/2016	6AC21JUN04-S pipe		Fresh Water	4 hrs	0.73 in	7.43	20.6	0.11		2.64	0.150	10	10
AIH1014PI	6/23/2016	6AC23JUN02-S pipe		Fresh Water	51 hrs	0 in	7.46	24.0	0.11	0.25	3.52	0.000	10	10
AIH1018MH	7/5/2016	6AC05JUL03-S sump		Fresh Water	1 hrs	0.61 in	7.40	23.7	0.10		1.76	1.000	10	10



Stormwater Report for: AIH1026RC
in the Town of Acushnet

South Main St near quarry

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: No Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: Evaluation Not Complete

No DW observations/samples and 1 WW sample. WW rank (1 Sample): Bact (1) and Nitrates (1), Total 2. Recommend: Continue monitoring for both DW and WW. Impair: None, discharge into trib of Acu R.

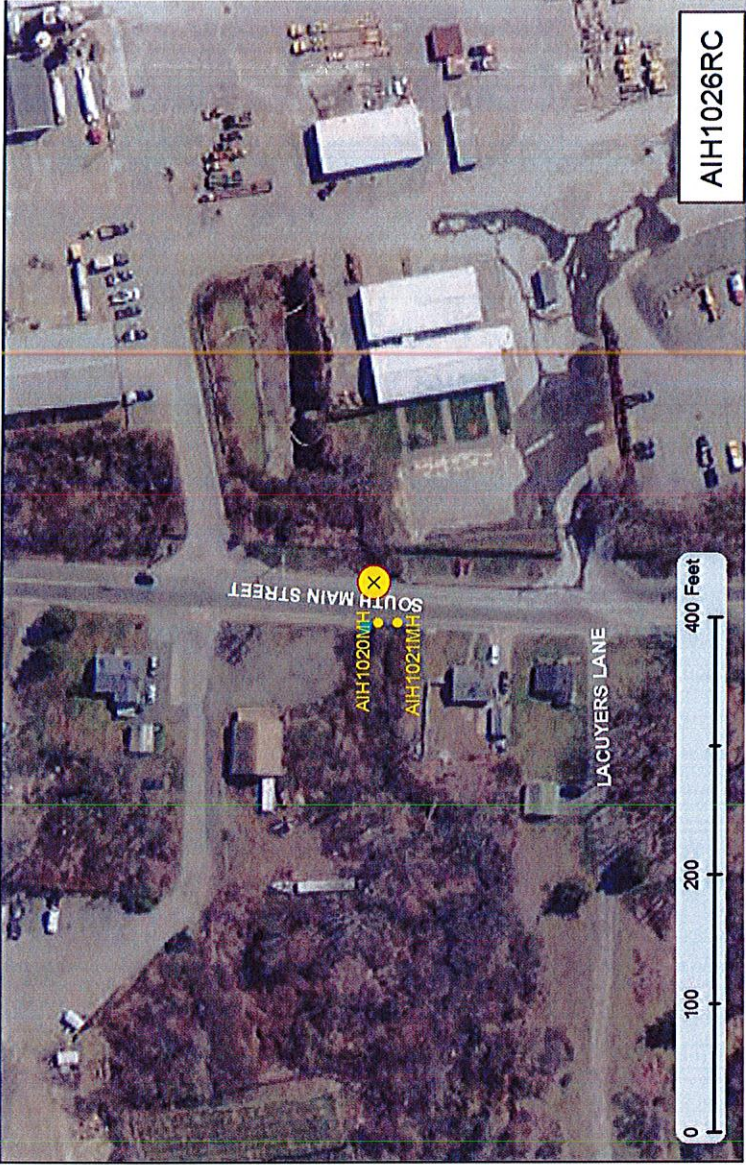
Rating

Wet Weather: 3

Dry Weather:

No Data or No Flow

0 'No Sample Visits'



Report Created on: 8/17/2018

Status and Recommendation based on the opinion of the BBNEP.

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surface	Enterococcus	Fecal Coliform
AIH1026RC	7/5/2016	6AC05JUL02-A	surface	Fresh Water	1 hrs	0.61 in	7.77	25.3	0.06	0.25	0.44		4500	19000

Stormwater Report for: AIH1011PI
in the Town of Acushnet

South Main St

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: No Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: Some Concern Warranted - Consider Corrective Action

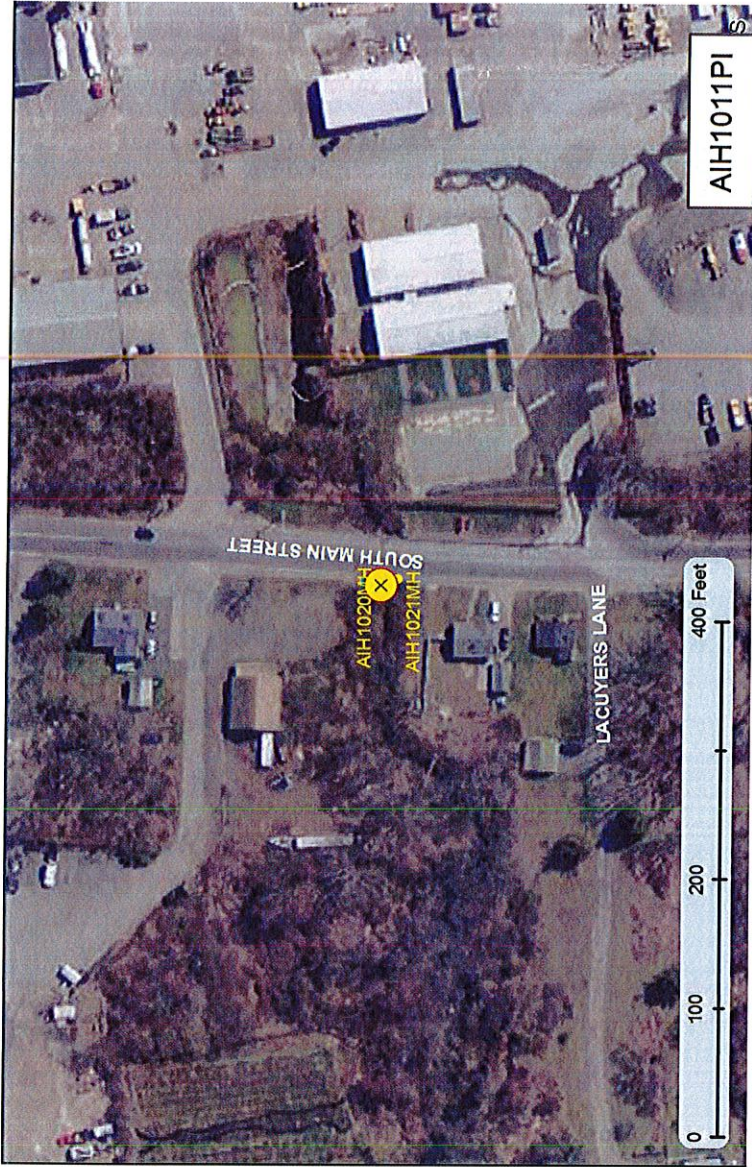
DW: mostly no flow, therefore not an issue. WW Rank Bact (2), Amm/Nitrates/Surf (1 ea), Tot 5. Recommend: Investigate for potential ID. Acu R: Impair: Bact, DO, N, OG.

Rating

Wet Weather: 5

Dry Weather: 2

4 'No Sample Visits'



		4 'No Sample Visits'		Status and Recommendation based on the opinion of the BBNEP.				Report Created on: 8/17/2018						
FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surfact	Enterococcus	Fecal Coliform
AIH1011PI	6/21/2016	6AC21JUN03-A	pipe	Fresh Water	3 hrs	0.73 in	6.89	21.1	0.06	0.00	2.64	0.250	19000	20000
AIH1011PI	6/23/2016	6AC23JUN01-A	pipe	Fresh Water	51 hrs	0 in	7.24	20.9	0.35	0.25	4.40	0.150	660	880
AIH1011PI	7/14/2016	6AC14JUL01-S	stream	Fresh Water	72 hrs	0 in	7.97	24.7	0.55	0.00			1380	1030
AIH1011PI	8/10/2016	6AC10AUG02-A-	pipe	Fresh Water	0 hrs	0.27 in	7.40	24.6	0.04	0.30	1.76	1.000	4100	4900
AIH1011PI	8/10/2016	6AC10AUG02-A	pipe	Fresh Water	0 hrs	0.27 in	7.37	24.7	0.04	0.30	2.64	1.000	2400	9000
AIH1011PI	6/5/2017	7AC05JUN01-A-	pipe	Fresh Water	1 hrs	0.42 in	7.74	15.9	0.56	1.00	4.40	0.250	3900	
AIH1011PI	6/5/2017	7AC05JUN01-A	pipe	Fresh Water	1 hrs	0.42 in	7.79	15.9	0.57	1.00	4.40	0.250	5200	

Stormwater Report for: AIH1012PI
in the Town of Acushnet

South Main St near quarry

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: No Class: SB Category: 5

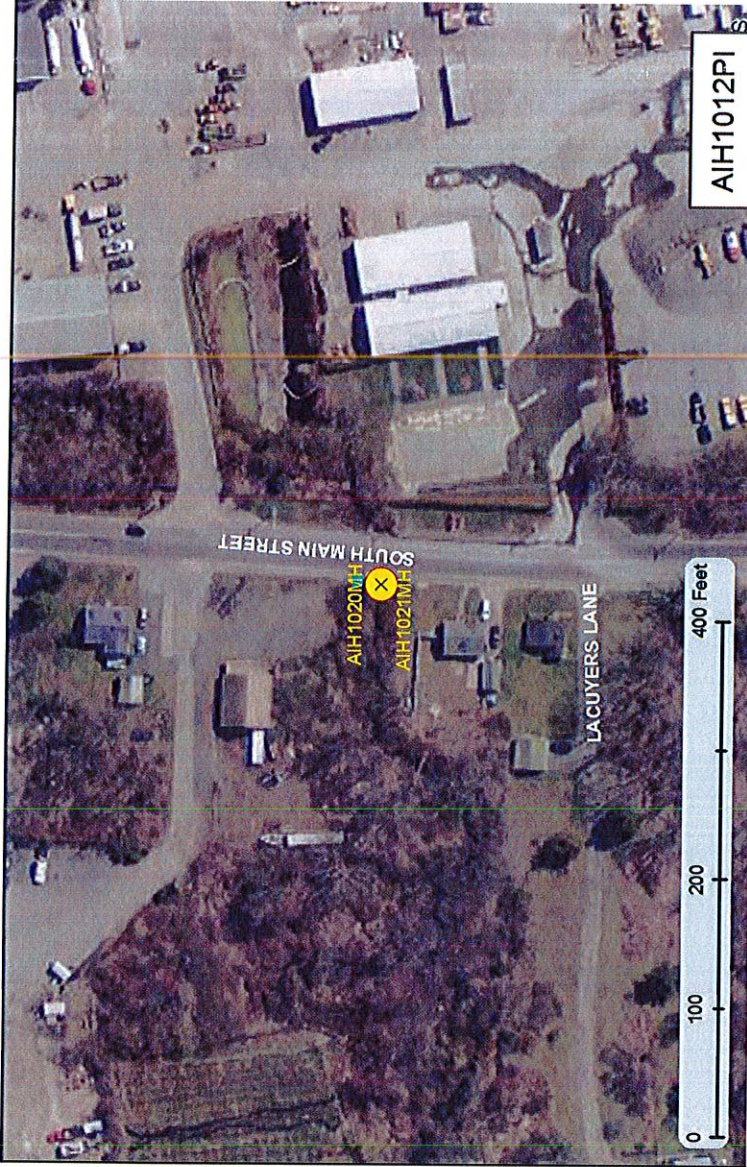
MS4 Ranking: High Priority Outfall

Status: Evaluation Not Complete

DW (from pipe observations): No flow, no issues. WW: Very high bacteria from surface sample. WW rank (1 surface sample), Bact (2), Nitrates (1) Tot. 3. Recommend: Continue monitoring WW from pipe discharge, not stream. Impair: None, discharge into trib of Acu R.

Rating
Wet Weather: 3
Dry Weather: 3

3 'No Sample Visits'



3		'No Sample Visits'		Status and Recommendation based on the opinion of the BBNEP.										Report Created on: 8/17/2018	
FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surfact	Enterococcus	Fecal Coliform	
AIH1012PI	6/8/2016	6AC08JUN02-A	stream	Fresh Water	60 hrs	0 in	6.85	22.3	0.12	0.25	4.40	0.100	1000	1100	
AIH1012PI	6/14/2016	6AC14JUN01-A	stream	Fresh Water	64 hrs	0 in	7.74	20.8	0.27	0.25	4.40	0.000	660	690	
AIH1012PI	6/20/2016	6AC20JUN01-A	stream	Fresh Water	55 hrs	0 in	7.65	20.5	0.76	0.25	4.40	0.000	540	1200	
AIH1012PI	6/21/2016	6AC21JUN02-A	surface	Fresh Water	2 hrs	0.73 in	8.18	21.5	0.15	0.00	0.44		67000	32000	
AIH1012PI	8/9/2016	6AC09AUG01-S-	stream	Fresh Water	54 hrs	0 in	8.02	27.9	0.61	0.25	4.40	0.150	180	920	
AIH1012PI	8/9/2016	6AC09AUG01-S	stream	Fresh Water	54 hrs	0 in	7.92	27.0	0.15	0.75	4.40	0.150	200	860	
AIH1012PI	8/10/2016	6AC10AUG01-A	stream	Fresh Water	0 hrs	0.26 in	7.62	22.1	0.13	0.25	4.40	0.200	2200	1800	
AIH1012PI	6/5/2017	7AC05JUN02-A	stream	Fresh Water	1 hrs	0.42 in	7.29	16.6	0.14	0.50	4.40	0.250	400		

Stormwater Report for: AIH1100PI
in the Town of Acushnet

South Main St near quarry

Water Body: Acushnet River Qualifier: SFR, CSO

Urbanized: Yes Sewered: No Class: SB Category: 5

MS4 Ranking: High Priority Outfall

Status: Some Concern Warranted - Consider Corrective Action

DW: No flow, no issues. WW Rank: Bact(2), Amm/Nitrates/Surf (1 ea), Total 5. Recommend: Investigate for potential ID. Impair: None, discharge into trib of Acu R.

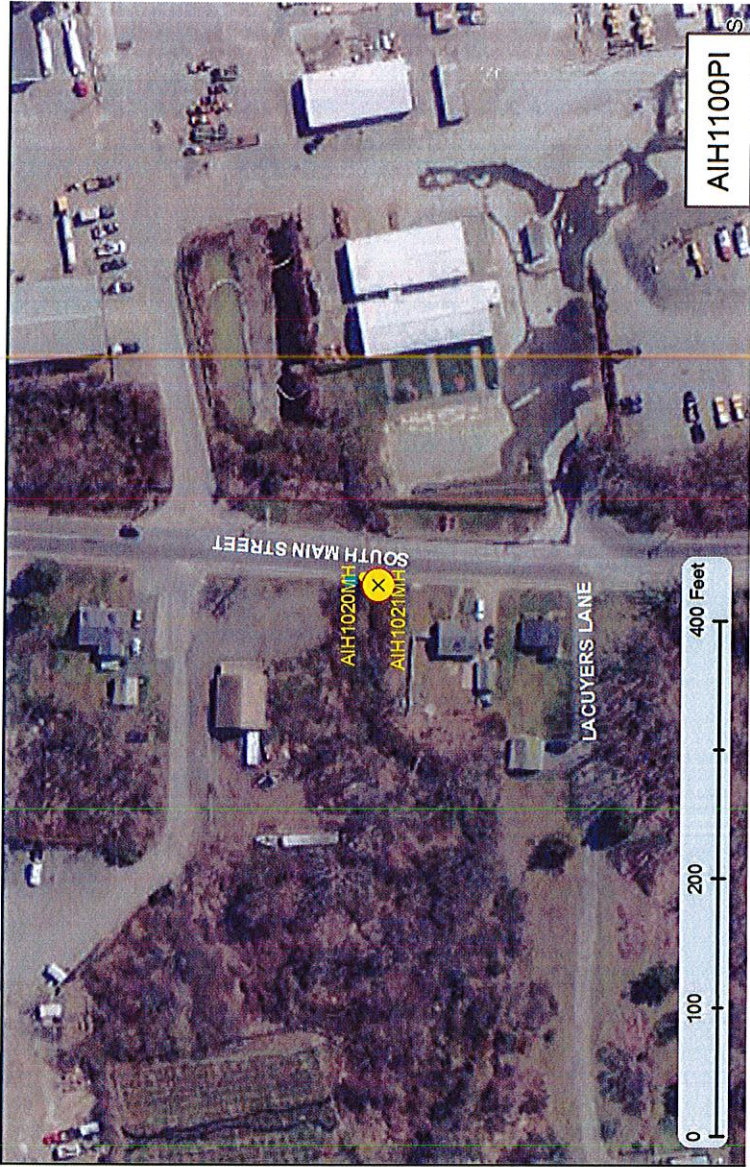
Rating

Wet Weather: 5

Dry Weather:

No Data or No Flow

6 'No Sample Visits'



		6 'No Sample Visits'		Status and Recommendation based on the opinion of the BBNEP.					Report Created on: 8/17/2018					
FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surfact	Enterococcus	Fecal Coliform
AIH1100PI	6/21/2016	6AC21JUN01-A	stream	Fresh Water	2 hrs	0.73 in	7.85	20.1	0.20	0.25	3.52	0.100	8500	16000
AIH1100PI	7/5/2016	6AC05JUL01-B	pipe	Fresh Water	0 hrs	0.61 in	7.15	24.1	0.03	0.25	0.44	0.300	6800	9600
AIH1100PI	7/5/2016	6AC05JUL01-A-D	pipe	Fresh Water	0 hrs	0.61 in	6.49	24.1	0.04	0.30	1.76	0.300		
AIH1100PI	7/5/2016	6AC05JUL01-A-D	pipe	Fresh Water	0 hrs	0.61 in	6.52	24.0	0.04	0.00	1.76	0.300	8700	7900
AIH1100PI	7/5/2016	6AC05JUL01-A	pipe	Fresh Water	0 hrs	0.61 in	6.60	23.9	0.08	0.00	1.76	0.300	9200	7300
AIH1100PI	8/10/2016	6AC10AUG03-A	pipe	Fresh Water	0 hrs	0.27 in	7.06	24.5	0.08	1.00	0.88	0.200	14000	31000



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

VIA EMAIL

June 26, 2019

Brian Noble
Town Administrator

And;

Merilee Kelly
Conservation Agent
122 Main Street
Acushnet, MA. 02743
mkelly@acushnet.ma.us

Re: National Pollutant Discharge Elimination System Permit ID #: MAR041085, Town of Acushnet

Dear Merilee Kelly:

The 2016 NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts (MS4 General Permit) is a jointly issued EPA-MassDEP permit. Your Notice of Intent (NOI) for coverage under this MS4 General Permit has been reviewed by EPA and appears to be complete. You are hereby granted authorization by EPA and MassDEP to discharge stormwater from your MS4 in accordance with the applicable terms and conditions of the MS4 General Permit, including all relevant and applicable Appendices. This authorization to discharge expires at midnight on **June 30, 2022**.

For those permittees that certified Endangered Species Act eligibility under Criterion C in their NOI, this authorization letter also serves as EPA's concurrence with your determination that your discharges will have no effect on the listed species present in your action area, based on the information provided in your NOI.

As a reminder, your first annual report is due by **September 30, 2019** for the reporting period from May 1, 2018 through June 30, 2019.

Information about the permit and available resources can be found on our website:
<https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit>. Should you have

any questions regarding this permit please contact Newton Tedder at tedder.newton@epa.gov or (617) 918-1038.

Sincerely,

A handwritten signature in blue ink that reads "Thelma Murphy". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Thelma Murphy, Chief
Stormwater and Construction Permits Section
Office of Ecosystem Protection
United States Environmental Protection Agency, Region 1

and;

A handwritten signature in black ink that reads "Lealdon Langley". The signature is cursive and somewhat stylized, with a large loop at the end.

Lealdon Langley, Director
Wetlands and Wastewater Program
Bureau of Water Resources
Massachusetts Department of Environmental Protection