

# Town of Allenstown Bacterial Source Tracking and Sampling



December 10, 2015

Prepared By:

**Hoyle, Tanner**  
& Associates, Inc.

# Table of Contents

<b>Background</b> .....	3
<b>Purpose</b> .....	3
<b>Procedure</b> .....	3
<b>Findings/Results</b> .....	4
<b>Conclusions</b> .....	7
<b>Recommendations</b> .....	8
<b>Appendix</b> .....	9

## **Background**

The National Pollutant Discharge Elimination System (NPDES) permit in New Hampshire is known as the New Hampshire Small Municipal Separate Storm Sewer System General Permit. The last enforceable New Hampshire Small MS4 General Permit (MS4) expired in 2008, but remains in effect until a new permit is issued. A Draft 2008 MS4 was written but never became enforceable as it stayed in draft form. The February 2013 draft version of the MS4 has served to update the requirements of the previous Draft 2008 MS4.

The MS4 permit applies to communities that contain urbanized areas within their political boundaries. The 2010 urbanized area data was released by the Bureau of the Census and as a result, many communities that did not fall under the MS4 permit during the 2008 draft now contain new “urbanized areas” which make them subject to the requirements of the MS4.

The Town of Allenstown, New Hampshire is one of the many communities that was not included in the 2008 draft MS4, but contains a new urbanized area represented in Figure 1. The “urbanized area” of Allenstown is considered part of the MS4 area as of the Draft 2013 Permit. This designation makes the Town responsible for meeting all of the MS4 conditions in the stormwater system. The Town of Allenstown is looking ahead in order to meet the requirements of this permit before the permit is finalized and then becomes enforceable by the USEPA. This urbanized area of Allenstown will be subject to the MS4 permit when it becomes final. Prior baseline outfall sampling and screening was conducted pursuant to Part 2.3.4.9.a. (dry weather) and 2.3.4.8.d.i-iii. of the 2013 draft MS4 during the summer of 2014. Results from the summer 2014 sampling event indicated that there were two outfalls containing E.coli above the water quality threshold levels: outfall one and outfall eighteen.

The Town of Allenstown recently completed its first round of bacterial source tracking and sampling in order to isolate and eventually remove E.coli sources found in outfalls one and eighteen which are contained within catchments one and eighteen. Catchments include all conveyance structures and piping that drains to each outfall.

## **Purpose**

The goals of this field effort were to: (1) Conduct a visual stormwater conveyance inspection within catchments one and eighteen in order to isolate any potential sources of E.coli contamination; (2) To sample locations along the stormwater conveyance system for E.coli within catchments one and eighteen; and (3) Analyze sampling results and update associated GIS shapefiles with the most up-to-date stormwater conveyance mapping and sampling data.

## **Procedure**

E.coli sampling locations were selected prior to the field effort using GIS mapping information from previous studies. Locations were selected prior to sampling in order to obtain the most representative samples to track the source of E.coli contamination within catchment one and eighteen.

Pre-selected sample locations were shifted in the field only when locations were dry, filled with sediment, or not containing enough flow to sample. In these cases the locations were either shifted to another location if possible or no sample was collected and notes indicating why were made as part of the sampling effort.

Samples were collected to be analyzed for E. coli when flow was encountered at sample locations. Clean lab containers were used to collect the samples. Samples were preserved according to lab requirements and holding times were met prior to delivery to the lab. Two duplicate samples, and two blanks were included as part of the sampling plan.

## Findings/Results

At least 100 mL of a stormwater sample must be collected in order for the lab to complete an analysis for E.coli. In some cases there was insufficient flow available to collect 100 mL of sample water. This was not known prior to the sampling event and the lab did not note it when the clean sample bottles were picked up prior to the sampling event. As a result, the samples with a greater than (>) symbol as part of the result are a bit elevated due to the lab completing a spike in order to be able to process the water to obtain reliable results. The lab results are summarized in Table 1 of the Summary Report Appendix.

According to the 2013 NH Small MS4 Draft Permit (water quality threshold criteria is contained in Table 1 of this report) the threshold water quality criteria for E.coli is 235 cfu/100 mL. Most Probable Number (MPN) is the same as Colony Forming Units (CFU) for this purpose. The lab reported the sampling results using the MPN method, and the threshold water quality criteria specifies the CFU method, but for this purpose they will be considered interchangeable.

A total of two catchment areas (outfall 1 and outfall 18) were sampled during this study. See Figure 2 and Figure 3 in the Appendix of this report for detailed maps of the actual sampling locations and associated sampling results. Outfalls 1 and 18 were sampled and inspected as well as manholes, catch basins, open channel and any other structures or features that made up catchment areas 1 and 18. In Figures 2 and 3, the dotted lines represent the delineated catchment areas. Sample locations were assigned numbers so the locations could be matched with lab results. The triangles indicate open channels, manholes, or catch basins that were either inspected or sampled. The grey triangles indicate that either the location was not sampled, or the E.coli results were found to be below the water quality threshold (contained in Table 1). The pink triangles indicate areas where the E.coli results were found to be above the water quality threshold. The labels at each location indicate the sample number, separated by a comma and then the sample results. If no sample was collected, a description is provided indicating why a sample collection was not possible in Table 2.

The thresholds for the minimum water quality parameters are contained in Table 1 and were obtained directly from the 2013 Draft NH Small MS4 Permit. For the purposes of this sampling event, only the threshold water quality levels for E.coli pertained.

**Table 1: Threshold Water Quality Criteria for MS4 Sampling**

<b>Minimum Parameters:</b>	<b>Threshold Levels / Single Sample</b>
Ammonia	≥ 0.5 mg/L
Chlorine	>0.02 mg/L
Surfactants (MBAs)	≥0.25 mg/L
E. Coli	235 cfu/100 mL
Specific Conductivity	NA
Salinity	NA
Temperature	≥83°F (28.3°C) and change 5°C (2.8°C) in rivers

## **Catchment One**

Figure 2 in the Appendix of the report depicts the sampling locations where each sample was collected. Sample #8 (located at outfall 1) showed E.coli levels higher than the lab reporting limit which was >2,420 MPN/100 mL exceeding the E.coli water quality threshold at 235 cfu/100mL. A duplicate sample (sample #8A) as well as a trip blank (sample #8B) were also taken at this location. The duplicate sample yielded the same E.coli results and the trip blank results indicated that there was no E.coli present in the sample (the trip blank was collected with distilled water following the same sample methods that were followed to collect all other samples).

The next manhole upstream (sample #5) had E.coli levels at >5,565 MPN/100 mL. This result is higher than the reporting limit because the sample volume was less than 100 mL. Refer to the Conclusions section of this report for a full discussion. The next manhole upstream and to the east was dry and therefore could not be sampled. Sample #4 was located in an upstream manhole and the E.coli reporting limits were elevated because the sample contained less than 100mL. E.coli results were found to be at >2,904 MPN/100 mL. The next sample upstream (sample #3) was in a manhole along Ferry Street, and to the east of sample #4. E.coli reporting limits were elevated because the sample contained less than 100mL for sample #3 at >3,629 MPN/100 mL. The next manhole upstream to the northeast that was planned to be sampled turned out to be dry, and all other locations along that pipe were also dry at the time of sampling. The final upstream manhole, samples #2 and #1 had three pipes coming into it. One from the brook, another from Ferry Street, and a pipe coming from a maintenance garage where the owners claim that it is tied into the roof drains of the building. Samples from the brook influent (sample #1) and the Ferry Street influent (sample #2) in this manhole were collected. Sample #1 had a no-detect for E.coli, while sample #2 contained 59.5 MPN/100 mL, which is under the 235 cfu/100 mL water quality threshold.

## **Catchment Eighteen**

Figure 3 in the Appendix of the report shows the sampling locations where each sample was collected. Outfall 18 (sample #9) was found to contain E.coli at >2,420 MPN/100 mL (higher than the lab reporting limit for a 100 mL sample), therefore exceeding the water quality threshold. This catchment consists of a drainage system that conveys a stream underneath a residential area. The stream begins at the “frog pond” outside of the EPA designated Town MS4 area. It is conveyed under a residential development to eventually daylight at the outfall 18 or sample #9.

Upstream and southwest of sample #9, the catchbasin was found to be full of still-moving water so it was not sampled. Catch basin sample #10 which was located upstream of sample #9 contained E.coli results that exceeded the water quality threshold at 2,420 MPN/100 mL (higher than the lab reporting limit for a 100 mL sample). Upstream of sample #10, results were found to be at >2,661 MPN/100 mL at the catch basin (sample #11) and higher than the lab reporting limit because there was less than 100mL of sample. Sample #11A was a duplicate of sample #11 and the E.coli results were 2,468 MPN/100 mL. Drainage piping connecting to the west of this catchbasin was dry because it functions as overflow piping when the regular piping gets overwhelmed with stormwater. Moving upstream and to the east of sample #11 there were two streams that converge, but one contained still (not flowing) water and was historically a stream, but was filled in at some point in the 1970’s. This portion of the stream was not sampled as a result. The other portion of the stream that was flowing was found to contain E.coli levels at 1,001 MPN/100 mL and was located upstream and southeast of sample 11/11A (sample #12). Further upstream the drainage system runs through a culvert under Townhouse Road and a hard piped system connects inside the

culvert. Within the hard-piped system, there was a dry manhole and it was also filled with >50% sediment. The Town was unaware of these drainage structures and piping at the time of the sampling event so it was added to the stormwater mapping as a result and will be included in future catch basin and manhole cleanings. The next manhole in the hard-piped system was found to be dry. There was flow found in the catch basin located at the most upstream portion of the system, but the downstream pipe appeared to be clogged with sediment shortly after that point. A sample was taken at this catch basin (sample #14) and the E.coli results were found to be well below the threshold limit at 6.3 MPN/100 mL. It is unknown where the flow from the catch basin was going because downstream the pipe appeared to be clogged and the downstream manholes were dry. Downstream of Sample #12 and to the southeast a sample was taken (sample #13) at the beginning of the culverted stream, and at this location a trip blank (sample #13A) was also taken. The results were as follows: 824 MPN/100 mL, <1 MPN/100 mL, respectively. The E. coli levels in sample #13 were found to exceed the threshold of 235 cfu/100 mL.

The Town is planning to reconstruct this portion of the sewer and drainage system in this area in the near future as it is known to historically be a problem area.

The lab and field results of this study are included in the Appendix of this report. An abbreviated representation of this information is presented in Table 2 below. The full version is in Table 3 which is included in the Appendix of this report.

**Table 2: Sampling Results (Abbreviated Version)**

Sample ID	Date/Time	E.Coli (MPN/100mL)	# mL's of sample	Designation (blank, dup)	Manhole, Catch Basin, Outfall, or Open Channel
1	8-6-2015/11:00	<1.3	80	-	MH
2	8-6-2015/11:07	<b>59.5</b>	83	-	MH
3	8-6-2015/12:00	<b>&gt;3629.4</b>	65	-	MH
4	8-6-2015/12:15	<b>&gt;2903.5</b>	83	-	MH
5	8-6-2015/13:14	<b>&gt;5565.1</b>	43	-	MH
8	8-6-2015/14:01	<b>&gt;2419.6</b>	100	-	Outfall
8A	8-6-2015/14:00	<1	100	Trip Blank	Outfall
8B	8-6-2015/14:02	<b>&gt;2419.6</b>	100	Duplicate	Outfall
9	8-6-2015/7:42	<b>&gt;2419.6</b>	100	-	Outfall
10	8-6-2015/7:50	<b>&gt;2419.6</b>	100	-	CB
11	8-6-2015/8:12	<b>&gt;2661.6</b>	93	-	CB
11A	8-6-2015/8:14	<b>2,468</b>	98	Duplicate	CB
12	8-6-2015/8:30	<b>1,001</b>	80	-	Stream
13	8-6-2015/8:57	<b>824</b>	82	-	Stream
13A	8-6-2015/9:00	<1.1	93	Trip Blank	Stream
14	8-6-2015/9:44	<b>6.3</b>	100	-	Round CB

**Bold** font indicates that the analyte was detected.  
 < = "Less than" indicates that the analyte was detected, but still below the minimum detection limit.  
 Grey Shading indicates that the analyte was detected above the Threshold Limit of 235 cfu/100 mL.  
 > = "Greater than" indicates that the total E.coli counts were higher than the lab reporting levels.

## Conclusions

This study served as the Town of Allentown's follow-up to the initial dry-weather sampling which revealed E.coli discharges above the threshold water quality criteria isolated to two catchments (catchments no. one and no. eighteen). At this point, discharges have been isolated to these two catchments and have been further isolated to certain areas within those catchments that could be an issue. Follow-up E.coli sampling is recommended in order to further investigate and remove potential illicit discharges to the Town's stormwater system.

Catchment no. one had exceedances for E.coli during the baseline dry weather summer sampling done in 2014 in addition to the follow-up E.coli tracking sampling during the summer 2015. Sources cannot yet be confirmed, but based on samples #1 and #2, it can be confirmed that the exceedances likely do not come from upstream of the WWTF, either from the brook (sample #1) or Ferry Street (upstream) (sample #2).

Catchment no. eighteen had exceedances for E.coli during the baseline dry weather summer sampling done in 2014 in addition to the follow-up E.coli tracking sampling during the summer of 2015. Sources cannot yet be confirmed but appear to be coming from within and outside the MS4 area. Sample #13 was taken at the upstream portion of the culvert in the open stream and results indicated a significant exceedance of E.coli over the water quality threshold indicating a potential illicit discharge to the stormwater system. However, upstream from this point, E.coli concentrations increase all the way to the outfall indicating that there may not only be a potential source from outside of the MS4 area, but that there are also sources contributing within the MS4.

It is important to note the detection limits in the lab instrumentation and how the samples that had less than 100 mL were handled. This is described in detail below:

When the sample bottles were given to the samplers, the containers did not clearly indicate the 100 mL mark and this was not made evident by the lab workers. When the samples were delivered to the lab after the samples were collected, some samples had less than 100 mL and this was when the lab workers mentioned that this is almost always an issue that comes back to them and discussed that to resolve this issue they would complete the following steps: 1. The sample bottle was marked with a sharpie to note the level of the sample that was provided. 2. In the lab, samples with insufficient volume (less than 100 ml) were filled with sterile distilled water until they reached 100 mL. 3. The sample was poured into a Quanti-Tray, and the Quanti-Tray was put through the sealer. Using the empty sample bottle, the container was filled with water to the sharpie line in order to measure the volume to find how much sample volume was provided. This volume was then used to determine the dilution factor (ex: 100 mL total /85 mL of sample). This dilution factor is used to calculate the results or raise the reporting limit if all the samples are positive for E.coli. In this case, E.coli was present in nearly all samples containing less than 100mL, so the latter applies and is described below.

The reporting limit is the lowest level at which there is certainty in the number of bacteria that are present within a sample. Normally when 100mL of sample is collected and analyzed, the lowest level is 1 MPN per 100 mL or in other words, 1 bacterium within that 100 mL. If there is less than 100 mL, the level of certainty is raised because it is still reported per 100 mL, but there is less sample available to analyze. For example if the sample contained 50 mL, and that 50 mL was absent of E. Coli it would be reported that there are < 2 MPN/100 mL, and that the reporting was unable to provide the standard <1 MPN/100 mL.

Alternatively, if all the samples were positive in a Quanti-Tray that contains 100 mL of sample, it can be reported that the sample is > 2419.6 MPN/100 mL because that is the limitation of the tray. If, however, there is less than 100 mL of sample then that level is raised. For example there is only 50 mL of sample, and after prepping and incubating in the Quanti-Tray, all the wells are positive, then the result would be > 4839.2 (because it is the equivalent of a 2X dilution). That is why the sampling results varied from >5565.1 to >2419.6 to <1. It depended on the amount of sample provided and the count calculated using the Quanti-Tray. In summary: all the results are just as reliable, only the equation used to calculate the results changes based on the volume, not the accuracy.

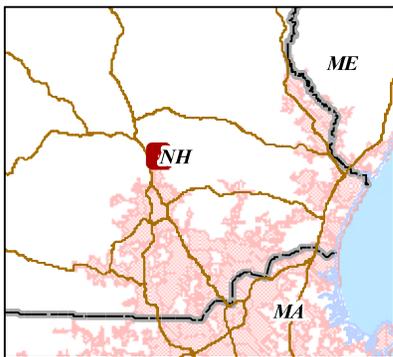
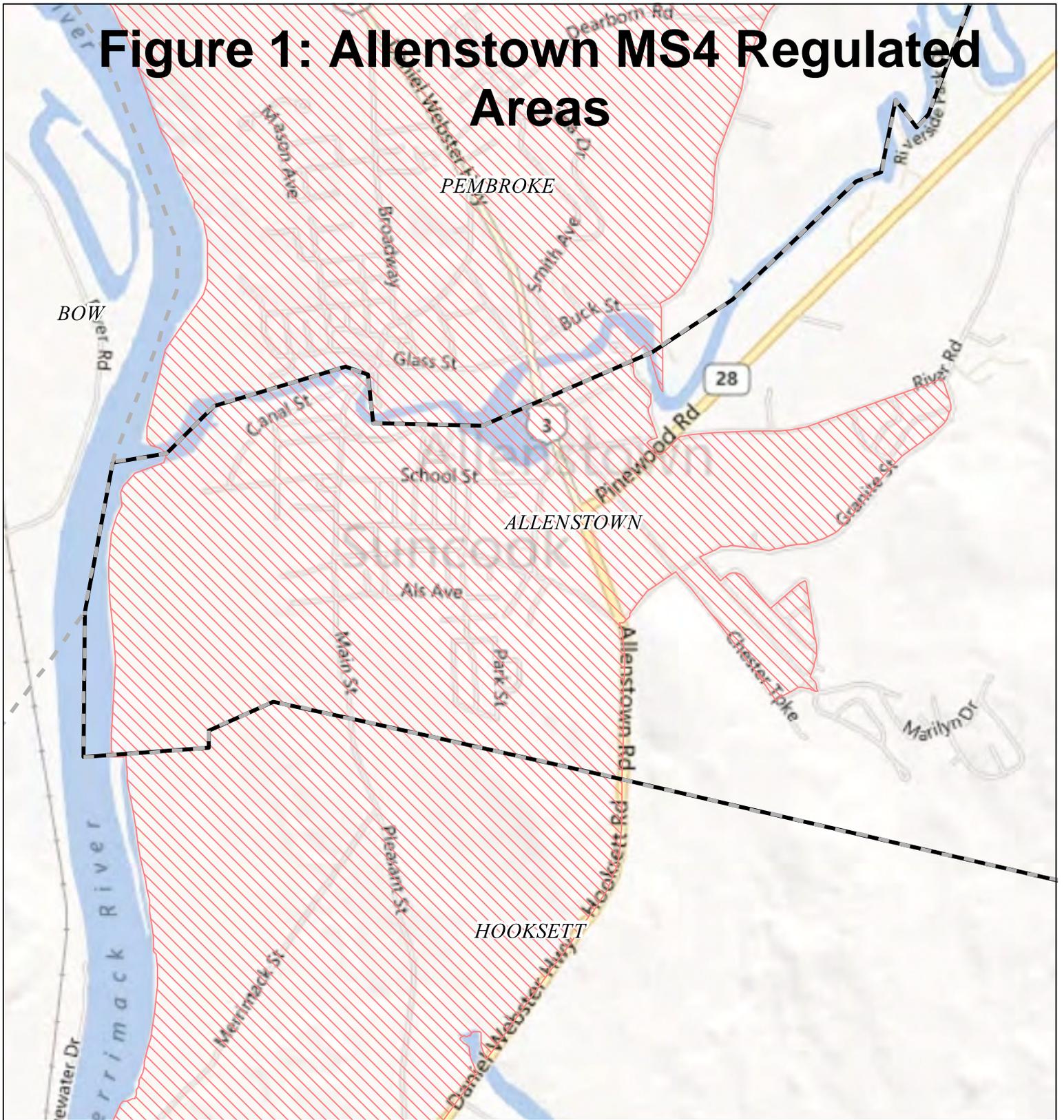
## Recommendations

1. It is recommended that the Town of Allenstown continue to isolate and eliminate the detected E.coli sources through follow-up E.coli tracking and sampling efforts during a repeat dry weather effort and also when flows are higher (in the spring) so that all manholes and catch basins that were dry during previous sampling events can be sampled.
2. Wet weather sampling (recommended in no. 1 above) should be done during a storm event > 0.25 inch total precipitation and when there has been very little or no rainfall during the preceding three (3) days.
3. In catchment no. 1, it is recommended to sample during both low flow and high-flow times in order to obtain samples from some locations that could not be sampled due to low flows.
4. In catchment no. 18, it is recommend to complete follow-up sampling outside of the MS4 area in order to confirm or disprove the fact that the source is outside the MS4 area but discharging to the MS4.
5. Subsequent sampling should be done in accordance with an approved Quality Assurance Project Plan (QAPP). Model QAPPs are available from the EPA and the NHDES that can be tailored to Allenstown's specific needs and goals.
6. In catchment no. 18, it is recommended that the catch basin that is clogged with sediment be flushed and that the drain line is also flushed as soon as possible. It is also recommended that after the flushing and cleaning is complete, this area should be dye tested and inspected in order to track where the stormwater is flowing to and from.
7. Someone that is experienced with the intricacies of E.coli sampling should be designated to complete the follow-up sampling. NHDES offers MS4 sampling workshops and training to municipalities to assist them in cutting costs while also learning how to sample effectively. Hoyle, Tanner could also assist in this training effort.
8. Ultimately, site-specific Best Management Practices (BMP's) will have to be developed and implemented to mitigate sources of bacteria.

# Appendix

# Figures

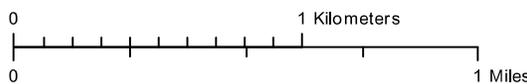
# Figure 1: Allenstown MS4 Regulated Areas



NPDES Phase II Stormwater Program  
Automatically Designated MS4 Areas

## Allenstown NH

 Regulated Area (2000 + 2010 Urbanized Area)



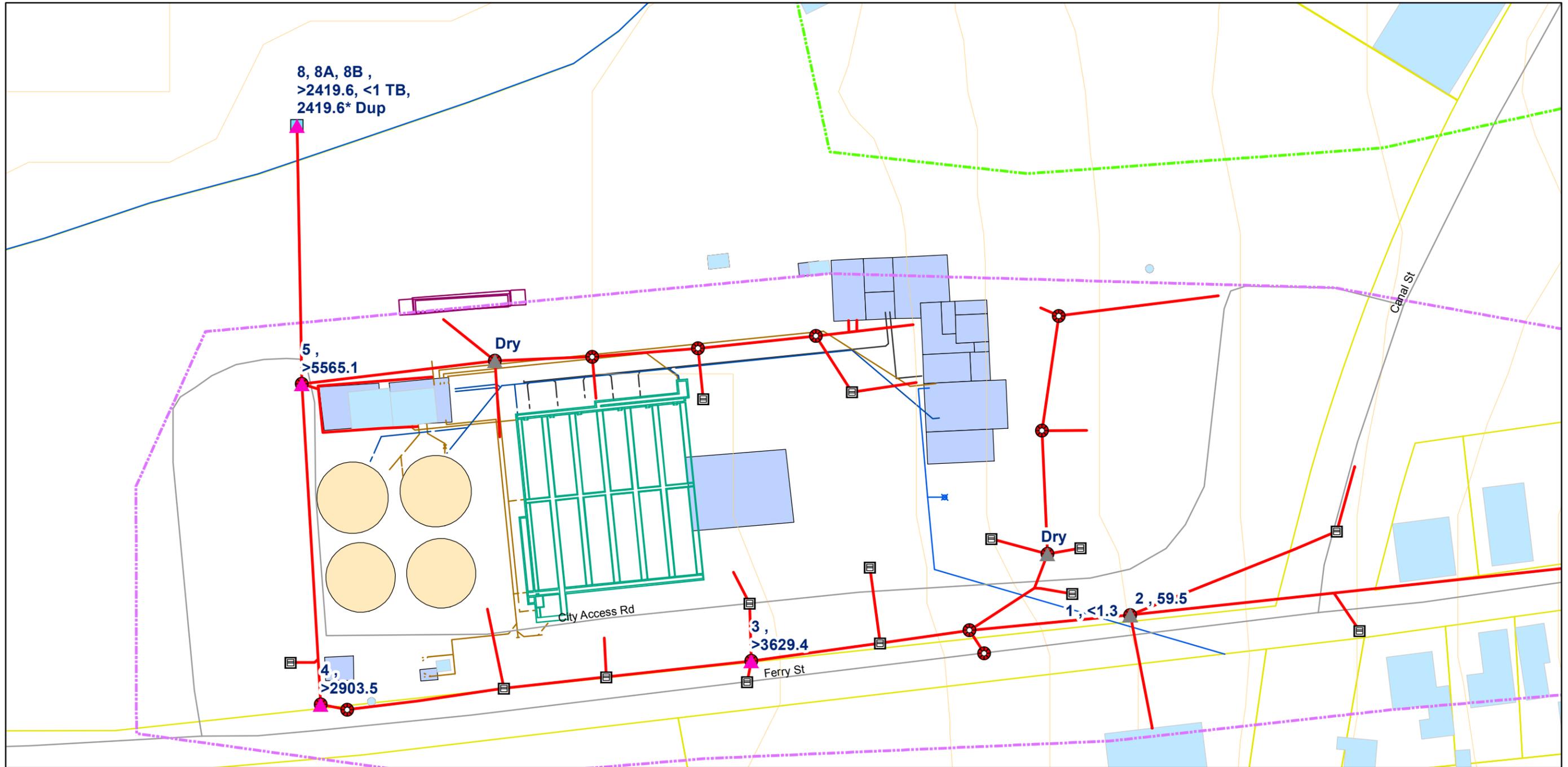
Town Population: **6521**  
Regulated Population: **2274**  
(Populations estimated from 2010 Census)



Urbanized Areas, Town Boundaries:  
US Census (2000, 2010)  
Base map © 2010 Microsoft Corporation  
and its data suppliers

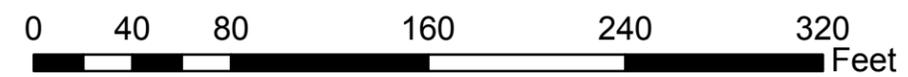
# TOWN OF ALLENSTOWN, NEW HAMPSHIRE

## BACTERIAL SOURCE TRACKING AND SAMPLING RESULTS - OUTFALL 1



**Legend**

<b>E.coli Results Above_235_CFU?</b>	1	9	17	Airlines
▲ No	2	10	18	Clarifier
▲ Yes	3	11	19	WTF_Locations
☐ Catch Basin	4	12	Buildings	WaterEdge
● Culvert Outlet	5	13	Aeration_Tanks	Scales
⊕ Manhole	6	14	Sludge_Piping	
⊡ Outfall	7	15		
— DrainagePipesAT	8	16		



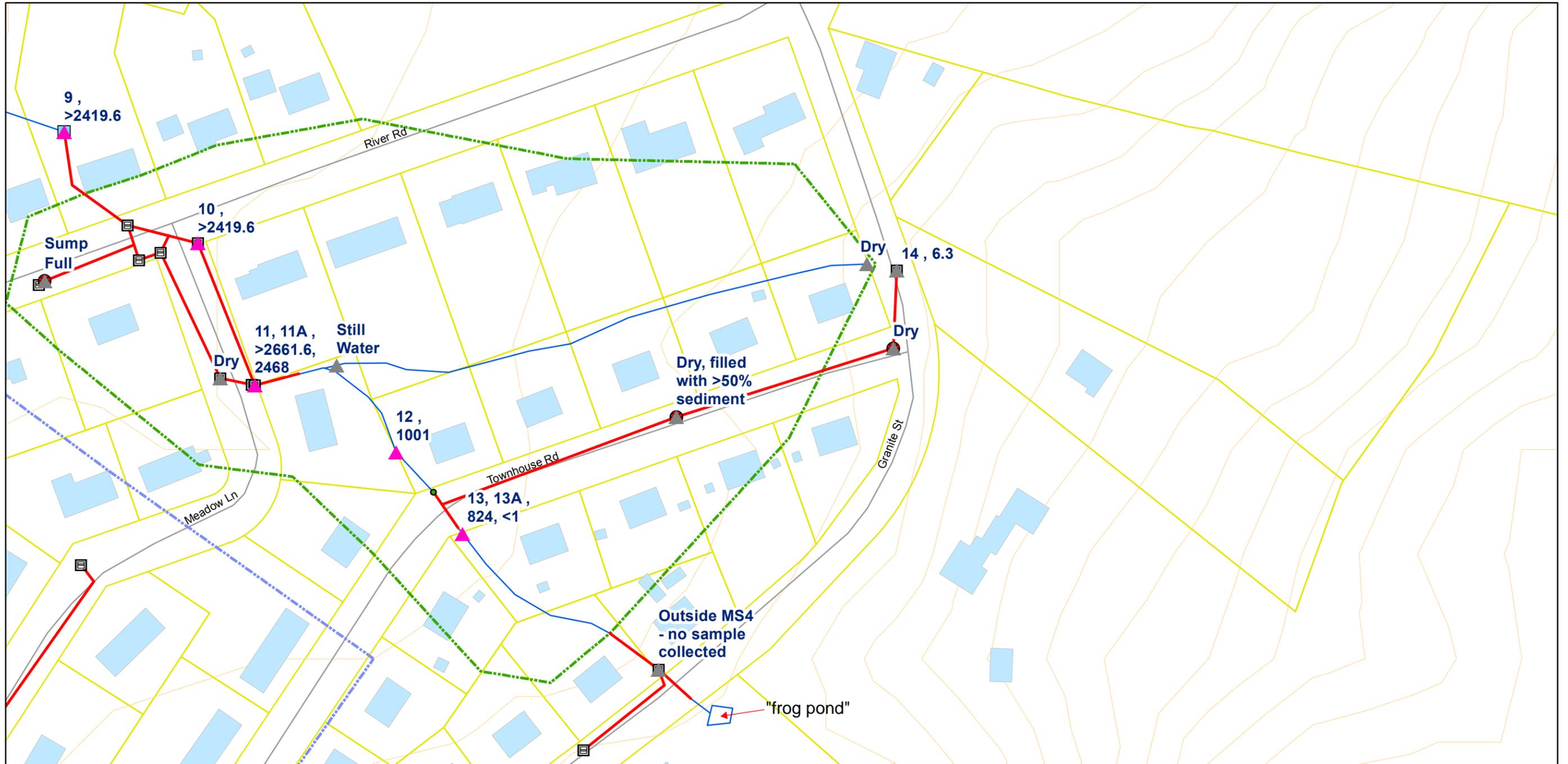
Date: December 2015

**Hoyle, Tanner**  
& Associates, Inc.



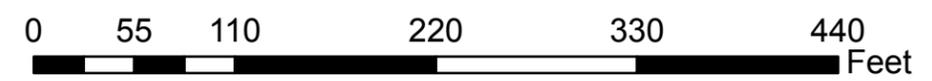
# TOWN OF ALLENSTOWN, NEW HAMPSHIRE

## BACTERIAL SOURCE TRACKING AND SAMPLING RESULTS - OUTFALL 18



**Legend**

<b>E.coli Results Above_235_CFU?</b>	1	9	17	Airlines
▲ No	2	10	18	Clarifier
▲ Yes	3	11	19	WTF_Locations
☐ Catch Basin	4	12	Buildings	
● Culvert Outlet	5	13	WaterEdge	
⊕ Manhole	6	14	Aeration_Tanks	
⊗ Outfall	7	15	Scales	
— DrainagePipesAT	8	16	Sludge_Piping	



Date: December 2015

**Hoyle, Tanner**  
& Associates, Inc.



# Tables

**Table 3: E.Coli Sampling Results**

Sample ID	Date / Time	E.Coli (MPN/100mL)	# mL's of sample	Designation (blank, dup)	Manhole, Catch Basin, Outfall, or Open Channel	Catchment #	Odor? (Y/N/petroleum?)	Flotables (Y/N)	Comment
1	8-6-2015/11:00	<1.3	80	-	MH	1	No	No	Coming from upstream CB and brook. Dumping into same manhole as sample #2. <i>Lab Comment: Sample had a volume of 80 mLs resulting in an elevated reporting limit.</i>
2	8-6-2015/11:07	<b>59.5</b>	83	-	MH	1	No	No	Coming from upstream drainage main. Dumping into same manhole as sample #1.
3	8-6-2015/12:00	<b>&gt;3629.4</b>	65	-	MH	1	No	No	<i>Lab Comment: All quantiwells were positive for E.coli resulting in a greater than value.</i>
4	8-6-2015/12:15	<b>&gt;2903.5</b>	83	-	MH	1	No	No	<i>Lab Comment: All quantiwells were positive for E.coli resulting in a greater than value.</i>
5	8-6-2015/13:14	<b>&gt;5565.1</b>	43	-	MH	1	No	No	<i>Lab Comment: All quantiwells were positive for E.coli resulting in a greater than value.</i>
8	8-6-2015/14:01	<b>&gt;2419.6</b>	100	-	Outfall	1	No	No	<i>Lab Comment: All quantiwells were positive for E.coli resulting in a greater than value.</i>
8A	8-6-2015/14:00	<1	100	Trip Blank	Outfall	1	No	No	-
8B	8-6-2015/14:02	<b>&gt;2419.6</b>	100	Duplicate	Outfall	1	No	No	<i>Lab Comment: All quantiwells were positive for E.coli resulting in a greater than value.</i>
9	8-6-2015/7:42	<b>&gt;2419.6</b>	100	-	Outfall	18	No	No	<i>Lab Comment: All quantiwells were positive for E.coli resulting in a greater than value.</i>
10	8-6-2015/7:50	<b>&gt;2419.6</b>	100	-	CB	18	No	No	<i>Lab Comment: All quantiwells were positive for E.coli resulting in a greater than value.</i>
11	8-6-2015/8:12	<b>&gt;2661.6</b>	93	-	CB	18	No	No	<i>Lab Comment: All quantiwells were positive for E.coli resulting in a greater than value.</i>
11A	8-6-2015/8:14	<b>2,468</b>	98	Duplicate	CB	18	No	No	-
12	8-6-2015/8:30	<b>1,001</b>	80	-	Stream	18	No	No	-
13	8-6-2015/8:57	<b>824</b>	82	-	Stream	18	No	No	-
13A	8-6-2015/9:00	<1.1	93	Trip Blank	Stream	18	No	No	<i>Lab Comment: Sample had a volume of 93 mLs resulting in an elevated reporting limit.</i>
14	8-6-2015/9:44	<b>6.3</b>	100	-	Round CB	18	No	No	-

**Notes:**

**Bold** font indicates that E.coli was detected.

< = "Less than" indicates that the analyte was detected, but still below the minimum detection limit.

Grey Shading indicates that the analyte was detected above the Threshold Limit of 235 cfu/100 mL.

1. 2419.9 MPN/100 mL was the reporting limit for the lab and the highest value the lab could detect in a 100 mL sample. Other values are higher due to adjustment for sample volumes.

# Lab Reports

Heidi Lemay  
Hoyle Tanner & Associates (NH)  
150 Dow Street  
Manchester, NH 03101-1227



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 146573  
Client Identification: Allenstown NH | 013629  
Date Received: 8/6/2015

Dear Ms. Lemay :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at [www.eailabs.com](http://www.eailabs.com) for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

- Solid samples are reported on a dry weight basis, unless otherwise noted
- < : "less than" followed by the reporting limit
- > : "greater than" followed by the reporting limit
- %R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269) and Vermont (VT1012).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

  
Lorraine Olashaw, Lab Director

8.14.15  
Date

6  
# of pages (excluding cover letter)



# SAMPLE CONDITIONS PAGE

EAI ID#: 146573

Client: **Hoyle Tanner & Associates (NH)**

Client Designation: **Allenstown NH | 013629**

Temperature upon receipt (°C): **5.7**

Received on ice or cold packs (Yes/No): **Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
146573.01	1	8/6/15	8/6/15	aqueous		Samples received with insufficient volume. Analysis authorized by client
146573.02	2	8/6/15	8/6/15	aqueous		Samples received with insufficient volume. Analysis authorized by client
146573.03	3	8/6/15	8/6/15	aqueous		Samples received with insufficient volume. Analysis authorized by client
146573.04	4	8/6/15	8/6/15	aqueous		Samples received with insufficient volume. Analysis authorized by client
146573.05	5	8/6/15	8/6/15	aqueous		Samples received with insufficient volume. Analysis authorized by client
146573.06	8	8/6/15	8/6/15	aqueous		Adheres to Sample Acceptance Policy
146573.07	10	8/6/15	8/6/15	aqueous		Adheres to Sample Acceptance Policy
146573.08	11A	8/6/15	8/6/15	aqueous		Samples received with insufficient volume. Analysis authorized by client
146573.09	12	8/6/15	8/6/15	aqueous		Samples received with insufficient volume. Analysis authorized by client
146573.1	13	8/6/15	8/6/15	aqueous		Samples received with insufficient volume. Analysis authorized by client
146573.11	14	8/6/15	8/6/15	aqueous		Adheres to Sample Acceptance Policy
146573.12	8A	8/6/15	8/6/15	aqueous		Adheres to Sample Acceptance Policy
146573.13	8B	8/6/15	8/6/15	aqueous		Adheres to Sample Acceptance Policy
146573.14	13A	8/6/15	8/6/15	aqueous		Samples received with insufficient volume. Analysis authorized by client
146573.15	11	8/6/15	8/6/15	aqueous		Samples received with insufficient volume. Analysis authorized by client
146573.16	9	8/6/15	8/6/15	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitibility, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis. Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

- 1) EPA 600/4-79-020, 1983
- 2) Standard Methods for Examination of Water and Wastewater, 20th Edition, 1998 and 22nd Edition, 2012
- 3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- 4) Hach Water Analysis Handbook, 2nd edition, 1992



# LABORATORY REPORT

EAI ID#: 146573

Client: **Hoyle Tanner & Associates (NH)**

Client Designation: **Allenstown NH | 013629**

Sample ID:	1	2	3	4					
Lab Sample ID:	146573.01	146573.02	146573.03	146573.04					
Matrix:	aqueous	aqueous	aqueous	aqueous					
Date Sampled:	8/6/15	8/6/15	8/6/15	8/6/15					
Date Received:	8/6/15	8/6/15	8/6/15	8/6/15					
					Units	Analysis		Method	Analyst
E.coli	< 1.3	59.5	> 3629.4	> 2903.5	MPN/100ml	08/06/15	15:25	9223B	SCW

Sample ID:	5	8	10	11A					
Lab Sample ID:	146573.05	146573.06	146573.07	146573.08					
Matrix:	aqueous	aqueous	aqueous	aqueous					
Date Sampled:	8/6/15	8/6/15	8/6/15	8/6/15					
Date Received:	8/6/15	8/6/15	8/6/15	8/6/15					
					Units	Analysis		Method	Analyst
E.coli	> 5565.1	> 2419.6	> 2419.6	2468	MPN/100ml	08/06/15	15:25	9223B	SCW

*E. coli*: Sample "1" had a volume of 80 mLs resulting in an elevated reporting limit.

*E. coli*: Sample "2" had a volume of 83 mLs.

*E. coli*: Sample "3" had a volume of 65 mLs. All quantiwells were positive for *E. coli* resulting in a greater than value.

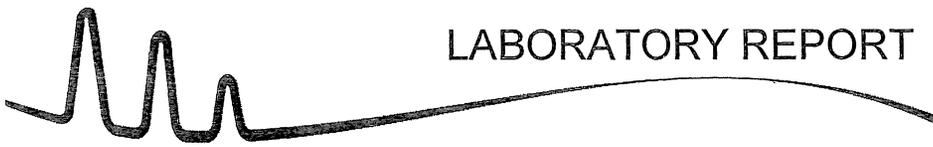
*E. coli*: Sample "4" had a volume of 83 mLs. All quantiwells were positive for *E. coli* resulting in a greater than value.

*E. coli*: Sample "5" had a volume of 43 mLs. All quantiwells were positive for *E. coli* resulting in a greater than value.

*E. coli*: Sample "8" had a volume of 100 mLs. All quantiwells were positive for *E. coli* resulting in a greater than value.

*E. coli*: Sample "10" had a volume of 100 mLs. All quantiwells were positive for *E. coli* resulting in a greater than value.

*E. coli*: Sample "11A" had a volume of 98 mLs.



# LABORATORY REPORT

EAI ID#: 146573

Client: **Hoyle Tanner & Associates (NH)**  
 Client Designation: **Allenstown NH | 013629**

<b>Sample ID:</b>	12	13	14	8A						
<b>Lab Sample ID:</b>	146573.09	146573.1	146573.11	146573.12						
<b>Matrix:</b>	aqueous	aqueous	aqueous	aqueous						
<b>Date Sampled:</b>	8/6/15	8/6/15	8/6/15	8/6/15						
<b>Date Received:</b>	8/6/15	8/6/15	8/6/15	8/6/15	<b>Units</b>	<b>Analysis</b>		<b>Date</b>	<b>Time</b>	<b>Method Analyst</b>
<b>E.coli</b>	<b>1001</b>	<b>824.0</b>	<b>6.3</b>	< 1	MPN/100ml	08/06/15	15:25	9223B	SCW	

<b>Sample ID:</b>	8B	13A	11	9						
<b>Lab Sample ID:</b>	146573.13	146573.14	146573.15	146573.16						
<b>Matrix:</b>	aqueous	aqueous	aqueous	aqueous						
<b>Date Sampled:</b>	8/6/15	8/6/15	8/6/15	8/6/15						
<b>Date Received:</b>	8/6/15	8/6/15	8/6/15	8/6/15	<b>Units</b>	<b>Analysis</b>		<b>Date</b>	<b>Time</b>	<b>Method Analyst</b>
<b>E.coli</b>	<b>&gt; 2419.6</b>	<b>&lt; 1.1</b>	<b>&gt; 2661.6</b>	<b>&gt; 2419.6</b>	MPN/100ml	08/06/15	15:25	9223B	SCW	

*E.coli*: Sample "12" had a volume of 80 mLs.  
*E.coli*: Sample "13" had a volume of 82 mLs.  
*E.coli*: Sample "14" had a volume of 100 mLs.  
*E.coli*: Sample "8A" had a volume of 100 mLs.  
*E.coli*: Sample "8B" had a volume of 100 mLs. All quantiwell were positive for *E.coli* resulting in a greater than value.  
*E.coli*: Sample "13A" had a volume of 93 mLs resulting in an elevated reporting limit.  
*E.coli*: Sample "11" had a volume of 93 mLs. All quantiwell were positive for *E.coli* resulting in a greater than value.  
*E.coli*: Sample "9" had a volume of 100 mLs. All quantiwell were positive for *E.coli* resulting in a greater than value.



**CHAIN-OF-CUSTODY RECORD**

146573

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

SAMPLE I.D.	SAMPLING DATE/TIME *IF COMPOSITE, INDICATE BOTH START & FINISH DATE/TIME	MATRIX (SEE BELOW)	GRAB/*COMPOSITE	VOC		SVOC		ICP METALS		INORGANICS		MICRO		OTHER	# OF CONTAINERS	NOTES MOSH VIAL #								
				524.2 524.2 BTEX 8260B 624 1, 4 DIOXANE	524.2 MTBE ONLY VTICS	8021B BTEX 8015B GRO 8270D 625 ABN A BN PAH	8015B DRO MAEPH	PEST 608 PEST 8081A PCB 608 PCB 8082	OIL & GREASE 1664 TPH 1664	TCLP 1311 YOC PEST	ABN METALS HERB	DISSOLVED METALS (LIST BELOW)	TOTAL METALS (LIST BELOW)				TS Br NO <sub>2</sub>	TSS Cl NO <sub>3</sub>	TDS F NO <sub>3</sub>	Spec. Con. SO <sub>4</sub> NO <sub>2</sub>	BOD CBOD TKN	T. Alk. T. Phos. NH <sub>3</sub>	O. Phos.	pH T. Res. Chlorine
11A	8/16/15 8:14	SW	G												1	*								
12	8/16/15 8:30	SW	G												1	*								
13	8/16/15 8:57	SW	G												1	*								
14	8/16/15 9:44	SW	G												1	*								
HL 75	8/16/15	SW	G												1	*								
HL 76	8/16/15	SW	G												1	*								
HL 8A	8/16/15 14:00	SW	G												1	*								
HL 8B	8/16/15 14:02	SW	G												1	*								
HL 13A	8/16/15 9:00	SW	G												1	*								
HL 200 11	8/16/15 8:12	SW	G												1	*								

MATRIX: A-AIR; S-SOIL; GW-GROUND WATER; SW-SURFACE WATER; DW-DRINKING WATER; WW-WASTE WATER  
 PRESERVATIVE: H-HCL; N-NHNO<sub>3</sub>; S-H<sub>2</sub>SO<sub>4</sub>; Na-NaOH; M-MEOH

PROJECT MANAGER: Heidi Lennay  
 COMPANY: Hoyle Tanner & Associates  
 ADDRESS: 156 Duss St.  
 CITY: Manchester, STATE: NH ZIP: 03101  
 PHONE: 603-669-5355 EXT.: 178  
 FAX: \_\_\_\_\_  
 E-MAIL: Heidi.Lennay@hoyletanner.com  
 SITE NAME: High Street WH  
 PROJECT #: 013629  
 STATE: NH MA ME VT OTHER: \_\_\_\_\_  
 REGULATORY PROGRAM: NPDES: RGP POTW STORMWATER OR  
 GWP, OIL FUND, BROWNFIELD OR OTHER: \_\_\_\_\_  
 QUOTE #: \_\_\_\_\_ PO #: \_\_\_\_\_

DATE NEEDED: 8/18/2015  
 QA/QC REPORTING LEVEL: A B C OR  
 PRESUMPTIVE CERTAINTY: \_\_\_\_\_  
 SAMPLER(S): Heidi Lennay & Amy Janson  
 RELINQUISHED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ RECEIVED BY: \_\_\_\_\_  
 RELINQUISHED BY: Heidi Lennay DATE: 8/15/15 TIME: 15:00 RECEIVED BY: [Signature]  
 RELINQUISHED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ RECEIVED BY: \_\_\_\_\_

TEMP: 57 °C  
 ICE?  YES  NO

METALS: 8 RCRA 13 PP FE, MN Pb, Cu  
 OTHER METALS: \_\_\_\_\_  
 SAMPLES FIELD FILTERED?  YES  NO  
 NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO, IF DIFFERENT)  
\* low volume  
 SITE HISTORY: \_\_\_\_\_  
 SUSPECTED CONTAMINATION: \_\_\_\_\_  
 FIELD READINGS: \_\_\_\_\_

