



Southeastern Vermont Watershed Alliance

2018 WQMP End of Year Report

LaRosa Program 012-18

Prepared by Ryan O'Donnell
March 2019

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Introduction

Southeastern Vermont Watershed Alliance’s (SeVWA) water quality monitoring program (WQMP) was made possible in 2018 by the LaRosa Partnership Program, dedicated teams of local volunteers, and E. coli analysis services provided by the laboratory at the Connecticut River Conservancy (CRC) in Greenfield, MA. SeVWA’s membership contributions and dues, funds contributed by some towns in southeast Vermont, and funds provided by a few businesses and organizations helped to support this program. The 2018 monitoring season was organized and run by SeVWA’s WQMP Coordinator, Ryan O’Donnell, the WQMP Committee and Local Stream Teams. They were assisted by EcoAmericorps member Billy Ernest.

In 2018, 40 volunteers monitored 32 sites that were sampled every two weeks on Wednesday mornings. All sites were scheduled to be sampled six times for E. coli, total nitrogen, total phosphorus, turbidity, and specific conductivity. Billy Ernest assisted with processing the E. coli samples at the CRC lab.

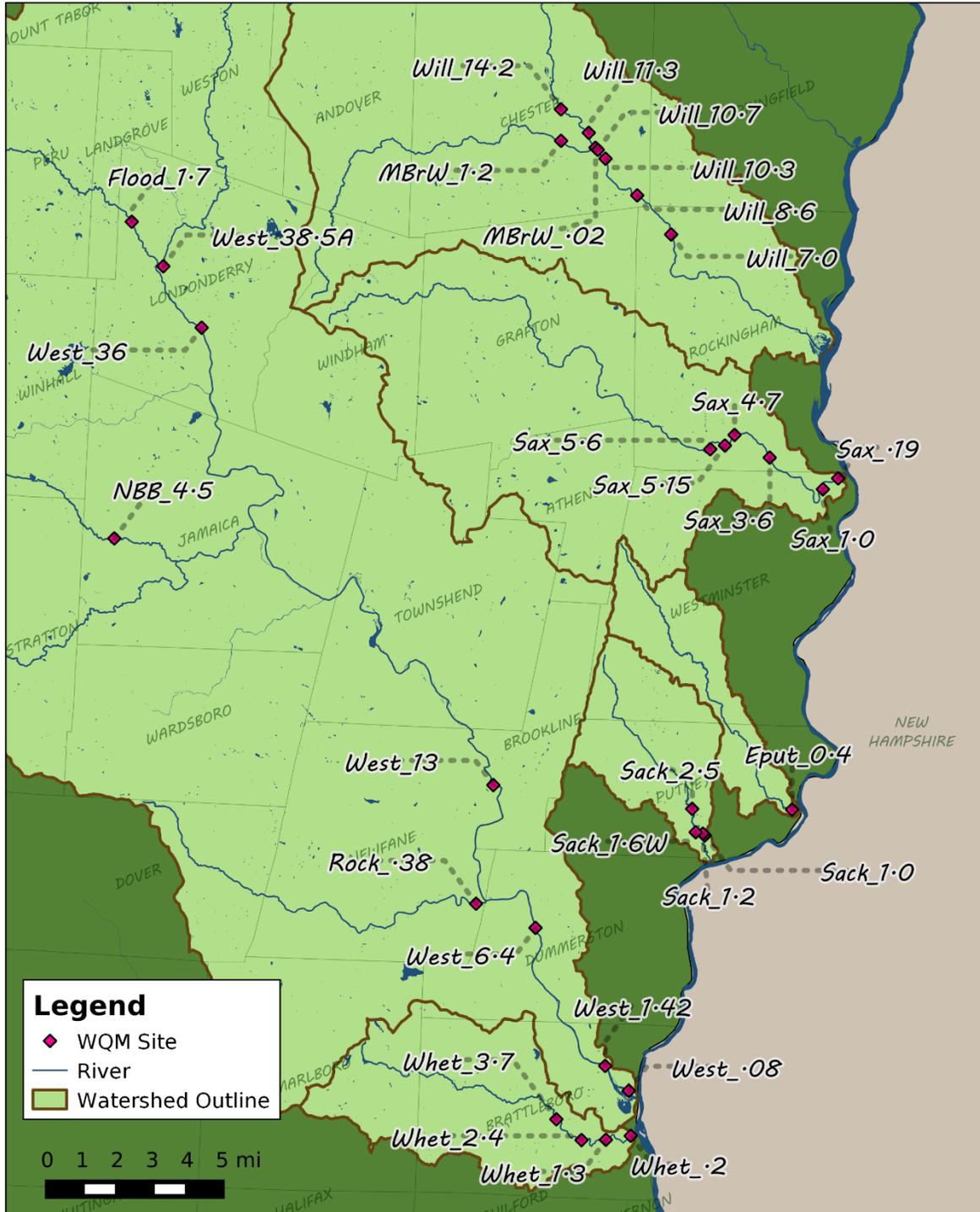
In 2010, Laurie Callahan was successful at procuring an incubator to be utilized by the CRC lab through the EPA Region 1 Equipment Loan grant program. This incubator, in addition to CRC’s two incubators, ensures that CRC will have adequate capacity for incubating SeVWA’s samples along with any other samples CRC processes.

Table 1 - 2017 Site Roster

| Site ID | Site Description | Town/Village | Latitude | Longitude |
|-----------------|---|-------------------|----------|-----------|
| West_08 | West River, Milk House Meadows | Brattleboro | 42.8694 | -72.5605 |
| West_1.42 | West River, Swimming hole behind Brattleboro Professional Center | Brattleboro | 42.87967 | -72.5738 |
| West_6.4 | West River, Dummerston covered bridge swimming hole | Dummerston | 42.9368 | -72.6132 |
| West_13 | West River, Brookline bridge, Hill Rd. | Brookline | 42.9959 | -72.6371 |
| West_36 | West River, Rows Rd. | South Londonderry | 43.185 | -72.8026 |
| West_38.5A | West River, 1/2 way between Londonderry & South Londonderry, Rte 100 just below Rte100 bridge | Londonderry | 43.21038 | -72.8244 |
| Rock_38 | Rock River, Indian Love Call swimming hole, just above West R. confluence & Rte30 bridge | Newfane | 42.94678 | -72.6467 |
| NBranchBrk_4.5 | North Branch Ball Mountain Brook, Pikes Falls swimming hole | Jamaica | 43.0976 | -72.8515 |
| Flood_1.7 | Flood Brook, End of Brophy Lane | Londonderry | 43.22878 | -72.8424 |
| Williams_14.2 | Williams River, Church St. (Above confl w Mid Br.) | Chester | 43.2758 | -72.5994 |
| Williams_11.3 | Williams River, Above Green Mtn Tpk & Pleasant St intersection | Chester | 43.2661 | -72.5836 |
| MBrWilliams_1.2 | Middle Branch Williams, School St Walking Bridge | Chester | 43.26275 | -72.5993 |
| MBrWilliams_.02 | Middle Branch Williams River, Just above Williams R. confluence | Chester | 43.2599 | -72.5798 |
| Williams_10.7 | Williams River, Rainbow Rock swimming hole | Chester | 43.25903 | -72.5785 |
| Williams_10.3 | Williams River, Below Chester WWTF | Chester | 43.25537 | -72.5741 |
| Williams_8.6 | Williams River, At railroad bridge below Missing Link Rd. & just below Halls Brook | Chester | 43.24018 | -72.5561 |
| Williams_7.0 | Williams River, Bartonsville bridge | Rockingham | 43.224 | -72.5369 |
| Saxtons_.19 | Saxtons River, "Sandy beach", just south of Bellows Falls & just above Rte 5 bridge | Westminster | 43.123 | -72.4424 |
| Saxtons_1.0 | Saxtons River, Below Twin Falls | Westminster | 43.11847 | -72.451 |
| Saxtons_3.6 | Saxtons River, above Barber Park Rd Bridge | Westminster | 43.1316 | -72.4811 |
| Saxtons_4.7 | Saxtons River, Off of Oak St, Below Main St Bridge | Westminster | 43.141 | -72.501 |
| Saxtons_5.15 | Saxtons River, Just above Saxtons River village WWTF | Saxtons River | 43.13661 | -72.5064 |
| Saxtons_5.6 | Saxtons River, Stickney's field swimming hole | Saxtons River | 43.13507 | -72.5147 |
| EPutney_0.4 | East Putney Brook, River Rd S culvert swimming hole | Putney | 42.98583 | -72.4686 |
| Sacketts_1.0 | Sacketts Brook, End of Mill St | Putney | 42.97512 | -72.5178 |
| Sacketts_1.2 | Sacketts Brook, below Paper Mill | Putney | 42.97584 | -72.5189 |
| Sacketts_1.6W | Sacketts Brook, Off Kimball Hill Rd | Putney | 42.97645 | -72.5229 |
| Sacketts_2.5 | Sacketts Brook, Portal Bridge swim hole | Putney | 42.98614 | -72.5249 |
| Whetstone_.2 | Whetstone Brook, Behind the former Brattleboro Coop | Brattleboro | 42.8507 | -72.5594 |
| Whetstone_1.3 | Whetstone Brook, off of Williams St | Brattleboro | 42.84906 | -72.5734 |
| Whetstone_2.4 | Whetstone Brook, Brattleboro Farmers Market, Western Ave. | Brattleboro | 42.84894 | -72.5871 |
| Whetstone_3.7 | Whetstone Brook, Vermont Land Trust Farm parcel | Brattleboro | 42.85753 | -72.6013 |

Figure 1 - Map of 2018 Sites

SeVWA 2018 Water Quality Monitoring



Quality Assurance & Determinations

Table 2 - Data Completeness

| Parameter | Analyzed By | # Anticipated Samples (including QC) | # Valid Samples Collected & Analyzed (including QC) | % Complete |
|-----------------------|-------------|--------------------------------------|---|------------|
| E. Coli | CRC | 228 | 225 | 99% |
| Total Nitrogen | VAEL | 228 | 224 | 98% |
| Total Phosphorus | | 228 | 218 | 96% |
| Turbidity | | 228 | 47 | 21% |
| Specific Conductivity | SeVWA | 228 | 215 | 94% |

Table 3 - Quality Control Completeness

| | Parameter | | | | |
|--|-----------|-----|-----|------|------|
| | E. Coli | TN | TP | Turb | Cond |
| Total Number of Samples | 225 | 224 | 218 | 47 | 215 |
| Total Number of Field Duplicates | 17 | 17 | 17 | 3 | 16 |
| % of Field Dups (Goal is ≥ 10%) | 8% | 8% | 8% | 6% | 7% |
| Total Number of Field Blanks | 17 | 17 | 17 | 3 | 15 |
| % of Field Blanks (Goal is ≥ 10%) | 8% | 8% | 8% | 6% | 7% |

Table 4 - Relative Percent Difference (RPD)

| Site ID | QC ID | Date | CRC | VAEL | | | SeVWA |
|-----------------|-------|-------|-------------------------------|------------|------------|----------------------------|------------|
| | | | E. coli | TN | TP | Turb | Cond |
| Flood_1.7 | QCA1 | 6/20 | 0% | 26% | 7% | N/A | 7% |
| NBranchBrk_4.5 | QCA2 | 6/20 | 11% | 0% | 12% | N/A | 3% |
| Rock_.38 | QCA3 | 6/20 | 54% | 5% | 16% | N/A | 7% |
| Williams_14.2 | QCA1 | 7/3 | 33% | 58% | 13% | N/A | 68% |
| Saxtons_5.6 | QCA2 | 7/3 | 35% | 56% | 4% | N/A | 67% |
| EPutney_0.4 | QCA3 | 7/3 | 14% | 43% | 27% | N/A | 11% |
| Saxtons_1.0 | QCA1 | 7/18 | 0% | 7% | 2% | 11% | N/A |
| West_13 | QCA2 | 7/18 | 64% | 4% | 11% | 11% | 3% |
| Williams_11.3 | QCA3 | 7/18 | 43% | 0% | 81% | 10% | 0% |
| Saxtons_5.15 | QCA1 | 8/1 | 1% | 6% | 3% | N/A | 4% |
| Sacketts_2.5 | QCA2 | 8/1 | 37% | 0% | 3% | N/A | 0% |
| Whetstone_2.4 | QCA3 | 8/1 | 6% | 11% | 19% | N/A | 1% |
| West_6.4 | QCA1 | 43327 | 14% | 5% | N/A | N/A | 12% |
| MBrWilliams_1.2 | QCA2 | 43327 | 11% | 0% | 6% | N/A | 1% |
| Saxtons_4.7 | QCA3 | 43327 | 3% | 5% | 6% | N/A | 4% |
| Sacketts_1.6W | QCA1 | 43341 | 0% | 4% | 2% | N/A | 0% |
| West_1.42 | QCA3 | 43341 | 26% | 8% | 11% | N/A | N/A |
| Mean RPD | | | 21% | 14% | 14% | 11% | 13% |
| RPD Goal | | | ≤50% ≤125 % (< 25 mpn) | ≤20% | ≤30% | ≤15% ≤50% (< 2 NTU) | ND |

$$\text{RPD formula used: } RPD_{\text{field duplicate pair}} = \frac{|sample_1 - sample_2|}{\text{Average}(sample_1, sample_2)}$$

Table 5 - Field Blank Results

| Date | Site ID | QC ID | E. coli | TN | TP | Turb | Cond |
|------------------------|----------------|-------|----------|------------|----------|------------|----------|
| 6/20/2018 | West_36 | QCB1 | < 1 | < 0.1 | < 5 | NT | 5.8 |
| 6/20/2018 | West_.8 | QCB2 | < 1 | < 0.1 | < 5 | NT | NT |
| 6/20/2018 | MBrWilliams_.2 | QCB3 | < 1 | < 0.1 | < 5 | NT | 3.2 |
| 7/3/2018 | NBranchBrk_4.5 | QCB1 | < 1 | < 0.1 | < 5 | NT | NT |
| 7/3/2018 | Saxtons_3.6 | QCB2 | < 1 | < 0.1 | < 5 | NT | 8.5 |
| 7/3/2018 | Sacketts_1.2 | QCB3 | < 1 | < 0.1 | < 5 | NT | 10.4 |
| 7/18/2018 | Whetstone_.2 | QCB1 | < 1 | < 0.1 | < 5 | < 0.2 | 4.3 |
| 7/18/2018 | Williams_1.7 | QCB2 | < 1 | < 0.1 | < 5 | < 0.2 | 1.8 |
| 7/18/2018 | Whetstone_1.3 | QCB3 | < 1 | < 0.1 | 14.5 | 0.38 | 2.3 |
| 8/1/2018 | Sacketts_1.0 | QCB1 | < 1 | < 0.1 | < 5 | NT | 10 |
| 8/1/2018 | Williams_10.3 | QCB2 | < 1 | < 0.1 | < 5 | NT | 2 |
| 8/1/2018 | Saxtons_.19 | QCB3 | < 1 | < 0.1 | < 5 | NT | 5.7 |
| 8/15/2018 | Whetstone_3.7 | QCB1 | < 1 | < 0.1 | < 5 | NT | 7.1 |
| 8/15/2018 | Williams_8.6 | QCB2 | < 1 | < 0.1 | < 5 | NT | 3.8 |
| 8/15/2018 | Sacketts_1.6 | QCB3 | < 1 | < 0.1 | < 5 | NT | 2.6 |
| 8/29/2018 | Williams_7.0 | QCB1 | < 1 | < 0.1 | < 5 | NT | 2.9 |
| 8/29/2018 | EPutney_.04 | QCB2 | < 1 | < 0.1 | 640 | NT | 203 |
| 8/29/2018 | West_6.4 | QCB3 | < 1 | < 0.1 | 491.5 | NT | 205.2 |
| Reporting Limit | | | 1 | 0.1 | 5 | 0.2 | 0 |

In 2018, SeVWA collected samples to test for *E. coli*, total nitrogen (TN), total phosphorus (TP), turbidity, and specific conductivity; volunteers also recorded air and water temperature measurements at each site using an alcohol thermometer while collecting their samples. *E. coli* samples were analyzed by the CRC lab in Greenfield, MA; TN, TP, and turbidity samples were analyzed by the Vermont Environmental and Agricultural Laboratory (VAEL); and conductivity samples were analyzed by SeVWA using a meter.

Data Completeness: *E. coli*, total nitrogen, total phosphorus, and conductivity met the data completeness goal of 90%. After the creation of the sampling plan, SeVWA was asked to vastly reduce the number of turbidity samples we sent in to be analyzed to about 50. Unfortunately, this was a last minute change and was not handled strategically by SeVWA, so the samples that were sent in were haphazardly selected and do not contribute to any sort of water quality understanding of these watersheds.

Quality Control Completeness: All parameters failed to meet the QC goal of 10% for field duplicates (see Table 3 - Quality Control Completeness). The field duplicate schedule was developed rounding down to 3 per sampling event at the request of the LaRosa program; the highest possible QC percentage using this schedule is 8%; all parameters were between 6% and 8%.

All parameters failed to meet the QC goal of 10% for field blanks (see Table 3 - Quality Control Completeness). The field blank schedule was developed rounding down to 3 per sampling event at the request of the LaRosa program; the highest possible QC percentage using this schedule is 8%; all parameters were between 6% and 8%.

Field Duplicates: Most field duplicates were within acceptable RPD goals except for 4 duplicate pairs (see Table 4 - Relative Percent Difference (RPD)). No results were rejected due to exceeding the RPD goal, although we chose to use one duplicate value in average calculations as it was slightly more consistent with results from that site. See the discussion of QA anomalies below for more information. All RPD means for the 2018 season were within acceptable ranges.

Field Blanks: Most field blanks were at or below the detection limit for all parameters. On 7/18/18, QCB2 seems to have been contaminated with sediment of some sort; this is consistent with observations that sometimes lab DI water arrives with sediment in the bottom of the bottle, but we have no other water to use. On 8/29/19, both QCB2 and QCB3 tested extremely high in Total Phosphorus and Conductivity; it is believed that the lab water was contaminated before arrival. Based on these three failures, SeVWA recommends VAEL review their handling procedures for DI water and their containers.

E. coli: All *E. coli* samples were delivered to the CRC lab within the 6 hours of sample collection and were set up for testing within the allotted 8-hour time frame. Although not all samples were below 4°C upon delivery, all samples showed evidence of cooling during transport. The CRC lab met all other QA criteria for *E. coli* testing. Nearly all *E. coli* field duplicates were below the RPD goal of 50% for samples ≥ 25 MPN or 125% for < 25 MPN. See the discussion of QA anomalies below for more information.

Total Nitrogen: Three TN duplicate pairs exceeded their RPD goal but were not rejected. See the discussion of QA anomalies below for more information.

Total Phosphorus: One TP result exceeded its RPD goal but was not rejected. Two TP values not associated with a duplicate pair were rejected for being atypically high and were likely contaminated. See QA anomaly discussion below for more information.

Turbidity: In January 2015, e-mail discussions between SeVWA and Jim Kellogg resulted in SeVWA deciding to accept turbidity RPD values of up to 50% for initial values below 2 NTU in addition to the accepted RPD goal of up to 15%. After still inconsistent RPD results for several years, SeVWA did its own turbidity analysis in 2015 with more success with consistent duplicate results. In 2016 and 2017, SeVWA decided to send its turbidity samples to VAEL. All turbidity field duplicates met the newer RPD goals except for 3 which were accepted due to approaching the detection limit of the test. See QA anomaly discussion below for more information.

Specific Conductivity: SeVWA continued conductivity analysis in 2018. Conductivity results were recorded on a log sheet for each analysis run and those log sheets are retained with field data sheets from the same sampling day. No conductivity results were rejected. SeVWA does not have information regarding RPD criteria for conductivity but all some RPDs were higher than average. This may be attributed to using a different meter than in years' past. SeVWA will be reviewing the conductivity testing procedures to reduce variance in testing.

Temperature: All thermometers used for air and water temperatures were calibrated with a NIST thermometer at the CRC laboratory before the 2018 monitoring season began.

QA Anomalies not resulting in data rejection:

- 7/3/18, Williams_14.2 & QCA1, Saxtons_6.5 & QCA2, EPutney_0.4 & QCA3, TN – All three duplicate pairs exceeded RPD goal of 20%, samples were not acidified within 24 hours due to July 4th holiday, however values were consistent with samples up and downstream and were not rejected
- 7/18/18, Williams_11.3 & QCA3, TP – Duplicate pair exceeded RPD goal of 30%, both values from pair were consistent with values observed at this site

QA Anomalies resulting data rejection:

- 6/20/18, Saxtons_1.6W, and 8/1/18, Saxtons_3.6 – Samples were flagged for being outside the scope of expected results and may have been contaminated; results were rejected and not used in calculations for this report

Preliminary Synopsis of Results

This overview is intended as a preliminary synopsis of results generated by the project. Full results can be found in the Appendix of this report.

West River Watershed

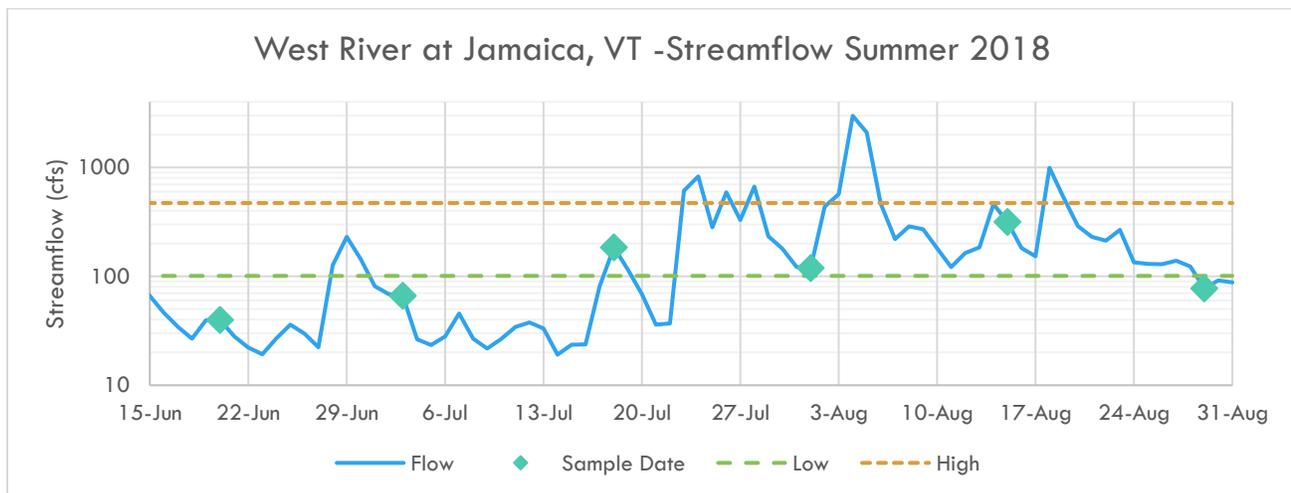
SeVWA monitored six sites on the West River and one site each on three tributaries to the West River: the Flood Brook, the North Branch Ball Mountain Brook, and the Rock River. All sites are classified as cold water Class B. Pikes Falls on the North Branch Brook is classified as an Outstanding Water Resource. Sites were tested for *E. coli*, total nitrogen, total phosphorus, turbidity, and specific conductivity. Turbidity samples were collected sporadically on some wet weather days at the request of the LaRosa Program.

TABLE 6- WEST RIVER WATERSHED FLOW OBSERVATIONS

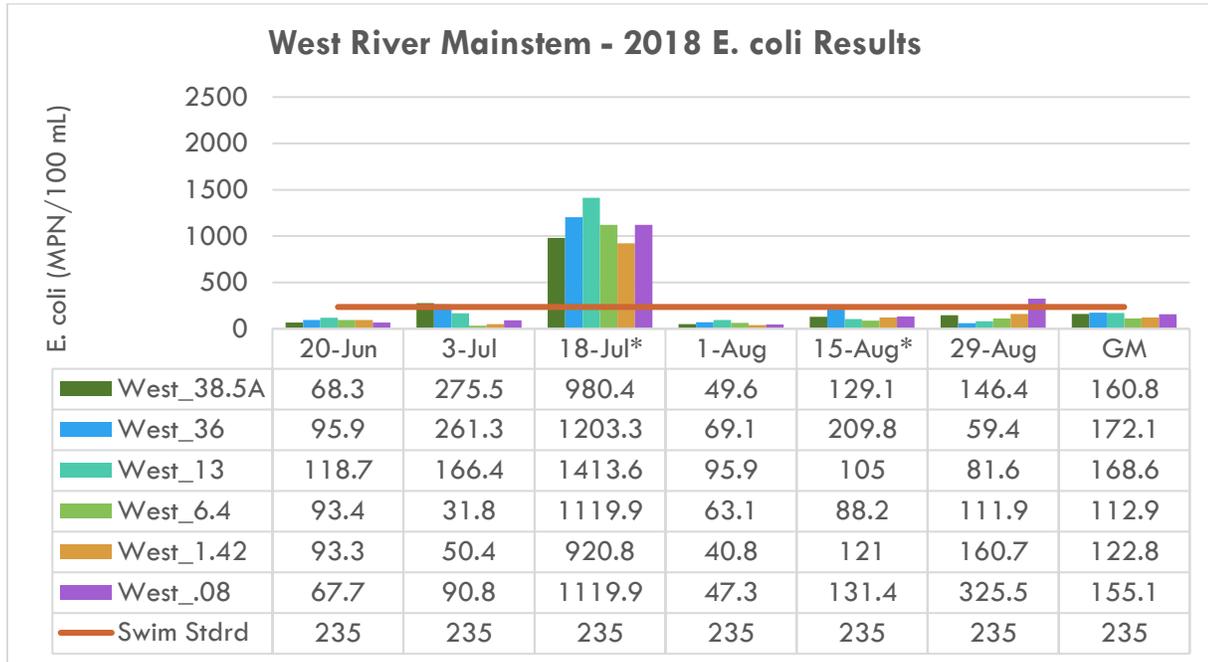
| Site | 6/20/2018 | | 7/3/2018 | | 7/18/2018 | | 8/1/2018 | | 8/15/2018 | | 8/29/2018 | |
|----------------|-----------|------|----------|------|-----------|-------|----------|-------|-----------|-------|-----------|------|
| | Level | Type | Level | Type | Level | Type | Level | Type | Level | Type | Level | Type |
| West_38.5A | mod | base | mod | base | mod | fresh | mod | fresh | mod | fresh | low | base |
| West_36 | mod | base | mod | base | mod | fresh | mod | fresh | mod | fresh | low | base |
| West_13 | mod | base | mod | base | high | fresh | mod | base | high | fresh | mod | base |
| West_6.4 | mod | base | low | base | high | fresh | mod | base | high | fresh | mod | base |
| West_1.42 | low | base | mod | base | mod | fresh | mod | base | high | fresh | low | base |
| West_.08 | low | base | mod | base | mod | fresh | high | fresh | high | fresh | high | base |
| Flood_1.7 | mod | base | mod | base | mod | fresh | mod | fresh | mod | fresh | low | base |
| NBranchBrk_4.5 | mod | base | mod | base | high | fresh | high | fresh | high | fresh | mod | base |
| Rock_.38 | low | base | mod | base | high | fresh | mod | base | high | fresh | NR | NR |

Volunteers are required to note the level and type of flow observed at each site at the time of sampling, presented above. These observations are inherently subjective, based on individual observations at specific sites. The West River has a USGS gage located in Jamaica, which is in the middle of the portion we monitor and upstream of the flood control dam in Townshend. The lowest reaches of the West River are sometimes subjected to backwater coming up the Connecticut River from the Vernon Dam. According to observations at the USGS gage, 6/20, 7/3, and 8/29 occurred during low flows and 7/18, 8/1, and 8/15 occurred during moderate flows.

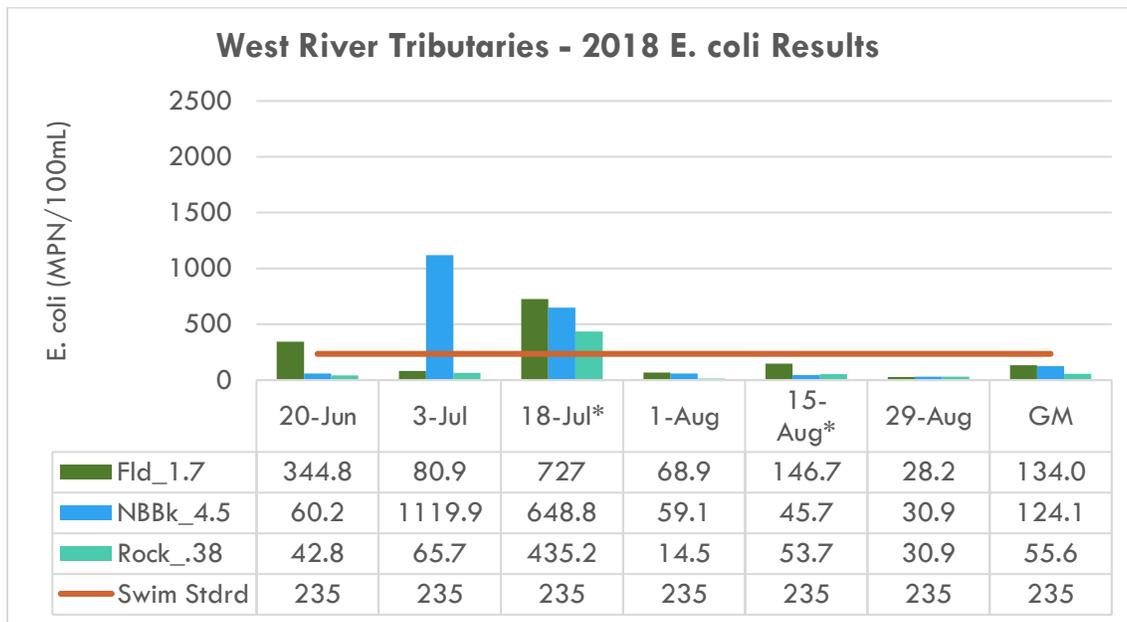
FIGURE 2 - WEST RIVER STREAMFLOW SUMMER 2018



The results for each parameter tested are presented in the graphs below.



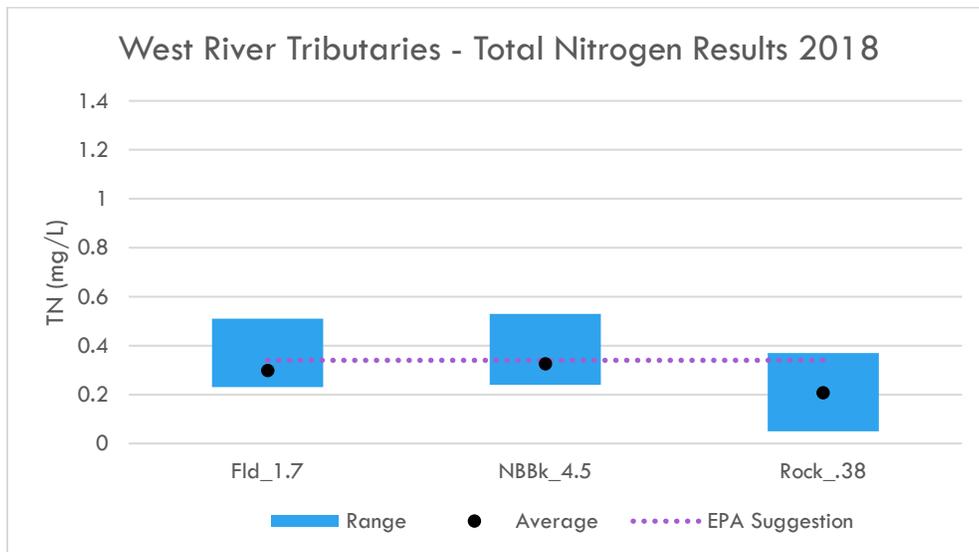
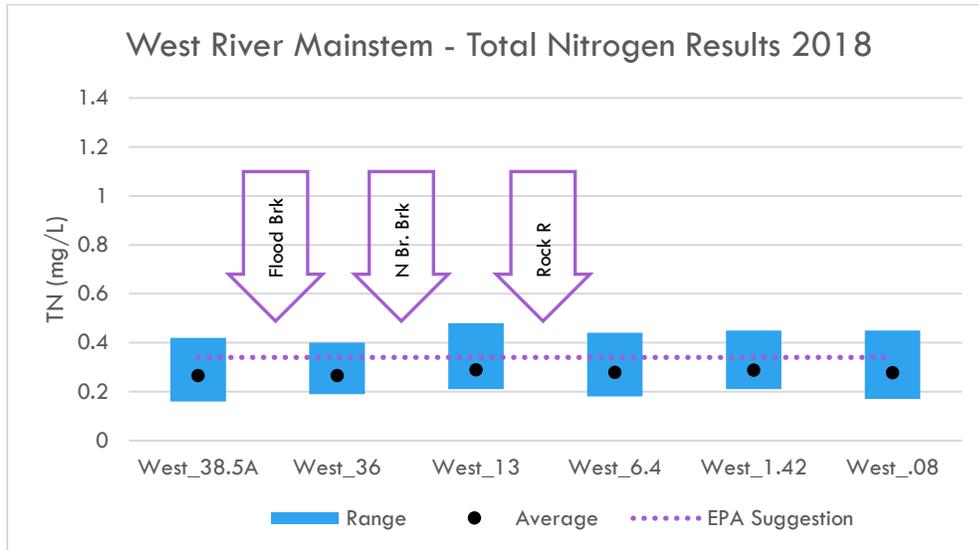
* Wet weather (>0.1" rain) in 24 hours prior to sampling



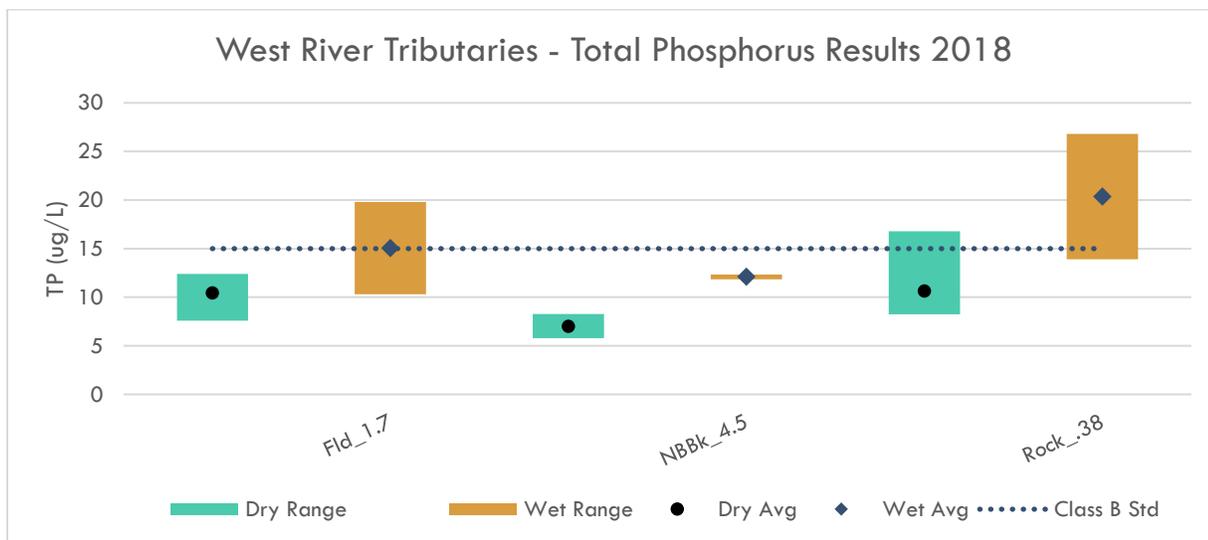
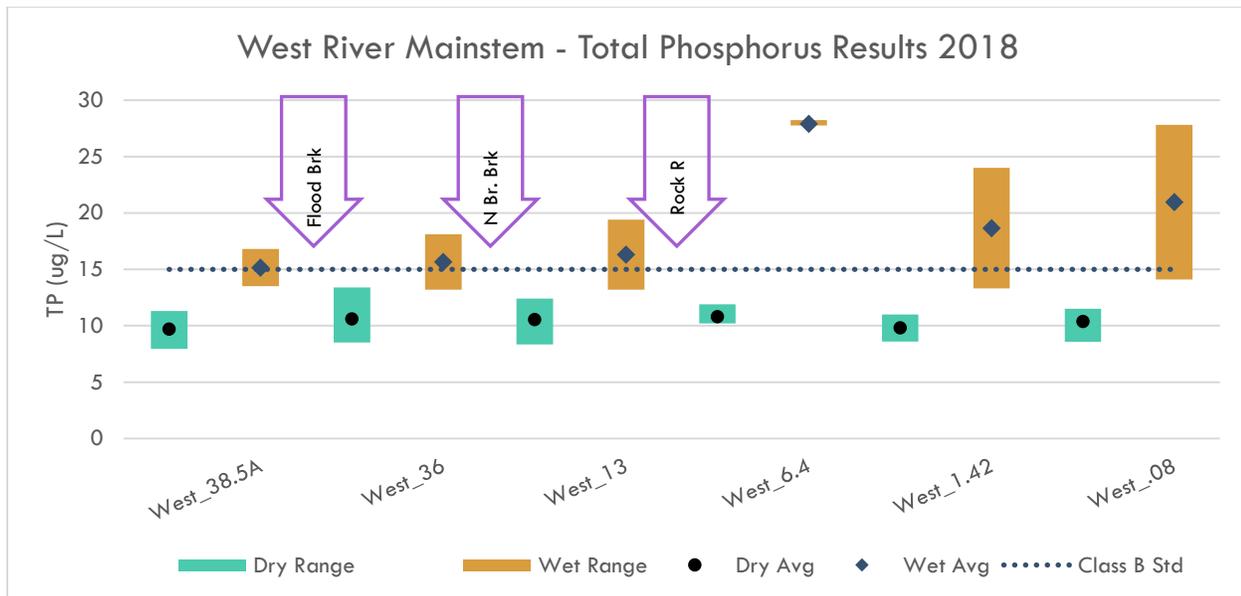
* Wet weather (>0.1" rain) in 24 hours prior to sampling

West_6.4, West_1.42, NBranchBrk_4.5, and Rock_.38 were the sites that had acceptable geometric means (GM) below the Vermont standard of 126 E. coli/100 mL. Heavy rains before sampling on July 18th had high results which pushed 2018 geometric means higher than in years' past. Most sites were below or just over the swimming standard of 235 MPN E. coli/100 mL on other sampling dates, including the other wet weather day, August 15th. There was an abnormally high result at NBranchBrk_4.5, Pikes Falls, on July 3rd; no cause was easily identified and

it seems to have dissipated after that. West_38.5A (Halfway between Londonderry and South Londonderry) and West_36 (Rowes Rd) are in a statewide bacteria TMDL project area.

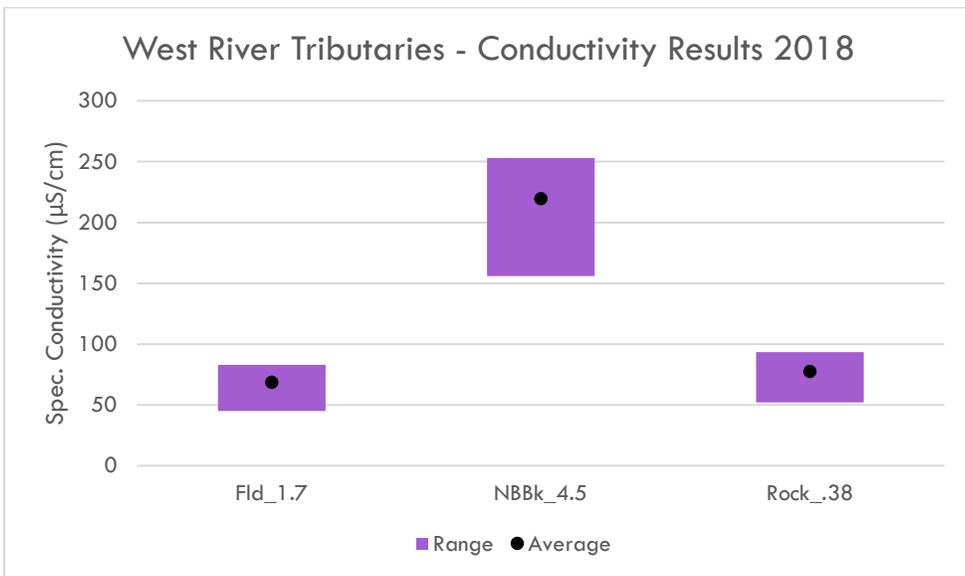
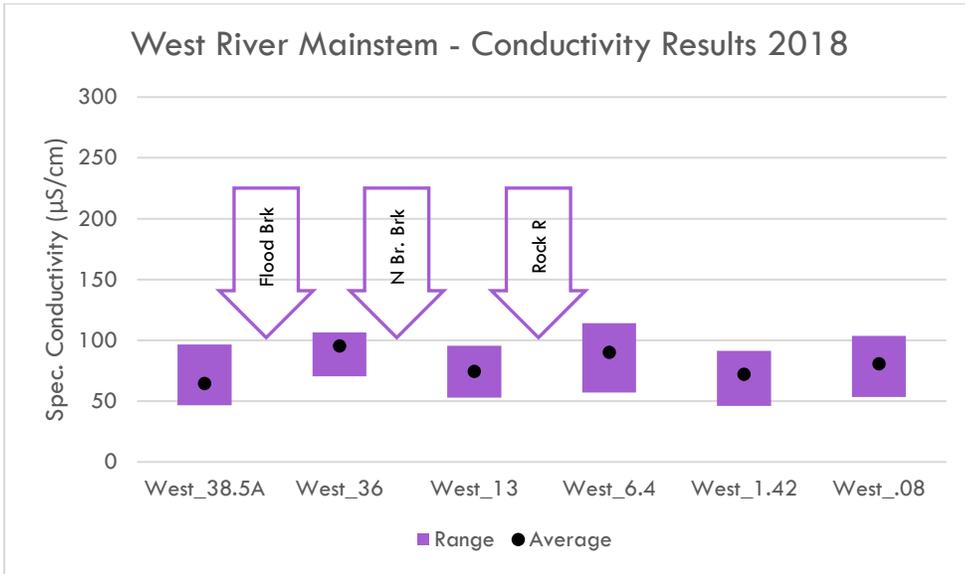


The averages for all sites on the mainstem and tributaries were below the Vermont standard of 5.0 mg-N/L as well as the EPA’s current suggested standard of 0.34 mg-N/L. The sites all had similar ranges and averages with the Rock River results coming in the lowest.



The TP results above are broken down by wet and dry weather sampling days. All site averages were below the Vermont standard for cold water streams of 15 µg-P/L during dry weather and all except the North Branch Brook site averages were above the standard in wet weather. The lower sites on the West mainstem have had higher nutrient levels for the past few years, so it may be worth investigating sources. Higher phosphorus results on the tributary sites are likely due to sediment from erosion.

Volunteers collected turbidity samples, but most were not processed at the request of the LaRosa program. The results can be found in the data appendix but there are not enough data points for an accurate discussion in this report.



There is no standard for conductivity in Vermont and no site stands out as particularly concerning. NBranchBrk_4.5 (Pikes Falls) has consistently had the highest conductivity results of any site that SeVWA monitors and this has been attributed to local geology. SeVWA plans to test chlorides at that site in 2019 to investigate that claim.

Whetstone Brook

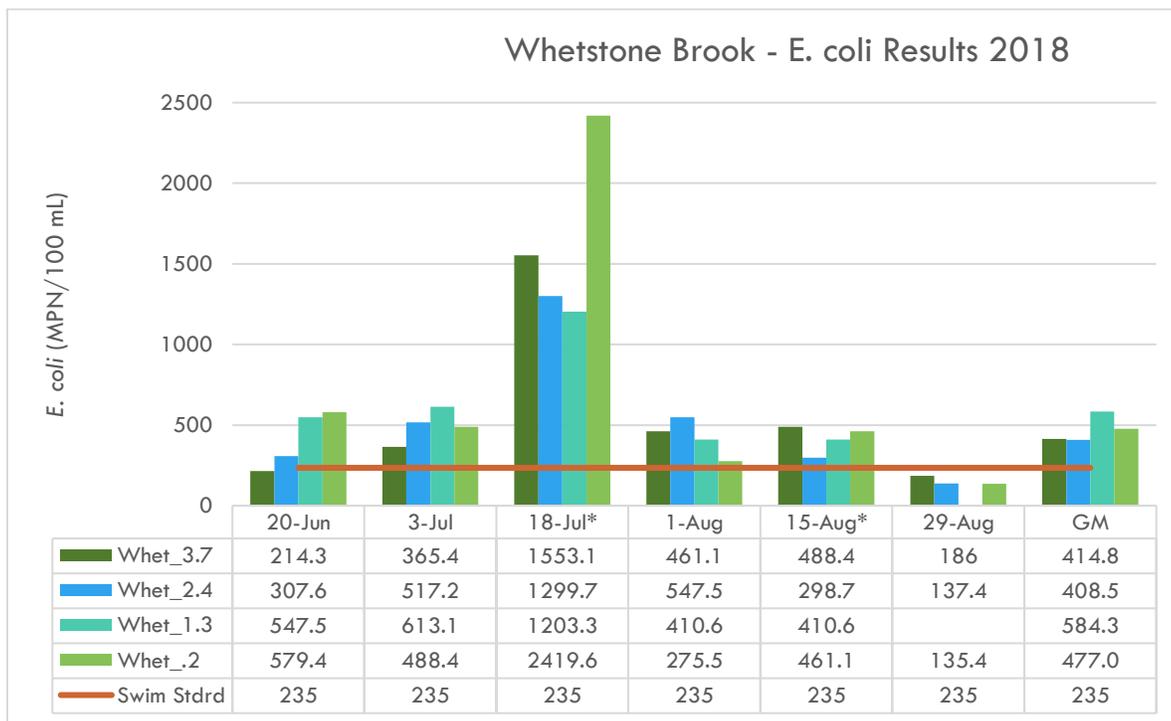
SeVWA monitored four sites on the Whetstone Brook. All sites are classified as cold water Class B. Sites were tested for *E. coli*, total nitrogen, total phosphorus, turbidity, and specific conductivity. Turbidity samples were collected sporadically on some wet weather days at the request of the LaRosa Program.

TABLE 7 - WHETSTONE BROOK STREAMFLOW OBSERVATIONS

| Site | 6/20/2018 | | 7/3/2018 | | 7/18/2018 | | 8/1/2018 | | 8/15/2018 | | 8/29/2018 | |
|---------------|-----------|------|----------|------|-----------|-------|----------|------|-----------|-------|-----------|------|
| | Level | Type | Level | Type | Level | Type | Level | Type | Level | Type | Level | Type |
| Whetstone_3.7 | mod | base | mod | base | mod | fresh | mod | base | mod | fresh | mod | base |
| Whetstone_2.4 | mod | base | mod | base | mod | fresh | mod | base | mod | fresh | mod | base |
| Whetstone_1.3 | low | base | low | base | high | fresh | mod | base | high | fresh | NT | NT |
| Whetstone_.2 | mod | base | mod | base | high | fresh | mod | base | high | fresh | mod | base |

Volunteers are required to note the level and type of flow observed at each site at the time of sampling, presented above. These observations are inherently subjective, based on individual observations at specific sites. The Whetstone River does not have a USGS gage to corroborate these observations and there is no clear surrogate gage in a similar watershed nearby. According to observations at the other USGS gages in SeVWA's monitoring area, the flows levels were low on 6/20 and 7/3, low to moderate on 7/18, moderate on 8/1, moderate to high on 8/15, and low to moderate on 8/29.

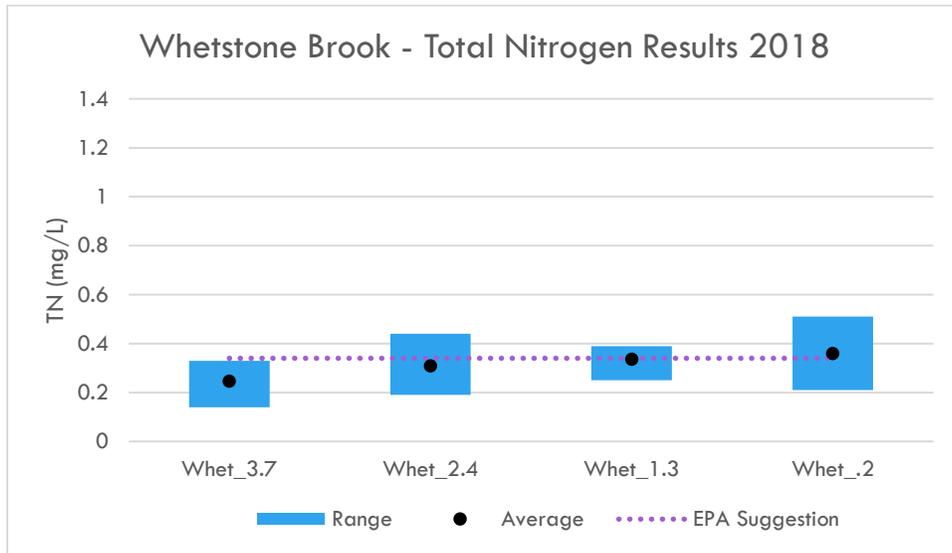
The results for all parameters tested are presented in the graphs below.



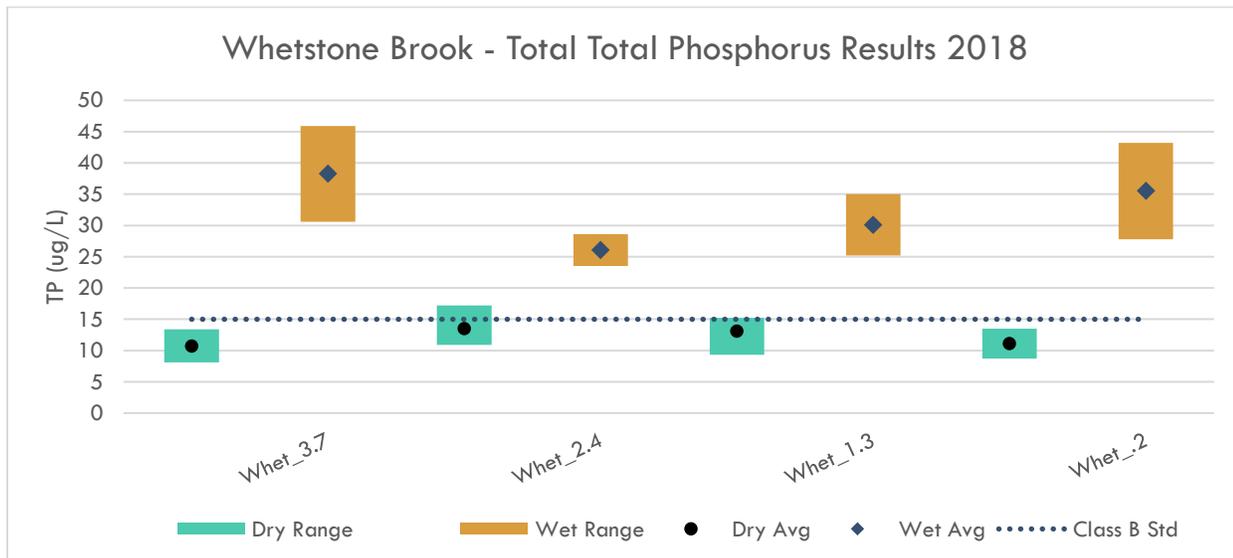
* Wet weather (>0.1" rain) in 24 hours prior to sampling

(*E. coli* discussion is on the following page.)

Most results were above the recommended level for primary contact recreation of 235 MPN/100 mL and all sites exceeded the water quality standard of a geometric mean of 126 MPN/100 mL. The Whetstone Brook is in a statewide bacteria TMDL project area. CRC and some VT officials are working with a landowner upstream of all these sites to address an issue with manure.

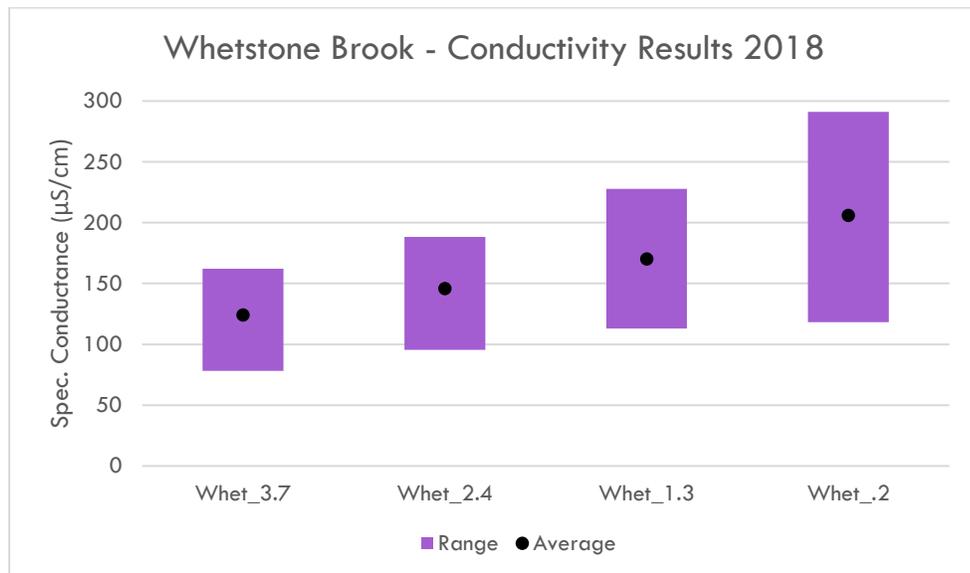


The averages for all Whetstone Brook sites were below the Vermont standard of 5.0 mg-N/L as well as the EPA's current suggested standard of 0.34 mg-N/L. Nitrogen concentrations seem to increase moving from upstream to downstream.



All sites tended to meet the Vermont standard of 15 µg/L when sampled during dry weather. All sites also greatly exceeded this standard in wet weather. The Whetstone Brook watershed has some significant mass failures that shed sediment during wet weather or high flows which may be contributing a significant amount of phosphorus to the water.

Volunteers collected turbidity samples, but most were not processed at the request of the LaRosa program. The results can be found in the data appendix but there are not enough data points for an accurate discussion in this report.



There is no standard for conductivity in Vermont. Conductivity increases from upstream to downstream, which is expected. The Whetstone Brook tends to have higher conductivity than other rivers that SeVWA monitors.

Williams River

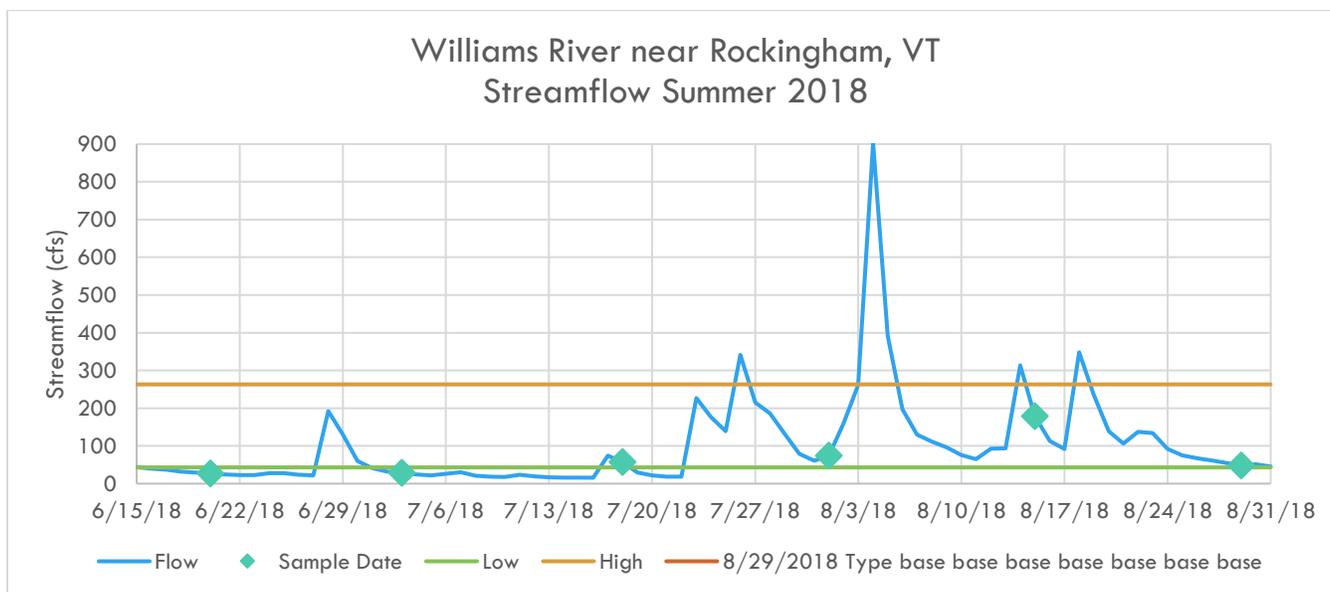
SeVWA monitored six sites on the Williams River and two on the Middle Branch Williams River. The Middle Branch Williams River enters the mainstem Williams between Williams_14.2 and Williams_10.7. All sites are classified as cold-water class B. Sites were tested for *E. coli*, total nitrogen, total phosphorus, turbidity, and specific conductivity.

TABLE 8 - WILLIAMS RIVER WATERSHED FLOW OBSERVATIONS

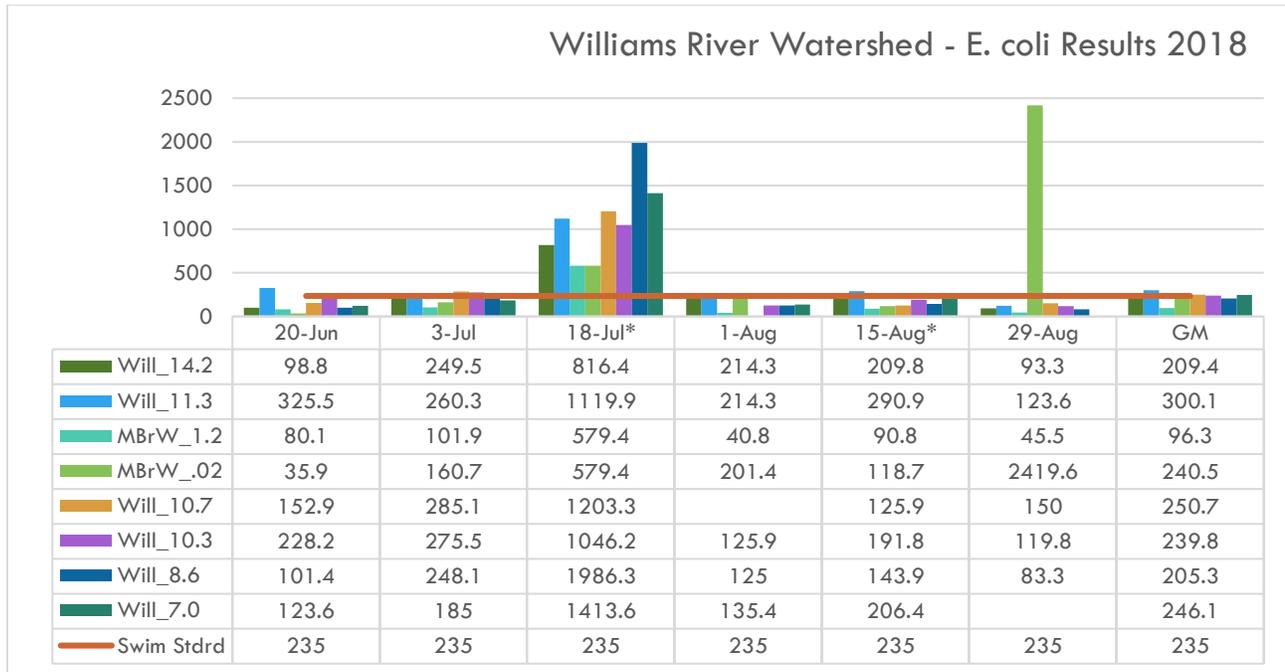
| Site | 6/20/2018 | | 7/3/2018 | | 7/18/2018 | | 8/1/2018 | | 8/15/2018 | | 8/29/2018 | |
|-----------------|-----------|------|----------|------|-----------|-------|----------|------|-----------|-------|-----------|------|
| | Level | Type | Level | Type | Level | Type | Level | Type | Level | Type | Level | Type |
| Williams_14.2 | low | base | low | base | mod | fresh | mod | base | mod | base | low | base |
| Williams_11.3 | low | base | mod | base | mod | fresh | mod | base | mod | base | mod | base |
| MBrWilliams_1.2 | low | base | low | base | mod | fresh | low | base | mod | base | mod | base |
| MBrWilliams_.02 | mod | base | mod | base | mod | fresh | mod | base | mod | fresh | mod | base |
| Williams_10.7 | mod | base | mod | base | NR | NR | NT | NT | mod | base | mod | base |
| Williams_10.3 | low | base | low | base | mod | fresh | low | base | mod | base | mod | base |
| Williams_8.6 | low | base | low | base | mod | fresh | mod | base | mod | fresh | mod | base |
| Williams_7.0 | low | base | low | base | mod | fresh | low | base | mod | fresh | NT | NT |

Volunteers are required to note the level and type of flow observed at each site at the time of sampling, presented above. These observations are inherently subjective, based on individual observations at specific sites. The Williams River has a USGS gage located in Rockingham, which is downstream of the portion we monitor. According to observations at the USGS gage, 6/20 and 7/3 were low flows and the rest were moderate.

FIGURE 3 - WILLIAMS RIVER STREAMFLOW SUMMER 2018

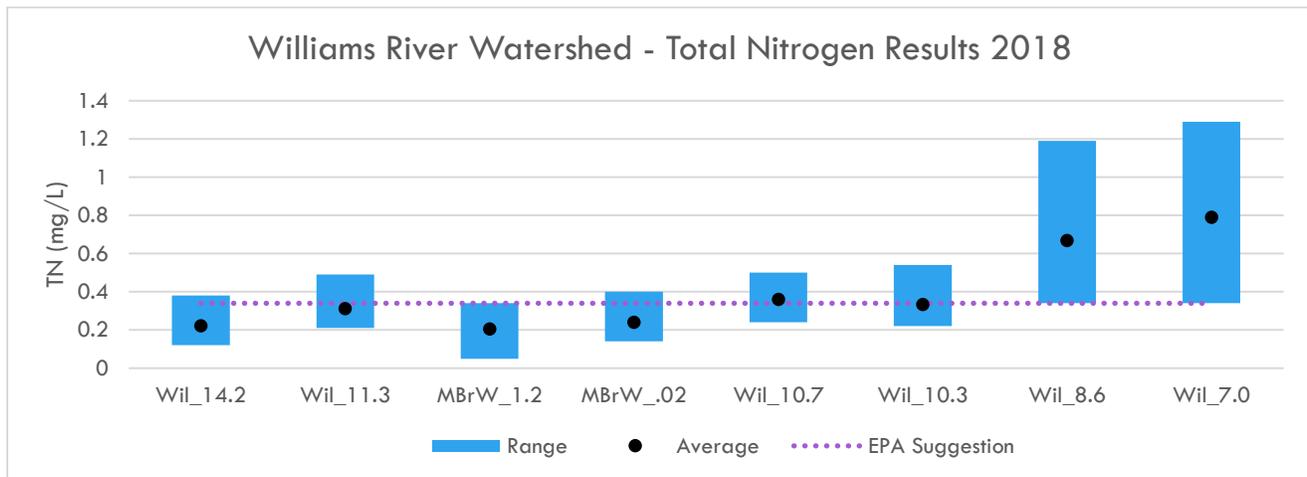


The results for each parameter are presented in the graphs below.

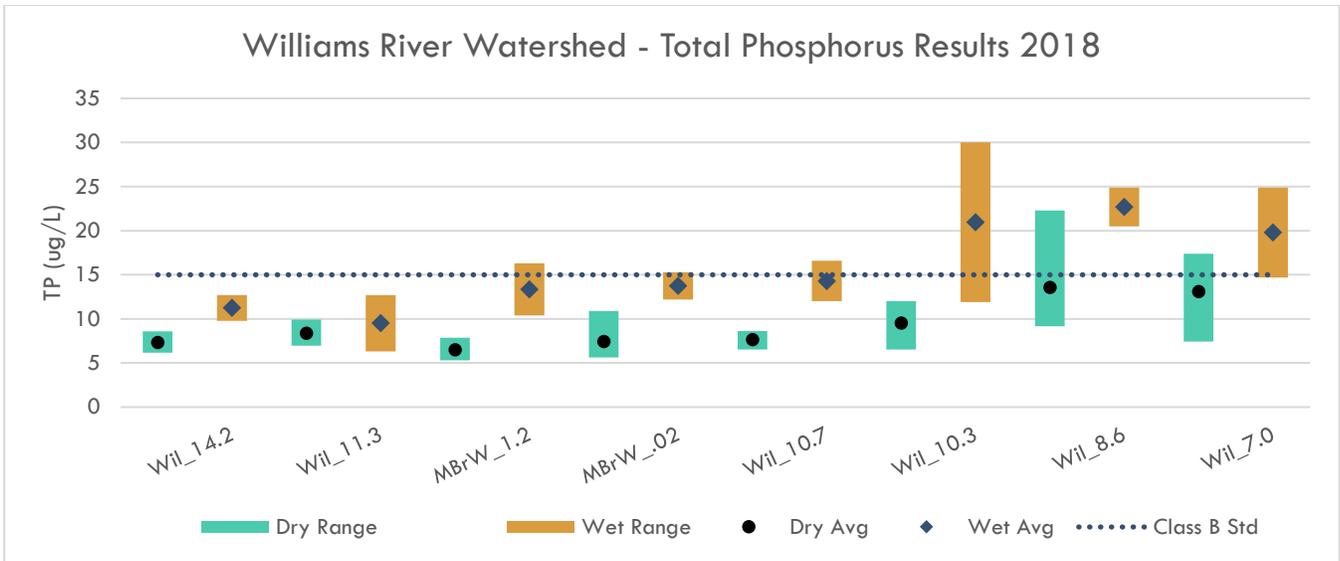


* Wet weather (>0.1" rain) in 24 hours prior to sampling

Most results hovered right around the recommended level for primary contact recreation of 235 MPN/100 mL and all sites except MBrWilliams_1.2 exceeded the water quality standard of a geometric mean of 126 MPN/100 mL. There was one atypical result on Aug 29th at MBrWilliams_02 (Just above Williams R confluence) no cause was identified on the field sheet however there is also no reason to believe that the sample was contaminated.

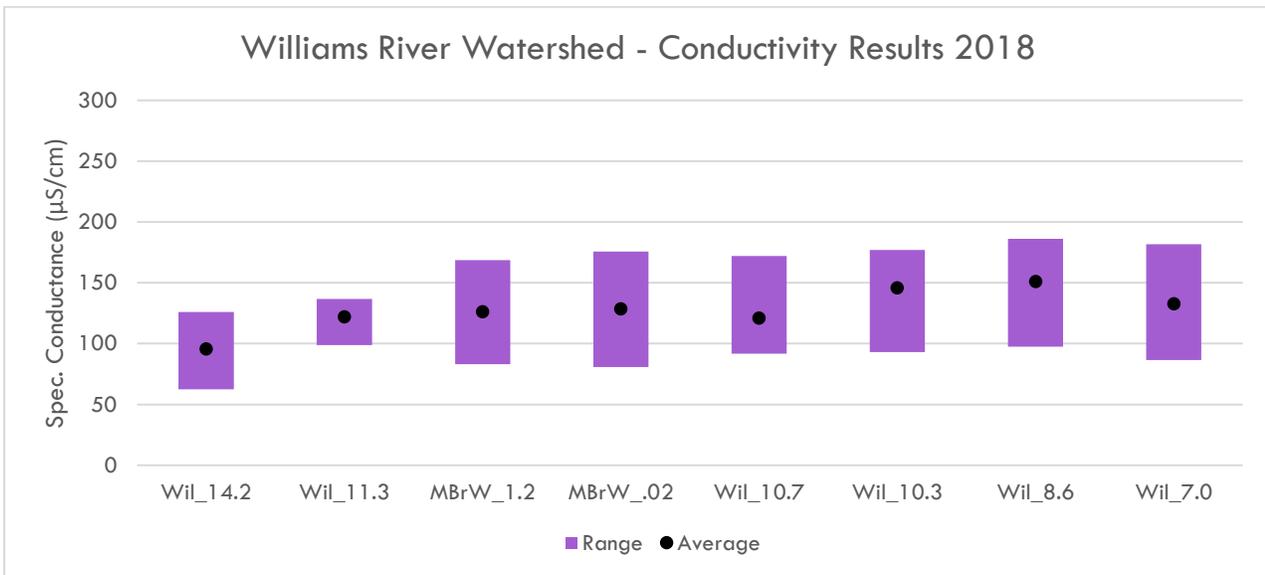


The averages for all Williams River watershed sites were well below the Vermont standard of 5.0 mg-N/L and most were below the EPA's current suggested standard of 0.34 mg-N/L. The nitrogen concentrations increase greatly between Williams_10.3 (Below Chester WWTF) and Williams_8.6 (Missing Link Rd), as the river passes through some heavy agricultural land use.



All sites tended to meet the Vermont standard of 15 $\mu\text{g/L}$ when sampled during dry weather until. Sites sampled during wet weather also met this standard until Williams_10.3 (Downstream of Chester WWTF). As noted in the section about Williams River Watershed total nitrogen, the lowest two sites are heavily agricultural.

Volunteers collected turbidity samples, but most were not processed at the request of the LaRosa program. The results can be found in the data appendix but there are not enough data points for an accurate discussion in this report.



There is no standard for conductivity in Vermont and no site stands out as particularly concerning. Conductivity increases moving from upstream to downstream which also correlates with moving into more development in the watershed. The lowest two sites are not significantly different which may suggest that the nitrogen and phosphorus present in those samples are not in the form of dissolved ions.

Saxtons River

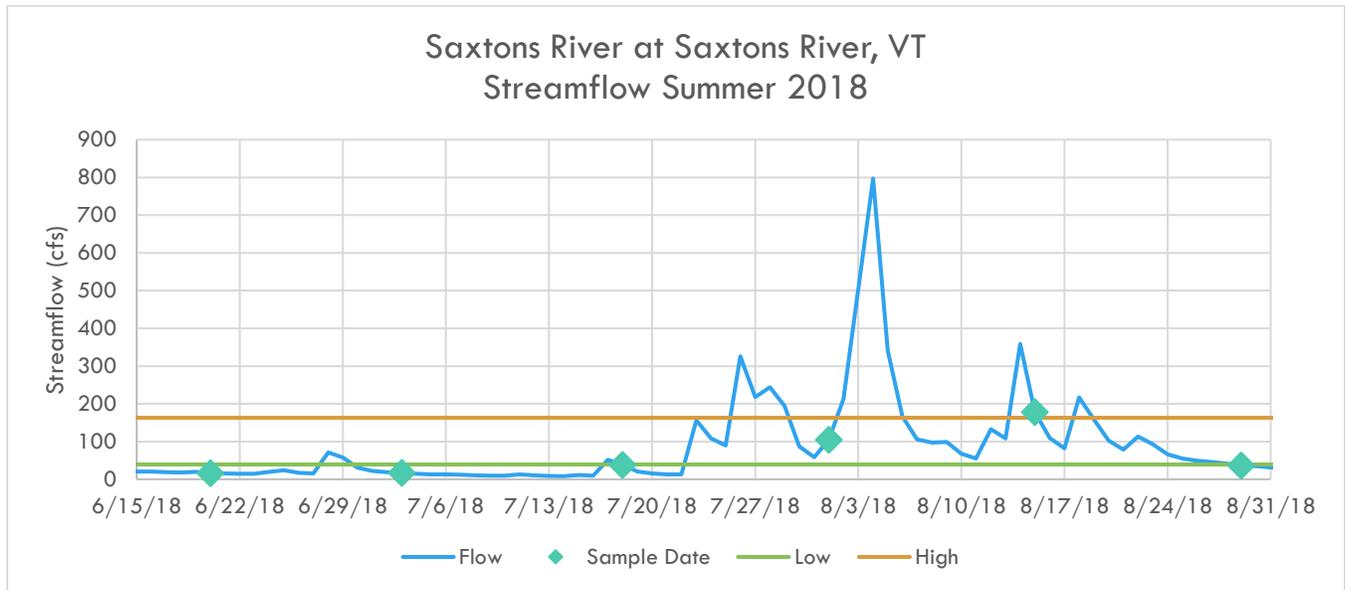
SeVWA monitored five sites on the Saxtons River. All sites are classified as cold-water class B. Sites were tested for E. coli, total nitrogen, total phosphorus, turbidity, and specific conductivity.

TABLE 9 - SAXTONS RIVER FLOW OBSERVATIONS

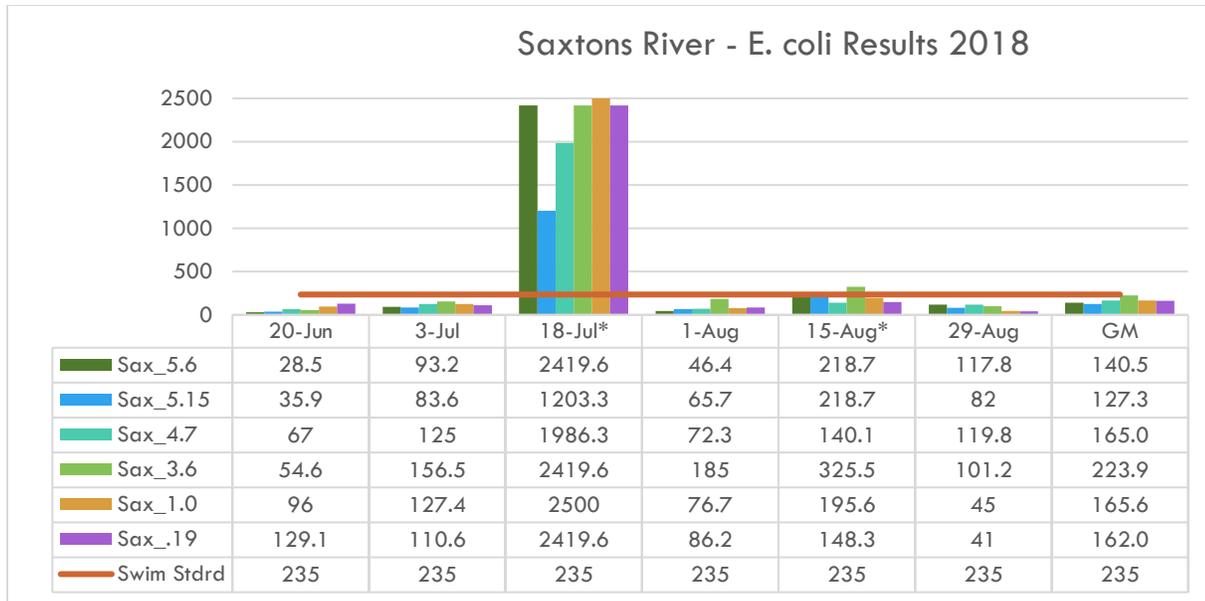
| Site | 6/20/2018 | | 7/3/2018 | | 7/18/2018 | | 8/1/2018 | | 8/15/2018 | | 8/29/2018 | |
|--------------|-----------|------|----------|------|-----------|-------|----------|-------|-----------|-------|-----------|------|
| | Level | Type | Level | Type | Level | Type | Level | Type | Level | Type | Level | Type |
| Saxtons_5.6 | mod | base | mod | base | mod | fresh | high | fresh | mod | fresh | mod | base |
| Saxtons_5.15 | low | base | low | base | mod | fresh | mod | base | mod | fresh | mod | base |
| Saxtons_4.7 | mod | base | mod | base | mod | fresh | mod | base | high | fresh | mod | base |
| Saxtons_3.6 | low | base | low | base | high | fresh | mod | fresh | mod | fresh | low | base |
| Saxtons_1.0 | low | base | low | base | high | fresh | mod | fresh | mod | fresh | low | base |
| Saxtons_.19 | low | base | low | base | high | fresh | mod | fresh | mod | fresh | low | base |

Volunteers are required to note the level and type of flow observed at each site at the time of sampling, presented above. These observations are inherently subjective, based on individual observations at specific sites. The Saxtons River has a USGS gage located in Saxtons River, which is closest to Saxtons_3.6. According to observations at the USGS gage, 6/20, 7/3, 7/18, and 8/29 occurred during low flows, 8/1 during moderate flows, and 8/15 during high flows.

FIGURE 4 - SAXTONS RIVER STREAMFLOW SUMMER 2018

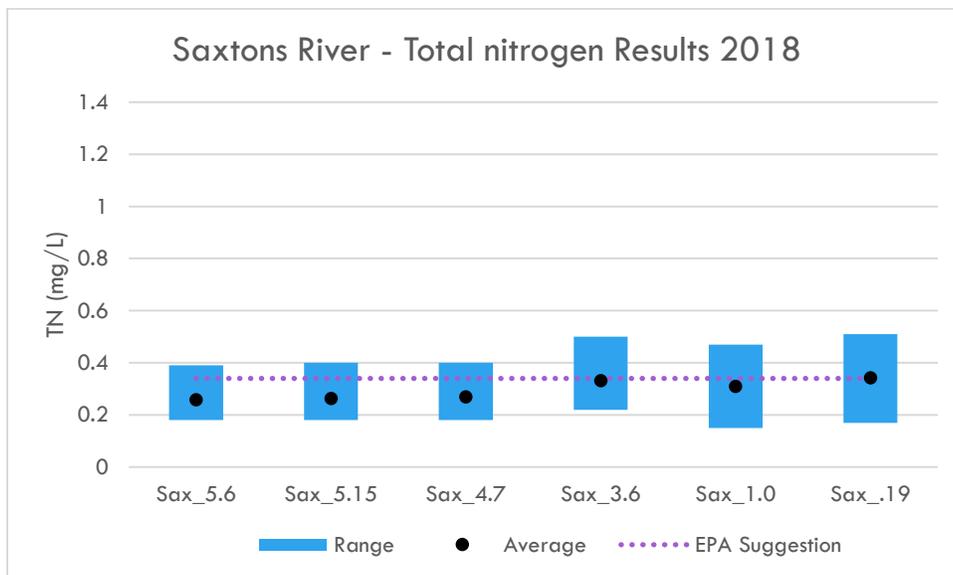


The results for each parameter are presented in the graphs below.

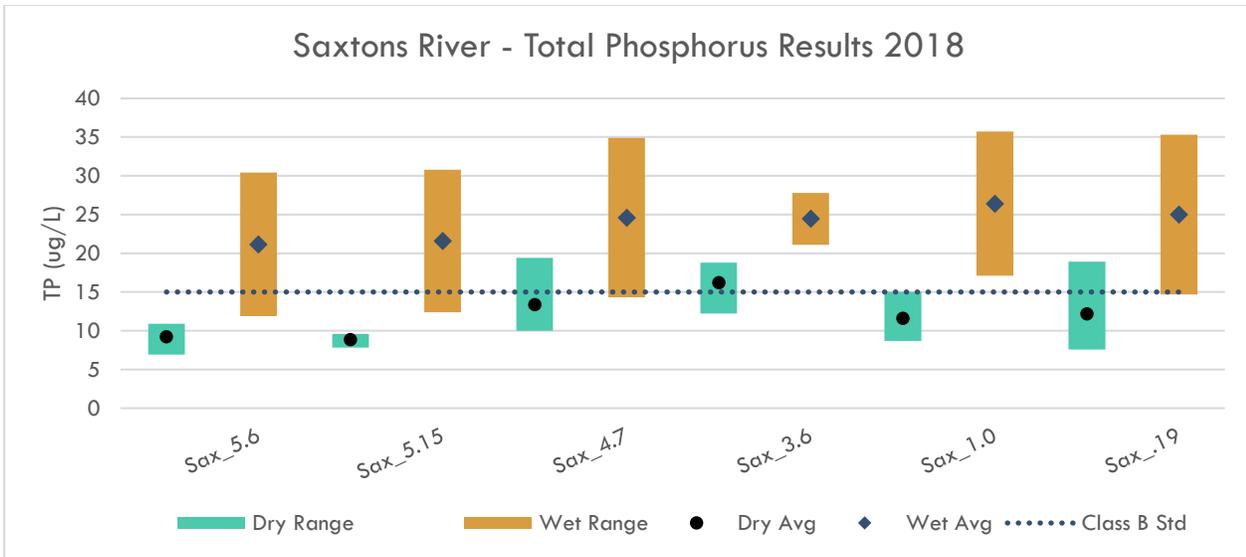


* Wet weather (>0.1" rain) in 24 hours prior to sampling

Most results were below the recommended level for primary contact recreation of 235 MPN/100 except on July 18th when sampling occurred right at the beginning of a rain event. All sites except the furthest upstream site Saxtons_5.6 exceeded the water quality standard of a geometric mean of 126 MPN/100 mL, although most were close to that level.



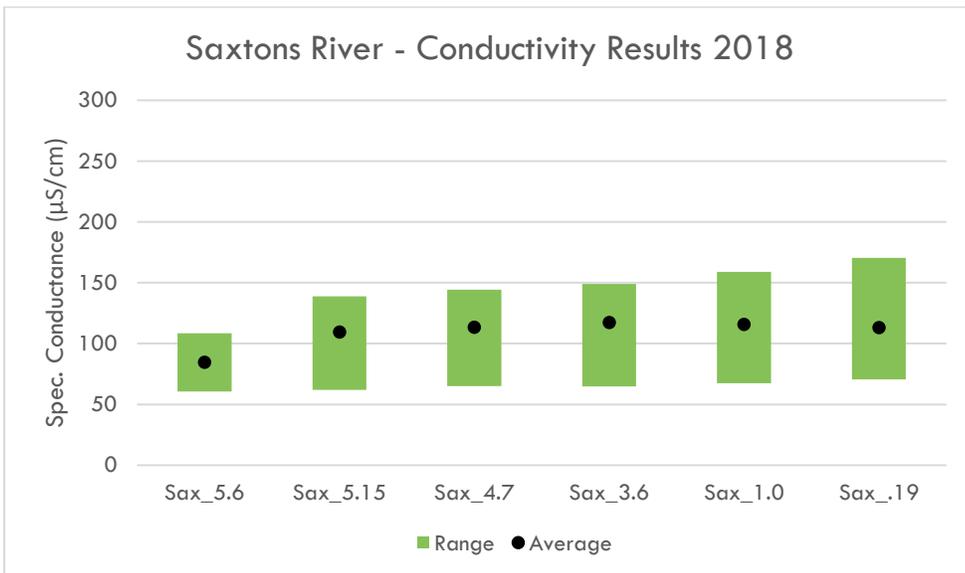
The averages for all Saxtons River sites were well below the Vermont standard of 5.0 mg-N/L and below the EPA's current suggested standard of 0.34 mg-N/L. The nitrogen concentrations generally increase from upstream to downstream with the exception of Saxtons_3.6 (Barber Park Rd) which was slightly elevated.



The averages for all sites during dry weather except for one, Saxtons_3.6 (Barber Park Rd), were below the Vermont standard for cold water streams of 15 µg-P/L and all sites exceeded this standard when sampled during wet weather.

Bacteria and nutrients are all slightly elevated at Saxtons_3.6 (Barber Park Rd). There is no immediately identifiable source for this although SeVWA continues to investigate.

Volunteers collected turbidity samples, but most were not processed at the request of the LaRosa program. The results can be found in the data appendix but there are not enough data points for an accurate discussion in this report.



There is no standard for conductivity in Vermont and no site stands out as particularly concerning. Conductivity increases moving from upstream to downstream which also correlates with moving into more development and urbanization of the watershed.

East Putney Brook & Sacketts Brook

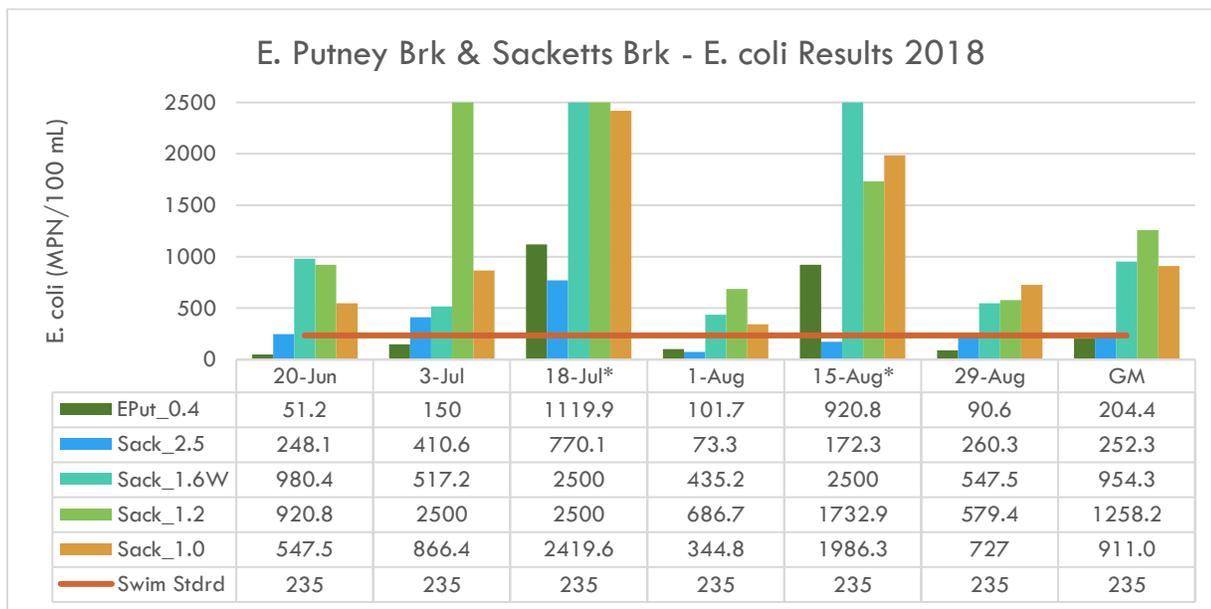
SeVWA monitored one site on the East Putney Brook and four sites on the Sacketts Brook. All sites are classified as cold-water class B. Sites were tested for *E. coli*, total nitrogen, total phosphorus, turbidity, and specific conductivity.

TABLE 10 - E. PUTNEY BROOK & SACKETTS BROOK FLOW OBSERVATIONS

| Site | 6/20/2018 | | 7/3/2018 | | 7/18/2018 | | 8/1/2018 | | 8/15/2018 | | 8/29/2018 | |
|---------------|-----------|------|----------|------|-----------|-------|----------|-------|-----------|-------|-----------|------|
| | Level | Type | Level | Type | Level | Type | Level | Type | Level | Type | Level | Type |
| EPutney_0.4 | mod | base | mod | base | high | fresh | mod | fresh | high | fresh | mod | base |
| Sacketts_2.5 | mod | base | mod | base | mod | base | mod | base | high | base | mod | base |
| Sacketts_1.6W | mod | base | low | base | mod | fresh | mod | fresh | mod | fresh | mod | base |
| Sacketts_1.2 | mod | base | low | base | mod | fresh | mod | fresh | mod | fresh | mod | base |
| Sacketts_1.0 | mod | base | low | base | high | fresh | mod | fresh | high | fresh | mod | base |

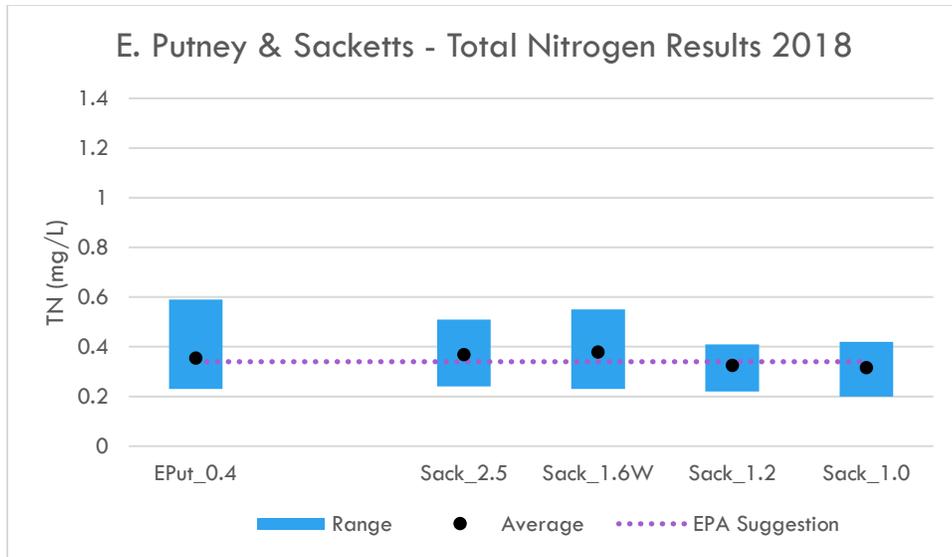
Volunteers are required to note the level and type of flow observed at each site at the time of sampling, presented above. These observations are inherently subjective, based on individual observations at specific sites. Neither the East Putney Brook nor the Sacketts Brook have a USGS gage to corroborate these observations and there is no clear surrogate gage in a similar watershed nearby. According to observations at the other USGS gages in SeVWA’s monitoring area, the flows levels were low on 6/20 and 7/3, low to moderate on 7/18, moderate on 8/1, moderate to high on 8/15, and low to moderate on 8/29.

The results for all parameters tested are presented in the graphs below.

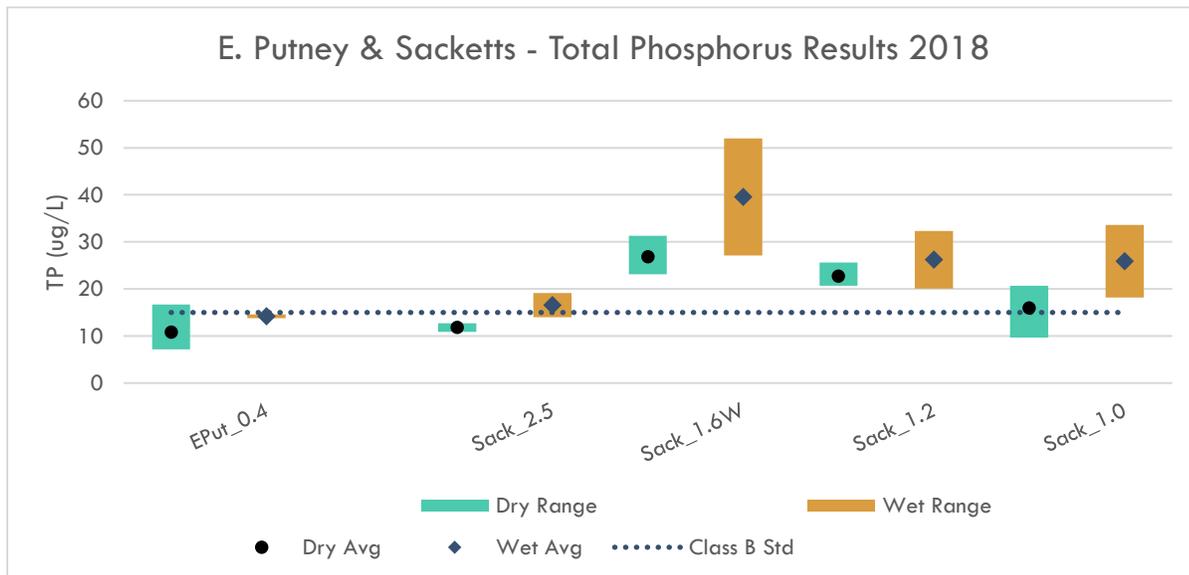


* Wet weather (>0.1" rain) in 24 hours prior to sampling

The East Putney Brook tended to meet recommended level for primary contact recreation of 235 MPN/100 mL during dry weather but not wet weather. Sacketts Brook sites only met this level at the furthest upstream site Sacketts_2.5 (Portal Bridge) twice, once during dry weather and once during wet weather. The lower three Sacketts Brook sites were always elevated wet or dry weather. All geometric means exceeded the state standard of 126 MPN/100 mL. We recommend that the Sacketts Brook be added to the statewide bacteria TMDL project areas.

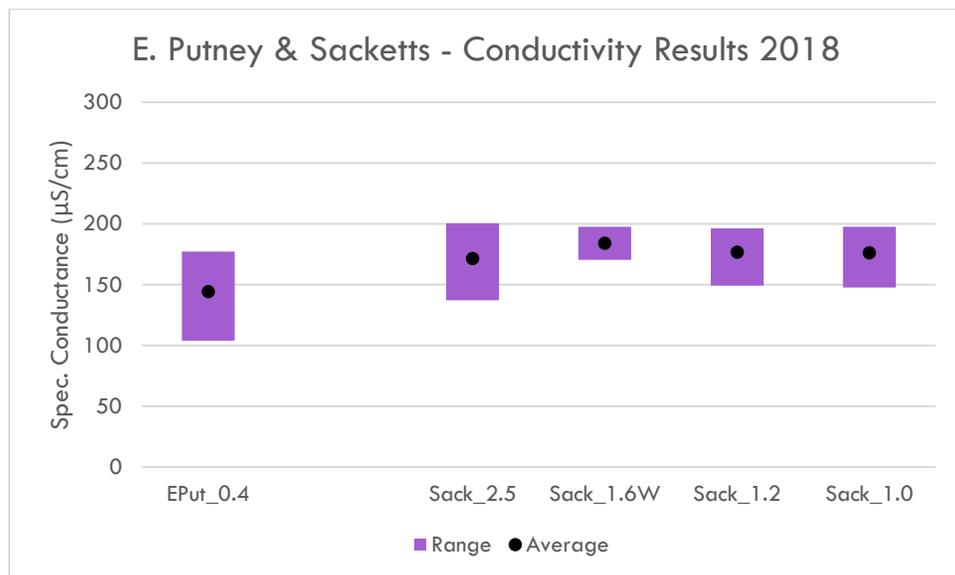


The averages and results for all E. Putney Brook and Sacketts Brook sites were well below the Vermont standard of 5.0 mg-N/L; the averages at each site hovered around the EPA’s current suggested standard of 0.34 mg-N/L and some individual results exceeded the threshold. The nitrogen concentrations generally peak at Sacketts_1.6W and then decrease moving downstream which would suggest the primary sources are upstream of this site.



The East Putney Brook met the Vermont standard for cold water streams of 15 µg-P/L in both wet and dry weather. The Sacketts Brook sites all exceeded the standard in wet weather and all except the furthest upstream site exceeded the standard in dry weather. Sacketts_1.6W once again had the highest results, which would suggest a major source of nutrients is upstream of this site.

Volunteers collected turbidity samples, but most were not processed at the request of the LaRosa program. The results can be found in the data appendix but there are not enough data points for an accurate discussion in this report.



There is no standard for conductivity in Vermont and no site stands out as particularly concerning. Conductivity is slightly higher on the Sacketts Brook than East Putney Brook. Conductivity is highest at Sacketts_1.6W and then decreases slightly from upstream to downstream, which is consistent with the nutrient results.

Epilogue

2018 was slightly atypical year for rainfall in southern Vermont although SeVWA missed the highest flows when sampling. We observed the usual hot spots that have been identified by this monitoring program. The following areas were of particular concern in 2018: the West River in the vicinity of mile 36 for E. coli, the Whetstone Brook below mile 4 for E. coli (especially miles 2-1) and the full length for phosphorus, likely due to sediment; the Williams River below mile 11 for E. coli and below mile 9 for nutrients, especially nitrogen; and the Sacketts Brook below mile 2 for E. coli and mile 1.6 and downstream for nutrients. The Saxtons River between 4.7 and .19 has been an area of concern in years' past for E. coli and phosphorus, but the results from 2018 show some improvement; SeVWA will continue to monitor that area to assure that this has improved.

Starting in 2012, SeVWA's E. coli results have been made available to the public through a variety of sources, including publishing on its website (<http://www.sevwa.org>), CTRiver.us, Facebook, iBrattleboro, iPutney, and postings by volunteers at public information kiosks and near monitoring locations.

Since 2010, VT DEC and the Connecticut River Watershed Council have entered a services exchange agreement that has provided a collaboration that enhances SeVWA's utilization of the CRC laboratory in Greenfield, MA, for its E. coli testing.

This report was produced to meet the requirements of the LaRosa Lab Services Partnership Program and is intended as a preliminary synopsis of results generated by the project. Additional analyses and reporting may be conducted as resources allow.

Appendix – Complete Monitoring Results

| Date | Site | Time | Sample # | Final E. Coli. (mpn/100ml) | Wet? (Y/N) | Sample # | TN (mg-N/l) | TP (µg-P/L) | Turbidity (NTU) | Spec. Cond. (µS/cm) | Air Temp. °C | Water Temp °C | Water Level | Flow Type | Sample or QA Notes: |
|-----------|-----------------|------|----------|----------------------------|------------|-----------|-------------|-------------|-----------------|---------------------|--------------|---------------|-------------|-----------|---|
| 6/20/2018 | Flood_1.7 | 8:36 | 7-3-18 | 344.8 | N | 181107-01 | 0.23 | 12.3 | NT | 83 | 12.5 | 13.5 | moderate | base | |
| 6/20/2018 | West_36 | 8:55 | 7-2-18 | 95.9 | N | 181107-02 | 0.23 | 13.4 | NT | 104.2 | 14.5 | 16 | moderate | base | |
| 6/20/2018 | West_38.5A | 8:09 | 7-1-18 | 68.3 | N | 181107-03 | 0.24 | 11.3 | NT | 52.5 | 15 | 16.5 | moderate | base | |
| 6/20/2018 | NBranchBrk_4.5 | 7:40 | 7-4-18 | 60.2 | N | 181107-04 | 0.28 | 7.41 | NT | 249 | 10 | 14 | moderate | base | |
| 6/20/2018 | Rock_38 | 6:25 | 7-5-18 | 42.8 | N | 181107-05 | 0.22 | 8.24 | NT | 92.2 | 10 | 15 | low | base | water only to sampler's calf - about 1"-12" below normal of previous year |
| 6/20/2018 | West_13 | 7:40 | 7-6-18 | 118.7 | N | 181107-06 | 0.3 | 12.4 | NT | 52.8 | 12 | 18 | moderate | base | |
| 6/20/2018 | West_6.4 | 7:45 | 7-7-18 | 93.4 | N | 181107-07 | 0.3 | 11.9 | NT | 114.2 | 17 | 19 | moderate | base | |
| 6/20/2018 | West_1.42 | 6:10 | 7-8-18 | 93.3 | N | 181107-08 | 0.33 | 11 | NT | 52 | 12 | 20.5 | low | base | |
| 6/20/2018 | West_08 | 8:20 | 7-9-18 | 67.7 | N | 181107-09 | 0.33 | 11.4 | NT | 53.3 | 17 | 23 | low | base | |
| 6/20/2018 | Williams_14.2 | 6:48 | 7-10-18 | 98.8 | N | 181107-10 | 0.22 | 7.76 | NT | 105.9 | 10 | 14 | low | base | |
| 6/20/2018 | Williams_11.3 | 6:45 | 7-11-18 | 325.5 | N | 181107-11 | 0.36 | 9.91 | NT | 120.8 | 10 | 15 | low | base | |
| 6/20/2018 | MBrWilliams_1.2 | 6:42 | 7-12-18 | 80.1 | N | 181107-12 | 0.28 | 7.47 | NT | 83.1 | 14 | 15 | low | base | |
| 6/20/2018 | MBrWilliams_02 | 7:06 | 7-13-18 | 35.9 | N | 181107-13 | 0.2 | 10.9 | NT | 80.8 | 10 | 15 | moderate | base | |
| 6/20/2018 | Williams_10.7 | 6:48 | 7-14-18 | 152.9 | N | 181107-14 | 0.41 | 7.79 | NT | 93 | 10 | 15.5 | moderate | base | |
| 6/20/2018 | Williams_10.3 | 6:22 | 7-15-18 | 228.2 | N | 181107-15 | 0.39 | 12 | NT | 169.9 | 9 | 15 | low | base | |
| 6/20/2018 | Williams_8.6 | 7:00 | 7-16-18 | 101.4 | N | 181107-16 | 1.19 | 22.3 | NT | 186.1 | 9 | 15 | low | base | |
| 6/20/2018 | Williams_7.0 | 7:00 | 7-17-18 | 123.6 | N | 181107-17 | 1.15 | 17.4 | NT | 181.6 | 9 | 15 | low | base | |
| 6/20/2018 | Saxtons_5.6 | 6:38 | 7-18-18 | 28.5 | N | 181107-18 | 0.26 | 10.9 | NT | 71.2 | 10 | 15 | moderate | base | |
| 6/20/2018 | Saxtons_5.15 | 7:14 | 7-19-18 | 35.9 | N | 181107-19 | 0.27 | 9.57 | NT | 138.9 | 13 | 15.5 | low | base | |
| 6/20/2018 | Saxtons_4.7 | 7:25 | 7-20-18 | 67 | N | 181107-20 | 0.29 | 19.4 | NT | 144.4 | 17.5 | 16 | moderate | base | |
| 6/20/2018 | Saxtons_3.6 | 6:50 | 7-21-18 | 54.6 | N | 181107-21 | 0.5 | 18.8 | NT | 149 | 11 | 18 | low | base | |
| 6/20/2018 | Saxtons_1.0 | 7:13 | 7-22-18 | 96 | N | 181107-22 | 0.38 | 15 | NT | 159 | 11 | 18 | low | base | |

| Date | Site | Time | Sample # | Final E. Coli. (mpn/100ml) | Wet? (Y/N) | Sample # | TN (mg-N/l) | TP (µg-P/L) | Turbidity (NTU) | Spec. Cond. (µS/cm) | Air Temp. °C | Water Temp °C | Water Level | Flow Type | Sample or QA Notes: |
|-----------|----------------|------|----------|----------------------------|------------|-----------|-------------|-------------|-----------------|---------------------|--------------|---------------|-------------|-----------|---|
| 6/20/2018 | Saxtons_19 | 7:35 | 7-23-18 | 129.1 | N | 181107-23 | 0.46 | 12.3 | NT | 90.3 | 11 | 18 | low | base | |
| 6/20/2018 | EPutney_0.4 | 7:30 | 7-25-18 | 51.2 | N | 181107-24 | 0.36 | 8.41 | NT | 167.1 | 14 | 18 | moderate | base | |
| 6/20/2018 | Sacketts_2.5 | 8:20 | 7-26-18 | 248.1 | N | 181107-25 | 0.47 | 10.9 | NT | 191.4 | NT | 12.5 | moderate | base | |
| 6/20/2018 | Sacketts_1.2 | 7:00 | 7-28-18 | 920.8 | N | 181107-26 | 0.36 | 20.7 | NT | 194.8 | 11 | 16 | moderate | base | |
| 6/20/2018 | Sacketts_1.6W | 7:24 | 7-27-18 | 980.4 | N | 181107-27 | 0.42 | 129 | NT | 197.5 | 11 | 18 | moderate | base | TP Result 129 - inconsistently high, rejected with note |
| 6/20/2018 | Sacketts_1.0 | 7:55 | 7-29-18 | 547.5 | N | 181107-28 | 0.37 | 18.5 | NT | 196.9 | 12.5 | 15.5 | moderate | base | |
| 6/20/2018 | Whetstone_3.7 | 6:10 | 7-30-18 | 214.3 | N | 181107-29 | 0.29 | 11.9 | NT | 152.9 | 9 | 14 | moderate | base | |
| 6/20/2018 | Whetstone_2.4 | 9:10 | 7-31-18 | 307.6 | N | 181107-30 | 0.36 | 12.6 | NT | 174.5 | NT | NT | moderate | base | |
| 6/20/2018 | Whetstone_1.3 | 8:20 | 7-32-18 | 547.5 | N | 181107-31 | 0.39 | 15.2 | NT | 197.5 | 16 | 15 | low | base | |
| 6/20/2018 | Whetstone_2 | 6:29 | 7-33-18 | 579.4 | N | 181107-32 | 0.49 | 13.5 | NT | 265.1 | 15 | 15 | moderate | base | |
| 6/20/2018 | QCA1 | 8:36 | 7-34-18 | 344.8 | N | 181107-33 | 0.3 | 13.2 | NT | 89.1 | 0 | 0 | 0 | 0 | West_38.5A |
| 6/20/2018 | QCA2 | 7:40 | 7-35-18 | 53.7 | N | 181107-34 | 0.28 | 6.6 | NT | 240.5 | 0 | 0 | 0 | 0 | NBranchBrk_4.5 |
| 6/20/2018 | QCA3 | 6:28 | 7-36-18 | 24.6 | N | 181107-35 | 0.21 | 9.67 | NT | 98.7 | 0 | 0 | 0 | 0 | Rock_38 |
| 6/20/2018 | QCB1 | 8:55 | 7-37-18 | < 1 | N | 181107-36 | < 0.1 | < 5 | NT | 5.8 | 0 | 0 | 0 | 0 | West_36 |
| 6/20/2018 | QCB2 | 8:31 | 7-38-18 | < 1 | N | 181107-37 | < 0.1 | < 5 | NT | NT | 0 | 0 | 0 | 0 | West_8 |
| 6/20/2018 | QCB3 | 7:00 | 7-39-18 | < 1 | N | 181107-38 | < 0.1 | < 5 | NT | 3.2 | 0 | 0 | 0 | 0 | MBrWilliams_2 |
| 7/3/2018 | West_38.5A | 7:25 | 11-1-18 | 275.5 | N | 181241-01 | 0.42 | 10.7 | NT | NT | 21.5 | 24 | moderate | base | Heat wave for previous 3 days |
| 7/3/2018 | West_36 | 7:38 | 11-2-18 | 261.3 | N | 181241-02 | 0.4 | 10.6 | NT | NT | 22.5 | 23.5 | moderate | base | |
| 7/3/2018 | Flood_1.7 | 7:05 | 11-3-18 | 80.9 | N | 181241-03 | 0.51 | 12.4 | NT | NT | 20 | 20 | moderate | base | |
| 7/3/2018 | NBranchBrk_4.5 | 7:12 | 11-4-18 | 1119.9 | N | 181241-04 | 0.53 | 8.27 | NT | NT | 21 | 16.5 | moderate | base | Volunteer did not have field sheet at time of sampling. Used personal thermometer measuring in Fahrenheit |
| 7/3/2018 | Rock_38 | 7:38 | 11-5-18 | 65.7 | N | 181241-05 | 0.37 | 8.53 | NT | 93.3 | 23 | 23 | moderate | base | |
| 7/3/2018 | West_13 | 7:50 | 11-6-18 | 166.4 | N | 181241-06 | 0.48 | 11.5 | NT | 52.9 | 23 | 24 | moderate | base | |
| 7/3/2018 | West_6.4 | 7:30 | 11-7-18 | 31.8 | N | 181241-07 | 0.44 | 10.2 | NT | 98.6 | 27 | 25 | low | base | Litter at site |
| 7/3/2018 | West_1.42 | 6:15 | 11-8-18 | 50.4 | N | 181241-08 | 0.45 | 10 | NT | 46 | 23 | 27 | moderate | base | |

| Date | Site | Time | Sample # | Final E. Coli. (mpn/100ml) | Wet? (Y/N) | Sample # | TN (mg-N/l) | TP (µg-P/L) | Turbidity (NTU) | Spec. Cond. (µS/cm) | Air Temp. °C | Water Temp °C | Water Level | Flow Type | Sample or QA Notes: |
|----------|-----------------|----------|----------|----------------------------|------------|-----------|-------------|-------------|-----------------|---------------------|--------------|---------------|-------------|-----------|---|
| 7/3/2018 | West_08 | 8:15 | 11-9-18 | 90.8 | N | 181241-09 | 0.45 | 11.5 | NT | 103.6 | 27 | 29 | moderate | base | |
| 7/3/2018 | Williams_14.2 | 7:10 | 11-10-18 | 249.5 | N | 181241-10 | 0.38 | 8.57 | NT | 62.4 | 23 | 21 | low | base | |
| 7/3/2018 | Williams_11.3 | 7:04 | 11-11-18 | 260.3 | N | 181241-11 | 0.49 | 9.56 | NT | 132.2 | NT | NT | moderate | base | Thermometer was not found till after sampling |
| 7/3/2018 | MBrWilliams_1.2 | 6:40 | 11-12-18 | 101.9 | N | 181241-12 | 0.34 | 7.86 | NT | 163.1 | 24 | 22 | low | base | *Took second pass with E. coli bottle. |
| 7/3/2018 | MBrWilliams_02 | 6:55 | 11-13-18 | 160.7 | N | 181241-13 | 0.4 | 7.48 | NT | 175.8 | 23 | 22 | moderate | base | |
| 7/3/2018 | Williams_10.7 | 6:57 | 11-14-18 | 285.1 | N | 181241-14 | 0.5 | 8.64 | NT | 172.1 | 23 | 22 | moderate | base | |
| 7/3/2018 | Williams_10.3 | 7:53 | 11-15-18 | 275.5 | N | 181241-15 | 0.54 | 10 | NT | 176.9 | 23 | 22 | low | base | |
| 7/3/2019 | Williams_8.6 | 07:00:00 | 11-16-18 | 248.1 | N | 181241-16 | 1.16 | 16.8 | NT | 189.6 | 23 | 22 | low | base | |
| 7/3/2018 | Williams_7.0 | 7:00 | 11-17-18 | 185 | N | 181241-17 | 1.29 | 14.4 | NT | 86.5 | 22 | 22 | low | base | |
| 7/3/2018 | Saxtons_5.6 | 6:48 | 11-18-18 | 93.2 | N | 181241-18 | 0.39 | 9.13 | NT | 63.8 | 23 | 23 | moderate | base | |
| 7/3/2018 | Saxtons_5.15 | 6:40 | 11-19-18 | 83.6 | N | 181241-19 | 0.4 | 9.6 | NT | 135.2 | 24 | 23 | low | base | Earthmovers are replacing WWTF downstream of sampling site. Disturbed sediment. |
| 7/3/2018 | Saxtons_4.7 | 8:08 | 11-20-18 | 125 | N | 181241-20 | 0.4 | 12.7 | NT | 138.4 | 30 | 24 | moderate | base | |
| 7/3/2018 | Saxtons_3.6 | 7:30 | 11-21-18 | 156.5 | N | 181241-21 | 0.43 | 17.6 | NT | 141.1 | 26 | 24 | low | base | |
| 7/3/2018 | Saxtons_1.0 | 7:50 | 11-22-18 | 127.4 | N | 181241-22 | 0.47 | 13.8 | NT | 152.4 | 26 | 24 | low | base | Thermometer difficult to read. |
| 7/3/2018 | Saxtons_19 | 8:10 | 11-23-18 | 110.6 | N | 181241-23 | 0.51 | 18.9 | NT | 170.4 | 26 | 24 | low | base | |
| 7/3/2018 | EPutney_0.4 | 7:45 | 11-24-18 | 150 | N | 181241-24 | 0.59 | 11.1 | NT | 177.3 | 24 | 18.5 | moderate | base | |
| 7/3/2018 | Sacketts_2.5 | 8:00 | 11-25-18 | 410.6 | N | 181241-25 | 0.51 | 12.1 | NT | 200.4 | 19.5 | 17.5 | moderate | base | Volunteer noted water running slowly. Felled tree downstream. They suspect beaver dam somewhere downstream. |
| 7/3/2018 | Sacketts_1.6W | 7:45 | 11-26-18 | 517.2 | N | 181241-26 | 0.39 | 31.3 | NT | 190.7 | 23 | 23 | low | base | |
| 7/3/2018 | Sacketts_1.2 | 7:18 | 11-27-18 | > 2419.6 | N | 181241-27 | 0.38 | 22.5 | NT | 196.3 | 23 | 23 | low | base | |
| 7/3/2018 | Sacketts_1.0 | 8:20 | 11-28-18 | 866.4 | N | 181241-28 | 0.39 | 20.7 | NT | 197.6 | 22 | 22.5 | low | base | |
| 7/3/2018 | Whetstone_3.7 | 5:43 | 11-29-18 | 365.4 | N | 181241-29 | 0.29 | 13.4 | NT | 162.2 | 22 | 20 | moderate | base | |
| 7/3/2018 | Whetstone_2.4 | 8:50 | 11-30-18 | 517.2 | N | 181241-30 | 0.44 | 17.2 | NT | 188.4 | 25 | 19 | moderate | base | |

| Date | Site | Time | Sample # | Final E. Coli. (mpn/100ml) | Wet? (Y/N) | Sample # | TN (mg-N/l) | TP (µg-P/L) | Turbidity (NTU) | Spec. Cond. (µS/cm) | Air Temp. °C | Water Temp °C | Water Level | Flow Type | Sample or QA Notes: |
|-----------|-----------------|----------|----------|----------------------------|------------|-----------|-------------|-------------|-----------------|---------------------|--------------|---------------|-------------|-----------|---|
| 7/3/2019 | Whetstone_1.3 | 8:15 | 7-31-18 | 613.1 | N | 181241-31 | 0.39 | 14.8 | NT | 227.8 | 25 | 20 | low | base | |
| 7/3/2018 | Whetstone_2 | 6:02 | 11-32-18 | 488.4 | N | 181241-32 | 0.51 | 13 | NT | 291.1 | 23 | 20 | moderate | base | |
| 7/3/2018 | QCA1 | 7:10 | 11-33-18 | 178.5 | N | 181241-33 | 0.21 | 7.56 | NT | 126.4 | 0 | 0 | 0 | 0 | Williams_14.2 |
| 7/3/2018 | QCA2 | 6:48 | 11-34-18 | 132.8 | N | 181241-34 | 0.22 | 9.49 | NT | 128.2 | 0 | 0 | 0 | 0 | Saxtons_5.6 |
| 7/3/2018 | QCA3 | 7:45 | 11-35-18 | 172.5 | N | 181241-35 | 0.38 | 8.42 | NT | 159 | 0 | 0 | 0 | 0 | EPutney_4 |
| 7/3/2018 | QCB1 | 7:12 | 11-36-18 | < 1 | N | 181241-36 | < 0.1 | < 5 | NT | NT | 0 | 0 | 0 | 0 | NBranchBrk_4.5 |
| 7/3/2018 | QCB2 | 7:30 | 11-37-18 | < 1 | N | 181241-37 | < 0.1 | < 5 | NT | 8.5 | 0 | 0 | 0 | 0 | Saxtons_3.6 |
| 7/3/2018 | QCB3 | 8:01 | 11-38-18 | < 1 | N | 181241-38 | < 0.1 | < 5 | NT | 10.4 | 0 | 0 | 0 | 0 | Sacketts_1.2 |
| 7/18/2018 | West_38.5A | 7:35 | 15-1-18 | 980.4 | Y | 181351-01 | 0.3 | 16.8 | 2.23 | 60.1 | 15 | 19 | moderate | freshet | |
| 7/18/2018 | West_36 | 7:50 | 15-2-18 | 1203.3 | Y | 181351-02 | 0.33 | 18.1 | 1.26 | 106.6 | 17.5 | 19 | moderate | freshet | |
| 7/18/2018 | Flood_1.7 | 07:20:00 | 15-3-18 | 727 | Y | 181351-03 | 0.33 | 19.8 | 1.13 | 45.1 | 15 | 17.5 | moderate | freshet | |
| 7/18/2018 | NBranchBrk_4.5 | 7:46 | 15-4-18 | 648.8 | Y | 181351-04 | 0.37 | 12.1 | 1.07 | 155.9 | NT | NT | high | freshet | |
| 7/18/2018 | Rock_38 | 6:55 | 15-5-18 | 435.2 | Y | 181351-05 | 0.3 | 26.8 | 5.18 | 76.8 | 18 | 18 | high | freshet | |
| 7/18/2018 | West_13 | 7:30 | 15-7-18 | 1413.6 | Y | 181351-06 | 0.27 | 19.4 | 5.28 | 95.5 | 17 | 20 | high | freshet | Mix up between bottles w/ West_6.4 |
| 7/18/2018 | West_6.4 | 7:50 | 15-8-18 | 1119.9 | Y | 181351-07 | 0.35 | 27.9 | 12.1 | 95.2 | 21 | 22 | high | freshet | Mix up between bottles w/ West_13 |
| 7/18/2018 | West_1.42 | 6:40 | 15-9-18 | 920.8 | Y | 181351-08 | 0.3 | 24 | 8.1 | 91.3 | 20 | 21 | moderate | freshet | Murky water |
| 7/18/2018 | West_08 | 7:00 | 15-10-18 | 1119.9 | Y | 181351-09 | 0.3 | 27.8 | 13.4 | 87.4 | 20 | 21 | moderate | freshet | Substitute volunteer |
| 7/18/2018 | Williams_14.2 | 6:55 | 15-11-18 | 816.4 | Y | 181351-10 | 0.26 | 12.7 | 1.79 | 98.8 | 16 | 18 | moderate | freshet | |
| 7/18/2018 | Williams_11.3 | 6:55 | 15-12-18 | 1119.9 | Y | 181351-11 | 0.34 | 15 | 2.13 | 98.9 | 17 | 18 | moderate | freshet | TP Value accepted, use duplicate value for calculations |
| 7/18/2018 | MBrWilliams_1.2 | 7:03 | 15-13-18 | 579.4 | Y | 181351-12 | 0.27 | 16.3 | 2.95 | 99.9 | 13 | 16 | moderate | freshet | |
| 7/18/2018 | MBrWilliams_02 | 6:55 | 15-14-18 | 579.4 | Y | 181351-13 | 0.32 | 15.3 | 4.15 | 107 | 16 | 18 | moderate | freshet | |
| 7/18/2018 | Williams_10.7 | 6:55 | 15-15-18 | 1203.3 | Y | 181351-14 | 0.36 | 16.6 | 2.92 | 95.2 | 16 | 18.5 | NT | NT | |
| 7/18/2018 | Williams_10.3 | 6:45 | 15-16-18 | 1046.2 | Y | 181351-15 | 0.37 | 30 | 3.01 | 112.9 | 21 | NT | moderate | freshet | |
| 7/18/2018 | Williams_8.6 | 7:05 | 15-17-18 | 1986.3 | Y | 181351-16 | 0.57 | 24.9 | 4.47 | 134.4 | 17 | 19 | moderate | freshet | |
| 7/18/2018 | Williams_7.0 | 7:28 | 15-18-18 | 1413.6 | Y | 181351-17 | 0.61 | 24.9 | 6.2 | 131.9 | 15 | 17 | moderate | freshet | Soapy bubbles present near shoreline |

| Date | Site | Time | Sample # | Final E. Coli. (mpn/100ml) | Wet? (Y/N) | Sample # | TN (mg-N/l) | TP (µg-P/L) | Turbidity (NTU) | Spec. Cond. (µS/cm) | Air Temp. °C | Water Temp °C | Water Level | Flow Type | Sample or QA Notes: |
|-----------|----------------|------|----------|----------------------------|------------|-----------|-------------|-------------|-----------------|---------------------|--------------|---------------|-------------|-----------|--|
| 7/18/2018 | Saxtons_5.6 | 6:34 | 15-19-18 | 2419.6 | Y | 181351-18 | 0.32 | 30.4 | 15.4 | 100 | 16 | 18 | moderate | freshet | Very murky water. Trouble seeing bottom to find thermometer. |
| 7/18/2018 | Saxtons_5.15 | 6:43 | 15-20-18 | 1203.3 | Y | 181351-19 | 0.34 | 30.8 | 13 | 108.9 | 18 | 19 | moderate | freshet | |
| 7/18/2018 | Saxtons_4.7 | 7:49 | 15-21-18 | 1986.3 | Y | 181351-20 | 0.35 | 34.9 | 13.1 | 112.9 | 19 | 19.5 | moderate | freshet | |
| 7/18/2018 | Saxtons_3.6 | 6:31 | 15-22-18 | 2419.6 | Y | 181351-21 | 0.37 | 27.8 | 8.88 | 117 | 15 | 19.5 | high | freshet | |
| 7/18/2018 | Saxtons_1.0 | 6:50 | 15-23-18 | > 2419.6 | Y | 181351-22 | 0.43 | 35.7 | 9.04 | NT | 15 | 19 | high | freshet | |
| 7/18/2018 | Saxtons_19 | 7:25 | 15-24-18 | 2419.6 | Y | 181351-23 | 0.45 | 35.3 | 10.2 | 126.6 | 17 | 19 | high | freshet | |
| 7/18/2018 | EPutney_0.4 | 6:20 | 15-25-18 | 1119.9 | Y | 181351-24 | 0.42 | 14.6 | 1.81 | 147.2 | 16 | 18 | high | freshet | |
| 7/18/2018 | Sacketts_2.5 | 8:30 | 15-26-18 | 770.1 | Y | 181351-25 | 0.42 | 19.1 | 4.66 | 137.2 | 18 | 17 | moderate | base | |
| 7/18/2018 | Sacketts_1.6W | 7:45 | 15-27-18 | > 2419.6 | Y | 181351-26 | 0.55 | 52 | 11.3 | 170.3 | 17 | 18 | moderate | freshet | |
| 7/18/2018 | Sacketts_1.2 | 8:55 | 15-28-18 | > 2419.6 | Y | 181351-27 | 0.41 | 32.3 | 7.93 | 164.5 | 17 | 18 | moderate | freshet | |
| 7/18/2018 | Sacketts_1.0 | 7:40 | 15-29-18 | 2419.6 | Y | 181351-28 | 0.42 | 33.6 | 9.28 | 162.2 | 17 | 17.5 | high | freshet | |
| 7/18/2018 | Whetstone_3.7 | 7:30 | 15-30-18 | 1553.1 | Y | 181351-29 | 0.33 | 30.6 | 6.42 | 98.5 | 18.5 | 17.5 | moderate | freshet | |
| 7/18/2018 | Whetstone_2.4 | 8:25 | 15-31-18 | 1299.7 | Y | 181351-30 | 0.35 | 28.6 | 4.32 | 114.7 | 18 | 17 | moderate | freshet | |
| 7/18/2018 | Whetstone_1.3 | 8:15 | 15-32-18 | 1203.3 | Y | 181351-31 | 0.35 | 35 | 4.87 | 121.9 | 19 | 18 | high | freshet | |
| 7/18/2018 | Whetstone_2 | 5:55 | 15-33-18 | 2419.6 | Y | 181351-32 | 0.37 | 43.2 | 7.04 | 126 | 18 | 19 | high | freshet | |
| 7/18/2018 | QCA1 | 6:55 | 15-34-18 | > 2419.6 | Y | 181351-33 | 0.4 | 36.6 | 10.1 | 119.7 | 0 | 0 | 0 | 0 | Saxtons_1. |
| 7/18/2018 | QCA2 | 7:40 | 15-35-18 | 727 | Y | 181351-34 | 0.26 | 21.6 | 5.92 | 92.6 | 0 | 0 | 0 | 0 | West_6.4 |
| 7/18/2018 | QCA3 | 6:55 | 15-36-18 | 1732.9 | Y | 181351-35 | 0.34 | 6.32 | 2.35 | 98.8 | 0 | 0 | 0 | 0 | Williams_11.3 |
| 7/18/2018 | QCB1 | 6:00 | 15-37-18 | < 1 | Y | 181351-36 | < 0.1 | < 5 | < 0.2 | 4.3 | 0 | 0 | 0 | 0 | Whetstone_2 |
| 7/18/2018 | QCB2 | 6:50 | 15-38-18 | < 1 | Y | 181351-37 | < 0.1 | < 5 | < 0.2 | 1.8 | 0 | 0 | 0 | 0 | Williams_1.7 |
| 7/18/2018 | QCB3 | 8:15 | 15-39-18 | < 1 | Y | 181351-38 | < 0.1 | 14.5 | 0.38 | 2.3 | 0 | 0 | 0 | 0 | Whetstone_1.3 |
| 8/1/2018 | West_38.5A | 7:34 | 19-1-18 | 49.6 | N | 181491-01 | 0.16 | 7.95 | NT | 96.5 | 16.5 | 19.5 | moderate | freshet | |
| 8/1/2018 | West_36 | 7:48 | 19-2-18 | 69.1 | N | 181491-02 | 0.21 | 8.52 | NT | 97 | 18 | 19 | moderate | freshet | |
| 8/1/2018 | Flood_1.7 | 7:14 | 19-3-18 | 68.9 | N | 181491-03 | 0.25 | 9.52 | NT | 76.4 | 16 | 17 | moderate | freshet | |
| 8/1/2018 | NBranchBrk_4.5 | 7:35 | 19-4-18 | 59.1 | N | 181491-04 | 0.24 | 5.8 | NT | 249.3 | 14.5 | 13.4 | high | freshet | |
| 8/1/2018 | Rock_38 | 6:45 | 19-5-18 | 14.5 | N | 181491-05 | 0.16 | 8.92 | NT | 75 | 17 | 18 | moderate | base | |

| Date | Site | Time | Sample # | Final E. Coli. (mpn/100ml) | Wet? (Y/N) | Sample # | TN (mg-N/l) | TP (µg-P/L) | Turbidity (NTU) | Spec. Cond. (µS/cm) | Air Temp. °C | Water Temp °C | Water Level | Flow Type | Sample or QA Notes: |
|----------|-----------------|------|----------|----------------------------|------------|-----------|-------------|-------------|-----------------|---------------------|--------------|---------------|-------------|-----------|---|
| 8/1/2018 | West_13 | 7:50 | 19-6-18 | 95.9 | N | 181491-06 | 0.21 | 8.35 | NT | 89.6 | 18 | 20 | moderate | base | |
| 8/1/2018 | West_6.4 | 7:12 | 19-7-18 | 63.1 | N | 181491-07 | 0.18 | NR | NT | 84.8 | 19 | 20 | moderate | base | |
| 8/1/2018 | West_1.42 | 5:50 | 19-8-18 | 40.8 | N | 181491-08 | 0.21 | 8.59 | NT | 87.9 | 20.5 | 21 | moderate | base | |
| 8/1/2018 | West_08 | 8:12 | 19-9-18 | 47.3 | N | 181491-09 | 0.17 | 8.57 | NT | 87.8 | 24 | 24 | high | freshet | |
| 8/1/2018 | Williams_14.2 | 7:02 | 19-10-18 | 214.3 | N | 181491-10 | 0.12 | 6.18 | NT | 125.9 | 20 | 18 | moderate | base | |
| 8/1/2018 | Williams_11.3 | 6:39 | 19-11-18 | 214.3 | N | 181491-11 | 0.21 | 6.98 | NT | 136.6 | 17 | 18 | moderate | base | |
| 8/1/2018 | MBrWilliams_1.2 | 6:55 | 19-12-18 | 40.8 | N | 181491-12 | < 0.1 | 5.3 | NT | 168.6 | 17 | 18 | low | base | |
| 8/1/2018 | MBrWilliams_02 | 7:00 | 19-13-18 | 201.4 | N | 181491-13 | 0.14 | 5.71 | NT | 169.6 | 17.5 | 18 | moderate | base | |
| 8/1/2018 | Williams_10.3 | 6:55 | 19-14-18 | 125.9 | N | 181491-15 | 0.22 | 6.55 | NT | 169.6 | 19 | 18 | low | base | |
| 8/1/2018 | Williams_8.6 | 7:10 | 19-15-18 | 125 | N | 181491-16 | 0.56 | 9.25 | NT | 176.6 | 23 | 19 | moderate | base | |
| 8/1/2018 | Williams_7.0 | 7:30 | 19-16-18 | 135.4 | N | 181491-17 | 0.56 | 7.45 | NT | 170.1 | 17 | 17.5 | low | base | |
| 8/1/2018 | Saxtons_5.6 | 6:56 | 19-17-18 | 46.4 | N | 181491-18 | 0.18 | 9.92 | NT | 103 | 18 | 17 | high | freshet | |
| 8/1/2018 | Saxtons_5.15 | 6:22 | 19-18-18 | 65.7 | N | 181491-19 | 0.18 | 8.33 | NT | 101.8 | 17.5 | 18.5 | moderate | base | |
| 8/1/2018 | Saxtons_4.7 | 7:47 | 19-19-18 | 72.3 | N | 181491-20 | 0.18 | 11.4 | 1.05 | 105.4 | 20 | 18.5 | moderate | base | |
| 8/1/2018 | Saxtons_3.6 | 7:25 | 19-20-18 | 185 | N | 181491-21 | 0.22 | 131 | 3.64 | 110.4 | 15 | NT | moderate | freshet | TP Result 131 - inconsistently high, rejected with note |
| 8/1/2018 | Saxtons_1.0 | 7:40 | 19-21-18 | 76.7 | N | 181491-22 | 0.15 | 9.01 | 1.31 | 71.3 | 15 | 19 | moderate | freshet | |
| 8/1/2018 | Saxtons_19 | 8:00 | 19-22-18 | 86.2 | N | 181491-23 | 0.17 | 9.96 | NT | 83.7 | 15 | 19 | moderate | freshet | |
| 8/1/2018 | EPutney_0.4 | 8:00 | 19-23-18 | 101.7 | N | 181491-24 | 0.29 | 16.7 | NT | 128.4 | 20 | 17 | moderate | freshet | Mix-up w/ bottles from Sacketts_1. |
| 8/1/2018 | Sacketts_2.5 | 8:15 | 19-24-18 | 73.3 | N | 181491-25 | 0.33 | 12.7 | 1.65 | 169.5 | 20 | 17 | moderate | base | |
| 8/1/2018 | Sacketts_1.6W | 7:16 | 19-25-18 | 435.2 | N | 181491-26 | 0.3 | 23.1 | 2.71 | 176.4 | 18 | 18 | moderate | freshet | |
| 8/1/2018 | Sacketts_1.2 | 7:33 | 19-26-18 | 686.7 | N | 181491-27 | 0.31 | 22 | 3.47 | 169.3 | 18 | 17 | moderate | freshet | |
| 8/1/2018 | Sacketts_1.0 | 8:30 | 19-27-18 | 344.8 | N | 181491-28 | 0.26 | 9.67 | 3.3 | 165.7 | 20 | 18.5 | moderate | freshet | Mix-up w/ bottles from EPutney_4 |
| 8/1/2018 | Whetstone_3.7 | 8:00 | 19-28-18 | 461.1 | N | 181491-29 | 0.24 | 8.08 | NT | 130 | 19 | 16.5 | moderate | base | |
| 8/1/2018 | Whetstone_2.4 | 8:30 | 19-29-18 | 547.5 | N | 181491-30 | 0.27 | 13.3 | NT | 157.3 | 22 | 16 | moderate | base | |
| 8/1/2018 | Whetstone_1.3 | 8:10 | 19-30-18 | 410.6 | N | 181491-31 | 0.3 | 9.33 | NT | 191 | 20 | 17 | moderate | base | |
| 8/1/2018 | Whetstone_2 | 6:05 | 19-32-18 | 275.5 | N | 181491-32 | 0.34 | 8.72 | NT | 221.9 | 19 | 17 | moderate | base | |

| Date | Site | Time | Sample # | Final E. Coli. (mpn/100ml) | Wet? (Y/N) | Sample # | TN (mg-N/l) | TP (µg-P/L) | Turbidity (NTU) | Spec. Cond. (µS/cm) | Air Temp. °C | Water Temp °C | Water Level | Flow Type | Sample or QA Notes: |
|-----------|-----------------|------|----------|----------------------------|------------|-----------|-------------|-------------|-----------------|---------------------|--------------|---------------|-------------|-----------|--------------------------------------|
| 8/1/2018 | QCA1 | 6:22 | 19-33-18 | 65 | N | 181491-33 | 0.17 | 8.05 | NT | 106.4 | 0 | 0 | 0 | 0 | Saxtons_5.15 |
| 8/1/2018 | QCA2 | 8:15 | 19-34-18 | 106.7 | N | 181491-34 | 0.33 | 13.1 | NT | 168.8 | 0 | 0 | 0 | 0 | Sacketts_2.5 |
| 8/1/2018 | QCA3 | 8:30 | 19-35-18 | 517.2 | N | 181491-35 | 0.3 | 11 | NT | 159.1 | 0 | 0 | 0 | 0 | Whetstone_2.4 |
| 8/1/2018 | QCB1 | 8:15 | 19-36-18 | < 1 | N | 181491-36 | < 0.1 | < 5 | NT | 10 | 0 | 0 | 0 | 0 | Sacketts_1.0 |
| 8/1/2018 | QCB2 | 6:55 | 19-37-18 | < 1 | N | 181491-37 | < 0.1 | < 5 | NT | 2 | 0 | 0 | 0 | 0 | Williams_10.3 |
| 8/1/2018 | QCB3 | 8:08 | 19-38-18 | < 1 | N | 181491-38 | < 0.1 | < 5 | NT | 5.7 | 0 | 0 | 0 | 0 | Saxtons_.19 |
| 8/15/2018 | West_38.5A | 7:26 | 23-1-18 | 129.1 | Y | 181622-01 | 0.25 | 13.5 | NT | 66.6 | 18.5 | 19 | moderate | freshet | |
| 8/15/2018 | West_36 | 7:34 | 23-2-18 | 209.8 | Y | 181622-02 | 0.24 | 13.2 | NT | 70.5 | 20 | 19 | moderate | freshet | |
| 8/15/2018 | Flood_1.7 | 7:05 | 23-3-18 | 146.7 | Y | 181622-03 | 0.24 | 10.3 | NT | 63.5 | 17 | 18 | moderate | freshet | |
| 8/15/2018 | NBranchBrk_4.5 | 7:40 | 23-4-18 | 45.7 | Y | 181622-04 | 0.27 | NR | NT | 190.5 | NT | NT | high | freshet | |
| 8/15/2018 | Rock_38 | 7:10 | 23-5-18 | 53.7 | Y | 181622-05 | 0.14 | 13.9 | NT | 52.1 | 20 | 18 | high | freshet | |
| 8/15/2018 | West_13 | 7:50 | 23-6-18 | 105 | Y | 181622-06 | 0.23 | 13.2 | NT | 68.5 | 19 | 19 | high | freshet | |
| 8/15/2018 | West_6.4 | 7:45 | 23-7-18 | 88.2 | Y | 181622-07 | 0.2 | NR | NT | 57.1 | 20 | 19 | high | freshet | |
| 8/15/2018 | West_1.42 | 7:15 | 23-8-18 | 121 | Y | 181622-08 | 0.21 | 13.3 | NT | 65.2 | 21.5 | 19.5 | high | freshet | |
| 8/15/2018 | West_.08 | 8:07 | 23-9-18 | 131.4 | Y | 181622-09 | 0.2 | 14.1 | NT | 60.7 | 24 | 20 | high | freshet | |
| 8/15/2018 | Williams_14.2 | 6:35 | 23-10-18 | 209.8 | Y | 181622-10 | 0.19 | 9.78 | NT | 69.2 | 20 | 18 | moderate | base | |
| 8/15/2018 | Williams_11.3 | 6:45 | 23-11-18 | 290.9 | Y | 181622-11 | 0.24 | 12.7 | NT | NT | 19 | 17 | moderate | base | |
| 8/15/2018 | MBrWilliams_1.2 | 6:45 | 23-12-18 | 90.8 | Y | 181622-12 | 0.17 | 10.4 | NT | 96.8 | 18 | 16 | moderate | base | variety of weather in days preceding |
| 8/15/2018 | MBrWilliams_.02 | 7:00 | 23-13-18 | 118.7 | Y | 181622-13 | 0.2 | 12.2 | NT | 88.5 | 18 | 18 | moderate | freshet | |
| 8/15/2018 | Williams_10.7 | 6:48 | 23-14-18 | 125.9 | Y | 181622-14 | 0.24 | 12 | NT | 91.8 | 19 | 18.5 | moderate | base | |
| 8/15/2018 | Williams_10.3 | 7:00 | 23-15-18 | 191.8 | Y | 181622-15 | 0.23 | 11.9 | NT | 93 | 18 | 18 | moderate | base | |
| 8/15/2018 | Williams_8.6 | 7:05 | 23-16-18 | 143.9 | Y | 181622-16 | 0.34 | 20.5 | NT | 97.6 | 19 | 18 | moderate | freshet | |
| 8/15/2018 | Williams_7.0 | 7:36 | 23-17-18 | 206.4 | Y | 181622-17 | 0.34 | 14.7 | NT | 93.4 | 18 | 17 | moderate | freshet | |
| 8/15/2018 | Saxtons_5.6 | 7:03 | 23-18-18 | 218.7 | Y | 181622-18 | 0.21 | 11.9 | NT | 60.7 | 18 | 18 | moderate | freshet | |
| 8/15/2018 | Saxtons_5.15 | 7:19 | 23-19-18 | 218.7 | Y | 181622-19 | 0.2 | 12.4 | NT | 61.9 | 18.5 | 19 | moderate | freshet | |
| 8/15/2018 | Saxtons_4.7 | 7:50 | 23-20-18 | 140.1 | Y | 181622-20 | 0.21 | 14.3 | NT | 65 | 21.5 | 19 | high | freshet | |
| 8/15/2018 | Saxtons_3.6 | 7:15 | 23-21-18 | 325.5 | Y | 181622-21 | 0.23 | 21.1 | NT | 64.9 | 20 | 18 | moderate | freshet | |

| Date | Site | Time | Sample # | Final E. Coli. (mpn/100ml) | Wet? (Y/N) | Sample # | TN (mg-N/l) | TP (µg-P/L) | Turbidity (NTU) | Spec. Cond. (µS/cm) | Air Temp. °C | Water Temp °C | Water Level | Flow Type | Sample or QA Notes: |
|-----------|----------------|------|----------|----------------------------|------------|-----------|-------------|-------------|-----------------|---------------------|--------------|---------------|-------------|-----------|---|
| 8/15/2018 | Saxtons_1.0 | 7:33 | 23-22-18 | 195.6 | Y | 181622-22 | 0.21 | 17.1 | NT | 67.3 | 20 | 18 | moderate | freshet | |
| 8/15/2018 | Saxtons_.19 | 7:52 | 23-45-13 | 148.3 | Y | 181622-23 | 0.21 | 14.7 | NT | 70.5 | 20 | 18 | moderate | freshet | |
| 8/15/2018 | EPutney_0.4 | 7:35 | 23-24-18 | 920.8 | Y | 181622-24 | 0.24 | 13.8 | NT | 103.9 | 20 | 17 | high | freshet | |
| 8/15/2018 | Sacketts_2.5 | 8:30 | 23-25-18 | 172.3 | Y | 181622-25 | 0.24 | 14 | NT | 142.9 | 21 | 17.5 | high | base | Down tree washed downstream |
| 8/15/2018 | Sacketts_1.6W | 7:30 | 23-26-18 | > 2419.6 | Y | 181622-26 | 0.38 | 27.1 | NT | 177.6 | 20 | 18 | moderate | freshet | |
| 8/15/2018 | Sacketts_1.2 | 7:45 | 23-27-18 | 1732.9 | Y | 181622-27 | 0.27 | 20.1 | NT | 149.1 | 18 | 17 | moderate | freshet | |
| 8/15/2018 | Sacketts_1.0 | 8:00 | 23-28-18 | 1986.3 | Y | 181622-28 | 0.26 | 18.2 | NT | 147.7 | 20 | 17 | high | freshet | |
| 8/15/2018 | Whetstone_3.7 | 6:19 | 23-29-18 | 488.4 | Y | 181622-29 | 0.19 | 45.9 | NT | 78.3 | 19 | 18 | moderate | freshet | |
| 8/15/2018 | Whetstone_2.4 | 8:25 | 23-30-18 | 298.7 | Y | 181622-30 | 0.24 | 23.5 | NT | 95.5 | 18 | 16 | moderate | freshet | |
| 8/15/2018 | Whetstone_1.3 | 8:10 | 23-32-18 | 410.6 | Y | 181622-31 | 0.25 | 25.2 | NT | 113 | 21 | 18 | high | freshet | |
| 8/15/2018 | Whetstone_.2 | 6:00 | 23-33-18 | 461.1 | Y | 181622-32 | 0.21 | 27.8 | NT | 118.2 | 21 | 18 | high | freshet | High flow! Above sampler knees - didn't get to thalweg - strong current |
| 8/15/2018 | QCA1 | 7:45 | 23-34-18 | 101.9 | Y | 181622-33 | 0.19 | 15.9 | NT | 64.7 | 0 | 0 | 0 | 0 | West_6.4 |
| 8/15/2018 | QCA2 | 6:45 | 23-35-18 | 81.6 | Y | 181622-34 | 0.17 | 11 | NT | 97.5 | 0 | 0 | 0 | 0 | MBrWilliams_1.2 |
| 8/15/2018 | QCA3 | 7:50 | 23-36-18 | 145 | Y | 181622-35 | 0.2 | 13.5 | NT | 67.4 | 0 | 0 | 0 | 0 | Saxtons_4.7 |
| 8/15/2018 | QCB1 | 6:12 | 23-37-18 | < 1 | Y | 181622-36 | < 0.1 | < 5 | NT | 7.1 | 0 | 0 | 0 | 0 | Whetstone_3.7 |
| 8/15/2018 | QCB2 | 7:05 | 23-38-18 | < 1 | Y | 181622-37 | < 0.1 | < 5 | NT | 3.8 | 0 | 0 | 0 | 0 | Williams_8.6 |
| 8/15/2018 | QCB3 | 7:30 | 23-39-18 | < 1 | Y | 181622-38 | < 0.1 | < 5 | NT | 2.6 | 0 | 0 | 0 | 0 | Sacketts_1.6 |
| 8/29/2018 | West_38.5A | 7:35 | 27-1-18 | 146.4 | N | 181731-01 | 0.23 | 8.84 | NT | 46.6 | 20 | 20.5 | low | base | |
| 8/29/2018 | West_36 | 7:51 | 27-2-18 | 59.4 | N | 181731-02 | 0.19 | 9.88 | NT | 97.3 | 20 | 20.5 | low | base | |
| 8/29/2018 | Flood_1.7 | 7:20 | 27-3-18 | 28.2 | N | 181731-03 | 0.23 | 7.58 | NT | 74.9 | 20.5 | 19 | low | base | |
| 8/29/2018 | NBranchBrk_4.5 | 7:35 | 27-4-18 | 30.9 | N | 181731-04 | 0.26 | 6.57 | NT | 252.9 | 20 | 12 | moderate | base | |
| 8/29/2018 | Rock_38 | 6:45 | 27-5-18 | 30.9 | N | 181731-05 | < 0.1 | 16.8 | NT | 76.1 | 20 | 20 | NT | NT | |
| 8/29/2018 | West_13 | 7:45 | 27-6-18 | 81.6 | N | 181731-06 | 0.25 | 9.95 | NT | 86.5 | 21 | 22 | moderate | base | |
| 8/29/2018 | West_6.4 | 7:45 | 27-7-18 | 111.9 | N | 181731-07 | 0.21 | 10.3 | NT | 90.1 | 22 | 22 | moderate | base | |
| 8/29/2018 | West_1.42 | 5:45 | 27-8-18 | 160.7 | N | 181731-08 | 0.23 | 9.72 | NT | 89.8 | 23 | 23 | low | base | |
| 8/29/2018 | West_.08 | 8:23 | 27-9-18 | 325.5 | N | 181731-09 | 0.22 | 10.1 | NT | 90.1 | 25 | 24 | high | base | |

| Date | Site | Time | Sample # | Final E. Coli. (mpn/100ml) | Wet? (Y/N) | Sample # | TN (mg-N/l) | TP (µg-P/L) | Turbidity (NTU) | Spec. Cond. (µS/cm) | Air Temp. °C | Water Temp °C | Water Level | Flow Type | Sample or QA Notes: |
|-----------|-----------------|------|----------|----------------------------|------------|-----------|-------------|-------------|-----------------|---------------------|--------------|---------------|-------------|-----------|--|
| 8/29/2018 | Williams_14.2 | 7:15 | 27-11-18 | 93.3 | N | 181731-10 | 0.16 | 6.78 | NT | 111.5 | 20 | 19 | low | base | |
| 8/29/2018 | Williams_11.3 | 6:50 | 27-12-18 | 123.6 | N | 181731-11 | 0.23 | 7.08 | NT | 122 | 19 | 20 | moderate | base | |
| 8/29/2018 | MBrWilliams_1.2 | 6:50 | 27-13-18 | 45.5 | N | 181731-12 | 0.12 | 5.38 | NT | 146.8 | 21 | 20 | moderate | base | |
| 8/29/2018 | MBrWilliams_02 | 7:00 | 27-14-18 | 2419.6 | N | 181731-13 | 0.18 | 5.64 | NT | 149.3 | 19.5 | 20 | moderate | base | |
| 8/29/2018 | Williams_10.7 | 6:40 | 27-15-18 | 150 | N | 181731-14 | 0.29 | 6.54 | NT | 152.9 | 20 | 21 | moderate | base | |
| 8/29/2018 | Williams_10.3 | 6:50 | 27-16-18 | 119.8 | N | 181731-15 | 0.25 | NR | NT | 152.4 | 20 | 19.5 | moderate | base | |
| 8/29/2018 | Williams_8.6 | 7:00 | 27-17-18 | 83.3 | N | 181731-16 | 0.68 | 9.18 | NT | 160.8 | 21 | 19.5 | moderate | base | |
| 8/29/2018 | Saxtons_5.6 | 6:52 | 27-18-18 | 117.8 | N | 181731-18 | 0.19 | 6.94 | NT | 108.5 | 21 | 20 | moderate | base | |
| 8/29/2018 | Saxtons_5.15 | 6:24 | 27-19-18 | 82 | N | 181731-19 | 0.19 | 7.83 | NT | 110.2 | 20.5 | 20 | moderate | base | |
| 8/29/2018 | Saxtons_4.7 | 7:50 | 27-20-18 | 119.8 | N | 181731-20 | 0.19 | 10 | NT | 114.1 | 23 | 20.5 | moderate | base | |
| 8/29/2018 | Saxtons_3.6 | 7:30 | 27-21-18 | 101.2 | N | 181731-21 | 0.24 | 12.2 | NT | 122.3 | 20 | 20 | low | base | |
| 8/29/2018 | Saxtons_1.0 | 7:45 | 27-22-18 | 45 | N | 181731-22 | 0.22 | 8.68 | NT | 128.4 | 20 | 20 | low | base | earthy odor |
| 8/29/2018 | Saxtons_19 | 8:05 | 27-23-18 | 41 | N | 181731-23 | 0.26 | 7.56 | NT | 136.8 | 20 | 20.5 | low | base | |
| 8/29/2018 | EPutney_0.4 | 7:55 | 27-24-18 | 90.6 | N | 181731-24 | 0.23 | 7.17 | NT | 141.7 | 21 | 18 | moderate | base | samples were off ice for 1 minutes in transport by volunteer |
| 8/29/2018 | Sacketts_2.5 | 8:05 | 27-25-18 | 260.3 | N | 181731-25 | 0.24 | 11.5 | 0.76 | 187.6 | 20 | 17 | moderate | base | |
| 8/29/2018 | Sacketts_1.6W | 7:30 | 27-26-18 | 547.5 | N | 181731-26 | 0.23 | 26.2 | 3.19 | 190.7 | 21 | 20 | moderate | base | very warm yesterday, in the 9s |
| 8/29/2018 | Sacketts_1.2 | 7:50 | 27-27-18 | 579.4 | N | 181731-27 | 0.22 | 25.6 | 2.81 | 185.4 | 20 | 19 | moderate | base | |
| 8/29/2018 | Sacketts_1.0 | 8:27 | 27-28-18 | 727 | N | 181731-28 | 0.2 | 14.9 | 2.02 | 186 | 20 | 18 | moderate | base | |
| 8/29/2018 | Whetstone_3.7 | 7:45 | 27-29-18 | 186 | N | 181731-29 | 0.14 | 9.32 | NT | 122.8 | 21.5 | 18 | moderate | base | |
| 8/29/2018 | Whetstone_2.4 | 9:15 | 27-30-18 | 137.4 | N | 181731-30 | 0.19 | 10.9 | NT | 145.3 | 22 | 19 | moderate | base | |
| 8/29/2018 | Whetstone_2 | 6:05 | 27-31-18 | 135.4 | N | 181731-32 | 0.24 | 9.14 | NT | 214.5 | 24 | 19 | moderate | base | |
| 8/29/2018 | QCA1 | 7:30 | 27-32-18 | 547.5 | N | 181731-33 | 0.24 | 26.6 | NT | 189.9 | 0 | 0 | 0 | 0 | Sacketts_1.6 |
| 8/29/2018 | QCA3 | 5:45 | 27-33-18 | 123.4 | N | 181731-35 | 0.25 | 10.8 | NT | NT | 0 | 0 | 0 | 0 | West_1.42 |
| 8/29/2018 | QCB1 | 7:25 | 27-34-18 | < 1 | N | 181731-36 | < 0.1 | < 5 | NT | 2.9 | 0 | 0 | 0 | 0 | Williams_7.0 |
| 8/29/2018 | QCB2 | 7:55 | 27-35-18 | < 1 | N | 181731-37 | < 0.1 | 640 | NT | 203 | 0 | 0 | 0 | 0 | EPutney_04 |
| 8/29/2018 | QCB3 | 7:45 | 27-36-18 | < 1 | N | 181731-38 | < 0.1 | 491.5 | NT | 205.2 | 0 | 0 | 0 | 0 | West_6.4 |

| Date | Site | Time | Sample # | Final E. Coli. (mpn/100ml) | Wet? (Y/N) | Sample # | TN (mg-N/l) | TP (µg-P/L) | Turbidity (NTU) | Spec. Cond. (µS/cm) | Air Temp. °C | Water Temp °C | Water Level | Flow Type | Sample or QA Notes: |
|-----------|---------------|------|----------|----------------------------|------------|----------|-------------|-------------|-----------------|---------------------|--------------|---------------|-------------|-----------|---------------------|
| 8/29/2018 | Saxtons_Trib. | 7:10 | 27-37-18 | 53.8 | N | NT | NT | NT | NT | NT | NT | NT | NT | NT | #N/A |