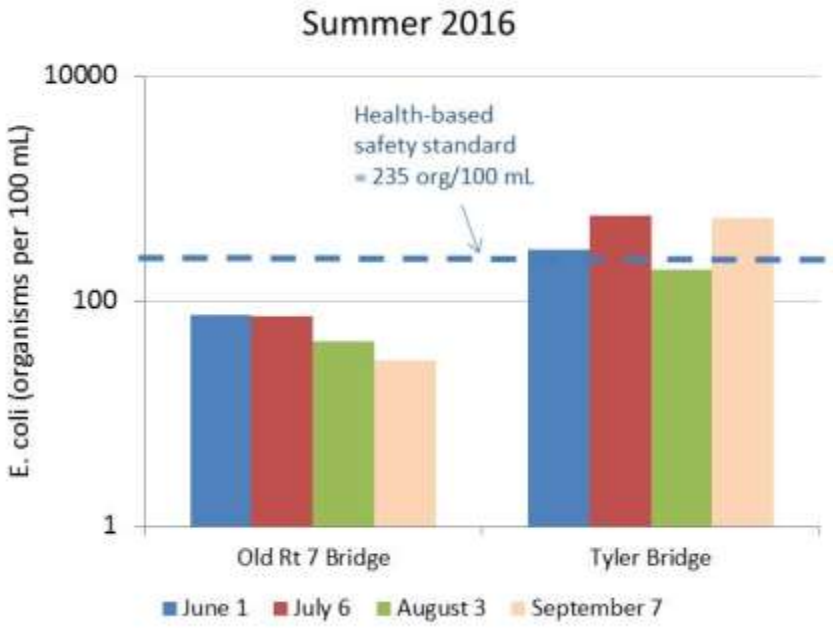
Lewis Creek - 2016 Water Quality Summary
Addison County River Watch Collaborative

Site	Location	Town
LCR3.7	Old Route 7 Bridge	Ferrisburgh
LCR14	Tyler Bridge	Monkton

The Addison County River Watch Collaborative has been monitoring water quality in the Lewis Creek since 1992. For years 2014 through 2017, the number of sampling locations in this watershed has been reduced to two sentinel stations monitored for longterm trends: LCR3.7 and LCR14.

During 2016, sampling occurred on two spring dates (April 6 and May 4) and four summer dates (June 1, July 6, August 3, and September 7). Following a February thaw and final ice-out and snowmelt in early March, the April and May sampling events took place during relatively low flows, characterized as baseflow conditions on the river, based on streamflow gaging records from the USGS streamflow gage located at the Route 7 crossing. Given below-normal rainfall, the June, July, August and September events occurred during low to very-low flows also representative of baseflow conditions (i.e., relatively stable flow stage, not significantly rising or falling in response to a rainfall or snowmelt event). On an average annual basis, flows in 2016 were below normal in the six Addison County watersheds monitored by the Collaborative.

Samples from the Lewis Creek watershed were tested for *E.coli*, total phosphorus, and turbidity; *E.coli* was tested only on the summer dates.



E.coli counts in the Lewis Creek at the two sentinel stations ranged from 29.8 to 579 organisms/100 mL. Vermont Water Quality Criteria (October 2014) state that *E.coli* is not to exceed a geometric mean of 126 organisms /100mL obtained over a representative period of 60 days, and no more than 10% of samples should be above 235 organisms/100 mL. *E.coli* counts exceeded the state's health-based

standard of 235 organisms/100 mL on three of the four summer sample dates at the Tyler Bridge station (LCR14). The geometric mean of summer sampling results was 366 org/100mL at LCR14 and 52 org/100mL at LCR3.7; the value for station LCR14 exceeded the state's geomean standard of 126 organisms/ 100 mL. Detected *E.coli* counts at this Tyler Bridge station were largely consistent with historic monitoring results which indicate chronic exceedances of the water quality standard for *E.coli.* Station LCR14 is located downstream of a dairy pasture where livestock have direct access to the stream. This station is also located downstream of the confluence with Hollow Brook which flows through wetlands populated by beavers.

Turbidity levels in the Lewis Creek at the sampled stations ranged from 1.8 to 8.7 NTUs, with a mean level of 4.1 NTUs for the six sample dates. The Vermont state standard of 10 NTUs (for Class B cold-water fisheries) is applicable during dry-weather, baseflow conditions which were relevant to all six sample dates. The turbidity standard was not exceeded at either sentinel station on the six sample dates in 2016. Based on past years' sampling results, turbidity can be elevated at times of increased flow – during a summer thunderstorm, or during spring runoff conditions – especially in the lower reaches of the river. An increasing trend in turbidity with distance downstream is generally observed during all flow conditions.

Phosphorus was detected at low to moderate concentrations during the six Spring and Summer sampling dates, ranging from 11 to 28 µg/L, with an average of 17.7 µg/L. The instream phosphorus criterion of 27 µg/L for warm-water medium gradient (WWMG) wadeable stream ecotypes in Class B waters is applicable at low median monthly flow conditions during June through October. Flows in the Lewis Creek were below the low median monthly flow on the July, August, and September sample dates, based on records from the USGS streamflow gage located at the Route 7 crossing. The mean of the phosphorus results available for these three summer sampling dates did not exceed the instream nutrient standard of 27 µg/L. Historic results for both sentinel and rotational sites have shown an increasing trend in phosphorus concentration with distance downstream, as well as a tendency for elevated phosphorus concentrations during high flows.

2017: The Addison County River Watch Collaborative will continue to monitor for *E.coli*, total phosphorus, and turbidity at these two sentinel sites in 2017. Additionally, the Collaborative has received technical and financial support from the Vermont Department of Environmental Conservation to conduct bracket monitoring in 2017 during both dry-weather and wet-weather conditions at additional sites in the vicinity of the Hollow Brook confluence to gain a better understanding of water quality patterns and potential sources of elevated pathogens, nutrients and sediments in this region.

An increased number of parameters and additional monitoring sites will be evaluated when a more intensive monitoring focus rotates back to the Lewis Creek for a two-year period beginning in the year 2018. Water quality data from the previous focus period (2012-2013) are being used by VTDEC biomonitoring teams to evaluate the health of several headwaters reaches. These data will inform ongoing municipal-level discussions and basin-planning efforts regarding water quality management and classification.

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