**Lake Champlain Basin Program**

**Quarterly Report**

**April 10, 2018**

**Organization Name:** Stone Environmental, Inc.

**Project Name:** Assessment of Tile Drainage System Impacts to Lake Champlain and Phosphorus Loads in Tile Drainage in the Jewett Brook Watershed of St. Albans Bay

**NEI Job Code:** 0100-310-002

**Project Code:** L-2016-060

**Final Report Due Date:** September 2018

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**Summary of Activities:**

***Task 1: Literature Review Examining Tile Drainage Systems***

Completed.

***Task 2: Assessment of Tile Drainage Systems in the Jewett Brook Watershed***

Flow monitoring and sample collection continued through March 2018 at all monitoring stations. Through March 2018, 48 sampling rounds had been performed. Samples are collected approximately weekly. Every 30 minutes, flow and sampling data are transmitted to Stone’s server. These data are checked periodically to assess whether the monitoring program is working as intended.

Collection of flow-paced composite samples was generally successful until the week of November 14, 2017, when all the composite sample carboys were frozen. As of November 14th, automated composite sampling was suspended due to below freezing conditions. Grab samples were collected from November 14, 2017 through March 2018, approximately once per week.

Various maintenance activities are performed on every sample collection date, including checking/changing instrument desiccant and removing vegetation or snow shading solar panels. The monitoring manholes were insulated to protect the flowmeters against freezing.

Samples collected at the tile drain monitoring stations are analyzed by the Vermont Agriculture and Environmental Laboratory for concentrations of total phosphorus (TP), total dissolved phosphorus (TDP), and total nitrogen (TN). Beginning in August, VTDEC—which supports the TN analysis—requested that TN be collected on alternate weeks as a cost saving measure until field conditions changed due to manure application or other agricultural activities.



Completing JBT01 station construction

A tremendous effort was devoted in the last quarter to manipulating flow data and identifying and making estimates for any gaps in the continuous (15-minute) flow and concentration time series data. This laborious effort is a necessary precursor to calculating seasonal and annual flow totals and TP and TDP concentrations and loads.

Each month, a brief monitoring report is prepared summarizing monitoring data collected to date. Thus far only nutrient concentration data have been included.

***Task 3: Phosphorus Load Estimation of Tile Drainage Systems in the Jewett Brook Watershed***

No activity.

**Project Status:**

The sampling program has been completed. Remaining sample analyses will be completed within the next month. The data analysis tasks will commence in earnest in the next quarter.

**Challenges Encountered:**

No power failures occurred in the month of March. This was due to longer days, milder temperatures, regular panel clearing, and a number of battery replacements made in January.

Due to difficulty with the field preservation procedure, the field technician with FNLC acidified TN samples at the VAEL Laboratory on five sampling dates: 12/4/2017, 12/15/2017, 12/19/2017, 01/16/2018, and 2/1/2018. All TN samples were preserved with sulfuric acid within 24 hours of collection.

Shortly after a mid-winter thaw on January 11th and 12th, sediment buried the autosampler intake line at station JBT19. Consequently, sample results at this site from 1/12/2018 through 3/31/2018 are invalid due to high sediment content. We believe this occurred as a result or soil pushing into the manhole through a gap where the tile drain pipe penetrates the manhole wall, not because of sediment settling from the tile drainage water.

**Work Anticipated Next Quarter:**

In the next quarter, sample analysis will be completed and approved, and the primary data analysis tasks will commence in earnest.