

## Memorandum

**To:** Bassett Creek Watershed Management Commission  
**From:** Barr Engineering Co.  
**Subject:** Item 5G – Consider Purchase of Dissolved Oxygen Sensor for Annual Stream Monitoring  
BCWMC June 16, 2022 Meeting  
**Date:** June 8, 2022

### 5G. Consider Purchase of Dissolved Oxygen Sensor for Annual Stream Monitoring

#### Recommendations:

1. Approve the purchase of an Onset HOBO Dissolved Oxygen Data Logger (HOBO Logger) (estimated cost of \$1,350) for dedicated use for the Commission's annual stream monitoring program.
2. Use the 2022 Plymouth Stream Monitoring Program budget for the purchase.

#### Background

The Commission Engineer recommends purchasing a new sensor/datalogger for collecting continuous dissolved oxygen data as part of the Commission's annual stream monitoring program. The stream monitoring program calls for dissolved oxygen (DO) measurements to be collected continuously for a minimum 4-day period each summer at the North Branch of Bassett Creek, the Sweeney Branch of Bassett Creek, or Plymouth Creek, depending on the given year (in 2022 it is Plymouth Creek). We originally planned to rent an Aanderaa DO sensor (approximately \$200/week) from Barr, which is compatible with the Commission's existing monitoring equipment. However, we have found a better alternative, which can save money and provide data of equal or better quality.

We recommend that the Commission purchase their own dissolved oxygen sensor, the Onset HOBO Dissolved Oxygen Data Logger (HOBO Logger), pictured here (for scale reference, it is 10-1/2" long x 1-1/2" dia.):



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This sensor could be dedicated to the Commission's annual stream monitoring program, but it could also be available for other Commission projects. The HOBO Logger is a relatively inexpensive (\$1,350), accurate, and self-contained sensor/datalogger. During the past couple of years, Barr has deployed these sensors at several lake monitoring sites for other clients. We also conducted a successful test run on the Sweeney Branch of Bassett Creek last October. The DO data were verified with a calibrated handheld meter at the start and end of the test period. In addition to DO, the HOBO Logger also measures and records continuous temperature data. The sensor/datalogger has performed well in all cases and is easier to use than our rental Aanderaa DO sensors. Barr already owns the software (needed for programming, calibrating, and data processing) and data shuttle (needed for downloading).

The HOBO Logger is self-contained, which means no cable needs to be wired to a datalogger, fished through a conduit, buried, and anchored to the streambed or streambank. The lack of a cable also reduces the chance of debris hanging up on the sensor and interfering with measurements. Calibration and programming are simpler and require less time. Like the Aanderaa DO sensor, the HOBO Logger uses optical sensor technology, which is accurate, robust and the current "cutting edge" technology for DO measurement. We estimate that using the HOBO Logger will save almost \$1,000/year in labor cost. The only recurring annual cost will be replacement of the DO cap at a cost of \$125/cap. Therefore, the initial purchase cost will be recovered by the second year. With only a week of use each year, the life of the sensor should be many years (minimum 5 years, expect 10 years). This sensor is an "off the shelf" product and can be acquired in 2-3 days. We recommend charging this purchase cost to the 2022 Plymouth Creek monitoring budget. Due to the labor savings, we expect the current 2022 Plymouth Creek monitoring budget to cover the costs.

The Commission Engineer will maintain the HOBO DO Logger and store it at Barr Engineering on behalf of the Commission, as is current practice for the other monitoring equipment purchased by the Commission (in 2017) and used for the Commission's annual stream monitoring program. When not in use for the annual stream monitoring program, this sensor would also be available for other Commission project work in any stream, lake, pond, or other waterbody.