

**Full Authority**  
**17 June 2021**  
**Agenda Item: 16**

**Flood Forecasting and Warning System Upgrades**

**Background**

The Crowe Valley Conservation Authority built a Flood Forecasting and Warning System in the late 1980's. The responsibilities of the Duty Forecaster are to record, analyze and determine dam adjustments to mitigate the effects of a flooding scenario. The daily readings are also vital to ensure summer and winter levels are maintained within the acceptable range as per the engineered study undertaken at the same time of the installation of the physical components of the system.

The items required for the system included the construction of gauge sites (stilling well, the building of the gauge house, hydro and phone hookup), obtaining computer hardware and software, various digital equipment and battery backups. Once in place and as per the Flood Warning Plan, the water level and flow readings are taken daily by the Duty Forecaster. At the time, this system was certainly equivalent to any flood forecasting and warning installed throughout the province by either a large or small conservation authority.

**Current Status**

The system has performed admirably, giving the CVCA staff the ability to take real time readings and further record readings either hourly or on a schedule pertinent for the conditions at the time. Typically, the equipment is set up to record the data every four hours which is more than adequate during non-flood events.

However, as well as it has delivered over the years, the entire system has become antiquated, leaving the Authority in a vulnerable position. Although the data loggers and other pieces of equipment are reliable, there is a risk in each passing year there will be failures. In particular, the software can only be operated on older computers which are well past their prime.

As an agency that is relied upon to dispense information to the public, municipalities and emergency services such as the OPP, the CVCA must always be able to deliver the necessary and accurate information to the various stakeholders. Therefore, staff have concluded upgrading the computer hardware, software and various other components would provide the reliability, accuracy and confidence in a system without jeopardizing the current operating system and procedures the CVCA staff have developed over the years.

Staff have compiled a detailed report of the expenses to be incurred to make the switch from a system that is 30+ years old to a system that will be up to date, reliable and expand our reporting and collection of data. This will offer considerably more flexibility to use the data being recorded including the presentation of information to the Board, the member municipalities and ultimately the public whom we serve.

The CVCA Board has recognized the need to set aside funding as per our asset management plan and the staff would like to phase in the changes over the next 2 to 3 years, starting in 2021. Based on expenses, staff are confident 2 of the 7 gauges could be completely changed this year with the Crowe Lake gauge change at least started.

The Crowe Lake gauge is more complicated since staff would like to physically change the location of the gauge. It is currently located at the dam, which is typical for many of the CVCA's gauges. There are a number of issues that a gauge location change would address including the following:

1. The gauge is below grade, susceptible to extremely high humidity and as a result has not worked consistently or at all for a number of years.
2. In effect, it has become a manual gauge requiring staff to physically read the gauge 365 days a year. This has been manageable, however continuing in this manner is becoming considerably more challenging, especially for weekend work.
3. The flow rate passing through the dam is high, especially during the spring freshet. The gate, hydro plant and stop logs are all passing water. This creates a draw down effect where the level of the water is considerably lower than the lake level leading to an inaccurate or false water level reading.

Relocating the gauge will solve all of these problems, which if left unchecked, could lead to decisions being made by less experienced staff that have a negative upstream and/or downstream effect on residents. Of course, this could lead to personal loss, damage to property and possibly other liability issues (accidents, etc.).

The funding to cover these improvements will be done through the funding added to the reserves based on the asset management allocation introduced in 2018. Current funding available is approximately \$30,000.

In addition to the quote provided, recent further investigation has indicated the option to invest in a satellite based system vs. a cell system is the better course of action due to unreliable cell service and better data retrieval. Upfront costs are higher, but would be recovered on the "flip" side since recurring costs (ie. monthly phone bills) would be permanently eliminated. The per site extra expense is \$2,100 for a total of \$16,800 for 8 sites. The CVCA's recurring expenses are \$3,100. Staff have estimated the recoup period would be approximately 5 ½ years.

*Staff Recommendation*

*That the Board approve the initiation of the upgrades to the Flood Forecasting and Warning system infrastructure, hardware and software as required for the Marmora, Paudash and Wollaston gauge sites and if possible, the inclusion of additional gauge sites would be preferred.*

**Board Decision**