Saugeen Valley Conservation Authority

Water Resources Committee Meeting

Friday July 7, 9:00 a.m.

Location: Formosa Administration Office

Agenda

1.0 Adoption of Agenda

THAT the agenda for the Water Resources Committee Meeting, July 7, 2023, be adopted as circulated.

2.0 Declaration of Pecuniary Interest

3.0 Adoption of Minutes – June 5, 2023

THAT the minutes of the Water Resources Committee Meeting, June 5, 2023, be adopted as circulated.

4.0 New Business

4.1. Flood Forecasting and Warning – Program Overview

THAT the SVCA Water Resources Committee receive this report for information.

4.2. Water Quality Program Overview

THAT the SVCA Water Resources Committee receive this report for information.

4.3. Water Resources Department – Proposed Staffing Plan

THAT the SVCA Water Resources Committee recommend to the Board of Directors that the proposed staffing plan be endorsed for the 2024 budget year.

Adjournment

Saugeen Valley Conservation Authority

Minutes – Water Resources Committee

Date: Monday June 5, 2023, 9:00 a.m.
Location: Formosa Administration Office
Chair: Tom Hutchinson
Members present: Barbara Dobreen, Dave Myette, Bill Stewart (remote)
Absent: Greg McLean
Staff present: Jennifer Stephens, Elise MacLeod, Janice Hagan

Tom Hutchinson called the meeting to order at 9:30 a.m.

1. Adoption of Agenda

Motion #WR23-12
Moved by Dave Myette
Seconded by Bill Stewart
THAT the agenda for the Water Resources Committee meeting, June 5, 2023, be adopted as circulated.

Carried

2. Declaration of Pecuniary Interest

There were no declarations of pecuniary interest relative to any item on the agenda.

3. Adoption of Minutes – May 4, 2023

Motion #WR23-13
Moved by Bill Stewart
Seconded by Dave Myette
THAT the minutes of the Water Resources Committee meeting held on May 4, 2023, be adopted as presented.

Carried

4. New Business – None at this time.

5. Closed Session

Motion #WR23-14
Moved by Dave Myette
Seconded by Bill Stewart
THAT the Water Resources Committee move into Closed Session, In Camera to discuss matters subject to potential litigation affecting the Authority and advice that is subject to

solicitor-client privilege; and

FURTHER THAT Jennifer Stephens, Elise MacLeod, and Janice Hagan remain in the meeting.

Carried

Motion #WR23-18
Moved by Dave Myette
Seconded by Barbara Dobreen
THAT the Water Resources Committee adjourn from Closed Session and rise and report.

Carried

Chair Hutchinson reported that there was only discussion in the Closed Session pertaining to the potential litigation affecting the Authority and that there was no direction given to staff.

There being no further business, the meeting was adjourned at 12:03 p.m. on the motion of Dave Myette and Bill Stewart.

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Tom Hutchinson
Chair

Janice Hagan
Executive Assistant / Recording Secretary

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Report To: Chair and Members, SVCA Water Resources Committee

From: Jody Duncan, Flood Forecasting and Warning Coordinator

Date: July 7, 2023

Subject: Flood Forecasting and Warning – Program Overview

Purpose: To provide an update on the state of SVCA's Flood Forecasting and Warning system

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Recommendation

THAT the SVCA Water Resources Committee receive this report for information.

Background

Saugeen Valley Conservation Authority operates a Flood Forecasting and Warning system (or hydrometric network), which consists of 10 SVCA-owned stream gauge stations, 10 Water Survey Canada stream gauge stations, 12 rain gauges and 1 operational weather station. There are two other weather stations at Sulphur Spring Conservation Area and Bells Lake, however these stations are currently inactive. Several stream gauge stations are also equipped with water and air temperature sensors which improve our understanding of frazil ice development and ice jamming potential.

SVCA is unique compared to many conservation authorities in the number of stream gauge stations that we own and operate. Most conservation authorities rely on stream gauge stations owned and maintained by Water Survey of Canada (WSC) to monitor their watershed. SVCA operates an additional 10 stations due to data gaps resulting from the size of our watershed and the spatial distribution of WSC stations within it. These additional stations are critical to provide the coverage needed to protect our communities from flooding.

Data collected from our monitoring network can be accessed remotely from the SVCA Administration Office. This network provides SVCA staff with near real-time information on water levels, flow, precipitation data, and weather conditions. All this information is interpreted and used to inform our Flood Forecasting and Warning system.

An integral component of operating SVCA's hydrometric network is the routine inspection and maintenance of equipment. Recently, SVCA staff have completed a detailed inventory of our network to understand the types and age of equipment currently in use, maintenance requirements, and stations in greatest need of repair or upgrade.

Discussion

Recent Equipment Replacement

Since 2019, three (3) of SVCA's stream gauges have been upgraded with new equipment, including the replacement of peripheral sensors (*i.e.*, rain gauge, air temperature, and water temperature sensors). The operational lifespan of most of this equipment is approximately 10-15 years, although some components will only last 5-8 years and will need to be replaced sooner.

Although equipment has been replaced, additional work is needed in the short term to develop a rating curve (also referred to as a stage-discharge relationship). A rating curve determines the relationship between water levels and flows and is specific to each station. To develop this rating curve, staff must collect 6 - 10 manual flow measurements, per station, at different water levels and relate them on a logarithmic curve. This involves wading into a watercourse with a flow measuring device. Smaller watercourses are easily wadable during low flow conditions, however larger systems such as the Saugeen River need to be measured using special equipment obtained through consultants.

As with all stream gauge stations, regular inspections, and routine maintenance of equipment is critical.

Remaining Equipment

SVCA's seven (7) remaining stream gauge stations are in desperate need of repair:

- Two stations (Beatty Saugeen and Greenock) are completely inactive and require the replacement of all equipment before becoming operational again. The Greenock station also requires significant repairs to the equipment structure as well as improvements to the retaining wall protecting the structure.
- One station (Saugeen River near Paisley) continues to collect data but is unable to transmit the data remotely due to a recent lightning strike, and thus provides little value for flood forecasting.
- One station (Aberdeen) continues to operate but the data is of questionable quality and is unreliable due to equipment issues.
- One station (Chesley) frequently stops recording and transmitting data due to high battery draw and the need to continually re-visit the site and re-charge the battery.
- The remaining two stations (Ripley and Priceville) operate with few issues but are using antiquated equipment that has surpassed its operational life and relies solely on LAN lines for data transmission that are sparsely maintained.

As noted above, SVCA also has two weather stations at Sulphur Spring Conservation Area and Bells Lake which are currently inactive and have been for quite some time. SVCA staff will investigate whether these stations can be brought back into operation with the existing equipment or if upgrades would be required. These weather stations are not critical to our

Flood Forecasting and Warning Network, but the additional coverage they provide would be beneficial.

Operational Challenges

The use of antiquated equipment presents numerous operational challenges for SVCA staff. Stations using this equipment tend to go offline more frequently and require more regular maintenance to remain operational. Not only does this 'down-time' cost more (*i.e.*, staff time, travel, equipment replacement), but it can also impede our ability to accurately forecast flood events. To compound the issue, maintenance records cannot be relied on to guide troubleshooting activities.

There is also little support externally for equipment maintenance and repair, as most conservation authorities are using more updated equipment and manufacturers no longer provide technical support.

All incoming water level, flow, precipitation, and weather station data is stored in a data management program called WISKI. This is a powerful data analysis tool that is used by most conservation authorities; however, it has a very steep learning curve. The program is complex, and it can take years for staff members to navigate the program efficiently; this has been a challenge as of late due to high staff turnover in the Flood Forecasting and Warning Coordinator position.

Routine maintenance of SVCA's monitoring network is extensive and time consuming. Maintenance of these stations includes cleaning or vacuuming out the stations, removing vermin, calibration of sensors, review of benchmarks, rating curve development, replacement of equipment, well flushing, etc. SVCA staff are currently working with a consultant to prepare a standard operating procedure for station maintenance to guide these practices in the future.

Improvements

Staff recommend improving SVCA's hydrometric network, over the next five (5) years, through the replacement of equipment and completion of necessary structure repairs. These improvements will ensure that we have a reliable and resilient monitoring network to support our flood forecasting and warning system. Staff would prioritize station repairs and those identified as the highest priority would be completed first.

Additionally, SVCA staff have identified the need for scheduling improvements, particularly as it relates to the frequency of inspections and maintenance, as well as record keeping. Due to how frequently our stations go offline, staff must prioritize the repair of these stations, which further impedes our ability for routine inspections and maintenance of other stations.

SVCA staff strive to resume monthly inspections and maintenance, though this may not always be achievable as other priorities arise (*e.g.*, the need to continuously troubleshoot other

stations). Upgrades to SVCA's aging equipment will greatly assist staff in achieving a more routine inspection and maintenance schedule.

SVCA staff do not currently have an operational forecasting model for the watershed; staff rely on professional judgment and understanding of the watershed, available floodplain mapping, and documentation of previous flood events to determine the need for flood messaging. Staff have been able to manage this program without a forecasting model, however more reliable tools are available. These tools would also benefit alternate Flood Duty Officers, during severe flood events when day and night shifts are needed. SVCA staff have met with Flood Coordinators from Maitland Valley Conservation Authority and South Nation Conservation to discuss the modelling software that they use, their successes, and associated costs. SVCA staff's understanding of current modelling software involves input of current river and soil conditions, rain forecasts, and, depending on season, snow conditions. The model would then compile all information and predict peak flows and peak times. Over time, additional functions could be added, such as having the model predict how much rain is required before flooding would occur.

A final improvement in SVCA's hydrometric network involves identifying data gaps within the watershed. For instance, SVCA's network does not currently have any precipitation data along the Lake Huron shoreline. Staff are currently in discussion with the Township of Huron-Kinloss regarding the installation of a weather station in Point Clark, though this has yet to be finalized.

Financial Implications

Staff anticipate the cost of upgrading SVCA's hydrometric monitoring equipment will be approximately $228,000 based on current equipment prices. Additionally, the cost to repair or replace damaged structures that house the equipment is estimated at $21,000. Equipment repairs and replacement will need to be completed over the next 5 years to re-establish a robust Flood Forecasting and Warning Network.

The above estimates do not account for the staff time required to replace equipment and repair or replace structures. External support may also be required for work that cannot be completed by SVCA staff, which is not reflected in the costs above. External costs are primarily associated with the development of rating curves where a river cannot be safely waded, to collect high flow measurements, and for equipment installation and initial calibration.

Prepared by:
< Original signed by:>
Jody Duncan
Flood Forecasting and Warning Coordinator

Approved by:
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Jennifer Stephens
General Manager / Secretary-Treasurer

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Report To: Chair and Directors, SVCA Water Resources Committee

From: Elise MacLeod, Manager, Water Resources

Date: July 7, 2023

Subject: Water Quality Program Overview

Purpose: To provide an overview of Saugeen Valley Conservation Authority's Water Quality program.

Recommendation

THAT the SVCA Water Resources Committee receive this report for information.

Background

Saugeen Valley Conservation Authority (SVCA) has been collecting water quality data as far back as the 1960's, partnering with the Ontario Ministry of the Environment. Surface water sampling in our watershed continued from the 1960's until 1996, when provincial funding was reduced.

SVCA's Water Quality program was revitalized in 2001 following the Walkerton Water Crisis (May 2000), which resulted in contamination of the Town of Walkerton's drinking water supply with *E. coli* bacteria. In response to the public health crisis, the Ontario government instituted sweeping changes to water management policies, ushering in an era of heightened vigilance and commitment to protecting water quality. SVCA's Water Quality program was re-established as a direct result of the Walkerton tragedy.

Presently SVCA's Water Quality program serves to monitor, protect, and enhance water quality in our jurisdiction, with dual aims of ensuring public health and preventing a recurrence of the Walkerton tragedy. Our Water Quality program encompasses the following components:

Provincial Water Quality Monitoring Network – Category 1 Program

Under the Provincial Water Quality Monitoring Network, SVCA staff collect surface water samples at 14 sites monthly during ice-free periods (April to November). These sites were selected to monitor wastewater discharges, and to provide representative water quality conditions across our watershed. Samples are analyzed in a laboratory by the Ministry of Environment, Conservation and Parks (MECP), for parameters such as nitrates, metals, phosphorus, and chloride, among others.

Surface Water Quality Monitoring – Category 3 Program

SVCA staff complete monthly surface water sampling at 15 additional sites within SVCA's jurisdiction, during ice free periods. These sites were selected with support from MECP to fill

important data gaps within the provincial monitoring program. These samples undergo analysis by trusted private laboratories and are tested for parameters consistent with the provincial program. Testing for *E. coli* at all provincial and SVCA sites is only completed under this program.

Provincial Groundwater Monitoring Network – Category 1 Program

SVCA staff monitor 23 aquifers situated at 13 different locations within the watershed. Water levels and water temperature in these wells are recorded on an hourly basis, and annual water quality samples are generally collected each Fall. Samples are analyzed in a laboratory by the Ministry of Environment, Conservation and Parks (MECP). Any results which surpass Ontario Drinking Water Quality Standards (ODWQS) are promptly reported to respective municipalities and the local Health Unit.

Consistent monitoring of groundwater levels and water quality assists SVCA in making informed decisions related to resource management. Several well sites also have rain gauges to better correlate rainfall and groundwater levels, further supporting our Low Water Response Program (Flood Forecasting and Warning).

Ontario Benthos Biomonitoring Program – Category 3 Program

Each year, SVCA staff collect benthic macroinvertebrates—organisms such as bottom-dwelling insects, crustaceans, worms, and mollusks—from rivers and streams across the watershed. These creatures serve as excellent indicators of water quality. The presence, absence, or relative abundance of various species provides invaluable insights into water quality and the extent and sources of habitat degradation based on their tolerance to pollution.

Biomonitoring and surface water quality sampling go together; biomonitoring identifies that there is a problem with the health of an aquatic system, and surface water sampling can help identify what that problem is and how it can be mitigated. Abundance and the type of organism found in a watercourse can also serve as an excellent proxy for the health of other aquatic organisms, such as fish.

Watershed Report Cards – Category 3 Program

Watershed Report Cards are developed every five (5) years using guidelines from Conservation Ontario. All conservation authorities across Ontario develop the Report Cards to ensure consistent reporting across the province and to provide watershed residents with a high-level summary of the state of our watershed.

Healthy Lake Huron Initiative – Category 3 Program

Since 2011, SVCA, along with other organizations, have been actively engaged in a collaborative effort to safeguard and enhance the water quality of Lake Huron, focusing on areas that demand immediate remedial action. Part of SVCA's contribution involves the monthly collection of baseline and storm-event (runoff) samples from the South Pine River located in the Township of Huron-Kinloss. This data, in conjunction with meteorological data, is fed into a computer-

based predictive tool which improves our understanding of how sediment and pollutants migrate from land into our watercourses.

Drinking Water Source Protection – Category 1 Program

The Drinking Water Source Protection program is a mandated program under the *Conservation Authorities Act.* Its primary objective is to safeguard the quality and quantity of current and future sources of municipal drinking water, thus ensuring the long-term availability of clean, safe drinking water for our communities.

In the Saugeen – Grey Sauble – North Bruce Peninsula Source Protection Region, SVCA collaborates with Grey Sauble Conservation Authority and the Municipality of Northern Bruce Peninsula to protect 38 municipal residential drinking water systems. The Source Protection Plan determines the areas that are vulnerable or at risk of contamination and outlines a set of policies to address identified threats.

Discussion:

Water quality monitoring is essential to identify man-made sources or activities that affect the suitability of surface water for drinking water source protection, conservation of aquatic life, and recreational opportunities. This data is used in the management of aquatic ecosystems, to determine where on-the-ground actions may be needed, and to evaluate the effectiveness of policies. Long-term data collection and trending is key to determine if water quality is improving or deteriorating over time.

Our water quality data allows SVCA to establish baseline conditions; establish and characterize long-term trends for various water quality indicator parameters; monitor compliance with Provincial Water Quality Objectives; provide information to municipalities and other regulatory agencies to support development (*i.e*., nutrient inputs and loading, stormwater discharge, sewage facility discharges, and infrastructure removals, such as dams and weirs); and to determine the effectiveness of our watershed programs.

Next Steps to Improve the Program

SVCA staff strive to improve our Water Quality program in the following ways:

- Make our water quality data publicly accessible and AODA (*Accessibility for Ontarians with Disabilities Act*) compliant.
- Prepare an annual water quality report to summarize, in depth, the current state of our watershed and how it might impact our communities.
- Re-focus our communication process to better inform and educate stakeholders and municipal partners about our watershed's health.
- Develop a series of achievable and realistic metrics to measure program success.
- Build a database of past stewardship and tree planting activities to compare water quality results against the success of these initiatives in affecting results.

- Improve data management using KiWQM, a water quality database which we have already invested in.
- Improve processes for data quality control and assurance.
- Develop Standard Operation Procedures (SOPs) to ensure consistent sampling and analysis methods are in place.

Staff are confident in the value of SVCA's Water Quality program and the benefits to our municipal stakeholders. The need to continue data collection becomes important when we consider climate change and our need for adaptation.

Our data collection efforts allow the Authority to track changes, identify emerging trends, and forecast potential challenges which will guide future decision-making.

Financial Implications

The continuation of SVCA's Water Quality Category 3 programs and services is at risk. Effective January 1, 2024, Category 3 Programs and Services require cost apportioning agreements between SVCA and each participating municipality to continue.

The annual operating funding amount to sustain these Category 3 Water Quality Monitoring Programs is $119,050 (2023). Additionally, annual funding to sustain public awareness and communications for water quality programming is $7,100 (2023).

Prepared by:

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Elise MacLeod
Manager, Water Resources

Approved by:

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Jennifer Stephens
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Report To: Chair and Directors, SVCA Water Resources Committee

From: Elise MacLeod, Manager, Water Resources

Date: July 7, 2023

Subject: Water Resources Department – Proposed Staffing Plan

Purpose: To provide an overview of Saugeen Valley Conservation Authority's Water Resources department and request additional staffing support.

Recommendation

THAT the SVCA Water Resources Committee recommend to the Board of Directors that the proposed staffing plan be endorsed for the 2024 budget year.

Background

The SVCA's Water Resources department is comprised of three main programs, including Water Quality, Flood Forecasting and Warning, and Water and Erosion Control Infrastructure:

> ***Water Quality Program*** – involves the monitoring of surface water quality, groundwater quality and quantity and benthic macroinvertebrate populations across all ten (10) sub-watersheds. Monitoring water quality helps us understand the impacts of land-use activities and allows us to make informed decisions about managing and protecting our resources.
> *Current staff compliment: 1 Water Quality Technician (full time, permanent)*
>
> ***Flood Forecasting and Warning Program*** – involves the collection and analysis of water level, flow, and precipitation data through our hydrometric network**,** and the monitoring of weather conditions to assess the risk of flooding. When flooding is possible or about to occur, SVCA issues flood messages to municipalities, media, first responders, etc.
> *Current staff compliment: 1 Flood Forecasting and Warning Coordinator (full time, permanent)*
>
> ***Water and Erosion Control Infrastructure*** – involves the inspection and maintenance of water and erosion infrastructure control projects, such as dams, dikes, and slope stability projects, which prevent loss of life, property damage and social disruption.
> *Current staff compliment: 1 Manager, Water Resources (full time, permanent) and 1 Water and Erosion Infrastructure Technician (full time, contract, 33% funding from each of the department's program reserves)*

Additionally, all maintenance and dam operations are completed by staff reporting to the Forestry and Lands department, specifically, the Field Operations Coordinator, Field Operations

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Assistant, and Durham Conservation Area Superintendent. Current staffing contribution from the Forestry and Lands department is equivalent to approximately 60% of a permanent staff member.

Discussion:

Over the past year, SVCA staff have thoroughly examined the state of each of the three main programs within the Water Resources department. Through this exercise, staff have identified the significant need for additional staffing resources to complete daily tasks.

The following staffing plan is proposed to address these shortfalls:

Water Quality Program
1 Water Quality Technician (full time, permanent) – *existing position*

Flood Forecasting and Warning Program
1 Flood Forecasting and Warning Coordinator (full time, permanent) – *existing position*
1 Water Resources Field Assistant (full time, contract) – *new position*

The Water Resources Field Assistant position would be supported through funding under the Canada Summer Jobs program, from May to September each year. This position would be used to support all field activities, including rating curve development, work on slopes, and generally working in and around water, all of which require a secondary person to accompany them for health and safety reasons. This role would also be used to provide support to the proposed Field Operations Coordinator – Water while undertaking select maintenance tasks as per health and safety policies.

Water and Erosion Control Infrastructure
1 Manager, Water Resources (full time, permanent) – *existing position*
1 Water and Erosion Infrastructure Technician (full time, permanent) – *modify position*
1 Field Operations Coordinator – Water (full time, 3-year contract) – *new position*

The Water and Erosion Infrastructure Technician currently exists as a contract position and has been in place for the last 1.5 years. Staff propose to modify this position to a full time, permanent position to support infrastructure inspections, scheduling of maintenance activities, management of easements and assets, and project coordination. This position is also critical for completion and maintenance of all *Conservation Authorities Act* deliverables due by December 31, 2024: Ice Management Plan; Natural Hazard Infrastructure Operational Management Plan; Asset Management Plan; and Watershed-Based Resource Management Plan.

The Field Operations Coordinator – Water position would lead all in-field maintenance activities on our water and erosion control infrastructure, including, tree removals, inspection, painting, parging, electrical repairs, general inspections, debris removal, etc. It is anticipated that grass cutting would still be completed by summer staff under the

Forestry and Lands department, although the specific division of tasks is yet to be discussed. Additionally, all dam operations would be led by this position, with support from additional Forestry and Lands staff. This position is critical as current workloads do not allow for fulsome maintenance on these structures. This position would also be responsible for thoroughly documenting all maintenance activities on water and erosion control infrastructure, a task which has not historically been achieved.

The above staffing recommendations are critical to ensure proper maintenance and documentation of the condition of SVCA's water and erosion control infrastructure. The proposed positions would also make existing workloads more manageable and allow for a more robust inspection and reporting process for our assets.

Financial Implications

The following financial implications are anticipated should the above positions be supported:

1 Water Resources Field Assistant (full time, contract) - $15,000 annually
Funded by 100% general levy, minus funding received through Canada Summer Jobs
Effective date: May 2024

1 Water and Erosion Infrastructure Technician (full time, permanent) - $80,000 annually
Funded by 100% general levy
Effective date: August 2023

1 Field Operations Coordinator – Water (full time, 3-year contract) - $100,000 annually
Funded by 20% general levy, 80% benefitting municipalities (5 municipalities affected)
Effective date: January 2024

The above cost estimates include consideration for expenses related to benefits and OMERS.

Should the above staff positions not be approved, additional funding will be required to outsource these activities, where possible. It should be noted, however, that not all activities can be outsourced and will require existing staff support.

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