BOARD OF DIRECTORS

February 5, 2026

Hamilton Conservation Authority

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Hamilton Conservation Authority

A Healthy Watershed for Everyone

Board of Directors Meeting and Annual General Meeting

Thursday, February 5, 2026 at 6:00 p.m.

This meeting will be held fully in person.

The meeting will be live streamed on HCA's You Tube Channel:
https://www.youtube.com/user/HamiltonConservation

1. **Welcome** – Lisa Burnside
   - 1.1. Land Acknowledgement
   - 1.2. Appointment of Acting Chair
2. **Election of Officers** – Angela Coleman
   - 2.1. Election Procedures
   - 2.2. Appoint Scrutineers
   - 2.3. Election of 2026 Chair
   - 2.4. Election of 2026 Vice-Chair
   - 2.5. Board Representatives to Budget & Administration Committee
   - 2.6. Board Representatives to Conservation Advisory Board
   - 2.7. Election of Chair to Conservation Advisory Board
   - 2.8. Election Wrap Up
3. **Call to Order** – Newly Appointed Chair
4. **Declarations of Conflict of Interest**
5. **Approval of Agenda**

6. Delegations

7. Consent Items for Applications, Minutes and Correspondence

7.1. Permit Applications Summary Report Page 1

7.2. Approval of Board of Directors Minutes – December 4, 2025 Page 7

7.3. Approved – October 9, 2025 - Conservation Advisory Board Minutes – for receipt only Page 17

7.4 Email Correspondence Regarding ERO, 025-1257, Changes to the Conservation Authorities' Act, labeled a to am – link to comments embedded on Page Page 23

8. Foundation Briefing Foundation Chair – André Chabot

9. Member Briefing

10. Business Arising from the Minutes

11. Reports from Budget & Administration Committee and Conservation Advisory Board

11.1. Conservation Advisory Board – December,11, 2025 – Wayne Terryberry (Recommendations)

11.1.1. CA2531 Ecological and Water Resources Monitoring Comprehensive Plan Page 25

12. Other Staff Reports/Memorandums

<u>Reports to be approved</u>

12.1. Hamilton Conservation Authority – Appointment of Officers under the Conservation Authorities Act – Gord Costie Page 83

12.2. 2026 Schedule of Meetings – Lisa Burnside Page 87

12.3. Voting Representatives to Conservation Ontario – Lisa Burnside Page 89

12.4. Appointment of Auditors for 2026 Fiscal Year – Scott Fleming Page 91

Memorandums to be received

12.5	Annual Reporting on CA Permit Review Timelines – January 1, 2025 to December 31, 2025	– Mike Stone	Page 93
12.6.	Watershed Conditions Report	– Scott Peck	Page 97
12.7.	Conservation Areas Services Update	– Liam Fletcher	Page 103

13. New Business

14. In-Camera Items

14.1. Confidential Report – BD/Feb 01-2026
(Land Matter)

14.2 Confidential Report – BD/Feb 02-2026
(Land Matter)

15. Next Meeting – Thursday, March 5, 2026 at 6:00 p.m.

16. Adjournment

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Hamilton Conservation Authority

A Healthy Watershed for Everyone

Report to:	Board of Directors
Approved for Circulation By:	Lisa Burnside, CAO
Reviewed By:	T. Scott Peck, MCIP, RPP, Deputy Chief Administrative Officer/Director, Watershed Management Services
Prepared By:	Mike Stone, MCIP, RPP, Senior Manager, Watershed Planning, Stewardship & Ecological Services
Meeting Date:	February 5, 2026
Subject:	Permit Applications Summary Report

HCA permit applications approved by staff under the *Conservation Authorities Act* and Ontario Regulation 41/24 between the dates of November 22, 2025 to January 23, 2026 are summarized in the following Permit Applications Summary Report (PASR-1/26).

Recommendation:

THAT the Board of Directors receive this Permit Application Summary Report PASR-1/26 as information.

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HAMILTON REGION CONSERVATION AUTHORITY

PERMIT APPLICATION SUMMARY REPORT (PASR 1/26)

HCA permit applications approved under the Conservation Authorities Act and Ontario Regulation 41/24 between the dates of November 22, 2025 - January 23, 2026

File Number	Date Received	Date Permit Issued	Review Days	Applicant Name	Location	Application Description	Recommendation / Conditions
SC/F,C/25/76	26-Nov-25	04-Dec-25	10		1408 to 1465 Highway 8 Lot 2, Concession 2 Stoney Creek	for the installation of new conduit with fibre optic cable and FTG vaults	Approved subject to standard conditions.
SC/F,C/25/85	26-Nov-25	12-Dec-25	17		Regalview Dr Lot 14, 15, Concession 3 Stoney Creek	for the installation of new ductbank	Approved subject to standard conditions.
A/F,C/24/53	22-Jul-24	12-Dec-25	120		820 Sulphur Springs Rd Lot 40, 41, Concession 1 Ancaster	for the construction of a new single-family residence, garage, and septic system, repairs to a former two-storey single dwelling and its conversion to an accessory storage building, and the construction of a new driveway	Approved subject to standard conditions.
D/F,C/25/87	15-Dec-25	19-Dec-25	5		26 Hope St Lot 15, Concession 1 Dundas	for the demolition of a one storey detached dwelling and construction of a two storey detached dwelling	Approved subject to standard conditions.
SC/C/25/88	18-Dec-25	19-Dec-25	3		21 Edgewater Dr Lot 14, Concession BF Stoney Creek	for the proposed basement works and deck replacement	Approved subject to standard conditions.

HAMILTON REGION CONSERVATION AUTHORITY

PERMIT APPLICATION SUMMARY REPORT (PASR 1/26)

HCA permit applications approved under the Conservation Authorities Act and Ontario Regulation 41/24 between the dates of November 22, 2025 - January 23, 2026

SC/F,C,A/25/84	26-Nov-25	19-Dec-25	25		345 Lewis Rd Lot 7, 8, Concession 1 Stoney Creek	for the construction of the track operations readiness facility and installation of a new culvert	Approved subject to standard conditions.
H/F,C,A/25/90	19-Dec-25	22-Dec-25	5		Red Hill Valley Pkwy, near Mud St W Lot 33, 34, Concession 6 Hamilton	to remove accumulated sediment from the main cell of stormwater management pond 117	Approved subject to standard conditions.
H/F,C,A/25/91	19-Dec-25	22-Dec-25	5		Red Hill Valley Pkwy, near Greenhill Ave Lot 33, Concession 4 Hamilton	to remove accumulated sediment from the main cell of stormwater management pond 109	Approved subject to standard conditions.
H/F,C,A/25/92	19-Dec-25	22-Dec-25	5		Red Hill Valley Pkwy, near Queenston Rd Lot 30, Concession 2 Hamilton	to remove accumulated sediment from the main cell of stormwater management pond 112	Approved subject to standard conditions.
D/C/25/93	27-Oct-25	07-Jan-26	74		61 Pimlico Dr Lot 50, Concession 1 Dundas	for the construction of a rear yard patio	Approved subject to standard conditions.

HAMILTON REGION CONSERVATION AUTHORITY

PERMIT APPLICATION SUMMARY REPORT (PASR 1/26)

HCA permit applications approved under the Conservation Authorities Act and Ontario Regulation 41/24 between the dates of November 22, 2025 - January 23, 2026

H/F,C,A/25/86	05-Dec-25	07-Jan-26	35		172 & 178 Rymal Rd W and 1204 West 5th St Lot 16, Concession 8 Hamilton	for the alteration of watercourses and construction of Phase 2 of the Sheldon's Gate residential subdivision	Approved subject to standard conditions.
SC/F,A/25/89	18-Dec-25	08-Jan-26	23	.	711 North Service Rd Lot 14, Concession BF Stoney Creek	for the proposed dredging works	Approved subject to standard conditions.
A/F,C/25/94	05-Jan-26	14-Jan-26	10		786 Stone Church Rd Lot 54, Concession 3 Ancaster	for the construction of a septic system and associated site alteration	Approved subject to standard conditions.

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Hamilton Region Conservation Authority

Minutes

Board of Directors Meeting

December 4, 2025

Minutes of the Board of Directors meeting held on Thursday, December 4, 2025 at 6:00 p.m., at the HCA main office, 838 Mineral Springs Road, in Ancaster, and livestreamed on YouTube.

PRESENT: **Brad Clark – in the Chair**
Elise Copps **Lisa DiCesare**
Susan Fielding **Wayne Terryberry**
Alex Wilson **Maureen Wilson**

REGRETS: **Jeff Beattie, Craig Cassar, Matt Francis, Mike Spadafora**

André Chabot – Foundation Chair

STAFF PRESENT: **Nancy Arnold, Lisa Burnside, Gord Costie, Marlene Ferreira, Scott Fleming, Liam Fletcher, Brandon Good, Rob Gray, Matt Hall, Nicole Karbusicky, Amanda Martin, Stacey McConnell, Scott Peck, Mike Stone, Erich Talbot, Jaime Tellier, Sandra Winninger**

OTHERS: **Justin Silvia (Conservation Halton)**

1. Call to Order

The Chair called the meeting to order and welcomed everyone present. HCA's Indigenous Land Acknowledgement was read.

2. Declarations of Conflict of Interest

The Chair asked members to declare any conflicts under the Board's Governance Policy. There were none.

3. Approval of Agenda

The Chair requested any additions or deletions to the agenda. Lisa Burnside indicated an Addendum was circulated, which included two items:

- Under number 8, Business Arising from the Minutes, Environmental Registry Posting 025-1257 - Proposed Boundaries for the Regional Consolidation of Ontario's Conservation Authorities, which will appear 8.2 on the agenda
- Under number 12, In-Camera Items, Confidential Memorandum – BD/Dec 03-2025, (Legal matter), will appear as 12.3 on the agenda

BD12, 3563 **MOVED BY: Susan Fielding**
SECONDED BY: Lisa DiCesare

THAT the agenda be approved, as amended.

CARRIED

4. Delegations

There were none.

5. Consent Items for Applications, Minutes and Correspondence

The following consent items were adopted:

5.1. Permit Applications Summary Report

5.2. Approval of Board of Directors Minutes – November 6, 2025

5.3. Approval of Board of Directors Minutes – Special Meeting, November 25, 2025

5.4. Approved – September 18, 2025 Budget & Administration Committee Minutes – for receipt only

5.5. Correspondence regarding Bill 68/ ERO Notice 025-1257 related to amendments to the Conservation Authorities Act, items labeled a to e.

6. Foundation Briefing

André Chabot, Chair of the Conservation Foundation, reported The Foundation has raised a total of $22,263 in donations from November 1st to November 30th, 2025. This brings the unofficial total for the fiscal year to $1,116,681, exceeding the fundraising goal of $847,300 by 32%. This is due to larger major gift commitments from new corporate partners for Saltfleet Conservation Area. Some gift highlights include:

- $5,000 from a family foundation in support of trails maintenance
- $11,000 from our fall fundraising appeal

- $588 in CAMIS donations

2025 Highlights:

Thanks to the fundraising success and the generosity of donors, the Foundation has granted approximately $1,000,000 back to HCA to support various projects, including:

- The Saltfleet Wetland and Restoration Project
- The Outdoor Environmental Education Program
- Land Acquisition
- Basadinna Indigenous Signage project in the Dundas Valley
- Capital Improvement projects including the 50 Point Fishing Platform, as well as the Valens Lake Lookout Tower.
- Trail improvement projects including work in the Dundas Valley and Christie Lake

Councillor Clark thanked the Foundation; the Board and staff, for their hard work this year and in exceeding their fundraising goal.

BD12, 3564 **MOVED BY: Alex Wilson**
SECONDED BY: Elise Copps

THAT the Foundation Briefing be received.

CARRIED

7. Member Briefing

7.1. Saltfleet Conservation Area Wetland Project – Progress Update

Scott Peck provided an overview of the Saltfleet Wetland project, indicating, the purpose of the project was to create a new conservation area in the east end of Hamilton as well as to provide natural hazard attenuation, protecting residents in lower Stoney Creek from watercourse flooding. He indicated that the first wetland was completed in 2022 and since that time, nature has embraced the area: both flora and fauna have taken hold in the new conservation area. The second wetland will be completed this fall and construction on the third wetland, is expected to begin in 2027. The Board indicated their appreciation for this project and its impact on the local community as well as having an impact on climate change.

BD,12 3565 **MOVED BY: Wayne Terryberry**
SECONDED BY: Lisa DiCesare

THAT the Member Briefing be received.

CARRIED

8. Business Arising from the Minutes

8.1. Motion in response to Bill 68/ERO from HCA Board of Directors

The proposed motion, which was crafted with input from Board members was read. Discussion occurred; concerns regarding the short consultation process as well as frustration regarding the Province's reasoning for the amendments to the Conservation Authorities Act were expressed.

Lisa Burnside advised that staff would share the Board position in a more public friendly version on HCA's digital platforms (website, social media and to our passholders and Foundation) as part of the communication plan.

BD12, 3566 **MOVED BY: Susan Fielding**
SECONDED BY: Elise Copps

THAT the Board of Directors approve the Motion regarding Bill 68/ERO

CARRIED

8.2 Environmental Registry Posting 025-1257 – Proposed Boundaries for the Regional Consolidation of Ontario's Conservation Authorities

The proposed comments for the ERO 025-1257 were reviewed. There was significant discussion regarding the proposed amalgamation of conservation authorities with multiple concerns raised. Additionally, a comparison was drawn between this proposed amalgamation and the amalgamation that formed the New City of Hamilton, noting it was an expensive and controversial process. Clarification occurred that Conservation Foundations are separate entities from conservation authorities and won't be amalgamated; there are still unanswered questions on what their focus would be in the new regional model.

BD12, 3567 **MOVED BY: Lisa DiCesare**
SECONDED BY: Wayne Terryberry

THAT the comments as detailed in Appendix A of the report titled "ERO Posting 025-1257 – Proposed Boundaries for the Regional Consolidation of Ontario's Conservation Authorities dated December 4, 2025 be approved; and further,

THAT HCA staff be directed to submit the approved comments to the Ministry of Environment, Conservation and Parks.

CARRIED

9. Reports from Budget & Administration Committee and Conservation Advisory Board

9.1. Budget & Administration Committee – November 20, 2025 (Recommendations)

9.1.1 BA 2541 HCA Reserves Policy

Susan Fielding provided an overview of the staff report indicating that the Policy establishes financial guidelines and controls for the creation, management and use of HCA's financial reserves and reserve funds.

Additionally, the report noted that as the Fifty Point Wetland Project has been fully completed and all related expenditures finalized, staff recommended that this reserve be closed and the remaining $85,977.72 be transferred to the Saltfleet Conservation Area Wetland Restoration Project Reserve, to support ongoing restoration.

BD12, 3568 **MOVED BY: Susan Fielding**
SECONDED BY: Lisa DiCesare

THAT the Budget & Administration Committee recommend to the Board of Directors:

THAT the HCA Reserves Policy, dated November 2025, as appended to this report, be approved; and further

THAT the Fifty Point Wetland reserve be closed and unused balance of $85,977.72 be transferred to the Saltfleet CA Wetland Restoration Project reserve.

CARRIED

9.1.2 Project Technical Advisory Committee – Insurance

Susan Fielding provided an overview of the staff report, indicating that the Committee (PTAC) provides assistance to staff by reviewing and approving funding applications for the Hamilton-Halton Watershed Stewardship Program. The report contained the list of current members to be recognized for insurance purposes.

BD12, 3569 **MOVED BY: Susan Fielding**
SECONDED BY: Elise Copps

HCA the Budget & Administration Committee recommends to the Board of Directors:

THAT the Project Technical Advisory Committee members be submitted for annual insurance coverage purposes.

CARRIED

There weren't any reports from the Conservation Advisory Board.

10. Other Staff Reports/Memoranda

Reports to be Approved

10.1. Final HCA 2026 Budget

Lisa Burnside presented the report and indicated that the $20.7M budget document was circulated to the City of Hamilton and Town of Puslinch for comment; none were received. It was noted that in addition as part of the draft budget, the Board requested special funding from the City of Hamilton to support HCA's land acquisition program. However, given the long-term nature of the special land acquisition funding request – and uncertainty regarding future priorities under a potential Western Lake Ontario Regional Conservation Authority – three options were developed for Board consideration before finalizing the budget regarding the special funding to either proceed, table and revisit or request redirection to a city fund. After a lengthy discussion an amendment was proposed to withdraw the special land acquisition funding request until a future date, with Councillor Alex Wilson wishing to be recorded as opposed. The motion to approve the HCA's 2026 budget was passed, as amended.

BD12, 3570 **MOVED BY: Lisa DiCesare**
SECONDED BY: Brad Clark

THAT to withdraw, until a future date, the special land acquisition funding request to the City of Hamilton from the HCA's 2026 budget

CARRIED

Recorded Vote

In favour	**Opposed**
Brad Clark	**Alex Wilson**
Elise Copps	
Lisa DiCesare	
Susan Fielding	
Wayne Terryberry	
Maureen Wilson	

BD12, 3571 **MOVED BY: Lisa DiCesare**
SECONDED BY: Brad Clark

THAT the 2026 draft budget be formally and finally approved in accordance with the Conservation Authorities Act and Ontario Regulation 402/22, and that the Board direct staff to table the special land acquisition funding request (Option 2 as outlined in the report) and revisit the request in a future budget year once there is greater clarity regarding the Province's proposed regional consolidation.

CARRIED

Memorandums to be Received

10.2. Watershed Conditions Report

Scott Peck provided an overview of the memorandum indicating that there were no significant watercourse flooding events, no significant watercourse water safety concerns, and no Lake Ontario shoreline flooding events.

BD12, 3572 **MOVED BY: Elise Copps**
SECONDED BY: Alex Wilson

THAT the Memorandum entitled Watershed Conditions Memorandum be received.

CARRIED

10.3. Conservation Areas Experiences Update

Brandon Good presented a summary of the memorandum, highlighting progress on construction of the new campground at Valens Lake Conservation Area, completion of the accessible fishing bridge at Fifty Point Conservation Area, installation of wayfinding signs at Christie Lake and Spencer Gorge Conservation Areas and the Christmas programs occurring at Westfield Heritage Village Conservation Area.

BD12, 3573 **MOVED BY: Susan Fielding**
SECONDED BY: Lisa DiCesare

THAT the memorandum Conservation Areas Experiences Update be received.

CARRIED

11. New Business

There was none.

12. In-Camera Items

BD12, 3574 **MOVED BY: Susan Fielding**
SECONDED BY: Lisa DiCesare

THAT the Board of Directors moves *in camera* for matters of law, personnel and property.

CARRIED

During the *in-camera* session, one personnel matter, one land matter and one legal matter and one were discussed.

12.1. Confidential Report – BD/Dec 01-2025
(Personnel Matter)

Marelene Ferriera provided a summary of the report regarding a personnel matter and answered the members' questions.

BD12, 3575 **MOVED BY: Alex Wilson**
SECONDED BY: Susan Fielding

THAT the confidential report entitled BD/Dec 01-2025 be approved and remain in camera.

CARRIED

12.2 Confidential Memorandum BD/Dec 02-2025
(Land Matter)

Scott Peck reviewed the confidential memorandum and answered members' questions.

BD12, 3576 **MOVED BY: Alex Wilson**
SECONDED BY: Wayne Terryberry

THAT the confidential memorandum entitled BD/Dec 02-2025 be received and remain in camera.

CARRIED

12.3 Confidential Memorandum BD/Dec 03-2025
(Legal Matter)

Lisa Burnside provided an overview of the confidential memorandum and answered members' questions.

BD12, 3577 **MOVED BY: Wayne Terryberry**
SECONDED BY: Elise Copps

THAT the confidential memorandum entitled BD/Dec 03-2025 be received and remain in camera.

CARRIED

BD12, 3578 **MOVED BY: Maureen Wilson**
SECONDED BY: Susan Fielding

THAT the Board of Directors moves out of closed session.

CARRIED

13. Next Meeting

The next meeting of the Board of Directors will be held on Thursday, February 5, 2026 at 6:00 p.m. at the HCA Main Administration Office – Woodend Auditorium, 838 Mineral Springs Road, Ancaster, Ontario.

14. Adjournment

On motion, the meeting adjourned.

_____
Scott Fleming
Secretary-Treasurer

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HAMILTON CONSERVATION AUTHORITY

Conservation Advisory Board

MINUTES

October 9, 2025

Minutes of the Conservation Advisory Board meeting held on Thursday, October 9, 2025 at 4:00 p.m., at the HCA main office, 838 Mineral Springs Road, in Ancaster, and livestreamed on YouTube.

PRESENT:	**Wayne Terryberry – in the Chair** **Craig Cassar** — **Elise Copps** **Natalie Faught** — **Jamie Freeman** **Haley McRae** — **Cortney Oliver** **Noah Stegman** **Susan Fielding – Ex-Officio**
REGRETS:	**Tyler Cunningham, Brad Clark (Ex-Officio)**
STAFF PRESENT:	**Madolyn Armstrong, Nancy Arnold, Jonathan Bastien, Lisa Burnside, Gord Costie, Lindsay Davidson, Liam Fletcher, Marlene Ferreira, Matt Hall, Amanda Martin, Jasmine Marinelli, Scott Peck, Mike Stone, Jaime Tellier, Stacey Van Opstal and Sandra Winninger**
OTHERS:	**Media – None**

1. Welcome

The Chair called the meeting to order and welcomed everyone present.

2. Declaration of Conflict of Interest

The Chair asked members to declare any conflicts under the HCA Administrative By-law. There were none.

3. Approval of Agenda

The Chair requested any additions or deletions to the agenda.

CA2519 **MOVED BY: Natalie Faught**
SECONDED BY: Noah Stegman

THAT the agenda be approved.

CARRIED

4. Delegations

There were none.

5. Member Briefing

5.1. Talking Forest Trail App Launch

Lindsay Davidson and Jasmine Marinelli provided an overview on the trail app, noting that it launched September 15, 2025 and is available at most of the major conservation areas: Christie Lake, Spencer Gorge/Websters Falls, Valens Lake, Westfield Heritage Village and Eramosa Karst. The app is expected to be available at Dundas Valley, Fifty Point and Saltfleet later in 2025, and, themed experiences within the conservation areas planned for 2026.

CA 2520 **MOVED BY: Haley McRae**
SECONDED BY: Noah Stegman

THAT the Member Briefing be received.

CARRIED

6. Chairman's Report on Board of Directors Actions

Wayne Terryberry noted the following items were approved by the Board of Directors at the July 3, 2025 Board meeting:

6.1 CA2515 Tiffany Falls Visitor Use Management Plan

6.2 CA2516 HCA's Planning and Regulations Policies Update

6.3 CA2517 HCA Conservation Areas Program – Proposed Visitor Engagement Opportunities

6.4 CA2518 HCA Conservation Areas Program – Access and Amenities Review and Proposed Initiatives

7. Approval of Minutes of Previous Meeting

7.1. Minutes – Conservation Advisory Board June 12, 2025

CA 2521 **MOVED BY: Noah Stegman**
SECONDED BY: Jamie Freeman

THAT the minutes of the June 12, 2025 Conservation Advisory Board meeting be approved.

CARRIED

8. Business Arising from the Minutes

There was none.

9. Staff Reports/Memorandums

Reports for Recommendation

9.1. HCA's Planning Regulations Policy Document

Mike Stone brought forward the staff report, indicating that following approvals from the Conservation Advisory Board and Board of Directors earlier this year, the document was circulated for comment, to the public as well as the stakeholders. The document will provide staff with direction when reviewing and commenting on land use and planning regulatory matters.

CA 2522 **MOVED BY: Haley McRae**
SECONDED BY: Natalie Faught

THAT the Conservation Advisory Board recommends to the Board of Directors;

THAT the *Policies for Land Use Planning and Development Regulation in the Watersheds of the Hamilton Conservation Authority (September 2025)* be adopted.

CARRIED

9.2. Final Eramosa Karst Conservation Area Master Plan and Chippawa Rail Trail Management Plan for Approval

Madolyn Armstrong brought forward the staff report and provided a summary of the two documents. Both plans will guide the respective conservation areas, including operations and capital works planned, for the next ten years.

Staff confirmed that the noted operational plan recommended for the Karst caves at Eramosa Karst Conservation Area to help provide a framework for managing and protecting the cave features in the conservation area would be brought to the Conservation Advisory Board in the future once completed.

CA 2523 **MOVED BY: Haley McRae**
SECONDED BY: Noah Stegman

THAT the Conservation Advisory Board recommends to the Board of Directors;

THAT this report and accompanying Master and Management Plans of September 2025 be received as information for project background and general understanding;

and further

THAT the Eramosa Karst Conservation Area Master Plan and Chippawa Rail Trail Management Plan of September 2025 be approved.

CARRIED

9.3 Water Resources Engineering Monitoring Network – Review and Enhancements

Stacey Van Opstal brought forward the staff report requesting approval to update the Water Resources Monitoring Network, including servers, modernizing gauge data loggers and enhancing opportunities for sharing information to the public.

CA 2524 **MOVED BY: Noah Stegman**
SECONDED BY: Haley McRae

THAT the Conservation Advisory Board recommends to the Board of Directors;

THAT the *Water Resources Engineering Monitoring Network - Review and Enhancements* staff report be adopted.

CARRIED

10. New Business

There was none.

11. Next Meeting

The next meeting of the Conservation Advisory Board is scheduled for Thursday, December 11, 2025 at 4:00 p.m., at the HCA Main Administration Office – Woodend Auditorium.

12. Adjournment

On motion, the meeting was adjourned.

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7.4 Email Correspondence Regarding ERO, 025-1257, Changes to the Conservation Authorities' Act, labeled a to am

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Hamilton Conservation Authority

A Healthy Watershed for Everyone

11.1.1

Report to:	Conservation Advisory Board
Approved for Circulation By:	Lisa Burnside, CAO
Reviewed By:	T. Scott Peck, MCIP, RPP, Deputy CAO/Director, watershed Management Services
Prepared By:	Mike Stone, MCIP, RPP, Manager, Watershed Planning, Stewardship & Ecological Services Lesley McDonell, Supervisor Stewardship and Ecological Services Colin Oaks, Aquatic Ecologist Stacey Van Opstal, Monitoring Technologist Allison Morgan, Climate Change Coordinator Kasia Zgurzynski, Natural Areas Inventory Coordinator
Meeting Date:	December 11, 2025
Subject:	Ecological and Water Resources Monitoring Comprehensive Plan

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Recommendation:

THAT the Conservation Advisory Board recommend to the Board of Directors,

THAT the document titled "Hamilton Conservation Authority's Ecological and Water Resource Monitoring Programs – A Comprehensive Plan for Program Development, Integration and Implementation November 2025", be approved.

Executive Summary:

This report highlights a HCA Strategic Plan First Year Priority to develop a comprehensive approach for the integration of the aquatic, terrestrial, and water quality monitoring programs. The Comprehensive Plan will also link these programs to the HCA Climate Change Strategy, in order to help gauge the impact of climate change on watershed health and formulate adaption and mitigation approaches.

Over the past 10 years, HCA has developed and refined its watershed

monitoring programs in water quality, aquatic and terrestrial systems. Prior to the development of the Comprehensive Plan, these programs had not been reviewed related to how they could be integrated with each other or how their results of one program could influence another. HCA staff detailed the existing programs, mapped existing monitoring stations throughout the watershed separately and combined to review how the monitoring programs could be used to gauge the impact of climate change. With this, gaps in the monitoring programs were identified to strengthen the monitoring programs and to gauge the impact of climate change. Short term and long term enhancements have been identified and will be implemented year over year and budget permitting to bring watershed science to a new level at HCA.

Staff Comment / Discussion:

The Comprehensive Plan for the Ecological and Water Monitoring Programs has been developed to identify a comprehensive approach for the integration of the aquatic, terrestrial, and water quality monitoring programs. The Plan will also link these programs to the HCA Climate Change Strategy, in order to help gauge the impact of climate change on watershed health and formulate adaption and mitigation approaches. These monitoring programs have been functioning in parallel for more than 10 years, this report brings the watershed science together. Each monitoring program is documented with details as to how it is executed and data stored and analyzed. The Comprehensive Plan is needed for the following reasons.

- To identify gaps within and between programs to ensure monitoring is comprehensive.
- To integrate HCA's monitoring programs so that data can be related between monitoring programs and any watershed threats identified and mitigated, such as climate change.
- To provide guidance on time frames and costs to integrate programs and address data gaps.

Goals for the programs over the short (5 years) and long (10 years) term have been created based on identified program gaps (See Pages 38, 39 and 40 of Monitoring Comprehensive Plan). There are three short term goals for the Terrestrial Resource Monitoring Program (TRMP) and the Water Quality Monitoring Program, two short term goals for the Aquatic Resource Monitoring Program (ARMP) and five short term goals for the combined programs. Examples of combined goals include:

- creation of an ecology database to house the TRMP and ARMP
- developing communications strategies to explain watershed science.

There are also several long-term goals identified, including four for the TRMP, two each for the ARMP and water quality monitoring program and two goals shared by all the programs. Common long terms goals centre around communication and creation of a monitoring program web page. Including these additional parameters will help HCA integrate the programs as well as provide information as to the impact of climate change on the watershed.

Strategic Plan Linkage:

The initiative refers directly to the HCA Strategic Plan 2025 – 2029:

- **Strategic Priority Area – Natural Heritage Conservation**
  - Improve our understanding of watershed ecosystems and address emerging issues by broadening the scope of HCA monitoring activities.

- **Strategic Priority Area – Water Resources Management**
  - Monitor the impacts of climate change through existing and enhanced monitoring programs and networks to inform adaptation and mitigation strategies.

Agency Comments:

N/A

Legal / Financial Implications:

The comprehensive plan includes a detailed section of short- and long-term goals with proposed budgets. Within the 2026 priorities, costs have been incorporated into the 2026 Budget for a statistical review (power analysis), spring ephemeral tracking dissolved organic carbon analysis and working group with an estimated costs of $30,000. Migratory bird surveys are also proposed for 2026 and have been included in a recent funding application.

Related Reports and Appendices:

Hamilton Conservation Authority's Ecological and Water Resource Monitoring Programs – A Comprehensive Plan for Program Development, Integration and Implementation November 2025

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Hamilton Conservation Authority

A Healthy Watershed for Everyone

Hamilton Conservation Authority's Ecological and Water Resource Monitoring Programs – A Comprehensive Plan for Program Development, Integration and Implementation

November 2025

1.0 Executive Summary

The Comprehensive Plan for the Ecological and Water Monitoring Programs has been developed to identify a comprehensive approach for the integration of the aquatic, terrestrial, and water quality monitoring programs. The Plan will also link these programs to the HCA Climate Change Strategy, in order to help gauge the impact of climate change on watershed health and formulate adaption and mitigation approaches. Each monitoring program is documented with details as to how it is executed and data stored and analyzed. The Comprehensive Plan is needed for the following reasons.

- To identify gaps within and between programs to ensure monitoring is comprehensive.
- To integrate HCA's monitoring programs so that data can be related between monitoring programs and any watershed threats identified and mitigated, such as climate change.
- To provide guidance on time frames and costs to integrate programs and address data gaps.

Goals for the programs over the short (5 years) and long (10 years) term have (been created based on identified program gaps. There are three short term goals for the Terrestrial Resource Monitoring Program (TRMP) and the Water Quality Monitoring Program, two short term goals for the Aquatic Resource Monitoring Program (ARMP) and five short term goals for the combined programs. Examples of combined goals include:

- Creation of an ecology database to house the TRMP and ARMP
- Developing communications strategies to explain watershed science.

There are also several long-term goals identified, including four for the TRMP, two each for the ARMP and water quality monitoring program and two goals shared by all the

programs. Common long terms goals centre around communication and creation of a monitoring program web page. These long- and short-term goals have a budgetary value between 0$ and $150,000. Including these additional parameters will help HCA integrate the programs as well as provide information as to the impact of climate change on the watershed.

2.0 Purpose and Goals

The Hamilton Conservation Authority (HCA) Board of Directors approved several priority initiatives in 2025 to support the implementation of the HCA Strategic Plan (2025-2029). One of the initiatives was to “develop a comprehensive plan for the aquatic, terrestrial, and water quality monitoring programs to gauge the impact of climate change and link this to the HCA Climate Change Strategy to formulate adaption and mitigation approaches.” This plan and the subsequent analysis will be used to gauge the impact of threats to the watershed that include a variety of factors including climate change, urbanization, pollution, recreation, and encroachment. Adaptation and mitigation approaches will address high level restoration opportunities as they become clear through monitoring program integration and analysis.

Over the past 20 years, HCA has developed an extensive monitoring program for aquatic, terrestrial, and water resources. These programs have been developed at different times, and generally independently of each other where integration via station selection and data analysis has not occurred. The purpose of this comprehensive plan is to review integration of these monitoring programs and how it could be achieved. This will include the identification of gaps within the current monitoring programs, both between programs and gaps in what is currently monitored within each program. The overall goal for all the monitoring programs and their integration is to:

1. Continue to build and improve on HCA’s knowledge of the health of fish populations, aquatic habitat, forests and wetlands within the watershed, and to integrate this ecological monitoring with water quality monitoring so that data can be compared and analysed.

2. To be able to report on trends and changes over time for all the monitoring programs and their specific metrics across the watershed.
3. To help focus restoration efforts where monitoring is showing degradation.
4. To monitor and report on the impacts of climate change across the watershed and identifying mitigation and adaptation approaches to address these impacts.

This plan should serve as a living document as more data is collected and monitored overtime, and recommendations are evaluated. It is anticipated that the comprehensive monitoring plan will be reviewed and updated every 5 years.

2.1 Monitoring Program Integration

This comprehensive plan will be the first step to integrate HCA's ecological and water resources monitoring programs, and will consider a variety of issues including

- Identification of gaps in the program,
- Identification of overlap in station location,
- Identification of data that can be shared that would affect the variables collected in the other programs.

A map that overlays all the monitoring across the watershed is included in Appendix A. This helps identify data gaps in each individual monitoring program, as well as gaps to be addressed in considering the integration of the programs. Further work will be needed reviewing all the programs together to see how each might influence a decision on monitoring program metrics. It will be important to develop metrics to evaluate status and trends of ecological integrity and ecosystem health across the watershed. The status and trend of different variables can be decided through the development of various metrics, such as Index of Biological Integrity (IBI). IBI is a scientific tool used to assess ecological health by comparing specific biological indicators to the ideal conditions for the stream type such as the presence of sensitive species. Status and trends for the three programs and the metrics within them can be reviewed at multiple spatial and temporal scales. Integrating these programs to monitor varied ecosystems components may aid in finding emerging threats and as an early warning sign of declines in ecosystem health and impacts of climate change.

3.0 Summary of Current Programs and Program Gaps

3.1 Aquatic Resource Monitoring Program

3.1.1 Background

The HCA's aquatic biological monitoring program began in the 1990's with individual projects generally restricted to a specific area or sub-watershed. The Aquatic Resource Monitoring Program (ARMP) was developed in 2004 to establish a long-term consistent approach to monitoring aquatic systems throughout HCA's jurisdiction. The program, which was approved by the HCA Board of Directors on April 7, 2005, integrates chemical (water chemistry via benthic macroinvertebrate community composition), biological (fish populations and communities) and physical (fish habitat, channel morphology) assessments within all of the HCA's major watersheds to provide an overall assessment of watershed health. The ARMP has evolved over time but maintains a focus on monitoring parameters that are indicators of ecological health. These parameters are analysed using an IBI.

3.1.2 Station Selection

To meet program objectives for stream sampling, a minimum of 26 stations has been designated to be surveyed every year for fish and benthic macroinvertebrates. This number is based on the size of each watershed as well as the resources and staffing capabilities. As a result, there are 36 designated monitoring stations in Spencer Creek, 10 in Red Hill Creek, 7 in Stoney Creek and 1 for Lake Ontario per year. Although similar in size to the Red Hill Creek watershed, a substantial proportion of the Stoney Creek watershed contains intermittent streams that dry through the summer months. Based on HCA resources, 13 stations were selected as annual monitoring stations and will be monitored yearly. The remaining stations are monitored over a split rotating 3-year cycle. 5 of the designated stations correspond with HCA's surface water quality and stream flow monitoring programs as annual monitoring stations. Through annual monitoring, chemical and discharge-related parameters influencing aquatic species and habitat at each of these stations can be analyzed and compared with the physical

analyses of fish, habitat, and benthic macroinvertebrate composition. See Appendix B for a complete listing of station codes and Figure 1 below for station locations.

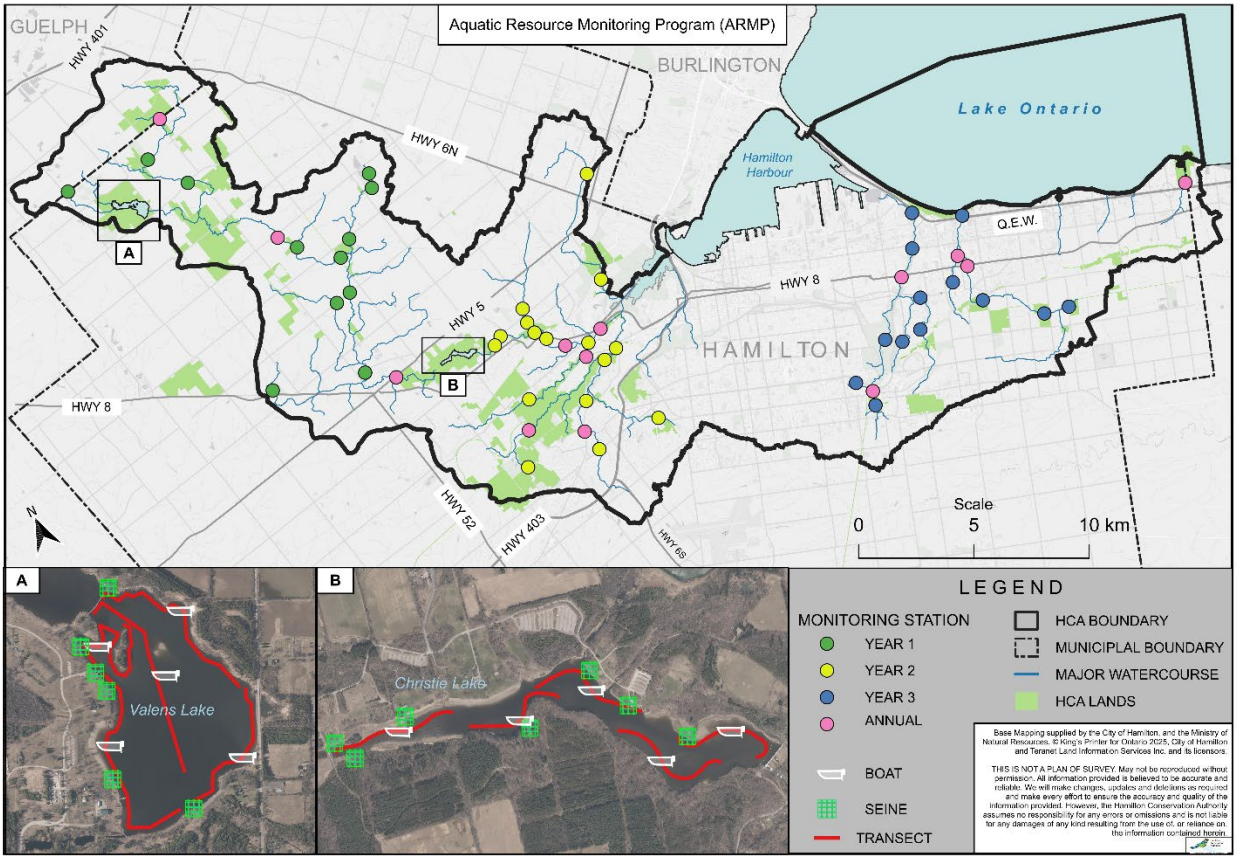

Figure 1: Map of Aquatic Resource Monitoring Program Stations, Seine Net and Boat Electrofishing Transects

Only fish sampling is conducted at the Valens Lake and Christie Lake reservoirs.5 systematically placed boat electrofishing transects were identified in each reservoir within the navigable portion. Additionally, 6 and 7 seine sites were identified along each reservoir shoreline respectively (Figure 1).

3.1.3 Sampling Program and Methodology Overview

13 annual sites and up to 13 rotating sites are sampled twice during the months of May – August as part of the ARMP for benthic macroinvertebrates and fish.

Benthic macro invertebrate sampling follows the Ontario Benthos Biomonitoring Network (OBBN) protocol (Jones et. al, 2005). The central purpose of this protocol is to assess the water quality and habitat conditions of aquatic ecosystems using benthic macroinvertebrates as indicators. These larger macroinvertebrates live within or on the bottom substrates of watercourses for at least a portion of their life cycle. Stream measurements are taken for habitat details and then the collected macroinvertebrates are returned to the HCA lab. At the lab the macroinvertebrates are identified to the family level for analysis.

For stream fish, ARMP uses sampling methodology developed by HCA that is very similar to the Ontario Streams Assessment Protocol (OSAP) (Stanfield L., 2010) single pass electrofishing method. A Halltech Model# HT- 2000B electrofishing unit is used for single pass presence/absence surveys. Fish community and habitat data is collected each year at these stations by an electrofishing crew using a backpack unit. This is completed in July and August. Station length, wetted width and hydraulic head are also recorded. IBI is calculated for each site. This rates sites based on the fish community present from Poor to Very Good. Fish community and habitat data is also collected via separate established protocols for seine nets and boat electrofishing in the Valens Lake and Christie Lake Reservoir.

3.1.4 Data Analysis

3.1.4.1 Watershed Report Card / Macroinvertebrate Assessment

The macroinvertebrate community (benthics) structure indicates the ecological health of an aquatic system. Benthic populations and species presence/absence can be useful in identifying environmental quality. Macroinvertebrates are directly linked to fish through the food chain; therefore, a change in their community can act as an indicator for possible change in a fish community. Benthic macroinvertebrate communities are recognized as less able to readily move about the stream as compared to fish species. As such, it is assumed that they are better representative of all physical, chemical, and biological changes at the site level than fish communities. Data analysis regarding macroinvertebrates follows the Watershed Report Card process which uses the Hilsenhoff 1988 Family Biotic Index as modified by New York State (Smith et al., 2009).

This involves calculating the average benthic value for the samples taken over the five-year period between watershed report cards for each sub watershed. The New York State Family Biotic Index Tolerance Values are used to determine the final point score and grade for each sampling site. The scores for each station across a subwatershed are then combined for the final score. Each site is rated from Very poor to Excellent for water quality based on the points scores which can then be rolled up to a subwatershed rating.

This benthic information is then combined with the surface water chemistry data from the Provincial Water Quality Monitoring Network (PWQMN) sampling to produce the surface water quality score for the Conservation Authority Watershed Report Card which is produced every 5 years.

3.1.4.2 Fish Community Assessment

Fish communities can be used as indicators of water and habitat quality. They are more mobile than benthic macroinvertebrates so as an indicator they are not as reliable. However, fish are generally the target organisms important to people for recreation and consumption and these results are most relatable to the public. Different species of fish have differing tolerances for water quality and pollution. Some are more tolerant while others like Brook Trout are very sensitive and can only live in the best conditions. One tool HCA uses to analyse fish catches and stream health is a IBI. T A modified version of the IBI has been created by Credit Valley Conservation (CVC) staff, tailoring the IBI to the Credit River watershed, and in general, to urbanized southern Ontario watersheds (Morris, Undated). This modified version of the IBI uses similar metrics and provides an IBI score for each species sampled. This methodology from CVC was adapted and adopted by HCA (Dunn et al, 2005 and Faulkenham et al, 2007). Each site is rated from Very poor to Excellent for water quality based on the points scored under the metrics. These combined metrics speak to the ecological integrity (EI) of the stream system and fish community.

3.1.4.3 Thermal Assessment

In 2019, HCA initiated a thermal stream assessment program and installed nine temperature loggers in the Spencer Creek system. The loggers are set to record the stream temperature every 30 minutes from installation (spring) to removal (fall). The loggers are left in place until late fall, usually early December. The temperature sites generally align with the ARMP sites in Spencer Creek. Additionally, 1 air logger is installed in the watershed to provide a local comparison to the standardised Environment Canada weather station sites (Hamilton Airport).

3.2 Aquatic Resource Monitoring Program Gaps

3.2.1 Statistical Analysis and Reporting

Formal reporting for the ARMP is generally not undertaken. Significant data is collected and stored in a database; however, minimal analysis is completed. Summary reports for the data should be produced after each full 3-year monitoring cycle. Additional metrics indexes and analysis of the catches and habitat should be included in the analysis beyond IBIs for fish and benthics. Each assessment type has limitations and using multiple variables provides a better understanding of the conditions present. At least 10 additional analysis variables/metrics have been identified for inclusion (Appendix C).

3.2.2 Additional Fish and Benthic Surveys

The fish monitoring site locations surveyed each year generally date back to the origins of the ARMP. However, since then, HCA has restored sections of the watershed, with wetlands created at three conservation areas, placement of recycled Christmas trees in stream corridors. With these restoration areas and the original survey locations, more capacity maybe needed in the fish monitoring program for summer staff or a longer season. With the naturalization of the pond at Fifty Point Conservation Area including a wetland and a natural fishery, stations should be added. Additionally, consideration should be given to adding monitoring stations to the shoreline of Lake Ontario. The number of stations will be determined. Finally, there are several subwatersheds that have insufficient data for the Watershed Report Card. While some of these subwatersheds have no stream systems, like urban Hamilton others could be surveyed

during springs of abundant rain as they are normally dry by survey season. A review should be completed to determine if it is possible to add benthic monitoring stations or rework the program to gain more watershed coverage in these areas. These additional benthic monitoring stations would be in addition to the standard ARMP sites unless the sites would also support fish monitoring.

3.2.3 Stream Temperature Logger Distribution

Stream temperature is monitored as part of the thermal assessment program. The existing program is restricted to the Spencer Creek system and represents less than one third of the total ARMP program area It would be beneficial to expand this program to the Redhill, Sulphur, Logies, Ancaster, Tiffany, all of Spring, Borers, and Stoney/Battlefield creeks. This would provide greater coverage of the watershed and allow HCA to monitor changes in stream temperature related to the changing climate and other factors such as urbanization or storm water management inputs. Stream temperature is crucial in maintaining the ecological integrity of aquatic ecosystems and limits the distribution and abundance of aquatic species (Jones, N.E. and L. Allin. 2010.). Fish are broken down into thermal guilds and as the climate warms, this will impact surface water temperature which could lead to changes in the fishery distribution. Identifying where changes in the temperature are occurring could provide opportunities to identify restoration projects either on HCA land or potentially for stewardship to work with landowners. Mitigation or adaptive management techniques in these locations could be implemented via active restoration. The number of stations and distribution will be determined in conjunction with the water quality monitoring team. It will also be influenced by the results of the power analysis, as discussed in Section 7. A power analysis is a statistical method that assesses the probability of correctly rejecting a null hypothesis when it is false (Steidl, R.J. and L. Thomas. 2001). In the context of monitoring, it is used to determine the minimum sample size needed in studies to detect significant changes in variables (like species population trends) with an acceptable confidence level (Steidl, R.J. and L. Thomas. 2001). This program is recommended for expansion above as it is ideal for tracking the effects of climate change on our aquatic stream environments (McBean, et al, 2022) and (Marcinkowski, P., 2024).

3.2.4 Important Fish and Benthic Habitat Area Maps

Fish species such as Brook Trout have specific habitat requirements for spawning. These habitats can be very limited on the landscape. Knowledge of the locations of these spawning habitats is poorly known in the watershed and therefore long-term protection is difficult. Surveys should be added to the monitoring program to map and protect these habitats.

3.2.5 Summary of Program Gaps

The table below provide a summary of the gaps monitoring gaps identified in the aquatic resources monitoring program. See section 6.1 for proposed costs and timing.

Table 1. Aquatic program gaps, and goal type

Gap	**Goal Type**
Statistical analysis and reporting.	Short term
Additional fish and benthic surveys	Short term
Stream temperature logger distribution	Short term
Important fish and benthic habitat area maps	Long term

3.3 Terrestrial Resource Monitoring Program (TRMP)

3.3.1 Background

HCA created a terrestrial monitoring program in 2012 which was then implemented in the spring of 2013. This program focuses on monitoring hardwood forests to determine if the Ecological Integrity (EI) of the watershed's hardwood forests differ between the urban (lower watershed - Hamilton and Stoney Creek area) and rural portions (upper watershed - Flamborough and Dundas areas). This type of forest was chosen because it is a large landscape component that occurs in all areas of the watershed, and there are a variety of indicators that can be used to gauge EI in this ecosystem type.

3.3.2 Station Selection

As hardwood forests are the focus for the beginning of the monitoring program, HCA reviewed the Ecological Land Classification as it relates to HCA property ownership and

distribution. Plots were selected based on their distribution in the watershed and occurrence of hardwood forests, regardless of condition. The plot set up resulted in 40 plots being set up over the last 13 years (2013-2025). There are 6 plots in Valens, Iroquois Heights and Felker's Falls Conservation Areas while the Dundas Valley Conservation Area has 8 plots. The remaining 14 are scattered throughout the watershed (Figure 2).

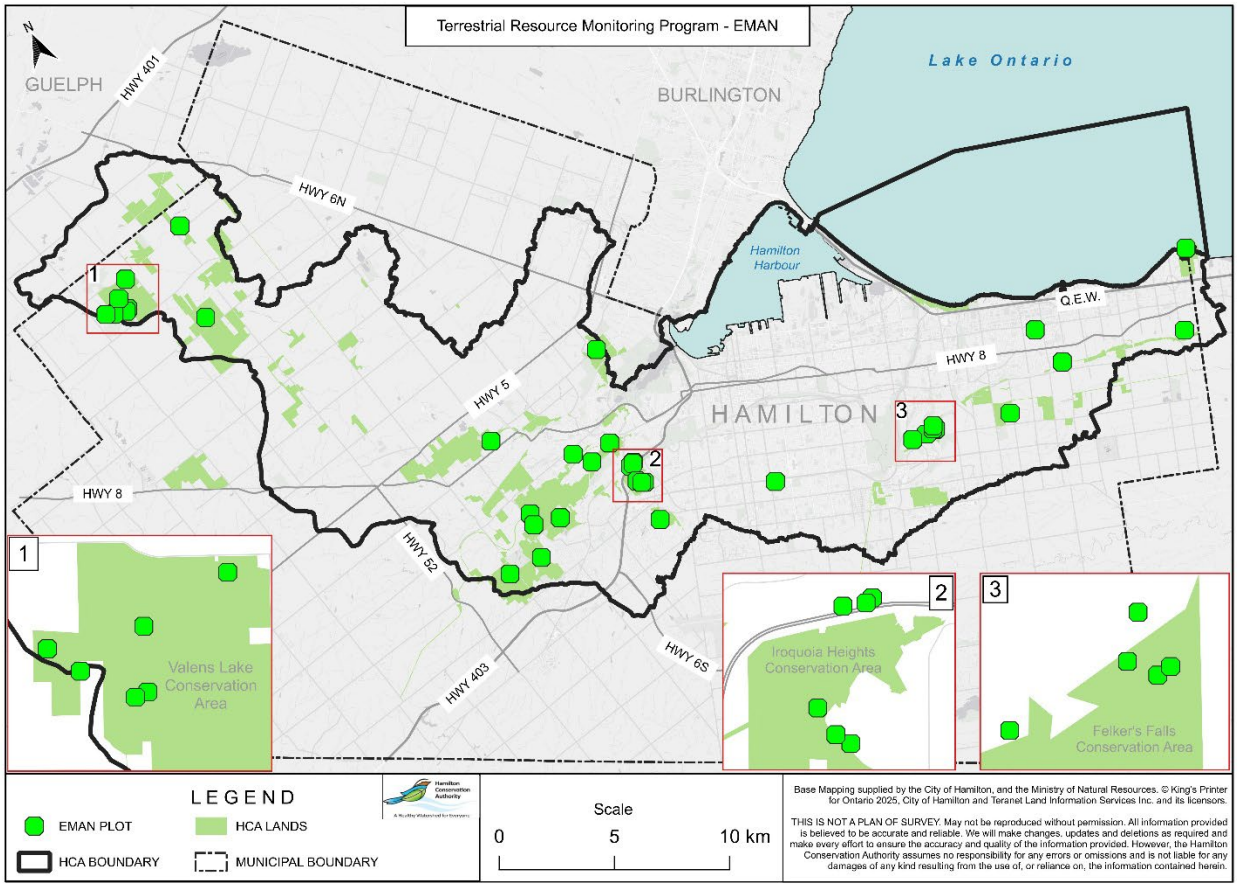

Figure 2: Ecological Monitoring Assessment Network Plots

3.3.3 Sampling Program and Methodology Overview

Forest plots have been set up according to standards developed by Environment Canada's Ecological Monitoring and Assessment Network (EMAN 2004a, EMAN 2004b, Roberts Pichette and Gillespie 1999), with slight modifications. This protocol is almost identical to that used by the Credit Valley Conservation, Conservation Halton, and

Toronto and Region Conservation Authority for forest monitoring (CVC 2010 and TRCA 2012).

Each forest vegetation plot consists of a 20 x 20m square plot (400 m^2) for monitoring tree health. Multiple variables are recorded in each plot, examples include tree status and condition (alive or dead, standing, leaning or broken), diversity of ground vegetation including invasive species while tree regeneration is done by stem counts in 2x2 m sub plots.

3.3.4 Data Analysis

HCA analyzes the data from this monitoring program using a spotlight system, of good, fair, and poor categories based on conditions. Metrics were developed based on forest structure, composition, and function. Forest structure monitoring is based on identifying the structures and processes that define the natural functions in the forests of the watershed (Aubin 2007). Forest structure is important to biodiversity because it provides a variety of habitats for differing species in multiple taxa. The loss of a single species may not necessarily signal a decrease in the overall integrity of the ecosystem, if the function of the ecosystem remains the same (King 1993). Species composition within forest types is unique, and this composition is constantly changing in relation to stress, succession and human impacts. The long-term monitoring of trees in permanent plots provides important information on the structure and function of forest systems (Roberts-Pichette and Gillespie 1999). These metrics help to build an index of biological integrity, like the aquatic program. This allows HCA to assess the ecological integrity of the watershed forests. In addition, the TRMP likely has enough stations to study trends over time of EI in both the rural and urban portions of the watershed.

3.3.5 Constructed Wetlands and Restoration

HCA is currently monitoring two constructed wetland projects at Saltfleet and 50-point conservation areas. Monitoring of a newly constructed wetland at Eramosa Karst Conservation Area will begin in 2026. This work includes frog call surveys, photo monitoring, and migratory bird monitoring. This type of monitoring tends to have a short

duration between 1-5 years as the site stabilizes. Methods used for this monitoring program could be translated to an overall wetland monitoring program.

3.3.6 Terrestrial Resource Monitoring Program Gaps

There are multiple gaps within the terrestrial monitoring program. The following is a list of monitoring gaps currently identified in the program. These include physical program gaps and analysis gaps.

3.3.6.1 Watershed Wide Wetland Monitoring

This would fill a large gap in our knowledge of the watershed's health and overall ecological integrity, while connecting the aquatic and water quality monitoring programs to the terrestrial program.

3.3.6.2 Forest Bird Monitoring

While it was proposed when the original TRMP program was developed, it was never implemented. It is valuable to monitor variables that include flora and fauna when looking at the ecological integrity of the watershed. The current program focuses on flora only. Aspects of forest bird monitoring can also be used to track the impacts of climate change, by studying bird species that are vulnerable to climate change.

3.3.6.3 Statistical Analysis and Reporting

Formal reporting for the TRMP is generally not undertaken. Significant data is collected and stored in a database; however, minimal analysis has been completed. Summary reports for the data should be produced after each full 4-year monitoring cycle.

3.3.6.4 Spring Ephemerals Monitoring

These plants are perennials that bloom early in the spring before retreating underground for the rest of the year. They thrive in deciduous woodlands, taking advantage of the sunlight available before the tree canopies fill out. The phenology of these spring ephemerals can be impacted by climate change (Petrauski, L. et al, 2019). Plant phenology refers to the study of the timing of biological events such as leafing,

flowering and how these are influenced by changes to climate (Petrauski, L. et al, 2019). While catching first flower may be too time consuming, HCA can designate the same week of EMAN surveys in late May or early June for the urban and rural plots. By going on the same week each year flowering and leafing out of certain species can be determined and tracked in an anecdotal way. HCA will need to analyze the 40 monitoring plots and find common spring ephemerals across monitoring plots to add to the specific study.

3.3.6.5 Vernal Pool Water Levels

There is a significant population of Jefferson Salamanders (JESA) in the HCA watershed. Although recently studied by the University of Guelph, the impact of changing rainfall patterns on the water levels in the vernal pools of the Dundas Valley is unknown. There is a concern that these pools will dry up mid-summer while the JESA have not fully metamorphized (S.G. Van Drunen et al, 2023). T-bars should be placed into the middle of known JESA breeding pools with rulers attached to monitor water levels. These pools should be visited yearly in early spring (April) and later summer (mid to late August) to assess water levels and therefore potential survival of JESA. Tracking this information year over year along with precipitation and soil moisture should allow HCA to track the impact of climate change on these vernal pools.

3.3.6.6 Watershed-wide Frog Call Surveys

Amphibians are sensitive to changes in their environment from urbanization to pollution to climate change. A watershed wide monitoring program for amphibians following the marsh monitoring program could be implemented to track changes in populations across the watershed. This would require a large-scale volunteer effort or the installation of acoustic monitors to record amphibian calls. A focused effort could also be implemented for western chorus frogs, a species determined to be moderately vulnerable to climate change via the Climate Change Vulnerability Assessment of Species in The Great Lakes Basin (Brinker, S., 2018). This is a species that occurs in the eastern portion of the HCA watershed, particularly at Saltfleet Conservation Area and roadside ditches between 1st and 8th roads, saltfleet. HCA could create a monitoring

program specifically for tracking the first calls of this species and population dynamics through the Marsh Monitoring Program or automated acoustic monitors for both chorus frogs and a watershed wide program. The number of stations needed would be determined through a power analysis as previously described. This monitoring program could be developed alongside a wetland monitoring program.

3.3.6.7 Abundance and Distribution of Insects and Pathogen Outbreaks

The current monitoring program tracks the following diseases and pathogens.

- Beech leaf disease
- Beech Bark disease
- Emerald Ash Borer
- LDD moth
- oak wilt
- Hemlock Wooley Adelgid
- Spotted Lantern Fly.

It is anticipated with climate change that tree disease and pathogens may more easily survive Canadian winters and therefore persist more within forests than in the past. Natural Resources Canada (2025), within their report tracking climate change effects in Canada's forest sector (2014) considers tracking the changes in distribution, frequency and severity of major forest insect pests (i.e. forest tent caterpillar) to be highly indicative of climate change. Insects are sensitive to climate change and can impact large areas of forest. Monitoring for these pests will be added to the field sheets of the TRMP. This will formalize the monitoring to specific station HCA will need to determine which forest pest/pathogens will be tracked and how increases or decreases will be linked to climate change.

3.3.7 Summary of Gaps

The table below provides a summary of the monitoring gaps identified in the TRMP. See section 6.1 for proposed costs and timing for filling these gaps.

Table 2. Terrestrial program gaps, and goal type

Gap	Goal type
Forest bird monitoring	Short term
Spring ephemerals monitoring	Short term
Vernal pool water levels	Short term
Statistical analysis and reporting	Short term
Watershed wide wetland monitoring	Long term
Frog call surveys, watershed wide	Long term
Abundance and distribution of insects and pathogen outbreaks	Long term

3.4 Hamilton Natural Areas Inventory

3.4.1 Background

The Hamilton Natural Areas Inventory (NAI) is a partner-led project, through the collaborative efforts of lead partners including City of Hamilton, Hamilton Naturalists' Club, and Hamilton Conservation Authority. Supporting partners include Niagara Peninsula Conservation Authority, Grand River Conservation Authority, Conservation Halton, Royal Botanical Gardens, and McMaster University. An NAI has been completed in Hamilton approximately every ten years since 1993, with the current NAI scheduled to be completed in 2027. This project has traditionally surveyed large natural areas (Environmentally Significant Areas) for plant and bird communities across the City of Hamilton. Not all areas were surveyed in each NAI cycle, but different areas were surveyed in each project.

3.4.2 Station Selection

In 2003, Ecological Land Classification (ELC) started being incorporated into survey efforts. This includes documenting species and habitat types based on the vegetation community. Previously, work was done mainly with biologists in the field documenting species. There is the opportunity, as some sample locations have been visited repeatedly, to look for changes over time and possibly the impact of climate change on these vegetation communities. Trends over time are being considered by returning to

areas with consistent data over the years; to analyze how specific biodiversity metrics have changed in these areas.

The current NAI (2024-2027) has a focus on identifying data gaps. Aquatic systems were identified as a data gap as they were not surveyed throughout previous NAIs. A data gap analysis has also uncovered terrestrial natural areas that are undocumented or data-deficient, which the project aims to survey or record for future survey potential. This will allow the survey of these areas in the future with the lens of climate change and changes over time.

3.4.3 Sampling Program and Methodology Overview

For the current NAI, 5 locations were identified with 37 overlapping polygons that have been surveyed for plants and ELC multiple times over the course of the NAIs since the early 1990s. This area will be surveyed in these locations with trends analyzed over time. Factors that may be impacted by climate change will be analyzed, such as changes in the distribution of sensitive species. These sites will likely continue to be surveyed during future iterations of the NAI, giving us long-term data to analyze habitat changes.

The sampling methodology for the NAI is like the TRMP and ARMP programs, aside from a few key differences. While aquatic sampling followed Ontario Benthic Biomonitoring Network (OBBN) guidelines, a fourth vial was collected for samples. This vial contained species that were not present in the other vials, to illustrate a more complete representation of the biodiversity at each site. Since the benthic and fish surveys are new to the NAI as of 2025, they will be used as a baseline for future NAI surveys, providing data over time that may also illustrate trends.

3.4.4 Data Analysis

Several metrics have been identified as useful to the analysis of data collected by the NAI. The mean Coefficient of Conservatism (CC) refers to the sensitivity of plants within an area, based on how specific their habitat requirements are. Each plant species is

assigned to a CC, and a higher CC indicates that the species has more specific habitat requirements. A mean CC can then be calculated for an area; that describes how particular the species are to the habitat present there. Floristic Quality Index (FQI) uses the mean CC, in addition to richness values, to describe the overall conservation value of an area, based on how many sensitive species rely on that specific ecosystem. The FQI can be a useful measure to describe the quality and rarity of an ecosystem and can be included in justification to protect unique and valuable habitats. The NAI is completing repeat measures in biodiversity and the metrics noted above in 37 polygons. This data analysis will allow for comparison in a broad sense if the change that has occurred over time to the woodlots that have been repeatedly surveyed. NatureServe (2021) has developed a Climate Change Vulnerability Index that can be used to assess the vulnerability of species found during NAI and potentially illustrate areas that may be more vulnerable to climate change than others, based on their distribution of species. There is potential to illustrate this through reports that include mapping sensitive areas, to identify where adaptive measures may be necessary.

Other biodiversity indices that can be used include Pielou's evenness index, which describes how evenly distributed species are throughout a given area. Shannon Diversity Index can then be calculated, which describes the biodiversity using both the evenness and the richness of the area. A higher Shannon Diversity index indicates a greater diversity that is more evenly distributed throughout the ecosystem, which implies greater resilience in the face of threats (Gastauer et al. 2021). These metrics may be used for quantitative abundance data, such as those derived from benthic or fish surveys through the NAI. Again, these metrics can be used to compare biodiversity between sites over various survey years.

3.4.5 NAI Data Gaps

3.4.5.1 iNaturalist Data Analysis

Similar to spring ephemeral monitoring in the terrestrial monitoring data gaps section, iNaturalist a public participation database, could be used to track changes in plant phenology watershed wide. These changes have not been tracked in the past. The data analysis for this gap can note the species that were previously considered more

southern as they arrive in our jurisdiction. There is also potential for the loss of certain climate vulnerable species and habitat types to shift and decrease abundance in Hamilton over the course of the NAIs. This can also be compared to changes noted in this metric in the terrestrial monitoring program.

3.4.5.2 Migratory Birds

This NAI is also aiming to document migratory bird species moving through Hamilton, as this is a data gap, with most bird data being from breeding bird surveys. Working with this data may be too complicated to use for monitoring, but this will be investigated.

3.5 Water Resource Monitoring Program

The water quality (chemistry) monitoring programs undertaken by the HCA provides essential information regarding the current state of water quality in key streams and groundwater areas within the watershed. Maintaining these programs over extended periods of time allows HCA to assess important trends in water quality, including the overall improvements to water quality due to water quality enhancement measures or changes in water quality due to changes to land use and infrastructure operations.

In addition, the data and assessments provide valuable information to assist HCA and partners / others (City of Hamilton, Ministry of Environment, Conservation & Parks, academia, development consultants) with their activities and decision making.
There are three main Water Quality (Chemistry) Monitoring Programs.

3.5.1 Hamilton Harbour Remedial Action Plan (HHRAP) Water Quality Monitoring of Main Tributaries to Cootes Paradise Marsh

3.5.1.1 Background

This program supports the HHRAP objective of establishing non-point sources of water quality inputs to the marsh, which is an important step in reaching the delisting objectives for the Hamilton Harbour Area of Concern. HCA's program focuses on collecting surface water quality samples and identifying water quality contributions to Cootes Paradise from key watercourses.

HCA has been involved with this water quality monitoring program in partnership with the HHRAP, Ministry of Environment Conservation and Parks (MECP), and the City of Hamilton since the spring of 2014. HCA's involvement in this water quality sampling program has steadily grown, in response to initial findings and HHRAP suggestions.

3.5.1.2 Station Selection

The current 11 sampling sites include 5 in Chedoke Creek, 4 in Ancaster Creek, 1 in Spencer Creek, and 1 in Borers Creek (Figure 3). Station locations have been selected collaboratively by HCA, HHRAP and MECP. Stations located near where the main watercourses enter Cootes Paradise were initially chosen to allow for the separate determination of water quality inputs from each of these watercourses. Additional upstream stations were also added in some watercourses, to assist in identifying potential sources of water quality within a particular watershed.

3.5.1.3 Sampling Program and Methodology Overview

Year-round bi-weekly grab samples and the addition of 5 new grab sampling sites have brought the total number of analyzed samples from 77 (7 sampling sites x 11 grab samples per monitoring year) in 2014 to 286 (11 sampling sites x 26 grab samples per monitoring year) in 2023.

Water quality samples collected and reviewed by HCA staff identify potential key sources of watercourse-delivered nutrient, sediment and *E. coli*, determines annual averages and long-term trends in watercourse concentrations, and monitors the effects of implemented remedial actions. Parameters collected for this program are:

- Ammonia + Ammonium as N,
- Escherichia coli,
- Nitrate, Nitrite,
- o-Phosphate,
- Total Phosphorus,
- Total Suspended Solids

- Volatile Suspended Solids.

In field parameters are water temperature, dissolved oxygen, conductivity, pH, and turbidity.

This water quality data is shared with the City of Hamilton and is also conveyed annually to our partners through the Hamilton Harbour Remedial Action Plan. This information is additionally used by City of Hamilton for its own water quality review. This information is also provided to academia and the consulting community for water quality modeling studies, integrated watershed studies and other water resource engineering studies.

3.5.1.4 Data Analysis

In April each year, HCA staff undertake a fulsome assessment of the years sampling data, ultimately providing analysis and presentations to HHRAP and its partners. These assessments include identifying samples that exceed target concentrations, that are expected to support delisting of Cootes Paradise and Hamilton Harbour. The assessments also include identifying differences in average annual and seasonal concentrations across the 11 sampling sites, between baseflow and storm event average concentrations, as well as seasonal trends. Long-term trend analysis is completed using available historical data from Royal Botanical Gardens (who undertook this sampling program prior to 2014).

The HCA sampling program is not intended as real time monitoring of water quality nor as real time spill monitoring.

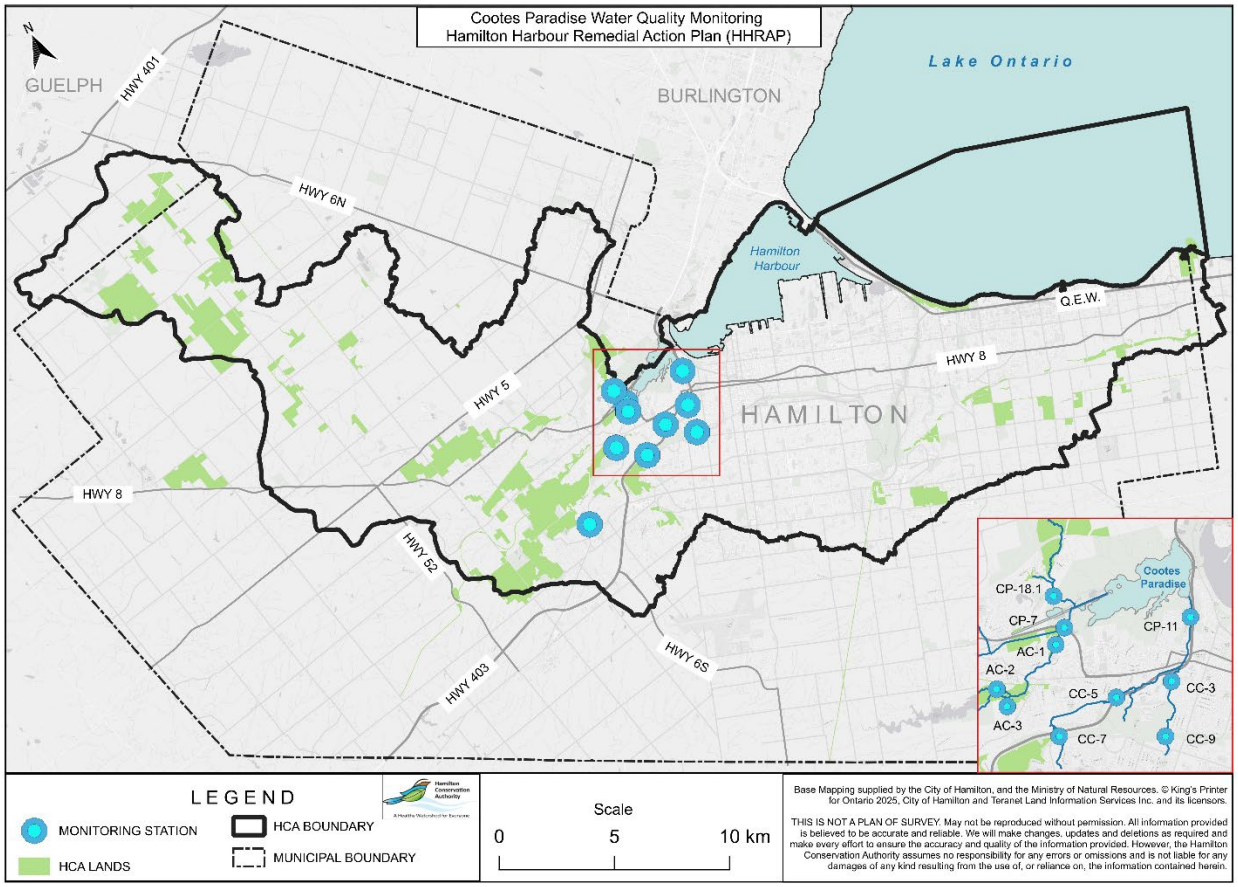

Figure 3: HHRAP Water Quality Monitoring Stations

3.5.2 Provincial Water Quality Monitoring Network (PWQMN) Sampling

3.5.2.1 Background and Station Selection

The Provincial Water Quality Monitoring Network (PWQMN) is a long-term partnership program between HCA and MECP, which started in 2002. HCA staff collect surface water quality samples, and MECP staff are responsible for the assessment of the sampling data. The surface water quality data provides long-term information about water quality conditions and trends. Six station locations across the HCA watershed were selected by MECP (Figure 5).

3.5.2.2 Sampling Program, Methodology Overview and Data Analysis

HCA collects surface water quality samples at the 6 stations once per month from April to November. In field parameters are also collected: water temperature, dissolved

oxygen, conductivity, pH, and turbidity. Samples are shipped to MECP for water quality analysis, and in field data is provided to MECP.

A copy of water quality analysis results is provided to HCA by MECP, who also provides access to the data through an open data catalogue. Parameters include nutrients and metals.

Sampling results provided by MECP are used by HCA as a key component to evaluate surface water quality as part of the HCA Watershed Report Cards which are developed every 5 years. The key data parameter used for the Watershed Report Cards is total phosphorus. Results are also used by HCA within integrated Sub-Watershed Studies.

3.5.3 Provincial Groundwater Monitoring Network (PGMN) Sampling

3.5.3.1 Background and Station Selection

The Provincial Groundwater Monitoring Network (PGMN) is another long-term partnership program between HCA and MECP, which also started in 2002. HCA staff collect groundwater quality samples, and MECP staff are responsible for the assessment of the sampling data. The ground water quality data provides long-term information about water quality conditions and trends. The wells are also used to continuously monitor ground water levels and temperature. Seven station locations including 9 wells across the HCA watershed were selected by MECP (Figure 4).

3.5.3.2 Sampling Program, Methodology Overview, and Data Analysis

HCA collects ground water quality samples at the 9 wells once per year in the autumn. Samples are shipped to MECP for water quality analysis. Also, ground water levels and temperature data are downloaded from each well periodically and provided to MECP.

A copy of sample results is provided to HCA staff by MECP, who also provides access to the data through an open data catalogue.

Sampling results provided by MECP are used by HCA staff as a key component to evaluate groundwater quality as part of the HCA Watershed Report Cards. The key

ground water quality parameters used for the Watershed Report Cards are Nitrite, Nitrate and Chloride. Results are also used by HCA within integrated Sub-Watershed Studies.

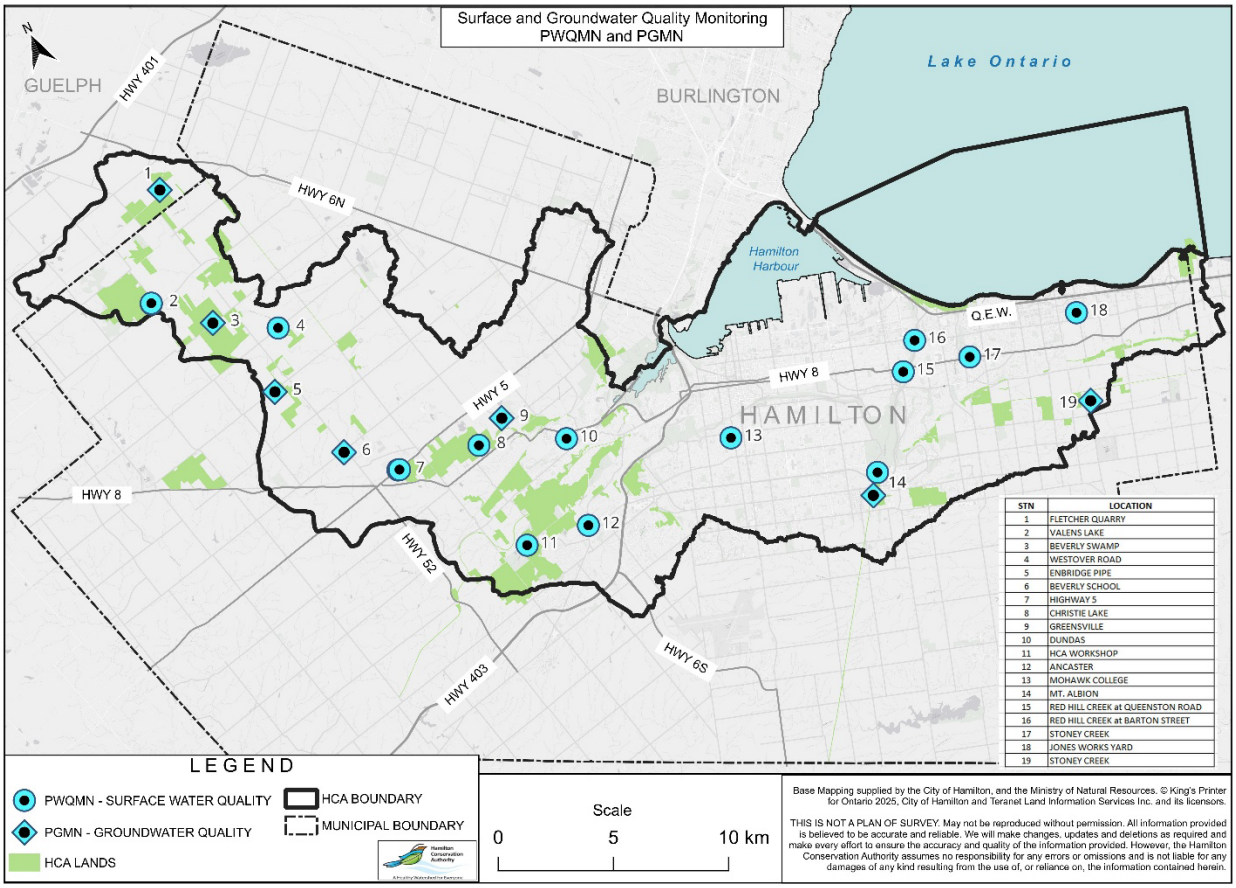

Figure 4: PWQMN and PGMN Sampling Locations

3.5.4 HCA Hydrometric Network

The HCA hydrological monitoring network consists of 6 streamflow, 10 precipitation gages, and 2 reservoirs water levels. Real time data is collected every 5 to 15 minutes for water levels and precipitation. Flows are calculated through rating curves created by the Water Survey of Canada (WSC). Data from the HCA hydrological monitoring network is used for our Flood Forecasting and Warning Program and our Low Water Response monitoring program. The Low Water Monitoring Response Program tracks 7-, 30- and 90-day moving averages for flow. Figure 5 depicts these station locations.

3.5.5 Snow Surveys

This is a long-term partnership program with Ministry of Natural Resources (MNR). Snow surveys at designated stations are made at regular intervals during the winter months to determine the depth of the snowpack and its water equivalent. The data obtained are of value in estimating the spring run-off potential, agricultural productivity, and fertilizer requirements, waterfowl populations, etc. Furthermore, they have application concerning livestock and wildlife survival, and in such problems as snow on roofs, etc.

The HCA has 4 snow courses within the watershed (Valens, Christie, Dundas Valley & Mt. Albion) that are monitored every 2 weeks during the winter. The MNRF will send the survey schedule prior to the season beginning (Figure 5).

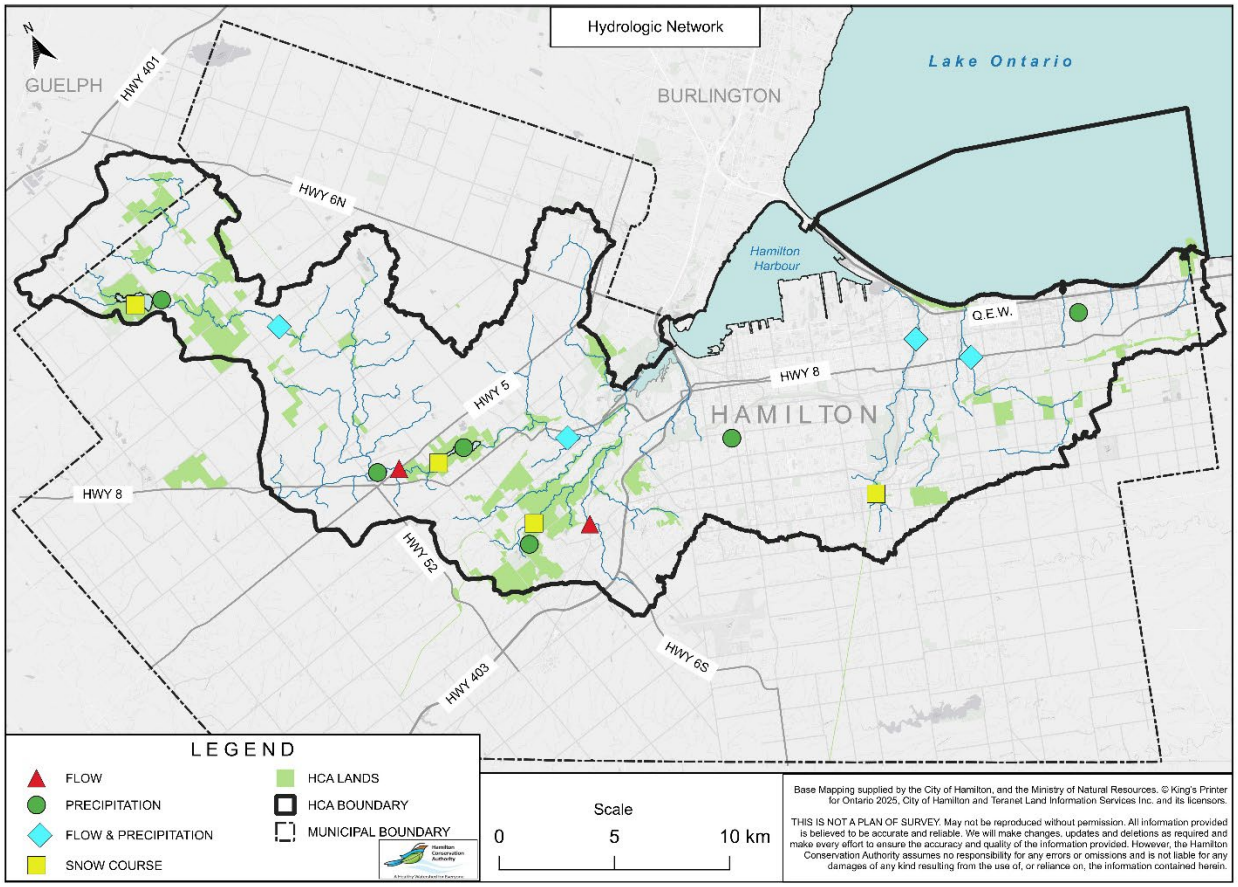

Figure 5: Hydrologic Network Stations and Snow Survey Stations

3.5.6 Water Resource Monitoring Gaps

There are several within program gaps for the water resources monitoring program.

3.5.6.1 Stream Flow

HCA monitoring program annual stream flows are captured at 3 locations on Spencer Creek, 1 location on Ancaster Creek, 1 location on Stoney Creek and 1 location on Redhill Creek are calculated. The calculation of the average of the highest three consecutive days of streamflow can be used to identify when the largest flow events happen and how the size and frequency of large flood events have changed over time, including the influence of climate change. The timing of the spring freshet annual high flow is also an indicator that can be used with HCA streamflow data. This indicator is important because streamflow can be strongly influenced by snowmelt and can directly

relate to climate conditions and climate change. The baseflow index is a measure of the ratio of baseflow volume to total streamflow volume. Baseflow typically represents the slow continuous contribution of groundwater to river flow, but in some settings is also the result of natural processes such as delayed flow through wetlands or anthropogenic processes such as flow regulation and wastewater discharge (Credit Valley Conservation, 2022a) Baseflow is also an indicator of drought stress. Metrics will be developed for these three measures of stream flow.

The following subwatersheds have been identified as areas where the installation of new flow gauge(s) is expected to be viable and would be beneficial to HCA's Flood Forecast and Warning (FFW) and Low Water Response (LWR) programs.

- Fletchers Creek
- Borers Creek
- Sydenham Creek
- Spring Creek
- Lower Ancaster Creek
- Lower Spencer Creek
- Battlefield Creek
- Chedoke Creek
- Stoney Creek – 2 existing gauges at Saltfleet (Green Mountain Rd.) and Saltfleet (3rd Line)

The potential locations are currently ungauged and thus require site observations to confirm watercourse and flooding conditions. These enhancements will increase the number of locations within the HCA watershed where local real-time flow data are available, which will enhance HCA's ability to forecast potential floods and monitor ongoing storm events.

In addition, these enhancements will be used to better connect water quality and aquatics monitoring. The addition of these sits will also add to the monitoring of local climate changes.

3.5.6.2 Precipitation

HCA has 10 precipitation gauges throughout the watershed that collect rainfall data at a 15-minute interval. This precipitation data is used to calculate daily, monthly and yearly totals and can be used to analyse changes in precipitation patterns year over year. Additionally, HCA uses data from three Environment Canada weather stations tracking air temperature and precipitation. HCA can use this data to determine the type of precipitation that has fallen. The percentage of precipitation that fell as rain can be used as an indicator of warming winters. The amount of snowfall or frozen precipitation over a timeframe can also be used to track warming winters. The sum of all precipitation for a given timeframe (month, season, year) can be used as indicators for more intense storms, drier summers, etc., and is a standard indicator for climate change. Specific metrics will be developed for these measures of climate change impacts on precipitation.

The following subwatersheds have been identified as areas where the installation of new precipitation gauge(s) is expected to be viable and would be beneficial to HCA's FFW and LWR programs.

- Fletchers Creek
- Middle Spencer Creek – HCA Millgrove Workshop
- Borers Creek
- Hannon Creek - Redhill Mount Albion
- Upper Davis Creek - Eramosa Karst Conservation Area
- Upper Battlefield Creek - Saltfleet Conservation Area
- Stoney Creek Numbered Watercourses - Fifty Point Conservation Area

These enhancements will increase the number of locations within the HCA watershed where local real-time precipitation data are available, which will enhance HCA's ability to forecast potential floods and monitor ongoing storm events, with a particular benefit for thunderstorm monitoring.

In addition, these enhancements will be used to better connect water quality and aquatics monitoring. The addition of these sits will also add to the monitoring of local climate changes.

3.5.6.3 Ground Water Elevation and Temperature Analysis with a Climate Lens

As part of the PGMN network ground water elevations and temperatures are obtained from 9 wells throughout the watershed. The timing of seasonal highs and lows can be used as a climate change indicator. Timing may shift due to a change in precipitation type. Late freezing and early thawing of the ground surface may result in more infiltration in the early winter and spring. Increases in groundwater levels may occur earlier in the spring if the snowpack and ground thaws earlier. This indicator is a measure of intra-annual fluctuations in mean monthly groundwater levels. Mean monthly groundwater levels is also an indicator that HCA can determine with its current monitoring program. Lower groundwater levels could be observed in summer months while higher levels could occur in spring and fall months. Increases in mean summer atmospheric temperature and corresponding increases in evapotranspiration rates may shift the fraction of precipitation that runs off as surface water or infiltrates to the subsurface as recharge. A reduction in recharge can correlate to lower groundwater levels (Credit Valley Conservation 2022a). Specific metrics will be developed for these measures of climate change impacts on groundwater.

3.5.6.4 Water Quality

The quality of water within a stream is linked to surrounding land uses, temperature, and precipitation. Water quality has a strong influence on the ability of some species to survive within a stream; those sensitive to pollution can survive only in streams with good water quality, while tolerant species can survive a wide range of pollutants. Surrounding land uses determine the chemical and nutrient inputs to a stream from both

point and non-point sources. Streams within forested areas are influenced by surrounding vegetation, with trees providing shade as well as nutrient inputs through leaf litter and woody debris. The vegetation helps to stabilize banks, and pervious surfaces help to filter out pollutants and protect against flooding and erosion (Conservation Halton, 2023). Both chlorides and total phosphorous can be used to monitor the changing climates impacts on water quality.

3.5.6.5 Chloride

HCA monitors Chloride concentrations of surface water through the PWQMN and ground water through the PGMN. HCA proposes adding chloride as a parameter to HHRAP sample locations to increase the number of watercourses throughout the watershed that measure chloride. The majority of HHRAP sampling locations are in denser populated areas that could see more road salt being used during winters. In the short term the number of freeze-thaw cycles are expected to increase, and the severity of winter weather will remain unpredictable. More road salt is used during severe winters, however, the impact of freeze-thaw cycles on salt use is unknown. Mean chloride concentrations could decrease if winters produce more rain events than snow, and as a result less winter de-icing material is applied to impervious surfaces. Additionally, greater infiltration could further dilute background chloride concentrations in groundwater. However, higher percolation rates due to the ground being unfrozen can result in more chloride contaminated water recharging aquifers. The number of stations and distribution will be determined in conjunction with the aquatic monitoring team as well as consider a power analysis for number of stations. Metrics for this will be determined as the program expands.

3.5.6.6 Total Phosphorus

HCA monitors total phosphorus in surface water as part of our HHRAP and PWQMN programs. Phosphorus typically comes from eroded soils entering streams. Milder winters may mean soils remain unfrozen for longer leaving them vulnerable to erosion during storm events. Erosion from high intensity summer storms can also potentially increase. These eroded soils, particularly in agricultural areas, will transport phosphorus to receiving watercourses. Tracking total phosphorus over time can be an indicator or

climate change and potential erosion occurring. Specific metrics to track this over time will be developed.

3.5.6.7 Dissolved Organic Carbon (DOC)

Organic carbon is stored in soils and a portion of it is exported to surface water as DOC. Warmer weather and increased precipitation may impact the production and mobilization of DOC from soils to surface water. HCA proposes adding DOC as a parameter to its HHRAP program to increase the number of watercourses monitored for this indicator of climate change.

3.5.7 Summary of in Program Gaps

The table below provide a summary of the gaps monitoring gaps identified in the water resources monitoring program. See section 6.1 for proposed costs and timing for filling these gaps.

Table 3. water resources program gaps, and goal type

Gap	Goal type
Sample more areas for chloride	Short term
Sample more areas for dissolved organic carbon	Short term
Install new stream flow gauges in nine subwatersheds	Long term
Install new precipitation gauges in seven subwatersheds	Long term
Water quality analysis with a climate lens	Long Term
Sample more areas for total phosphorus	Long Term

4.0 Between Program and Overall Gaps

Within each monitoring program described above data gaps were identified that are program specific or would assist HCA in quantifying the impacts of various threats like climate change or urbanization. This section relates specifically to gaps between programs or that are needed for all the programs. These include a power analysis for all program areas and creating overlap between the aquatic and water quality monitoring programs. Appendix A includes a map of all the monitoring programs overlain across

the watershed. The relevance of this map is discussed below. Details on these gaps is provided below and summarized in the table.

4.1 Power Analysis

One of the largest data gaps for the monitoring programs at HCA is the completion of a power analysis. Power analysis is a critical tool in monitoring, helping researchers design studies capable of detecting meaningful changes with sufficient statistical power. Power analysis is required for HCA's monitoring programs to ensure there are enough stations within each program to make statistically significant assessment of the information being produced.

Generally, a power analysis helps ensure that monitoring programs are efficient and effective, maximizing the use of limited resources. Power analysis allows for the optimization of study designs by estimating necessary sample sizes and identifying the most effective strategies to detect trends. This step is vital during the planning phase, especially when assessing impact or change due to management actions or environmental changes. It can also be applied retrospectively to assess the reliability and effectiveness of monitoring data already collected, helping researchers understand whether observed trends are statistically significant or likely due to random variation (Steidl, R.J. and L. Thomas. 2001).

In sum, power analysis is essential for monitoring as it guides the design and implementation of studies that aim to identify changes in ecological patterns and processes reliably. By effectively utilizing power analysis, researchers can improve accuracy, resource allocation, and the overall impact of their monitoring efforts. A power analysis should be completed on the existing monitoring program data to assess its ability to assess the impacts of watershed wide threats like climate change and urbanization. It should also be completed on any new variable to be monitored to ensure there are enough stations to view any trends in the data. The power analysis will also be used within the programs to examine the ecological integrity of the watershed in the TRMP, ARMP and water quality monitoring programs.

4.2 Enhanced Program Integration

In reviewing the map in Appendix A, it is noticeable that there is a lack of overlap in the monitoring programs in Middle Spencer Creek where there are currently only aquatic resource monitoring stations. If possible, adding both terrestrial and water quality stations in this area would give a more fulsome picture of the watershed, especially in this location. Looking at the information in an integrated manner is an existing gap. All the programs currently sample independently of one and other. Review and analysis of data across all monitoring programs should be completed to see if there are any trends that are evident across programs.

4.3 Water Chemistry and Aquatic Ecology

When the ARMP was first developed, 5 sites were overlapped with 5 of the PWQMN sites. The intention of this overlap was the opportunity to compare results between what the aquatic ecology and water chemistry regarding water quality. Data has been now collected for 20 years however; interpretation of data has been limited. Additionally, given the duration of the sampling program, this combined analysis could provide valuable insights and directions on whether there is a need to expand the sites where overlap occurs or where restoration is needed. As this sampling is restricted to specific watersheds, there may be a need to expand this to other subwatersheds for a fuller picture of any issues. Possible areas to extend this work to might include Spring, Sulphur, Fletcher, and Borer's creeks depending on the results of the analysis. This would have financial implications as the current lab testing for the PWQMN sampling is covered by the province and any additional sites would have to be covered by HCA.

There are also subwatersheds which has insufficient data to provide results in the watershed report card between the aquatic and water quality monitoring programs. The Urban Hamilton Core (buried creeks) and Greenhill are either buried in pipes or lack enough flow to sample which is like Ottawa Creek and Sydenham creek. Upper Davis creek and the numbered watercourse in Stoney creek could be sampled in wet years as they are otherwise intermittent and difficult to sample. Additions of sampling sites could be considered so the health of these subwatersheds could be reported and tracked.

4.4 Erosion Monitoring (Dundas Valley)

Adding erosion monitoring to the overall monitoring program, would assist the terrestrial, aquatic and water quality programs to assess the health of valleys with active erosion. Examples include Ancaster, Spring and Sulphur creeks, where unimpeded storm water adds significant fluctuations to the water levels during storm events. This leads to erosion in these creek corridors. Erosion increases the amount of phosphorus the water as the soil is suspended and the phosphorus released. Monitoring erosion hotspots for changes would help inform areas where restoration is required or stormwater retrofits would be applicable to slow the amount and intensity of water moving through the system.

4.5 Climate Change

Tracking the health of the watershed in relation to the impacts of climate change is a difficult task as this is an emerging science. There are generally five criteria for indicators of impacts that can be used to select among a host of candidate indicators (Gauthier, S. et al 2025). These include:

1. Sensitivity to climate,
2. Measurability,
3. Feasibility,
4. Spatial temporal scope, and
5. Relevance.

Indicators selected by CVC for their watershed will be reviewed along with other literature to begin the selection of climate change indicators for the HCA watersheds. Many of the metrics collected already in each monitoring program could be used to analyze the impact of climate change in the watershed. A variety of metrics have been recommended under specific monitoring programs.

4.6 Soil Moisture

Soil temperature and dryness is an additional gap. Climate change can make droughts larger as they both shift rainfall patterns and because of increases in temperature

(Canadian Climate Institute ,2024). This leaves ecosystems increasingly vulnerable to dry conditions. These dry conditions lead to higher tree mortality, higher fire risk and larger, more frequent insect outbreaks (McCauley et al 2022). It also has impacts on the regeneration of forests as climatic changes can impact forest regeneration at different stages from flower development, pollination, seed development, and ultimately seedling establishment. Impacts to just one stage in seedling development due to climate change can have detrimental impacts to forest regeneration (Williams, N. 2021). Incorporating soil moisture monitoring into the TRMP will require the purchase of equipment to test or monitor soil moisture at existing monitoring plots. Specific metrics for tacking this will be developed.

As part of HCA's Flood Forecasting and Warning (FFW) program, Environment Canada satellite data is used to estimate soil moisture at the surface and in the root zone. In-situ soil moisture probes are available on the market that can be added to the Monitoring Network, to provide enhanced local real-time soil moisture measurements. Soil moisture is a key parameter for estimating the potential watershed response to rain or snowmelt runoff for FFW assessments. Real-time measurements of the liquid or frozen state of soil moisture would also be highly beneficial, as it allows for enhanced estimations of the potential watershed response to rain or snowmelt runoff.

The preferred locations for such soil moisture sensors are still to be evaluated. Preference is being given to locations with existing or planned precipitation or flow gauges.

5.0 Link to HCA's Climate Change Strategy

HCA's mandate includes addressing the impacts of flooding and erosion and managing natural resources on a watershed basis in partnership with member municipalities. This work also includes considering and addressing the effects of climate change at the watershed level. The HCA has a role to play in understanding climate change impacts

within our watershed and the adaption and mitigation efforts required to help reduce them.

The HCA's Climate Change Strategy (2023) provides broad and comprehensive suggestions for mitigating and adapting to climate change in all aspects of the HCA's operations and lands. In the document, solutions for carbon storage, energy usage, water management, wetland management, as well as invasive species, natural heritage and wildlife protection were explored. The Strategy discusses the importance of a climate change monitoring network and up-to-date forecasting tools to understand the changes occurring in our watershed. Proactive monitoring programs are advantageous over reactive measures which often become costly and disruptive.

The recommended approaches for monitoring provided in this document highlights how HCA can monitor the impacts of climate change in our watershed.

6.0 Summary of Recommendations

6.1 In Program and Between Program Gap Summaries

6.2 Short-term Goals

There are portions of the proposed additions to each monitoring program that could be added within the next 5 years depending on budget and staff resources. Certain additions/tasks are essential for the stability of monitoring programs and analysis moving forward. This is the power analysis on each program. This process will ensure that there are enough stations collecting data within each program to allow for trends to be analyzed over time and between locations.

Table 4: Short term goals to implement years 1-5

Program	Task	Cost	Timing
Terrestrial	Spring ephemeral tracking	$0	2026
NAI	Migratory Bird Surveys (funding pending)	$25,500	2026
Water quality	Add dissolved organic carbon to HHRAP	TBD	2026

All	Power analysis across all programs (summer student)	$25,000	2026
All	Working group creation with all monitoring program staff. Cost is staff time	~$500-800/year	2026
Terrestrial	Breeding bird surveys (staff time)	$5000	2027
Terrestrial	Vernal pool monitoring (staff time)	$2000	2027
Aquatic	Upgrade ARMP database. Cost is staff time or a consultant	~$4,000-$10,000	2027
Water quality	Install additional water level and flow gauges	TBD	2027
Aquatic and water quality	Analyze data where ARMP and water quality stations overlap. Cost is staff time	~$4,000-$6,000	2027
Terrestrial and aquatic	Create an ecology database. Cost is staff time or consultant	~$4,000-$10,000	2027
Aquatic	Temperature data analysis (spencer creek). Cost is staff time.	~$6000	2026-2027
Water quality	Chloride sampling	TBD	2026-2027
All	Summarize results of all programs and publish them on website. Staff time.	$5,000	2030

6.3 Long-term Goals

These are goals that may require additional staff resources or significant amounts of time to plan changes to the monitoring programs. Longer terms goals include:

Table 5: Long term goals (5-10 years)

Program	Task	Cost	Timing
Terrestrial	Add Tree disease and pathogen monitoring (staff time)	$2,000	2030
NAI	Start a new NAI project	Split between partner organizations	2034

All	Summary results of all programs on website. Cost is staff time.	$50,000 - $60,000	2030
Terrestrial	Create a wetland monitoring program (new staff and equipment)	$150,000	2030-2035
Terrestrial	Frog call monitoring program (automated)	$10,000	2030-2035
Terrestrial	Soil moisture monitoring	$10,000	2030-2035
Aquatic	Expand stream temperature monitoring, watershed wide. Potentially looking at upwards of 40 additional stations depending on scope and budget. Up front Costs are mostly related to purchase of equipment. Annual operating budget covers some staff costs and ongoing equipment costs.	Up front costs $15 000 to $20 000 Annual operating budget $2000 to $5000	2027-2030, ongoing
Aquatic	Map important fish and benthic habitats. Cost is staff time.	$9000/year	2027-2033
All	Erosion monitoring program (Dundas Valley)	$40,000	2027-2030
Water quality	In-situ soil moisture sensor instillation	TBD	2027-2030
Water quality	Replace precipitation tipping buckets	TBD	2027, ongoing

7.0 Recommended Mitigation and Adaptation Approaches

The results of the monitoring programs will be used to help reduce the threats to the watershed, mitigate impacts and adapt to changing conditions. These mitigations measures can come in many forms within and between the monitoring programs. For example, increases in tree diseases and pathogens and monitoring results showing drier soil conditions could result in recommendations for tree plantings that are focused on more adaptable species and increasing diversity to mitigate the impact of species-specific tree diseases. HCA could review the option to add more southern tree species

to our forests to increase resilience to drought, invasive pests and temperature increases. This would include investigating what ecologists call assisted migration. Plant species can take years to migrate across the landscape temperatures shift and favourable growing conditions move. Assisted migration is moving plant species north to live in the predicted hotter drier climates in the climate change scenarios. This would include HCA investigating which tree species, like American Yellow wood, it might want to introduce to our forests to make them more resilient. Restoration and stabilization of HCA's forests will help make them more resilient to threats from climate change, urbanization, invasive species, among a host of other threats.

Expansion of the stream temperature monitoring program will give HCA an idea of locations for instream restoration to cool streams with tree plantings or narrow them with instream structures. This will assist with the stabilization of stream temperatures and fish habitat. It could also inform where Redside Dace which are identified as extremely vulnerable to climate change (Brinker et al, 2018) could be re-introduced. This species has likely been extirpated from our watershed already.

Working together in analysing the data over the aquatics, water quality and terrestrial monitoring programs will provide greater clarity on potential gaps within and between programs will give HCA a better idea of where restoration should occur. Results of erosion monitoring in the Dundas valley could result in the creation of storm water management (SWM) solutions where none exist to help slow and infiltrate water to reduce surface runoff volumes and increase recharge via groundwater. Holding back water can reduce erosion and cool the water before it is released back into receiving streams.

8.0 Next Steps

Next steps are to create an internal working group to move integration of the monitoring programs forward. Meeting regularly to discuss the monitoring programs will enhance integration and data analysis. Short term goals included in this comprehensive plan will

be reviewed for inclusion in future budgets. Station data for all programs will be reviewed for inclusion in a power analysis.

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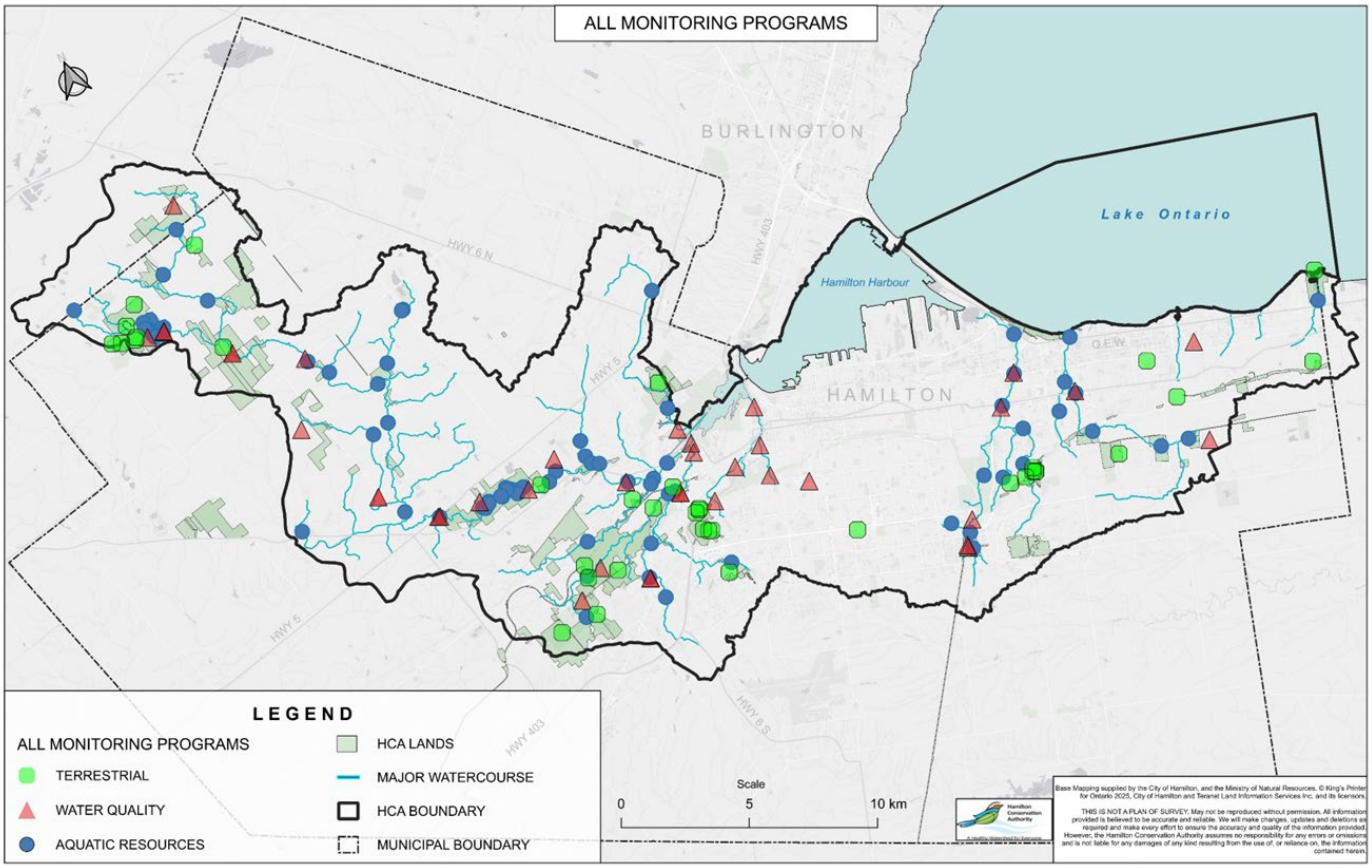
10.0 Appendices

Appendix A

Watershed wide monitoring station map, all programs



Appendix B – Aquatic Monitoring Stations and Locations

ID_NUM	WATERSHED	SUBWATERSHED
Year 1 sites		
MSP319-A1	Spencer Creek	Mid Spencer Creek
MSP323-A1	Spencer Creek	Mid Spencer Creek
USP301-H1	Spencer Creek	Upper Spencer Creek
USP315-A1	Spencer Creek	Upper Spencer Creek
USP315-A1a	Spencer Creek	Upper Spencer Creek
USP315-D2	Spencer Creek	Upper Spencer Creek
WES321-A3	Spencer Creek	Westover Creek
WSP324-A3	Spencer Creek	West Spencer Creek
FLE308-C1	Spencer Creek	Fletcher Creek
FLE312-B2	Spencer Creek	Fletcher Creek
FLM316-A1	Spencer Creek	Flamborough Creek
FLM317-A1b	Spencer Creek	Flamborough Creek
Year 2 sites		
ANC367-A2	Spencer Creek	Ancaster Creek
ANC369-A1	Spencer Creek	Ancaster Creek
ANC375-A1	Spencer Creek	Ancaster Creek
BOR351-A1	Spencer Creek	Borers Creek
BOR354-A2	Spencer Creek	Borers Creek
LOG326-A2	Spencer Creek	Logie's Creek
LOG338-B2	Spencer Creek	Logie's Creek
LSP378-A4	Spencer Creek	Lower Spencer Creek
MSP332-A1	Spencer Creek	Mid Spencer Creek
MSP332-A4	Spencer Creek	Mid Spencer Creek
MSP338-A1	Spencer Creek	Mid Spencer Creek
MSP338-A1f	Spencer Creek	Mid Spencer Creek
SPR343-A1	Spencer Creek	Spring Creek
SUL356-K1	Spencer Creek	Sulphur Creek

SUL361-A1	Spencer Creek	Sulphur Creek
TIF382-F1	Spencer Creek	Tiffany Creek

Year 3 sites

BATB6-A4	Stoney Creek	Battlefield Creek
LDA2201-A1	Red Hill Creek	Lower Davis Creek
LDA2201-A3	Red Hill Creek	Lower Davis Creek
MON2101-A3	Red Hill Creek	Montgomery Creek
OTT1017-A7	Red Hill Creek	Upper Ottawa Creek
RED1001-A1	Red Hill Creek	Red Hill Creek
RED1005-A1	Red Hill Creek	Red Hill Creek
RED1015-A3	Red Hill Creek	Red Hill Creek
STOS2-A1	Stoney Creek	Stoney Creek
STOS3-A2	Stoney Creek	Stoney Creek
STOS9-A3	Stoney Creek	Stoney Creek
UHA3002-A1	Red Hill Creek	Upper Hannon Creek
STOS3-A5	Stoney Creek	Stoney Creek

Annual Sites

ANC368-A1	Spencer Creek	Ancaster Creek
BATB6-A2	Stoney Creek	Battlefield Creek
FIF126-A1f	Stoney Creek	Watercourse 12 (Fifty Creek)
FLE307-A2	Spencer Creek	Fletcher Creek
LSP378-A1	Spencer Creek	Lower Spencer Creek
MSP330-A1	Spencer Creek	Mid Spencer Creek
MSP339-A1	Spencer Creek	Mid Spencer Creek
RED1009-A1	Red Hill Creek	Red Hill Creek
SPR346-A2	Spencer Creek	Spring Creek
STOS6-A3	Stoney Creek	Stoney Creek
SUL350-A1	Spencer Creek	Sulphur Creek
UHA3001-A1	Red Hill Creek	Upper Hannon Creek

USP315-C3	Spencer Creek	Upper Spencer Creek

Appendix C

Aquatic ARMP Analysis to add to program (Armanini, et. al 2010)

- GHFI – New Index created by several Neighbouring Conservation Authorities to improve on the limitations of Steedman (1988) for our area. Looks at abundance, whether species present are Stenotherms or not, the sensitivity of the species and their trophic status (Moore, D. 2025)
- Shannon Wiener Diversity - measures the species diversity and evenness and we can infer site integrity from this as sites with higher diversity scores are generally healthier sites
- Abundance analysis – simple measure of the numbers of each species present at a site
- Non-native Abundance Analysis simple comparison of the numbers of non-native species present
- Biomass for our fish catches – measure of the weight of the fish caught as a measure of the productivity of the site. Healthier sites should produce higher productivities
- Biomass of target species eg Brook Trout – for sites with Brook Trout present measures the weight of the Brook Trout caught as a measure of the site's productivity. Changes in the biomass of Brook Trout could indicate changes at the site. Brook Trout are coldwater species and valued game fish native to our watershed. This could also be applied to other valued species in reaches with out Brook Trout (Credit Valley Conservation, 2022c).
- Modified EPT (mEPT) (per cent) - Proportion (percentage) of the sample made up of Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) (i.e. EPT which are generally sensitive organisms), sites with higher percentages of theses families are generally healthier (Credit Valley Conservation, 2022b).
- ICHAEBO (per cent) (Isopoda, Chironomidae, Hydropsychidae, Amphipoda, Elmidae, Baetidae and Oligochaeta) – Similar to EPT but is the opposite measure as these species are less sensitive and higher numbers of them can be indicators of poorer quality habitats (Credit Valley Conservation, 2022b).

- Scrapers: Shredders+Collectors - Ratio of organisms whose are consumers of autotrophs (algae/ microscopic organism -eating/) vs. heterotrophic (leaf/detritus-eating). Sites with high integrity generally have lower ratio of Scrapers: Shredders+Collectors (Credit Valley Conservation, 2022b).
- Burrowers: Clingers+Sprawlers - compares organism habitat preferences, i.e. Burrowers live in the hyporheic (sub-surface) zone vs. Sprawlers/Clingers who reside on substrate surfaces. Sites with lower velocities and finer particles tend to support higher ratios of Burrowers:Clingers+Sprawlers (Credit Valley Conservation, 2022b).
- Canadian Ecological Flow Index (CEFI) - Indicator for the effects of watercourse flow alteration, index can indicate a change in community composition as a result of streamflow alteration (Armanini, et al, 2010).
- Hilsenhoff Family Biotic Index (HBI) This is part of the Watershed report card and could be formally reported as well. This is the result we have been including in the BoD report for the last 2 years

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Hamilton Conservation Authority

A Healthy Watershed for Everyone

Report to:	Board of Directors
Approved for Circulation By:	Lisa Burnside, CAO
Reviewed By:	Gord Costie, Director, Conservation Area Services
Prepared By:	Liam Fletcher, Eastern Senior Manager Conservation Area Services
Meeting Date:	February 5, 2026
Subject:	Hamilton Conservation Authority – Appointment of Officers under the *Conservation Authorities Act*

Recommendation:

THAT the HCA Board of Directors appoint the staff identified in Attachment A as Officers under Section 30.1 of the *Conservation Authorities Act*, for the purposes of enforcing the *Conservation Authorities Act* and related regulations, as well as the *Trespass to Property Act,* as more specifically identified in Attachment A.

Executive Summary:

HCA staff in the Conservation Area Services Division have responsibilities related to the administration and enforcement of the *Conservation Authorities Act* and its regulations. In this regard, Conservation Area Managers, Superintendents, and Assistant Superintendents within Conservation Areas Services Division have responsibilities related to the administration and enforcement of Section 29 of the *Conservation Authorities Act* and *O. Reg. 688/21: Rules of Conduct in Conservation Areas*.

Under Section 30.1 of the *Conservation Authorities Act* an Authority may appoint Officers for the purposes of ensuring compliance with the Act and the regulations. The appointment of Officers under Section 30.1 of the *Conservation Authorities Act* is necessary in order to fulfill class designation requirements for HCA Officers to be designated as Provincial Offences Officers. On March 20, 2024, the Minister of Natural Resources and Forestry issued a class designation under the authority of subsection 1(3) of the *Provincial Offences Act* to designate Officers appointed under Section 30.1

of the *Conservation Authorities Act* as Provincial Offences Officers for the purpose of enforcing the *Conservation Authorities Act* and its regulations, as well as the *Trespass to Property Act*, within the jurisdiction of their Conservation Authority.

The purpose of this report is to seek the appointment of the HCA staff identified in Attachment A, as Officers of the HCA and Provincial Offences Officers.

Staff Comment / Discussion:

HCA staff in Conservation Area Services Divisions have responsibilities related to the administration and enforcement of the *Conservation Authorities Act* and its regulations. This includes enforcing rules of conduct in Conservation Areas and supporting court proceedings and prosecutions when necessary. Appointment of HCA staff in Conservation Area Services Division as Officers under Section 30.1 of the *Conservation Authorities Act* provides staff with the necessary authorities to carry out their job duties.

The staff identified in Attachment A have satisfied the criteria for appointment as Officers under Section 30.1 of the *Conservation Authorities Act* as outlined in the *Protocol for Conservation Authority Designation of a Provincial Offences Officer* developed by Conservation Ontario, which requires:

1. The officer shall provide proof of a clean criminal record check

2. The officer shall be adequately trained in the legislation they are to enforce (i.e. the *Conservation Authorities Act, Provincial Offences Act, and the Trespass to Property Act*).

Strategic Plan Linkage:

The initiative refers directly to the HCA Strategic Plan 2025 – 2029:

- **Strategic Priority Area – Organizational Excellence**
    - Promote employee training, engagement, well-being, diversity, and inclusivity to strengthen our organizational resilience and ensure employees are equipped with the necessary skills to address emerging needs**.**

Agency Comments:

Not applicable

Legal / Financial Implications:

Not applicable

Related Reports and Appendices:

- Attachment A, Staff Appointments

ATTACHEMENT A

HCA staff appointments for the purposes of enforcing Section 29 of the *Conservation Authorities Act* and related regulations, as well as the *Trespass to Property Act*

Jack Elderman, Park Superintendent, Confederation Beach Park

Nick Burgess, Assistant Superintendent, Hamilton Mountain Conservation Area

Hamilton Conservation Authority

A Healthy Watershed for Everyone

2026 Board of Directors Meeting Schedule

Hamilton Conservation Authority

838 Mineral Springs Road, Ancaster

1st Thursday of each month at 6:00 p.m., excluding January and August

February 5, 2026 – AGM
March 5, 2026
April 2, 2026
May 7, 2026
June 4, 2026
July 2, 2026
September 3, 2026
October 1, 2026
November 5, 2026
December 3, 2026

Section 28 Hearing Dates

2nd Thursday of every other month at 6:00 p.m., alternating with regularly scheduled Conservation Advisory Board meetings.

March 12, 2026
May 14 2026
July 9, 2026
September 10, 2026

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Hamilton Conservation Authority

A Healthy Watershed for Everyone

Report to: Board of Directors

Prepared & Reviewed By: Lisa Burnside, CAO

Meeting Date: February 5, 2026

Subject: 2026 Voting members for Conservation Ontario

Recommendation:

THAT the following members be appointed to Conservation Ontario for 2026:

Designate: **Chair**
Alternate: **Vice Chair**
Second Alternate: **Chief Administrative Officer, and further**

THAT Conservation Ontario be advised of these appointments.

Executive Summary:

The purpose of this report is to establish the voting representatives to Conservation Ontario as per Annual General Meeting (AGM) requirements, internal business planning purposes and awareness for Conservation Ontario.

As noted in the HCA Administrative By-Law in Section 5B, Meeting Procedures, the Authority at the Annual General Meeting shall include in its course of business the appointment of the voting delegates to Conservation Ontario.

Conservation Ontario is a non-profit association that represents Ontario's 36 Conservation Authorities. Conservation Ontario is directed by a Council comprised of appointed and elected municipal/citizen officials from the 36 Conservation Authorities Boards of Directors. All Conservation Authorities designate voting delegates to Conservation Ontario. It is recommended that HCA continue with its designation of the Chair with noted alternates.

Staff Comment / Discussion:

The HCA has traditionally designated the Chair as the voting representative to Conservation Ontario with alternates. Conservation Ontario holds quarterly meetings in the Toronto area, at a central location for the 36 conservation authorities. Meetings are held both in-person and virtually. The meeting dates for 2026 have been set for:

- Monday, April 13, AGM (in-person)
- Monday, June 22 (virtual)
- Monday, September 21 (in-person)
- Monday, December 7 (virtual)

Strategic Plan Linkage:

The initiative refers directly to the HCA Strategic Plan 2025 – 2029:

- **Strategic Priority Area – Organizational Excellence**

Agency Comments:

N/A

Legal / Financial Implications:

There are no new or additional financial implications posed by adoption of the Board of Directors' appointment of voting representatives as presented

Related Reports and Appendices:

N/A

Hamilton Conservation Authority

A Healthy Watershed for Everyone

Report to: Board of Directors

Approved for Circulation By: Lisa Burnside, CAO

Prepared & Reviewed By: Scott Fleming, Director of Finance and Central Support Services

Meeting Date: February 5, 2026

Subject: Appointment of Auditors for 2026 Fiscal Year

Recommendation:

STAFF RECOMMENDATION

THAT the Hamilton Conservation Authority appoints KPMG LLP as its auditors for the 2026 fiscal year.

Executive Summary:

The purpose of this report is to appoint the auditors for the HCA for the 2026 fiscal year as per Annual General Meeting (AGM) requirements and for internal business planning.

As noted in the HCA Administrative By-Law in Section B, Governance, (7), Appointment of Auditor, the Board of Directors at the Annual General Meeting shall include in its course of business the appointment of the auditor for the upcoming year.

Staff Comment / Discussion:

KPMG LLP was awarded a five-year contract for audit services in 2025 following an RFP process. In addition to the HCA, they will also carry out the audit of the Hamilton Conservation Foundation and review the statements of Confederation Beach Park prepared as required by the Management Agreement between the HCA and the City of Hamilton. Additionally, advisory and/or other services may be requested by KPMG LLP on an as needed basis.

As part of their service, a senior representative of the firm will attend the Budget & Administration Committee and/or Board of Directors meeting when the Audited Financial Statement is presented.

STRATEGIC PLAN LINKAGE

The initiative refers directly to the HCA Strategic Plan 2025 - 2029:

- **Strategic Priority Area – Organizational Excellence**

AGENCY COMMENTS

Not applicable

LEGAL/FINANCIAL IMPLICATIONS

Sufficient funding has been allocated within the HCA's annual operating budget to support external audit.

Related Reports and Appendices:

Not applicable

Hamilton Conservation Authority

A Healthy Watershed for Everyone

Memorandum to: Board of Directors

Approved for Circulation By: Lisa Burnside, CAO

Reviewed By: T. Scott Peck, MCIP, RPP, Deputy CAO/Director, Watershed Management Services

Prepared By: Mike Stone, MCIP, RPP, Senior Manager, Watershed Planning, Stewardship & Ecological Services

Meeting Date: February 5, 2026

Subject: Annual Reporting on HCA Permit Review Timelines – January 1, 2025 to December 31, 2025

Executive Summary:

The *Conservation Authorities Act* (CA Act) sets out specific timelines related to the review of permit applications and issuance of permit decisions. Under the CA Act, conservation authorities (CA) are required to prepare an annual report on their permit review timelines and compliance with legislative requirements. HCA issued ninety-two (92) permits in 2025 and achieved a high level of compliance with the review timelines established under the CA Act, as well as the permit review guidelines provided by Conservation Ontario (CO).

Staff Comment / Discussion:

Background

HCA is committed to providing excellent client service under its planning and regulations programs. In support of this, HCA tracks and reports on permit review timelines annually.

Legislative and regulatory changes to the CA Act that came into effect April 1, 2024 established new legislative requirements related to permitting. The CA Act and *Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits* (O. Reg. 41/24) outline two distinct timelines associated with the review of permit applications:

1. Upon receipt of an application and the applicable fee, a CA has 21 days to notify the applicant in writing whether or not the application is deemed a complete application.

2. Once an application is deemed complete, a CA is to complete their review and make a decision on the application within 90 days. If a CA has not made a decision within 90 days the applicant may appeal the application directly to the Ontario Land Tribunal (OLT) on the basis of a non-decision.

It should be noted the 21 day and 90 day timeframes now established under the CA Act and O. Reg. 41/24 represent calendar days. In tracking permit review timelines, CAs have traditionally made a distinction between calendar days and actual review days, where the later excludes days where an applicant is working to address CA comments and prepare resubmission materials (i.e. 'stopping the review clock').

To support CAs in implementing the new legislative requirements for permitting, Conservation Ontario released new guidelines in September 2024 – *Annual Reporting Guidance and Template: Permit Timelines and Regulatory Compliance – For review of permits pursuant to Section 28.1 of the Conservation Authorities Act*. The 2024 guidelines update and replace earlier 2019 CO guidelines and 2010 Ministry of Natural Resources (MNR) guidelines regarding permitting review timelines.

Under the 2024 guidelines, once a CA deems a permit application complete, it will have 90 days to make a decision regarding a major permit and 30 days for a minor permit. The guidelines note that where a CA has requested clarification or further details regarding the application, a CA may "stop the review clock" on their decision-making timeline when awaiting clarification or additional details. Despite the recommended 90 day (major permit) and 30 day (minor permit) review timelines, the ability to appeal a non-decision to the OLT remains 90 calendar days following the confirmation of a complete application, regardless of a permit's classification as major or minor.

<u>HCA Permit Review Timelines 2025</u>

HCA issued ninety-two (92) permits between January 1 and December 31, 2025. Table 1 below provides a summary of HCA's permitting review timelines and statistics for 2025 in relation to legislative requirements and Conservation Ontario guidelines. Results from 2024 are also included to allow for comparison year over year.

Table 1

	2025	2024
No. permits issued (major + minor)	92 (25+67)	72 (17 + 55)
No. complete application reviews within 21 calendar days*	88 (96%)	67 (93%)
No. permits issued within 90 calendar days*	85 (92%)	54 (75%)
No. major permits issued within 90 review days +	22 (88%)	16 (94%)
No. minor permits issued within 30 review days +	67 (100%)	42 (76%)

* Timeline established in legislation under CA Act or O. Reg. 41/24
+ Timeline established in 2024 CO guidelines

Table 1 illustrates that HCA achieved a high level of compliance with the permit review timeline requirements and guidelines that came into effect in 2024, generally meeting or exceeding these over 90% of the time. Permit review timelines in 2025 were generally consistent with or improved compared to 2024 results. In particular, a greater percentage (92%) of permits were issued within the legislated 90 calendar day decision timeline compared to 2024. Eighty-eight percent (88%) of major permits and 100% of minor permits were issued within the 90 and 30 review day guidelines recommended by CO. HCA's permit review timelines and statistics are reported annually to CO.

Strategic Plan Linkage:

The initiative refers directly to the HCA Strategic Plan 2025 - 2029:

- **Strategic Priority Area – Organizational Excellence**
  - Initiative - Enhance communications efforts to promote our accomplishments, programs, and services, including results of our monitoring and restoration programs, to strengthen awareness and engagement with the watershed community.

Agency Comments:

N/A

Legal / Financial Implications:

Ontario Regulation 686/21 (Mandatory Programs and Services) made under the *Conservation Authorities Act* requires conservation authorities to prepare an annual report outlining statistics on permits, including the level of compliance with the requirements of *Ontario Regulation 41/24 (Prohibited Activities,*

Exemptions and Permits) respecting the application for and issuance of permits, including any associated timelines.

The *Conservation Authorities Act* also provides permit applicants the ability to appeal an application directly to the OLT if a conservation authority fails to give the applicant notice of a decision with respect to the application within 90 days of the application being deemed complete.

Related Reports and Appendices:

N/A

Hamilton Conservation Authority

A Healthy Watershed for Everyone

Memorandum to: Board of Directors

Approved for Circulation By: Lisa Burnside, CAO

Reviewed By: T. Scott Peck, MCIP, RPP, Deputy Chief Administrative Officer / Director, Watershed Management Services

Prepared By: Jonathan Bastien, P. Eng., Manager, Water Resources Engineering

Meeting Date: January 23rd, 2026

Subject: Watershed Conditions Memorandum

Executive Summary:

During the period of November 24th, 2025, to January 23rd, 2026, there were no significant watercourse flooding events, and no Lake Ontario shoreline flooding events. However, three rain and snowmelt events warranted issuing messages and additional monitoring of watercourse conditions. For the early January 2026 event, although no reports were received, it is expected that localized watercourse flooding of low-lying areas that typically flood during higher water levels and significant water safety concerns occurred in Lower Spencer Creek.

In December, January and currently, ice conditions artificially affected readings at the streamflow gauges, thus flow measurements are not considered accurate.

There are no observations, reports, or expectations that significant watercourse flooding, localized watercourse flooding of low-lying areas that typically flood during higher water levels, or significant water safety concerns are occurring at this time. Current flows are estimated to be near baseflow conditions to elevated but below thresholds for significant water safety concerns.

The average monthly flows for December and January so far are not considered accurate, due to ice conditions that have artificially affected readings at the streamflow gauges. November average recorded flows ranged between significantly below long-term averages to near long-term averages.

There are no observations, reports, or expectations that significant Lake Ontario shoreline flooding is occurring at this time. The Lake Ontario mean daily water level averaged across the entire lake is 3 cm below average for this time of year, as of yesterday.

Christie Lake and Valens Lake water levels are currently within the preferred winter operating levels.

The most recent drought assessment indicated that normal conditions are an appropriate overall characterization of the watershed at this time.

There are currently no significant rainfall or snowmelt events, nor significant Lake Ontario shoreline flooding, forecasted for the watershed over the next 2 weeks.

HCA staff will continue to undertake monthly drought assessments, and coordinate with the Hamilton Low Water Response Team if drought conditions warrant actions.

Staff Comment / Discussion:

CURRENT WATERSHED CONDITIONS – January 23rd, 2026

Current Flows in Major Area Watercourses

In December, January and currently, ice conditions artificially affected readings at the streamflow gauges, thus flow measurements are not considered accurate.

There are no observations, reports, or expectations that significant watercourse flooding, localized watercourse flooding of low-lying areas that typically flood during higher water levels, or significant water safety concerns are occurring at this time.

Current flows are estimated to be near baseflow conditions to elevated but below thresholds for significant water safety concerns. The five available streamflow gauges are Upper Spencer Creek at Safari Road, Middle Spencer Creek at Highway 5, Lower Spencer Creek at Market Street, Ancaster Creek at Wilson Street and Red Hill Creek at Barton Street.

The average monthly flows for December and January so far are not considered accurate, due to ice conditions that have artificially affected readings at the streamflow gauges.

November average recorded flows ranged between significantly below long-term averages to near long-term averages. Monthly flow in Upper Spencer Creek at Safari Road was considered near average. However, Upper Spencer Creek at Safari Road gauge may have been experiencing debris related issues that artificially elevating recorded flows. Monthly flow in Middle Spencer Creek at Highway 5 was considered significantly below average. Monthly flow in Lower Spencer Creek at Market Street was considered significantly below average. Monthly flow in Ancaster Creek at Wilson Street was considered below average. Monthly flow in Red Hill Creek at Barton Street was considered well below average. It is noted that streamflows in Spencer Creek were increased during November as a result of the winter drawdowns of the Valens Lake reservoir (October 20 to November 6) and the Christie Lake reservoir (October 24 to December 3).

Current Lake Ontario Water Levels

There are no observations, reports, or expectations that significant Lake Ontario shoreline flooding is occurring at this time. The Lake Ontario mean daily water level in the Hamilton area was 74.55 to 74.56 m IGLD85 as of yesterday. The Lake Ontario mean daily water level averaged across the entire lake (74.57 m IGLD85 as of yesterday) is 3 cm below average for this time of year.

Current Storages in HCA Reservoirs

Christie Lake levels (765.50 ft) are currently within preferred winter operating levels (765.30 to 765.80 ft).

Valens Lake levels (274.23 m) are currently within the preferred winter operating levels (274.15 to 274.40 m).

Current Soil Conditions

Surface and root-zone soils are considered wet to saturated, and fully frozen, across the watershed.

RECENT STORM EVENTS

During the period of November 24th, 2025, to January 23rd, 2026, there were no significant watercourse flooding events, and no Lake Ontario shoreline flooding events.

However, three rain and snowmelt events warranted issuing messages and additional monitoring of watercourse conditions.

Potential for Watercourse Flooding During Rain and Snowmelt Event

December 17th to 23rd, 2025

Prior to this event, up to 16 mm of snowmelt was forecasted for the Hamilton area with an additional up to 15 mm of rain, combined over December 17 and 18th. There was considerable uncertainty as to the amount of runoff that would occur. HCA staff continued to monitor watercourse and weather conditions closely and reassessed the potential for flooding.

There were no received observations, reports, or expectations of significant watercourse flooding, localized watercourse flooding of low-lying areas that typically flood during higher water levels, or significant water safety concerns.

HCA engineering staff issued the following messages related to this event, to communicate the potential watercourse flooding and water safety concerns to the community:

- December 16th: Flood Watch – Inland Lake and River Flooding
- December 23rd: Cancellation - Flood Watch – Inland Lake and River Flooding

Potential for Watercourse Flooding During Rain and Snowmelt Event

December 28th to 30th, 2025

Prior to this event, 25 to 50 mm of rain including thunderstorm activity was forecasted for the Hamilton area for December 28th. There was considerable uncertainty as to the amount of runoff that would occur. HCA staff continued to monitor watercourse and weather conditions closely and reassessed the potential for flooding.

There were no received observations, reports, or expectations of significant watercourse flooding, localized watercourse flooding of low-lying areas that typically flood during higher water levels, or significant water safety concerns.

HCA engineering staff issued the following messages related to this event, to communicate the potential watercourse flooding and water safety concerns to the community:

- December 27th: Flood Watch – Inland Lake and River Flooding
- December 30th: Cancellation - Flood Watch – Inland Lake and River Flooding

Potential for Watercourse Flooding During Rain and Snowmelt Event

January 6th to 12th, 2026

Prior to this event, up to 33 mm of snowmelt was forecasted for the Hamilton area with an additional up to 43 mm of rain, combined over January 6 to 10th. There was considerable uncertainty as to the amount of runoff that would occur. HCA staff continued to monitor watercourse and weather conditions closely and reassessed the potential for flooding.

There were no received observations, reports, or expectations of significant watercourse flooding. However, although no reports were received, it is expected that localized watercourse flooding of low-lying areas that typically flood during higher water levels and significant water safety concerns occurred in Lower Spencer Creek.

HCA engineering staff issued the following messages related to this event, to communicate the potential watercourse flooding and water safety concerns to the community:

- January 5th: Flood Watch – Inland Lake and River Flooding
- January 12th: Cancellation - Flood Watch – Inland Lake and River Flooding

RECENT WATERSHED LOW WATER CONDITIONS

The most recent drought assessment (including data up to December 31) indicated that normal conditions are an appropriate overall characterization of the watershed at this time.

FORECASTED WATERSHED CONDITIONS

Watercourse Flooding

There are currently no significant rainfall or snowmelt events (+20 mm in a day) forecasted for the watershed over the next 2 weeks. HCA staff continue to monitor conditions and forecasts routinely. Resultant water levels and flows from currently anticipated rain or snowmelt are not expected to result in significant watercourse flooding.

Lake Ontario Shoreline Flooding

In the next 2 weeks, no significant Lake Ontario shoreline flooding is currently expected.

Watershed Low Water Conditions

HCA staff will continue to undertake monthly drought assessments, and coordinate with the Hamilton Low Water Response Team if drought conditions warrant actions.

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Hamilton Conservation Authority

A Healthy Watershed for Everyone

Memorandum to: Board of Directors

Approved for Circulation By: Lisa Burnside, CAO

Reviewed By: Gord Costie, Director, Conservation Area Services

Prepared By: Liam Fletcher, Senior Manager, Conservation Area Services

Meeting Date: Thursday February 5, 2026

Subject: Conservation Area Services Update

Executive Summary:

Enjoy Family Day with winter activities across Hamilton Conservation areas. Valens Lake Conservation Area is now open for on-ice activities, welcoming anglers of all ages to fish or skate. On Monday, February 16 from 10 AM to 4 PM, Westfield Heritage Village hosts Hike for Hot Chocolate, featuring scenic hikes, free hot chocolate, wagon rides, campfires, scavenger hunts, and family-friendly learning experiences. Throughout the Family Day long weekend, all major conservation areas will be open for hiking, snowshoeing, fishing, and enjoying winter scenery. Visitors are encouraged to check the HCA website for alerts before heading out.

Staff Comment / Discussion:

- **Valens Lake Conservation Area – On Ice Activities**
  As of Monday January 19, the Valens lake reservoir is now open for on ice activities. Anglers of all ages are welcome to try their luck for a variety of pan fish species on the hard water of the Valens lake reservoir. As a reminder, the HCA has a voluntary catch and release program that helps support a sustainable fishery for future generations to enjoy sport fishing. Good luck to all the anglers who try to land the big one.

- **Westfield Heritage Village – Hike for Hot Chocolate**
  Step outside this Family Day at Westfield Heritage Village. Take a hike around the historic village and trails as you warm up with a complimentary hot chocolate. Enjoy a day of outdoor winter activities with your family, including tractor pulled wagon rides around the village, outdoor campfires, a scavenger hunt, and learn

about native birds found at Westfield. Visitors can also learn about the history of chocolate in early times. This event will be held on Monday, February 16 from 10 AM to 4 PM.

- **Family Day Weekend**
  All of our major conservation areas will be open and staffed for the Family day long weekend. Get out into nature and shake the winter blues by hiking, snowshoeing, fishing or taking in the beauty of our many waterfalls. Visitors are encouraged to wear appropriate footwear as trail conditions can vary this time of year. Don’t forget to check the HCA website for up to date alerts for all areas or trail closures before heading out.