

ONTARIO LAND TRIBUNAL

Appeals by ClubLink Corporation ULC of Zoning By-law Amendment and Plan of Subdivision Applications for 7000 Campeau Drive, Ottawa

OLT Case No. PL200195

WITNESS STATEMENT OF JEAN-FRANCOIS SABOURIN, M.Eng., P.Eng., ing.

November 12, 2021

Qualifications

1. I have 38 years of experience in providing engineering services to public and private clients in the geographic regions within Eastern Ontario and the Greater Toronto Area, as well as across the province of Québec. I have undertaken, managed and directed numerous water resources related studies, such as detailed conceptual drainage designs for new developments, rehabilitation of municipal projects related to drainage systems, low impact development (LID) research studies, flood mapping studies, watershed studies, rainfall / flow / snowmelt monitoring studies, hydrologic model calibration, master drainage plans, and development and programming of several hydrologic software that are distributed across Canada, such as SWMHYMO.
2. A copy of my *curriculum vitae* is attached to this Witness Statement, together with a signed Acknowledgement of Expert's Duty.

Retainer

3. J.F. Sabourin and Associates Inc. (JFSA) was retained by David Schaeffer Engineering Ltd (DSEL) on behalf of ClubLink Corporation ULC to address stormwater management requirements to support draft plan of subdivision and zoning by-law amendment applications for the proposed redevelopment of 7000 Campeau Drive, Ottawa. As part of this retainer, I prepared a number of reports, which are identified within the "List of Documents to be Referred to" at the end of this Witness Statement.

Summary of Evidence and Opinions

4. In my evidence, I will review, as necessary, key portions of the reports I prepared, as identified above. I will also address the issues as follows:

City of Ottawa Issues

5. **Issue 2. Is the proposed plan of subdivision consistent with the Provincial Policy Statement, particularly policies ... 1.6.6.7 ...?**

1.6.6.7: Planning for stormwater management shall:

- b) minimize, or, where possible, prevent increases in contaminant loads;
6. *Response: The proposed stormwater management plan incorporates a treatment train approach including reduced lot grading, amended soils, catch basins equipped with CB Shields and deep sumps, an exfiltration system, and oil grit separators. Reduced lot grading, exfiltration systems, bioswales (bioretention filters), and oil grit separators are identified in the SWMP Manual as a means to mitigate against contaminant loading and promote groundwater infiltration.*
7. *The “Beaver Pond” is the SWM facility currently receiving, treating, and controlling the runoff from the existing development area, including the golf course. There are currently no other SWM features, with an associated ECA, that provide stormwater quantity and quality controls within the area that drains to the Beaver Pond. While the proposed development will continue to drain to the Beaver Pond, it will incorporate the necessary SWM features to not increase contaminant loads to the Beaver Pond.*
8. c) minimize erosion and changes in water balance, and prepare for the impacts of a changing climate through the effective management of stormwater, including the use of green infrastructure;
9. *Response: The water balance will be met with the use of Low Impact Development (LID) measures such as amended soils, bioswales where they can be integrated, and the use of exfiltration systems tied to catch basins.*
10. d) mitigate risks to human health, safety, property and the environment;
11. *Response: The proposed stormwater management plan ensures that there are no adverse increases in the hydraulic grade line of the receiving sewer system.*
12. *The proposed treatment train ensures that quality control objectives are met prior to the release of stormwater to the existing sewer system.*
13. e) maximize the extent and function of vegetative and pervious surfaces;

14. *Response: The proposed use of amended soils, bioswales and the maintenance of natural areas will maximize the extent and function of vegetative and pervious surfaces.*
15. f) promote stormwater management best practices, including stormwater attenuation and re-use, water conservation and efficiency, and low impact development.
16. *Response: The proposed stormwater management plan incorporates best practices and attenuates stormwater runoff onsite prior to discharging to the existing storm network. Standard applications of water conservation are incorporated into the development plan including reduced lot grading, directing rain water roof leaders to pervious areas, City standard rear yard swales, incorporation of exfiltration system, bioswales, catch basins with deep sumps and CB shields, end of pipe treatment systems, all in keeping with City standards.*
17. **Issue 4. Does the proposed plan of subdivision conform to the Official Plan of the City of Ottawa, particularly policies ... 2.3.3.1, 2.3.3.3... and is it compatible with adjacent plans of subdivision (s.51(24)(c))?**
18. PPS Policy 2.3.3.1: Development will be in accordance with the system capacity for drainage and will implement stormwater management and where relevant, will conform to stormwater site management plans, the Infrastructure Master Plan and community design plans practices necessary to protect, improve or restore the quality and quantity of water in the receiving watercourse. [Amendment #76, OMB File #PL100206, August 18, 2011]
19. *Response: JFSA / DSEL prepared an up-to-date storm drainage model to represent the existing condition where the previous materials (Sept 1986 – OMM Kanata Lakes Storm Drainage Report and Shirley's Brook & Watt's Creek Phase 2 Stormwater Management Study) were found to be out of date or inconsistent with the existing condition, in order to determine and establish the current system capacity of the receiving stormwater system (sewers, Beaver Pond, Kizell Drain, and Watts Creek).*
20. *We found the following items inconsistent with the existing conditions:*
- *Tributary areas illustrated in the September 1986 report are inconsistent with the as-built condition and current topographical mapping.*
 - *In previous studies by others (AECOM for the City of Ottawa, draft 2013 and final report 2015), local rainfall measurements combined with the continuous monitoring of the Beaver Pond water elevations were used to calibrate the hydrologic model (SWMHYMO) for the entire area draining to the Beaver Pond. To get a better comparison between simulated and observed flows, the AECOM model had to incorporate a sub-surface storage volume to both the Kizell Wetland (18,586 m³) and the Beaver Pond (53,604 m³). This sub-surface*

storage was thought to be found around the foundation of all structures (homes) in the permeable backfill material that was used during construction. As far as we know, this type of underground storage has never been accounted for in any other SWM facility, or to improve a model's calibration.

21. *For the proposed development application, JFSA undertook additional rainfall and flow measurements within the study area. For the first time (to our knowledge), flows within the existing storm sewers were measured. Two sites were selected; 1) on Campeau Drive where runoff from an existing developed portion of the area was the only flow contributor and 2) on Weslock Drive, where both the runoff from existing developments as well as a portion of the golf course were flow contributors.*
22. *The newly acquired monitoring data was used to re-calibrate the previous AECOM stormwater model for the area. Through this re-calibration it was found that the underground storage, that had to be included previously, could be removed from the model.*
23. *The updated model was then used to re-evaluate existing conditions and proposed future conditions with and without the approved KNL Stage 9 developed. Potential impacts to the Beaver Pond outflow and along the downstream reaches of the receiving watercourse were assessed. Based on the proposed SWM design for the proposed development of the Kanata Lakes Golf Course, stormwater quality would not be impacted, and no increases in design peak flows out of the Beaver Pond and along the Kizell Drain / Watt's Creek would occur.*
24. City Official Plan Policy 2.3.3.3: Where approved Master Drainage Plans are in place but do not meet current receiving system standards or requirements for quality or quantity controls, as identified in consultation with appropriate Conservation Authority and municipal infrastructure staff, current standards may supersede the requirements of the Master Drainage Plan. The determination of the application of current standards will be subject to consultation between the City, appropriate Conservation Authority, affected landowners and other relevant stakeholders and will have regard to the planning, design and approval status of developments and infrastructure within the drainage area [Amendment #76, Ministerial Modification #9, OMB File #PL100206, August 18, 2011]
25. *Response: JFSA and DSEL prepared an up to date storm drainage model to represent the existing condition where the previous materials (Sept 1986 – OMM Kanata Lakes Storm Drainage Report and Shirley's Brook & Watt's Creek Phase 2 Stormwater Management Study) were found to be out of date or inconsistent with the existing condition, in order to determine and establish the current system capacity of the receiving stormwater system (sewers, Beaver Pond, Kizell Drain, and Watts Creek).*
26. *JFSA / DSEL met with the regulatory authorities to determine the appropriateness of the existing stormwater models.*

- *March 19, 2019 – City Staff*
27. *The City’s model of record is the calibrated AECOM model with the inclusion of sub-surface storage volumes to both the Kizell Wetland and the Beaver Pond.*
 - *April 30, 2019 – MVCA Staff <- which model to use*
 28. *The MVCA’s model of record is the one used for flood plain mapping purposes. It is a version of the AECOM model with the addition of known / planned future development projects in place without future quantity controls with the use of stormwater management features.*
 - *November 18, 2020 – City Staff <- Model calibration discussion*
 29. *JFSA’s model calibration was documented and discussed with City Staff. JFSA’s updated model calibration made use of parameters that are more in line with standard City parameters, and the need to incorporate the “underground storage” to both the Kizell Wetland and the Beaver Pond was eliminated. The updated model is also a continuous model as compared to a single event model and incorporates a baseflow component which is not included in the original City model of record.*
 30. *The SWMHYMO drainage model was prepared with and without the KNL Stage 9 lands developed as per IBI’s proposed SWM Plan. As instructed by the City, other Stages of KNL (7 and 8) have not yet been approved, hence were not included in our analysis.*
 31. *The 6301-6475 Campeau Drive application submitted during the 7000 Campeau application process will, if approved, change the runoff volumes that need to be conveyed through the proposed SWM system and ultimately to the Beaver Pond. For quality control purposes, the 6301-6475 Campeau Drive application proposes the use an OGS with a reported removal efficiency of more than 80%.*
 32. **Issue 15. Has the major overland flow from the proposed draft plan of subdivision lands, and connecting existing residential lands, into the Beaver Pond been accounted for?**
 33. *The proposed stormwater management plan does not introduce a major overland flow into the existing community. All storms up to and including the 100-year event are contained within the proposed development and released to the existing storm sewer system.*
 34. **Issue 23. Is the proposed zoning consistent with the Provincial Policy Statement, particularly policies ... 1.6.6.7...?**
 35. *See my response to Issue 2.*

36. **Issue 25. Does the proposed zoning conform to the Official Plan of the City of Ottawa, particularly policies ... 2.3.3.1, 2.3.3.3 ...?**

37. *See my response to Issue 4.*

38. **Issue 32. Is the proposed zoning amendment and plan of subdivision consistent with the PPS 2020 with particular reference to Section ...1.6.6.7...?**

39. *See my response to Issue 2.*

40. **Issue 34. Is the proposed zoning amendment and plan of subdivision in general conformity with the Official Plan with particular reference to the following sections:**

41. 2.3.3 – Drainage and Stormwater Management Services

Land-use change creates the need for drainage services to ensure safe, well-drained sites. The provision of storm sewers to efficiently convey frequent runoff is combined with overflow (or surface) routes that convey larger, less frequent flows that exceed storm sewer capacity. This “major/minor” system approach to drainage provides protection from flooding in new developments.

42. *Response: The proposed stormwater management plan includes provisions for a major and minor system drainage network prior to discharge to the existing sewers.*

43. 2.3.3 (continued): Uncontrolled stormwater runoff can also impair aquatic habitat, increase erosion threats and limit the recreational potential of local rivers and streams. Increased flooding and erosion can also impact municipal drains when development occurs adjacent to them. Beyond protecting life, property and infrastructure from flooding, stormwater management services are also required to mitigate the impacts of land-use change on receiving watercourses, including municipal drains.

The provision of appropriate drainage and stormwater management services requires coordination with land-use planning, and assessment of receiving watercourses (including municipal drains), environmental features and natural hazards, all of which is typically achieved through environmental management plans and subwatershed plans. Policies for these plans and stormwater site management plans are found elsewhere in this Plan.

As noted above, the Infrastructure Master Plan provides a comprehensive statement of the City’s stormwater management policies. These policies cover established practices as well as identify new directions for stormwater management planning, in particular:

- Planning for stormwater retrofit; and
- Requiring increased efforts to reduce runoff volumes.

Stormwater retrofit planning is required to address the cumulative impacts of infill/redevelopment in areas of the city that developed without stormwater management. Requiring increased efforts to reduce runoff volumes reflects the growing body of science that indicates conventional stormwater management efforts (peak flow controls) are not always sufficient to maintain the long-term health and stability of receiving watercourses.

44. *Response: The proposed stormwater management plan was reviewed and it was determined that the receiving infrastructure is adequate to support the proposed infill development where LIDs, OGS's, and wet ponds are provided to maintain the local water balance and control stormwater prior to discharge to the existing sewers in a treatment train process in line with the MECP future Consolidated Linear Infrastructure Permissions Approach (CLI).*

List of Documents to be Referred To

- Ottawa Sewer Design Guidelines,
City of Ottawa, *SDG002*, October 2012
(*City Standards*)
 - Technical Bulletin ISDTB-2014-01
City of Ottawa, February 5, 2014
(*ITSB-2014-01*)
 - Technical Bulletin PIEDTB-2016-01
City of Ottawa, September 6, 2016
(*PIEDTB-2016-01*)
 - Technical Bulletin ISTB-2018-01
City of Ottawa, March 21, 2018
(*ISTB-2018-01*)
 - Technical Bulletin ISTB-2018-04
City of Ottawa, June 27, 2018
(*ISTB-2018-04*)
 - Technical Bulletin ISTB-2019-02
City of Ottawa, July 18, 2019
(*ISTB-2019-02*)
- Ottawa Design Guidelines – Water Distribution
City of Ottawa, July 2010.
(*Water Supply Guidelines*)
 - Technical Bulletin ISD-2010-2
City of Ottawa, December 15, 2010.
(*ISD-2010-2*)
 - Technical Bulletin ISDTB-2014-2
City of Ottawa, May 27, 2014.
(*ISDTB-2014-2*)

- Technical Bulletin ISTB-2018-02
City of Ottawa, March 21, 2018
(*ISTB-2018-02*)
- Technical Bulletin ISTB-2021-03
City of Ottawa, August 18, 2021
(*ISTB-2021-03*)
- Stormwater Planning and Design Manual,
Ministry of the Environment, March 2003. (formerly MOE)
(*SWMP Design Manual*)
- Kanata North Community Design Plan, Master Servicing Study
Novatech Engineering, June 28, 2016. (*KNCDP*)
- Geotechnical Investigation, Kanata Lakes Golf and Country Club, 7000 Campeau
Drive, Ottawa, Ontario
Paterson Group, May 2020 (Report: PG4135-2 Rev4) (*Paterson Geotechnical
Report*)
- Kanata Golf and Country Club – 2018 Surface Infiltration Testing
J.F. Sabourin and Associates Inc., February 6, 2019 (*JFSA Infiltration*)
- Kanata Golf & Country Club, 2019 Monitoring & Hydrologic Model Calibration
Report
J.F. Sabourin and Associates Inc., (Updated July 2020) (*JFSA Calibration*)
- 7000 Campeau Drive Subdivision – Preliminary Stormwater Management Plan
J.F. Sabourin and Associates Inc., June 2021 (*JFSA SWM Plan*)
- Downstream of 7000 Campeau Drive – Hydrologic Assessment
J.F. Sabourin and Associates Inc., June 2021 (*JFSA Hydrologic Assessment*)
- Kizell Drain Downstream of 7000 Campeau Drive – Geomorphological and
Erosion Threshold Assessment, Kanata, Ontario
GEO Morphix., May 2021 (*GEO Morphix Assessment*)
- Kanata Lakes Storm Drainage Report – Campeau Corporation, Oliver,
Mangione, McCalla and Associates Ltd, March 1985
- Kanata Lakes Storm Drainage Report Addendum No 1 – Campeau Corporation,
Oliver, Mangione, McCalla and Associates Ltd, September 1986
- Shirley's Brook and Watt's Creek Phase 2 Stormwater Management Study – City
of Ottawa, April 27, 2015

A handwritten signature in black ink, appearing to read 'J.F. Sabourin', written over a horizontal line. The signature is stylized and cursive.

J.F. Sabourin, M.Eng, P.Eng., ing.



Jean-François Sabourin, M.Eng, P.Eng., ing.

Senior Water Resources Engineer
President

EDUCATION

- Bachelor in Applied Sciences (B.A.Sc.Eng.), U.of O, 1979-83
- Masters in Engineering (M.Eng., Water Resources)
University of Ottawa, 1987-1992 (part time)

LANGUAGES

- English
- French

EMPLOYMENT

- 1993-now J.F. Sabourin and Associates Inc.
- 1987-1993 Paul Wisner & Associates - Water Resources
- 1986-1987 University of Ottawa - IMPSWM Research Group
- 1984-1986 W.Rourke Ltd - General Construction Division
- 1983 University of Ottawa - IMPSWM Research Group
- 1982 (Co-op term) Ontario Hydro - Transmission Line Div.
- 1981 (Co-op term) Parks Canada - Prof. Services Division

POSITION

Director of Water Resources Projects
Associate & Project manager
Research assistant coordinator
Project manager and Field Supervisor
Research assistant
Co-op student
Co-op student

PROFILE

Mr. Sabourin graduated in 1983 from the University of Ottawa where he obtained both a Bachelor of Applied Science degree in Civil Engineering and a Master's degree in Engineering (Water Resources). With his numerous years and depth of experience, Mr. Sabourin is considered to be an expert in various aspects of water resources, such as urban hydrology, sewer and river hydraulics, flood plain and flood line mapping, development of computer models, and planning / design of stormwater management systems. As President and Director of Water Resources Projects for JFSA, Mr. Sabourin has participated / coordinated / undertaken over 1500 environmental related projects, with a primary focus on water resources. Mr. Sabourin's practical experience, combined with his research capabilities, exceptional communication and relationship building abilities are the basis for his frequent involvement in the development of policy and guidelines in the water resource arena, as well as regular appointment as a reviewer of reports and documents prepared in support of national, provincial and local initiatives/development. Mr. Sabourin oversees the work of more than 30 employees at JFSA's 5 offices in Ontario and Quebec, ranging in disciplines including water resources engineers, hydrologists, hydrogeologists, biologists, land planners and technical support staff.

OVERALL EXPERIENCE

DEVELOPMENT/ REVIEW OF GUIDELINES AND REPORTS

- **Project manager and main author of a computerized "Selection Tool" for the assessment of urban drainage systems.** Developed with and for The Toronto and Region Conservation Authority, (1999), Toronto, Ontario.
- **Contributor to Impacts and Adaptation of Drainage Systems, Design Methods and Policies** - investigated and quantified the potential effects of climate change on drainage infrastructure and performance of existing stormwater management ponds. Study by Kije Sipi Ltd. in partnership with City of Edmonton, Regional Municipality of Ottawa-Carleton and the Mississippi Valley Conservation Authority. For Natural Resources Canada, Climate Change Action Fund, 2000 - 2001.
- **Contributor to a Climate Change Action Fund research project;** investigated and quantified the potential effects of climate change on drainage infrastructure and performance of existing stormwater management ponds.
- **Project manager and coordinator of an updated research study on the use of grass swales and perforated pipe drainage systems.** Undertaken in partnership with RMOC, MOEE/SWAMP, City of Ottawa, City of Gloucester, City of Nepean, City of Kanata, and four pipe manufacturers, Ottawa, Ontario.
- **Development of a Hydrologic Model Calibration Guideline,** for the City of Ottawa, Ontario.
- **Guidance for the Evaluation of Water Monitoring Networks for Climate Change Adaptation,**

CCME. The project resulted in a reference document (Selected Tools to Evaluate Water Monitoring Networks for Climate Change Adaptation) for non-specialist water managers and climate change adaptation planners. The document was developed to help Canadian federal, provincial and territorial governments determine the suitability of their water monitoring networks to provide the data needed to plan for and to adapt to a changing climate. The document describes proven and practical ways for jurisdictions to set priorities for water monitoring networks for climate change adaptation, and then evaluate the ability of these networks to provide the data needed to support climate change adaptation needs. (August 2010 to January 2011)

- **Updated and developed a Design Guideline and oversaw the development of the GSPP Design Tool for the design and construction of Grass-Swale-Perforated-Pipe-Drainage systems** for the City of Ottawa, Ontario.
- **Update to City of Ottawa SWM Guidelines** to address key issues associated with stormwater management and conveyance in new development projects within the City of Ottawa including: developing flat lands where major system capacity is limited; the impact of increasing imperviousness (due to intensification) and changing design standards on existing and proposed infrastructure and overland flow routes; and the need to plan for climate change. To help visualize how the proposed standard changes, City of Ottawa, Ontario. (May 2017)
- **Initiated an Analysis of Rainfall Drying Time on Common Urban Materials** with RiverLabs in Cornwall, Ontario. Purpose of these investigations was to improve estimates of evaporation by quantitatively measuring the drying time of common anthropogenic surfaces. The project took into consideration temperature, wind speed and relative humidity, all of which impact the rates of evaporation of water on anthropogenic surfaces. (March 2017)
- **Climate Change Adaptation – Water Monitoring Data Requirements and Indicators**, Canadian Council of Ministers of the Environment (CCME). Study which identified the hydrologic parameters that should be measured by water monitoring networks in Canada for climate vulnerability assessment and climate change adaptation planning.
- **National Floodplain Mapping Assessment contributor and reviewer** for report establishing framework for Canadian Government development of floodplain management supporting national documents and guidelines. (2015/16)
- **Review of PIEVC Protocols that deal with stormwater related public infrastructure**, Infrastructure Canada. The purpose of this study was to assess if the current PIEVC protocols can adequately assist a city with the evaluation of the vulnerability of their storm water infrastructure to climate change.
- **Review of Low Impact Development Stormwater Management Guidance Manual** for Ministry of Environment and Climate Change Low (2017/18)
- Designer, Project Manager and Coordinator of development and delivery of **Flood Preparation and Response Tool** for City of Ottawa (2018/19)
- Reviewer of **Risk Return on Investment Tool Technical Manual** for Credit Valley Conservation Authority and Risk Sciences International (2019 ongoing).

FLOOD PLAIN MANAGEMENT / WATERSHED ANALYSIS / URBAN STORMWATER MANAGEMENT (1986 to Present)

- **Conducted or was senior technical advisor on numerous flood plain, flood line and fill line delineation studies** on numerous watercourses: Cataragui Creek; Highgate Creek; Grand Canal, La Drize and La Jogne Rivers, Switzerland; Shirley's Brook; Sixteen Mile Creek; Taylor Creek; Upper Thames River; Garry River; Ottawa River near Britannia; Ottawa River near Moussette Beach, Gatineau (formerly Hull), Québec; Gatineau River at Lac Leamy, Gatineau (formerly Hull), Québec; Ottawa River near Clarence Island; Ottawa River near Hamilton Island, Hawkesbury, Ontario; Rideau River at City Hall, Ottawa, Ontario; Tributaries C and D, Brampton, Ontario; Daigneault Creek, Brossard, Québec; Moore Creek, Gatineau, Québec; Humber River within the City of Toronto, Ontario; Jock River, Ontario; Ottawa River near Rockland, Ontario; Village of Richmond Flood Plain Mapping, City of Ottawa, Ontario; Gatineau River Floodplain Mapping between Ottawa River and Farmer Rapids Power Dam, Gatineau, Québec, (March 2012 to June 2013); Marcoux Municipal Drain, North Glengarry; Castor

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River Tributary preliminary floodplain mapping.

- **Conducted or senior technical advisor to numerous technical reviews and peer reviews of flood plain mapping reports and related work**, including hydrologic and hydraulic analyses and modelling, including: Technical Review of 2015/2016 and 2018-2020 (ongoing) Conservation Authority Flood Plain Mapping Reports for City of Ottawa; Ottawa River Flood Risk Mapping, City of Ottawa; John Boyce and Osgoode Garden Cedar Acres Municipal Drain, South Nation Conservation; Glen Meadows Estates, Town of Arnprior (stormwater management plan, flooding issues); Rideau River (Hogs Back Falls to Ottawa River; Kars to Hogs Back Falls, and Buritts Rapids to Kars); Constance Creek;
- **Senior investigator and one of the authors for a National Floodplain Mapping Assessment**, conducted for Public Safety Canada, Ottawa with MMM Group (lead), to assess the current status of flood plain mapping in Canada (2013/2014).
- Participated in several **watershed analyses and Master Drainage Plans (MDP)**: Ingleside; Area 1A, Markham; Barcelona (for 1992 Olympics), Spain; Riviere Milette, Trois-Riviere; Le Grand Canal, Switzerland; La Drize, Switzerland; Bath Creek, Bath; Relief sewer analysis, Hawkesbury; Riverbend Road Neighborhoods, Edmonton; Exhibition Creek, Markham; MGS Lands, Markham; Garry River, Alexandria; Moore Creek, Aylmer-Hull; Moose Creek, Casselman; Daigneault Creek, Brossard; Moreau Creek, Gatineau; Jock River, Ottawa; Moore Creek, Gatineau.
- **Designed Stormwater Management Plans** for various types of development: Aldermac Orphan Mine Site, Val d'Or; Cardinal Trail 2, Ottawa; Scugog Island Casino, Scugog; Zellers Property, Hawkesbury; Cardinal Trail 3, Ottawa; Le Plateau de la Capitale, Hull; Lazyboy, Innes Road, Ottawa; Secteur C, Ville de Brossard; Cardinal Trail 6, Ottawa; Vales of Castlemoore South Subdivision, Brampton; Tumbridge Subdivision Phase 1, Brampton; Forest Ridge Infill Development, Ottawa; Hull Armories, Gatineau; Morris Village, Rockland; Moodie Drive Townhouse Infill Development, Ottawa; Cambrian Heights Phase V, Ottawa; Corvenelli Development, Russell; Shomberg Subdivision, King Township.
- **Designed and built a physical river and town model** to determine flood water levels in conjunction with a mathematical river model. Both models were verified against measured flood data and alternatives to reduce risks of flooding were determined, St. Mary's, Ontario.
- **Dispersion and assimilative studies** undertaken for a proposed causeway on the Ottawa River: Clarence Island, Clarence-Thurso; for a proposed sewage treatment outfall on the St-Lawrence River: Ingleside, Ontario.
- **Developed Infiltration / Inflow models** for the analysis of sanitary sewer systems: RMOC, Ottawa; City of St. Therese, Québec; City of Edmonton, Alberta.
- **Developed Stormwater Management (SWM) design criteria** for on-site detention in Markham, Ontario.
- **Water budget analyses** prepared for Summerside Wetland in London, Ontario; Mattamy Staines Subdivision Morningside Heights Community, Toronto, Ontario.
- **Overseeing surface water component of water budget analysis** for East Urban Community Mixed Use Development and watercourse assessment and feature specific water budget analysis for the proposed Fernbank Quarry, Ottawa, Ontario
- **Conducted flood damage estimations** from high river water levels and wind effects (wave + setup). Potential flood damage reduction measures were also identified. Lac Deschenes, Ottawa, Ontario.
- **Senior technical advisor for Hydrologic and Hydraulic Assessment**, Chamberland Street, City of Clarence-Rockland: assessment of flooding potential.
- **Collaboration with fluvial geomorphologist** on the Greens Creek Watershed: Integrated Fluvial Geomorphology and Hydrological Study in which data on the watershed's existing conditions were gathered from background information, field investigations, and hydrological analysis and used with the geomorphological assessment to advance understanding of the hydrological functioning of the watershed and subwatersheds, for National Capital Commission, Ottawa, Ontario
- Participated to the **development of the Stomwater Management Strategy**, Phase 1 - Understanding the System, for the City of Ottawa, Ontario.
- **Undertook subwatershed analysis** to evaluate the SWM needs for the development of a site by the

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Department of National Defence, in the Ottawa, Ontario.

- **Stormwater Management Planning and Design** for Hunt Club Road Extension from Hawthorne Road to new MTO Interchange on Hwy 417, City of Ottawa, Ontario.
- **Hydrology/hydraulic components** of Pinecrest Creek Restoration Plan: Integrating Fluvial Geomorphology, Hydrology and Ecology, for National Capital Commission, Ottawa, Ontario
- **Pinecrest Creek/Westboro Stormwater Management Retrofit Study, Pinecrest/Centrepointe Stormwater Management Criteria Study, and SWM Guidelines for Pinecrest Creek/Westboro Area (in progress), and the Feasibility Study** for the Implementation of SWM Retrofit Measures on City Owned Properties using LID measures, for City of Ottawa, Ontario.
- **Preliminary SWM plan, pond design, floodplain analysis and channel realignment** for Richmond Village Development (in progress), for DSEL, City of Ottawa., Ontario.
- **Westboro Lot Level Pilot Project**, provision of technical assistance to Carleton University engineering students preparing preliminary modelling to design and assess lot level SWM retrofit project, for City of Ottawa, Ontario
- **SWM Facility Feasibility Study** for a Surface Stormwater Management Facility on NCC Lands at Baseline Road and Woodroffe Ave, for City of Ottawa, Ontario.
- Monahan Drain Constructed Wetland, **preparation of Design Brief for the Reconstruction of the Monahan Drain Constructed Wetland** and associated studies and retrofit, for DSEL, Ottawa, Ontario.
- Monahan Drain Constructed **Wetland, Cell 1 model update**, for the City of Ottawa, Ontario.
- Feedmill Creek **SWM Criteria Study** , for City of Ottawa, Ontario
- **Pinecrest Creek Cumulative Impacts Study** (Morrison Hershfield Ltd. for City of Ottawa, Ontario)
- **Technical advisor in the design of a retrofit SWM pond** at the head of Pinecrest Creek (in progress), with Morrison Hershfield Ltd. for the City of Ottawa.
- **Hydrodynamic Analysis** of the Lower Reach of the Jock River, for Caivan Properties, in Ottawa, Ontario (2017 to 2019).
- **Lead engineer in a 2D Hydraulic analysis** of McKinnons Creek floodplain analysis, in Ottawa, Ontario (September 2017).
- **Lead engineer and designer of a Flood Preparedness 3D Visual Tool** to manage resources during flood periods on the Ottawa River and Rideau River, City of Ottawa, 2019. The tool was effectively used by the City and the Canadian military during the 2019 flood.

CONCEPTUAL DESIGN

- **Prepared preliminary and detailed designs of stormwater quantity /quality pond:** JML Subdivision, Alexandria, Ontario; Secteur C (5 ponds), Brossard, Québec; Ruisseau Leamy, Hull, Québec; Rollin Subdivision, Vars; Cambrian Heights Phase V, Ottawa; Le Breton Flats Development, Ottawa; Morris Village, Rockland; Mayfield West Community (11 ponds), Town of Caledon; Quartier des Bois Subdivision, Casselman; Tranquility West Subdivision, Town of Richmond Hill; Mattamy on Rouge Subdivision, City of Toronto; Timber Trails Phase II, City of Pickering; Lafèche Environmental Landfill Site (200 ha), Casselman; Deglos Landfill Site (60 ha), St.Lucia (UK); Le Plateau de la Capitale (4 ponds), Gatineau;
- **Participated in several trunk sewer designs:** Lynnwood Village, Ottawa; Hawskbury, Ontario; Markham, Ontario; Brossard, Québec.
- **Developed a model for the design of Grass Swale Perforated Pipe drainage systems:** MOE research study.
- **Designed strip marshes within an existing drainage system** to reduce nutrient levels in contaminated stormwater: Maitland, Ontario.
- **Prepared preliminary and detailed design of new storm sewers** for Crestview Road: Ottawa, Ontario.
- **Analysed the initial and prepared final drainage design** for the Earl Armstrong Park and Ride facility

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in Ottawa, Ontario; in order to meet previously set target flows rates, the use of underground storage and surface storage had to be incorporated in the design requiring extensive hydraulic analyses; in Ottawa, Ontario.

- **Oversaw the hydrologic and hydraulic analyses** required to design the necessary underground storage and surface storage for the stormwater management for the Woodroffe Ave. (Chapman Hills) Park and Ride facility in Ottawa, Ontario.
- **Conceptual Drainage Design**, Cardinal Creek Village, for DSEL, in Ottawa, Ontario.
- **Participated to the design of a permeable pavement demonstration project for parking rehabilitatee projects with the City of Ottawa, 2019-21.**

SEWER INFRASTRUCTURE ANALYSES AND UPGRADE / I-I ANALYSES / MODEL DEVELOPMENT & CALIBRATION / CSO ANALYSES

- **Infiltration/Inflow analyses** in sanitary sewers using measured data and calibrated mathematical models: Alta-Vista, Ottawa; Bathurst & Wilson, North York; RMOC, Ottawa, Ontario
- Undertook an **Infiltration/Inflow and CSO Modelling Study** for the upgrade of a treatment plant, Ste-Thérèse and Blainville, North of Montréal, Québec.
- **CSO Modelling and Infiltration/Inflow Study** for the upgrade of a treatment plant, Ste-Thérèse and Blainville, North of Montréal, Québec.
- **Analyses of flow monitoring data and calibration: of a complex hydrologic/hydraulic I/I model**, RMOC; of a partially and combined sewer system in the North Rosedale and Moore Park districts, City of Toronto, Ontario.
- **Sewer Rehabilitation and Sewer Hydraulic study**, Town of Hawkesbury; Crestview Road, Ottawa; Fallowfield Road, Ottawa.
- **Development of a Variable Diurnal DWF model**, City of Edmonton, Alberta. This model has been used successfully for the City of Toronto, and in the Ottawa area.
- **Infiltration/Inflow Analysis, Sewer Hydraulic, Model Calibration, and Sewer Rehabilitation Study** to identify feasible and cost effective solutions to reduce the occurrence of basement flooding, City of Gatineau, Québec.
- **Analysis of flow data and combined sewer overflows to calibrate a hydrologic model** which was then used to evaluate the effects of various flow reduction measures: City of Toronto, Ontario.
- **Servicing study** for the Sector C in Brossard, Québec.
- **Sewer Rehabilitation, CSO Reduction and Sewer Hydraulic study** for the Old Ottawa East area, Ottawa, Ontario.
- **Estimation of sewer flows (sanitary and storm) for new storm sewers and partially separated sewers** for Argyle Street and Park Avenue Sewer Rehabilitation, Ottawa, Ontario.
- **SWMHYMO model calibration and validation, as well as PCSWMM model validation for the drainage area to the Beaver Pond in the Kanata Lakes subdivision (2018-2020).**
- **SWMHYMO model calibration for the Shirley's Brook subwatershed in Kanata, (2021)**

WATER QUALITY & EROSION CONTROL

Development of a methodology for the assessment of chloride impacts on receiving waters from several alternative snow dump sites in the City of Ottawa (formerly Ottawa-Carleton Regional Municipality), Ontario. The method is based on a regional analysis of monthly low flows and background concentrations. Based on snowmelt runoff rates from snow dumps and potential for dilution in the receiving water bodies, impact indices were determined.

- Undertook flow/velocity/quality measurements and dispersion analyses for the design of a treatment plant outfall in the St Lawrence River, Ingleside, Ontario.
- Conducted erosion protection studies and analyses of the effects of urbanization on erosion: Caledon, Ontario; Taylor Creek, Cumberland; Shirley's Brook, Kanata, Ontario.

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- Undertook flow/velocity measurements and shear stress analyses for the design of a beach protection scheme: Hull, Québec.
- Undertook field measurements and conducted a detailed water budget analysis of Lac Leamy to investigate the possibility of opening it to the Gatineau and Ottawa rivers: Hull, Québec.
- Undertook a water budget analysis of an existing wetland to identify impacts of a proposed future development where a portion of the future drainage area would be diverted: London, Ontario.
- Developed a stormwater quality management plan for an industrial site where high levels of nitrogen-based compounds are contaminating nearby surface water bodies: Maitland, Ontario.
- Participated to various Source Protection Surface Water Vulnerability Assessment studies for the towns/cities of Hawkesbury, Rockland, Plantagenet, Wendover, Perth, Smiths Falls, Carleton Place, Ontario.
- Hydrologic and hydraulic assessment along Mud Creek to support a Fluvial Geomorphic assessment for the Mud Creek Slope Stability Study, with Golder Associates for City of Ottawa, Ontario.

CONSTRUCTION, FIELD WORK AND MONITORING

- In charge of the construction supervision of a sewage lagoon for the Department of National Defence. Carp, Ontario.
- In charge of the construction supervision of an underground helicopter garage at a Department of National Defence base (Defenbunker), Carp, Ontario.
- Project engineer and general site manager of a \$ 2 million construction project for the City of Ottawa. Work included quantity estimates, orders, dealings with architects, engineers, unions and all subtrades. All aspects of work, schedules and meetings were coordinated and progress billings, invoicing, time sheets, etc. were also accounted for City of Ottawa, Ontario.
- Coordinated and participated in field investigations to obtain water quality and flow measurement quantities: St.Lawrence River, Ingleside; Ottawa River, Moussette Beach-Hull; Jock River, Goulbourn Township, Ontario
- Coordinated and participated in various sewer flow and water quality measurements: Amberwood sub-division, Nepean; Bravard subdivision, Manotick; Pineglen subdivision, Nepean; Heart's Desire subdivision, Nepean; Landfill site, Casselman, Ontario..
- Coordinated and participated in infiltration capacities and groundwater monitoring: Pineglen subdivision, Nepean; Heart's Desire subdivision, Nepean.
- Coordinated and participated in a GPS survey of approximately 2 km of a creek to be modelled with HEC-RAS, Ruisseau Moore, Hull, Québec.
- Coordinated and oversaw the gathering of ADCP flow and continuous water level monitoring on: Poole Creek (2008-2009) at the Amberwood Golf Course in Stittsville, Ontario; Dickinson Creek (2009) at the Nation Golf Club, in Curran, Ontario; and Greens Creek (2008), in Ottawa, Ontario.
- Coordinated and oversaw the gathering of ADCP flow measurements on: Pinecrest Creek (2009), in Ottawa, Ontario.; Carp River (2008-2009) at the Kinburn Gauge, in Ottawa, Ontario; Cardinal Creek (2012-2013) in Ottawa, Ontario; Jock River (2017), in Ottawa, Ontario.
- Coordinated and oversaw the gathering of continuous rainfall, storm sewer flow and pond water level data in and around the Kanata Lakes subdivision and Kanata Lakes Golf Course. The data was used to calibrate and validate hydrologic models (2018-19).
- Coordinated and oversaw the undertaking of surface infiltration tests at various locations; Amberwood Village (Ottawa, Ontario), Westport (Ontario), Barrhaven (Ottawa, Ontario), Stittsville wetland (Ottawa, Ontario), 2018-21.

EXPERT OPINION, REVIEW and OMB HEARINGS

Mr. Sabourin has conducted several reviews, analyses and acted as an expert witness to several damage causing storm and flooding event.

- July 1987 storm and flooding in the City of Montréal, Québec (analysis of rainfall and modelling

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analysis)

- April 1994 flooding on the Lapèche River, Québec (analysis of rainfall and modelling analysis)
- August 1996 storm and flooding in the Ottawa region, Ontario (analysis of rainfall and radar data, and modelling)
- August 1996 storm and flooding in the City of Gatineau, Québec (analysis of rainfall and radar data, and modelling)
- June 1997 flooding in the Village of l'Original, Ontario (modelling analysis)
- July 1997 storm and flooding in the City of St-Hubert, Québec (analysis of rainfall and radar data)
- July 1997 storm and flooding in the City of Chambly, Québec (analysis of rainfall and radar data)
- June 1998 storm and flooding in the City of Gatineau, Québec (sewer modelling analysis)
- January 1999 flooding on the Salmon River, New York (interpretation of data)
- June 2000 storm and flooding in the City of Gatineau, Québec (analysis of rainfall and radar data, and sewer modelling analysis)
- June 2001 storm in the City of St-Hubert, Québec (analysis of rainfall and radar data)
- 2001 to 2003 rainfall events in St. Lucia, UK (analysis of rainfall data)
- January 2003 flooding event at the Hull Casino, Québec (analysis and interpretation of event)
- December 2003; served as expert witness in drainage related matters in an OMB hearing for FrancoScenie.
- July 2004 storm and flooding in the City of Saint-Hyacinthe, Québec (analysis of rainfall and radar data)
- July 2004 storm in the City of Gatineau - Buckingham, Québec (interpretation of rainfall intensities and radar data).
- April 2005 of well contamination in the Town of l'Original, Ontario (analysis and interpretation of event)
- June 2005 storm and flooding event in the City of Shawinigan, Québec (analysis and interpretation of rainfall event using radar data).
- September 2005 storm and flooding event in the City of Québec, Québec (analysis and interpretation of rainfall event).
- August 2006 storm and flooding event in the Cities of Saint-Eustache and des Deux Montagnes, Québec (analysis and interpretation of rainfall event using radar data).
- August 2006 storm and flooding event in the Town of Saintes-Annes-des-Plaines, Québec (analysis and interpretation of rainfall event using radar data).
- June and July 2007 storm and flooding event in the City of Levis, Québec (analysis and interpretation of rainfall event using radar data).
- August 2, 2008, storm and flooding event in City of Montréal, Québec (analysis and interpretation of rainfall event using radar data, liaison with insurance companies and legal representatives). November 2009 onward,
- Progressive flooding of lands in the City of Terrebonne, Québec, following the construction of Highway 640 (continuous hydrologic and hydraulic simulations to determine if changes in drainage patterns caused by the construction of the 640 can explain the increase flooding frequency and duration of subject lands). Court appearance in the fall of 2014.
- September 2010 storm event in the Cities of Saint-Eustache and Rosemère, Québec (analysis and interpretation of rainfall event using radar data).
- June 23-24, 2012 storm and flooding event in City of Gatineau, Québec (analysis and interpretation of rainfall event using radar data - in progress).
- October 2014, expert witness report for the August 22, 2013 storm event in the City of Drummondville, Québec (analysis and interpretation of rainfall event using radar data).
- April 2015, served as expert witness in drainage related matters in an OMB hearing for the development of the Chenier Lands, in Ottawa.

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- October 2015, served as expert witness in drainage related matters in an OMB hearing for the development of the Bronte Green Lands, in Oakville, Ontario. Summer of 2016 acted as key hydrologic and hydraulic engineer in dealings to settle the case.
- February 2017, retained by both City of Ottawa and homeowner to assess and resolve a perceived drainage problem with the Emerald Estate subdivision, in Ottawa.
- December 2019, second trial (previous one was in 2014) on the impacts of improper design and maintenance of highway drainage which created wetlands on adjacent private properties in Terrebonne (Qc).

USE OF APPLIED HYDRAULIC AND HYDROLOGIC MODELS

- **OTTHYMO**: An improved version of HYMO (HYdrologic MOdel) which generates runoff from not only large non-urban basins, but also from urban basins.
- **INTERHYMO/OTTHYMO-89**: The newly expanded version of OTTHYMO.
- **SWMHYMO**: A single event and continuous model based on the principles of HYMO and OTTHYMO. Latest version of model also incorporates the Infiltration / Inflow capabilities of SEWHYMO.
- **QUALHYMO**: Is a unit hydrograph based hydrologic model used to predict the long-term quantity and quality of runoff from rural and urban watersheds. The model can also produce exceedance curves for overflows and pollutants in ponds.
- **SEWHYMO**: A single event and continuous model for the analysis of Infiltration / Inflow and combined sewer overflows
- **HEC-2 / HEC-RAS**: A mathematical river model used to determine water surface profiles for sub-critical and super-critical flow conditions.
- **IMPRAM**: A program for the Improved Rational Method used for sizing storm sewers.
- **CFA_3.1**: Is the Consolidated Frequency Analysis Package from Environment Canada used to generate flood frequency curves fitted to a series of annual floods or levels.
- **STORM**: Is the Storage Treatment Overflow Runoff Model used to predict the long-term quantity and quality of runoff from urban basins.
- **STORMS 2000 and STORM 2010**: A program used for the frequency of observed rainfall events
- **OTTSWMM and DDSWMM**: Is the University of Ottawa's improved version of SWMM (Storm Water Management Model from EPA) which generates runoff from urban basins by analysing both minor (pipes) and major (street) flows.
- **EXTRAN**: Us the EXtended TRANsport model distributed by EPA and used to dynamically analyse flow routing and surcharges in complex sewer systems.
- **HYSTEM/EXTRAN**: is the German version of EXTRAN.
- **SWMM / PC-SWMM / XP-SWMM / XP-STORM**: EPA's Stormwater Management Model.
- **MIDUSS**: Microcomputer Interactive Design of Urban Stormwater Systems, developed by A. Smith et al.

SOFTWARE DEVELOPMENT

Mr. Sabourin has over 30 years of programming experience including the development of numerous in-house programs to improve the company's and client's efficiency. Those programs and/or applications include:

- **IMPRAM**: The Improved Rational Method.
- **TRAINHYD**: A training hydrologic software.
- **FASTHYMO, MINI-OTTHYMO, LUMPHYD, ULTRA**: User friendly versions of the hydrograph commands from OTTHYMO
- **SEWHYMO**: A single event and continuous model for the analysis of Infiltration / Inflow and combined sewer overflows
- **OTTHYMO-89**: An improved version of the original OTTHYMO hydrologic model
- **SWMHYMO**: A single event and continuous model based on the principles of HYMO, OTTHYMO and

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QUALHYMO. Latest version of model also incorporates the Infiltration / Inflow capabilities of SEWHYMO.

- **STORMS, STORMS 2000 and STORMS 2010:** Programs to generate design storms, plot hyetographs, generate IDF curves and analyse the return period of an observed rainfall event.
- **PLOTHYD:** A program used to plot hydrographs generated by OTTHYMO-89 or SWMHYMO
- **DVMS for SEWER VIDEOS:** A digital video management system to accelerate the review and improve the use of sewer videos
- **DIG-VT:** Digital-Virtual Tour; a system that integrates the use of digital photos and GPS to allow users to conduct a virtual tour of, for instance a creek, from their computer.
- **Drainage System Selection Tool:** Designed the concept and directed the development of an EXCEL spreadsheet program that allows user to identify drainage system components that are compatible with specific site characteristics, development characteristics and SWM objectives. Based on user selected components, the tool provides approximate capital and operational costs for the drainage system.
- **GSPP:** Directed the development of a software integrated within an EXCEL spreadsheet that allows users to design grass swale and perforated pipe drainage systems.

RESEARCH CONTRIBUTIONS

- Was research associate of the IMPSWM program at the University of Ottawa.
- Developed several user friendly micro-computer programs: IMPRAM (Improved Rational Method), TRAINHYD (used to learn hydrologic principles), FASTHYMO, MINI-OTTHYMO, LUMPHYD, ULTRA.
- Contributed to the calibration of OTTHYMO on several watersheds using observed rainfall and runoff measurements.
- Tested, debugged and improved the QUALHYMO model.
- Tested and debugged the EXTRAN model.
- Developed and was main author of the INTERHYMO/OTTHYMO-89 hydrologic model.
- Analysed of real storms and determination of new design storms for the Town of Markham, Ontario.
- Compared of real storms with design storms for the City of Laval, Québec.
- Project manager of an MOE funded research study on the potential use of grass swales and perforated pipe storm drainage systems to control and reduce urban stormwater pollutant loadings, (1991-92).
- Developed and main author of the SEWHYMO infiltration/inflow model for sanitary sewers, (1993-94).
- Conducted a detailed analysis to determine the use of design storms in infiltration/inflow modeling. (M.Eng. Thesis) Developed and main author of the SWMHYMO model, an improved version of the popular OTTHYMO-89 hydrologic model, (1995-99). Project manager and main researcher for a study entitled
- “Evaluation of Roadside Ditches and Other Related Stormwater Management Practices” (1997) conducted for Toronto and Region Conservation Authority, Toronto, Ontario.
- Project manager and principle investigator for a demonstration project, Keep the Rain Out of the Drain, using alternative drainage methods for the City of Toronto, Moore-Park & Rosedale areas (1997-98), Toronto, Ontario.
- Project manager of an investigative study to measure the drying time of several types of surfaces / materials such as asphalt, concrete, roof singles, pavers, etc. (2017).
- Developed a methodology and managed the continuous monitoring of rainfall precipitation in a forest setting to determine / observe the process of wetting losses caused by trees and their leaves (2018 and 2019).
- Developed a methodology and managed the continuous monitoring of rainfall precipitation, wetting losses, retention, and evaporation of various soils, materials, and plants (2020).

LECTURES, PUBLICATIONS AND PAPERS

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Mr. Sabourin has lectured at several Urban Hydrology short courses in Markham, Ontario; Mississauga, Ontario; London, Ontario; Edmonton, Alberta; Calgary, Alberta; Laval, Québec; Vancouver, British Columbia; Toronto, Ontario. He is also the author/co-author of several published papers which were presented at conferences across Canada and abroad:

1. *"Comparison of the IMPRAM Model (Improved Rational Method) with other Hydrologic Models."*
2. *"Rule of Simplified Micro-Computer Models as Parts of Multi-level Hydrological Packages,"* Stormwater and Water Quality Management Modelling and SWM Users Group Meeting, Toronto, Sept. 17-18, 1986.
3. *"Teaching Models for Simulation and Real Time Control Operation of Urban Drainage Systems."*
4. *"Use of Physical and Mathematical Modelling for Bridge Hydraulics,"* XXII Congress IAHR, Lausanne, Switzerland, 1987.
5. *"Development of a Multi-Level Package of Stormwater Management Models."*
6. *"Design of Windpower Pumped Water Storage Reservoirs by Microcomputers,"* Microcomputers and Civil Engineering, Orlando, Florida, November, 1987.
7. *"Joint Use of the HEC-2 Model and a Physical Model for Floodline Delineation Upstream of a Bridge,"* Can. J. Civ. Eng., Vol 16 No 1, 1989.
8. *"The Use of Grass Swales and Perforated Pipes as a Stormwater Quality Control Alternative,"* Good Roads Conference, Penticton, B.C. (1991) and Toronto, Ont. (1993).
9. *"Mechanics of Scour in the Vicinity of Bridge Piers", Working paper, University of Ottawa, December, 1987.*
10. *"Performance Review of Grass Swale Perforated Storm Sewer Systems",* Annual Conference - Water Environment Association of Ontario, Windsor, Ontario, April 1994.
11. *"SEWHYMO-4, A Model for the Analysis of Infiltration / Inflow in Sanitary Sewer Systems",* unpublished.
12. *"Mathematical Simulation of Wet Weather Processes in a Sewerage System",* WEFTEC '94, Water Environment Federation 67th Annual Conference & Exposition, Chicago, Illinois, October 15-16, 1994.
13. *"Developing and Using a Dry Weather Flow Model for Sewerage Systems Analysis",* 1995 Annual Conference of the Canadian Society for Civil Engineering, June 1-3, 1995, Ottawa, Ontario.
14. *"The use of Design Storms for Infiltration / Inflow Modelling",* 1995 Annual Conference of the Canadian Society for Civil Engineering, June 1-3, 1995, Ottawa, Ontario.
15. *"Evaluation of Roadside Ditches and Other Related Stormwater Management Practices",* Controlling Stormwater: 2001 and Beyond, October 16-17, 1996, Burlington, Ontario.
16. *"Selection of an Optimum Road Drainage System",* SWAMP, Stormwater/CSO Technology Transfer Conference, February 23-24, 1998, Toronto, Ontario.
17. Taught the 4th university course CVG 45114 *"Hydraulics of Water Supply and Sewer Systems"* at the University of Ottawa, 2005.
18. *"Grass Swale and Perforated Pipe Drainage Systems a 20 year Performance Evaluation";* Credit Valley Conservation Workshop on "Lessons Learned from Impacting LID in Northern U.S. and Canada", Oct. 7th 2008.
19. *"Grass Swale and Perforated Pipe Drainage Systems a 20 year Performance Evaluation";* Water2010 International Conference, Québec City, July 2010.
20. *"Grass Swale and Perforated Pipe Drainage Systems a 20 year Performance Evaluation";* WEFTEC 2011. 84th Annual Water Environment Federation Technical Exhibition and Conference, Los Angeles, USA, October 2011.
21. *"Measurement of rainfall interception of tree canopies – how we had it wrong, all these years",* Unpublished, June 2020.

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Ontario

Ontario Land Tribunal

Tribunal ontarien de l'aménagement du territoire

Acknowledgment Of Expert's Duty

OLT Case Number	Municipality
PL200195	City of Ottawa

1. My name is.....Jean-Francois Sabourin
I live at the 124 Kimpton Drive
in the city ofOttawa
in the province ofOntario
2. I have been engaged by or on behalf of ClubLink Corporation ULC to provide evidence in relation to the above-noted Ontario Land Tribunal ('Tribunal') proceeding.
3. I acknowledge that it is my duty to provide evidence in relation to this proceeding as follows:
 - a. to provide opinion evidence that is fair, objective and non-partisan;
 - b. to provide opinion evidence that is related only to matters that are within my area of expertise;
 - c. to provide such additional assistance as the Tribunal may reasonably require, to determine a matter in issue; and
 - d. not to seek or receive assistance or communication, except technical support, while under cross examination, through any means including any electronic means, from any third party, including but not limited to legal counsel or client.
4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

Date... Nov 12 /21

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Signature