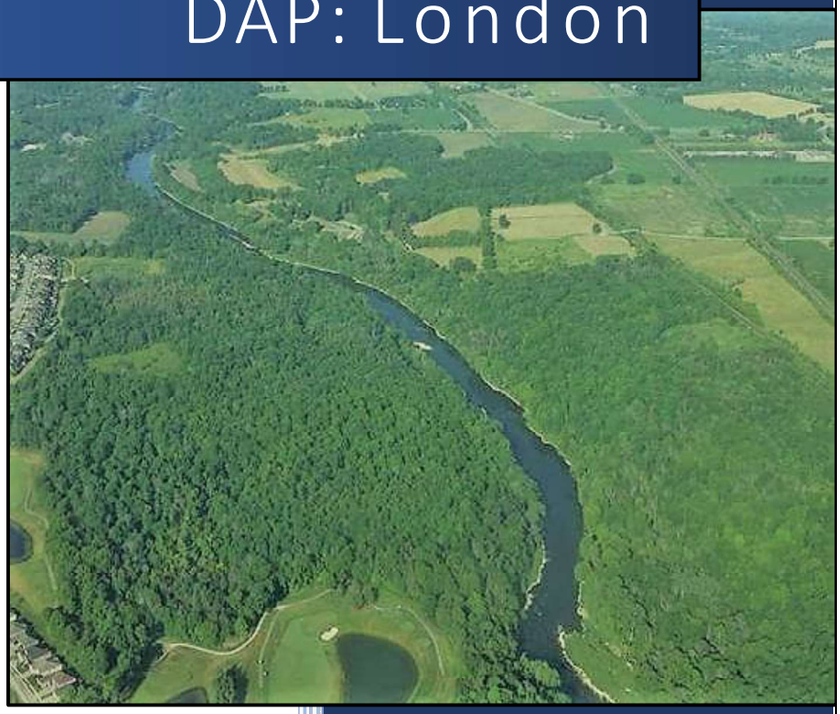
Appendix ‘A’

Domestic Action Plan (DAP): London – A Proposal for Phosphorus Reduction

September 13, 2017

DAP: London



A Proposal for Phosphorus Reduction

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City of London

Prepared for:
Ministry of the Environment and Climate Change
Toronto, ON

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1. Phosphorus and the London Context

Excessive phosphorus loading into Lake Erie can significantly degrade overall water quality and cause undesirable outcomes such as low oxygen zones and excessive plant growth which ultimately trigger toxic and nuisance algal blooms in the Lake. Human health is also of concern as a result of these blooms impacting drinking water supplies. To overcome these negative outcomes and improve the health of Lake Erie Basin, important targets, including a 40 % reduction in spring loads of total phosphorus and soluble reactive phosphorus for priority tributaries have been set. The Thames River is one the largest tributaries which feeds into Lake St. Clair and ultimately, into Lake Erie. The City of London is the largest municipality within the Thames River Watershed.

Along this major tributary, approximately 15 % of the phosphorus loads are thought to originate from urban sources. Point sources, such as treated wastewater effluent, have a higher soluble reactive phosphorus content than non-point sources (i.e., agricultural), which is a primary driver for algae growth. These point sources are also easier to quantify and implement technologies to help mitigate or reduce phosphorus loadings; however, improvements to these point sources are generally only achieved at a high cost. The following figure shows the various concentrations of phosphorus measured throughout the City of London.

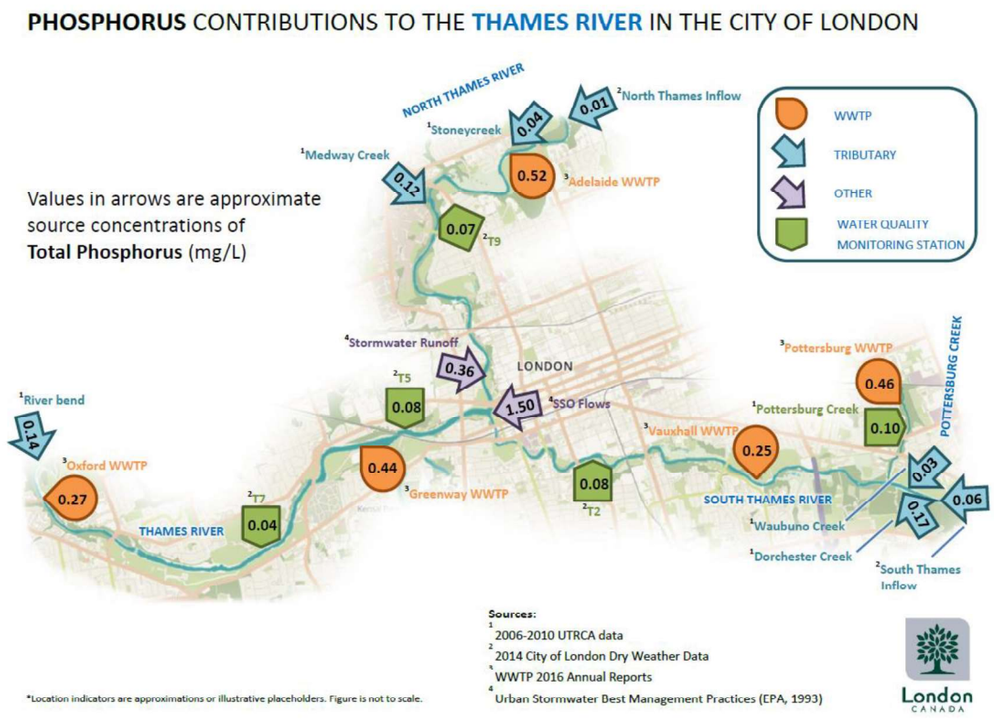


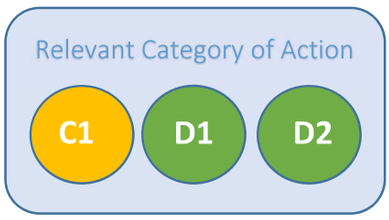
Figure 1: Phosphorus in the Thames River within London

The City of London is the largest urban centre in the Thames River Watershed. It currently has hundreds of stormwater outlets into the Thames River, some of which remain as combined sewer flow during high rainfall events. Since 2008, which is the identified baseline year, the City has spent approximately $40 million on separating these sewers to reduce the number of combined sewers and associated overflows, however, 149 still exist. The City has five wastewater treatment plants (WWTPs) which have undergone upgrades to improve effluent quality as well as optimization studies to improve system operations. These five WWTPs rank in the top ten for largest WWTPs within the watershed. In 2008, these WWTPs contributed 43 tonnes per year (12.7 %) total phosphorus load of the total 339 tonnes per year measured in the Thames River at a downstream monitoring location. There exist opportunities to further reduce phosphorus loading from these WWTPs.

Being a leader in environmental improvements, the City of London has undertaken many initiatives and upgrades to reduce the amount of phosphorus discharged into the Thames River. However, in order to meet the recommended reductions, more work will have to be done. The following sections highlight the work completed to date and future plans to improve our systems which will ultimately reduce phosphorus loading to the Thames River. These areas include an extensive monitoring program, enhanced wastewater treatment, combined sewer replacement and overflow reduction, advances in low impact development (LID) and stormwater management (SWM) retrofits.

This document both highlights the City of London's current plans that result in phosphorus reduction and also highlights opportunities for the City to "Go Beyond" our current plans and what is required in current regulatory requirements. The City's 20-year financial plan meets the current regulatory requirements in a systematic and fiscally appropriate manner. DAP: London also highlights opportunities to move beyond our current capital plan objectives and achieve the objectives of the Domestic Action Plan. This work, as discussed throughout the document, will help to significantly decrease the amount of phosphorus within the Thames River watershed to meet Canada's international commitments. In order to implement DAP: London, sizable financial contributions will be required from our Federal and Provincial partners.

2. Leader in Watershed Monitoring



The City of London has been a leader in watershed-based monitoring and analysis of the Thames River with relevant data spanning over 40 years. The City currently operates and maintains a network of 15 permanent water quality monitoring (WQM) sites along the Thames River. In addition, there are 15 sites installed within sub-watersheds of the Thames, and a further six temporary locations installed for the collection of supporting data specific to ongoing studies.

Currently, the results of the WQM program are posted to the City of London website and are available to the public in a PDF format. While most of the stations have records dating back to the 1970's, some have data that date back to the 1950's. The Upper and Lower Thames River Conservation Authorities also maintain water quality monitoring programs which can be correlated with much of the water quality data the City has accrued. This increases the data set from which to establish long term patterns and impacts.

All City of London WWTPs sample the raw wastewater and final treated plant effluent and send it to the City's accredited lab for analysis. The results of this analysis are posted for public viewing as part of the annual report required by the Ontario Ministry of the Environment and Climate Change (MOECC). In addition, electronic SCADA records are maintained in City servers. This data is available for more detailed analysis if required.

Our Plans

The City is currently implementing an enhanced database reporting software that will enable quick production of standardized reports for the various City facilities. This data management will cross divisional boundaries, meaning data related to Wastewater Collection, Wastewater Treatment, Water Distribution, and SWM can all be accessed quickly from the same platform. Rainfall data will also be available. The new database also has the ability to push data directly to the web. This will allow the public and agencies to view up-to-date monitoring data directly from their computer or mobile device. The monitoring data could be provided in the form of charts, tables or other creative ways.

Go Beyond

City staff are in the process of considering other partnerships in order to collect monitoring data. The City has recently engaged with Trojan Technologies who is a member of a European Union based program named INTCATCH 2020. The INTCATCH 2020 program is a partnership of 20 academic and industry partners that are developing novel programs to provide integrated tools for monitoring and managing watersheds. An aspect of the program that the City of London is interested in is the creation of community/ stakeholder based monitoring initiatives. One of the partner organizations is a community based organization called Thames21.

Thames21 (located in London, England) is an organization that mobilizes over 20,000 volunteers with an aim to rebuild the relationship between communities and their rivers; restoring river health and boosting wellbeing and community cohesion in the process. Thames21's River Watch Program (facilitated through INTCATCH) engages the community to undertake water sampling which is then posted online in an open data format where it can be used by government and agencies to supplement their own data collection work.

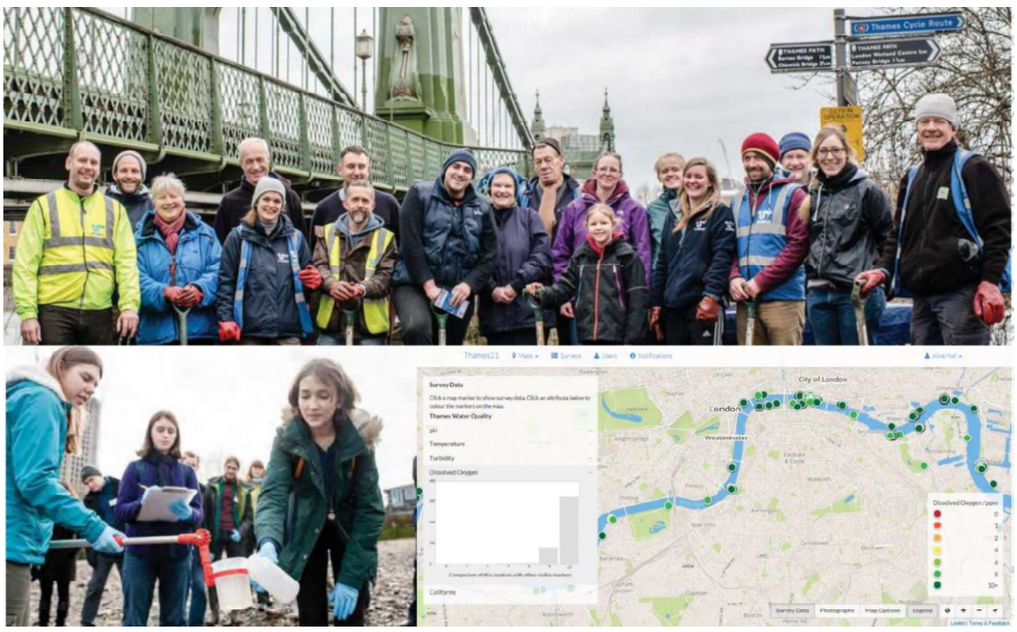


Figure 2: Thames21 River Watch Initiative

With support from senior governments we would develop a similar community based monitoring program in London (Ontario). This program would provide community based training, laboratory services, equipment and public engagement staff to support volunteers and students in gathering important monitoring data.

Recommendations

- The City of London will coordinate its water quality monitoring with the Upper Thames River Conservation Authority to aid river improvement efforts and studies.

3. Enhanced Wastewater Treatment

The City of London operates five WWTPs with a combined treatment capacity of 266 MLD; four plants are secondary level treatment and one is tertiary. In 2008, the total phosphorus loading to the Thames River from these plants was 43 tonnes. In 2015 the amount of phosphorus released declined to 33 tonnes (0.45 mg/L).

Relevant Category of Action

A2 C4

Prior to the announcement of the Lake Erie Bi-National Phosphorus Reduction Target, the City of London had developed an optimization strategy to evaluate future needs and opportunities at its plants including:

- Identifying performance and capacity enhancements;

- Improving wet weather performance;
- Flood proofing, asset management and energy efficiency; and
- Potential future effluent criteria.

Current operating efficiencies for the five WWTPs are highlighted in the following table. The objective for total phosphorus varies for each plant, ranging between 0.5 to 0.75 mg/L. The average actual achieved levels for the five plants is however around 0.4 mg/L, which is lower than the set objectives. The objectives and limits shown in brackets at Greenway WWTP reflect those that will be in place once the expansion project is complete.

Table 1: Current objectives and limits at the five WWTPs in the City of London for various parameters

Plant	Parameter	Objective	Limit	Actual (2016)
Adelaide	TP	0.7	1.0	0.52
Greenway	TP	0.6 (0.4)	0.75 (0.58)	0.43
Oxford	TP	0.5	0.65	0.29
Pottersburg	TP	0.5	0.75	0.46
Vauxhall	TP	0.75	1.0	0.24

Plans

Within the next few months an equipment supplier will perform bench-scale testing at each site to confirm phosphorus reductions. The City will also confirm the ability to incorporate the upgrades without causing hydraulic bottlenecks or the loss of treatment capacity in addition to potential synergies between the proposed technologies and the objectives of the original optimization strategy. Of note is the potential to utilize effluent pumping, installed as part of the flood proofing measures, to overcome the head losses associated with the phosphorus removal equipment. The City will also evaluate expanding our wet weather storage capacity in the southern portion of the City as this area is prone to high wet weather flows related to a large number of weeping tiles and down spout cross connections within the sanitary system. Additional storage will help reduce overflows and will have an immediate impact on the release of phosphorus, solids and BOD related to these cross connections.

Go Beyond

Following the announcement of the Lake Erie Bi-National Phosphorus Reduction Target and in conjunction with the Phase One of the Clean Water and Wastewater Funding (CWWF), the optimization strategy was expanded to include reducing effluent phosphorus loadings. Based on modelling results, the City has identified a package of technologies that the supplier claims can reduce our total phosphorus levels to 0.1 mg/L, or approximately 10 tonnes annually, at current rated capacities. These are “bolt on” technologies which can be installed in a relatively short timeframe without significant modifications. They can also be used to improve wet

weather treatment performance with further phosphorus reductions. Before the end of 2017, the City of London will be in a position to discuss the modifications, costs and logistics required to reduce the effluent phosphorus objective limit to a concentration as low as 0.1 mg/L.

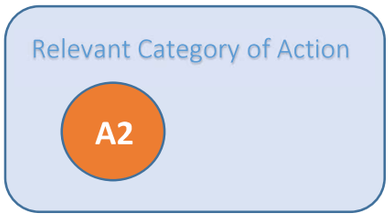
These technologies are extremely promising but require significant levels of additional funding that is not currently part of the City's 20-year financial plan. With additional funding from upper levels of government, the City of London could integrate phosphorus reducing technologies to reduce phosphorus discharges to as much as 75 % below 2008 levels.

Recommendations

- The City of London will undertake a pilot project using new technologies as an alternative to conventional tertiary treatment, with the objective of achieving effluent quality of 0.1 mg/L and will, upon successful completion of the pilot project, develop a plan to roll-out phosphorus reduction technologies to the five major treatment plants.[i]

4. Combined Sewer Replacement

The City of London's combined sewer infrastructure has been gradually separated over time through the lifecycle capital replacement program. The discharge from combined sewer infrastructure is a source of untreated wastewater discharge (phosphorus release) to receivers, when these combined sewers discharge to storm sewer infrastructure/ outlets.



Since 2008, over $40 million have been spent on the separation of combined sewers and mitigation of CSOs, as shown below.

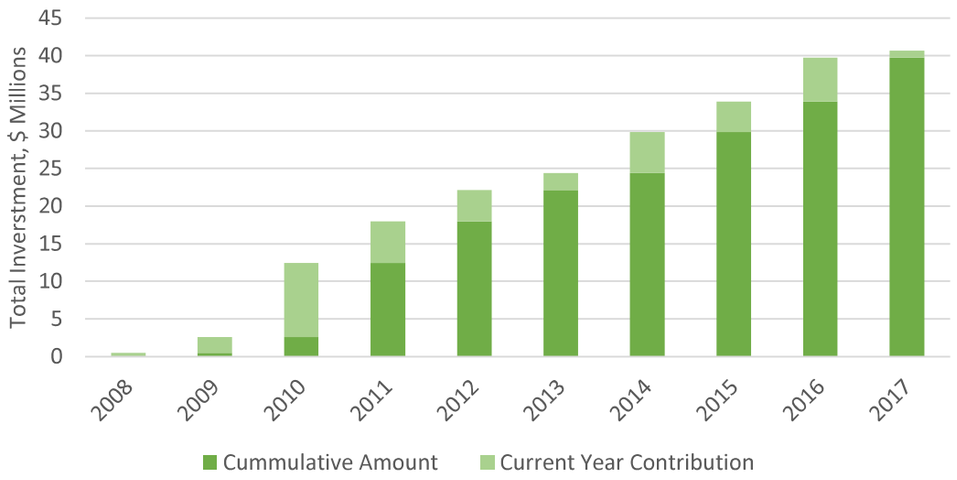


Figure 3: Level of investment for combined sewer separation and CSO mitigation from 2008 to 2017

Plans

There remains approximately 20 km of combined sewer to be replaced around the City. This accounts for 1.5 % of the entire sanitary sewer network. Each year, this number is reduced through the City's Infrastructure Renewal Program (IRP). The following figure highlights the areas within the City that remain to be separated as well as the sections of combined sewer that have been replaced since 2013. The replacement of these combined sewers could be further accelerated and prioritized with additional funding sources.

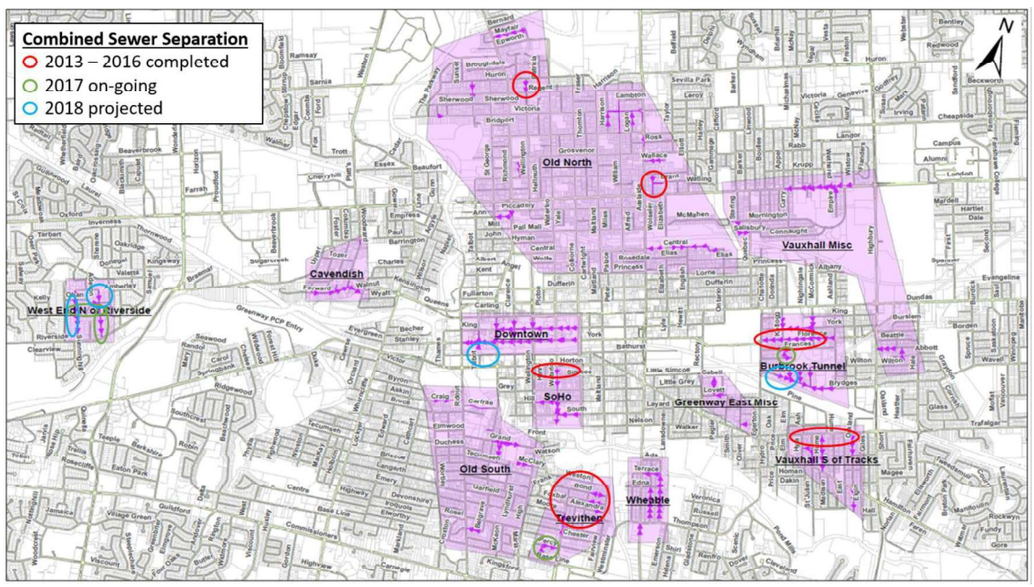


Figure 4: Combined sewer separation locations from 2013 to 2018

There are two large obstacles encountered when replacing combined sewers. Firstly, the limited space within the street to replace a single pipe with two pipes can pose a significant design constraint. In the downtown core, there exists a high number of utilities that crowd the already limited space. The second major obstacle is the limited availability and size of existing stormwater outlets that exist in the highly built-out downstream area. Often times, before eliminating the combined sewer, downstream work must be completed to provide an appropriately sized storm water outlet.

Under our existing financial plan, 80 % of London's remaining combined sewers will be replaced by the year 2029. The following table outlines the areas that still have combined sewers to be replaced, their associated length and the planned percent to be replaced by the year 2029.

Table 2: Areas in the City of London with remaining combined sewers

Combined Sewer Area	Length (m)	Total Planned for Replacement 2017-2030 (m)	Percentage Separated
West End N of Riverside	1,180	1,180	100 %
Cavendish	830	400	48 %
Old North	4,250	3,390	80 %
Downtown	3,410	1,820	53 %
SoHo	1,450	1,450	100 %
Old South	1,520	560	37 %

Trevithen	1,180	1,010	86 %
Wheable	1,280	1,140	89 %
Greenway East Misc.	480	480	100 %
Vauxhall Misc.	1,820	1,560	86 %
Burbrook Tunnel	3,040	3,040	100 %
Vauxhall S of Tracks	1,300	1,300	100 %
TOTAL	**21,750**	**17,340**	**80 %**

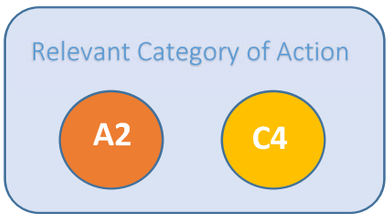
Go Beyond

The current plan to replace 80 % of our remaining combined sewer network by 2029 is an ambitious target and is the product of many years of capital investments and support from City Staff and Council. The plan balances the need to separate these sewers with the corporate fiscal constraints. The current plan is affordable and achievable at current rate levels but could be accelerated given additional financial support from higher levels of government. Given further financial support, the program could be accelerated and achieved by 2025.

Recommendation

- The City of London will accelerate plans for separation of combined sewers, including the design and construction of necessary stormwater outlets with the target of separating 80 percent (17 km) of the City's combined sewer system by 2025.[i]

5. Sewer System Overflow Reduction



The City of London is committed to system improvements for its sanitary and combined sewer infrastructure. SSOs and other bypasses currently exist in the City of London wastewater system. These overflows were originally designed and constructed to protect homes from basement flooding caused by excessive inflow and infiltration in the system. The discharge from these SSOs and bypasses are directed to receivers, including the Thames River, Dingman Creek, Medway Creek, Pottersburg Creek and the Coves. The discharge from SSOs and bypasses is a source of untreated wastewater discharge (phosphorus release) to receivers, when these combined sewers discharge to storm sewer infrastructure/outlet.

The City of London initiated a Pollution Prevention and Control Plan (PPCP) in 2012 in accordance with the Master Planning process outlined in the Municipal Engineers Association Municipal Class Environmental Assessment. The primary objective of the PPCP is to develop an implementation plan that provides a long-term solution to limit the volume and frequency of untreated wastewater discharges to receivers, from various SSOs and bypasses throughout the City, while maintaining an acceptable level of service and protection against basement flooding.

Phase 1 of the PPCP characterized the water quality in the Thames River and its major tributaries. Phase 1 identified a total of 149 SSOs in the City's sewer infrastructure, and included a ranking of the severity of these overflows.

Phase 2 of the PPCP is currently being finalized and includes a refinement of the priority ranking of SSOs. The criteria for prioritizing these overflows included: annual volume of overflow, frequency of overflow, compliance of overflow with Procedure F-5-5 capture rate and level of receiver water quality impairment based on the water quality index. Examples of water quality indices considered include: BioMAP Water Quality Index and the Family-level Biotic Index (FBI).

A preliminary list of the prioritized SSOs based on Phase 2 of the PPCP is provided in the following table.

Table 3: List of priority SSOs as highlighted by Phase 2 of the PCPP

SSO ID	Typical Year Overflow Volume (m^3)	BioMAP WQ Rating	Complies with F-5-5 Capture Rate (Y/N)
DS-01	81,000	Unimpaired	Y
SW-01	40,300	Unimpaired	N
CW-03	10,500	Unimpaired	N
PM-02	10,300	Unimpaired	N
SD-01	10,000	Unimpaired	Y
PM-09	7,800	Unimpaired	N
CW-04	4,700	Unimpaired	Y
SN-05	3,400	Unimpaired	N
SD-05	2,500	Unimpaired	Y
PM-03	1,400	Unimpaired	Y
SD-08	1,300	Unimpaired	Y
CP-09	300	Impaired	Y
SW-03	5	Impaired	Y

Overflows and bypasses occur when sanitary sewers become overloaded during heavy rainfall events. The primary cause of this is the direct connection of weeping tiles to the sanitary system. It is estimated that there are approximately 50,000 homes within the City of London that have this direct connection. The City of London offers a Basement Flooding Grant Program, which provides protection to homeowners from flooding and improves our system by

partially funding weeping tile disconnections. Examples of available measures include installation of a backwater valve, sump pit and pump with weeping tiles disconnected, storm private drain connection and backwater valve alarm. Recent changes to the program now cover 90 % of the total construction cost for eligible works, up to a pre-determined maximum upset limit. City staff will continue to promote and encourage sign-ups to the program, when applicable.

Plans

The location of the prioritized overflows and the location of wastewater pumping stations and WWTPs are illustrated below. The removal or mitigation of these overflows will be confirmed during Phase 3 of the PPCP which will be completed in December, 2017. As demonstrated from our advances in the sewer replacement program, the City continues to proceed with the reduction of SSOs as the PPCP continues to be developed and finalized.

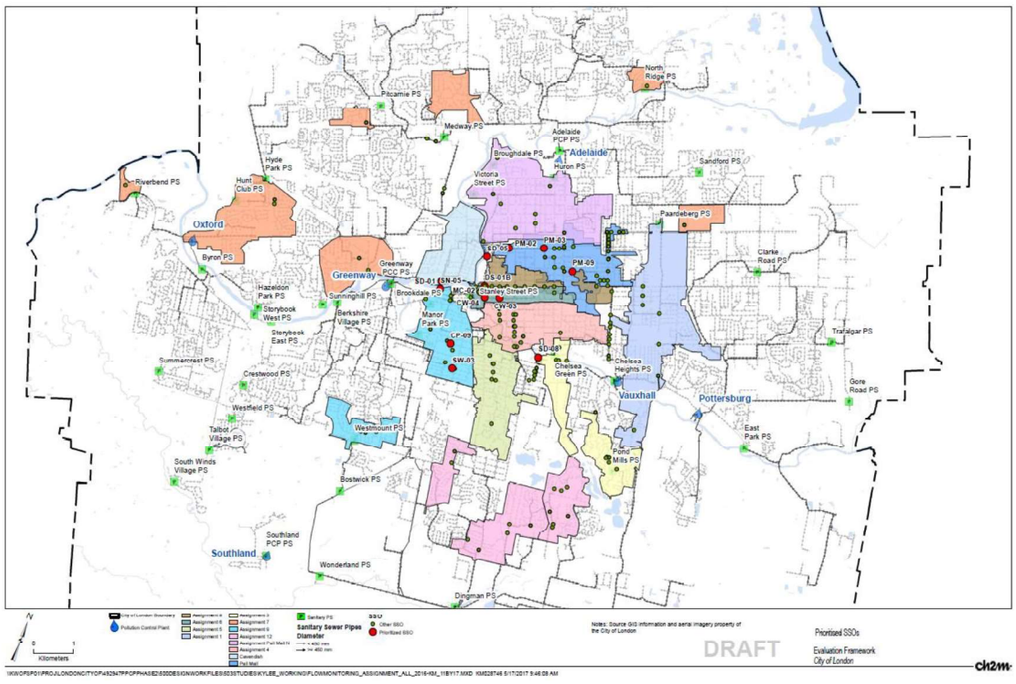


Figure 5: Location of prioritized overflows in the City of London as highlighted by Phase 2 of the PPCP

The screening of various mitigation alternatives for each of the prioritized SSOs is presented in the following table. Phase 3 of the PPCP will also include an implementation plan to address the removal or mitigation of these overflows in the upcoming years.

Table 4: Mitigation of SSOs and screening of alternatives

SSO Location / ID	Weir/Overflow Adjustment/ Backwater Valves	Sewer Upsize/ Relief Sewer	Sewer Separation/ Source Control	Inline Storage	Offline Storage	Pump Capacity Upgrades	HRT & CDS
DS-01	✗	✗	✓	✗	✗	✗	✗
SW-01	✓	✓	✓	✓	✓	✗	✗
CW-03	✓	✓	✓	✓	✓	✗	✗
PM-02	✓	✓	✗	✓	✓	✗	✗
SD-01	✓	✓	✗	✓	✓	✗	✗
PM-09	✓	✓	✗	✓	✗	✗	✗
CW-04	✓	✓	✗	✓	✗	✗	✗
SN-05	✓	✓	✗	✓	✗	✗	✗
SD-05	✓	✓	✗	✓	✗	✗	✗
PM-03	✓	✓	✗	✓	✗	✗	✗
SD-08	✓	✓	✗	✓	✗	✗	✗
CP-09	✓	✓	✗	✓	✗	✗	✗
SW-03	✓	✓	✗	✓	✗	✗	✗

HRT = High Rate Treatment

CDS = Continuous Deflective Separation

✗ = Alternative Fails Screening

✓ = Alternative Passes Screening

[a] = Indicates that this SSO location is aligned with a currently planned infrastructure renewal project

Beyond the PPCP work, the City is currently working with industry and academic partners to develop new and innovative technologies to treat CSOs. The City is in the early stages of developing a partnership with Trojan Technologies (based in London) and Western University to pilot high rate CSO treatment technologies. Currently, through the INTCATCH partnership, Trojan is piloting a similar system at a CSO discharge point in Villa Bagatta, Italy (near Lake Garda). It is anticipated that this system will come on-line in September, 2017. This is an exciting opportunity for the City of London to partner with academic and industry to address our CSO challenge while supporting local research and development.

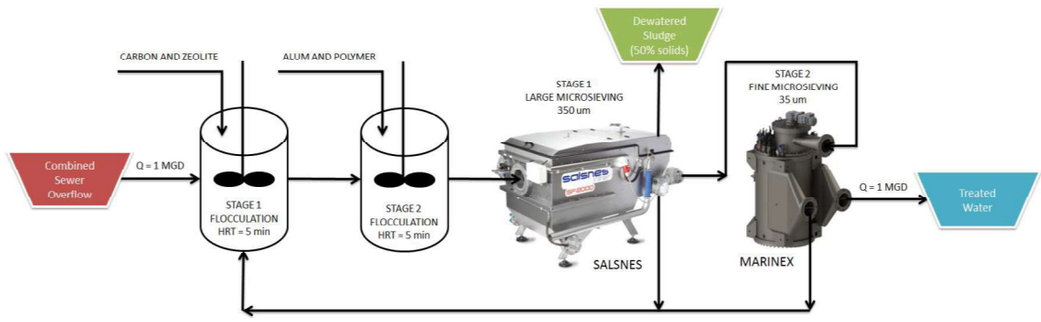


Figure 6: Trojan Technologies pilot system process diagram.

Go Beyond

London faces significant challenges related to CSOs. Many of these sewer overflows have been in place for over 100 years and will take many years to remedy. Phase 3 of the PPCP will be completed by Q4, 2017 and will provide a road map for the management of these sewer overflows. Based on current funding levels, it will take many years and tens of millions of dollars to implement the final plan. Financial support from upper levels of government is essential if the proposed works are to be implemented in a timely fashion.

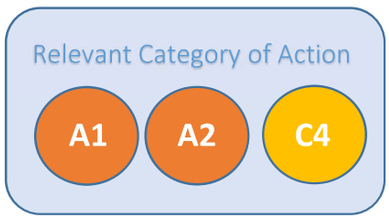
While this plan is being finalized there are opportunities to pilot exciting new technologies working with Ontario industry and academic partners. Supporting a pilot project within the City of London will provide benefits to the Thames River and an opportunity for practical in-field research.

Recommendations

- The City of London will circulate for agency and public review an implementation plan that provides the scope and timing for managing the highest priority sanitary sewer overflows as identified in the City's Pollution Prevention and Control Plan by the end of Q2 2018. To support the implementation, the City of London will facilitate a proof of concept in-field pilot project of high-rate treatment technologies with the support of industry (Trojan Technologies) and academic (Western University) partners, and will continue its private property weeping tile disconnection program.

6. Low Impact Development Rollout

Urban Stormwater runoff receives phosphorus from various sources, including lawn fertilizers and organic matter such as leaf litter, grass clippings and organic soils. Stormwater controls can provide water quality benefit by settling out phosphorus particulate and providing removal of dissolved phosphorus through sorption and filtration.



Much of the older, built-up areas of the City do not have stormwater infrastructure to address water quality. Generally, stormwater management began to address water quality in the 1990's. Approximately 35 km^2, or 15 %, of the City's urban growth boundary provides water quality control to urban runoff.

The MOECC is in the process of developing a Low Impact Development (LID) Stormwater Management Guidance Manual, to be released in 2017. This document will shift the approach and requirements of stormwater management within the Province of Ontario. LID stormwater management designs:

- Treat runoff at the source and promote greater infiltration than traditional stormwater controls;
- Can be designed to reduce runoff phosphorus levels through greater infiltration and sorption;
- Present an opportunity for older areas of the City to be retrofitted to include stormwater control; and
- Can be implemented at specific locations targeted to provide beneficial phosphorus removal.

This new approach will build on London's current at-source stormwater control requirements. The City currently requires mandatory private onsite stormwater controls for all high density, multi-family and commercial developments.

Stormwater quality control is provided to all new development within the City of London through the construction of SWM facilities (primarily wet and dry ponds, and oil-grit separators). Sampling undertaken by the City shows that in most instances wet ponds provide a net removal of phosphorus as compared to untreated stormwater run-off.

Plans

In anticipation of provincial direction for LID stormwater controls, the City of London has led initiatives to build the local understanding and knowledge of LID design and implementation.

In 2016, the City of London began instigating LID design in select roadway reconstruction projects as part of the annual IRP. Projects that lent themselves well to inclusion of LID designs were identified as LID pilot projects candidates. Two roadway reconstruction projects to be constructed in 2017 will include stormwater LID controls. Three projects to be constructed in 2018, have designs currently underway, which will explore LID stormwater controls.

Recognizing the approval requirements for LID design, the City engaged with the MOECC Innovations Branch to develop a subwatershed based Environmental Compliance Approval (ECA). This ECA will pre-approve stormwater management works within an entire subwatershed and will include LID works. The ECA will be developed with an adaptive management strategy based on a framework of pre-approved works, infrastructure inventory, and an operations and monitoring program.

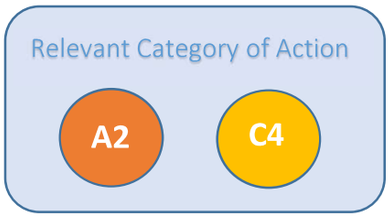
Go Beyond

In the urban context, the primary source of untreated stormwater released is within built-out areas constructed prior to the 1990s. These areas make up the majority of the City. Through the City's IRP, older areas (sometimes older then Canada) are being systematically replaced. Given the tight fiscal constraints of any City with old and aging infrastructure, it is a challenge to keep up with the current need to replace infrastructure that is already beyond its design life. Incorporating new services, such as stormwater treatment, increases the pressure on the limited availability of funding. With the support from the Federal and Provincial governments, the City of London could expand the rollout of LID based stormwater treatment to built-out areas through its currently established IRP.

Recommendations

- The City of London will incorporate low impact development (LID) and adaptive environmental management principles into MOECC's Dingman Creek subwatershed area-wide ECA pilot project, and will implement a program to maximize the treatment and infiltration of stormwater using LID technologies in built-out areas in coordination with the City's linear infrastructure renewal program[i]

7. Stormwater Retrofits



The City of London currently maintains 46 SWM facilities through two programs including annual short term maintenance and full rehabilitation program.

The City's annual short term maintenance program has made significant gains since 2010 in terms of efficiencies, effectiveness and economics. Each year a team of dedicated staff are assigned to this program. Continuity through staffing assignments provides invaluable benefit including consistent documentation, recollections and full accounts of deficiency progression and conveyance of design, and maintenance recommendations based on annual observations specific to unique, or primary attributes of each facility.

The City's full rehabilitation program offers the same benefits noted in the annual short term maintenance program, however, the scope of work is much more focused and extensive, from project planning through to project completion. The primary objective of this program is to reinstate a SWM facility to its original condition with design functionality as the primary driver.

Plans

The City of London is assuming SWM facilities at a significant rate, seeing an increase of nearly 200 % over a five year term. Concurrently, growing concerns over the presence of 'legacy' phosphorus on natural water courses is being realized. Legacy phosphorus refers to the buildup of soil characterized by intermediate storage and remobilization along flow paths. SWM facilities are now being considered as a source of the problem, despite initial intentions of

such engineering facilities. As such, the City of London has undertaken an aggressive program to cleanout existing stormwater ponds. The City has a budget ramping up to $1.1 million per year to undertake major reconstruction of stormwater ponds. Each year two to three regional ponds, some with drainage areas of 100 ha or more, are dredged and re-constructed. A cleanout of a pond can range from $200,000 to $400,000, depending on the size of the facility. Often, upon sampling sediment, it is determined that the sediment must be disposed of in the City's landfill site. This additional cost has led to increasing cost pressure on the stormwater pond maintenance program.

As part of the City of London's CWWF request, a submission was made to retrofit an existing stormwater pond to both increase its treatment capacity and improve its functionality. The main objective of the Applegate Stormwater Pond retrofit is to improve the water quality discharging to the receiver, Dingman Creek. The project involves constructing a retrofit design using the existing land area. The design maximizes the volume of the pond (providing treatment levels beyond MOECC requirements) and improves the flow paths through the facility to decrease areas of stagnant water. The City is in the early stages of considering similar retrofits in other municipally owned ponds.

Go Beyond

There are many opportunities within the City of London to reduce stormwater based phosphorus discharges in both older and newer areas of the City. Firstly, given appropriate levels of funding, there are opportunities to retrofit existing facilities to maximize their ability to treat stormwater within their current footprint. Additionally, these retrofits could include LID features within the stormwater block to maximize infiltration and filtration of stormwater. As noted, much of the sediment from existing stormwater facilities is being trucked to the City's landfill site both eating up capacity in our landfill and resulting in high disposal costs. The City is in the early stages of considering the creation of a regional stormwater sediment handling facility. The City is exploring the opportunity to dewater stormwater sediment at a centralized location and amending the sediment with municipally collected yard waste materials with the goal of finding a new purpose for the pond sediment and resultant legacy phosphorus. With additional funding these early plans could be made a reality.

Recommendations

- The City of London will expand its current monitoring program to prioritize the retrofitting of stormwater ponds, and will develop a stormwater pond retrofit program to improve operational performance and legacy phosphorus removal. To support this program, the City of London will evaluate the need to develop a stormwater sediment handling facility with the goal of repurposing stormwater pond sediment and appropriately managing the legacy phosphorus contained within it.[i]

8. Next Steps

The Domestic Action Plan is a bold initiative with an ambitious goal to reduce phosphorus loadings by 40 % from 2008 levels by 2025. Our plan to "Go Beyond" is also ambitious and will need support from upper levels of government to achieve. The City of London wants to work proactively with the Federal and Provincial governments to meet Canada's international commitments. Moving forward with the various initiatives highlighted in this document will help Canada to meet its international commitments and improve the health of the Thames River Watershed. The City of London is pleased to be part of the solution and to play a major role in this Federal-Municipal-Provincial partnership.

[i] Subject to upper level government funding partnerships.

Appendix A

Summary of the Canada-Ontario Action Plan for Lake Erie

Goal: Reduce Canadian Phosphorus Loadings by 40 Percent				
Category of Action				
Reduce Phosphorus Loadings	**Ensure Effective Policies, Programs and Legislation**	**Improve the Knowledge Base**	**Educate and Build Awareness**	**Strengthen Leadership and Coordination**
Strategic Actions				
A1 Support watershed and nearshore-based strategies and community-based planning for reducing phosphorus loadings	B1 Support and strengthen policies, programs and legislation	C1 Conduct monitoring and modelling	D1 Enhance communication and outreach to build awareness, improve understanding and influence change	E1 Improve communication and coordination
A2 Reduce phosphorus loadings from urban areas[5]	B2 Strengthen decision-making tools	C2 Conduct research to better understand nutrient dynamics in the Lake Erie basin	D2 Share data and information	E2 Establish an adaptive management framework
A3 Reduce phosphorus loadings from agricultural and rural areas[6]		C3 Conduct research to better understand and predict the impact of climate change on the Lake Erie ecosystem		
		C4 Conduct research to improve existing practices and develop new innovative practices and technologies for phosphorus loss reduction		