

# WELCOME TO THE PUBLIC OPEN HOUSE for the City of Kitchener Integrated Stormwater Management Master Plan



Public Open House  
Thursday April 28<sup>th</sup>, 2016  
Victoria Park Pavillion  
80 Schneider Ave, Kitchener, ON  
6-8 p.m.





# WELCOME TO THE PUBLIC OPEN HOUSE for the City of Kitchener Integrated Stormwater Management Master Plan

The City of Kitchener has completed the development of an Integrated Stormwater Management Master Plan (ISWM-MP) that follows the Municipal Class Environmental Assessment Process for Master Plans.

The long range planning has enabled the City of Kitchener to identify opportunities and be proactive in addressing stormwater issues before they become a problem.

## Tonight's meeting format and purpose

Tonight's meeting includes a presentation and boards that have been prepared and separated into two equally important zones for you to explore:

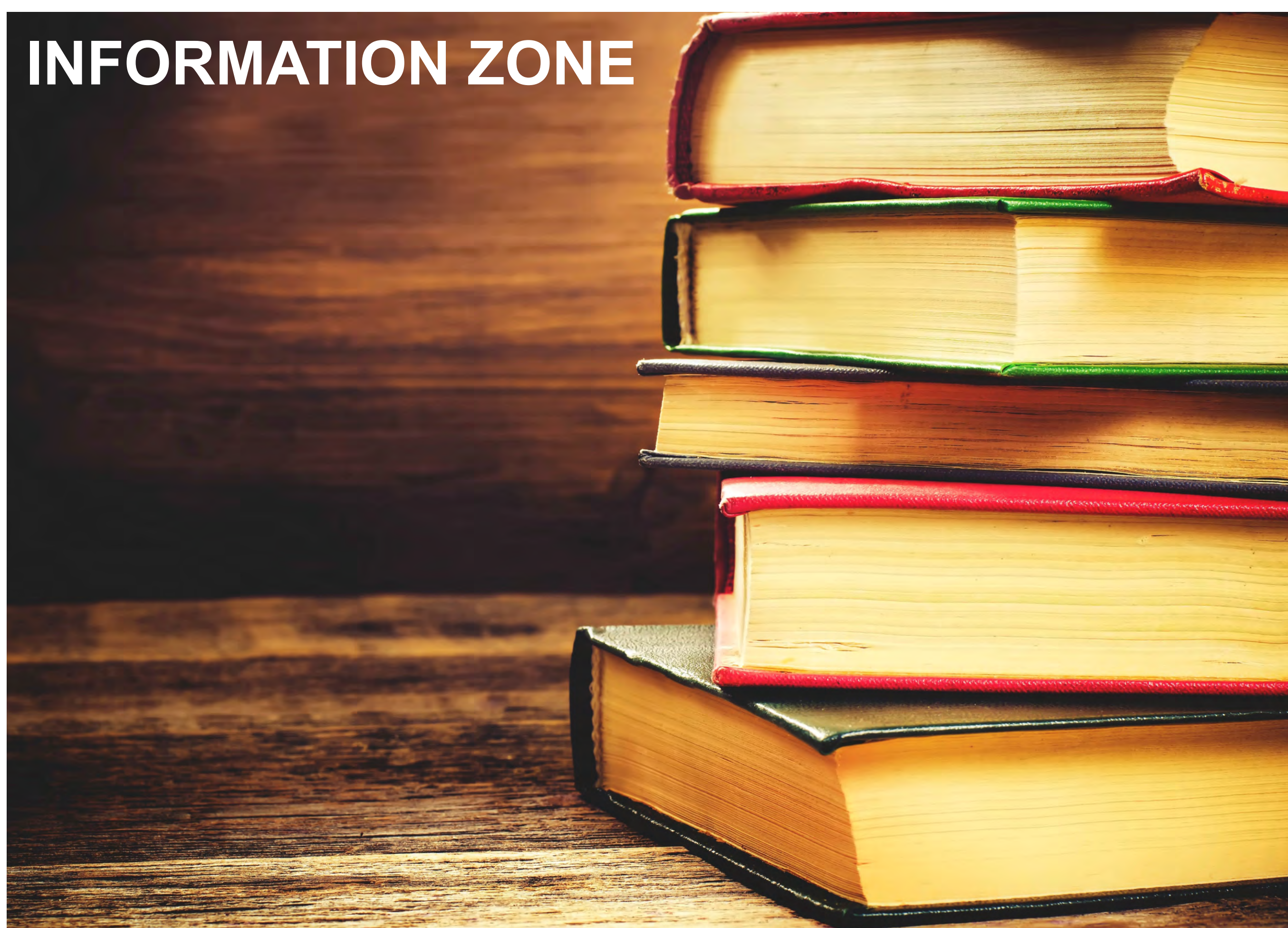
The **INFORMATION ZONE** provides an opportunity for you to review the study process and outcomes. Boards present the identified stormwater opportunities within various neighbourhoods of the City.

*The identified opportunities within the Master Plan will be implemented over the next 15 years. Further public consultation will be undertaken for each individual project as part of detailed design.*

The **IDEAS ZONE** is for you to share your vision and ideas for improving stormwater management in your neighbourhood. We are seeking your ideas about:

- the design and 'look' of stormwater features in your neighbourhood
- other measures to reduce runoff and enhance your neighbourhood
- what can be done on your property to help reduce runoff and flooding while beautifying your landscape.

## INFORMATION ZONE



## IDEAS ZONE





# City of Kitchener Integrated Stormwater Management Master Plan

## - Study Process & Timeframes -

### Study process

**Where** are we in the study process.

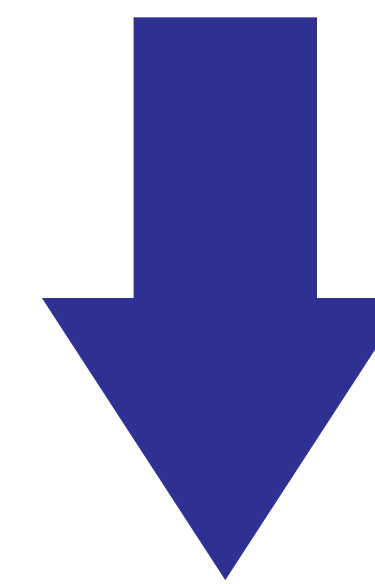
**Project Commencement**  
**October 8, 2014**

**Open House #1**  
**June 24, 2015**

**WE ARE HERE**  
**April 28, 2016**

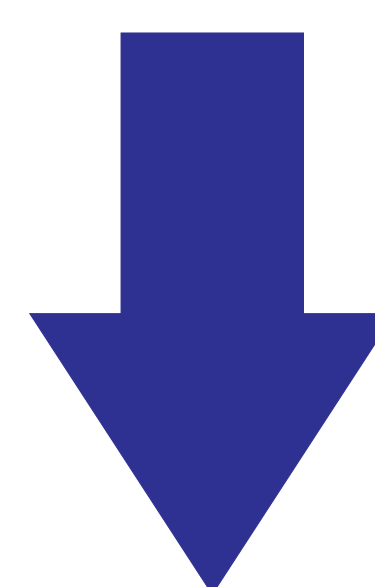
#### **STAGE 1**

- Review background information & identify data gaps
  - Define existing conditions
- Identify the problem and opportunity
- Identify study goals and objectives
- Develop long list of alternatives



#### **STAGE 2**

- Fulfill data gaps (field work)
- Complete social marketing research
- Develop and evaluate alternative management strategies
  - Develop short list
- Selection of preferred alternatives
- Describe preferred stormwater management strategy



**STUDY COMPLETION**  
**Completion of the Class EA Master Plan**  
**May 2016**

#### **NEXT STEP**

**Implementation Plan Development (September 2016)**  
• Develop implementation plan



This study is being conducted in accordance with the requirements for Master Plans under Approach #2 of the Act, which is an approved process that fulfills all of the Class EA requirements for Schedule A, A+, and B projects and identifies any Schedule C projects for future studies.



# City of Kitchener Integrated Stormwater Management Master Plan

## - Problem Statement, Study Goals & Objectives -

### ***Problem Statement, Opportunities and Constraints***

The City last completed a Master Stormwater Management (SWM) Plan in 2001, which resulted in the development of the SWM policy (I-1135). When completed, the plan and policy were generally considered 'state-of-the-art'; however, since that time, the field of stormwater management has evolved.

The current Integrated Stormwater Management Master Plan (ISWM-MP) was initiated in order to update the 2001 SWM policy study and serves as a decision support tool as well as a methodology for the prioritization of works. The master plan will also serve as a transparent community process by which the city can establish stormwater management guidelines and policies for the next 15 years.

Urban areas may degrade the environment in many ways, as a result of both new development and from existing development. Pollutants from a variety of residential, commercial and industrial sources impact the environment, as well as terrestrial and aquatic life when conveyed to the receiving bodies of water. Urban development can also result in a transformation of the hydrologic characteristics within subwatersheds, where rainfall events that previously contributed little or no runoff to streams now cause flow to occur and consequently, the amount of water draining to streams significantly increases in volume. As a result of existing land uses, together with proposed land use changes, a number of potential environmental problems have been identified. These include:



- Degraded surface water and groundwater quality
  - Thermal enrichment of surface water
  - Increased sediment loads to surface water
  - Adverse effects on human and animal health
- Loss and degradation of fish and wildlife habitat, natural features and processes
- Increased flooding and erosion
- Disruption of the pre-development hydrologic process: reduction in groundwater recharge and stream baseflow
- Urban flooding (overwhelming of the municipal storm sewer system)



### **Study Goals and Objectives:**

The City of Kitchener ISWM-MP considers flood and erosion control, groundwater and surface water quality management, environment management and infrastructure, all in an integrated manner. In addition, the ISWM-MP integrates existing policies, regulations, acts and guidelines and where appropriate will develop new policies to aid in implementation of the preferred alternative(s) as part of a separate implementation plan.

#### ***Water quality***

- Maintain or improve surface water and groundwater quality.
- Minimize sediment loading to surface water and groundwater.
- Maintain or enhance the quality of drinking water sources.
- Maintain existing thermal watercourse regimes and enhance cool/coldwater regimes where possible.

#### ***Water quantity***

- Preserve and re-establish the natural hydrologic process to protect, restore and replenish surface water and groundwater resources.
- Minimize the threat to life and property from flooding.
- Maintain or enhance groundwater supplies through infiltration while minimizing the risks from future land uses and activities.

#### ***Erosion control***

- Maintain existing erosion rates or reduce the impacts of excessive erosion on aquatic and terrestrial habitat and property.
- Integrate stream erosion within a master planning process.

#### ***Natural environment***

- Protect, enhance and restore natural features and functions such as wetlands, riparian and ecological corridors as well as identified linkages.
- Improve warmwater, coolwater and coldwater fisheries if appropriate.
- Control or reduce invasive species.

#### ***Water resource sustainability***

- Holistically integrate goals, objectives and targets for water resources (water, sanitary and storm).
- Improve stormwater infrastructure resiliency and adaptation in the context of climate change.

#### ***Infrastructure***

- Provide a level of service for stormwater management which is consistent with municipal and agency standards.
- Continue to ensure effective functioning of stormwater infrastructure.
- Encourage the implementation of innovative solutions including Low Impact Development (LID) and Green Infrastructure (GI) to mitigate stormwater runoff as part of the development of sustainable infrastructure solutions.

#### ***Policy and implementation***

- Reflect the acts, policies and regulation developed or amended after 2001.
- Integration of Asset Management Plans for Stormwater which includes long-range forecast and planning direction for many of the specific policy items and recommendations (i.e. ponds, OGS and stream rehabilitation).
- Fundamentally integrate the Level of Service (LOS) model as detailed within the existing Asset Management Report.



# City of Kitchener Integrated Stormwater Management Master Plan

## - Baseline Study & Existing Conditions -

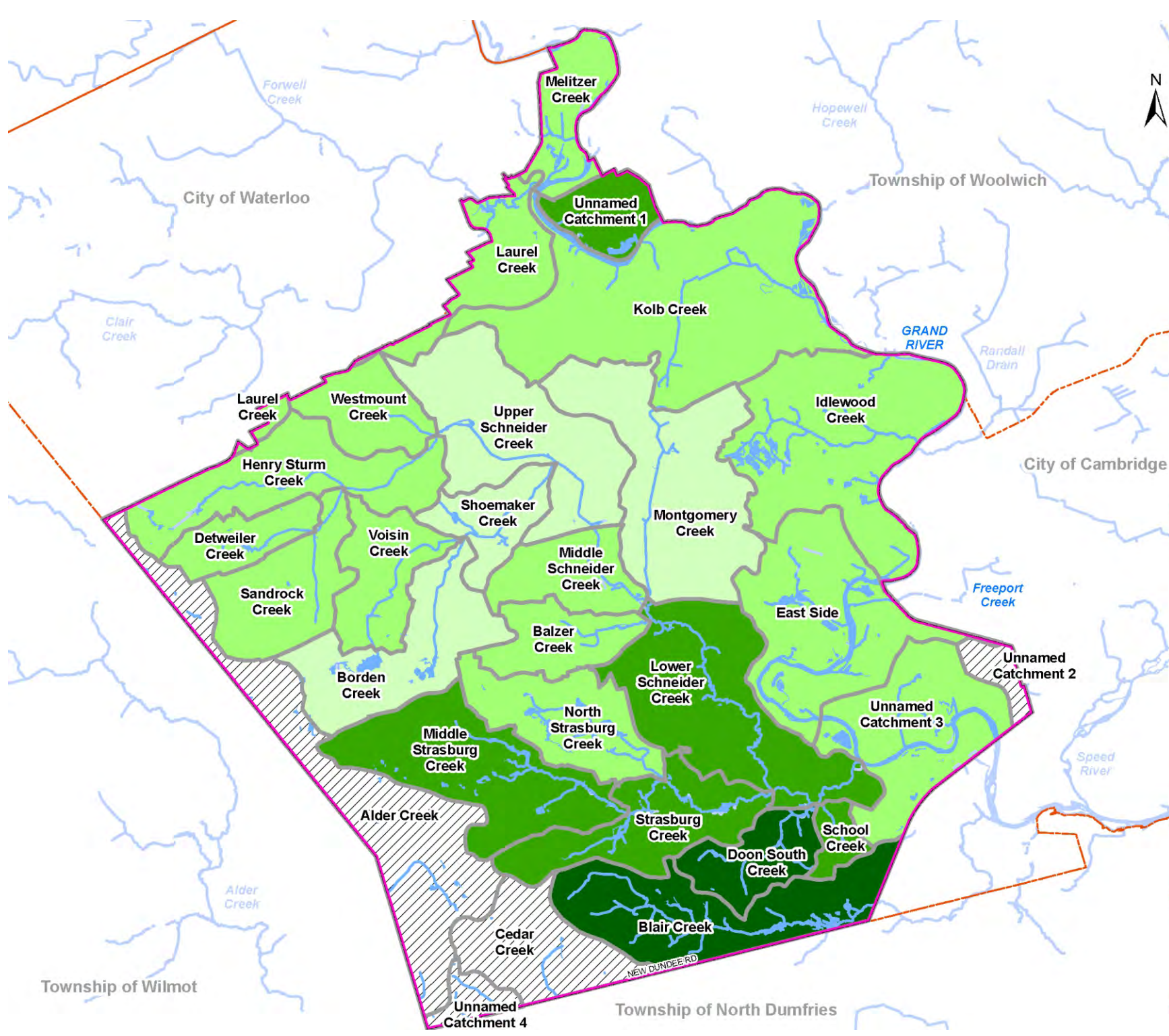
### Baseline Study & Existing Conditions

The existing conditions of the study area have been characterized through a background review and field investigations and are summarized in an **Existing Conditions Report (April, 2015)**, which describes the existing environmental, surface and groundwater, wastewater and stormwater conditions and assets.

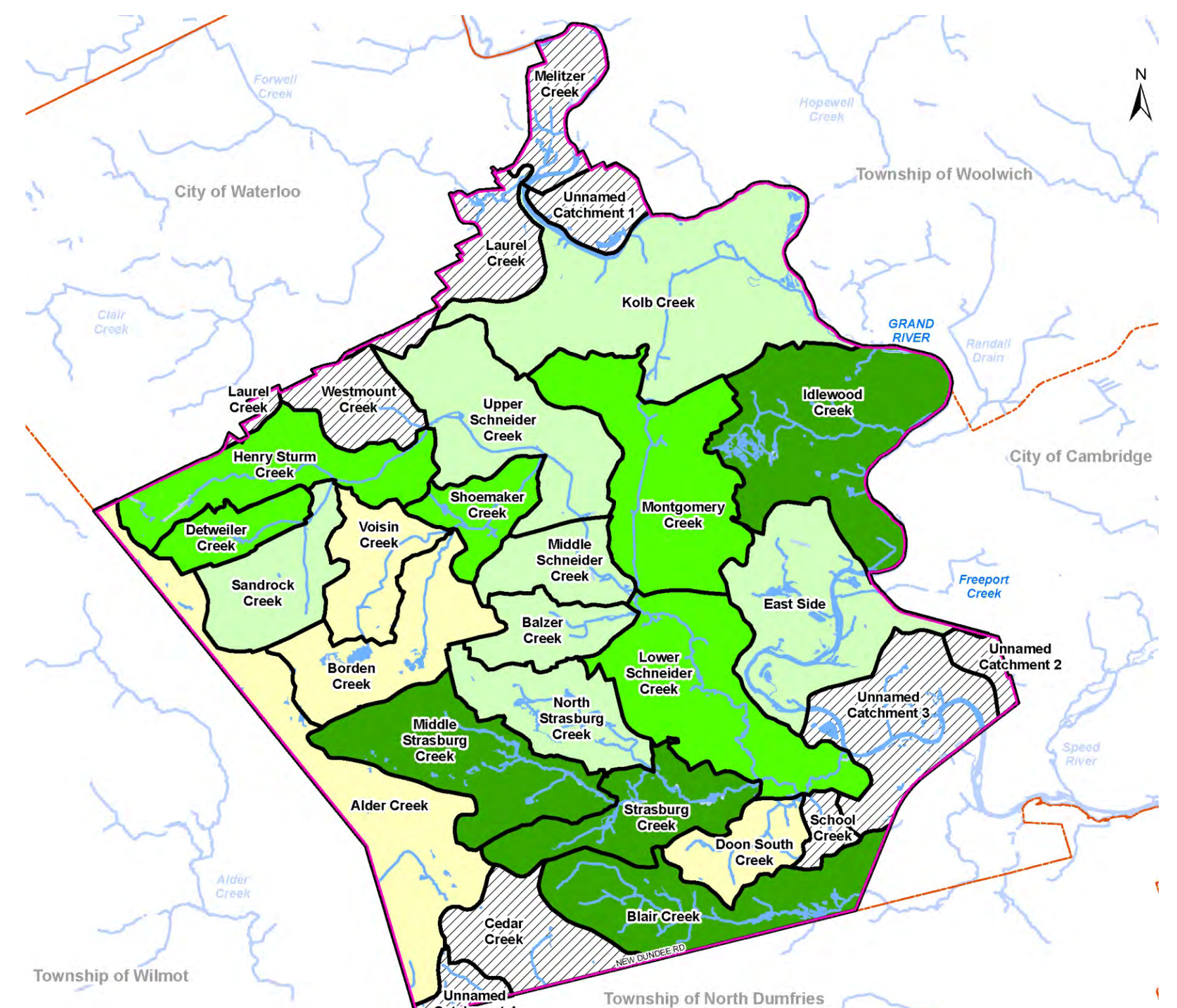
***The existing conditions report can be viewed at:***

[www.kitchener.ca/stormwatermasterplan](http://www.kitchener.ca/stormwatermasterplan)

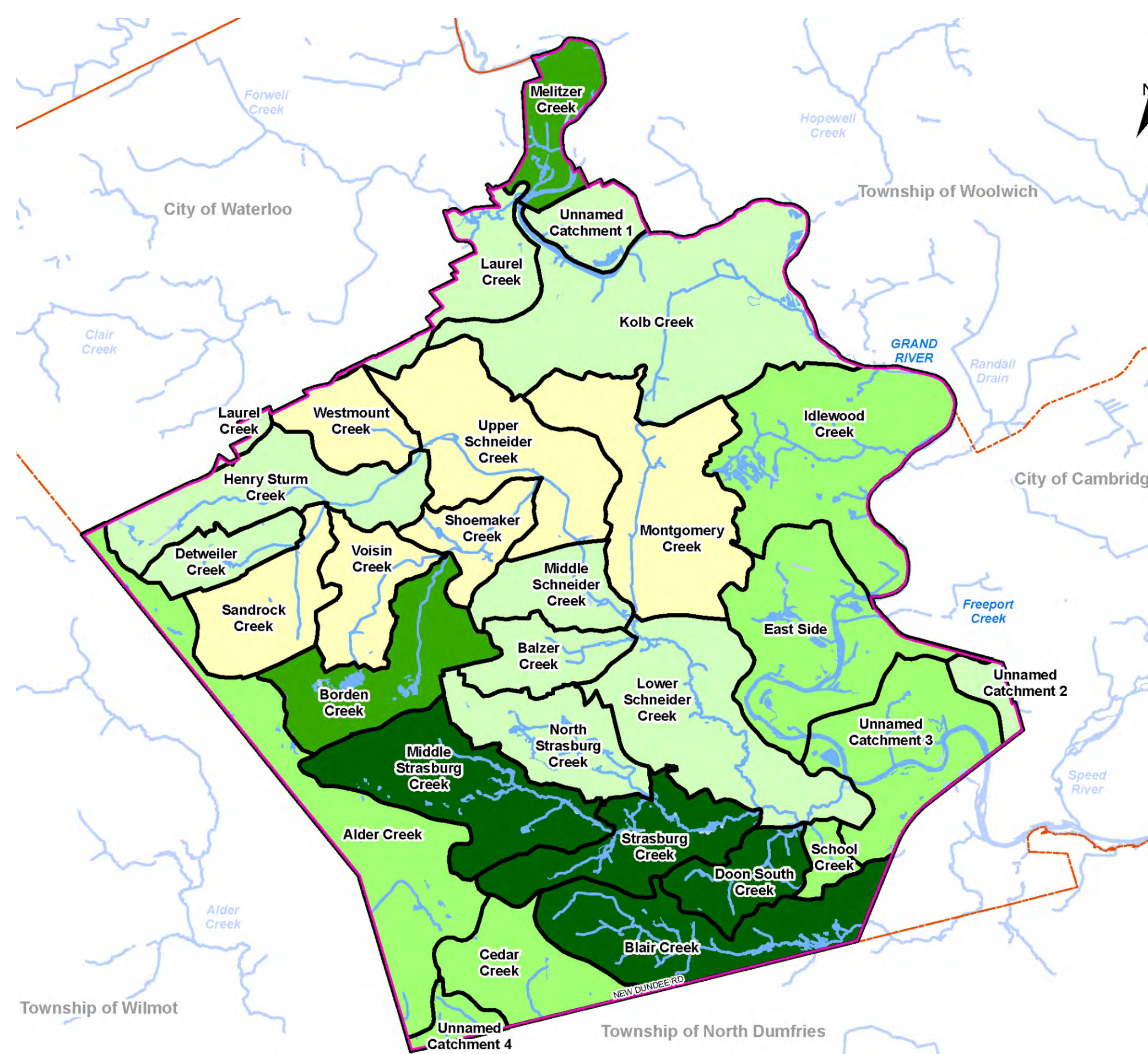
The Figures below summarize the overall Stream Health, Water Quality, Stormwater, Aquatic Ecology, and Terrestrial Ecology for each subwatershed in the City.



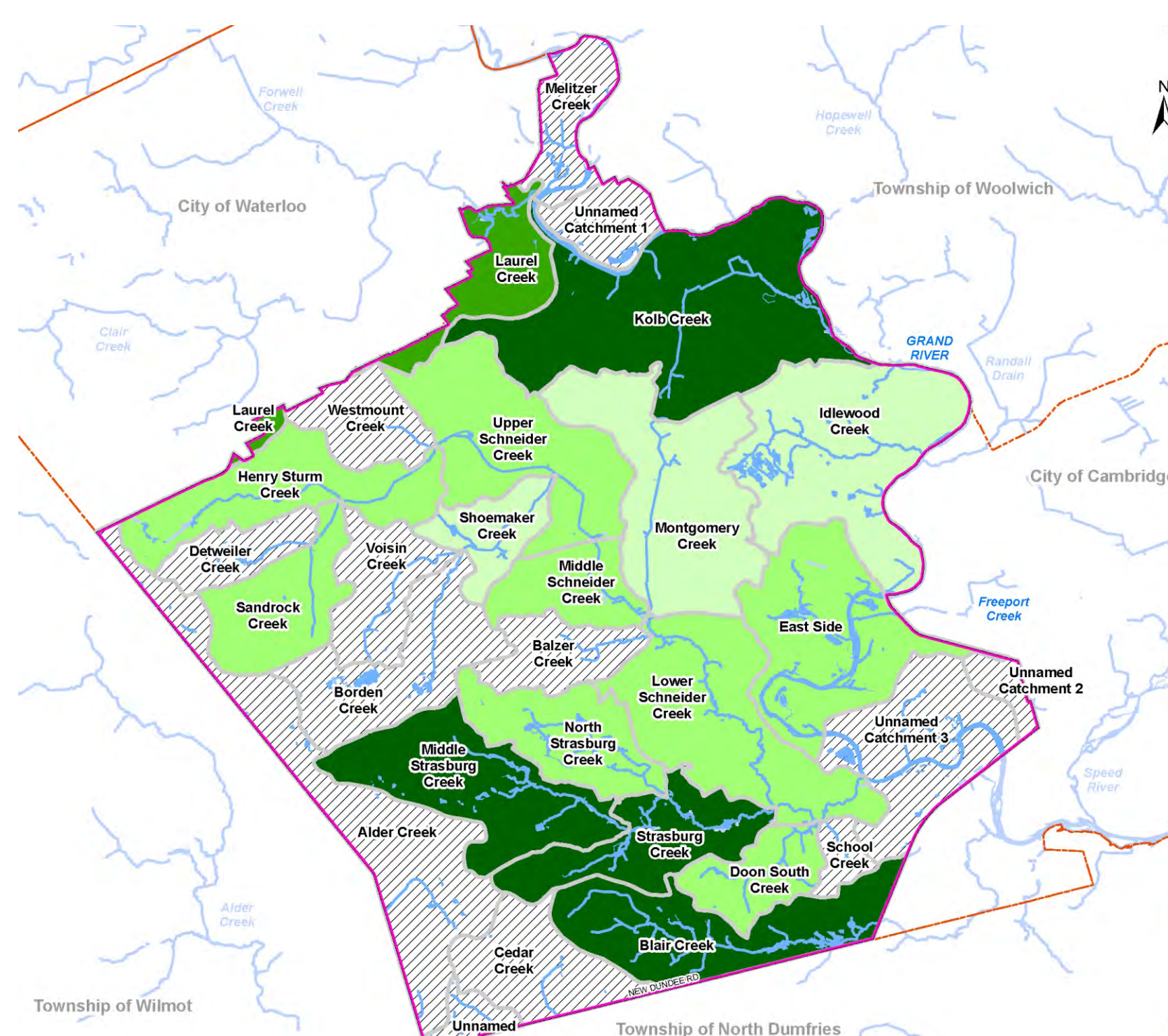
**Subwatershed Ranking  
Stream Health**



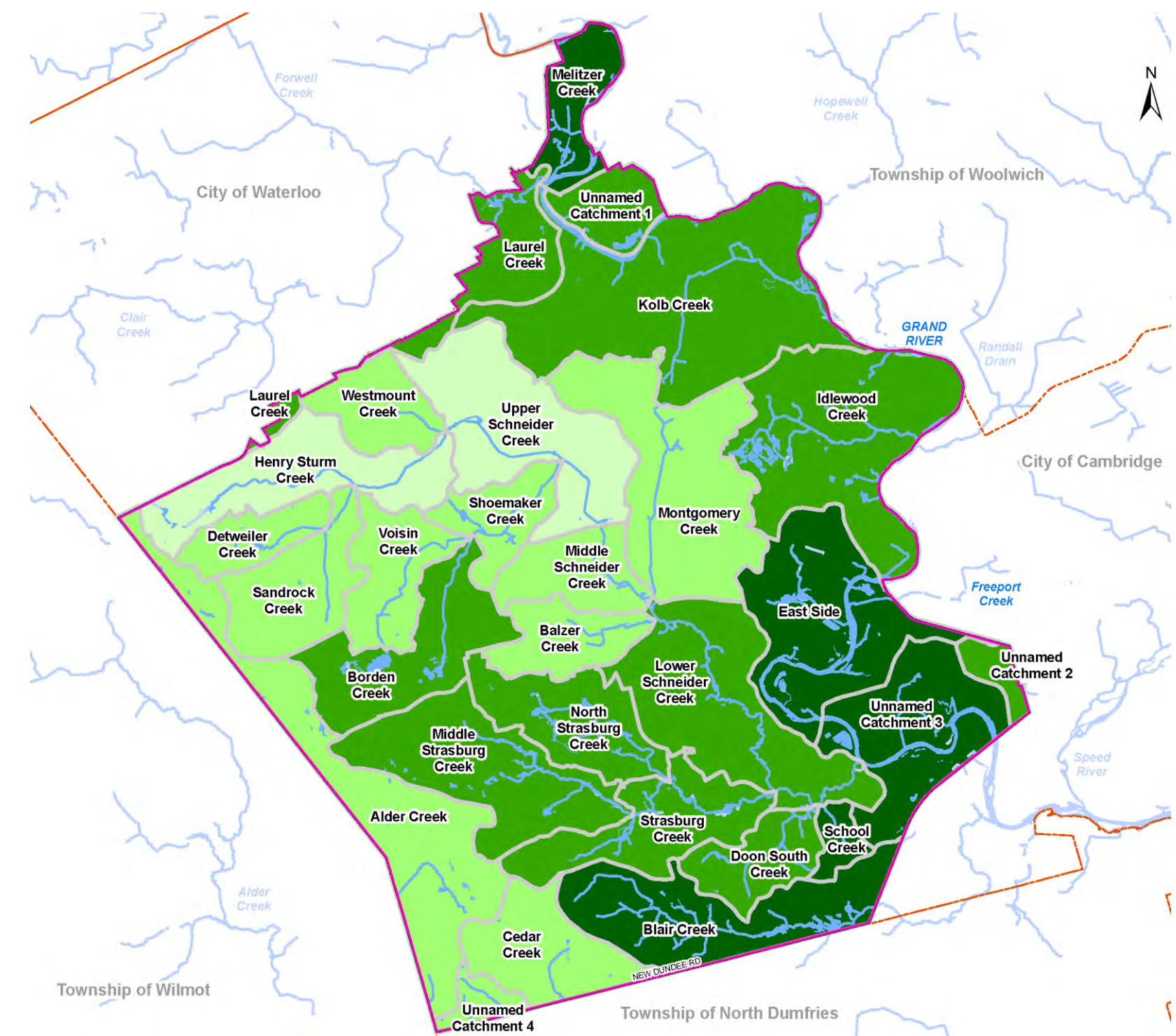
**Subwatershed Ranking  
Water Quality**



**Subwatershed Ranking  
Stormwater Management**



**Subwatershed Ranking  
Aquatic Ecology**



**Subwatershed Ranking  
Terrestrial Ecology**



# City of Kitchener Integrated Stormwater Management Master Plan

## - Pollution Prevention, Municipal Management, & Operational Practices -

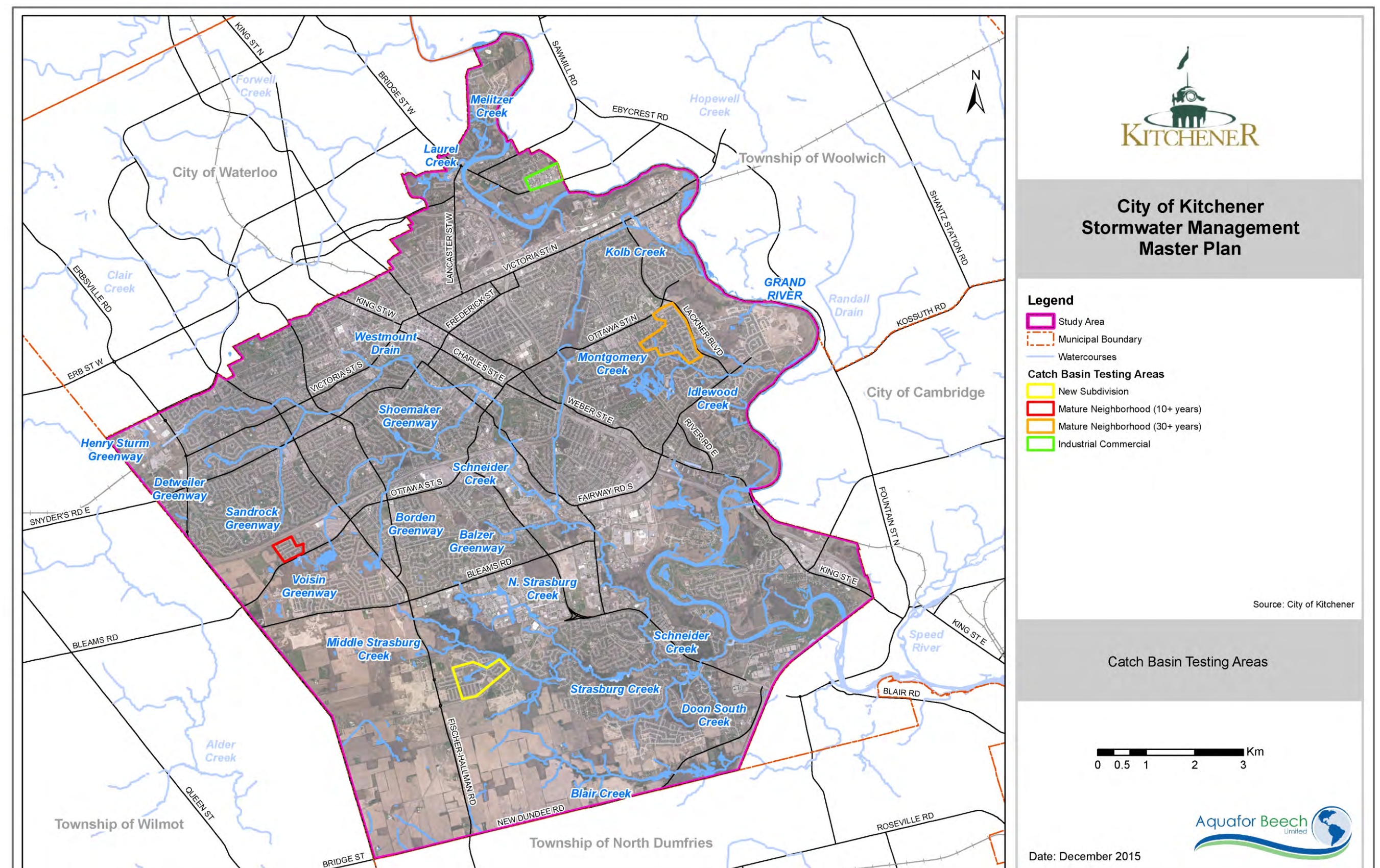
Pollution Prevention, Municipal Management and Operational Practices are important to ensure pollutants are prevented from impacting the environment and to ensure stormwater infrastructure maintain their effectiveness. The study explored approaches to manage pollutants and sediment within the City's stormwater management infrastructure in the most cost effective manner. The following study and resulting recommended works have been completed following Schedule A/A+ of the Municipal Class EA process, and therefore, are pre-approved.

### Catch Basin Clean-out, Street Sweeping and Leak Pick-up Program

This pollution prevention study aimed to determine the effectiveness of a catch basin clean-out program to reduce sediment loads. The study looked at **sediment quality** and **loading rates (quantity)** within four (4) representative areas.

1. New subdivisions
2. Mature subdivision (minimum of 10 years old)
3. Old subdivision (minimum of 30 years old)
4. Industrial/commercial area

The adjacent figure illustrates the neighbourhoods where the catch basin clean-out program was undertaken.



### Key Finding & Recommendations:

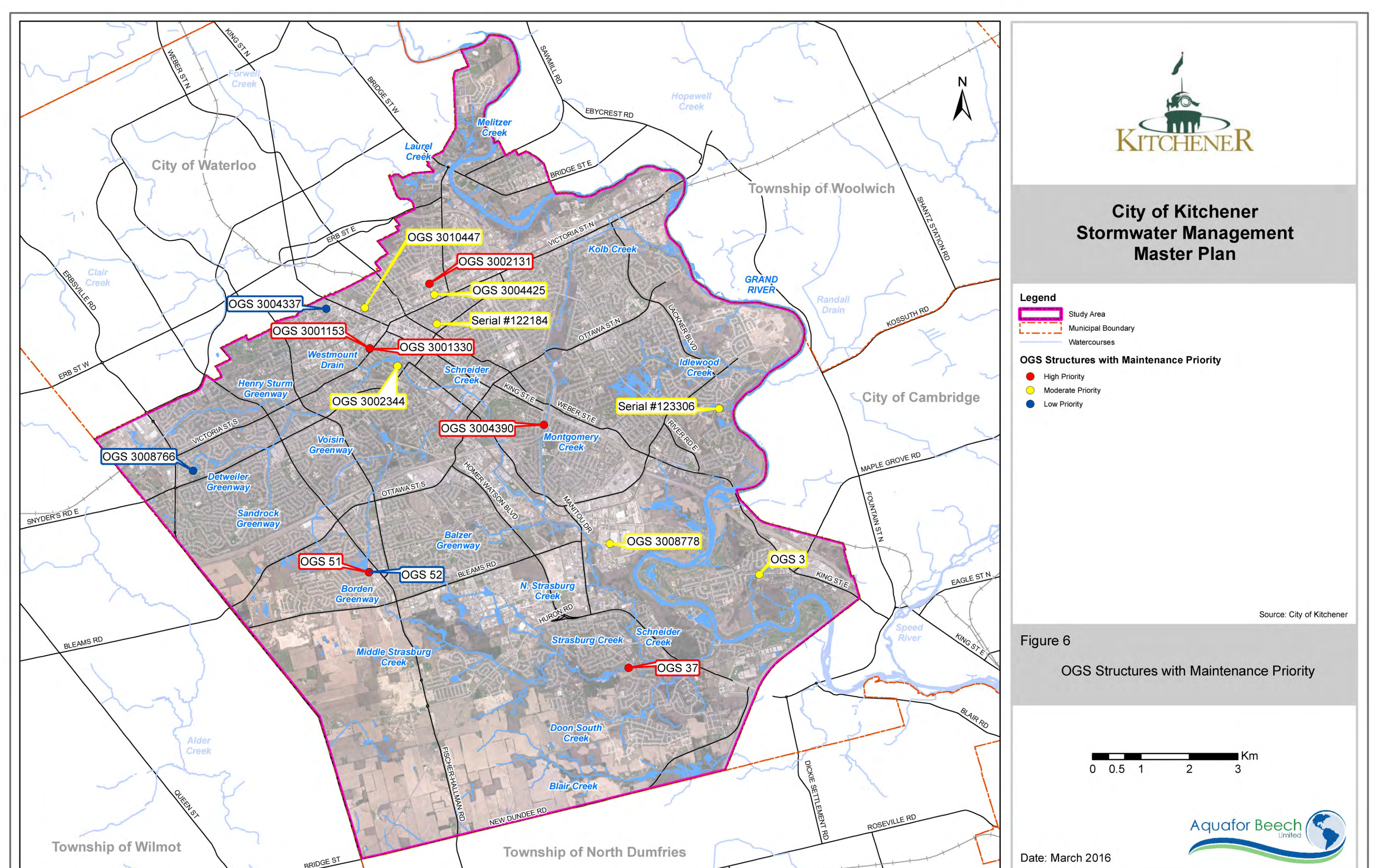
1. Recommended that the efficiency of the existing street sweeping and leaf collecting programs and the potential to integrate catch-basin cleaning be investigated.
2. Sediment removal from catch-basins within uncontrolled areas (without end-of-pipe ponds or OGS units) is recommended.
3. The one-time clean-out of the 8,561 catch basins in the City of Kitchener within uncontrolled drainage areas is estimated to cost approximately \$595,000.

### Oil and Grit Separator (OGS) Clean-outs

OGS units are design to capture sediment from the storm sewer network prior to stormwater being discharged.

The City of Kitchener is responsible for the operation and maintenance of sixty-five (65) OGS units in the City.

Maintenance has been completed for fourteen (14) of the most critical units and the remainder have been prioritized based operational status



The study evaluated thirty-two (32) units with available information and quantified their overall maintenance requirements.

This study concluded that sixteen (16) OGS units required maintenance:

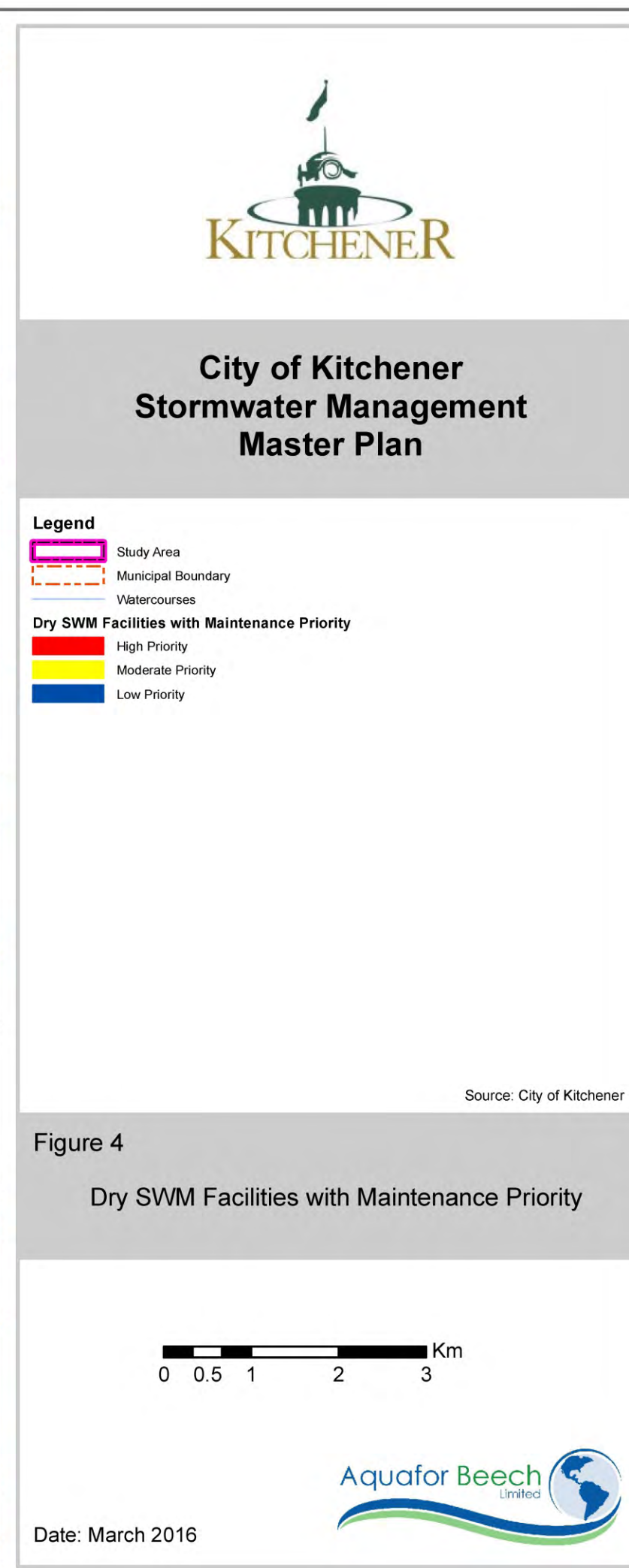
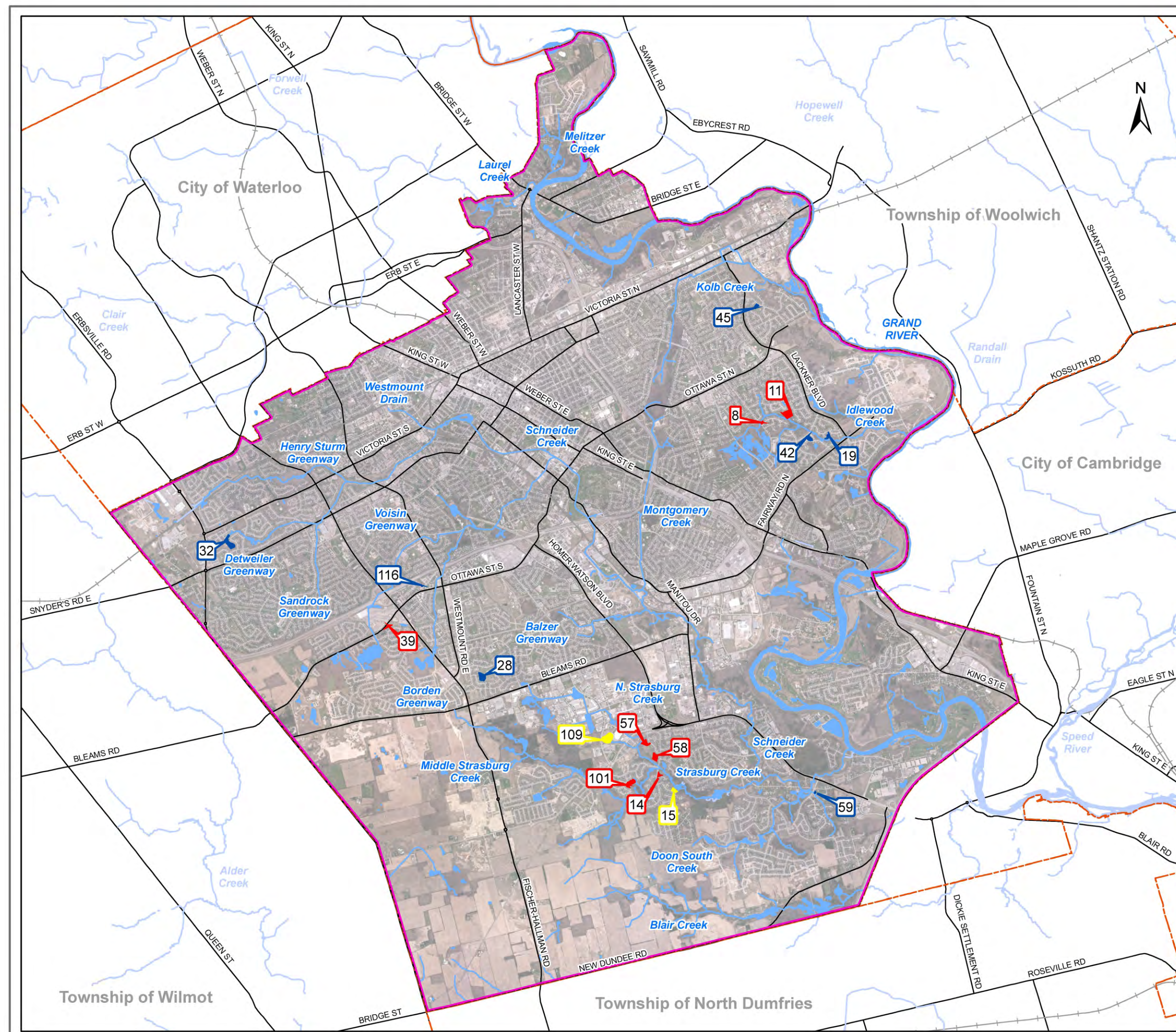
- High Priority Clean-outs: Six (6) OGS Units (Estimated Cost: \$130,000)
- Moderate and Low Priority Clean-outs: Ten (10) OGS Units (Estimate Cost: \$65,000)



# City of Kitchener Integrated Stormwater Management Master Plan

## - Stormwater Management (SWM) Facilities -

The following study has been completed following Schedule A/A+ of the Municipal Class EA process, and therefore, all recommended works are considered pre-approved. The City of Kitchener inventory includes one hundred and forty-two (142) SWM Facilities that require regular maintenance. This study determined the effect of sediment accumulation on SWM facilities and developed a prioritized list of those requiring maintenance. The SWM facilities were grouped according to the facility type (i.e Dry versus Wet Facilities). The prioritization ranking was based on the amount of sediment within each facility and the effect of this accumulation in terms of loss in storage or decrease in performance.



**Dry facilities** focus on quantity control and were assessed based on the loss in storage capacity

Of the Thirty-one (31) Dry facilities identified:

- **Seven (7) were High Priority (>20% Loss):**  
(Estimate Cost \$360,000)
- **Two (2) were Moderate Priority (11-20% Loss):**  
(Estimated Cost \$530,000)
- **Seven (7) were Low Priority (6 -10% Loss):**  
(Estimated Cost \$410,000)



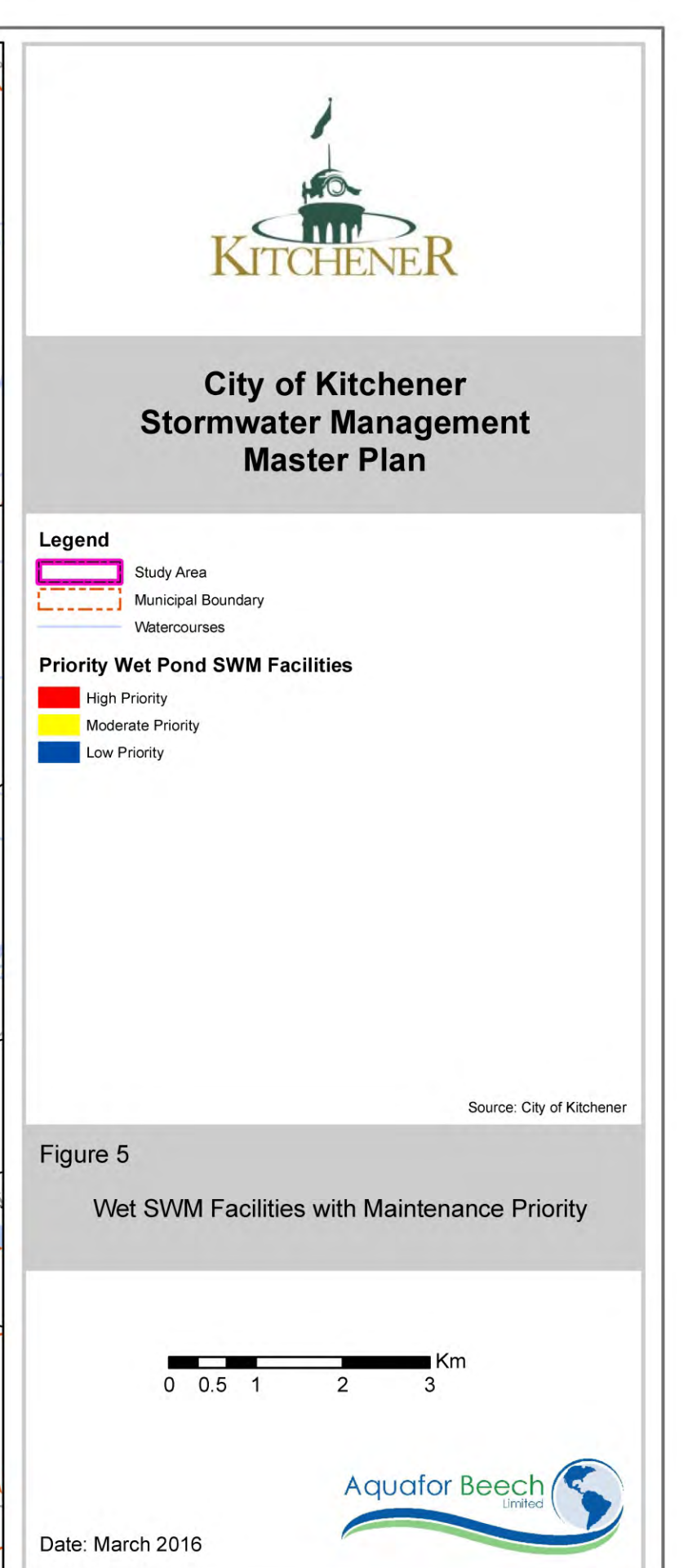
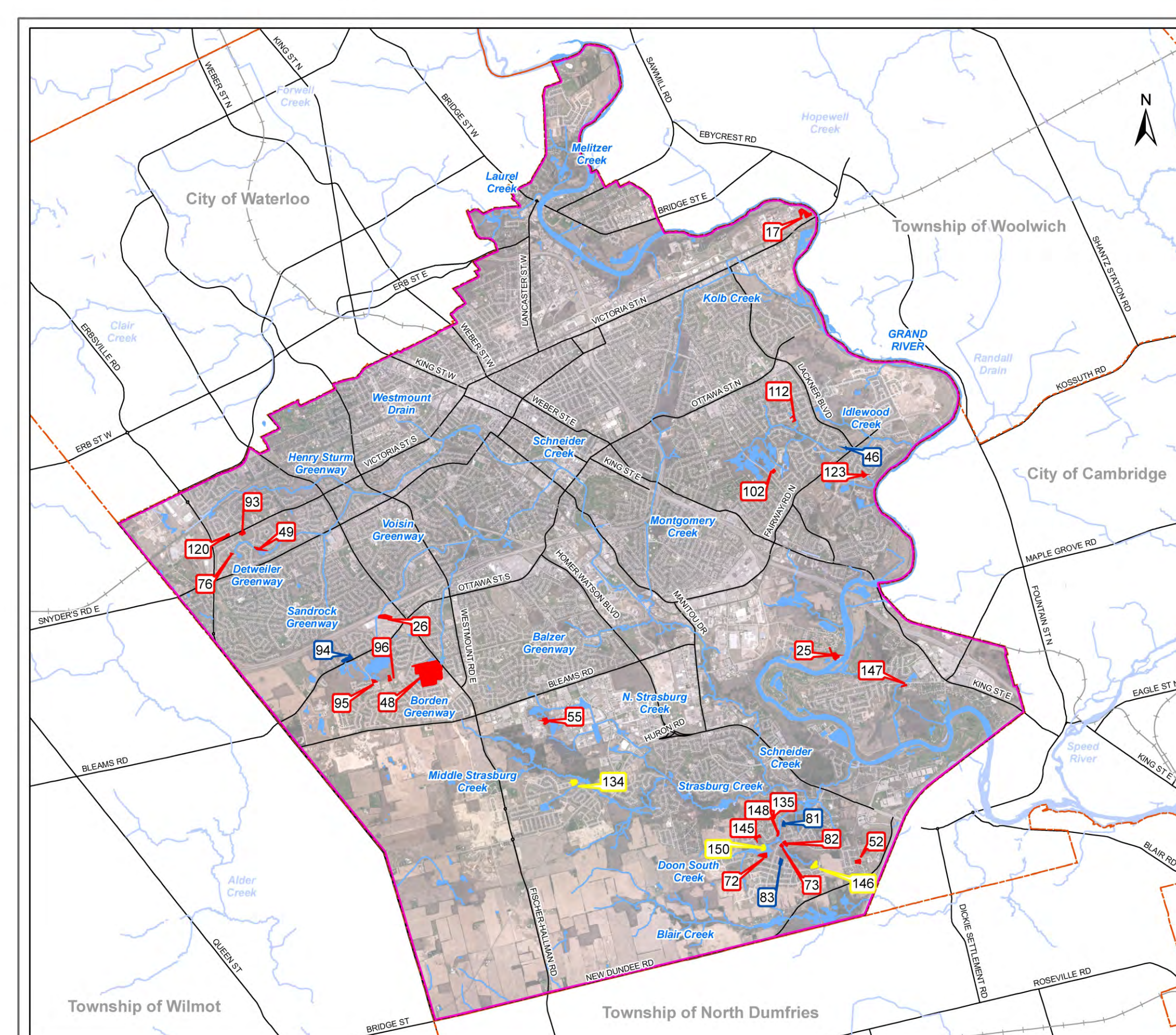
**Wet Facilities** are designed to provide quality control via permanent pools to allow the accumulation of sediment from stormwater. Wet facility sizing is based on the level of protection to be provided in terms of Total Suspended Solid Removal (TSS). A decrease in performance was represented as a loss in efficiency/level of protection due to sediment accumulation. Maintenance requirements (i.e. clean-outs) were prioritized accordingly.

Of the Sixty-two (62) wet facilities that were analyzed:

- **Twenty-Two (22) were assessed as High Priority Wet Facilities**  
(Estimated Cost for Maintenance: \$1.65 Million)
- **Three (3) were assessed as Moderate Priority Wet Facilities:**  
(Estimated Cost for Maintenance: \$135,000)
- **Two (2) were assessed as Low Priority Wet Facilities:**  
(Estimated Cost for Maintenance: \$130,000)



Thistledown Pond (107),  
Kitchener, ON





## - Source Control and Market Strategies -

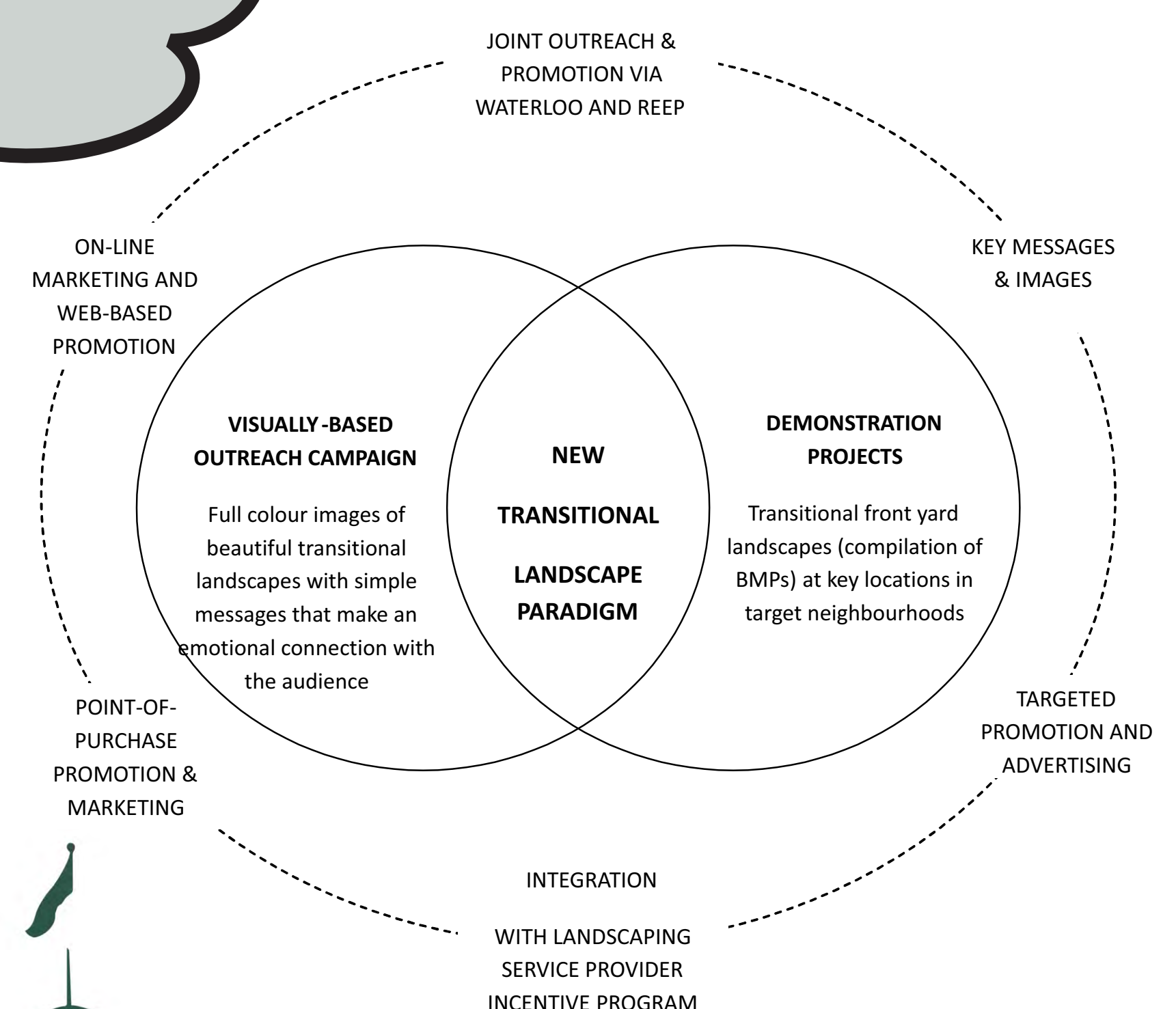


The number of applications to participate in the Stormwater Utility Credit Policy have decreased in volume recently relative to when the program was introduced in 2012. To increase uptake of stormwater management (SWM) and pollution prevention practices, market-based research was undertaken to determine enhancements to current SWM programming.

The goal will be to achieve a twenty percent (20%) uptake over a five year period, allowing the City to secure source-level SWM measures at just over 25% of non-residential properties by 2021.

This landscape runoff, absorb improves water requires less

**This landscape reduces runoff, absorbs rainwater, improves water quality, and requires less irrigation.**





# City of Kitchener Integrated Stormwater Management Master Plan

## - Conveyance Control and The Municipal Right-of-Way (ROW) -

The following study has been completed following Schedule A/A+ of the Municipal Class EA process, and therefore, all recommended works are considered pre-approved. The Master Plan recommends implementing conveyance control measures within the Municipal ROW as part of capital road reconstruction projects.

### Conveyance control measures

Conveyance controls are linear stormwater transport systems that are generally located adjacent to or within roadways. They encourage infiltration of water into the ground, improve water quality and reduce runoff. They can include traditional curb and gutter systems and techniques such as bioswales, grassed channels and subsurface perforated pipe systems.



Bioswale



Perforated pipe system



Grassed swale

### Infiltration Policy

The City of Kitchener has developed an **infiltration Policy** in consultation with the Region of Waterloo that governs how and where stormwater is infiltrated to manage risks. The policy focuses on retrofit opportunities and/or redevelopment of land within the Built-up Areas (including in the Municipal ROW).

#### Infiltration Policy

Followed a “Risk-Based” approach for protecting groundwater resources for all land-uses including roads per the relevant Source Protection Plan (SPP).

The intent of the policy is to protect groundwater resources and drinking water supplies from contamination and provide constraints on infiltration based practices in context of:

- Issue Contributing Areas (ICAs) and
- Wellhead Protection Areas (WHPAs)

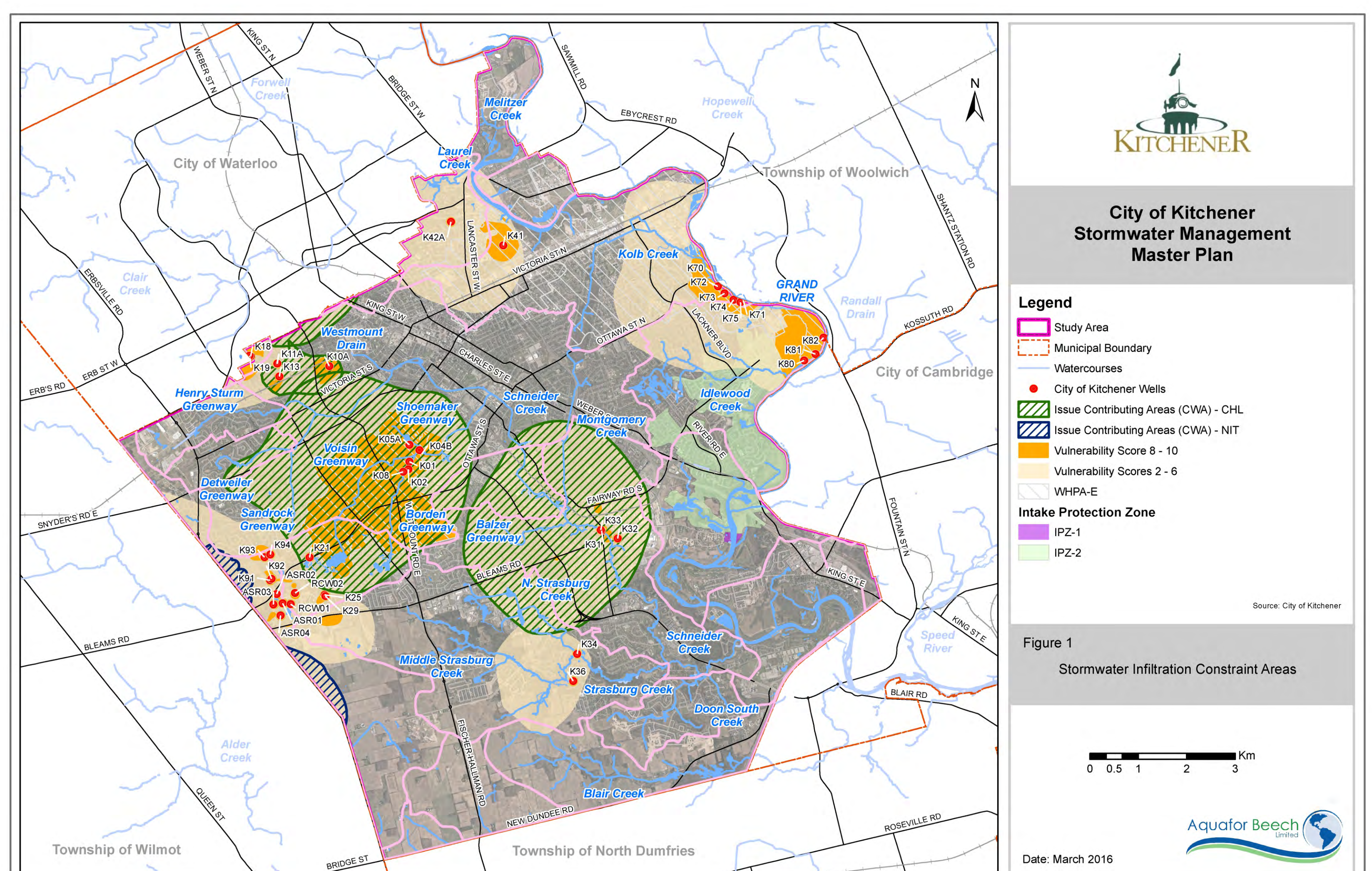


### Stormwater & Issue Contributing Areas (ICAs)

Drinking water threats were identified for four (4) wells in Kitchener relating to impacts from chlorides (CHL) and nitrates (NIT). To protect these drinking water sources issue contributing areas (ICA) have been developed. Within these areas activities that may direct chlorides and nitrates to groundwater must be managed.

### Water Supply

Kitchener is served by a combination of 24 groundwater wells and the surface water intake at the Grand River (Hidden Valley Intake).



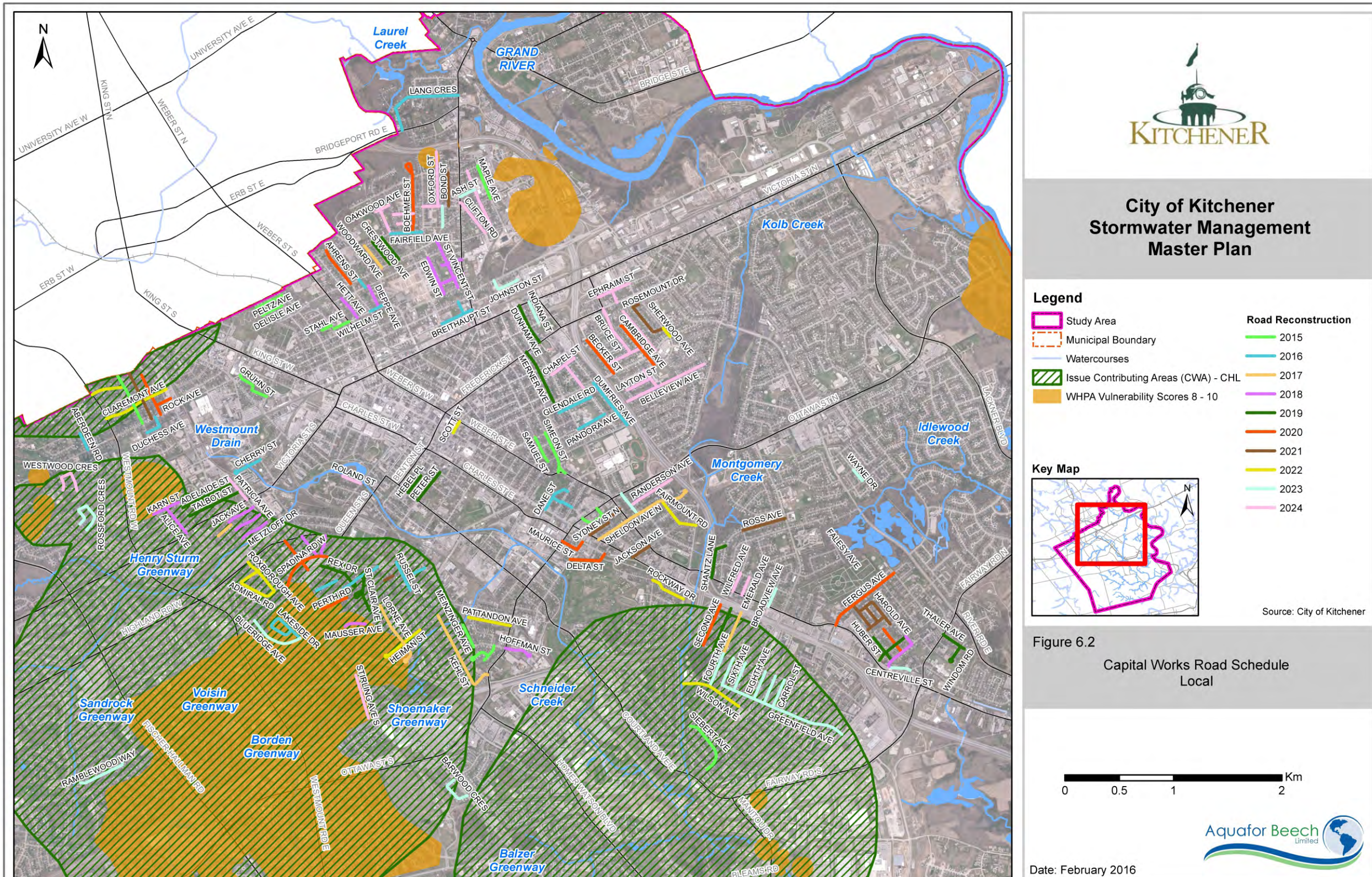


# City of Kitchener Integrated Stormwater Management Master Plan

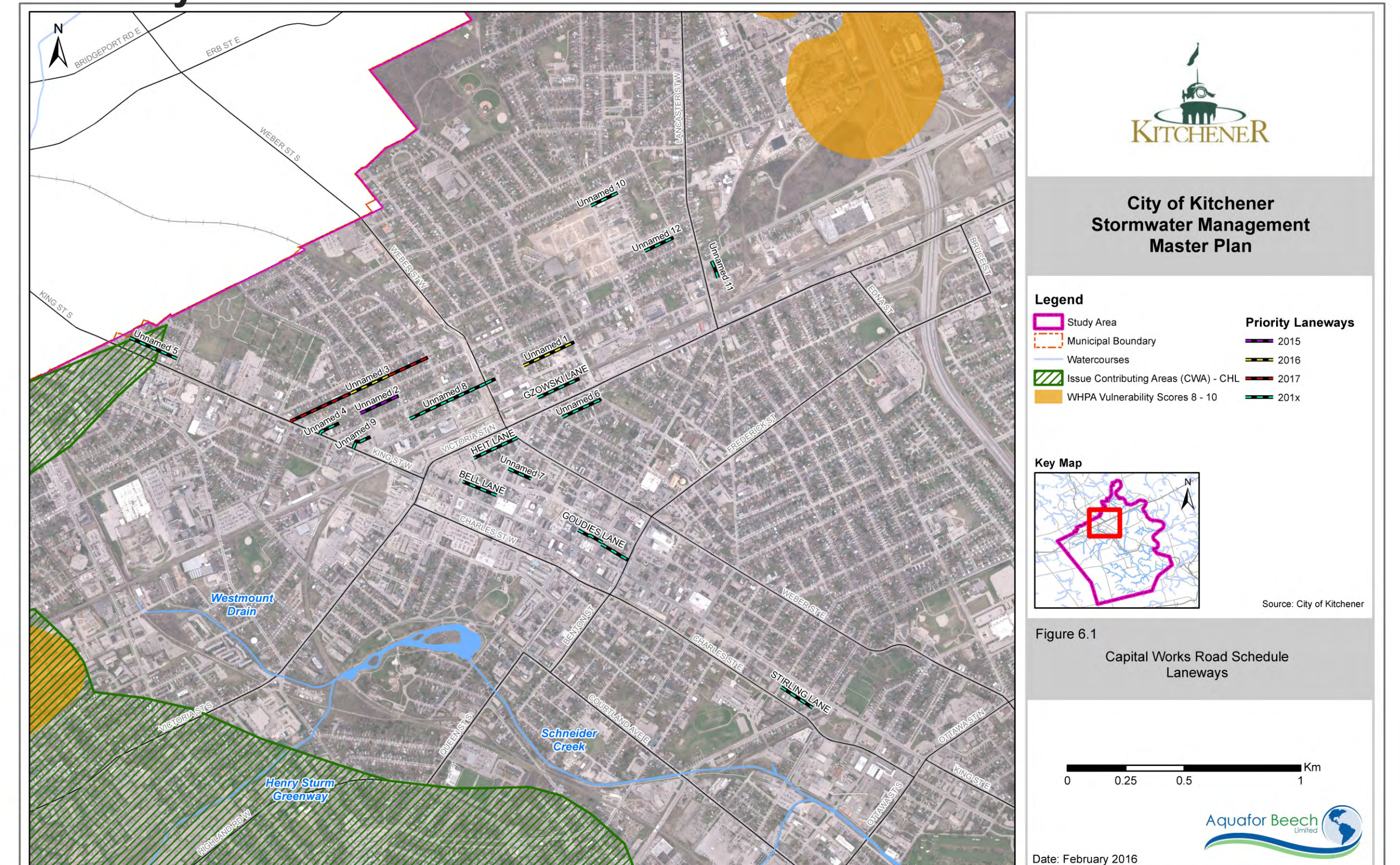
## - Conveyance Control and The Municipal Right-of-Way -

The City has identified stormwater management treatment options that can be incorporated into the 10-year Capital Forecast for road right-of-way reconstruction (resurfacing) and full reconstruction projects until 2024. The purpose of the study was to provide a decision framework to select the appropriate SWM treatment options for all Capital ROW projects.

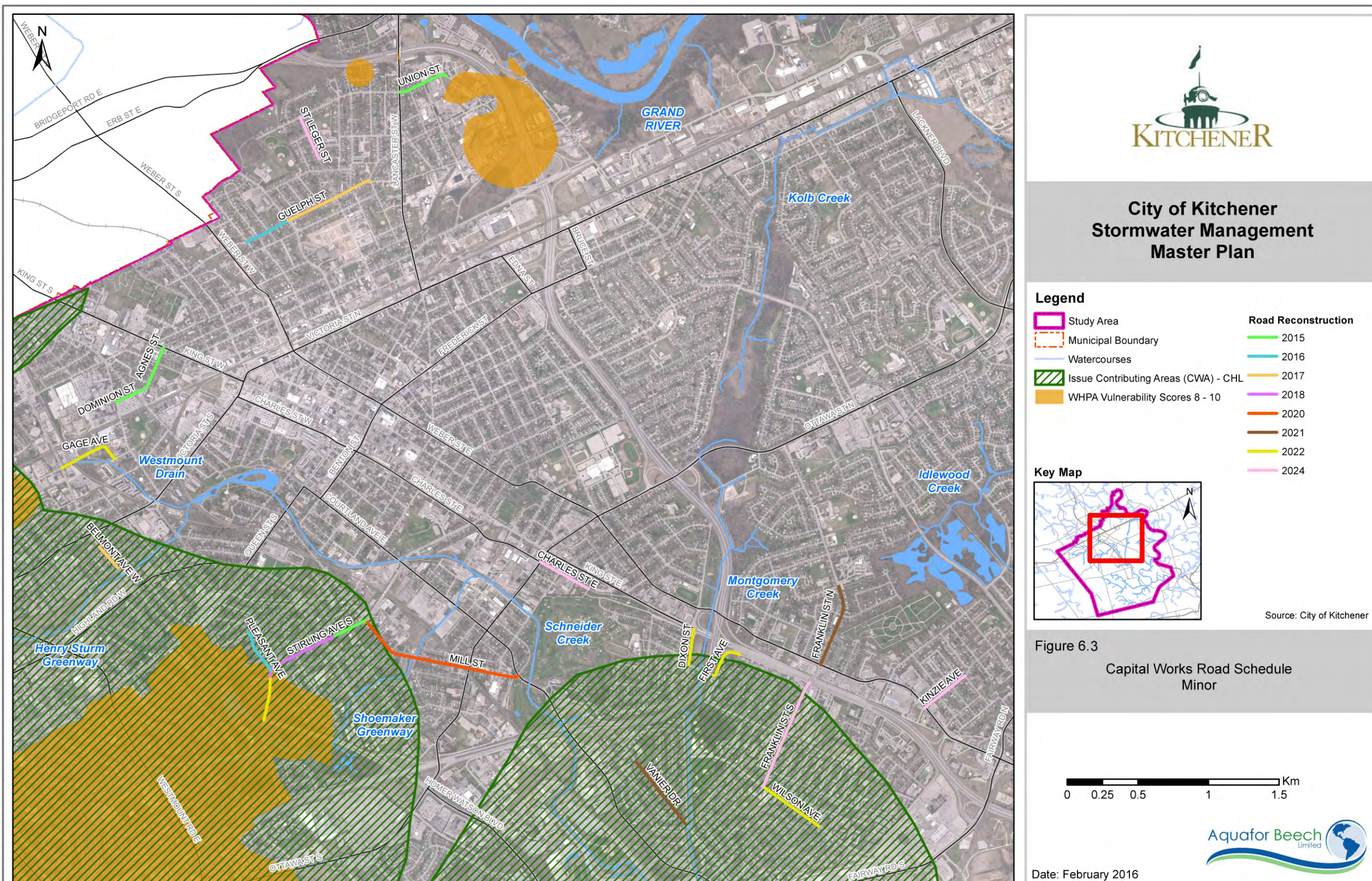
### Local Road Retrofits



### Laneway Retrofits



### Minor Road Retrofits

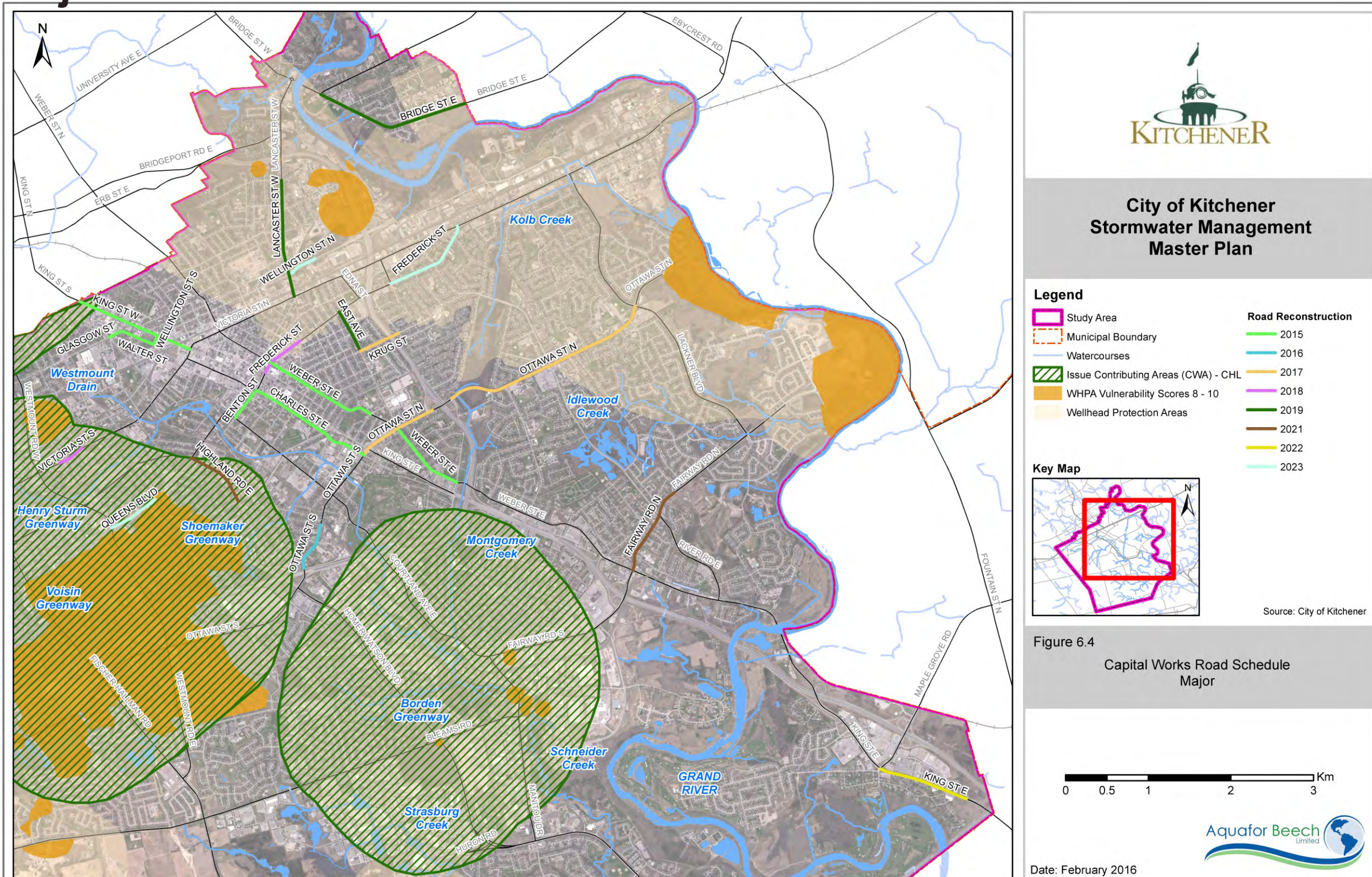


### Gzowski Lane, City of Kitchener



The implementation of the twenty-two (22) proposed laneway works would require an additional \$1.7 million or a savings of \$330,000

### Major Road Retrofits



### Admiral Road, City of Kitchener



The implementation of the One-Hundred Seven (107) proposed roadway works would require an additional \$1.9 to \$11.1 million in CAPITAL FUNDING up to 2024 for turf versus highly vegetated streetscaping options, respectively.



## - Stormwater Management Facilities - Planned Retrofits -

The map displays the Grand River watershed within the City of Waterloo. The watershed boundary is outlined in pink. Major roads shown include King St N, Bridge St N, Bridge St E, King St W, King St E, Victoria St N, Victoria St S, Ottawa St N, Ottawa St S, Weber St N, Weber St E, and others. Creeks and greenways are labeled in blue, including Meltzer Creek, Kolb Creek, Montgomery Creek, Henry Sturm Greenway, Voisin Greenway, and others. The map also shows surrounding municipalities: City of Waterloo, Township of Woolwich, City of Cambridge, Township of Wilmot, and Township of North Dumfries. A north arrow is located in the top right corner.



## Pond 4 - After

A wide-angle photograph of a pond, identified as Pond 4, after a restoration project. The foreground is dominated by a large area of white, rounded stones or gravel that forms a shoreline. To the right of the stones, there is a patch of green grass and yellow wildflowers. The pond itself is a calm body of water, reflecting the blue sky and the surrounding greenery. In the background, there are several trees, a white fence, and a large electrical transmission tower. The sky is a clear blue with a few wispy clouds. The overall scene suggests a well-maintained and restored natural area.



# City of Kitchener Integrated Stormwater Management Master Plan

## - Park Rehabilitation and SWM Enhancements -

In fulfillment of Schedule B Class EA requirements each location was evaluated using criteria under the primary categories of:

### Physical & Natural Environment

#### Criteria

Water Quality  
Stream Geomorphology  
Aquatic Habitat  
Fisheries  
Wildlife  
Groundwater Resources

### Economic Criteria

Capital Costs  
Operations & Maintenance Cost  
Lifecycle Costs  
Ability to coordinate with other projects

### Social & Cultural Criteria

Visual Aesthetics  
Recreational Opportunities  
Cultural/Heritage Resources  
Health & Safety

### Technical & Engineering Criteria

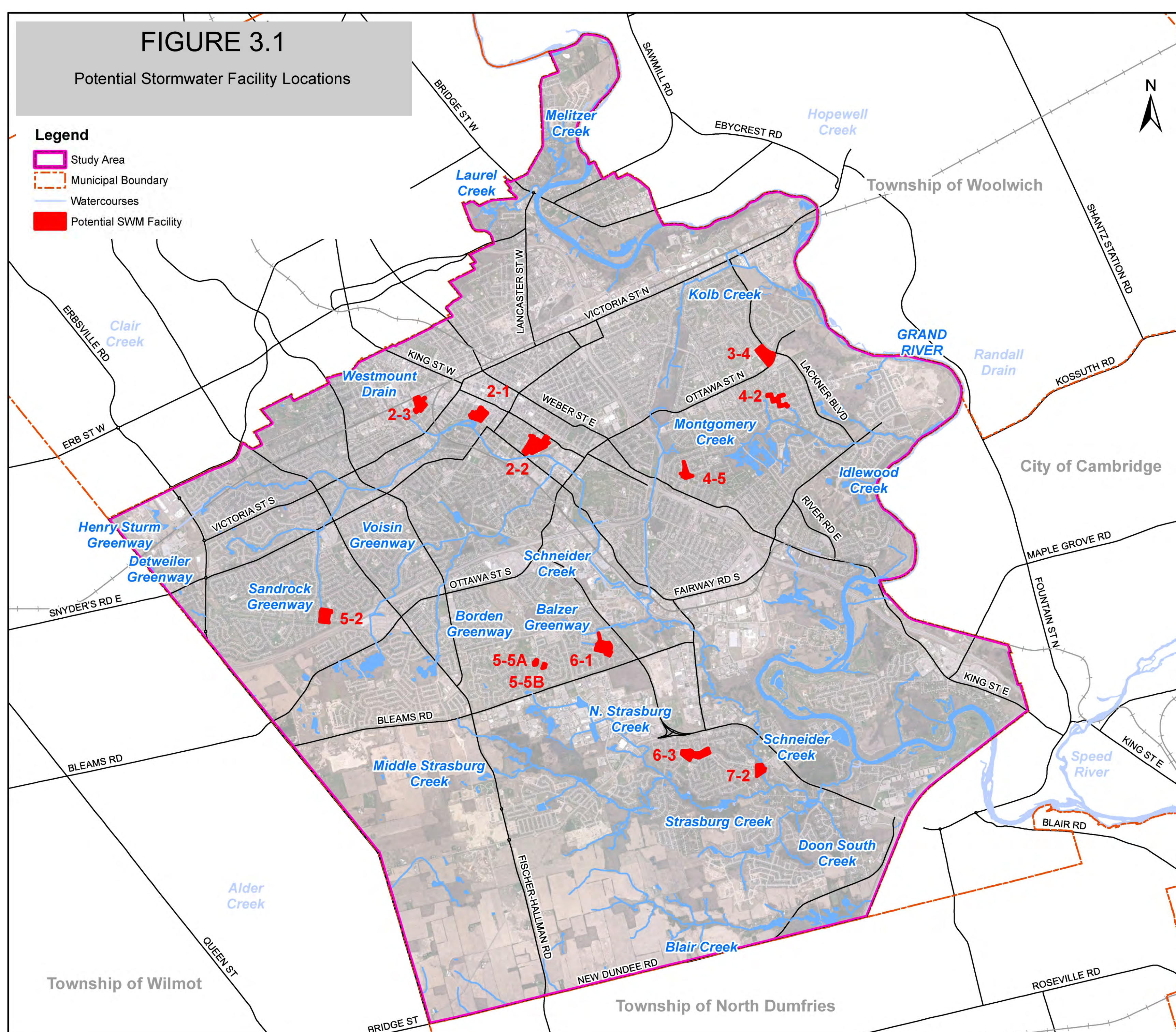
Flood Control  
Erosion Control  
Ease of Implementation  
Operations & Maintenance

A four (4) phase feasibility assessment was conducted to identify available areas to accommodate **new stormwater management facilities** in existing areas and in combination with park rehabilitations.

A total of 30 potential sites were screened, of which 12 were deemed feasible. In total, seven (7) sites were identified as surface facilities (ponds) and five (5) sites were identified as subsurface storage facilities.



Example of a New SWM Facility and Park Enhancements (Mississauga, ON)



### Twelve (12) Feasible Sites

- Cameron Height Pool & Kaufman Park (2-2)
  - Cherry Park (2-3)
  - Rosenberg Park (3-4)
  - Prospect Park (4-5)
- Sandrock Hydro Corridor (5-2)
  - Millwood Park (6-3)
  - Country Hill Park (6-1)
  - Biehn Park (7-2)
  - Victoria Park (2-1)
- Idlewood Greenway (4-2)
- Countryside Park (5-5A)
- Countryside Park (5-5B)

### NEXT STEPS

Prior to construction, the City will be undertaking the following steps over the coming years:

1. Allocating funding for future works over the next 15 years.
2. Obtaining necessary environmental approvals.
3. Undertaking public consultation for individual projects.
4. Develop detailed designs.



The implementation of the proposed SWM facility opportunities would cost \$22.9 – \$30.1 million with an additional \$3.7 – 7.4 million required for park rehabilitation. The implementation of the twelve opportunities and would increase the SWM control in the urban area in the City of Kitchener by an additional 478 ha (4.2%) to a total of 3,343 ha (29.4%).





# City of Kitchener Integrated Stormwater Management Master Plan

## - Stream System Understanding and Erosion -

### Description of Study

The purpose of the stream erosion assessment component was to document the physical health of Kitchener streams and to create an inventory of erosion sites that could potentially be addressed through creek-based restoration works. The methodology assessed the levels of risk and environmental opportunity. Where mitigation of erosion is not considered urgent, erosion sites are classified as stream restoration opportunities to be integrated into a system-wide prioritization and implementation plan. Stream restoration opportunities have also been evaluated within the context of the Ecological Restoration Areas identified within the City of Kitchener's Official Plan and with the recently approved Fish Habitat Banking arrangement with the Department of Fisheries and Oceans Canada.

### Examples of Existing Conditions

Example restoration reach and erosion site opportunities include locations of localized bank erosion and exposed infrastructure (Borden Creek); debris and failed engineering works in channels (Laurel Creek); and degraded concrete and trapezoidal channels (Shoemaker Creek).



Borden Creek  
Exposed Sewer



Laurel Creek  
Concrete Debris



Shoemaker Creek  
Concrete Channel

### Alternative Solutions and Evaluation Criteria

Alternative solutions have been assessed each of the primary stream restoration opportunities (erosion sites and restoration reaches). The preliminary alternative solutions evaluated in each case include "Do Nothing", "Local Works", "Reach Based Works", and "Removal of Risk".

In fulfilment of Schedule B Class EA requirements each location was evaluated using criteria under the primary categories of:

- 1) Physical/Natural Environment;
- 2) Social/Cultural Environment;
- 3) Economic Environment; and
- 4) Technical/Engineering Considerations.

### Evaluation Criteria

#### Physical & Natural Environment Criteria

- Potential Aquatic Habitat Benefit (Water Temperature)
- Potential Aquatic Habitat Benefit (Fish Passage)
- Potential to Reduce Erosion of Public Lands
- Potential to Reduce Erosion of Private Lands
- Potential to Reduce Stream bank and Stream bed Erosion
- Potential to Enhance Groundwater Regime
- Potential to Reduce Flooding
- Potential to Improve Terrestrial Habitat
- Integration with Existing Infrastructure
- Integration with Existing Environment

#### Technical & Engineering Criteria

- Ease of Implementation
- Agency Acceptance
- Policy/Bylaw Requirements
- Technical Feasibility

#### Economic Criteria

- Construction Costs
- Operations & Maintenance Cost
- Infrastructure Protection

#### Social & Cultural Criteria

- Aesthetic / Recreation
- Compatibility with Adjacent Land Use
- Community Disruption
- Public Health and Safety



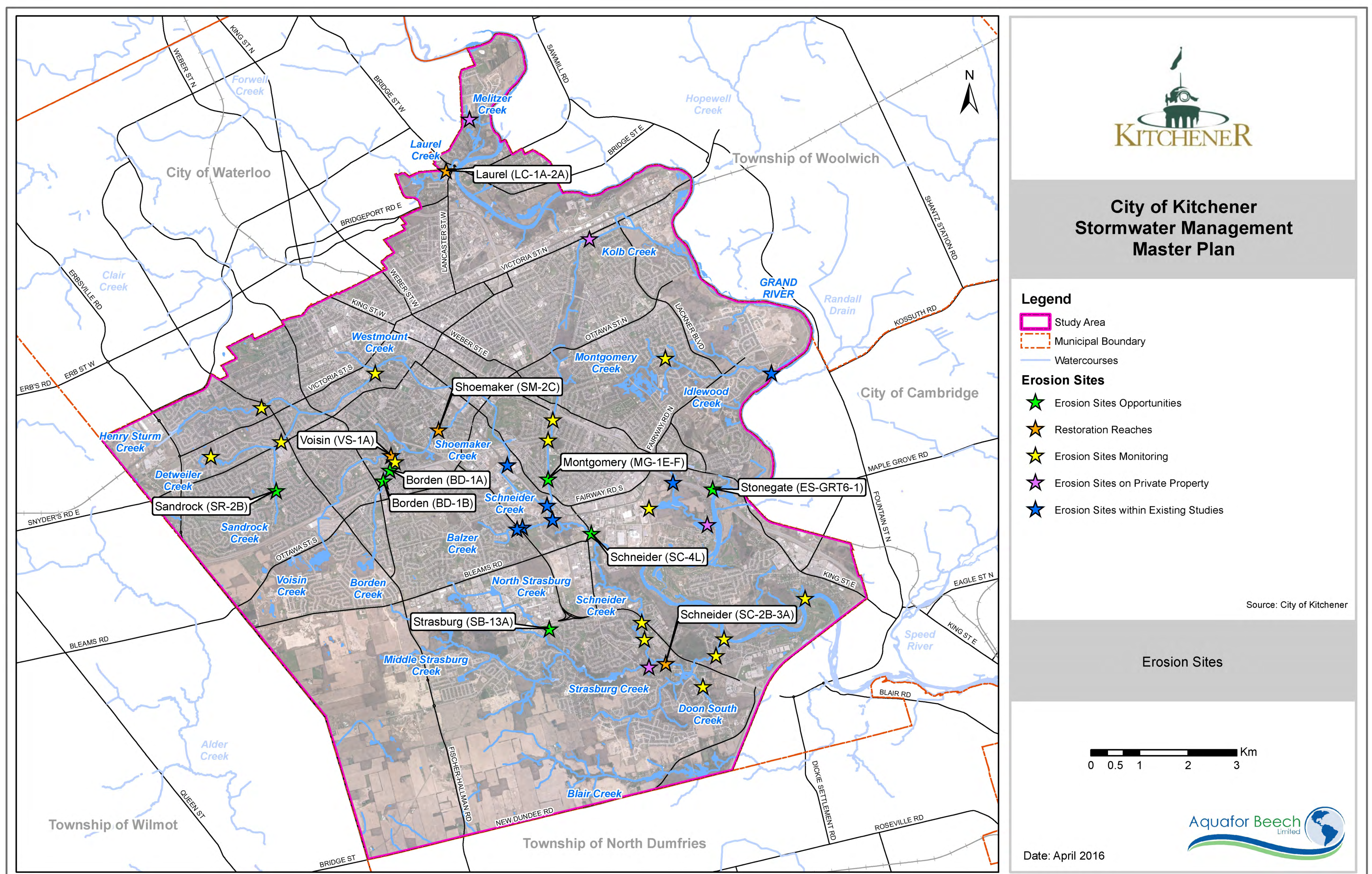


# City of Kitchener Integrated Stormwater Management Master Plan

## - Stream System Understanding and Erosion -

### Examples of Future Conditions

Mitigation of erosion issues and enhancement of stream habitat can be achieved through bioengineering of channel banks (“vegetated geogrid”); re-engineering channels constrained by infrastructure and property with natural substrates between vegetated armourstone banks; or rehabilitating natural channels within restored stream corridors (Filsinger Park). The figure below summarizes the location of identified erosion sites.



### Stream Restoration Estimated Costs

**Primary Stream Restoration Opportunities**  
Erosion Sites and Restoration Reaches  
**\$10–15 Million** in stream restoration projects

**Secondary Erosion Sites Opportunities**  
Recommended for Monitoring or Classified on Private Property  
**\$4–5 Million** in secondary projects that the City may consider when opportunities arise with other City projects, not including any associated costs for land rights on private property (not including stream restoration projects within existing studies)



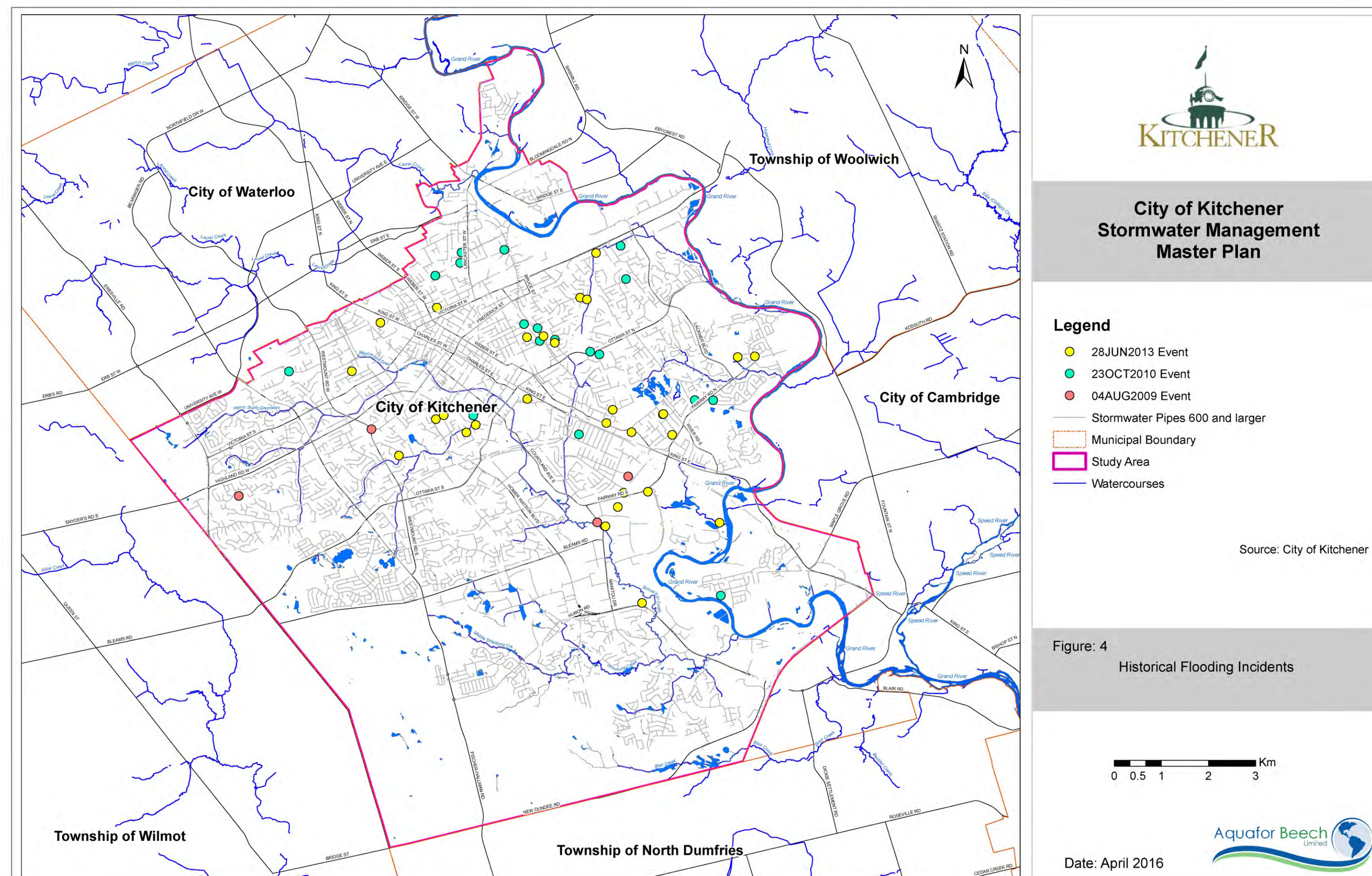
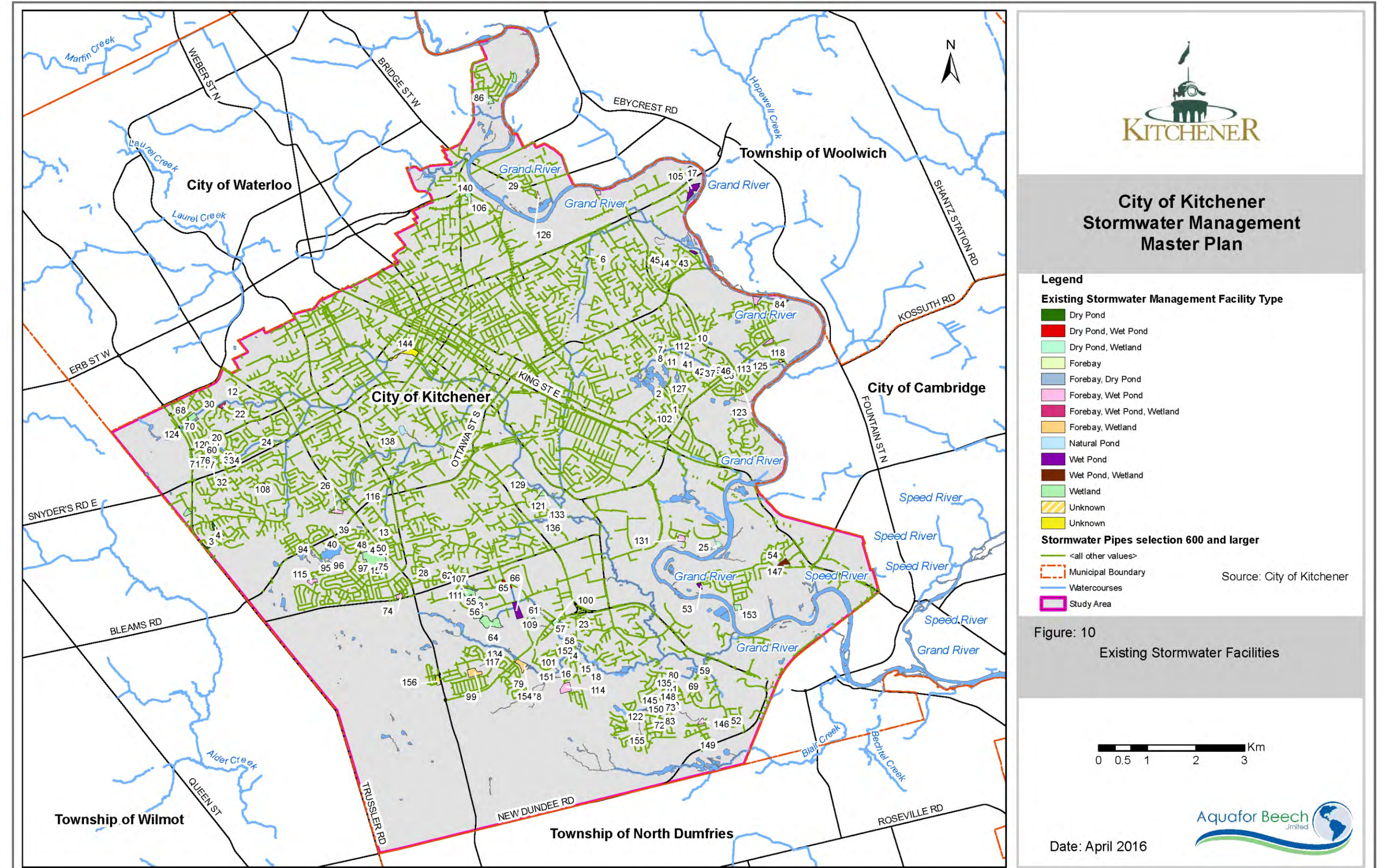
# City of Kitchener Integrated Stormwater Management Master Plan

## - Existing Conditions - Storm Sewer Infrastructure -

The objectives of the stormwater infrastructure component of the study are primarily to:

- Develop a storm trunk sewer network model, and
- Identify and assess the capacity of the existing stormwater management ponds

The accompanying figure illustrates the location of existing storm sewers (600mm or larger) that were included in the assessment as well as the stormwater management facilities.

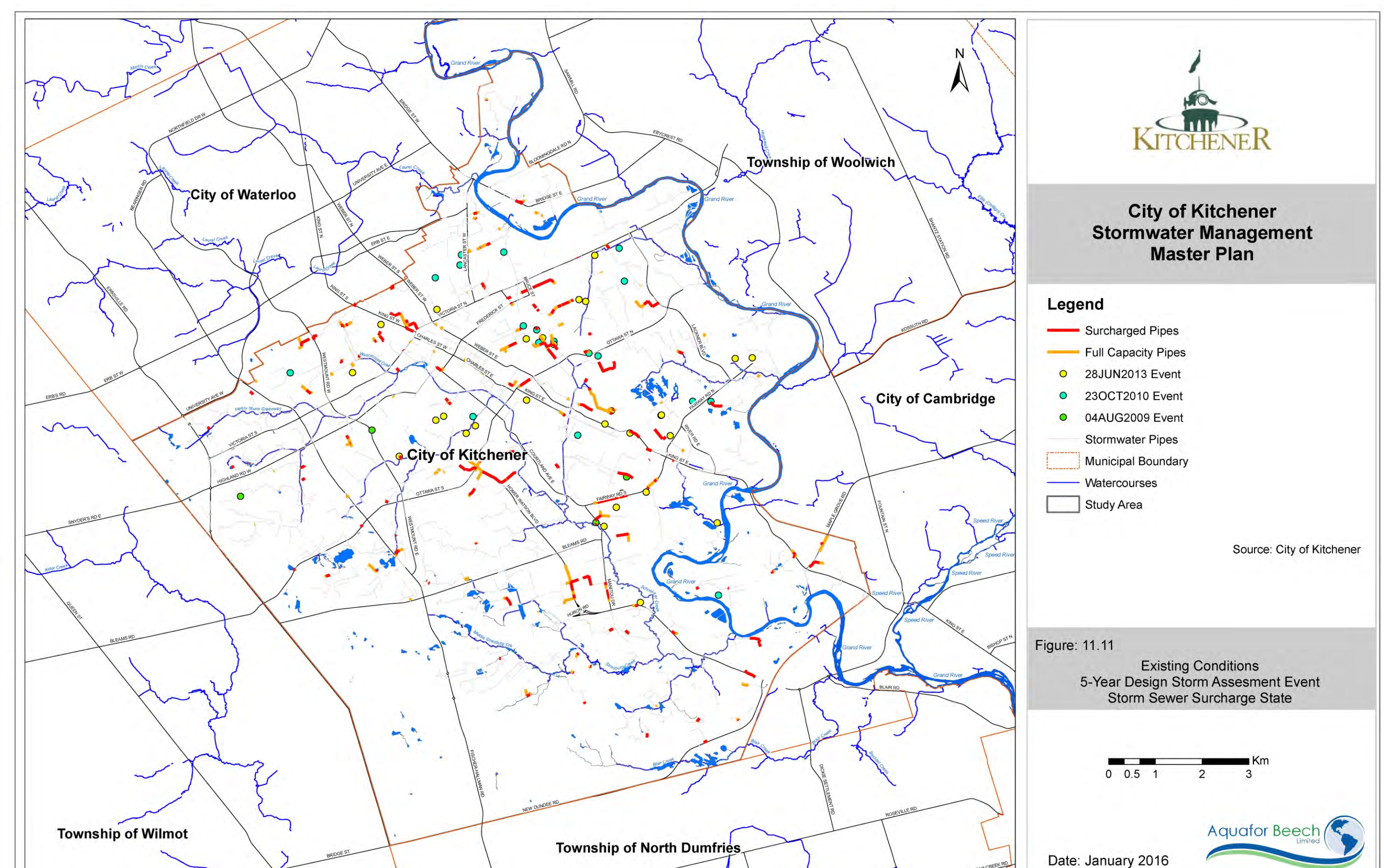


The accompanying figure illustrates the general location where basement or surface flooding has occurred since 2009. This study will primarily address flooding related to a lack of capacity in the storm sewer system (including stormwater ponds).



The accompanying figure illustrates the “level of service”, or storm sewer capacity, currently provided by each of the 6,000 existing storm sewers which are 600mm or larger.

Sewers designed to convey the 5 year design storm (rainfall event size) suggests that, on average, the capacity of the sewer will be exceeded every 5 years.





# City of Kitchener Integrated Stormwater Management Master Plan

## - Summary of Recommended Approach -

The recommended stormwater management approach for the City of Kitchener is comprised of a variety of practices, opportunities, and identified projects which aim to protect and where possible improve the local environment as well as better and more efficiently service the residents of Kitchener. The following summarizes the recommended approaches for future implementation within the various neighborhoods of the City.

### Pollution Prevention, Municipal Management and Operation Practices

Will ensure that pollutants are prevented from impacting the environment and that existing stormwater infrastructure maintain their effectiveness. Key elements of the recommended strategy include:

- Sediment removal from catch-basins
- Immediate maintenance of sixteen (16) Oil and Grit Separators and the continued maintenance of all OGS per the recommended schedule.



### Source Control and Market Strategies

Based on the results of the market-based research, the City intends to evaluate the opportunity to determine the appropriateness of a variety of incentives and programs to support and service those interested in improving stormwater management on their properties. Incentive approaches will be evaluated and appropriate methods will be detailed as part of the implementation plan to be developed in the coming months and tested using a series of pilot projects within priority watersheds. The goal will be to achieve a twenty percent (20%) uptake over a five year period, allowing the City to secure source-level SWM measures at just over 25% of non-residential properties by 2021.

### Conveyance Control and The Municipal Right-of-Way (ROW)

As part of capital road reconstruction projects until 2024 and per the established Infiltration Policy, the City intends to implement linear stormwater systems located within and adjacent to roadways to encourage infiltration of water into the ground, improve water quality and reduce runoff.



### Stormwater Management Facilities

To effectively manage the City's existing stormwater facilities and maintain their effectiveness, the city intends to:

- Retrofit of ten (10) previously identified Stormwater Management Facilities
- Remove sediment from 16 Dry facilities and 27 wet facilities
- Construct twelve (12) new stormwater facilities as part of park rehabilitations

### Stream System Understanding and Erosion

Following the stream erosion assessment and to improve the environmental form and function of the City watercourses the City intends to undertake the restoration of erosion sites and stream reaches on Stonegate Creek, Sandrock Creek, Montgomery Creek, Strasburg Creek and Borden as well as Laurel Creek, Shoemaker Creek, Voisin Creek and Schneider Creek respectively.



### Storm Sewer Infrastructure

Following the development of storm trunk sewer network model, and identification and assessment of the capacity of the existing stormwater management ponds, the City intends to expand the sewer network model in areas identified for future study to evaluate and select the preferred remedial approaches to improve the level of service.





# City of Kitchener Integrated Stormwater Management Master Plan

## - Next Steps & Contact Information -

### Stage 2 – Completion of the Master Plan

1. Undertake field activities (**completed**);
2. Complete social marketing research (**completed**);
3. Finalize the alternative stormwater measures and practices (**completed**);
4. Undertake an environmental evaluation and screening process to determine feasible alternatives and priority (**completed**);
5. Development of a short list of stormwater measures and practices (**completed**);
6. Present to public at public open house (**completed**);
7. Development and assessment of alternative strategies (**completed**);
8. Recommendation of stormwater management strategy measures (**completed**);
9. Community and Infrastructure Services Committee: May 30 2016; and,
10. Council: June 2016 followed by a thirty (30) day review and posting to the City's website.

### NEXT STEPS

#### Implementation

Over the coming months the City will be developing an implementation plan with supporting policies in accordance with the recommended approach. This separate document will prioritize the identified projects on a subwatershed basis based on the existing conditions and the opportunities for improvement.



**Please visit the Ideas Zone to share you ideas about implementation.**



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**Thank you for participating**

