Kanata West Overall Monitoring Plan

Background

On November 24, 2009 the Ministry of Environment advised the City of Ottawa (City) that the City and Kanata West Owner's Group (KWOG) had satisfied the requirements of Conditions 1 and 2 of the Minister's Order dated July 21, 2008. This clearance allowed the City and KWOG to make preparations to proceed to Condition 3 of the Minister's Order – revising and updating the Class EAs for the Carp River Restoration Project, the Master Servicing Study and the Transportation Master Plan. The Notice of Completion for these projects was posted on July 30, 2010. In response to the Notice of Completion, 88 Part II Order requests were received from local environmental groups, local community groups, and members of the public asking the City of Ottawa and Kanata West Owner's Group be required to prepare an individual environmental assessment for seven of the twenty-two disputed projects in the Kanata West *Transportation Master Plan Amendment*, the *Master Servicing Study* and the *Carp River, Poole Creek and Feedmill Creek Restoration* projects.

In its letter dated November 24, 2009 the Ministry requested that the City prepare and submit an Overall Monitoring Plan Report to the MOE's Ottawa District Office by April 1 of each year, with the first report submitted by April 1, 2010. Given the date of the letter and the winter season the first report largely reflected the commitments contained within the Kanata West Implementation Plan and a brief summary of the July 23-24, 2009 rainfall events. Annual results regarding stream flow and water level monitoring results will also be posted on the MVCA website. Additional flow monitors were installed in the spring of 2010 on Poole Creek and Maple Grove and Carp River at Maple Grove in accordance with the recommendations of the Third Party Review.

Minister of Environment Decision

On March 30, 2011 the City and KWOG were notified that the Minister of Environment had decided that an individual environmental assessment was not required for the seven projects. The Part II Order requests were denied and the following conditions were placed on the City and KWOG:

1) The City and KWOG shall implement all commitments made in the letter of October 15, 2009;

   a) Additional Stormwater Management Runoff Volume Controls and widening of Planned Restoration Corridor

   In response to Condition 1.1 of the Minister's Order, the City and KWOG committed to ensuring the provision of a worst case runoff volume identified in the Third Party Review – Carp River Restoration Plan through at source SWM controls of 120m³ per hectare of development until the SWM models are validated or until monitoring and/or model validation indicates changes are necessary; and including the

provision for 25% of the TPR worst case deficit volume be incorporated into the design of the Carp River, Poole Creek and Feedmill Creek Restoration project.

b) Municipal Planning Controls Regarding Floodplain Management

In response to Condition 1.2 of the Minister's Order, the City and KWOG committed to the application of municipal planning designations and controls with respect to floodplain policies as set out in the City's letter dated October 15, 2009 and in the I*mplementation Plan Kanata West Development Area* (*Implementation Plan*).

c) SWM Model Validation and Contingency Plan

In response to Condition 2.1 of the Minister's Order concerning Water Level and Flow Modeling Data, the City and KWOG committed to completing the validation of the SWM modeling, which includes the preparation of a Model Validation report and the implementation of a contingency plan, as outlined in the *Implementation Plan*.

d) Water Level and Flow Rate Monitoring Plan

In response to Condition 2.2 of the Minister's Order concerning Water Level and Flow Rate Monitoring Plan, the City and KWOG committed to implementing a long-term Water Level and Stream Flow Monitoring Program, as set out in the Implementation Plan.

e) Development Phasing Plan, Restoration Project Phasing and Interim Development

In response to Condition 2.3 of the Minister's Order concerning the Development Phasing Plan relating to SWM, the City and KWOG committed to:

1. Adhering to development thresholds as specified in Table 1 of the *Implementation Plan;*
2. Commencing the Restoration Project within 24 months of Class EA approval as per the *Implementation Plan*;
3. Ensuring that each development application submitted to the City demonstrates through an interim analysis that any incremental changes to the floodplain/SWM Pond design will not increase water levels upstream or downstream in accordance with the *Implementation Plan*; and
4. Phasing of the Restoration Project and development in such a manner that there will be no reduction in available flood storage capacity of the corridor as set out in the *Implementation Plan* and the City's response letter dated October 15, 2009.

f) Kanata West Overall Monitoring Plan and Report

With respect to Condition 2.3 of the Minister's Order the City and KWOG committed to providing an Overall Monitoring Plan as specified in the

Implementation Plan that tracks and reports on all aspects of the servicing of the development area including the following:

1. The various monitoring programs contained in the *Implementation Plan*;
2. The status and Progress of development including conformance with the Development Phasing Plan;
3. The application of SWM controls and performance;
4. The results of all model validation efforts;
5. Construction phasing and progress on the Restoration Project;
6. Any contingency and adaptive management measures.

The City and KWOG have committed to preparing the overall Monitoring Plan report on an annual basis that will be submitted to the MOE on April 1st of each year and made available to the public and other review agencies. This report represents the third annual report the first having been submitted on April 1, 2010.

Model Validation Report

Initially the monitoring program stream flow and/or water levels will be assessed to validate the hydrologic and hydraulic models of existing/baseline conditions. Minor changes in land use data may occur in the model, depending on the pace of development, so that comparison of monitoring and modeling results are valid. Annual results regarding stream flow and water level monitoring results will be posted on the MVC website.

The Third Party Review has suggested one or two meaningful events plus smaller events can be used to validate the model of record. Meaningful events have been described as greater than 25 mm of rainfall within a two to six hour time period. The impact of such an event may also be tempered by the antecedent moisture conditions prior to the event as well.

A rainfall event on July 24, 2009 provided an opportunity to collect data for the Carp River. This monitoring undertaken includes water level data and will be used towards the development of rating curves for the purposes of model validation. City radar imagery was utilized and validated by five City rainfall gauges in the watershed. Water level information from one flow monitor has been provided by the MVC to the City for assessment within the model recognizing that rating curves are required prior to the event being used for validation. High-water marks were staked and surveyed in the field and are being input into the model. Two additional flow monitors were installed on Poole Creek and Maple Grove and Carp River at Maple Grove consistent with the recommendations of the Third Party Review. This event and subsequent rainfalls will be monitored and utilized by the City for validation purposes. Ultimate validation assessment will have to ensure and document that the monitored data received is sufficient and adequate for validation.

Since the completion of the Third Party Review the model has been updated with new/active developments. New stormwater management facilities have been updated from those in the original model. These and other updates will occur on an ongoing basis as part of the Model Keeper role.

Condition 2 of the Minister's Decision of March 30, 2010 also indicated that the City and KWOG not implement SWM Ponds 1, 2, or 5 until such time as the City and KWOG have calibrated and validated the SWM models for the Upper Carp River watershed and prepared the associated Model Validation Report referenced in Condition 1.

In the event that the Model Validation Report identifies significant differences between the observed and simulated results that cannot be rationalized, Condition 3 of the Minister's decision requires the City and KWOG to implement the Contingency Plan (as required by Condition 1) and re-evaluate and determine the impact these changes may have on the *KWMSS* and the *Restoration Plan*.

Since the April 2010 report an adequate number of additional rainfall events were monitored in 2010 such that a Model Validation report has been finalized. The report reviews the monitoring data that has been collected over the past two years and specifically addresses:

- Whether this data is sufficient to augment the original model calibration efforts and:
- Whether the adjusted calibrated models can validate the conditions being measured during subsequent events.

The report was finalized and reviewed by Conservation Authority and the City of Ottawa. The final version of this report dated July 13, 2011 was submitted to the Ministry of Environment and posted on the City's website in August 2011(http://ottawa.ca/en/residents/water-and-environment/air-land-and-water/carp-river-model-calibration-validation-exercise)

Stormwater Management Monitoring

The City provides on-going monitoring of stormwater management facilities for suspended solids, phosphorous, and temperature (if required by the classification of the receiver). Visual inspections of SWM facilities occur after each large event (15 mm or greater) and debris is removed as necessary to ensure proper functioning of the facility. Routine inspections of inlets/outlets and the depth of sediment are carried out at the same time.

Construction inspection staff regularly checks these facilities prior to the City assuming the facilities after 80% build-out and identify any remedial measures required to be implemented by the developer to ensure the protection of the receiving stream. An operation and maintenance manual must be prepared and provided to the City prior to assumption of the facility.

The following represents a standardized SWM monitoring program for the Kanata West Area:

Monitoring Program:

1. The stormwater monitoring program shall be implemented for a minimum of two years and shall continue to be implemented until such time that the MOE's Ottawa District Office provides written notice that the program may be discontinued;

2. Monitoring will be provided during the period between May 1st and October 31st for water quality and water level as well as general performance. Water quality would be established for both baseflow and rainfall event conditions;

3. Routine operational inspections would be conducted over the life of the facility, to confirm: general site conditions (erosion/landscaping); ensure monitoring equipment is functioning appropriately; and that orifices and weirs are not clogged with debris. Routine cleaning of any blockages would be done during the inspections, if required;

4. Pond water levels would be monitored to determine drawdown characteristics of the facility (typically 24 - 48 hours). No flow monitoring is proposed in this program;

5. Water quality samples would consist of composite samples (collected utilizing automated equipment or by grab sampling) taken at the facility inlet and outlet during/after specified rainfall events. The routine inspection would typically be conducted coincident with sample collection activities;

6. Water quality parameters would include the Total Suspended Solids (TSS) and Total Phosphorous (TP) and Water Temperature (spot measurement);

7. The sample collection, preservation, handling and analytical methods including detection limits, would be documented. Sample analysis to be conducted per Standard Methods or approved equivalent at a CALA certified laboratory. Field and lab QA/QC procedures would reflect standard sampling protocols (i.e. samples delivered within 12 hours to lab following collection);

8. Provide monitoring (sampling, water levels) during the following events over a two year period to ensure that the facility is performing as designed:

    - Two small rainfall events (less than 7mm)
    - Two medium rainfall events (7-15mm)
    - Three large rainfall events (greater than 15mm)

9. The requirement is for a minimum of the 7 noted events of the size specified. Monitoring activities would typically capture a number of other events during the process, as the amount of rainfall from an event is not predictable in advance. All events that are monitored/sampled are to be reported in the annual reports. The sampling of all the events within a one year period, although possible, is not acceptable as the intent is a two year program;

10. Rainfall measurements should be obtained from the nearest available City of Ottawa rain gauge(s) to the facility;

11. A topographic/bathymetric survey should be undertaken after 3-5 years of operation to determine sediment deposition and sediment deposition rates. This would allow for more concise forecast of forebay cleanout frequency; either confirming or revising the frequency in final SWM report.

Annual Stormwater Monitoring Report

The Annual Stormwater monitoring report shall be prepared and submitted to the District Manager, Ottawa District Office of MOE within six months following the end of the monitoring period. The Annual Stormwater Monitoring Report shall be provided to the City of Ottawa's Planning and Growth Management Department so that the City can review and include results in its annual Overall Monitoring Report in accordance with the *Implementation Plan Kanata West Development Area*; the Report is to contain the following:

a) A description of the physical works, its location, and how it is designed to function;

b) A tabulation, interpretation and summary of all monitoring data with an assessment of the performance of the facility based on TSS removal including comparison of the water quality data with applicable criteria such as the Provincial Water Quality Objectives (PWQO's);

c) An evaluation of the pond's performance and its ability to meet the design performance criteria of 70% TSS removal (during the monitoring period) and ability to achieve an appropriate draw down time (24 – 48 hours);

d) A description of any operating problems encountered and corrective actions taken during the reporting period and the need for further investigation in the following reporting period for pond refinements or ways of improving the performance of the facility to meet the performance target;

e) Any need for modifications of the monitoring program and/or the work plan;

f) A summary of any complaints received during the reporting period and any steps taken to address the complaints;

g) Appendices of inspection logs and facility photos;

h) Any other information that is deemed to have been obtained by the Owner pursuant to the requirements of the Certificate of Approval that the MOE District Manager requires for inclusion in the reports.

Monitoring for Interim Stormwater Management Facilities

SWMP monitoring requirements for each facility will be identified in the Ministry of the Environment's Certificate of Approval for each facility. The City of Ottawa and the Mississippi Valley Conservation Authority (MVC) requires a comprehensive monitoring program to ensure the Carp River, Poole Creek and Feedmill Creek restoration project and preferred stormwater management solutions identified in the Master Servicing Plan operate and perform to the specifications and standards described in the Class Environmental Assessment documents.

Stream flow monitoring will form an important component of the monitoring program. The City and the MVC are committed to implementing a long-term stream flow monitoring program for the Upper Carp River Watershed. The program will support the mandate of the MVCA, including flood forecasting. It will also be utilized, by the City of Ottawa to confirm the current hydrologic and hydraulic models that have been developed for the Upper Carp River Watershed. The current models contain stormwater management proposals, including at source, stormwater management ponds and conveyance systems that meet the water management objectives of the City of Ottawa, the MVC, MNR, MOE and MTO. The City, along with MVCA and provincial agencies, has a vested interest in ensuring water management objectives for the Carp River system is met.

The following additional requirements for interim SWM facilities shall be provided in addition to the above Stormwater Management Monitoring Program requirements:

- The stormwater monitoring program shall be implemented for a minimum of two years and shall continue to be implemented until such time that the Ministry of Environment provides written notice that the program may be discontinued;
- An annual stormwater monitoring report shall be prepared and submitted to the Ministry of Environment (Ottawa District Office) than March 31st of each and every year. The annual reports shall cover the monitoring period for the previous year,
- The annual monitoring reports and associated data are also to be provided to the City of Ottawa, so that the municipality can review and include the results in its

annual Overall Monitoring Report in accordance with the *Implementation Plan* for the Kanata West Development Area; and

- All annual monitoring reports shall include the following additional information for the reporting period
    - an estimate of baseflow from the facility;
    - an estimate of the percentage of build out for the contributing drainage area of the facility; and
    - A description of any considerations that may need to be implemented upon transition and/or decommissioning of the interim facility once an ultimate SWM facility is provided.

Stream Flow and Fisheries Monitoring

The City of Ottawa is undertaking a comprehensive monitoring program to ensure the Carp River, Poole Creek and Feedmill Creek restoration projects operate and perform to the specifications and standards described in the Class Environmental Assessment documents. An integrated monitoring program has been developed and implemented that will include but not be limited to:

- Semi-annual fisheries and terrestrial monitoring/reporting to DFO
- Stream Flow monitoring

Semi-annual fisheries and terrestrial monitoring/reporting to DFO

This monitoring will include assessment of erosion and deposition through the system as well as any erosion/scour at major crossings including 417. Observations will be documented with field measurements and photos depicting the stabilization process of the restoration features. In the event that specific areas demonstrate the need for remedial action, repair or restoration will be made accordingly. The reports would be circulated to other agencies as required. Two kinds of monitoring of the aquatic environment are particularly relevant:

(1) Construction monitoring to ensure that the new channel and ponds are constructed as per specifications; and

(2) Post-construction monitoring to determine whether the newly constructed channels and ponds have indeed improved aquatic habitats.

Construction monitoring of the fish habitat compensations will be carried out to demonstrate that proposed activities have been implemented.

- Biologists, environmental inspectors, or experienced contractors will inspect the compensation works during and after completion and will collect photographic evidence to show that the works were completed as agreed upon in the plan and for the purpose of an authorization under Section 35 of the *Fisheries Act*.

Sediment and erosion control measures will be inspected regularly and maintained in proper working order until all areas are fully stabilized.

The City of Ottawa currently monitors water quality, fish and benthic invertebrates in the Carp River system on a frequent basis, and it is anticipated that the City will continue to do so following construction.

- Monitoring will be conducted in years 1 and 2 after full construction, then at 2 year intervals until the system is demonstrated to be stabilized. The information gained from this monitoring will be useful for determining the success of the plan, and may provide insight for future restoration activities in the Carp River and elsewhere.
- Monitoring will include indicators of the physical and chemical environment, as well as of the biological responses (fish and benthos).

During years 1 and 2 (Post Construction), the stability of the banks, and streambed will be assessed and any features that are determined to not be functioning as intended will be corrected. Additional plantings and/or seeding will be applied where the establishment of vegetation is insufficient to meet soil stability.

Streamflow velocity, water quality (pH, dissolved oxygen, total suspended solids, conductivity, copper, hardness, and total and unionized ammonia, TKN, and phosphorus) will be recorded on a seasonal basis (spring, summer, and fall). Temperature loggers will be installed to collect continuous data through the summer months. Benthos sampling will be completed annually, in late summer, and measurements of abundance and diversity will be calculated for temporal comparisons. Electro fishing will be carried out following a standardized protocol (e.g., OSAP as per Stanfield et al., 2000) so that the data are comparable to preconstruction data.

In addition to the monitoring described herein, the Third Party Review recommends the collection of in-stream sediment samples during the construction phases of the Restoration Plan. To augment the data being collected and assess local impacts, additional samples could also be collected downstream of the Huntley Creek confluence. By including this downstream location, all sampling would help qualify the upper Carp River impacts downstream. This data could also be used to augment any future databases for the Carp River.

Monitoring reports content and frequency will be determined by DFO but may include:

- A photographic record showing the areas where compensation measures took place. The photographic record will include hard copies of digital photographs documenting the site before, during, and after construction, and once a year for the extent of the monitoring plan. The photographs will be taken from similar vantage points for ease of comparison. Electronic copies of the digital photos will be made available to Fisheries and Oceans Canada if required;
- Summaries of the data collected in tabular form for ease of comparison over time; and
- Recommendations for changes and/or improvements to the monitoring plan or the monitoring methods.

Stream Flow monitoring

The City and the MVCA are committed to implementing a long-term streamflow monitoring program for the Upper Carp River Watershed. The program will support the mandate of the MVCA, including flood forecasting and warning. Annual results will be posted on the MVCA website.

Continuous monitoring of water level and streamflow (year round) will occur at three locations in the Upper Carp River Watershed including the Carp River and Poole Creek.

- Carp River at Richardson Side Road
- Carp River at Maple Grove Road
- Poole Creek at Maple Grove Road

All of these streamflow monitoring stations are permanent gauges as part of the ongoing MVCA long-term monitoring program. Water level data is currently being collected and stage-discharge rating curves are being developed for each location. The Carp River gauges closely relate to flows at MTO's 417 bridge structure. Gauges located at Richardson Side Road and two on Maple Grove Road (one at the Carp and one at the Poole crossing) will provide appropriate information as the flows from Feedmill are intermittent and can be inferred from the other locations. Palladium Drive was also considered as a replacement for Maple Grove Road location at the Carp River which would not be affected by the future changes to Maple Grove but not selected by the MVC for access and safety reasons. The results from the streamflow monitoring will be provided in the Model Validation report expected to be submitted in late spring 2011.

Enhanced Mitigation

The results of the Fisheries / Terrestrial and Stream Flow monitoring will be used by the City of Ottawa to indicate where enhanced mitigation measures would be beneficial. These measures could include:

- Oil grit separators, bio-retention filters or other technologies for addressing specific types of contaminants in runoff for land uses where these contaminants likely originate
- Increases in downstream flow efficiency
- Corridor widening
- On-site control continuation following model validation
- Modifications to fish habitats
- Increased riparian plantings

These adaptive management measures will be implemented in the event that future calibrated/validated models indicate higher water levels than the current model.

The City of Ottawa's Water Environment Protection Program provides up to date information on the condition of Ottawa's surface water resources. As far as existing monitoring sites within Kanata West the City have the following in the Baseline program:

- Carp River @ Richardson Side Rd - water quality data for 10 years;
- Carp River @ Huntmar - baseflow in 2009; to be added for biological monitoring in 2010;
- Poole Creek upstream of Stittsville - baseflow in 2009; added as part of expanded program in 2010 for water quality and biological; fish community information since 2005; and
- Feedmill Creek – stream habitat assessment completed in 2004 for three areas between the Carp River and Highway 417 (includes habitat, fish and benthos community, thermal stability information).

The City has initiated further monitoring of the aquatic environment in the vicinity of the restoration efforts on the Carp River, Feedmill Creek and Poole Creek to determine restoration effectiveness. Key concepts of the Project Outline include:

- Quantitative assessments to determine restoration effectiveness;
- Pre-construction monitoring to document condition of aquatic indicators before restoration and develop restoration effectiveness criteria
- Post construction monitoring to document condition of aquatic indicators after restoration for comparison to criteria; and
- Post-monitoring analysis to determine changes in aquatic indicators and level of restoration effectiveness.

Fieldwork commenced in June 2010 and was completed by the end of October. Fish habitat assessments, benthos community assessments, fish community sampling and assessment were carried out as well as water chemistry sampling and water temperature monitoring. Field work for 2011 was also undertaken and the results of the 2011 work program are also provided on the City's website. Additional information on the City's Baseline Water Quality Monitoring Program can be found at the following link:

ottawa.ca/calendar/ottawa/citycouncil/pec/2007/08-28/ACS2007-PWS-UTL-0014%20-%20ENG.htm

Water Demand Monitoring

A regular water demand monitoring program will be required to accurately identify the timing of the construction of upgrades to the sub-pressure zones. All infrastructure will be included in the City infrastructure management program. Infrastructure under developer warranty will not be included in this program.

The watermains are associated with the area arterial and collector roadway construction and watermain looping needs to service adjacent and proposed development. The timing of the proposed transmission watermains is subject to the timing of the local developments they serve and the construction timing of the transportation network. Looping of the watermain is required in the lands south of the 417 at 1000 units and north of the 417 at 500 units. Prior to approval of a development application containing the 1000th unit the developer(s) will submit for approval, the design and construction

schedule for watermain looping. It is recommended that the representatives of the KWOG attend development meetings prior to Draft approval of each application to work with developers and the City to assess the level of development and schedule for implementation of these ultimate watermains prior to the Building permit issuance of the 1000th unit.

Sanitary Monitoring

A regular flow monitoring program will be performed by the City to accurately identify the timing of the various upgrades to the Signature Ridge Pumping Station (SRPS) required to facilitate the development of Area “A” (Kanata West Master Servicing Plan - MSS). The hydraulic analysis in Master Servicing Study uses current City design guidelines to demonstrate that Phase IA can build out within the design capacity of the upgraded SRPS. Detailed design has been completed for a minor upgrade including overflow for the Signature Ridge Pump Station which will be constructed in 2013.

Area “B” as shown on the MSS includes the area within Kanata West which will be tributary to the new pumping station to be built on Maple Grove Road west of the Carp River. This pumping station will drain to the Stittsville Collector Sewer on an interim basis via a temporary forcemain in Maple Grove Road, Huntmar Road and Iber Road. All of Area “B” will not be able to be tributary to the Stittsville Collector on an interim basis and a regular flow monitoring program is required to determine the exact amount of development which will be allowed into the Stittsville system on an interim basis.

A regular flow monitoring program is in place for the Stittsville system to accurately identify development needs and capacity use.

The new Kanata West Pump Station and associated forcemains and overflow are currently under design with construction scheduled to occur between 2013 and 2015.

Development – Timing and Phasing

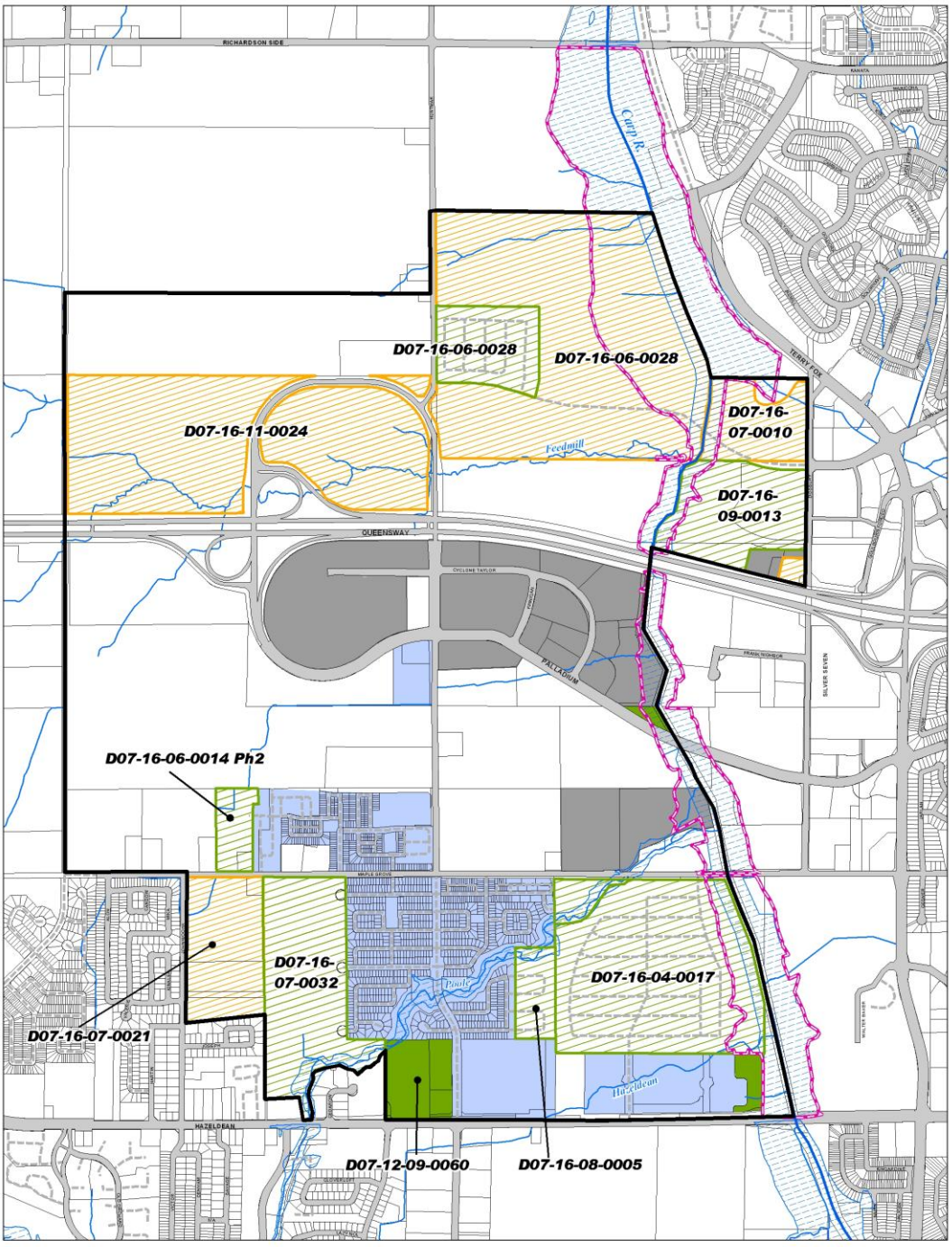
As of April 1 2012, a limited amount of development within Kanata West has started. Figure 1 illustrates the status of developments in Kanata West. Describe MAP. Given the uncertain status of the Kanata West EAs until the Minister’s decision of March 30, 2011, and based on existing sanitary sewer capacity constraints and significant land and SWM ponds tied to the Carp River Restoration there has been very limited development in the Kanata West area to date.

The Kanata West Area is comprised of approximately 722 hectares of land. A total of approximately 73 hectares of land represents “existing development” (i.e. Scotiabank Place, Palladium Auto Park, Maple Grove Works Yards, and the Bridge Church). A total of 83.3 hectares is made up of constructed or registered residential lots including the retail area long Hazeldean Road and the Fairwinds North and South subdivisions along Maple Grove Road. An additional 9 hectares of land along Hazeldean Road has been approved but not yet constructed. In terms of constructed, registered and ready to

develop land, a total of 92 hectares exists in Kanata West which represents approximately 13% of the total land area. In addition a further 109 hectares of residential land has been draft approved. Much of this land cannot be developed until the Kanata West Pump Station has been commissioned or the Carp River Restoration Project has been completed. In terms of draft approved and registered lands a total of 201.4 hectares exists within Kanata West representing 28% of the total land area in Kanata West.

Applications have been received for a further 158 hectares of land for which approvals have not been granted and final approval/construction will be some time based on servicing constraints (Sanitary Pump Stations, SWM ponds).

Figure 1



http://ottawa.ca/en/residents/water-and-environment/carp-river-watershedsubwatershed-study

Thresholds

The Third Party Review identified a worst case volume of runoff that should be accommodated in advance of the models being validated with monitored results. The volume was prorated to around 100 to 120 m^3/ha of new development. To address this scenario in the absence of model validation, at-source controls were initially implemented to the limited number of developments that proceeded in advance of model validation.

The Third Party Review had identified a threshold development that can proceed prior to the completion of the restoration plan. The following scenarios in Table 1 for build out were considered:

Table 1: Threshold Summary
% of Kanata West and Fernbank*
Development Permitted Conditions

34%	With no Carp River restoration, no monitored data to validate model and no other measures taken to compensate for deficit volume
53.6%	With Carp River restoration completed but no other measures to compensate for deficit volume
65%	With no Carp River restoration and no monitored data to validate model, an additional 85,600m^3 of storage to be provided on a pro rata basis by development within Kanata West or through other areas with the drainage area
100%	The restoration plan for the Carp River to be completed and constructed and either of a) the model to be validated; or b) the additional 85,600m^3 of storage to be provided within Kanata West.

* Reference to Fernbank only relates to the portion of the Fernbank Community Design Plan area which contributes to the Carp River. The Fernbank development area is located adjacent to Kanata West on the south side of Hazeldean Road.

The above assumption in the Third Party Review was applied as a very conservative approach. The *Model Validation Report* has confirmed that that these additional storage volumes are not required. The calibrated model indicates lower water levels. The 1983 MVC water elevation has been applied to provide an additional level of protection that will meet the City's requirements for the maximum volume in the corridor at any time. Further information can be obtained in the *Model Validation Report.*

Status of EA Projects

There were 22 projects approved through the three Environmental Assessment Studies, seven of which were subject to Part II Order requests in response to the June 2006 Notice of Completion. The other 15 were deemed to be approved and could proceed to

construction in accordance with the Class EA process. In July of 2010 a new Notice of Completion was filed for the 7 disputed projects and the four roadway projects that had not as of yet commenced. On March 30, 2011 the Minister of Environment issued a decision dismissing the subsequent Part II Order requests to the July 2011 Notice of Completion. Table 1 lists the 22 projects, provides an indication of their current status and when the deadline for commencement of the project is based on the date of the corresponding Environmental Assessment Process (10 years from 2006 or 2011).

TABLE 1

Project	Implementation Status	Deadline for Project Commencement before EA Update Required
Master Servicing Study		
Water Projects		
Watermains in Huntmar Road Extension from Halzeldean Road to Maple Grove Rd.	Watermain in Huntmar Road constructed	N/A construction started
Watermains in Huntmar Road Widening from Maple Grove Road to Campeau Drive	Not started	2016
Watermains in Campeau Drive from Didsbury Road to North South Arterial	Detailed design underway – between Didsbury and Huntmar construction scheduled early 2013	2016
Watermain in Maple Grove Road from Stittsville Main Street to Terry Fox Drive	Watermain in Maple Grove Road partially constructed	N/A construction started
Watermains in North-South Arterial from Hazeldean Road to Campeau Drive Extension	Not started	2016
Watermains in Stittsville Main Street Extension from Maple Grove Road to Palladium Drive	Not started	2016
Stormwater Projects		
Stormwater Management Pond # 1 and associated storm sewers	Not started	2021
Stormwater Management Pond # 2 and associated storm sewers	Not started	2021
Stormwater Management Pond # 3 and associated storm sewers	Design Started	2016
Stormwater Management Pond # 4 and associated storm sewers	Partial trunk storm sewer along Maple Grove constructed	N/A construction started
Stormwater Management Pond # 5 and associated storm sewers	Design Started	2021
Stormwater Management Pond # 6 and associated storm sewers	Design Started	2016
Stormwater Management Pond # 7 and associated storm sewers	Not started	2016

Sanitary Projects		
Signature Ridge Pump Station Upgrade and associated gravity sanitary sewers	Detailed design underway for minor upgrade and overflow Detailed design underway for sanitary sewers – construction commencement scheduled 2013	2021
Kanata West Pumping Station and associated gravity sanitary sewers - Permanent Twinned Force main to the Tri Party Collector - Trunk Sanitary from Silver Seven, & along Carp River between Maple Grove Road and Palladium Drive	Detailed design underway – to be tendered in 2013. Construction 2013-15. Part of Sanitary Trunk to the Kanata West Pump Station constructed	N/A construction started
Transportation Master Plan		
Huntmar Road Extension from Halzeldean Road to Maple Grove Road	Construction Complete	N/A construction completed
Campeau Drive from Didsbury Road to North-South Arterial	Detailed design underway – partial construction commencement scheduled 2013	2016
Huntmar Road Widening from Maple Grove Road to Campeau Drive	Not started	2021
Maple Grove Road Widening from west of Huntmar Road to Terry Fox Drive	Not started	2021
North-South Arterial from Hazeldean Road to Campeau Drive Extension	Not started	2021
Stittsville Main Street Extension from Maple Grove Road to North-South Arterial	Not started	2021
Transitway	Transitway EA completed	N/A no expiry for TPAP
Carp River, Poole Creek and Feedmill Creek Restoration		
Carp River, Poole Creek and Feedmill Creek Restoration	Detailed Design underway – project to commence by March 30, 2013	2021

Timing of Annual Report

This reporting will occur on an annual basis (April 1st). The report will be sent to the local MOE office and posted on the City's website at the following link:

http://ottawa.ca/en/residents/water-and-environment/carp-river-watershedsubwatershed-study