

9.0 Conclusions and Recommendations

This report should provide the National Capital Commission with the tools it requires to make informed policy decisions on potential flood control or erosion prevention measures, a watercourse management plan on recommended maintenance and stream corridor restoration works, and an estimate of appropriate costs along with recommended method of collect back from the landowners within the watershed.

9.1 IMMEDIATE NEEDS

The following immediate needs can be identified at this point:

9.1.1 Drain Maintenance and Improvements

As noted, the Carling Ave culvert needs replacement, there are several obstructions along the drain, erosion of tile drains are a problem and there is a need for general maintenance of the Drain.

To deal with this work and perhaps improve the drain, the NCC Greenbelt Authority should request the City for a drainage improvement under Section 78 of the Act.

9.1.2 Current Development Proposals in the Kizzel Drain Watershed

The KNL developments are pursuing subdivision approvals for lands tributary to the Kizzel Drain. In reviewing the conditions to development, the water management requirements of the 1999 Shirley's Brook and Watts Creek Sub-watershed Study by Dillon, should be applied to the extent possible and practical.

In the context of the Water Management Strategy, strictly adhering to targets for flow, and to maintain annual and seasonal volumes of water table recharge, to maintain the contribution to creek base flows is considered necessary for the long term environment health of the creek.

9.1.3 Integrated Review of Development Proposals

To ensure the intent of the 1999 Shirley's Brook and Watts Creek Sub-watershed Study is met, the need for an integrated environmental impact review of land **development** proposals is emphasized.

9.1.4 Agency Identification

As a necessary first step in the implementation of the proposed water course management plan there is an immediate need to identify the lead agency that will act as project proponent and steward for the water shed and water course.

9.1.5 Immediate Monitoring Needs

As has been explained the monitoring of the water course is considered an immediate need to ensure a firm basis for measuring the effectiveness of water control efforts.

Concurrent investigation of erosion including control sections is recommended to determine the need for and benefit of additional erosion control or a future in line flow control structure.

9.1.6 Erosion and Slope Stability Investigations

Geotechnical investigation of slope conditions and erosive processes at work along the Watts Creek water course upstream of the Kizzel drain should be undertaken as soon as possible.

9.2 SUMMARY OF ISSUES

The following Table provide a summary of the issues within the Watts Creek and Kizzel Drain Watersheds.

Issue	Recommended Actions	Lead Agency (Support Agency)	Notes	References
1 Trillium Forest and Kanata Lakes Beaver Pond	Consideration be given to an NCC land exchange. "Design with nature" approach and develop on the lands best suited for development. Give a high weighting to forest areas like the Trillium forest.	City of Ottawa, NCC & Developer	May require an appointed mediator to negotiate a fair exchange. Zoning changes may be time sensitive and will require cooperation with all 3 levels of government.	Section 1.1.4 and 4.3
	b Development is Subject to OMB Draft Conditions. Ensure tree clearing is not permitted until all the conditions are fulfilled.	City of Ottawa: WW&DS	The current City of Ottawa Resolution requiring the developer to clear all conditions prior to any tree clearing may be subject to an OMB hearing.	Draft Plan Conditions and Section 1.1.4
2 Carling Avenue Culvert Replacement	Culvert verified as needing replacement. Require City confirmation that it will be replaced with one in Kind. Specifically, a single barrel culvert with the same end area.	City of Ottawa	Channel Realignment on NCC/Greenbelt Lands requires an amendment to the current 1973 Municipal Drain By-law. Also consideration should be given to location long term monitoring station at this location.	Sections 1.1.5, 7.0, Drainage Bylaw, and Oct 2008 Carling Ave Culvert Structure Renewal Options Analysis Report, Subsequent City of Ottawa letter
3 DND Drainage Modifications	Retrofit existing drainage system to current standards in conjunction with new development. Water quality targets per the 1999 Shirley should be consistent with current provincial guidelines.	DND, NCC Greenbelt, City/MOE Approvals	DND is not legally required to implement SWM controls.	
4 Shirley's Bay Rehabilitation and Environmental Development	Conduct an EA study on opportunities for alternative environmental development within Shirley's Bay including possible breaching of the dyke.	Ottawa River Regularity Agency, MOE, DFO, and other		Section 4.6.1
	Do Nothing	City of Ottawa: DSD & CS-D (RVCA, DFO, MOE)		
5 Abandoned Watts Creek Sewage Treatment Plant	Plan to decommission and remove the existing buildings and infrastructure. Undertake a Property Condition Assessment Detail Report.	City of Ottawa and NCC	The Cities and NCC liability/responsibility requires a legal opinion.	
6 Erosion and Obstructions of and within Watts Creek	Address critical erosion areas including tile drain outlets, railway embankments, and culvert crossings. Remove obstructions including old beaver dams and control beaver population if necessary.	NCC (MVCA, DFO)	Permits are required, address fisheries issues, fluvial geomorphic considerations, and long-term maintenance issues/cost sharing	Section 7.0, 8.0 and 9.0
7 Review of Land Development Proposals	The NCC is circulated with and is given the opportunity to comment all development plans in the watershed. Apply updated guidelines for new development (through all stages of development approval process). Ensure City is aware of and is applying the 1999 Shirley Brook and Watts Creek Study recommendations	City of Ottawa: DSD/RVCA	Guidelines for development and impact assessments have been updated	Section 5.0 7.3 and 9.0
8 Integrated Monitoring Program	Develop an integrated monitoring program to assess the erosion process and to more accurately track the health of the watercourse. Develop water quality and Quantity stations at key locations. The locations should be accessible and representative of the water shed. 2 locations on the Kizell Drain and 2 on the Watts Creek.	City of Ottawa: (MVCA, DFO, MOE,NCC)	Monitoring program to include elements of fluvial geomorphology, biology, base flow measurement, etc.; will also incorporate assessment of the effectiveness of urban development Storm water Management and proposed Agricultural best management practices. The water quality monitoring program to be developed with the intent of increasing fish habitat and in lieu of effluent monitoring at the storm outfalls.	Section 5.3 and 7.3
9 Water course Management Plan	The watercourse should be maintained. Impediments to flow along the drain caused by, beaver dams, minor mud slides and culvert constrictions should be removed. Erosion protection at structures, including the Railway embankment and at tile outlets should be added. Fish habitat enhancements and shading are recommended. Provide access to aesthetically and geologically significant areas of interest. A regular (annual) inspection and maintenance program should be developed. Costs within the Municipal drain reach would be assessed in accordance with the procedures described in the Act.	City of Ottawa (WW&DS)	The Kizell Drain and Watts Creek, from the Kizell Drain to the twin culverts under the CNR tracks, is currently designated as municipal drain under Ontario Drainage Act	Section 7.2
10 Agricultural Landuse Controls	Consider a program of smaller properties and rentals to land stewards that promote environmentally sustainable agriculture/organic farming. Investigate the tile drainage outlets as potential sources of nutrient contamination. Modify agricultural landuse. Under take a cost benefit analysis to determine the costs of land use conversion to forest lands and hay fields and a reduced grain crop rotation (i.e. corn and soybeans).	NCC Greenbelt		Section 5.3
11 Cost Recovery	a Development Charges	City of Ottawa	Specific to projects that relate to development. Subject to City approval and could be disputed at OMB	Section 8.0
	b Municipal Drainage Act	NCC/City of Ottawa	Part of the Drain is already a Municipal Drain. Ideal mechanism for cost sharing related to watercourse management. Will require a Engineers report, Meeting to Consider, Court of Revision and could be disputed at a Tribunal Hearing.	Section 8.0
	c Mutual Cost Sharing Agreements	City/NCC/ Developers	Needs a cooperative attitude created by a tangible benefit to the parties involved.	Section 8.0
11 Public Awareness and Education	a Promote measures to reduce runoff from residential and commercial properties	City of Ottawa	Consider a program targeted to Watts Creek watershed, specifically using the recommendations in the 1999 Shirley's Brook Watts Creek Study	
	b Educational signage at strategic locations	Community Associations/NCC	Assistance to be provided by City of Ottawa / MVCA	Section 7.2.1
	c Creek clean-up and riparian planting days	Community associations/NCC	Assistance to be provided by City of Ottawa / MVCA; focus plantings within priority areas	