

March 27, 2023

Smithville Subwatershed Study and Stormwater Master Plan



Subwatershed Study Purpose

- The Subwatershed Study is the component of the planning process which investigates the existing natural environment within the area, and the impacts from future development.
- A Subwatershed Study involves several environmental specialists, and investigates that natural features, natural hazards, and movement of water within and surrounding the existing and future development areas.
- Key outcomes from a Subwatershed Study are recommendations for the protection and management of the natural environment following development, and includes planning input and criteria for:
 - Land Use Planning (Defining the Natural Heritage System)
 - Watercourse Management
 - Stormwater Management

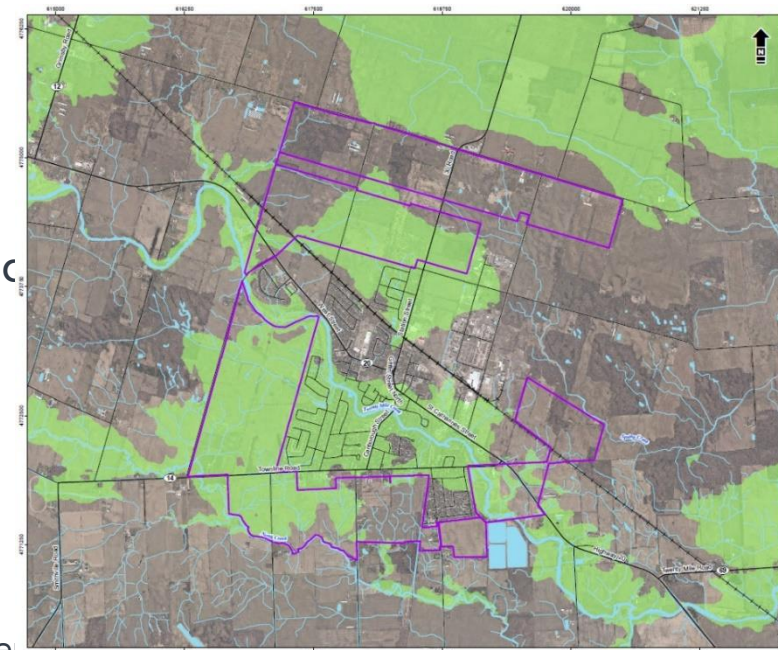
Subwatershed Study Process

- The Subwatershed Study was completed under the following phased approach, in parallel with the overall land use and infrastructure planning process:
 - Phase 1: Subwatershed Characterization and Integration
 - Phase 2: Impact Assessment
 - Phase 3: Management, Implementation and Monitoring Plan

Subwatershed Study Key Findings and Recommendations

Groundwater

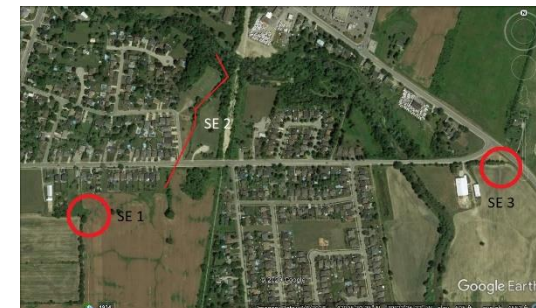
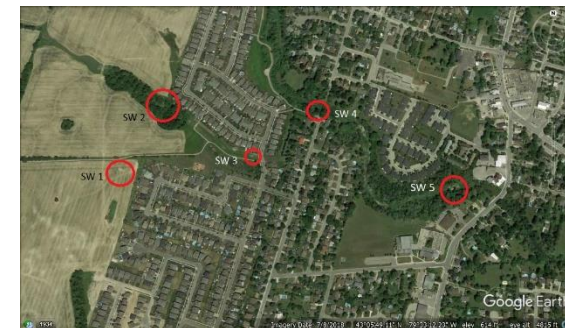
- Impacts to groundwater resulting from future development include reduced infiltration and groundwater recharge, interception of shallow groundwater from shallow infrastructure and leakage into storm and sanitary sewers, interception of deep groundwater from deep infrastructure and need for dewatering.
- Management alternatives include:
 - Employing Low Impact Development infiltration techniques to maintain groundwater recharge
 - Compliance with guidelines provided by the MECP for dewatering activities
 - Use of anti-seepage collars or clay plugs to manage redirection of groundwater flow along the permeable backfill of utility trenches



Subwatershed Study Key Findings and Recommendations

Karst

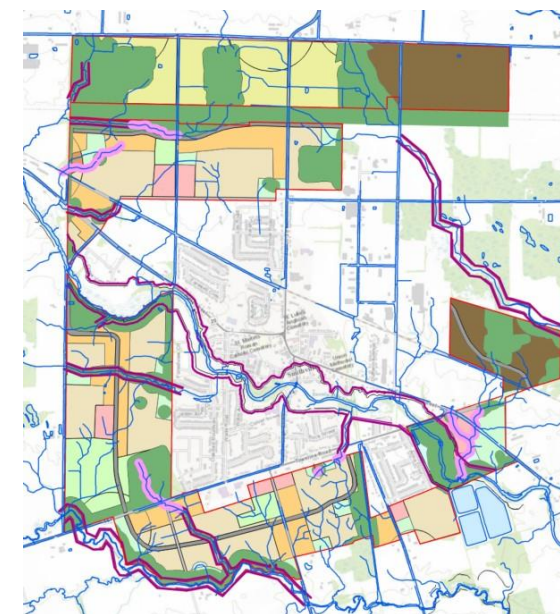
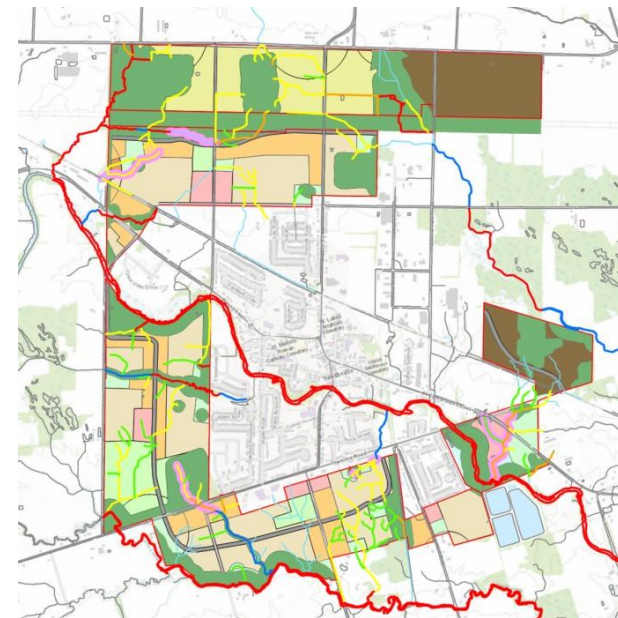
- Future development in the vicinity of some karst features may increase the runoff volume and peak flow toward the feature thus creating a flood hazard, additional hazards in the vicinity of features identified as a Karst Hazardous Site.
- Management alternatives have been recommended specific to identified karst features, which include:
 - Filling and grouting of karst feature
 - Local improvements for conveyance (i.e. replacement of culverts)
 - Buffering, particularly for designated Karst Hazardous Sites



Subwatershed Study Key Findings and Recommendations

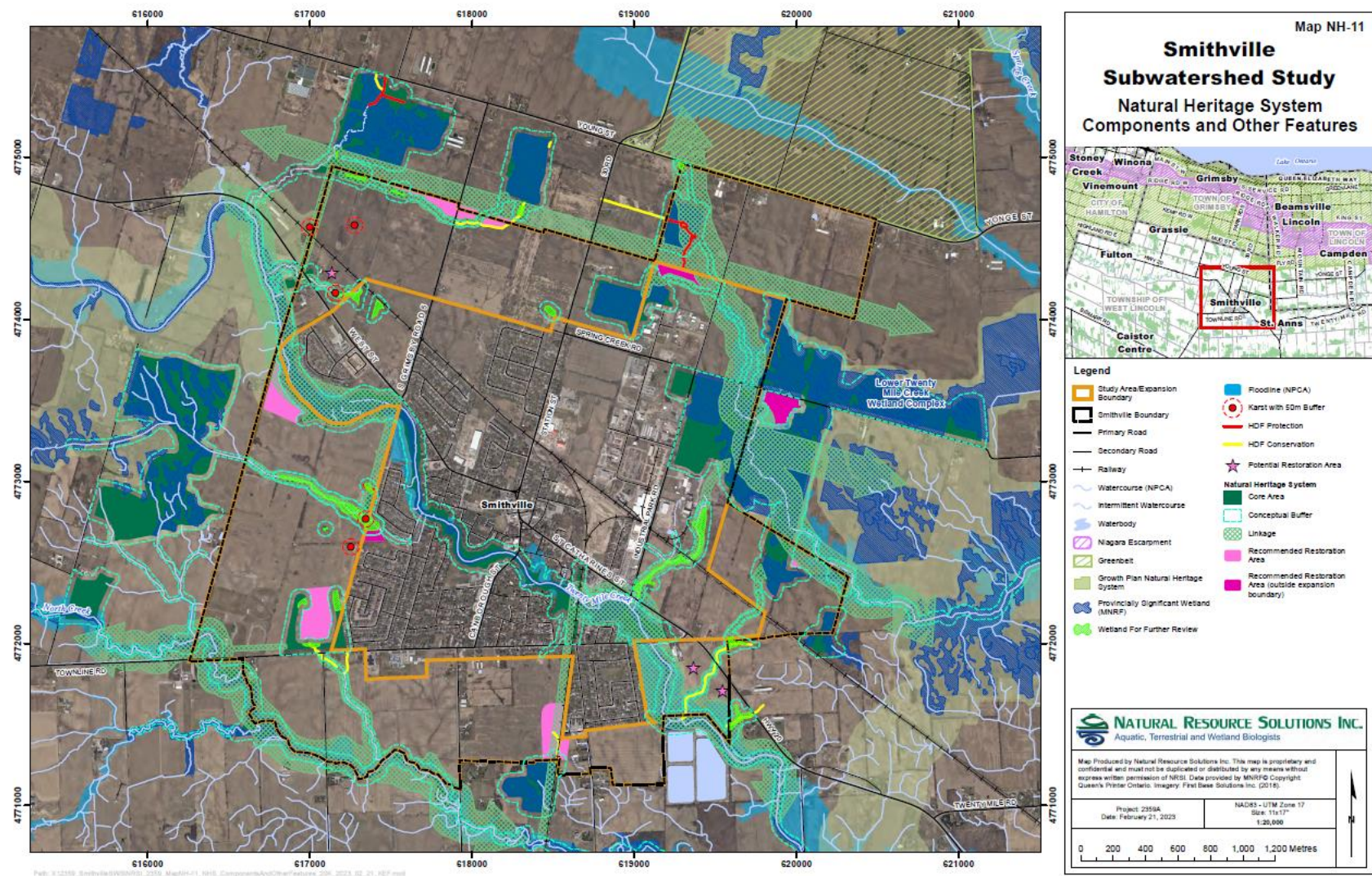
Watercourses and Drainage Features

- Future development and watercourse crossings may reduce natural cover to watercourses, accelerate watercourse erosion, and degrade aquatic habitat
- Management alternatives have been recommended which include:
 - Reach specific recommendations for management (i.e. protect in-situ, realign with enhancements within regulated corridor, integrate into NHS, maintain specific function of feature)
 - Guidance for siting of watercourse crossings to minimize the number of crossings, and design crossings in accordance with current guidance
 - Incorporation of stormwater management recommendations for flooding and erosion control



Ecology and Natural Heritage System

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Subwatershed Study Key Findings and Recommendations

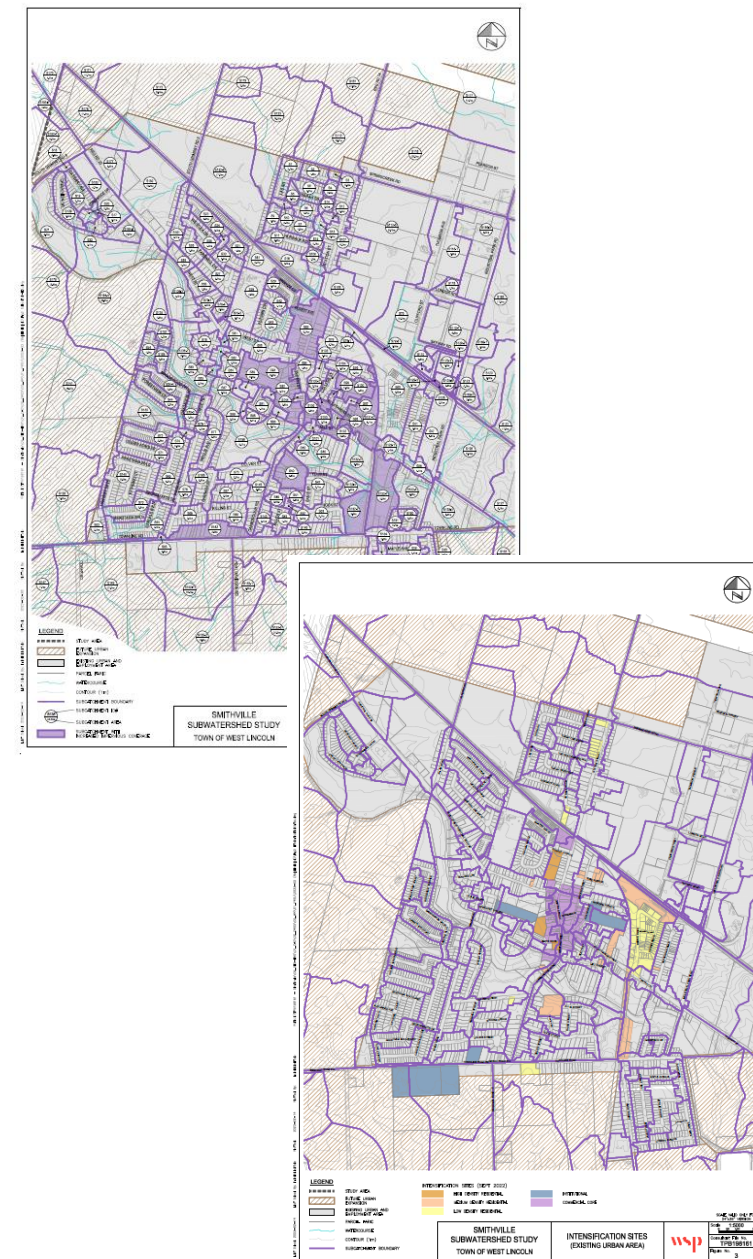
- The Subwatershed Study along with the Region's Niagara Official Plan informed OPA 63 and delineation of natural features.
- The Subwatershed Study and the Region's Niagara Official Plan provided the framework and basis for developing policies for OPA 63 that protect certain features (e.g. PSWs) and policy thresholds to be met (e.g. no negative impact to other features).
- Policies were also established regarding identification and establishment of buffers and linkages, and the approach to address cover targets identified in the Township's OP, all of which contribute toward the preservation and management of the Natural Heritage System.

Subwatershed Study Key Findings and Recommendations

Recommendations for Future Studies

- Guidance is provided for future studies to verify and refine as appropriate the conclusions and recommendations from the Subwatershed Study and will be implemented through the Block Plan / Master Environmental Servicing Plan process
- Recommendations are provided for future monitoring programs to verify performance of stormwater and environmental management plans, and inform adaptive management

- A Stormwater Master Plan was undertaken to establish stormwater management requirements for future infill, intensification, and redevelopment within the existing urban centre of Smithville
- The future development and increased densities within the urban centre are anticipated to have limited effect on the existing drainage system due to the extent of existing development within the urban centre and limited change in impervious coverage from future development
- Stormwater management requirements for all future infill and redevelopment are to be determined on a case-by-case basis and in consultation with the Township
- For the St. Catherine Street sewershed, opportunity exists to replace two sections of pipe to provide greater capacity and accommodate the increased flow from the future infill and intensification within this sewershed; the ultimate acceptance of this alternative is subject to approval from the Township and Region and supported by further study and analysis.





Thank you



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