

DRAFT

ENVIRONMENTAL MANAGEMENT GUIDELINE

JUNE 2013

In Support of the Environmental Policies of the City of Vaughan Official Plan (VOP 2010)

Prepared by
City of Vaughan
2141 Major Mackenzie Drive
Vaughan ON L6A 1T1

TABLE OF CONTENTS

A. INTRODUCTION	2
A.1 Purpose of the Guide	2
A.2 City of Vaughan Policy Direction	3
A.3 Conservation Context	5
B. ENVIRONMENTAL REPORTING PROCESS	10
B.1 Scope of Environmental Reports	10
B.2 Contents of Environmental Reports	15
C. ATTRIBUTES OF THE NATURAL HERITAGE NETWORK, NATURAL FEATURES AND ECOSYSTEM FUNCTIONS	21
C.1 Water Resources	22
C.2 Habitat of Endangered and Threatened Species	27
C.3 Fish Habitat	31
C.4 Wetlands	35
C.5 Valley and Stream Corridors and Significant Valleylands	38
C.6 Significant Wildlife Habitat	41
C.7 Woodlands	45
C.8 Areas of Natural and Scientific Interest (ANSIs) and Environmentally Significant Areas (ESAs)	50
REFERENCES	51
APPENDIX 1 - Region Of York Definitions	53
APPENDIX 2 - City Of Vaughan Definitions	55
APPENDIX 3 - Glossary of Additional Terms Referenced in the Environmental Management Guide	58

A. INTRODUCTION

A.1 Purpose of the Guide

The City of Vaughan Official Plan (Council-adopted September 2010 and subject to Council modifications on September 27, 2011, March 20, 2012 and April 17, 2012), endorsed by York Region Council on June 28, 2012, designates a Natural Heritage Network (NHN) and establishes Vaughan's commitment to an ecosystem-function approach to planning consistent with natural heritage policies under Section 2.1 of the Provincial Policy Statement (PPS).

The Environmental Management Guideline (EMG) identifies the range of studies and provides guidance regarding the level of detail of submittal information to prepare environmental reports in support of development applications according to the environmental policies in Chapter 3 of the City of Vaughan Official Plan. Sections 3.9.2 and 3.9.3 of the Vaughan Official Plan (VOP 2010) describes an Environmental Impact Study (EIS) and a Master Environment and Servicing Plan (MESP) as the main environmental reports in support of development projects at the site scale and/or block plan, as required.

The EMG replaces the 1994 Environmental Management Guideline developed for Official Plan Amendment 400. Policy 3.9.1.2 of the VOP 2010 directs that the EMG is reviewed, updated and refined from time to time to facilitate the successful implementation of the ecosystem function approach. The EMG reflects the policy direction of Chapter 3 of the Official Plan with particular emphasis to support the Natural Heritage Network. Related aspects of the PPS, such as cultural heritage and natural hazards, are also noted where applicable.

A.1.1 Using This Guide

Section B, *Environmental Reporting Process*, of this Guideline provides information regarding the scope and outline of environmental reports in support of a development application. Section C, *Attributes of the Natural Heritage Network, Natural Features and Ecosystem Functions*, provides more detail about specific environmental attributes and functions for consideration in the ecological evaluation. Sections B and C must be consulted in order to determine the appropriate level of detail for an ecological evaluation.

This Guideline is based primarily on the revised Natural Heritage Reference Manual: Second Edition (OMNR 2010), although resources listed below are additional key sources of information. Each subsection in Section C of the Guide includes a list of key resources relevant to the natural feature described in the subsection.

AECOM. 2010. City of Vaughan: Natural Heritage in the City. 119 pp.

North-South Environmental Inc. 2012. Phase 1 of the Natural Heritage Network Study for the City of Vaughan.

OMNR. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario. 248 pp.

Region of York. 2010. Region of York Official Plan: Ministry approved September 2010.

TRCA. 2007. Environmental Impact Statement Guidelines.

<http://www.trca.on.ca/planning-services-permits/developers-and-consultants-information/planning-and-development-procedural-manual.dot>

A.2 City of Vaughan Policy Direction

A.2.1 Green Directions Vaughan - The Community Sustainability and Environmental Master Plan

Green Directions Vaughan (GDV) establishes the principles of sustainability in Vaughan. It is a guide to be used in other master plans and studies to help achieve a healthy natural environment, vibrant communities and a strong economy. GDV provides two distinct functions: (1) it creates a series of sustainability action plans to guide the City's operational and regulatory functions; and (2) it acts as the City's first Integrated Community Sustainability Plan.

GDV includes a series of recommended actions that span the entire scope of municipal responsibility, including operational and regulatory functions. The City provides infrastructure and services to communities and operates as a regulator through such processes as *Planning Act* approvals. GDV focuses on these areas as being the ones that will provide the greatest opportunity for positive results.

In addition to determining areas that will affect the operations and functions of the City, GDV also serves as an Integrated Community Sustainability Plan (ICSP), which is a long-term plan that provides direction for the community to realize environmental, cultural, social and economic sustainability objectives.

Vaughan's Natural Heritage Network (NHN) is a living document. As scientific understanding of environmental impacts of urban development progresses and knowledge about Vaughan's natural heritage improves, targets need to be updated to complete the NHN by ensuring that the appropriate ecological functions and biodiversity are maintained for the long term, consistent with Policy 2.1.2 of the Provincial Policy Statement (PPS). Two specific action items in Green Directions Vaughan relate to completing a natural heritage system.

Action Item 1.3.2. Through the development of the City's new Official Plan, and in partnership with the Toronto and Region Conservation Authority, ensure protection of remaining natural features and explore opportunities for habitat restoration in headwater areas, along riparian corridors, and around wetlands.

Action Item 2.2.4. Develop a comprehensive Natural Heritage Strategy that examines the City's natural capital and diversity and how best to enhance and connect it. As part of this action:

- Develop an inventory of Vaughan's natural heritage, and identify opportunities for habitat restoration;
- Ensure that policies in the City's new Official Plan protect all ecological features and functions as per current provincial and regional policies, and also include consideration for locally significant natural features and functions.

A.2.2 City of Vaughan Official Plan

Components of the Natural Heritage Network

The environmental policies of the City of Vaughan Official Plan define the components of the Natural Heritage Network (NHN) as a connected system of natural features and ecosystem functions. Criteria
City of Vaughan DRAFT Environmental Management Guideline in support of the Vaughan Official Plan (VOP 2010) 3
June 2013

defining Core Features and Enhancement Areas will be further refined through the Natural Heritage Network Study. The Core Features of the NHN should ultimately include:

- significant valleylands and stream corridors;
- significant wetlands as identified by the City in consultation with the Toronto and Region Conservation Authority (TRCA);
- significant woodlands;
- habitat of threatened and endangered species;
- significant wildlife habitat, using guidance provided in the NHRM and in MNR's Draft Ecoregion Schedules for Ecoregion 6E; including, most importantly, concentrations of biodiversity such as habitat for species of Conservation Concern, area-sensitive species, reptile and amphibian breeding and hibernation habitat, ecological linkages etc. as this habitat becomes known through further studies;
- fish habitat (including all watercourses);
- Environmentally Significant Areas and Areas of Natural and Scientific Interest (regional and provincial life science);
- Key Natural Heritage Features and Key Hydrological Features and their Vegetation Protection Zones on lands to which the Greenbelt Plan and/or Oak Ridges Moraine Conservation Plan policies and/or regulations apply; and,
- hazard lands and hazardous sites (floodplains, meander belts and stable top of bank).

Enhancement Areas include those supporting lands that either add to or connect the Core Features. Enhancement Areas are identified conceptually on Schedule 2 of the Official Plan (Attachment 1 to this Guide), such that further study is required to determine the additional habitat and/or ecological connectivity value of these areas. Enhancement Areas include:

- stormwater management ponds that are contiguous with a valley corridor or other identified natural heritage feature;
- grasslands, including (and supportive of) agricultural uses connected to the Network;
- landscape connectivity opportunities where there may be more than one alternative to create a linkage; and,
- habitat enhancement areas identified through studies and consultation with TRCA and the Region of York.

Built-up Valleylands are also an identified component of the NHN. These are recognized areas of residential, commercial or industrial development below top of bank that provide natural heritage functions that must be maintained.

The environmental policies set the direction and define the tools to protect and enhance the NHN through the development review process. This is achieved through appropriate studies fulfilling the requirements of a Master Environment and Servicing Plan (MESP) and/or Environmental Impact Study. In particular, Policy 3.2.3.2 of the Official Plan notes that defining the NHN is an ongoing process:

Policy 3.2.3.2 That the policy text prevails over the mapping shown on Schedule 2 in determining the Natural Heritage Network. Identification of elements comprising the Natural Heritage Network is an ongoing process and as such the Natural Heritage Network identified on Schedule 2 is based on the best information available. Schedule 2 may not identify all the natural heritage features in Vaughan. The precise limits of mapped natural heritage features, and any additions to the mapped network, will be determined through appropriate study undertaken in consultation with the Toronto and Region

Conservation Authority and the Province. This may occur on a site-by-site basis through the development process or through studies carried out by the City, Region, Toronto and Region Conservation Authority or other government agencies.

The City of Vaughan Natural Heritage Network Study is due to be completed in 2014. The overall Natural Heritage Network Study will assess the role of the existing Natural Heritage Network in maintaining elements of biodiversity and ecological functions for the long term, consistent with Provincial Policy Statement (PPS) 2.1.2. At the completion of all phases of the Natural Heritage Network Study, additional NHN areas may be proposed to meet ecosystem targets of the natural heritage system related to biodiversity persistence and ecological function. This may result in boundary changes to Core Features and Enhancement Areas based on refined criteria. Built-up Valleylands may also be recommended to be removed from the NHN.

Relation to the Greenbelt Plan and Oak Ridges Moraine Conservation Plan

In the Greenbelt Plan area and Oak Ridges Moraine Conservation Plan area, Core Features of the NHN are equivalent to Key Natural Heritage Features and/or Key Hydrologic Features. Specific policies are provided for these areas consistent with Provincial Plans and York Region policies. In particular, Policy 2.2.9 of the Region of York Official Plan states:

“That where a woodland, wetland, or Life Science Area of Natural and Scientific Interest identified for protection is located both within and outside the boundary of the Oak Ridges Moraine, the Lake Simcoe watershed, or the Natural Heritage System of the Protected Countryside in the Greenbelt, and more than 50% of the feature is located within that boundary, the vegetation protection zone that is most protective of the feature shall generally apply to the portion outside of the Provincial Plan area unless an environmental impact study demonstrates that a lesser buffer is appropriate. The vegetation protection zone outside of the Provincial Plan area shall not be less than that required by Section 2.2 of this Plan.”

Outside of Core Features, policies regarding (a) the Protected Countryside and Natural Heritage System overlay of the Greenbelt Plan and (b) Natural Core, Natural Linkage and Countryside designations of the Oak Ridges Moraine Conservation Plan, provide further support to the NHN in Vaughan. See Policy 3.2.3.18 and Policy 3.2.3.19 of the Official Plan.

A.3 Conservation Context

Green Directions Vaughan and the City of Vaughan Official Plan provide the policy direction to complete the NHN. Two critical aspects of conservation planning set the context for the approach in the EMG: (a) a connected and linked natural heritage system as directed in the PPS; and, (b) watershed planning.

A.3.1 Natural Heritage Systems

Policies 2.1.1 and 2.1.2 of the PPS direct municipalities to:

- protect natural features and areas *in situ* and from incompatible land uses;
- maintain, restore or improve the diversity and connectivity of natural features in a natural heritage system; and
- maintain, restore or improve the long-term ecological function and biodiversity of natural heritage systems.

The PPS provides policy direction on planning for a connected natural landscape that will support biodiversity, be ecologically functional and recognize linkages between and among natural heritage and water features. The natural heritage system is defined in the PPS to be able to include lands that have been restored or have the potential to be restored. This approach emphasizes the need to set targets for specific elements of biodiversity and ecological functions to determine when the system is complete. Furthermore, identifying available opportunities for ecological restoration must be a prominent aspect of all development applications in proximity to the NHN.

The Oak Ridges Moraine Conservation Plan (ORMCP) and the Greenbelt Plan build on the PPS and provide substantial policy direction on the protection of natural heritage features. Technical papers to aid in the implementation of the ORMCP were finalized in 2007, and similar materials are being developed for the Greenbelt Plan. In general, where the provincial plans and the PPS conflict, provincial plans take precedence over the PPS as specified in Policy 4.9 of the PPS. Likewise, the PPS would provide policy direction in the case of a matter that the provincial plans do not address, such as specific hazard land policies not contained in the ORMCP.

Excerpts from Section 2 of the Provincial Policy Statement

(Italics indicate terms further defined in the PPS)

2.1.1 Natural features and areas shall be protected for the long term.

2.1.2 The diversity and connectivity of natural features in an area, and the long-term *ecological function* and biodiversity of *natural heritage systems*, should be maintained, restored or, where possible, improved, recognizing linkages between and among *natural heritage features and areas*, *surface water features* and *ground water features*.

Excerpts from Provincial Policy Statement 2005, Policy 2.1

Natural Heritage System: means a system made up of *natural heritage features and areas*, linked by natural corridors which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species and ecosystems. These systems can include lands that have been restored and areas with the potential to be restored to a natural state.

Provincial Policy Statement 2005, Section 6.0 Definitions

Natural heritage features and areas: means features and areas, including *significant wetlands*, *significant coastal wetlands*, *fish habitat*, *significant woodlands* south and east of the Canadian Shield, *significant valleylands* south and east of the Canadian Shield, *significant habitat of endangered species* and *threatened species*, *significant wildlife habitat*, and *significant areas of natural and scientific interest*, which are important for their environmental and social values as a legacy of the natural landscapes of an area.

Provincial Policy Statement 2005, Section 6.0 Definitions

Ecological Function: means the natural processes, products or services that living and non-living environments provide or perform within or between species, ecosystems and landscapes. These may include biological, physical and socio-economic interactions.

Provincial Policy Statement 2005, Section 6.0 Definitions

A.3.2 Watershed Planning

The watershed is the primary geographic unit for conservation planning. The Toronto and Region Conservation Authority (TRCA) has completed watershed plans for the Don River and Humber River. The watershed plans provide extensive baseline information and recommendations to incorporate into ecological evaluations, including information regarding aquatic systems, terrestrial systems and connected open space. Objectives of the two watershed plans are incorporated into Section C of this Guide.

The Humber River Watershed Plan includes indicators and targets for watershed conditions (Appendix C of the Plan) associated with 24 objectives (below) grouped under three headings: Environment, Society and Economy.

Environment

Stream Form

1. Protect the form and function of the Humber River and its tributaries

Groundwater

2. Protect groundwater recharge and discharge
3. Prevent groundwater contamination

Surface Water

4. Protect and restore the natural variability of annual and seasonal stream flow
5. Maintain and restore natural levels of baseflow
6. Eliminate or minimize risks to human life and property due to flooding
7. Protect and restore surface water quality, with respect to toxic contaminants and other pollutants (such as sediment, nutrients, bacteria and road salt)
8. Manage stormwater to protect people and the health of streams and rivers

Air

9. Reduce air pollution to levels that protect human health, natural ecosystems and crops, and do not exacerbate global climate change

Aquatic System

10. Protect, restore and enhance the health and diversity of native aquatic habitats, communities and species
11. Provide for sustainable fishing opportunities and the safe consumption of fish

Terrestrial System

12. Protect, restore and enhance natural cover to improve connectivity, quality, biodiversity and ecological function
13. Minimize negative influences from surrounding land uses on terrestrial natural heritage system quality and function

Society

Cultural Heritage

14. Identify, document, protect and conserve cultural and heritage resources
15. Celebrate the diverse culture and heritage resources of the Humber watershed
16. Identify and promote the economic value of cultural and heritage resources

Nature-based Recreation

17. Incorporate greenspace in all urban and rural developments and create an accessible and connected greenspace system that is compatible with ecological and cultural integrity
18. Develop a system of inter-regional trails and local and regional-scale nature-based recreation, education and tourism destinations within the greenspace system

Economy

Land Use

19. Protect the form and function of landforms such as the Niagara Escarpment, Oak Ridges Moraine and South Slope
20. Balance economic development with protection of the environment and society
21. Improve sustainability in urban form at community and building site scales
22. Protect and enhance the integrity and economic viability of agricultural areas

Resource Use

23. Practice sustainable resource use by individuals, households, businesses, institutions and governments
24. Use ground and surface water at sustainable rates

The Don River Watershed Plan includes 26 objectives grouped under four headings: Caring for Water, Caring for Nature, Caring for Community, and Getting it Done. Objectives for water, nature and community are listed below as these objectives include indicators and targets for watershed conditions in Chapter 3 of the Don River Watershed Plan.

Caring for Water

1. Protect and restore the quantity and quality of groundwater.
2. Protect and restore the natural variability of annual and seasonal stream flow.
3. Maintain and restore natural levels of baseflow.
4. Eliminate or minimize risks to human life and property due to flooding.
5. Manage stormwater to protect people and health of streams and rivers.
6. Protect and restore surface water quality with respect to toxic contaminants and other pollutants, such as sediment, nutrients, bacteria and road salt.
7. Protect and regenerate the natural form and function of the Don's valley and stream corridors.

Caring for Nature

8. Reduce air pollution to levels that protect human health and natural ecosystems, and do not exacerbate global climate change.
9. Protect, regenerate and enhance the health and diversity of native aquatic habitats, communities and species.
10. Protect and expand the Terrestrial Natural Heritage System and improve connectivity among the watershed's forests, meadows, and wetlands.
11. Regenerate the health of natural areas, and the whole urban landscape, to improve their quality, biodiversity, and ecological function.
12. Manage the impact of human activities and neighbouring land uses in the watershed.

Caring for Community

13. Improve sustainability in urban form at community and building site scales.
14. Practice sustainable resource use by individuals, households, businesses, institutions and governments.
15. Connect people and places in the Don River watershed.
16. Protect and regenerate natural areas and greenspaces for nature-based experiences.
17. Celebrate the natural and cultural heritage of the Don River watershed.
18. Identify, document, protect and celebrate the cultural and heritage resources of the watershed.

DRAFT

B. ENVIRONMENTAL REPORTING PROCESS

B.1 Scope of Environmental Reports

Policies regarding the Environmental Impact Study (EIS) and Master Environment and Servicing Plan (MESP), as the main environmental reports in support of the environmental policies of the VOP 2010, are provided in Sections 3.9.2 and 3.9.3 of the Plan. Ecological evaluations vary in detail and scope. They can be comprehensive and integrated studies within the MESP. An EIS may include a detailed natural heritage evaluation as the focus of the study or be limited to a scoped study based on the specific features and functions characterizing a site. The environmental report must provide information on: (a) a proposed development and potential environmental impacts; (b) the existing natural features present and their associated ecological functions; and, (c) an evaluation of the need and/or potential for ecological restoration to grow or improve the integrity of the NHN. This does not ensure development proposals will be approved, but is necessary information to enable informed planning decisions that are consistent with the PPS, the policies of the Official Plan, and the intent of Green Directions Vaughan.

An EIS or MESP is required at the earliest appropriate stage in the development review process for a particular application. This will ensure delineation of any modifications of the NHN, potential restoration areas and mitigation measures, such as buffers, are identified that may result in modifying the development design. The process may be iterative: that is, designs can be brought forward, modified, if feasible, according to discussions with agencies and other experts and refined for a final report.

Criteria to assist in determining the scope of environmental reports are provided below in this subsection. Subsection B.2, *Contents of Environmental Reports*, must also be reviewed to assist in establishing the scope of required ecological evaluations.

B.1.1 Environmental Impact Study (EIS)

An EIS is more than a description of constraints on a property. It is an evaluation that must anticipate the implications of changes in land use and the interaction of these changes with the features and functions of an area. This requires:

- a thorough inventory of abiotic conditions, flora and fauna;
- analysis of the inter-relationships among the biotic and abiotic elements of a site (i.e. its ecology);
- a description of the proposed development, including all aspects that have the potential to affect adjacent natural features and functions;
- determination of the direct and indirect effects the proposed changes will have on the existing conditions and consideration of cumulative effects;
- identification of potential improvements or enhancements to the existing natural features and Natural Heritage Network; and
- any modification to the development proposal as well as evaluation of mitigation measures, including restoration options.

Most importantly, the EIS must determine if it is definite or probable that there will be negative impacts (as defined by the PPS) to the natural features or their ecological functions, if the development proceeds under a given proposed design. This information is required by decision makers in order to determine the need for modifications to proposed plans, buffers, NHN additions and other mitigation strategies to fairly evaluate the implications of a land use change. Ultimately, this information is required to achieve decisions that are consistent with the PPS. Consult Subsection B.2, *Contents of*

City of Vaughan DRAFT Environmental Management Guideline in support of the Vaughan Official Plan (VOP 2010) 10
June 2013

Environmental Reports, to assist in determining the information and analysis required for a particular EIS.

B.1.2 Master Environment and Servicing Plan (MESP)

The MESP will address the complete range of relevant natural features and ecosystem functions as provided for by the Official Plan, with particular attention to maintaining and/or enhancing the Natural Heritage Network.

The MESP provides the foundation for the layout of a Block Plan by identifying the areas of environmental priority. This includes confirming Core Features, delineating more appropriate ecological buffers, proposing details of Enhancement Areas, and identifying additional restoration opportunities to include as modifications to the NHN or other open space options. All elements of the Block Plan will be required to conform to the standards and requirements of the approved MESP, including transportation and servicing networks, Landscape and Open Space Master Plan, Woodlot and Buffer Edge Management Plan, Vegetation Inventory/Assessment and Preservation Report.

The MESP document will include:

- a. Planning background, scope and focus of the work plan;
- b. Study boundaries and justification;
- c. Overview of existing information;
- d. Description and analysis of natural systems and ecosystem functions within and outside of the NHN requiring protection, restoration, or enhancement. Subsection B.2, *Contents of Environmental Reports*, provides more details regarding information and analysis while Section C identifies a range of objectives and attributes for natural features.
 - i) Water resource system studies shall address and confirm:
 - Groundwater recharge and discharge areas, flow rates and flow paths;
 - Aquifer vulnerability;
 - Water balance;
 - Flood and erosion risks and controls, and mitigation opportunities;
 - Least risk areas for stream crossings and other infrastructure identified through a geomorphic analysis;
 - A water management strategy describing the stormwater drainage design including source, conveyance and end-of-pipe measures to be utilized in proposed developments and their anticipated performance metrics (e.g. rainwater retained on site, flows, etc) including approximate locations and preliminary sizing; and
 - Water quality controls for the proposed development.
 - ii) Terrestrial natural heritage system studies shall address and confirm:
 - The extent and composition of the existing natural heritage system;
 - Evaluation of all relevant attributes of natural features, ecosystem functions and NHN functions (refer to Section C of the EMG for guidance);
 - Transfer of relevant data to the City;

- Recommendations for modification of the NHN, where needed, to act on new natural heritage information gained from the study;
 - Reference to the TRCA Target Terrestrial Natural Heritage System, the Region of York Regional Greenlands system and the City of Vaughan Natural Heritage Network Study and how refinements to these systems will be implemented based on locally identified opportunities and the most current field data;
 - The functional relationship and interdependencies of the water resources system and the natural heritage system;
 - Evaluation of restoration options to improve habitat and ecological linkages;
 - Recommendations for monitoring to ensure mitigation is implemented correctly and that the mitigation measures proposed are effective in maintaining and enhancing the NHN; and
 - Recommendations for maintaining a monitoring database so that monitoring results can be tracked, lessons learned from effective and ineffective mitigation techniques, and actions taken to improve mitigation in the course of development.
- e. Identification of development limits, rationale/justification for the limits, summary of mitigation measures, and summary of net ecological gain based on the ecological evaluations;
- f. Description of proposed development and required infrastructure:
- Servicing connectivity to adjacent development;
 - Route diagrams for all sewers/watermains, sewage flow and drainage direction;
 - Phasing/sequencing of major infrastructure;
 - Preliminary siting and sizing of stormwater management facilities; and
 - Feasibility of implementing alternative development standards.
- g. Preliminary Site Preparation/Grading Plan (where special measures are needed i.e., steep slopes, lands surrounding woodlands);
- h. The MESP shall address sustainability issues at the appropriate level of detail, although it is acknowledged that more detail may be required at later stages of development approval:
- Region of York Official Plan policies regarding sustainable communities and sustainable buildings (Section 5.2);
 - City of Vaughan guidelines and metrics regarding sustainable development appropriate to the scale of development;
 - Cultural heritage and archaeological investigations and consultation requirements;
 - Conceptual trail routes and greenspace enhancements;
 - Description of how the development proposal, including the retained NHN, potential restoration areas and/or mitigation measures are integrated with the Landscape and Open Space Master Plan for the site;
 - Evaluation of Low Impact Development options;
 - Identification of contaminated soil and/or contaminated groundwater;
 - Implementation of transportation strategies and servicing master plans to minimize the number of crossings of the natural heritage system and stream corridors and minimize interference with significant recharge areas;
 - Implementation of water and energy conservation strategies; and
 - Establishment of the pre-development baseline monitoring program.

The City of Vaughan may request additional information as part of the MESP studies. For example, the Development/Transportation Engineering department requires identification of items to be financed through the Development Charges Act versus Developer Agreements.

B.1.3 Early Consultation

The requirement for “pre-application consultation” and a “complete application” is current policy in the City of Vaughan as set out in Policy 10.1.3 of the Official Plan. The following Reports provide information on “pre-application consultation” and a “complete application”.

Committee of the Whole (Public Hearing), November 10, 2009. Report No. 52, Item No. 4. Official Plan Amendment File OP.09.005. Site Plan Control Amendment General File 13.6. City of Vaughan. The Planning and Conservation Land Statute Law Amendment Act – Bill 51 Amendments.

Committee of the Whole, December 1, 2009. Report No. 54, Item No. 16. Official Plan Amendment File OP.09.005. Site Plan Control Amendment General File 13.6. City of Vaughan. The Planning and Conservation Land Statute Law Amendment Act – Bill 51 Amendments.

By-Law No. 276-2009. A By-law to adopt Amendment Number 705 to the Official Plan of the Vaughan Planning Area.

By-Law No. 278-2009. A By-law to adopt City-wide procedures for Pre-Application Consultation (PAC) meetings as a means for the City to identify the material(s) and information required for the submission of a complete development planning application.

The purpose of this initial consultation is to identify all information required to be submitted to support a development application. A cursory review of the development proposal may be undertaken to identify, on a preliminary basis, issues that must be considered. As part of this process, the contents of the environmental reports, if required, can be identified by the City in consultation with the TRCA. Initiating the ecological evaluation early in the planning process also provides the opportunity for it to inform the creation of development concepts, thus avoiding impacts through design.

B.1.4 Determining the Scope of Environmental Reports

A development proposal may be assigned to one of three types of assessments.

1. Full Master Environment and Servicing Plan (MESP) and/or Detailed Environmental Impact Study (EIS)

A full MESP and/or detailed EIS are required for:

- the preparation of a Block Plan or development application for a large site (see Policy 3.9.3.1), and/or
- an application for development on lands that include an Enhancement Area as shown on Schedule 2 of the Official Plan.

This is the highest level of detail and integration of various studies to identify (a) areas of protection and opportunities for restoration, and (b) a modified concept design to achieve protection and restoration and minimize impacts. Emphasis is placed on recognizing the role of the NHN and evaluating options to enhance the NHN. Refer to section 3.9 of the City of Vaughan Official Plan for

the policy intent of the EIS and MESP. Refer to Section C of the EMG for an outline of the attributes of natural features, ecosystem functions and NHN functions.

2. Scoped Environmental Impact Study

City of Vaughan staff, in collaboration with the TRCA, will consider the items listed below to determine the scope of an EIS where a full MESP or detailed EIS may not be warranted. For example, this may include areas where environmental studies have been conducted in the recent past, in which case a gap analysis would indicate where studies should be focused, or areas that are heavily altered by human activities (i.e. manicured areas). The level of detail of the evaluation and assessments will vary depending on the overlap with items listed below and/or the potential for the proposed development to impact the NHN. Section C of the EMG is required to be consulted to set out the Terms of Reference for the scoped EIS in order to adequately address relevant attributes of natural features, ecosystem functions and NHN functions. In addition to reviewing Section C of the EMG to determine the scope of the ecological evaluation, the following items should be assessed with respect to the proposed development. The applicant or representative is required to address the items below in the pre-application consultation.

- Proximity (within 120 m) to the NHN (see Schedule 2 of the Official Plan);
- Proximity (within 120 m) to Enhancement Areas as shown on Schedule 2 of the Official Plan;
- An application for *significant development*¹ on or adjacent to the Natural Heritage Network;
- Opportunity to provide a linkage or connection function of the NHN;
- Identification of the site as a study area or regeneration area in the Humber River Watershed Plan or Don River Watershed Plan;
- Overlap with areas identified in the TRCA Terrestrial Natural Heritage System (<http://trca.on.ca/protect/land/terrestrial-natural-heritage/>);
- A study area or habitat area identified as habitat for an endangered or threatened species;
- Inclusion or proximity to spill areas, Flood Vulnerable Areas (FVAs) or Flood Vulnerable Roads (FVRs) identified in the City-Wide Drainage and Stormwater Management Criteria Study (Clarifica Inc. 2009);
- Inclusion or proximity (within 120 m) to headwater streams;
- Within, in proximity to (within 120 m), or including the following biodiversity attributes delineated in the natural heritage background report, Natural Heritage in the City (<http://www.vaughtantomorrow.ca/OPR/background.html>):
 - Biodiversity Concentration Areas identified on Figure 3;
 - Known occurrences of rare species shown on Figure 12;
 - Areas of hydrogeological sensitivity as identified on Figure 5;
 - Known occurrences of sensitive fish species and coldwater streams identified on Figure 7;
 - Sensitive Fish Areas identified on Figure 8;
 - Sensitive Bird Areas or Sensitive Amphibian Areas identified on Figure 9;
 - Forest areas shown on Figure 11 not already included in the NHN.

3. Detailed Assessments Are Not Required

Previous studies may be available demonstrating that, due to the nature, size, or location of certain development activities, the level of land disturbance and the availability of previous studies, there will be no negative impacts or indirect adverse impacts on nearby natural heritage features or functions.

¹ The term “significant development” is not referenced in the policies in section 3.9 of the VOP 2010..Significant development is defined in Section 10.2.2 of the VOP 2010 as a “development with 100 or more residential dwelling units or a total gross floor area of all uses of 12,500 m² or greater.”

In such cases, a submittal is required citing the specific details in the available studies to ensure that a) the specified elements of an ecological evaluation have been completed based on the latest available information and in accordance with the latest City policies; and b) sufficient detail and analysis is provided with respect to the types of development and impacts considered by the study. Existing studies shall be current and address site-specific effects in sufficient detail to be consistent with the requirements of the natural heritage policies of the Official Plan and the PPS. In this case, a submittal shall demonstrate that the proposal design minimizes impacts. The decision that a detailed or scoped EIS is not required will be determined in consultation with the TRCA.

B.2 Contents of Environmental Reports

The applicant must submit a Terms of Reference that outlines the work plan for the required studies for an MESP and either a detailed or scoped EIS. The applicants should complete initial consultation with other relevant agencies before submitting the Terms of Reference. The Terms of Reference must also identify the types of studies to explore restoration options, where relevant to the site and development application.

In general, an environmental report includes: (a) a description of the proposal; (b) an inventory, evaluation and analysis of biophysical attributes; (c) description of impacts; (d) consideration of alternate development scenarios and/or mitigation options; (e) an evaluation of monitoring approaches; and (f) conclusions and recommendations. The outline below is adapted from the Natural Heritage Reference Manual: Second Edition (OMNR 2010)² and provides a further elaboration of the general steps with emphasis on addressing enhancement opportunities for the NHN. Steps 1 through 5 identify steps to be taken to prepare the Terms of Reference for review. The following sections describe the contents of the EIS report.

Terms of Reference

The following describes the requirements for the Terms of Reference that outlines the work plan for the required studies. This will provide the document to which the agencies can refer and can refine during consultation.

1. Introductory section

- purpose and rationale of the proposal;
- the location of the site, including location maps and site plans;
- description of the site's landscape context;
- existing and past land uses and ownership patterns;
- existing and proposed official plan designations and zoning;
- proximity to and potential relationship to the existing NHN.

2. Determine Information Needs

- identify pertinent biodiversity attributes and ecosystem functions from the background report, Natural Heritage in the City, and the Natural Heritage Network Study;
- identify gaps in the available information;
- assess methods for dealing with information gaps;
- evaluate implications of data/information gaps.

² The Natural Heritage Reference Manual: Second Edition (OMNR 2010) can be found at <http://www.mnr.gov.on.ca/en/Business/LUEPS/Publication/249081.html>.

3. Determine Study Area Boundaries

- the study area boundaries shall include the development parcel and adjacent lands as defined in the Natural Heritage Reference Manual: Second Edition (OMNR 2010);
- if access to adjacent properties is not obtained, relevant observations shall be made from the subject property and with the aid and interpretation of aerial photographs;
- for a scoped EIS, a site visit may be necessary to determine the boundary of the features and adjacent lands in order to establish the appropriate study limits;
- an MESP and detailed EIS require several field visits, such that the study limits may be modified based on the results of field investigations. The proponent and the City shall agree on study area boundaries at the outset of the study.

4. Describe Work Plan

- for an MESP, outline the methodology for 4 season flora and fauna field investigations;
- for a detailed or scoped EIS, determine the need and appropriate time of year and methodology (e.g., monitoring protocols) for field investigations (based on information gaps);
- describe methods for evaluation of significance to the NHN.

5. Provide preliminary report Table of Contents

- Summarize above steps in a Table of Contents for review by agencies; provide preliminary background information where available.

Environmental Report

The environmental report will use the Table of Contents and other information provided in the Terms of Reference as the basis to summarize information gathered during preliminary and subsequent studies. Any changes to the Terms of Reference and table of contents should be recorded, and the work plan re-drafted accordingly. The report should have the following sections.

1. Introductory Section

- purpose and rationale of the proposal;
- the location of the site, including location maps and site plans;
- description of the site's landscape context;
- existing and past land uses and ownership patterns;
- existing and proposed official plan designations and zoning;
- proximity to and potential relationship to the existing NHN

2. Consultation Section

- description of the submission of the TOR, comments from agencies, and how those comments were addressed (provide TOR in an appendix).

3. Methods Section

- date(s) of site visits, time and weather conditions during field work, where relevant;
- description of protocols for each survey; and
- explain the methods used to determine the effects of the proposed development.

4. Findings Section

- map of Ecological Land Classification (ELC) on aerial photography, identifying vegetation communities and other important features on and adjacent to the property;
- description of vegetation and wildlife within ELC units;
- map of significant species and feature locations; particularly those that are criteria for NHN targets; significant species and features to include those to which Significant Wildlife Habitat criteria may apply such as amphibian breeding ponds, area-sensitive birds (approximate locations) provincially, locally and regionally significant plants, turtle nesting areas, etc. Also refer to the Natural Heritage Reference Manual: Second Edition, TRCA's EIS Guidelines, and Section C of this Guide for considerations to document and map natural features and functions;
- description of habitat needs of significant species on the site, including vegetation communities corresponding to significant species' habitat needs and other pertinent information, including appropriate ecological buffers and recommended additions to the NHN;
- surface and subsurface soils analysis, including groundwater conditions;
- identification of local landform types;
- catchment boundaries of any surface water features, including wetlands;
- water balance, depending on the types of features present;
- infiltration capabilities of the site.

5. Analysis Section

a. Identify and analyse key features and functions and additions to the Natural Heritage Network

- identify key features and ecological functions, including the natural heritage features identified in the PPS, key natural heritage features identified in the ORMCP and Greenbelt Plan and their functions, both on the property and on adjacent properties, that may be affected by development; this will include previously-known features and functions as well as those discovered during the ecological evaluation;
- examine these features and functions and identify those which are ecologically sensitive or could serve as good indicators of impacts;
- analyze the inter-relationships of various features and functions within the context of the NHN, ecosystem and broader landscape;
- identify indicator, keystone, flagship or focal species to help in the assessment of habitat conditions;
- identify key features or functions that contribute significantly to the ecological integrity or importance of the natural heritage network, feature or function; and
- identify features (e.g. certain vegetation communities that support concentrations of significant species, structures, habitat elements) that would qualify as significant habitat.

b. Identify diversity and connectivity elements, and areas supporting ecological function and biodiversity of natural heritage systems and natural processes

- diversity and connectivity should be explored within the proposed development site and, where applicable, in a landscape context.
- emphasis is given to evaluating options for enhancing the ecological integrity and/or connectivity of the NHN.

i. Diversity

- Identify features that contribute to the genetic, species and ecosystem diversity of Ontario at provincial, regional and local scales. For example, larger patches may contribute disproportionately to maintenance of biodiversity.

ii. Connectivity

- Evaluate habitat and/or connectivity. Consideration of areas that are likely to function as pathways or natural corridors, or otherwise support a functional relationship between natural heritage features and areas is important in assessing potential development-related impacts.
- Aquatic linkages include intermittent and permanent watercourses, water bodies and wetlands in the study area. Permanence of flow and surface and subsurface gradients relative to other aquatic and terrestrial habitats will provide information about the importance of connections between surface and groundwater in maintaining fish and aquatic habitat.
- Riparian linkages support and enhance the ecological functioning of aquatic features by, for example, helping to maintain water quality and thermal regime and detaining flow in storm events. Terrestrial linkages include tablelands not necessarily connected to a watercourse. These linkages provide for movement and life cycle processes of terrestrial and wetland flora and fauna. They generally link wetlands, woodlands, valleylands, wildlife habitats or other features and may be described in terms of their characteristics (width, length and vegetation) and functions.

iii. Natural processes

- Evaluate the site for its contribution to maintaining natural processes. Physical processes such as those related to water flow and erosion are likely of most relevance in urban areas. However, nutrient cycles, disturbance regimes that promote diversity and gene flow are examples of chemical and biological processes. Successional processes also contribute to biodiversity, and thus there should be an analysis of whether successional processes will continue.

6. Description of the proposed development

- The description of the proposal should provide enough detail to accurately predict development impacts, so that the City and relevant review agencies can undertake an appropriate review and make an informed decision on the proposal;
- Description and evaluation of alternative development designs for the subject lands.

7. Outline potential impacts

The level of detail to outline potential impacts relates to the likelihood and severity of potential impacts, confidence in mitigation techniques, and the significance of the site in the context of the Natural Heritage Network.

- Describe potential impacts on key features and functions and possible mitigation measures; this should include analysis of all short-term and long-term direct and indirect aspects of the development such as construction, runoff, access, grading, lighting, noise, impacts of people,

potential for encroachment, etc. A number of factors shall be considered in assessing potential impacts, including but not limited to:

- the spatial extent, magnitude, frequency and duration of the impacts;
 - the extent and degree to which adjacent lands will be affected; and
 - potential impacts on specific features and functions;
- To the extent possible, evaluate possible future and cumulative impacts of development that may occur:
 - Impacts that could arise as a result of demand created by the present development;
 - impacts that could be magnified over time; and
 - impacts that could be magnified because of interaction of one impact with another.
 - Appendix C.1.1 of the Natural Heritage Reference Manual: Second Edition provides examples of potential impacts associated with various development activities, and some possible mitigation techniques. The Significant Wildlife Habitat Decision Support System provides excellent descriptions of potential impacts to wildlife habitat.

8. Identify mitigation measures

- Recommend actions that may be necessary to prevent, mitigate or remedy the effects of the development, alternative methods to carry out the development and alternatives to the form of the proposed development;
- In many cases, alternatives to the methods and form of the proposed development can be discussed with the proponent, and a “best case” configuration decided upon prior to submission of the EIS. In this case, previous development configurations or methods could be discussed, and the reasons they were abandoned used to support the current configuration and methods of the development.
- The proponent will demonstrate that the proposed development and mitigation measures they have identified will not result in negative impacts on the natural features or on the ecological functions for which the area is identified.
- For a project that may have negative impacts on fish habitat (i.e. may result in an alteration of habitat), the applicants must consult the Fish Habitat Referral Protocol for Ontario, 2009 (<http://www.mnr.gov.on.ca/264110.pdf>), as may be amended. In addition, TRCA has an agreement with the Department of Fisheries and Oceans giving authority to TRCA for development review regarding fish habitat.
- Residual impacts (i.e., those impacts that would remain after mitigation measures have been implemented), if any, must be identified. The assessment of residual impacts shall consider whether there is the potential for cumulative impacts resulting from the development. The impact assessment should clearly identify residual impacts with discussion about their significance, severity and longevity.

9. Outline a monitoring program

- Provide measures that can be used to assess the existing and future conditions, including evaluation of restoration options, for key features or functions (i.e., functional loss can be predicted through sampling, modelling, or other accepted methods) (e.g., stream temperature

to measure water quality in a cold water stream; use of Citygreen³ or other available models for tracking biomass, tree canopy and/or ecosystem services);

- Assessment of habitat changes generally are more meaningful than changes in the relative abundance of species using a particular habitat;
- Monitoring can be roughly separated into effectiveness monitoring, to determine whether the mitigation measures are being implemented effectively, and performance monitoring, to determine if the mitigation is protecting the features and functions it is supposed to protect. Monitoring plans should include provisions for both types of monitoring.

Data Sharing

- Spatial and database information shall be submitted electronically to the City in approved formats. This allows the City to incorporate new information into the NHN inventory and act on new information. Approved digital formats must be confirmed at the time of the pre-application consultation meeting.
- The monitoring program should include a mechanism by which monitoring results are transferred to the City where they can inform future development applications.

DRAFT

³ Citygreen (<http://www.americanforests.org/productsandpubs/citygreen/>)

C. ATTRIBUTES OF THE NATURAL HERITAGE NETWORK, NATURAL FEATURES AND ECOSYSTEM FUNCTIONS

This section of the EMG identifies a variety of attributes of the biodiversity and ecosystem functions associated with natural features in the NHN. While not comprehensive, it serves as a check list to assist in determining the need and/or detail of an ecological evaluation.

Each subsection has a similar structure.

Information Sources

Relevant information sources for known occurrences, standards, best practices, and/or thresholds are listed.

Objectives

PPS and Region of York Official Plan requirements are noted and specific outcomes of studies are listed. Emphasis is given to evaluating options for habitat restoration/enhancement and linkages.

Ecosystem Functions

The common ecological processes associated with natural features are listed. The inventory of attributes may expand on the ecosystem functions.

Inventory

Typical attributes of the biophysical description of the natural feature and ecosystem functions are listed.

Adjacent Lands

Common recommended distances to evaluate impacts from development on adjacent lands are noted.

C.1 Water Resources

C.1.1 Information Sources

Credit Valley Conservation and Toronto and Region Conservation. 2009. Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines. Updated March 2009. Appendix H in the TRCA Planning and Development Procedural Manual (<http://trca.on.ca/planning-services-permits/developers-and-consultants-information/planning-and-development-procedural-manual.dot>)

Ministry of the Environment. 2003. Stormwater Management Planning and Design Manual. Queen's Printer for Ontario. ISBN 0-7794-2969-9. (http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/std01_079721.pdf)

TRCA. 2009. Don River Watershed Plan. Toronto, Ontario. ISBN: 978-0-9811107-4-5. (<http://trca.on.ca/protect/watersheds/don-river/don-river-watershed-plan.dot>)

TRCA. 2008. Humber River Watershed Plan. Toronto, Ontario. ISBN: 978-0-9811107-1-4. (<http://trca.on.ca/protect/watersheds/humber-river/resources.dot>)

TRCA. 2006. Stormwater Management Criteria. (<http://trca.on.ca/protect/water-management/storm-water-management.dot>)

Credit Valley Conservation and Toronto and Region Conservation. 2010. Low Impact Development Stormwater Planning and Design Guide: Version 1.0. 300 pp + Appendices. (http://www.sustainabletechnologies.ca/portal/alias__Rainbow/lang__en/tabID__578/DesktopDefault.aspx)

C.1.2 Objectives

Policies related to water resources are found in Section 3.6 of the VOP 2010.

Provincial Policy Statement

Section 2.2 of the PPS sets the watershed as the ecologically meaningful spatial scale for planning. Section 2.2 of the PPS also identifies surface water features, ground water features, and hydrologic functions, in addition to natural heritage features, as necessary to ensure the ecological and hydrological integrity of the watershed.

Region of York Official Plan

The Region of York Official Plan (Ministry approved 2010) includes 39 policies in Section 2.3 regarding Water Systems. While applicants will have regard to all policies, particular policies are excerpted below related to the Natural Heritage Network and to inventory information. Italicized terms are defined in the Region of York Official Plan and excerpted in Appendix 1 of this Guide.

Policy 2.3.2. That *development* and *site alteration* be designed with the goal of protecting, improving or restoring ground and surface water quality and quantity and biological and hydrological characteristics of *key hydrologic features*. Efforts to maintain these characteristics and functions shall be demonstrated through master environmental

servicing plans, or other appropriate technical studies, which include strategies and techniques to address the goal.

- Policy 2.3.3 To maintain linkages and related functions among surface water features, groundwater features, hydrologic function and *key natural heritage features*.
- Policy 2.3.4. To direct *development* or *site alteration* away from *vulnerable* and *sensitive surface water features* and *vulnerable* and *sensitive groundwater features*.
- Policy 2.3.5. That notwithstanding policy 2.3.4, an application for major development⁴ within a *significant groundwater recharge area* shall be accompanied by an environmental impact study that demonstrates that the groundwater recharge functions will be protected, improved or restored.
- Policy 2.3.7. To amend mapping and policies to reflect new requirements, assessments and recommendations from the Source Water Protection Plan and Oak Ridges Moraine Conservation Plan by amendment to this Plan.
- Policy 2.3.13. To require the preparation of comprehensive master environmental servicing plans as part of secondary plans to protect, improve or restore water quality and quantity including hydrologic function of water systems. Such plans will incorporate best management practices with a goal that water balance and hydrologic functions will be maintained as much as possible. These plans will emphasize water conservation and may include water reuse and innovative technologies..
- Policy 2.3.33. To work in partnership with local municipalities, conservation authorities, adjacent municipalities and other agencies to co-ordinate watershed planning initiatives and implement watershed plan objectives that:
- protect, improve or restore river system function and linkages;
 - achieve water quality and quantity objectives for the watershed;
 - address the long term cumulative impact of *development* on the watershed through regional monitoring, reporting and adaptive management as necessary;
 - protect, improve and restore *key natural heritage features*, *key hydrologic features* and their functions;
 - provide guidelines for sustainable development, design and construction; and,
 - provide retrofits of existing neighbourhoods to ensure better hydrologic function.

TRCA Guidance

The TRCA sets out 8 objectives related to water resources in the Humber River Watershed Plan:

1. Protect the form and function of the Humber River and its tributaries;
2. Protect and restore groundwater recharge and discharge;
3. Prevent groundwater contamination;
4. Protect and restore the natural variability of annual and seasonal stream flow;
5. Maintain and restore natural levels of base flow;
6. Eliminate or minimize risks to human life and property due to flooding;
7. Protect and restore surface water quality, with respect to toxic contaminants and other pollutants (such as sediment, nutrients, bacteria and road salt);

⁴ Note that "major development" is not italicized in Policy 2.3.5 of the Region of York Official Plan, although a definition is provided in the Plan and is excerpted in Appendix 1 of this Guide.

8. Manage stormwater to protect people and the health of streams and rivers.

Outcomes

Based on the review of the PPS, relevant Region of York policies and TRCA guidance, specific outcomes of studies regarding water resources shall:

- identify and protect significant and/or high volume recharge areas and vulnerable aquifer areas;
- identify and protect local recharge areas that provide groundwater flow to tributaries;
- identify discharge areas and determine appropriate approaches to maintain discharge, including protection in open space or the NHN;
- identify headwater areas that contribute significantly to the integrity of the NHN;
- identify stream corridor objectives and maintain or enhance base flow, as needed;
- maintain the channel form of the Humber and Don Rivers and their tributaries;
- identify options to naturalize the channel form of impaired tributaries;
- identify groundwater flow paths and contributions to natural heritage features, where applicable, and in detail appropriate to the scale of study;
- maintain complex groundwater flow directions;
- evaluate options for a treatment train approach to stormwater management;
- evaluate options to minimize impervious surfaces;
- evaluate options to disconnect appropriate impervious areas from the stormwater system; and
- ensure information is provided to the City in a compatible format so that it can inform decisions about the NHN.

C.1.3 Inventory (Biophysical Description)

Geotechnical and Hydrologic Resources

- Describe soils, landforms, topography and surficial geology;
- Note any feature staking that has been done to date (e.g. staking the top and/or toe of the valley slope). Indicate the calculated hazard land limits (e.g. floodplain analysis, geotechnical review of slope stability and watercourse erosion, meander belt width analysis, erosion hazard limit, etc.);
- Identify any hydrological or hydrogeological resources and issues, including surface water features, recharge/discharge zones, groundwater quality and quantity, groundwater elevations and flow directions, connections between groundwater and surface water features; and
- Justify the sampling density and depth of boreholes and sampling frequency of surface flow measurements, and other more in-depth information as required, depending on the scope, scale and issues identified for the proposal.

Water Balance

- Complete a pre-development water balance for the site, using data at appropriate spatial and temporal scales to determine the pre-development baseline, in order to assess the quantity and quality of existing water budget components on the site;
- Establish site-specific water balance criteria that maintain ecosystem functions;
- If there are existing natural heritage features on the subject property, including wetlands, woodlands, and watercourses, then a more detailed feature-based water balance will be required to determine existing flow paths and contributions to these features;
- Identify existing precipitation, evapotranspiration, runoff and infiltration volumes on a monthly basis;

- Provide spatial and quantity details of the infiltration capabilities of the site. Where infiltration opportunities are limited, evaluate the spatial and quantity requirements to address water balance objectives for the reduction of runoff volume using low impact development measures and other similar treatment train approaches, including water reuse options; and
- Evaluate appropriate measures to maintain groundwater flow in areas of high water table, including connections to water courses and other groundwater discharge areas.

Recharge Areas

- Identify significant recharge areas and vulnerable aquifer areas as noted in the Region of York Official Plan (Ministry approved 2010);
- Identify potentially significant, ecologically significant and high volume recharge areas as defined in the Humber River Watershed Plan (TRCA 2008) and Don River Watershed Plan (TRCA 2009);
- Identify local recharge areas that provide groundwater flow to tributaries, particularly where target fish species rely on groundwater discharge, as noted in the Humber River Watershed Plan (TRCA 2008); and
- Evaluate development design options to demonstrate that impervious surfaces are minimized.

Water Quality

- Consult the TRCA Stormwater Management Criteria (internet address provided above, but see also Don River Watershed Plan - Beyond Forty Steps (2009) - Chapter 5: Management Strategies, <http://trca.on.ca/protect/watersheds/don-river/don-river-watershed-plan.dot>, and Humber River Watershed Plan - Pathways to a Healthy Humber (2008) - Chapter 5: Management Strategies, <http://trca.on.ca/protect/watersheds/humber-river/resources.dot>.);
- Evaluate low impact development measures as outlined in the Low Impact Development Stormwater Planning and Design Guide: Version 1.0 (CVC & TRCA 2010);
- Evaluate treatment train options for stormwater management with emphasis on lot level/source and conveyance methods;
- Demonstrate consistency with the Greater Golden Horseshoe Conservation Authorities' Erosion and Sediment Control Guideline for Urban Construction, December 2006 (<http://trca.on.ca/planning-services-permits/developers-and-consultants-information/planning-and-development-procedural-manual.dot>);
- Maintain pre-development volumes of surface runoff; and
- Demonstrate how the appropriate proportion of infiltration and evaporation/reuse measures for stormwater management will achieve site-specific water balance objectives.

Flood and Erosion Hazards

- Consult the TRCA Stormwater Management Criteria for unit rate equations;
- Identify Flood Vulnerable Areas (FVAs), Flood Vulnerable Roads (FVRs) and spill areas based on the City-Wide Drainage Study report (Clarifica 2009);
- Determine elements of flood risk if the proposed development is in proximity to the Special Policy Area, FVAs, FVRs or spill areas;
- Identify slopes > 10%;
- Undertake bank stability analysis when in proximity to river valley and/or stream corridors, as required; and
- Define the 100 year erosion limit.

Source Water Protection

- Note Wellhead Protection Areas (WHPAs) and appropriate protection measures; and
- Demonstrate consistency with the Assessment Reports prepared by Source Water Protection Committees.

DRAFT

C.2 Habitat of Endangered Species and Threatened Species

C.2.1 Information Sources

Species at Risk in Ontario (SARO) list (<http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/276722.html>) provides most up-to-date information on species' status

Federal Species at Risk Public Registry (http://www.sararegistry.gc.ca/sar/index/default_e.cfm) provides information on federal status, which informs provincial status so provides “early warning” of species that may be designated provincially as well

Available Recovery Strategies under the Ontario Endangered Species Act, 2007 (<http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/287123.html>)

Habitat Regulations under the Ontario Endangered Species Act (<http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/244438.html>)

Species at Risk Environmental Registry Notices (<http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/241718.html>)

Redside Dace Recovery Team. 2010. Recovery Strategy for Redside Dace (*Clinostomus elongatus*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vi + 29 pp. (<http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/287136.html>)

Draft Government Response Statement to the Recovery Strategy for Redside Dace (*Clinostomus elongatus*) in Ontario. (<http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/287136.html>)

Natural Heritage Information Centre (NHIC) Biodiversity Explorer (<http://nhic.mnr.gov.on.ca/>)

TRCA. 2005. Fisheries Management Plan for the Humber River. (<http://trca.on.ca/protect/aquatic-habitat/fisheries-management.dot>)

C.2.2 Objectives

Policies regarding species at risk are found in Section 3.3.4 of the VOP 2010.

Provincial Policy Statement

The PPS directs that no development or site alteration is permitted in significant habitat of endangered species and threatened species. To be consistent with policies 2.1.3 a) and 2.1.6 of the PPS, planning authorities must sustain habitats for endangered species and threatened species, and promote the recovery of these species by:

- directing development and site alteration away from their significant habitats; and
- requiring the ecological function of the adjacent lands to be evaluated and demonstration of no negative impacts on the significant habitats or their ecological functions, if development and site alteration are to be permitted on the adjacent lands.

The definition of “significant” habitat of endangered species and threatened species includes habitat that is:

- a) necessary for maintenance, survival and/or recovery of naturally occurring or reintroduced populations; and
- b) occupied or habitually occupied by the species during all or any part(s) of its life cycle.

Not all locations of endangered and threatened species in Vaughan are known: for example, all habitat for redbreasted dace typical of cold and cool water streams, bobolink in hayfields or butternut trees in open forests may not have been surveyed. As a result, all applications for development in proximity to the NHN (i.e. 120 m)⁵ must provide sufficient information regarding any known locations of endangered and threatened species. The Natural Heritage Reference Manual: Second Edition (OMNR 2010) provides a three-step process, summarized in Subsection C.2.3 below, to determine whether the development application could impact significant habitat of endangered and threatened species when either:

- (1) preliminary scoping and letters from relevant agencies, such as TRCA, cannot rule out the presence of habitat of endangered and threatened species; and
- (2) detailed information from the Ministry of Natural Resources, such as a recovery plan, is not available.

Note that MNR is responsible for approving the delineation of significant habitat for species identified as endangered and threatened and MNR district offices should be contacted as part of early consultation.

Region of York Official Plan

Significant habitat of endangered and threatened species is identified as a Key Natural Heritage Feature/Key Hydrologic Feature in the Region of York Official Plan (Ministry approved 2010), but the features are not specifically mapped. Hence, it is stated in policy 2.2.3 of the Region of York Official Plan (Ministry approved 2010) that significant habitat of endangered and threatened species “shall be precisely delineated on a site-by-site basis using procedures established by the Province, where applicable. Such delineation shall occur through the approval of *Planning Act* applications supported by appropriate technical studies such as master environmental servicing plans, *environmental impact studies*, natural heritage or hydrological evaluations.”

Outcomes

Specific outcomes of studies regarding the habitat of endangered and threatened species shall:

- identify, map and describe the habitat of endangered species and threatened species;
- determine the surrounding landscape context that is necessary for the species’ persistence;
- demonstrate recommendations for protection consistent with the recommended actions in the available recovery plans;
- provide measures, such as ecological buffers or development design, to maintain habitat features and functions;
- determine if additions to the Natural Heritage Network are required to appropriately maintain and/or improve the population viability of the endangered and threatened species;

⁵ The Natural Heritage Reference Manual: Second Edition (OMNR 2010) often describes adjacent lands as up to 120 m from a natural feature. Policy 2.1.9 of the Region of York Official Plan requires an EIS for applications within 120 m of the Regional Greenlands System.

- identify possible linkage/enhancement areas to maintain and/or improve the population viability of the endangered and threatened species;
- mitigate impacts of development in adjacent lands according to the Natural Heritage Reference Manual: Second Edition (OMNR 2010); and
- provide new information to the City in compatible format so it can be used to inform the configuration of the NHN.

C.2.3 Inventory (Biophysical Description)

Species classified as an endangered species and a threatened species for the purposes of PPS Policy 2.1.3 are identified in the Species at Risk in Ontario (SARO) List regulation to the Endangered Species Act, 2007 (ESA). The SARO List also classifies species as extirpated species and special concern species.

The Ministry of Natural Resources (MNR) is developing policy and procedures under the ESA that will help guide the identification of habitat for threatened and endangered species. Contact the local MNR district office when significant habitat information (for purposes of the PPS) is not available for a species.

A three-step process described in the Natural Heritage Reference Manual: Second Edition (OMNR 2010) is to be used when detailed information about significant habitat is not available. A summary is provided below.

Step 1 - Preliminary Ecological Site Assessment/Pre-application Environmental Impact Study

Preliminary ecological site assessment can be undertaken using the following information sources:

- information about known occurrences within the recommended screening distance of at least one kilometre⁶;
- information provided by MNR to municipalities (e.g., screening information, species lists, range maps);
- where MNR has not provided such information, contact local MNR district office for guidance;
- existing local knowledge (e.g., conservation authority and municipal staff) of the area and the species likely to occur, given their ranges and habitat needs; and
- preliminary field investigations (if needed to confirm the presence of species).

Step 2 - Detailed Site Assessment

A detailed ecological site assessment is required if the information resulting from Step 1 determines that a site may provide or be adjacent to significant habitat for an endangered or threatened species. In this case, a qualified professional working on behalf of the applicant completes the following components of Step 2:

- a. Contact the MNR to determine whether more detailed information is available for any species occurrence located on or adjacent to the property and whether MNR has established criteria or other considerations for determining significant habitat;

⁶ One kilometre distance is based on Natural Heritage Information Centre's spatial resolution for species generalized locations.

- b. Undertake additional field investigations⁷ to confirm the presence, status and population health of the identified species. This should be done at the appropriate(s) time of year, which will vary for different species; and
- c. Delineate the extent of any significant habitat which meets criteria established by MNR or seek MNR approval to confirm the identified area(s).

Step 3 - Environmental Impact Study for Proposed Development Adjacent to Significant Habitat

The applicant shall undertake an EIS that demonstrates no negative impacts for the proposed development or site alteration within adjacent lands (i.e. 120 m of significant habitat) that considers the following:

- whether the proposal could degrade the health or integrity of the significant habitat of endangered and threatened species or its ecological functions; and
- whether a detailed plan is required to avoid negative impacts on the identified species or its/their significant habitat.

DRAFT

⁷ To conduct field investigations (e.g., carrying out species collection or monitoring), an authorization under the ESA through the issuance of a permit may be required. For information, see MNR's Species at Risk webpages at <http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/244440.html>.

C.3 Fish Habitat

C.3.1 Information Sources

The Fish Habitat Referral Protocol for Ontario, 2009 (<http://www.mnr.gov.on.ca/264110.pdf>)

Adaptive Management of Stream Corridors in Ontario

(http://www.iwsstore.ca/publication_5.asp.

http://www.mnr.gov.on.ca/en/Business/Water/Publication/MNR_E002317P.html)

Stanfield, L. (editor). 2010. Ontario Stream Assessment Protocol. Version 8.0. Fisheries Policy Section. Ontario Ministry of Natural Resources. Peterborough, Ontario. 376 pp. .

(<http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@letsfish/documents/document/226871.pdf>)

Credit Valley Conservation and Toronto and Region Conservation. 2009. Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines. Updated March 2009.

Appendix H in the TRCA Planning and Development Procedural Manual

(<http://trca.on.ca/planning-services-permits/developers-and-consultants-information/planning-and-development-procedural-manual.dot>)

TRCA. 2005. Fisheries Management Plan for the Humber River. (<http://trca.on.ca/protect/aquatic-habitat/fisheries-management.dot>) and (<http://trca.on.ca/dotAsset/25855.pdf>)

TRCA. *In progress*. Don River Fisheries Management Plan (Draft in development)

(<http://trca.on.ca/protect/aquatic-habitat/fisheries-management.dot>)

TRCA. 2007. Environmental Impact Statement Guidelines. Appendix H in the Planning and Development Procedural Manual. (<http://trca.on.ca/planning-services-permits/developers-and-consultants-information/planning-and-development-procedural-manual.dot>) and at

(<http://trca.on.ca/dotAsset/40021.pdf>)

C.3.2 Objectives

Policies regarding fish habitat are found in Section 3.3.5 of the Official Plan.

Fish habitat is generally protected via protection of streams and drainage channels in the Natural Heritage Network (NHN). Fisheries Management Plans and watershed plans for the Don River and Humber River, prepared by TRCA, must be consulted to determine whether additional studies may be required to provide further protection measures for fish habitat and/or to recommend design options and mitigative techniques of the proposed development form adjacent (generally 120 m, see Subsection C.3.5 below) to fish habitat. Of particular importance is to evaluate intermittent and headwater areas to determine which areas are important to maintaining quality and quantity of fish habitat.

TRCA has a Level III Agreement with Fisheries and Oceans Canada (DFO) to review projects for any potential harmful alteration, disruption or destruction (HADD) of fish habitat, under Section 35 of the Federal Fisheries Act. A Level III Agreement means that TRCA is responsible for determining if a project will likely constitute a HADD, and if so, negotiate compensation with the proponent. TRCA subsequently forwards the application to DFO to authorize the works under federal law.

Provincial Policy Statement

To be consistent with policies 2.1.5 and 2.1.6 of the PPS within the City of Vaughan, fish habitat shall be protected by:

- not permitting development and site alteration in fish habitat except in accordance with other applicable legislation, policies and standards administered by the federal or provincial governments for the purpose of the protection of fish and their habitat; and
- not permitting development and site alteration on adjacent lands (see Subsection C.3.5) unless the ecological function has been evaluated and it has been demonstrated that there will be no negative impacts on the feature or its ecological function.

Region of York Official Plan

Fish habitat is identified as a Key Natural Heritage Feature/Key Hydrologic Feature in the Region of York Official Plan (Ministry approved 2010), but the features are not specifically mapped. Hence, it is stated in policy 2.2.3 of the Region of York Official Plan (Ministry approved 2010) that significant habitat of endangered and threatened species “shall be precisely delineated on a site-by-site basis using procedures established by the Province, where applicable. Such delineation shall occur through the approval of *Planning Act* applications supported by appropriate technical studies such as master environmental servicing plans, *environmental impact studies*, natural heritage or hydrological evaluations.”

Outcomes

Specific outcomes of studies regarding fish habitat shall:

- describe existing fishery and habitat conditions;
- provide measures, such as ecological buffers or development design, to maintain natural variation in stream flows associated with fish habitat;
- determine if additions to the NHN are required to appropriately protect and/or restore fish habitat;
- provide measures, such as natural channel design, to maintain and/or restore fish habitat;
- identify possible linkage/enhancement areas to support the connected NHN;
- evaluate alternative ways of undertaking the project and the potential impacts associated with the various alternatives;
- mitigate impacts of development according to the Natural Heritage Reference Manual: Second Edition (OMNR 2010);
- recommend specific locations for essential or proposed infrastructure (e.g. road and/or pedestrian crossings) that minimize impacts;
- determine net effects of developments after application of mitigative measures;
- identify opportunities to compensate for loss of habitat if there will be a loss that cannot be avoided or mitigated; and
- provide new information to the City in compatible format so it can be used to inform the configuration of the NHN.

C.3.3 Ecosystem Functions

Functions of fish habitat are related to the aquatic ecosystem types. See functions for wetlands (Section C.4), and streams and valleylands (Section C.5).

C.3.4 Inventory (Biophysical Description)

Refer to Section A1 of the TRCA Environmental Impact Statement Guidelines (2007), specifically pages A1-7 to A1-8, for fish habitat attributes.

Broad Habitat Attributes:

All lands and waters within the meander belt of a permanent or intermittent stream, and kettle lakes.

Stream Habitat Attributes:

Warmwater, coolwater and coldwater streams.

Attributes of Fish Habitat in Streams:

- water quality;
- water quantity;
- food;
- shelter;
- reproductive areas
- vegetative cover; and
- channel structure.

Functions on which fish depend directly or indirectly to carry out life cycle processes:

- spawning grounds and nursery;
- overwintering habitat;
- rearing;
- food supply;
- trophic migration routes (e.g. to access habitat for different life stages);
- refuge migration routes (e.g. to stay in preferred habitat such as preferred thermal regimes); and
- reproductive migration (e.g. to access spawning grounds).

Consideration of additional habitat areas and ecological functions:

- define headwater tributaries;
- groundwater discharge/recharge; and
- determine whether MNR mapping has identified Critical Habitats, Important Habitats or Marginal Habitats.

Detailed site specific fish habitat mapping and assessment should:

- confirm the presence or absence of fish habitat at a particular site;
- identify intermittent and headwater streams and seasonally flooded areas that are not depicted on the broad scale maps and determine their importance as fish habitat;
- understand the spatial and temporal habitat requirements of the various life stages of fishes at a particular site;
- identify any barriers to fish passage; and
- determine the sensitivity of the various types of fish habitat at a site.

C.3.5 Adjacent Lands

PPS Fish Habitat Feature	Adjacent Lands (distance from feature for considering potential negative impacts)
Intermittent stream and drainage feature with no defined bed and banks, including headwater drainage feature	120 m from the centre line of a channel or depression that concentrates flow
Non-meandering stream with defined bed and banks	120 m from the normal high-water mark
Meandering stream with defined bed and banks	120 m from the line that connects each outside curve/concave bank at the bankfull stage ⁸
Lakes and large rivers	120 m from the normal high-water mark

The Province recommends that the areas identified above as adjacent lands contiguous to fish habitat are the minimum needed to address the concerns listed in the Natural Heritage Reference Manual. There may be development proposals that have the potential for affecting fish habitat from a greater distance. In these cases, a larger area of adjacent lands may need to be included in the study area and mitigation options must have a suitable scope. Such a change to adjacent lands distances shall be determined in consultation with TRCA given that TRCA has a Level III Agreement with DFO.

Riparian areas provide critical ecological functions related to fish habitat and shall be included in the assessment of adjacent lands. MNR's recommended minimum distances for riparian area natural vegetated cover for fish habitat are provided in the table below.

Stream Type	Recommended Riparian Area Natural Vegetated Cover
Warmwater stream	30 m or 15 m where it is demonstrated as satisfying Policy 2.1.6 of the PPS
Coolwater stream	30 m or 20 m where it is demonstrated as satisfying Policy 2.1.6 of the PPS
Coldwater stream	30 m from the fish habitat

The pre-consultation, scoping and/or preliminary findings of the ecological assessment should consider the need for greater distances under certain circumstances which can include:

- a highly stressed water feature;
- presence of an aquatic species that is endangered or threatened;
- enhancement of functions including detrital input, bank stabilization, pollutant removal and wildlife habitat/corridors are identified as further objectives; and
- another feature or area that has ecosystem-based planning importance (e.g., natural heritage system, floodplain or significant valleyland) is present.

⁸ The meander belt allowance concept is used for natural hazards policies under Policy 3.1 of the PPS. For more information, refer to Subsection 11.4 of the Natural Heritage Reference Manual: Second Edition (OMNR 2010), Adaptive Management of Stream Corridors in Ontario (OMNR 2001) and/or the Valley and Stream Corridor Management Program (TRCA 1994).

C.4 Wetlands

C.4.1 Information Sources

OMNR 1993. Ontario Wetland Evaluation System Southern Manual (Covering Hill's Site Regions 6 and 7). 3rd Edition. NEST Technical Manual TM-002. Revised December 2002. ISBN MO-7778-0997-4. (http://publicdocs.mnr.gov.on.ca/View.asp?Document_ID=15728&Attachment_ID=33036)

OMNR. 2012. Provincially Significant East Humber River Wetland Complex. Ontario Ministry of Natural Resources.

Contact OMNR District Office for up-to-date boundaries.

TRCA. 2011. Water Balance Guidelines For The Protection Of Natural Features. (<http://www.sustainabletechnologies.ca/Portals/Rainbow/Documents/Water%20Balance%20for%20the%20Protection%20of%20Natural%20Features%20Guideline%20.pdf>)

TRCA. 2011. The Impacts Of Urbanization On The Hydrology Of Wetlands: A Literature Review. (http://www.sustainabletechnologies.ca/portal/alias_rainbow/lang_en/tabID_615/DesktopDefault.aspx)

C.4.2 Objectives

Policies regarding wetlands are found in Section 3.3.2 of the Official Plan.

Provincial Policy Statement

Policy 2.1.3 (b) of the PPS states that "*Development and site alteration shall not be permitted in significant wetlands in Ecoregions 5E, 6E and 7E. "Significant wetlands," as defined by the PPS, are referred to as "provincially significant wetlands" (PSWs) when identified, mapped and scored using the scientific point-based ranking system described in the Ontario Wetland Evaluation System (OWES).*

Evaluated wetlands are protected as Core Features in the Natural Heritage Network (NHN). Studies may be required to evaluate additional wetlands not already identified, provide further protection measures for wetlands and/or to recommend design options and mitigative techniques of proposed development form adjacent to wetlands.

Region of York Official Plan

The Region of York Official Plan (Ministry approved 2010) identifies wetlands as a Key Natural Heritage Feature/Key Hydrologic Feature. The general location of all evaluated wetlands in York Region, as well as identified wetlands within the Oak Ridges Moraine, Greenbelt, and Lake Simcoe watershed, is shown on Map 4 of the Region of York Official Plan (Ministry approved 2010). More detailed information, as well as more recent wetland evaluations are available from the Province.

Outcomes

Specific outcomes of studies shall ensure no net loss of wetland function or area, and identify appropriate restoration opportunities by:

- Determining more accurately the features and functions of wetlands, as well as whether they meet the criteria for other provincial designations such as Significant Wildlife Habitat;
- Maintain quantity of surface water and groundwater contributions that ensures the pre-development hydroperiod (seasonal pattern of water level fluctuation) of the wetland is protected;
- Determining appropriate minimum vegetation protection zones around evaluated and mapped wetlands;
- Assessing the restoration potential of existing wetlands and opportunities to create wetlands;
- Determine if additions to the Natural Heritage Network are required to appropriately protect and/or restore wetland features and connected ecological functions;
- Maintaining and/or enhancing the surface water and groundwater connections associated with wetlands;
- Mitigating impacts of development in adjacent lands according to the Natural Heritage Reference Manual: Second Edition (OMNR 2010); and
- Providing new information to the City in compatible format so it can be used to inform the configuration of the NHN.

C.4.3 Ecosystem Functions

- ground water recharge and discharge;
- water storage and release;
- flood damage reduction;
- shoreline stabilization;
- enhancing water quality through sediment trapping, nutrient and contaminant uptake and removal;
- food chain support;
- habitat for fish and wildlife;
- attendant social and economic benefits.

C.4.4 Inventory (Biophysical Description)

The Ontario Wetland Evaluation Wetland System (OWES) manuals describe the procedures for identifying wetlands. Wetlands can be identified and evaluated by the MNR or by other qualified professionals, provided they use the approved OWES methodology and have received MNR training in the use of the province's wetland evaluation system. In all cases, MNR is responsible for reviewing and approving the evaluations. The MNR recognizes only ministry-sanctioned wetland evaluation courses. Wetland evaluations conducted by individuals trained by other organizations will not be considered. OWES training is required when conducting evaluations or verifying the locations of the outer boundaries of evaluated wetlands. The MNR routinely offers training courses in wetland evaluation.

C.4.5 Adjacent Lands

The Province recommends that adjacent lands are those lands within 120 metres of individual significant wetlands or significant coastal wetlands; or, in the case of wetland complexes within 120 metres of individual wetlands comprising the complex. This recommended adjacent land width was chosen because it is known that developments within 120 metres of wetlands have a reasonable probability of affecting the ecological functions of the wetlands which they surround, and because wetland species are often dependent on adjacent lands for activities such as nesting, resting, feeding or shelter.

There may be a need in some situations for greater adjacent land widths, while in others lesser distances may suffice. Site-specific evaluations done at appropriate time(s) of the year are needed to identify the distance that is most appropriate to the features and functions of the wetland and the nature of the development proposal.

The ecological functions of the adjacent lands as defined by the PPS must be assessed in relation to the functions of a wetland. The extent of adjacent lands and their ecological functions need to be determined based on professional judgment and local circumstances. Adjacent land distances may vary depending on such factors as wildlife habitat function, topography, soil types, hydrological connectivity, adjacent land uses and other features. Examples not related to wildlife habitat could include local recharge areas adjacent to a wetland, vegetated areas that physically protect the wetland edge from sedimentation, and overhanging trees that provide detritus to support food webs. The TRCA's "Water Balance Guidelines for the Protection of Natural Features" should be consulted as it addresses, in particular, surface water and groundwater contributions in relation to the hydroperiod (seasonal pattern of water level fluctuation) of a wetland.

An important factor in determining the extent of adjacent lands based on wildlife habitat function is upland habitat. Upland habitat areas can occur a considerable distance from a wetland when being used as nesting habitat by turtles and waterfowl. Upland habitat may include vernal pool habitat for breeding amphibians, many of which inhabit a variety of wooded or late successional habitat in the non-breeding season. Amphibians must be able to access upland habitat in the summer for foraging and in the winter for hibernating. The upland habitat must be assessed as potential adjacent lands to determine an appropriate distance that will account for its potential importance to amphibians, and other species including reptiles, in completing their life cycles. For example, if they support nesting waterfowl or nesting turtles, adjacent lands may in fact qualify as Significant Wildlife Habitat (q.v.), which is protected (with its own adjacent lands) under the PPS.

As noted previously, in certain circumstances, the adjacent lands width will need to be expanded beyond the recommendations provided in the manual and there may be cases that those expanded adjacent land widths will require a buffer to cover the entire area. The plant communities and other ecological features of adjacent lands that are found to be critical to the function of a wetland (e.g., fields that provide displaying or foraging areas for wetland birds, banks that provide nesting areas for turtles, and breeding habitat for woodland frogs), should be included in, and will at least partly determine, the ecological buffer. These approaches must be justified relative to the overall objective of ensuring that there will be no negative impacts on significant wetlands and significant coastal wetlands.

C.5 Valley and Stream Corridors and Significant Valleylands

C.5.1 Information Sources

Stanfield, L. (editor). 2010. Ontario Stream Assessment Protocol. Version 8.0. Fisheries Policy Section. Ontario Ministry of Natural Resources. Peterborough, Ontario. 376 pp. .
(<http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@letsfish/documents/document/226871.pdf>)

OMNR. 2001. Adaptive Management of Stream Corridors in Ontario Including Natural Hazards Technical Guides, and Understanding Natural Hazards. Watershed Science Centre, Trent University, Peterborough, Ontario, Canada. Queen's Printer for Ontario. ISBN 0-9688196-0-5.
(http://www.iwsstore.ca/publication_5.asp.
http://www.mnr.gov.on.ca/en/Business/Water/Publication/MNR_E002317P.html)

TRCA. 1994. Valley and Stream Corridor Management Program. 81 pp.
(<http://trca.on.ca/planning-services-permits/regulation-and-policy-development.dot>)

C.5.2 Objectives

Policies regarding valley and stream corridors are found in Section 3.3.1 of the Official Plan.

Provincial Policy Statement

Policies 2.1.4(c) and 2.1.6 of the PPS direct that the connectivity values of valleylands south and east of the Canadian Shield are maintained by:

- not permitting development and site alteration in significant valleylands unless it has been demonstrated that there will be no negative impacts on the feature or its ecological function; and
- not permitting development and site alteration on adjacent lands unless the ecological function has been evaluated and it is demonstrated that there will be no negative impacts on the feature or its ecological function.

All watercourses and drainage features are protected in the Natural Heritage Network (NHN). There are examples of existing urban development in valleylands, such that parts of these areas that come forward as development applications must adhere to current valley and floodplain policies. Additional studies may be required to provide further protection measures for valleylands and/or to recommend design options and mitigative techniques of the proposed development form adjacent to valleylands. Policy 3.3.1.5 of the VOP 2010 allows for modifications to watercourses where such alterations satisfy the requirements of the TRCA, address considerations in the EMG, and demonstrate an overall improvement in the ecological function of the watercourse.

Region of York Official Plan

The Region of York Official Plan (Ministry approved 2010) identifies significant valleylands as a Key Natural Heritage Feature/Key Hydrologic Feature, but the features are not specifically mapped. Hence, it is stated in the Region of York Official Plan (Ministry approved 2010) that significant valleylands “shall be precisely delineated on a site-by-site basis using procedures established by the Province, where applicable. Such delineation shall occur through the approval of *Planning Act* applications supported by appropriate technical studies such as master environmental servicing plans, *environmental impact studies*, natural heritage or hydrological evaluations”.

Outcomes

Specific outcomes of studies should sustain the connectivity values of valleylands by:

- assessing any cultural heritage values often associated with valleylands and recommending appropriate conservation measures;
- assessing whether valleylands support Significant Wildlife Habitat or other provincially significant features that may inform requirements for mitigation and protection;
- providing measures, such as ecological buffers or development design, to protect the landform or geomorphic character of valleylands and preventing erosion and other hazards;
- providing measures such as restoration plans to maintain and/or improve water quality of streams associated with valleylands;
- providing measures, such as buffers and restoration plans, to maintain and/or improve fish habitat associated with nearby valleylands;
- assessing the restoration potential and connectivity value of valleylands;
- determine if additions to the NHN are required to appropriately protect and/or restore valleyland features and connected ecological functions;
- maintaining and/or enhancing the surface water and groundwater connections associated with valleylands;
- mitigate impacts of development according to the Natural Heritage Reference Manual; and
- provide new information to the City in compatible format so it can be used to inform the configuration of the NHN.

C.5.3 Ecosystem Functions

- Surface water flow;
- Groundwater recharge and/or discharge;
- Meandering of a water course;
- Flood inundation and attenuation, relation to spill areas and flood vulnerable areas;
- Sediment trapping and erosion control related to slope, soils and vegetated surfaces;
- Headwaters protection;
- Movement and/or dispersal corridor; and
- Air quality improvements related to biomass metrics, such as leaf area index or canopy cover.

C.5.4 Inventory (Biophysical Description)

Broad Habitat Attributes

Top of bank to top of bank or other boundary limits such as area of land within the floodplain; land within the meander belt or within the highest general level of seasonal inundation; conveyance of and provision for short-term storage of storm and melt waters.

Social and Cultural Heritage Values

The inclusion of trails for passive recreational use or the protection of archaeological resources may require enhanced buffers or other protective measures.

Landform-Related Functions and Attributes

- Surface water functions (e.g. water/sediment conveyance function, associated wetlands);
- Groundwater functions (e.g. discharge as springs and seepage, areas of infiltration); and
- Landform prominence (e.g. well-defined valley as a landscape feature) and distinct geomorphic landforms (e.g. oxbows, bottomlands, terraces, deltas, exposed soil strata or eroding slopes along riverbanks or valley walls).

Ecological Features

- Degree of naturalness;
- Community and species diversity (e.g. diverse habitats along local landscape gradients or catenas);
- Unique communities and species (i.e. related to a range of diverse physical habitat types);
- Habitat value (e.g. existing or potential restored role in maintaining viable populations of native species); and
- Linkage function (i.e. for animal movement and/or species dispersal).

Restoration Potential and Value

- Areas where restoration will provide important ecological benefits such as linkage function, improvement of habitat for rare species, reduced fragmentation effects, and/or increased core natural areas;
- Areas where restoration will provide a minimum 30 m corridor of riparian vegetation on each side of surface water features;
- Areas where the community is interested in assisting in the implementation of ecological restoration;
- Areas that are in public ownership and which would benefit from restoration; and
- Areas where restoration would provide buffering to existing natural areas from the effects of adjacent development.

C.5.5 Adjacent Lands

The Province recommends that adjacent lands are those lands within 120 metres of significant valleylands where there are no other overlapping features of Provincial interest. This adjacent land width is recommended based on concerns related to the protection of features adjacent to valleylands such as woodlands and wildlife habitat, as well as addressing concerns related to protection of natural hazard lands (wetlands, flood-prone areas and unstable slopes). When valleylands are associated with other features such as woodlands, wetlands, fisheries habitat, etc., then these features should be considered in defining adjacent lands. Site-specific evaluations based on the inventory attributes noted above may demonstrate the need for greater or lesser distances for adjacent land widths. The foregoing does not affect the application of regulations under the Conservation Authorities Act.

C.6 Significant Wildlife Habitat

C.6.1 Information Sources

OMNR. 2000. Significant Wildlife Habitat Technical Guide. Queen's printer for Ontario. 151 pp. ISBN# 0-7794-0262-6-6 (Internet).

http://www.mnr.gov.on.ca/en/Business/FW/Publication/MNR_E001285P.html

OMNR 2000. Significant Wildlife Habitat decision support system
(http://www.mnr.gov.on.ca/en/Business/FW/Publication/MNR_E001285P.html)

Draft 2012 Significant Wildlife Habitat Ecoregion Criteria Schedules:
<http://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTE1ODc5&statusId=MTczNDgy&language=en>

The Ecoregion schedules addendum will be updated as new information becomes available. When finalized, it will be made available through MNR's Municipal Planning in Ontario webpage at http://www.mnr.gov.on.ca/en/Business/LUEPS/2ColumnSubPage/STEL02_165804.html

Natural Heritage Information Centre 2012. Biodiversity Explorer: species and vegetation community status. (<https://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/mainSubmit.do>)

Federal Species at Risk Public Registry. 2012.
(http://www.sararegistry.gc.ca/sar/index/default_e.cfm)

Provides information on federal designations which trigger discussion of the species' provincial designation. Presence of federal threatened and endangered species is a criterion for SWH

TRCA. 2007. Environmental Impact Statement Guidelines. Appendix H in the Planning and Development Procedural Manual. (<http://trca.on.ca/planning-services-permits/developers-and-consultants-information/planning-and-development-procedural-manual.dot>) and at (<http://trca.on.ca/dotAsset/40021.pdf>)

C.6.2 Objectives

Policies regarding significant wildlife habitat are found in Section 3.3.4 of the Official Plan.

Provincial Policy Statement

To be consistent with policies 2.1.4(d) and 2.1.6 of the PPS, planning authorities shall protect significant wildlife habitat by:

- not permitting development and site alteration in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the feature or its ecological function; and
- not permitting development and site alteration on adjacent lands unless the ecological function has been evaluated and it is demonstrated that there will be no negative impacts on the feature or its ecological function.

The protection of other natural heritage features and areas may address significant wildlife habitat. Nevertheless, in the absence of a comprehensive, City-wide assessment, site evaluations of significant wildlife habitat shall be carried out with regard to the scale of development and consistent with the Significant Wildlife Habitat Technical Guide (OMNR 2000).

Region of York Official Plan

The Region of York Official Plan (Ministry approved 2010) identifies significant wildlife habitat as a Key Natural Heritage Feature/Key Hydrologic Feature, but the features are not specifically mapped. Hence, it is stated in the Region of York Official Plan (Ministry approved 2010) that significant wildlife habitat “shall be precisely delineated on a site-by-site basis using procedures established by the Province, where applicable. Such delineation shall occur through the approval of *Planning Act* applications supported by appropriate technical studies such as master environmental servicing plans, *environmental impact studies*, natural heritage or hydrological evaluations”.

Outcomes

Specific outcomes of Significant Wildlife Habitat assessments are provided below.

- Provide background information on the habitat use of the subject lands and adjacent lands by wildlife related to the four categories described in the Significant Wildlife Habitat Technical Guide and using the ecoregion criteria schedules that match ELC types to wildlife habitat:
 - habitats of seasonal concentrations of animals;
 - rare vegetation communities or specialized habitat for wildlife;
 - habitat of species of conservation concern;
 - animal movement corridors.
- Determine if the habitat condition and proposed development constitutes a trigger for significant wildlife habitat assessment. In particular, the applicant should review the following information regarding biodiversity attributes delineated in the natural heritage background report, Natural Heritage in the City (<http://www.vaughtantomorrow.ca/OPR/background.html>):
 - Biodiversity Concentration Areas identified on Figure 3;
 - known occurrences of rare species shown on Figure 12;
 - areas of hydrogeological sensitivity as identified on Figure 5;
 - known occurrences of sensitive fish species and coldwater streams identified on Figure 7;
 - Sensitive Fish Areas identified on Figure 8;
 - Sensitive Bird Areas or Sensitive Amphibian Areas identified on Figure 9.
- Determine whether SWH occurs on the site and whether it is already protected within the NHN through other designations such as Significant Woodlands or Wetlands.
- Determine whether habitat included in other designations (e.g. Significant Wetlands or Significant Woodlands) contains features and species for which it may be considered Significant Wildlife Habitat.
- Evaluate habitat potential through restoration and connectivity options to determine whether there is a Candidate Significant Wildlife Habitat.
- Determine if additions to the NHN are required to appropriately protect and/or restore Significant Wildlife Habitat and connected ecological functions.
- Mitigate impacts of development according to the Natural Heritage Reference Manual and Significant Wildlife Habitat Decision Support System.

- Provide new information to the City in compatible format so it can be used to inform the configuration of the NHN.

C.6.3 Inventory (Biophysical Description)

See Section 9.3.2 of the Natural Heritage Reference Manual: Second Edition (OMNR 2010) for a five-step process to identify and confirm Significant Wildlife Habitat.

The Significant Wildlife Habitat Technical Guide describes four categories of significant wildlife habitat:

1. Habitats of seasonal concentrations of animals:

- areas where animals occur in relatively high densities for the species at specific periods in their life cycles and/or in particular seasons; and
- seasonal concentration areas, which tend to be localized and relatively small in relation to the area of habitat used at other times of the year.

2. Rare vegetation communities or specialized habitat for wildlife:

- rare vegetation communities include:
 - areas that contain a provincially rare vegetation community (according to the NHIC); and
 - areas that contain a vegetation community that is rare within the planning area.
- specialized wildlife habitats include:
 - areas that support wildlife species that have highly specific habitat requirements;
 - areas with exceptionally high species diversity or community diversity; and
 - areas that provide habitat that greatly enhances species' survival.

3. Habitat of species of conservation concern:

- includes the habitat of species that are rare or substantially declining, or have a high percentage of their global population in Ontario (this includes species of conservation concern such as regionally and locally rare species of plants and animals);
- includes special concern species identified under the ESA on the SARO List, which were formally referred to as "vulnerable" in the Significant Wildlife Habitat Technical Guide;
- species identified as nationally endangered or threatened by the Committee on the Status of Endangered Wildlife in Canada, which are not protected in regulation under Ontario's ESA;
- may overlap with habitats of endangered and threatened species covered under PPS Policy 2.1.3(a).

4. Animal movement corridors:

- habitats that link two or more wildlife habitats that are critical to the maintenance of a population of a particular species or group of species; and

- habitats with a key ecological function to enable wildlife to move, with minimum mortality, between areas of significant wildlife habitat or core natural areas

The Significant Wildlife Habitat Technical Guide (SWHTG) and the draft MNR Ecoregion schedules provide guidance as to criteria and thresholds for the above categories that can be used to define SWH. The ecoregion schedules (for Vaughan, the schedule for Ecoregion 6E is applicable) were posted to the Environmental Registry (EBR #011-4750) for comment in January 2012. The Ecoregion schedules are still in draft form, and have not been accepted as the supporting document for designation of SWH, though they are currently used in projects where OMNR approval is required, such as Renewable Energy applications. The SWHTG is still considered the accepted guidance document for designation of SWH, though the Ecoregion schedules provide useful reference and guidance.

The original intent for SWH (noted in the SWHTG) was to provide guidance for evaluation of SWH on a municipality-wide basis. For example, for amphibian breeding habitat, it was intended that information on amphibian breeding habitat would be compared throughout the municipality, after which criteria would be developed to map the most significant habitat. However, municipalities have generally not had resources to evaluate SWH on a municipality-wide basis. Guidance in the 2010 NHRM provides a protocol by which studies would indicate the potential for individual features to qualify as SWH, without the need for municipality-wide studies, and thresholds provided by the Ecoregion criteria help in this regard.

The City of Vaughan Natural Heritage Network Study, due to be completed in 2014, addresses Significant Wildlife Habitat at a municipal-wide scale. The NHN Study will identify, for example, SWH that is most likely to occur outside the current NHN, that could provide guidance for future habitat needs to be incorporated into the NHN. Relevant SWH are identified in tables according to each category of SWH (e.g. seasonal concentration areas, rare vegetation communities, specialized habitat for wildlife, as well as species of conservation concern). Animal movement corridors, a fourth category of SWH, are not addressed. Studies to delineate this type of habitat are labour-intensive, and should be scoped, if necessary, following confirmation of other types of SWH such as amphibian breeding habitat that will require connection to the NHN.

C.6.3 Adjacent Lands

The Province recommends that adjacent lands are those within a minimum of 120 metres of significant wildlife habitat. Considerations for alternative adjacent lands widths associated with significant wildlife habitat include:

- potential for impacts during the construction phase of the development (e.g., type of construction activity, vegetation removal), particularly for times of the year where populations may be more sensitive;
- sensitivity of the species using the significant wildlife habitat;
- potential impacts on wildlife species using the significant wildlife habitat after the development is completed (e.g., change in microclimate, increase in nutrients or contaminants, increased anthropogenic disturbance from traffic, light, noise and predation by pets; introduction of non-native plant species, further removal of vegetation); and
- potential for mitigation of temporary and long-term impacts.

C.7 Woodlands

C.7.1 Information Sources

AMEC Earth and Environmental. 2002. Focus Rural Area Woodland Ecosystem Assessment. Submitted to City of Vaughan Planning Department.

Ontario Nature. 2004. Suggested Conservation Guidelines for the Identification of Significant Woodlands in Southern Ontario.
(www.ontarionature.org/discover/resources/PDFs/reports/sig_woodlands_aug2004.pdf)

North-South Environmental Inc. 2005. York Region Significant Woodlands Study. 92 pp.

OMNR. 2000. Significant Wildlife Habitat: Technical Guide. Queen's Printer for Ontario. 151 pp. ISBN# 0-7794-0262-6-6 (Internet)
(http://www.mnr.gov.on.ca/en/Business/FW/Publication/MNR_E001285P.html)

TRCA. 2007. Environmental Impact Statement Guidelines. Appendix H in the Planning and Development Procedural Manual. (<http://trca.on.ca/planning-services-permits/developers-and-consultants-information/planning-and-development-procedural-manual.dot>) and at (<http://trca.on.ca/dotAsset/40021.pdf>)

C.7.2 Objectives

In the State of Ontario's Biodiversity 2010 Report (<http://viewer.zmags.com/publication/6aa599ac#/6aa599ac/1>)⁹, it is noted with respect to the forest habitat indicator that only 17% forest cover remains in the southwest zone with limited habitat for forest interior birds. The City of Vaughan is located in the Central zone, which includes over 30% land cover. However, about 23% forest cover exists for the Region of York portion of the Central zone and approximately 16% for the City of Vaughan.

Policies regarding woodlands are found in Section 3.3.3 of the Official Plan.

Provincial Policy Statement

Policy 2.1.4(b) of the PPS protects *significant woodlands* south and east of the Canadian Shield "unless it has been demonstrated that there will be no *negative impacts* on the natural features or their *ecological functions*." Criteria for determining the significance of woodlands is provided in the Natural Heritage Reference Manual: Second Edition (OMNR 2010).

Region of York Official Plan

The Region of York Official Plan (Ministry approved 2010) identifies significant woodlands as a Key Natural Heritage Feature. The general location of evaluated woodlands in York Region is shown on Map 5 of the Region of York Official Plan (Ministry approved 2010). Significant woodlands have been identified by the Region based on best available data, without field verification; site specific studies are required on all woodlands to verify significance in accordance with the criteria.

All woodlands evaluated as Regionally Significant Woodlands are protected in the Natural Heritage Network (NHN). Additional studies may be required to: (a) confirm the significance of all woodlands

⁹ See also the see Ontario Biodiversity Strategy (<http://www.mnr.gov.on.ca/en/Business/Biodiversity/index.html>).
City of Vaughan DRAFT Environmental Management Guideline in support of the Vaughan Official Plan (VOP 2010) June 2013

within the planning area by applying the Region's Significant Woodlands Criteria; (b) provide further protection measures for significant woodlands; (c) identify and recommend protection measures for other woodlands currently outside of the NHN; and, (d) recommend design options and mitigative techniques of the proposed development form adjacent to woodlands.

Outcomes

Specific outcomes of studies shall demonstrate habitat values and ecological functions by:

- determining more accurately the functions and features of the woodland; as well as whether it meets the criteria for other provincial designations such as Significant Wildlife Habitat;
- providing measures, such as ecological buffers or development design, to protect the landform of the woodland;
- providing measures, such as buffers and restoration plans, to maintain and/or improve wildlife habitat values, particularly with respect to interior forest habitat;
- assessing the restoration potential and connectivity value of woodlands, such as through criteria identified in the York Region Significant Woodlands Study (North-South Environmental Inc. 2005) and the City's Natural Heritage Network Study;
- determine if additions to the Natural Heritage Network are required to appropriately protect and/or restore woodland features and connected ecological functions;
- assess ecosystem functions using appropriate quantitative values, such as stem density, tree diameter, leaf area index, and other metrics that can be used to determine ecosystem functions related to air pollution removal, carbon storage, attenuation of runoff volumes, contaminant removal from runoff, and cooling through shade and evapotranspiration;
- recommend measures so that impacts of passive uses such as trails are minimized;
- mitigate impacts of development according to the Natural Heritage Reference Manual: Second Edition (OMNR 2010); and
- provide new information to the City in compatible format so it can be used to inform the configuration of the NHN.

Mitigative measures regarding woodlands are to be provided in a detailed edge management study recommending woodlot-specific management measures and a monitoring strategy for the time period during and following development. This includes detailed mitigation/restoration plans and an implementation strategy. These measures shall be addressed as a component of the Landscape and Open Space Master Plan required as a condition of development approval.

C.7.3 Ecosystem Functions

- Prevent soil erosion;
- Sediment trapping and erosion control related to slope, soils and vegetated surfaces;
- Water quantity improvement by reducing volume and intensity of storm water flows;
- Water quality improvement by removing nutrients, sediment and toxins from surface water flows;
- Regulating stream temperature through shading thereby improving fish habitat;
- Habitat for wildlife;
- Protection of groundwater recharge area;
- Headwaters protection;
- Regulating local microclimates, such as cooling through shading and evapotranspiration; and
- Air quality improvements related to biomass metrics, such as leaf area index or canopy cover.

C.7.4 Inventory (Biophysical Description)

The Focus Rural Area Woodland Ecosystem Assessment (AMEC Earth and Environmental 2002) provides a useful framework for evaluating woodlands based primarily on habitat criteria and secondarily on contribution to other ecological functions such as the hydrologic cycle and unique or special elements.

Broad Habitat Attributes

Regionally Significant Woodlands are defined in the Region of York Official Plan (Ministry approved 2010) as any woodland meeting one of the following criteria:

- a. is 0.5 hectares or larger and:
 - i. directly supports *globally or provincially rare plants, animals or communities* as assigned by the Natural Heritage Information Centre; or,
 - ii. directly supports *threatened or endangered species*, with the exception of specimens deemed not requiring protection by the Province (e.g. as is sometimes the case with Butternut); or,
 - iii. is within 30 metres of a provincially significant *wetland* or *wetland* as identified on Map 4, *waterbody, permanent stream or intermittent stream*;
- b. is 2 hectares or larger and:
 - i. is located outside of the Urban Area and is within 100 metres of a *Life Science Area of Natural and Scientific Interest*, a provincially significant *wetland* or *wetland* as identified on Map 4, *significant valleyland, Environmentally Significant Area, or fish habitat*; or,
 - ii. occurs within the Regional Greenlands System;
- c. is south of the Oak Ridges Moraine and is 4 hectares or larger in size;
- d. is north of the Oak Ridges Moraine and is 10 hectares or larger in size;
- e. on the Oak Ridges Moraine the *woodland* will be evaluated for significance based on the requirements of the Oak Ridges Moraine Conservation Plan and associated technical papers; or, g. on the Oak Ridges Moraine the *woodland* will be evaluated for significance based on the requirements of the Oak Ridges Moraine Conservation Plan and associated technical papers; or
- f. on lands in the Greenbelt Natural Heritage System, the *woodland* will be evaluated for significance based on the requirements of the Greenbelt Plan and associated technical papers.

Forest Composition:

Ecological Land Classification and vegetation inventory.

Criteria for Identifying Significant Woodlands in the Natural Heritage Reference Manual

- Woodland Size
- Ecological Functions
 - Interior habitat
 - Proximity to other woodlands
 - Linkages
 - Water protection
 - Woodland diversity

- Uncommon characteristics (e.g. older age classes, sensitive species)
- Economic and Social Functional Values

Wildlife Habitat Features

- Breeding bird surveys (see TRCA EIS Guidelines)
- Amphibian surveys (see TRCA EIS Guidelines)
- Interior habitat
- Consideration of significant wildlife habitat features and functions (see Subsection C.6 of this Guide for a discussion of the four types of significant wildlife habitat: seasonal concentration areas, rare communities or specialized habitats, species of conservation concern, and animal movement corridors).

Forest Condition

- Degree of naturalness versus disturbance
- Extent of invasive species
- Age class distribution
- Canopy complexity
- Evidence of natural regeneration

C.7.5 Adjacent Lands

For the purposes of Policy 2.1.6 of the PPS, the Province recommends that adjacent lands are those lands within 120 metres of a significant woodland. Considerations to recommend alternative adjacent lands widths include:

- sensitivities of the plant and animal species in the woodland;
- contribution of the woodland to ecological functions beyond its boundaries;
- potential for direct and indirect disruption, and changes in soil moisture and compaction;
- susceptibility to erosion;
- fear of hazards from falling edge trees that are functional when standing (e.g., as screening or cavity habitat trees); and
- the cumulative impacts of potential nearby developments and uses.

C.7.6 Region of York Woodland Securement Criteria

The securement criteria described in the York Region Significant Woodlands Study (2005) are intended to set priorities for land purchase or other securement approaches. The criteria provide a useful framework for evaluating the likelihood and feasibility of protection and restoration options for woodlands.

Habitat Representation on and south of the Oak Ridges Moraine

- On the Oak Ridges Moraine (3 species associations)
 - beech
 - maple
 - maple beech
- South of the Oak Ridges Moraine (10 species associations)
 - beech
 - cedar
 - cedar mixed
 - deciduous mixed
 - elm mixed
 - maple

maple-beech
maple-beech-oak
maple mixed
oak mixed

Increasing woodland patch size

- Providing > 4 ha of contiguous interior forest through expansion areas that would contribute to increasing the area of an existing woodland to over 16 ha;
- Areas between existing woodland patches that are part of a group of woodlands that would facilitate the creation of a woodland greater than 100 ha in size.

Protection of significant species

- Any area that would increase the size of an existing woodland less than 4 ha containing a significant plant species, or less than 10 ha and containing a significant animal species. Significant species are defined in Appendix 6 of the York Region Significant Woodland Study as G1 to G3 and S1 to S3 listed species by the Natural Heritage Information Centre, and Endangered, Threatened, Vulnerable and Special Concern species listed under COSSARO (Committee on the Status of Species at Risk in Ontario) or COSEWIC (Committee on the Status of Endangered Wildlife in Canada).

Strengthening connection with other natural features

- Any area that, if restored to woodland, would increase the connectivity among two or more existing woodland patches, or between one or more woodland patches and other significant natural features. Appendix 6 of the York Region Significant Woodland Study defines significant natural features as:
 - all evaluated wetlands;
 - all life science ANSIs (regionally and provincially significant);
 - all significant valleylands as determined by the MNR or TRCA;
 - Environmentally Significant/Sensitive Areas (ESAs); and
 - ORM Key Natural Heritage Features and their associated vegetation protection zones.

Upland Woodlands South of the Oak Ridges Moraine

- Any area that would increase the size or number of upland woodlands south of the Oak Ridges Moraine.

Improving the shape of existing woodlands

- Any area that, if restored to woodland, would either make an existing woodland patch more circular or square in shape (as opposed to long and narrow), or which creates smoother woodland edges through restoration of indentations in the boundary.

Restores native woodland communities

- Plantations or other areas that can be converted to native woodland communities by restoration or natural regeneration techniques.

C.8 Areas of Natural and Scientific Interest (ANSIs) and Environmentally Significant Areas (ESAs)

C.8.1 Information Sources

Six ANSIs and 24 ESAs are listed and briefly described in Sections 4.4.3 and 4.4.4 of Appendix C of the background report, Natural Heritage in the City.

C.8.2 Objectives

Provincial Policy Statement

Policy 2.1.4(e) of the PPS protects *significant areas of natural and scientific interest* from development “unless it has been demonstrated that there will be no *negative impacts* on the natural features or their *ecological functions*”. Only provincially ranked ANSIs are considered significant under the PPS. However, all six ANSIs in the City of Vaughan are protected as Core Features in the NHN.

Region of York Official Plan

The Region of York Official Plan (Ministry approved 2010) identifies Life Science Areas of Natural and Scientific Interest and Environmentally Significant Areas as Key Natural Heritage Features and/or Key Hydrologic Features. The general locations of Life Science ANSIs and ESAs in York Region are shown on Map 3 of the Region of York Official Plan.

Objectives

- Objectives of studies regarding ANSIs and ESAs shall reflect the main habitat types in these areas. See subsections of the EMG above for valley and stream corridors, wetlands, fish habitat, habitat of endangered and threatened species, significant wildlife habitat, and woodlands.
- provide new information to the City in compatible format so it can be used to inform the configuration of the NHN.

Adjacent Lands

The Province recommends that adjacent lands are those lands within 120 metres of Life Science ANSIs and within 50 m Earth Science ANSIs. Adjacent lands for ESAs should be based on the predominant vegetation type.

REFERENCES

AECOM. 2010. City of Vaughan: Natural Heritage in the City. 119 pp.

AMEC Earth and Environmental. 2002. Focus Rural Area Woodland Ecosystem Assessment. Submitted to City of Vaughan Planning Department.

Clarifica Inc. 2009. City-Wide Drainage and Stormwater Management Criteria Study. Prepared for the City of Vaughan. 85 pp.

Conservation Halton. 2005. Conservation Halton Environmental Impact Study Guidelines. 48 pp.

COSEWIC (2004) Canadian Species At Risk May 2004 Committee On The Status Of Endangered Wildlife in Canada. 49 pp.

Credit Valley Conservation and Toronto and Region Conservation Authority. 2009. Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines. 22 pp.

Environment Canada. 2004. How Much habitat Is Enough?. A Framework of Guiding Habitat Rehabilitation in Great Lakes Areas of Concern 2nd Edition. Minister of Public Works and Government Services Canada. Downsview, Ontario 80 pp.

Halton Region. 2005. Halton Region Environmental Impact Assessment Guidelines. Halton Region Council Approved July 15, 2005. 15 pp.

KRCA (2002) Watershed Management Policies. Kawartha Region Conservation Authority Lindsay Ontario 54 pp.

Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P.Uhlig, S.McMurray (1998). Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, South Central Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-o2. 225 pp.

OMMAH 2005. Provincial Policy Statement. Ontario Ministry of Municipal Affairs and Housing. Toronto: Queens Printer for Ontario 37 pp

OMNR. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario. 248 pp.

OMNR. 2001. Adaptive Management of Stream Corridors in Ontario Including Natural Hazards Technical Guides, and Understanding Natural Hazards. Watershed Science Centre, Trent University, Peterborough, Ontario, Canada. Queen's Printer for Ontario. ISBN 0-9688196-0-5.

OMNR (1999) Natural Heritage Reference Manual for Policy 2.3 of the Provincial Policy Statement. Ontario Ministry of Natural Resources 127 pp

Region of York. 2009. Region of York Official Plan: Council-adopted December 2009.

Toronto and Region Conservation Authority (TRCA). 2007. Terrestrial Natural Heritage System Strategy. (<http://trca.on.ca/protect/land/terrestrial-natural-heritage/>)

Toronto and Region Conservation Authority (TRCA). 2007. Environmental Impact Statement Guidelines.
(<http://www.trca.on.ca/planning-services-permits/developers-and-consultants-information/planning-and-development-procedural-manual.dot>)

Toronto and Region Conservation Authority (TRCA). 1994. Valley and Stream Corridor Management Program. 80 pp.

DRAFT

APPENDIX 1

Region Of York Official Plan Definitions

DEVELOPMENT

The creation of a new lot, a change in land use, or the construction of buildings and structures, requiring approval under the Planning Act, but does not include:

- a. activities that create or maintain infrastructure authorized under an environmental assessment, Planning Act, or Condominium Act process; or,
- b. works subject to the Drainage Act.

ENDANGERED AND THREATENED SPECIES,

A species that is listed or categorized as an “Endangered Species” or “Threatened Species” on the Ontario Ministry of Natural Resources’ official Species At Risk in Ontario List, as updated and amended from time to time..

KEY HYDROLOGIC FEATURE

Key hydrologic features are described in Section 2.2 of this [York Region Official] Plan and include *wetlands, lakes and their littoral zones, permanent and intermittent streams, kettle lakes, seepage areas and springs*, and the Lake Simcoe Shoreline.

KEY NATURAL HERITAGE FEATURE

Key natural heritage features are described in Section 2.2 of this [York Region Official] Plan and include the *habitat of endangered species, threatened species and special concern species, fish habitat, wetlands, Life Science Areas of Natural and Scientific Interest, Environmentally Significant Areas, significant valleylands, significant woodlands, significant wildlife habitat, sand barrens, savannahs and tallgrass prairies*.

MAJOR DEVELOPMENT

Consists of:

- a. the creation of four or more lots;
- b. the construction of a building or buildings with a ground floor area of 500 square metres or more; or,
- c. the establishment of a *major recreational use*.

SENSITIVE GROUNDWATER FEATURES

Water-related features in the earth’s subsurface, including recharge/discharge areas, water tables, aquifers and unsaturated zones that can be defined by surface and subsurface hydrogeologic investigations, that are particularly susceptible to impacts from activities or events including, but not limited to, water withdrawals, and additions of pollutants.

SENSITIVE SURFACE WATER FEATURES

Water-related features on the earth’s surface, including headwaters, rivers, stream channels, inland lakes, seepage areas, recharge/discharge areas, springs, wetlands, and associated riparian lands that can be defined by their soil moisture, soil type, vegetation or topographic characteristics, that are particularly susceptible to impacts from activities or events including, but not limited to, water withdrawals, and additions of pollutants.

SIGNIFICANT GROUNDWATER RECHARGE AREA

An area within which it is desirable to regulate or monitor drinking water threats that may affect the recharge of an aquifer.

SIGNIFICANT HABITAT (AS IT RELATES TO ENDANGERED, THREATENED, SPECIAL CONCERN OR PROVINCIALLY RARE SPECIES)

The habitat, as determined by the Ontario Ministry of Natural Resources, that is necessary for the maintenance, survival, and/or the recovery of naturally occurring or reintroduced populations of the species, and where those areas of occurrence are occupied by the species during all or any part(s) of its life cycle.

SIGNIFICANT WILDLIFE HABITAT

Wildlife habitat consists of areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species. Significant wildlife habitat includes those areas which are ecologically important in terms of features, functions, representation or amount, and contribute to the quality and diversity of an identifiable geographic area or natural heritage system.

SIGNIFICANT WOODLANDS

Woodlands which meet any one of the criteria in policy 2.2.45 of this Plan, except those excluded by policy 2.2.48 of this Plan.

WETLAND

Lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens. Periodically soaked or wet lands being used for agricultural purposes which no longer exhibit wetland characteristics are not considered to be wetlands for the purposes of this definition.

WOODLAND

An area of land at least 0.2 hectare in area with at least:

- a. 1000 *trees* of any size, per hectare;
- b. 750 *trees* measuring over 5 centimetres diameter at breast height, per hectare;
- c. 500 *trees* measuring over 12 centimetres diameter at breast height, per hectare; or,
- d. 250 *trees* measuring over 20 centimetres diameter at breast height, per hectare,

but does not include a cultivated fruit or nut orchard, a plantation established and used for the purpose of producing Christmas trees or nursery stock. For the purposes of defining a woodland, treed areas separated by more than 20 metres will be considered a separate woodland. When determining the limit of a woodland, continuous agricultural hedgerows and woodland fingers or narrow woodland patches will be considered part of a woodland if they have a minimum average width of at least 40 metres and narrower sections have a length to width ratio of 3 to 1 or less. Undeveloped clearings within woodland patches are generally included within a woodland if the total area of each clearing is no greater than 0.2 hectares. In areas covered by Provincial Plan policies, woodland includes treed areas as further described by the Ministry of Natural Resources. For the purposes of determining the densities above for woodlands outside of Provincial Plan Areas, the following species are excluded: staghorn sumac, European buckthorn and common lilac.

APPENDIX 2 City Of Vaughan Official Plan Definitions

Adjacent

When applied to natural heritage, those lands contiguous to a *Core Feature* where it is likely that development or site alteration can reasonably be expected to have an impact on the feature. Generally, adjacent lands are considered to be within 120 metres from any part of the feature. When applied to cultural or built heritage, those lands contiguous to a protected heritage property.

Built-up Valley Lands

Built-up Valley Lands recognize existing and occupied developed lands located below the physical top of bank. Such lands are found in and around Woodbridge and Kleinburg in the Humber Valley and contribute to the overall Natural Heritage Network. Minor modifications or additions within these areas are permitted with restrictions.

Core Features

Core Features include *valley and stream corridors; woodlands; wetlands;* fish and wildlife habitat; significant habitat of endangered and threatened species; and Environmentally Significant Areas and Areas of Natural and Scientific Interest. Core Features also include key natural heritage features and key hydrological features within the Greenbelt and Oak Ridges Moraine Conservation Plan areas. These features are the core elements of the Natural Heritage Network to be protected and enhanced as identified on Schedule 2. Except as specifically set out in this Plan, development and/or site alteration will not be permitted in such areas. Significant alteration or expansion of any existing development in such areas will not be permitted except as specifically set out in this Plan.

Development

When applicable to the Oak Ridges Moraine Conservation Area:

The creation of a new lot, a change in land use, or the construction of buildings and structures, any of which require approval under the *Planning Act*, the *Environmental Assessment Act*, or the *Drainage Act*, but does not include:

- a) the construction of facilities for transportation, infrastructure and utilities uses, as described in subsection 3.4.10 of the VOP 2010, by a public body, or
- b) for greater certainty,
 - i. the reconstruction, repair or maintenance of a drain approved under the *Drainage Act* and in existence on November 15, 2001, or
 - ii. the carrying out of agricultural practices on land that was being used for agricultural uses on November 15, 2001;

When applicable to the Greenbelt Plan Area:

The creation of a new lot, a change in land use, or the construction of buildings and structures, any of which require approval under the *Planning Act*, or that are subject to the *Environmental Assessment Act*, but does not include:

- a) the construction of facilities for transportation, infrastructure and utilities used by a public body;
- b) activities or works under the *Drainage Act*; or
- c) the carrying out of agricultural practices on land that was being used for agricultural uses on the date the Plan came into effect (PPS, 2005).

When applicable to lands outside of the Oak Ridges Moraine Conservation Plan and Greenbelt Plan:

The creation of a new lot, a change in land use, or the construction of buildings and structures, requiring approval under the *Planning Act*, but does not include:

- a. activities that create or maintain infrastructure authorized under an environmental assessment, *Planning Act*, or *Condominium Act* process; or,
- b. works subject to the *Drainage Act*.

Ecological Integrity

Includes hydrological integrity and means the condition of ecosystems in which:

- a) the structure, composition and function of the ecosystems are unimpaired by stresses from human activity;
- b) natural ecological processes are intact and self-sustaining; and,
- c) the ecosystems evolve naturally.

Enhancement Area

Enhancement Area opportunities have been identified consistent with the York Region Official Plan policies to identify potential **Enhancement Area** and linkages that complement the Regional Greenlands System. In consultation with the Toronto and Region Conservation Authority, the potential Enhancement Area reflect the best opportunities on remaining undeveloped land to provide additional habitat and/or ecological connectivity of the Natural Heritage Network through restoration or renaturalization of specific natural features. **Enhancement Area** have been identified conceptually on Schedule 2. The request for and precise limits of **Enhancement Area** to add to the Natural Heritage Network will be determined through appropriate studies to be initiated by the City or prepared as part of the development approvals process.

Habitat of Endangered and Threatened Species

Habitat of endangered species and threatened species, means the habitat, as approved by the Ontario Ministry of Natural Resources, that is necessary for the maintenance, survival, and/or the recovery of naturally occurring or reintroduced populations of endangered species or threatened species, and where those areas of occurrence are occupied or habitually occupied by the species during all or any part(s) of its life cycle. In addition, select species placed on the Species at Risk in Ontario List are identified in regulations under the Endangered Species Act, which may provide further definition of habitat of endangered and threatened species.

Significant Development

A development with 100 or more residential dwelling units or a total gross floor area of all uses of 12,500 m² or greater.

Significant Wildlife Habitat

Areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species. These areas are ecologically important in terms of features, functions, representation or amount, and contribute to the quality and diversity of an identifiable geographic area or natural heritage system. The Provincial Significant Wildlife Habitat Technical Guide should be referenced to determine significant wildlife habitat.

Site Alteration

When applicable to the Oak Ridges Moraine Conservation Area and the Greenbelt Plan Area:

Activities such as filling, grading and excavation that would change the landform and natural vegetative characteristics of land, but does not include,

- a) the construction of facilities for transportation, infrastructure and utilities uses by a public body, or
- b) for greater certainty,
 - i. the reconstruction, repair or maintenance of a drain approved under the *Drainage Act* and in existence on November 15, 2001, or
 - ii. the carrying out of agricultural practices on land that was being used for agricultural uses on November 15, 2001.

When applicable to lands outside of the Oak Ridges Moraine Conservation Area and the Greenbelt Plan area:

Activities, such as grading, excavation and the placement of fill that would change the landform and natural vegetative characteristics of a site.

Valley and Stream Corridor

Valley and stream corridors are the natural resources associated with river systems characterized by their landforms, features and functions. Valley and stream corridors are distinguished from other physiographic features by their connection to the river system as a whole.

The physical landform of a valley corridor can visually be identified from its surrounding landscape (it is well-defined). The physical landform of a stream corridor cannot be visually identified from its surrounding landscape (it is ill-defined). Therefore, valley corridors are distinguished from stream corridors by the presence of a distinct landform.

Valley corridors may or may not have a defined watercourse channel. Stream corridors will typically have a defined watercourse channel, except at the upper limit of the corridor - source area – where the watercourse (headwater stream) is characterized by surface flow and/or high water tables originating from springs and seepage areas.

Where a Significant Area, as defined in the Valley and Stream Corridor Management Program, is within and/or immediately *adjacent* to a valley or stream corridor, the corridor boundary is extended to include the Significant Area and a minimum 10 metres inland.

Valley and stream corridors are significant valleylands and will be further clarified through ongoing studies such as the Natural Heritage Network Study and studies in support of development applications.

Wetland

Lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens. Periodically soaked or wet lands being used for agricultural purposes which no longer exhibit wetland characteristics are not considered to be wetlands for the purposes of this definition.

Wetlands on the Oak Ridges Moraine and Greenbelt include any wetlands identified by the Ministry of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time.

Woodland

A treed area of land at least 0.2 hectare in size with at least:

- a) 1000 trees of any size, per hectare;
- b) 750 trees measuring over 5 centimetres diameter at breast height, per hectare;
- c) 500 trees measuring over 12 centimetres diameter at breast height, per hectare; or,
- d) 250 trees measuring over 20 centimetres diameter at breast height, per hectare, but does not include a cultivated fruit or nut orchard, a plantation established for the purpose of producing Christmas trees or nursery stock.

For the purposes of defining a woodland, treed areas separated by more than 20 metres will be considered a separate woodland.

APPENDIX 3

Glossary of Additional Terms Referenced in the Environmental Management Guide

Normal High-Water Mark

The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bankfull level” which is often the one-to two-year flood flow return level. For inland lakes, it refers to those parts of the waterbody bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water-tolerant species). For reservoirs this refers to normal high operating levels. (Source: Natural Heritage Reference Manual: Second Edition, 2010)

Qualified Professional

A person carrying out studies or evaluations as recommended or required by the Natural Heritage Reference Manual who meets any specific requirements (e.g., wetland evaluation training) to carry out the study or evaluation and where appropriate meets professional standards in their particular field and is accredited by a professional association. (Source: Natural Heritage Reference Manual: Second Edition, 2010)

DRAFT