Final

Erbsville South Environmental Study

Prepared for Sunvest Development Corp.
by Dougan & Associates; IBI Group; JTB Environmental Systems Inc.; LVM, a division of EnGlobe Corp.; C. Portt and Associates
May 11, 2018

STUDY TEAM

DOUGAN & ASSOCIATES

Jim Dougan, M.Sc.
Karl Konze, B.Sc.
Wendy Charron-Frise, BES
Ian Richards, B.Sc.
Dylan White, B.Sc.
Kristen Beauchamp, B.Sc.
Zack Harris, M.Sc.
Christina Myrdal, B.Sc.
Mary Anne Young, BLA

IBI GROUP

Elizabeth Caston, BES
Thomas C. Hardacre, MCIP, RPP
Andy Kroess, P. Eng.

JTB ENVIRONMENTAL SYSTEMS INC.

Dr. John T. Beebe, Ph.D.

LVM, A DIVISION OF ENGLOBE CORP.

Reinhard Zapata, P. Geo, Ph. D.
Elysha Brears, B.Sc., G.I.T.

C. PORTT AND ASSOCIATES

Cam Portt, M.Sc.

Table of Contents

Table of Contents (continued)

Table of Contents (continued)

Table of Contents (continued)

Table of Contents (continued)

Figures

Table of Contents (continued)

Table of Contents (continued)

Appendices

Executive Summary

The Erbsville South Environmental Study focuses on lands located within the southern portion of the Erbsville Settlement Area, more specifically along the east and west sides of Erbsville Road, south of Laurel Creek and north of Wideman Road excluding the approved Regal Place Subdivision west of Erbsville Road. The study area is within the northern portion of Subwatershed #309 of the Laurel Creek Watershed.

The purpose of the Erbsville South Environmental Study is to supplement existing environmental information that is contained in the *Laurel Creek Watershed Study* and the subsequent *Final Subwatershed Management Plan #313 and #309* and to update that information in the light of current policies in the City of Waterloo and Region of Waterloo Official Plans and the 2014 Provincial Policy Statement. The study identifies and categorizes natural features and functions within the study area, delineates areas to be protected and recommends development setbacks and mitigation measures necessary to maintain or improve the ecological sustainability within the study area.

The key recommendations of the Environmental Management Plan for the Erbsville South Study Area include:

1. **Core Environmental Features** - Confirm the boundaries of all core natural areas within the Erbsville South study area so that they can be adequately protected before, during, and after the development process. This includes Provincially Significant Wetlands, Environmentally Sensitive Policy Areas, areas of Significant Wildlife Habitat, and their ecological linkages, as well as the immediately contiguous Laurel Creek Headwaters Environmentally Sensitive Landscape. During the Environmental Assessment process required for the widening of Erbsville Road it is recommended that alternative approaches be investigated for maintaining the long term protection of the functions associated with the small wetland feature located at the corner of Wideman and Erbsville Roads that was recently complexed by MNRF with the Sunfish Lake - Laurel Creek PSW.

2. **Watercourses** – Retain and protect all watercourses within the Erbsville South study area. During the Environmental Assessment process required for the widening of Erbsville Road it is recommended that alternative approaches be explored for the stormwater outflow tributary at Wideman Road including the current functions of this watercourse.

3. **Development Setbacks** – Based on current policy guidance and findings from the field studies undertaken for the Erbsville South Environmental Study, the following minimum development setbacks are recommended:

    - PSW wetland: 30 metres
    - ESPA: 10 metres
    - Watercourses: 30 metres
    - Woodlands: 10 metres

    Finalized buffer widths should be established and confirmed at the development application stage through an Environmental Impact Study, when information on proposed adjacent land uses and lot layouts are known.

4. **Corridors/Linkages** – Establish and enhance with natural plantings a minimum width of 30 metres along each side of Wideman Creek as a wildlife corridor and linkage between core areas. Prior to any development within the study area and/or in conjunction with the upgrading of Erbsville Road, the Wideman Creek culvert under Erbsville Road should be improved to convey the Regulatory storm peak flow and reduce the upstream Regulatory Floodline. The design should incorporate an open bottom culvert including terrestrial benches and other design features to provide a safe wildlife crossing.

5. **Hydrogeology** - The post-development water balance should endeavour to match the pre-development water balance, by maintaining spatial distribution of infiltration across the Study Area. In order to

maintain the form and function of wetlands, the proposed residential development will need to maintain pre-development groundwater levels, and seasonal runoff volumes. House footings must be separated from the seasonally high water table levels.

6. **Stormwater Management Strategy** – For all future development areas with in the study area the following criteria must be adhered to:

    - Stormwater management facilities are required to provide water quantity (peak flow) control for the 2, 5, 25, and 100 year storms;
    - Extended detention control for erosion control is required for runoff volume in excess of the existing 100 year runoff volume and are to be released over a 48 hour period;
    - Stormwater management facilities are required to provide an enhanced level of water quality control for all flows not infiltrated across the site utilizing Low Impact Development (LID) measures;
    - Thermal impacts on Laurel Creek and Wideman Tributary must be avoided or mitigated where necessary;
    - Infiltration of clean treated runoff to depth is to be provided and seepage toward wetland areas maintained as close to existing levels as possible; and
    - Grading and servicing design must ensure that there are no adverse impacts on groundwater and on the adjacent significant natural features.
    - A program of Systems and Post Development Monitoring should continue to be undertaken by public agencies and/or stewardship programs. In addition, a comprehensive Development Monitoring program should be undertaken by developers that includes three phases: 1) pre-development; 2) during construction; and 3) post development.

7. **Stewardship Initiatives** - The City of Waterloo, Regional Municipality of Waterloo and other agencies implement a Public Education Program that covers such topics as potential environmental impacts of public activities, groundwater protection strategies and terrestrial preservation techniques. It should be noted that the City of Waterloo has developed the “Naturally Your Waterloo” environmental stewardship brochure. Purchasing and providing copies to new home owners will be a condition of draft plan approval.

8. **Future Studies** – Submit Scoped Environmental Impact Studies with future development applications to verify or refine findings and recommendations presented in this report. An Information Gathering Form (IGF) must be completed and submitted to MNRF for any development proposed within the study area.

The Erbsville South Environmental Study meets the requirements of the Council-approved Terms of Reference and has been prepared in accordance with the Technical Work Plan approved by the City of Waterloo, the Regional Municipality of Waterloo, the Grand River Conservation Authority and the Ministry of Natural Resources and Forestry. This study is also consistent with the policies of these agencies with regard to completion of subwatershed studies. The Erbsville South Environmental Study provides an environmental management strategy that will guide the development of the Erbsville South Block Plan Study.

1 Introduction

On behalf of **Sunvest Development Corp.**, **IBI Group (IBI)**, **Dougan & Associates (DA)**, **C. Portt and Associates (Portt)**, **JTB Environmental Systems Inc. (JTB)**, and **LVM, a division of EnGlobe Corp. (Englobe)** were retained to complete the Erbsville South Environmental Study (ES). The study area is comprised of lands located within the southern portion of the Erbsville Settlement Area, more specifically along the east and west sides of Erbsville Road, south of Laurel Creek and north of Wideman Road excluding the approved Regal Place Subdivision west of Erbsville Road (See **Figure 1.1**). Laurel Creek borders three sides of the study area. A small tributary known as Wideman Creek traverses the southern parcel of the study area from west to east, crossing Erbsville Road and continuing east to meet with Laurel Creek.

The study area is within the northern portion of Subwatershed #309 of the Laurel Creek Watershed. The *Laurel Creek Watershed Study* (WS) was completed in 1993 by the City of Waterloo in conjunction with the Grand River Conservation Authority. In accordance with the recommendations of the Watershed Study, in 1996 the *Final Subwatershed Management Plan #313 and #309*, prepared by Planning Initiatives Ltd. and Associates was completed. Since that time most of the southern portion of Subwatershed #309 south of Wideman Road has been developed.

1.1 Background

In early 2010, landowners within the study area approached the City of Waterloo to initiate discussions regarding the advancement of development on their lands prior to the completion of a comprehensive district plan for the Erbsville area. It was agreed and considered reasonable that a Block Plan Study for the Erbsville South Area could be undertaken in advance of a district-level study as 1) a Subwatershed Study, a prerequisite for permitting significant areas of new development, has been completed for the area, 2) it is anticipated that lands within the study area are serviceable by gravity sanitary sewers to existing infrastructure, and 3) provisions had been included within the Council-adopted Official Plan that supported the approach. These provisions also excluded the Regal Place subdivision from the Block Plan Study process as it was an approved plan of subdivision.

Two Terms of Reference were prepared one for the Erbsville South Block Plan Study that will be coordinated by the City of Waterloo, and a second for the Erbsville South Environmental Study (ES) that will be coordinated by IBI Group on behalf of Sunvest Development Corp. The ES will guide the environmental planning components of the Block Plan Study. Both Terms of Reference were approved by City of Waterloo Council in October 2012.

The reader will note that **Figure 1.1** shows that the study area includes two components: the Primary Study Area and an Extended Study Area for Habitat Assessments and Species Inventories. During public and agency consultation of the Terms of Reference for the ES some concern was expressed that the Study Area was too small to effectively understand the environmental issues within the area, particularly with the natural habitats that extend beyond the Primary Study Area. As a result, additional lands to the west of the Study Area were added and are referred to as the “Extended Study Area” where the focus is on habitat assessment and species inventories. The extent of the extended area was based on the Ministry of Natural Resources and Forestry definition for adjacent lands of 120 metres for most significant natural features, which is generally regarded as the extent to which potential impacts from proposed land use change might occur. The Extended Study Area also helps fulfill Regional Official Plan Policy 7.B.12 which deals with development applications on lands contiguous to Environmentally Sensitive Landscapes.

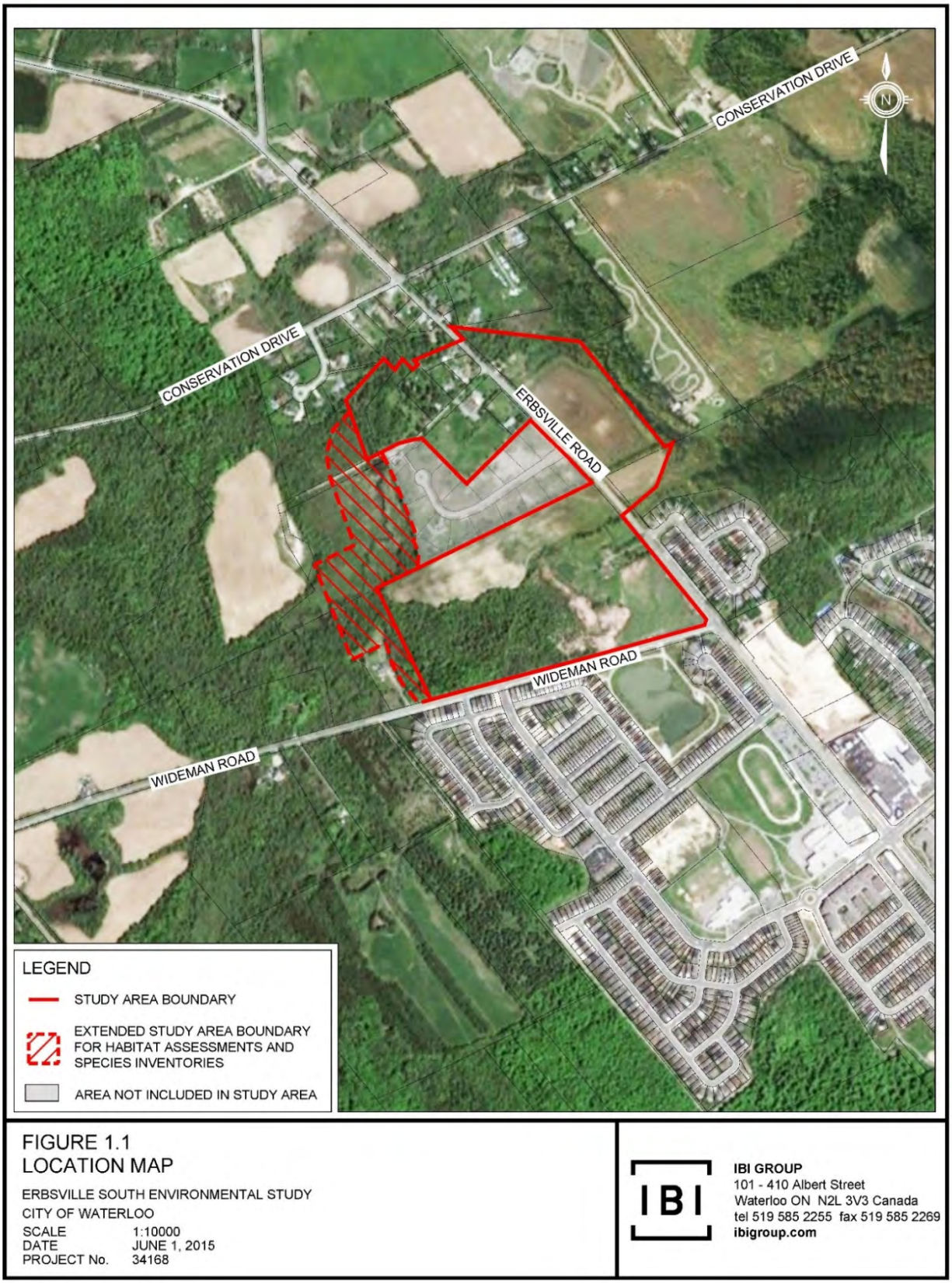

Figure 1-1 Location Map

1.2 Study Purpose

The purpose of the Erbsville South Environmental Study is to supplement existing environmental information that is contained in the *Laurel Creek Watershed Study* and the subsequent *Final Subwatershed Management Plan #313 and #309*. The ES identifies and categorizes natural features and functions within the study area, delineates areas to be protected and recommends development setbacks and mitigation measures necessary to maintain or improve the ecological sustainability within the study area.

In accordance with the Terms of Reference for the ES, a Technical Work Plan was prepared by the Study Team to outline in more detail the process that will be utilized to complete this study. **Dougan & Associates** was responsible for terrestrial resources including flora and fauna, **C. Portt and Associates** for aquatic resources, **JTB Environmental Systems Inc.** for the fluvial geomorphology component, **LVM, a division of EnGlobe Corp.** for hydrogeology and **IBI Group** for civil engineering, hydrology and stormwater management. The work plan was reviewed by various agencies including the City of Waterloo, Regional Municipality of Waterloo, Grand River Conservation Authority and the Ministry of Natural Resources and Forestry with final approval given on October 4, 2013. This approval date marked the commencement of the Study.

As part of the ES process, the following protocol was to be adhered to for the purpose of embedding checkpoints to ensure study findings and results were aligning with existing information:

- *Interim Technical Memos covering all parameters of the study will be prepared and issued at the 4 and 8 month mark from the commencement of the study.*
- *The Technical Memos will summarize the findings to date and demonstrate how they fit within the context of/align with existing data.*
- *Should the data not align, the Technical Memos will outline how the fieldwork program will be modified to address anomalies/inconsistencies.*
- *If substantive work plan changes are required it is understood that City staff will report back to Council.*
- *The Interim Technical Memos will be made available to members of the public as information upon request and will be available on the City's website.*

The *1st Interim Technical Memo* was submitted to the City of Waterloo on February 14, 2014 followed by the *2nd Interim Technical Memo* on June 13, 2014. City staff circulated both Interim Memos to the Regional Municipality of Waterloo, Grand River Conservation Authority, and the Ministry of Natural Resources and Forestry. The Interim Memos were also posted on the City's website for public review.

Both *Interim Technical Memos* concluded that the investigations undertaken up to June 4, 2014 aligned with previous work undertaken in the area. As a consequence no adjustments to the work plan were required to address anomalies or inconsistencies.

The Erbsville South Environmental Study Terms of Reference, Technical Work Plan and Interim Technical Memos can all be found in Appendix 1 of the associated Erbsville South Environmental Study Appendices document.

2 Existing Policy Framework

Since the approval of the *Laurel Creek Watershed Study* in 1993 and the subsequent *Final Subwatershed Management Plan #313 and #309* in 1996, policies associated with subwatershed planning have undertaken various changes at all levels including Provincial, Regional, City and Conservation Authority. Local policy documents have been updated to recognize and incorporate the recommendations provided in the various watershed and subwatershed studies. As a consequence watershed and subwatershed planning remains a primary focus to guide future land use decisions. The following outlines the current environmental policy framework affecting the Erbsville South Study Area.

2.1 Provincial Policy

Since 1996 the *Provincial Policy Statement* (PPS), issued under section 3 of the *Planning Act*, has been revised twice the most recent coming into effect on April 30, 2014. The PPS sets the policy foundation for providing for appropriate development while protecting resources of provincial interest, public health and safety as well as the quality of the natural and built environment. To this end, decisions affecting planning matters "*shall be consistent with*" policy statements issued under the Act. Growth and development is focused within urban and rural settlement areas to support the viability of rural areas. Natural heritage resources and water resources must be managed in a sustainable way to conserve biodiversity and protect important ecological processes. Likewise the PPS directs development away from areas of natural hazards such as flooding and erosion, and human-made hazards such as mine hazards (mineral or aggregate) or petroleum resource operations.

Under *Section 2.1, Natural Heritage* the PPS establishes clear direction on the adoption of an ecosystem approach stating that:

> "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*."

Development and site alteration, specific to the Study Area, is therefore not permitted in significant wetlands, and unless it can be demonstrated there will be no negative impacts on the natural features or their ecological functions, neither within significant woodlands, significant valleylands, significant wildlife habitat, nor areas of natural and scientific interest. Development and site alteration within fish habitat and habitat of endangered species and threatened species is also prohibited except in accordance with provincial and federal requirements. In addition the PPS states that development and site alteration on adjacent lands to any of these natural heritage features are not permitted "unless the *ecological function* of the *adjacent lands* has been evaluated and it has been demonstrated that there will be no *negative impacts* on the natural features or on their *ecological functions*."

Under *Section 2.2, Water* the PPS provides for the protection of the linkages and related functions between groundwater and surface water features, hydrologic functions, as well as natural heritage features and areas while recognizing that mitigative measures and/or alternative development approaches may be required in order to protect, improve or restore sensitive features and their functions.

With respect to areas of *natural hazards* within the Study Area the PPS states that development and site alteration shall not be permitted in areas subject to flooding hazards unless specific policies have been approved and where the effects and risk to public safety are minor and could be mitigated in accordance with provincial standards. To date no such policies have been approved within the Study Area.

Previously, in March 2010, the Province released the Second Edition of the Natural Heritage Reference Manual (NHRM), which is intended to guide the implementation of the PPS. This update explicitly recognizes linkages "*between & among natural heritage features & areas, surface water features & ground water features, & hydrological functions*" which are necessary for the ecological and hydrological integrity of watersheds. Until further updates are released to support the 2014 PPS, this document remains a useful tool.

2.2 Region of Waterloo

The Region of Waterloo adopted a new *Regional Official Plan* (ROP) in June 2009. The Province of Ontario approved the ROP with amendments in December 2010, however, from January 24, 2011, to June 18, 2015, the ROP in its entirety was under appeal before the Ontario Municipal Board. An oral decision was issued on June 18, 2015 approving the new ROP subject to a settlement agreed by the Region and the appellants with respect to future development lands.

The ROP establishes a Greenlands Network of environmental features and linkages and provides a layered approach to protecting *Landscape Level Systems*, *Core Environmental Features* and *Supporting Environmental Features*. Various policies are provided for each layer with a focus on watershed planning as the main tool for maintaining, enhancing and restoring the Greenlands network. Landscape Level Systems are comprised of the following:

a) Environmentally Sensitive Landscapes;
b) Significant Valleys;
c) Regional Recharge Areas; and
d) Provincial Greenbelt Natural Heritage System.

Core Environmental Features are features of both provincially or regional significance and include:

a) Significant Habitat of Endangered or Threatened Species;
b) Provincially Significant Wetlands;
c) Environmentally Sensitive Policy Areas (ESPA);
d) Significant Woodlands;
e) Environmentally Significant Valley Features; and
f) Significant Areas of Natural and Scientific Interest.

Supporting Environmental Features are those features that do not meet criteria to be considered Regionally significant but which are important in maintaining ecological functions of the Greenlands Network. The Erbsville South Study Area borders the Laurel Creek Headwaters Environmentally Sensitive Landscape (ESL) and includes Core Environmental Features relating to Wetlands, ESPA and Valleylands as shown in **Figure 2.1** as excerpted from Map No. 4 of the ROP.

The Region has developed a companion *Regional Greenlands Network Implementation Guideline* to assist with the implementation of the various ROP policies including the preparation of Environmental Impact Statements, delineating Environmental Features, determining buffers around environmental features as well as determining linkages. This document received approval by Regional Council on June 22, 2016.

2.3 City of Waterloo

The City of Waterloo Official Plan (OP) was adopted by City Council in April 2012. In November 2012, the Region of Waterloo approved the plan, in part, with modifications. Subsequent to the regional decision, three appeals were filed regarding parts of the decision, one of which has since been resolved. The two remaining appeals remain before the Ontario Municipal Board. The parts of the plan that were approved by the region and not the subject of an appeal came into effect on December 21, 2012.

As with the ROP the OP has included policies for *Landscape Level Systems*, *Core Natural Features*, *Supporting Natural Features* as well as Restoration Areas and Linkages, however these last two have yet to be incorporated onto the associated Schedules within the OP. **Figures 2.2** and **Figure 2.3** show the designated Land Use for the Study Area as excerpted from *Schedule A* of the OP and the designated Natural System from *Schedule A4* respectively. Both *Core Natural Features* and *Supporting Natural Features* have been identified within the Study Area.

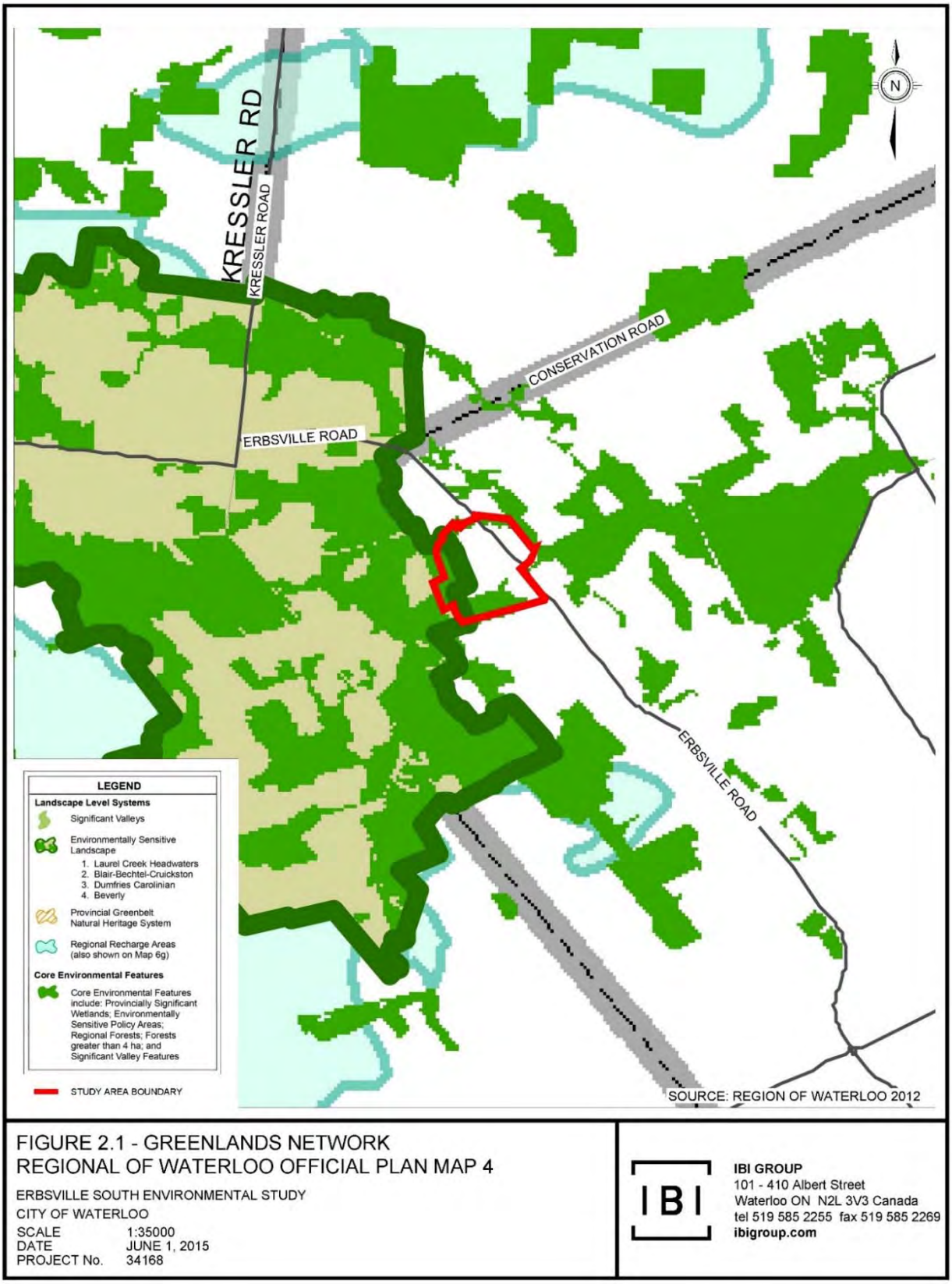

Figure 2-1 Greenlands Network, ROP Map 4

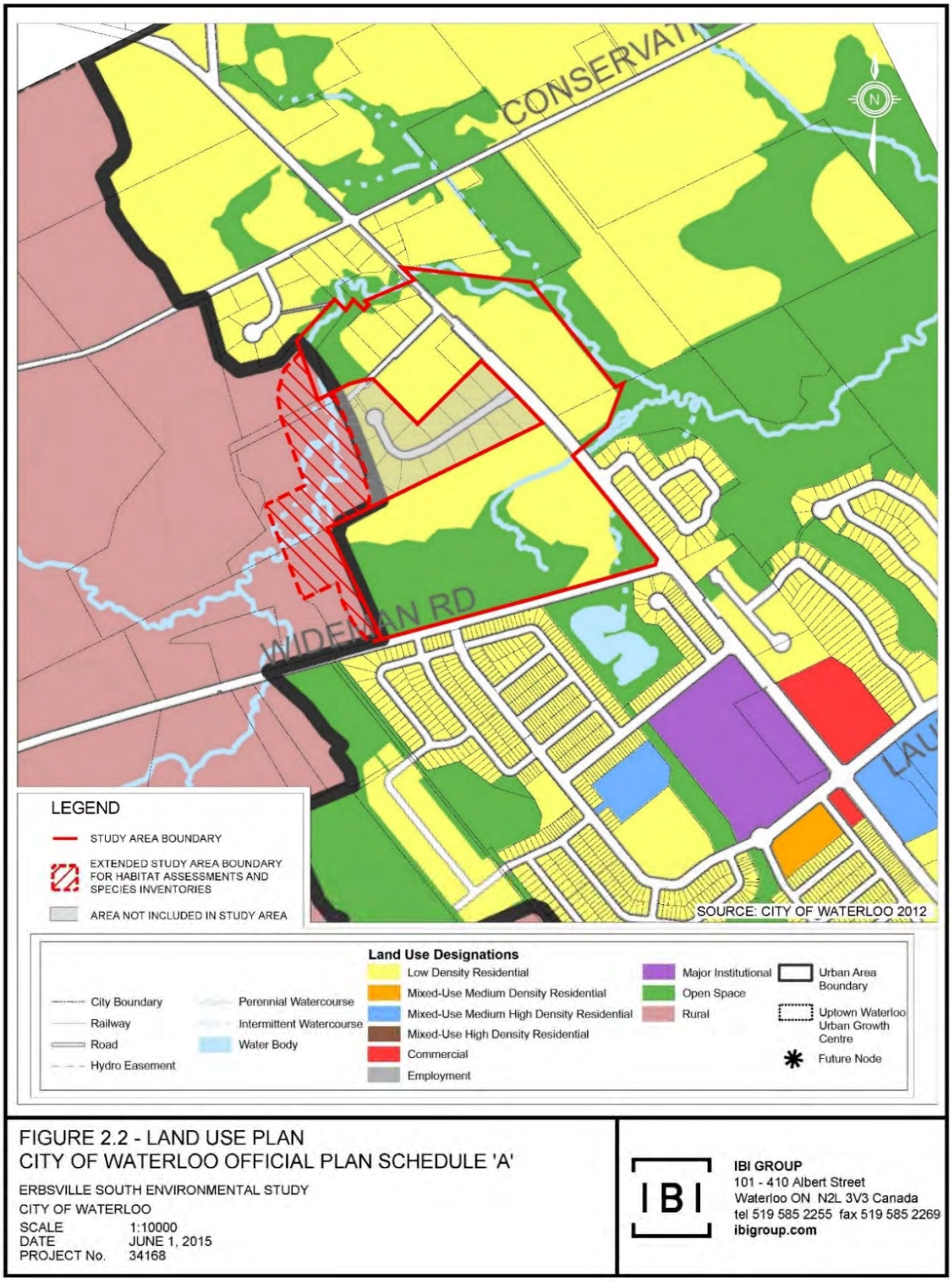

Figure 2-2 Land Use Plan, City of Waterloo Official Plan, Schedule "A"

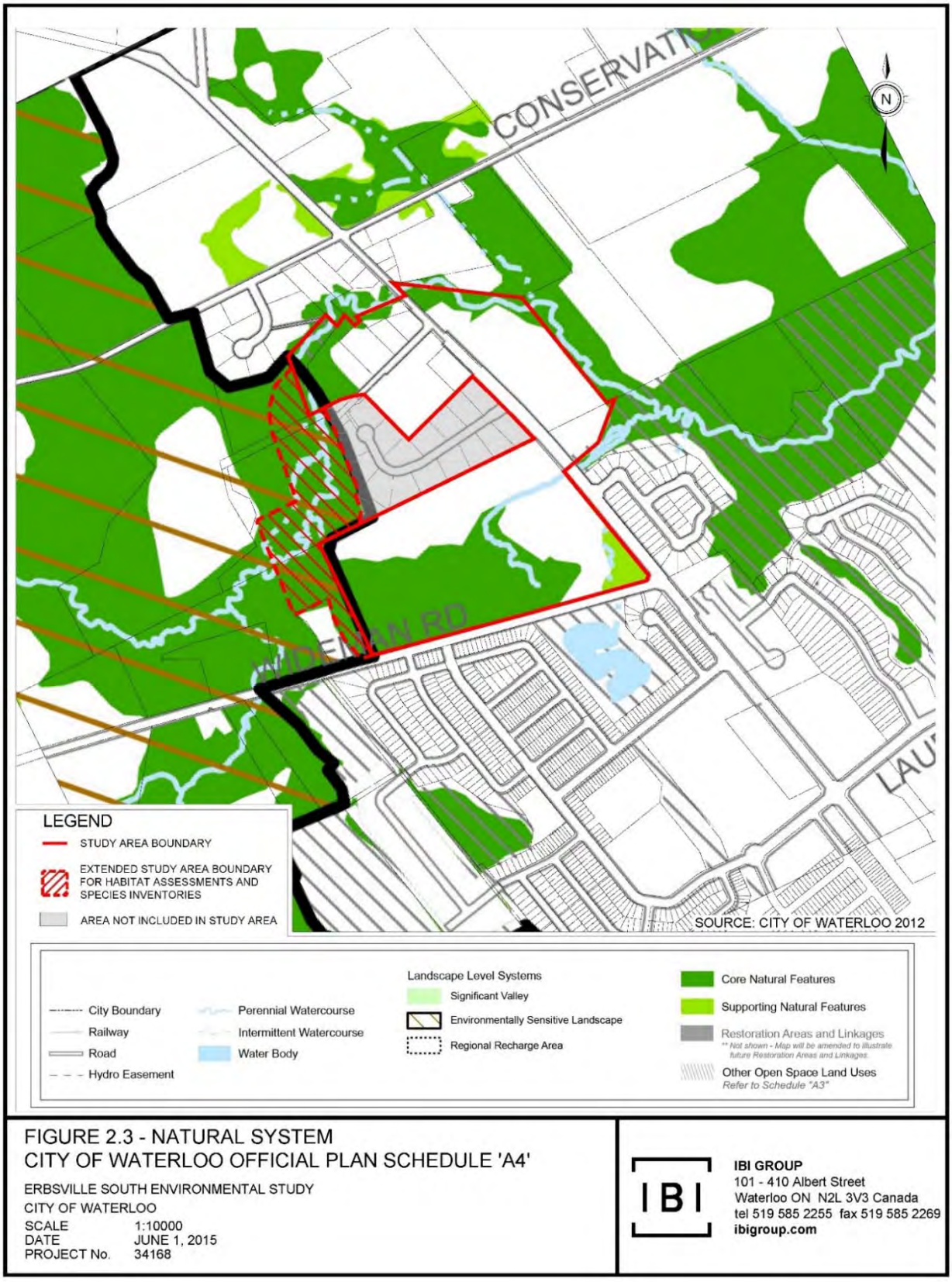

Figure 2-3 Natural System, City of Waterloo Official Plan, Schedule "A4"

Figure 2.4 excerpted from Schedule A5 of the OP indicates that portions of the study area are designated as *Natural Hazards*. Specifically these areas, associated with areas susceptible to flooding, are indicated as *One Zone Policy Area Flooding Hazard*. Flooding hazards are identified, mapped and regulated by the Grand River Conservation Authority, and development or site alteration is generally not permitted in these areas. No *Erosion Hazards* are mapped within the Erbsville South Study Area.

The OP includes the following provision for the Erbsville Community the limits of which are shown on **Figure 2.5** as excerpted from *Schedule A6* of the OP:

> **"11.1.3 Specific Provision Area 3** (Erbsville Community) (1) For lands in the area Erbsville community shown as SPA 3 on **Schedule 'A6' – Specific Provision Areas**, notwithstanding policies contained elsewhere in this Plan, development of these lands may proceed prior to the preparation of a revised District Plan, provided a block planning exercise has been completed for all lands subject to the Specific Provision Area to the satisfaction of the City. In addition to any studies required as part of a *development* application, excluding *site plan* applications, the City will require necessary studies to ascertain that a pumping station is not required to service these lands. Any proposed development must demonstrate to the satisfaction of the City of Waterloo that the development will not interfere with any existing wells."

The current Erbsville District Plan was originally approved in November 1978 and is in need of updating. The above noted provision provides the basis for proceeding with the block planning exercise for the Erbsville South Study Area, for which this Environmental Study has been undertaken.

In addition to the Official Plan, mention should also be made to the current Zoning By-law. By-law 1418 was originally passed by City of Waterloo Council in February, 1961 and various amendments have been made over the years. Properties within the Study Area remain zoned as *A – Agriculture* as shown on **Figure 2.6**. Any future development applications will require a zoning by-law amendment.

2.4 Grand River Conservation Authority

In 1998, the Province of Ontario modified the *Conservation Authorities Act* to enable conservation authorities to enact the *Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation* (Ontario Regulation 97/04) to replace the previous *Fill, Construction and Alteration to Waterways Regulation* (R.R.O. 1990, Regulation 149 as amended by Ontario Regulation 142/98). The new regulation is more inclusive and allows conservation authorities to prevent or restrict development in areas where the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected by development, in order to prevent the creation of new hazards or the aggravation of existing ones. Subsequently *Ontario Regulation 150/06,* which is specific to the Grand River Watershed and consistent with *Ontario Regulation 97/04*, was approved in May 2006 by the Ministry of Natural Resources. The Grand River Conservation Authority (GRCA) also developed *Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation,* last revised in January 2013.

With the new regulation came new mapping identifying regulated areas for the entire Grand River Watershed. In addition the GRCA has mapped various environmental features such as flood plains, areas of steep slopes, and wetlands to name a few. **Figure 2.7** shows the areas regulated by the GRCA with the Erbsville South Study Area. Any future development within the regulated area will require the prior issuance of a permit pursuant to *Ontario Regulation 150/06*.

Besides its regulatory role, the GRCA also plays an advisory role to its member municipalities under the *Planning Act* through Memoranda of Agreement for a range of matters including but not limited to natural hazards, natural heritage, and water quality and quantity. In addition in 1995, the Ministry of Natural Resources delegated its responsibility for municipal plan input and review for natural hazards to the GRCA to ensure municipal policy documents and development proposals are consistent with the *Ontario Provincial Policy.*

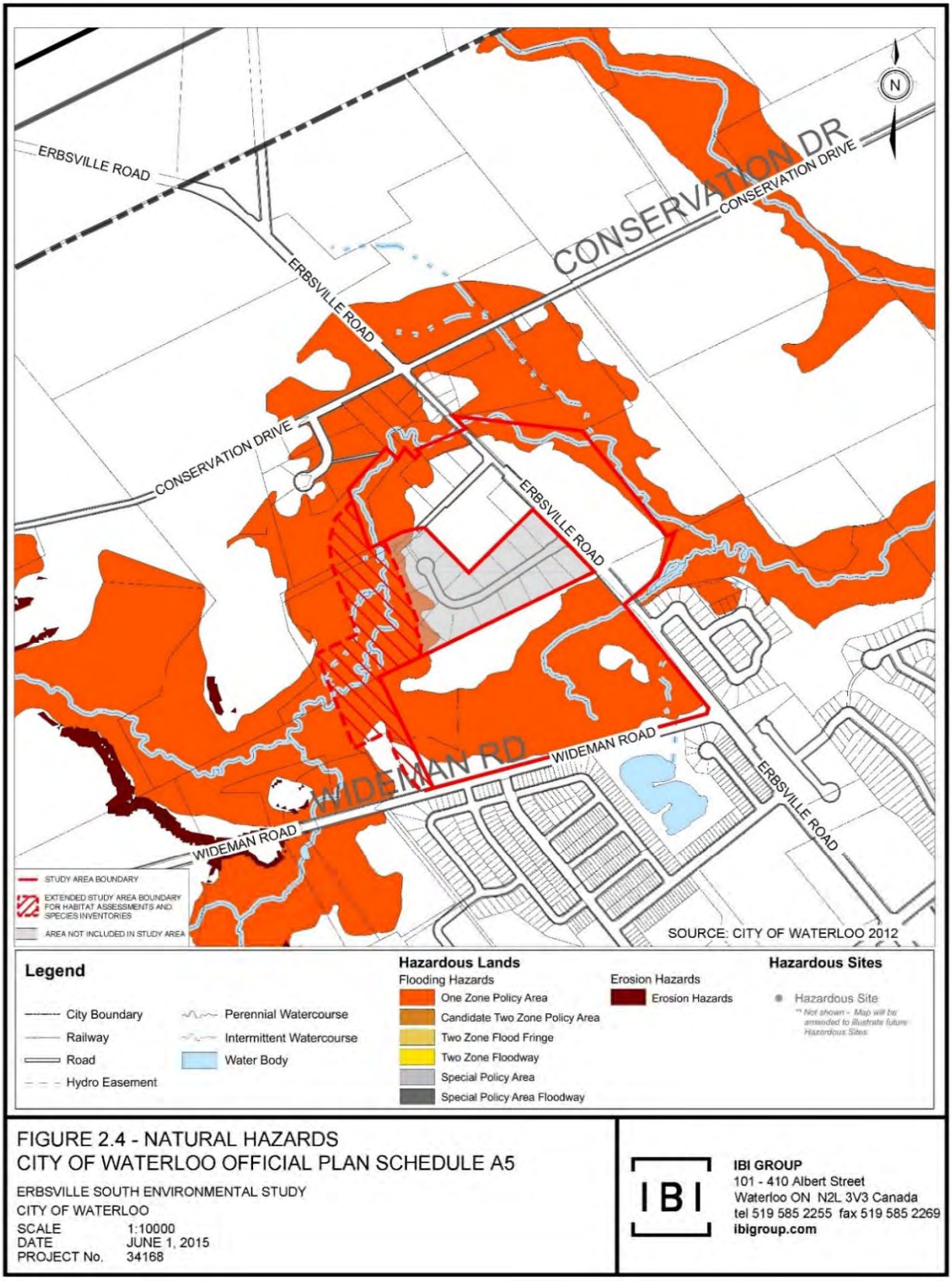

Figure 2-4 Natural Hazards, City of Waterloo Official Plan, Schedule "A5"

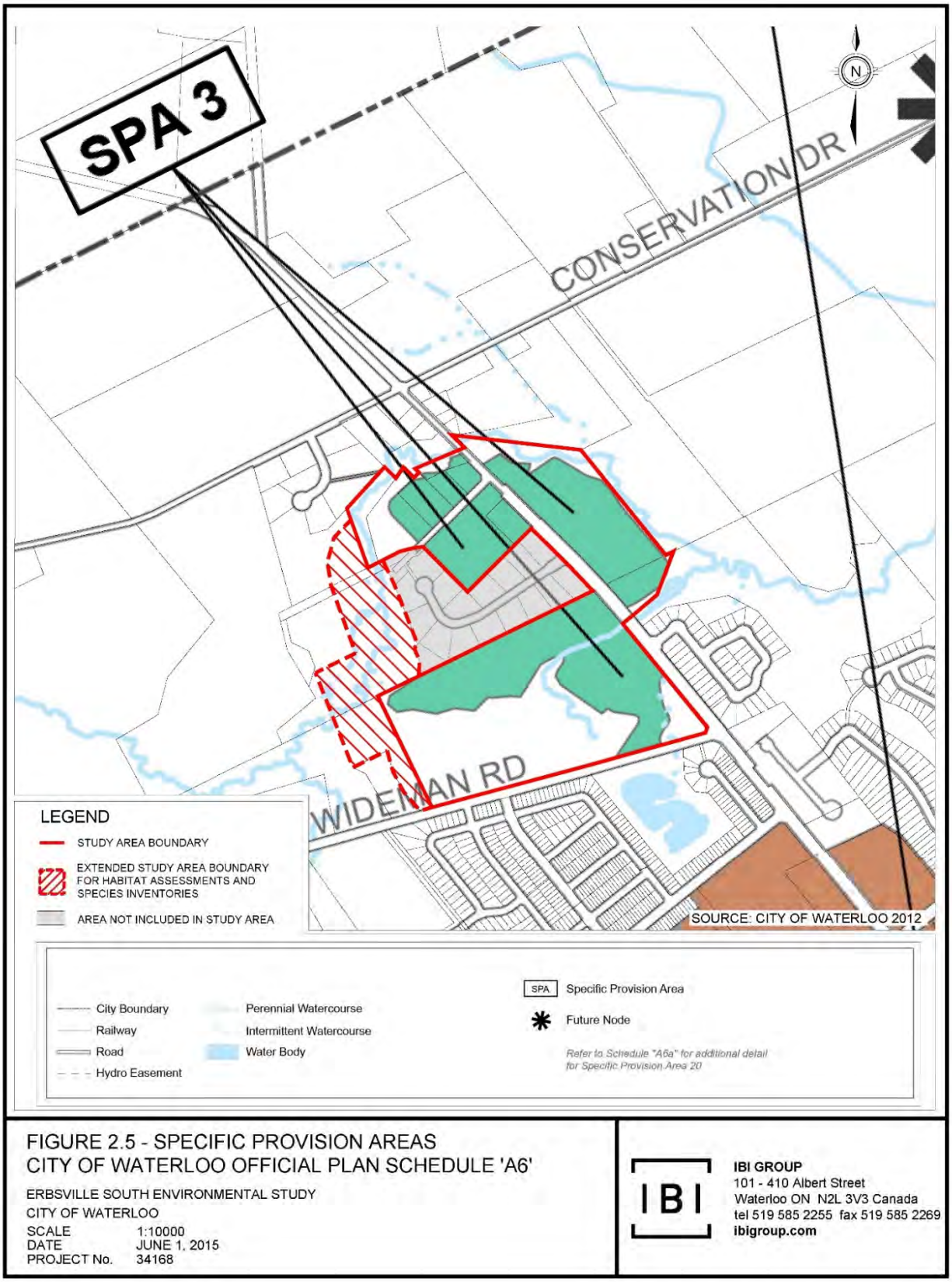

Figure 2-5 Specific Provision Areas, City of Waterloo Official Plan, Schedule "A6"

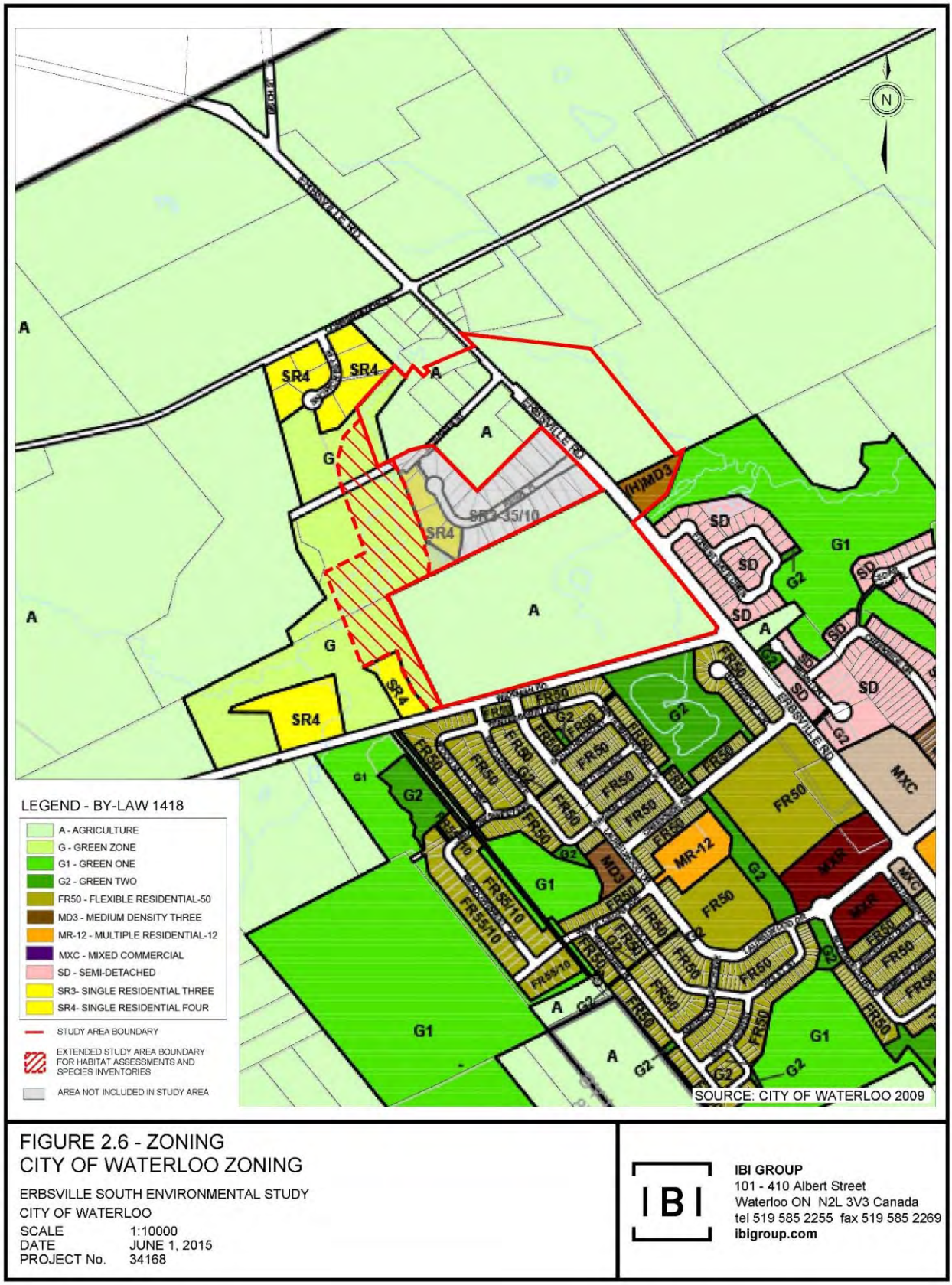

Figure 2-6 Zoning, City of Waterloo Zoning By-Law 1418

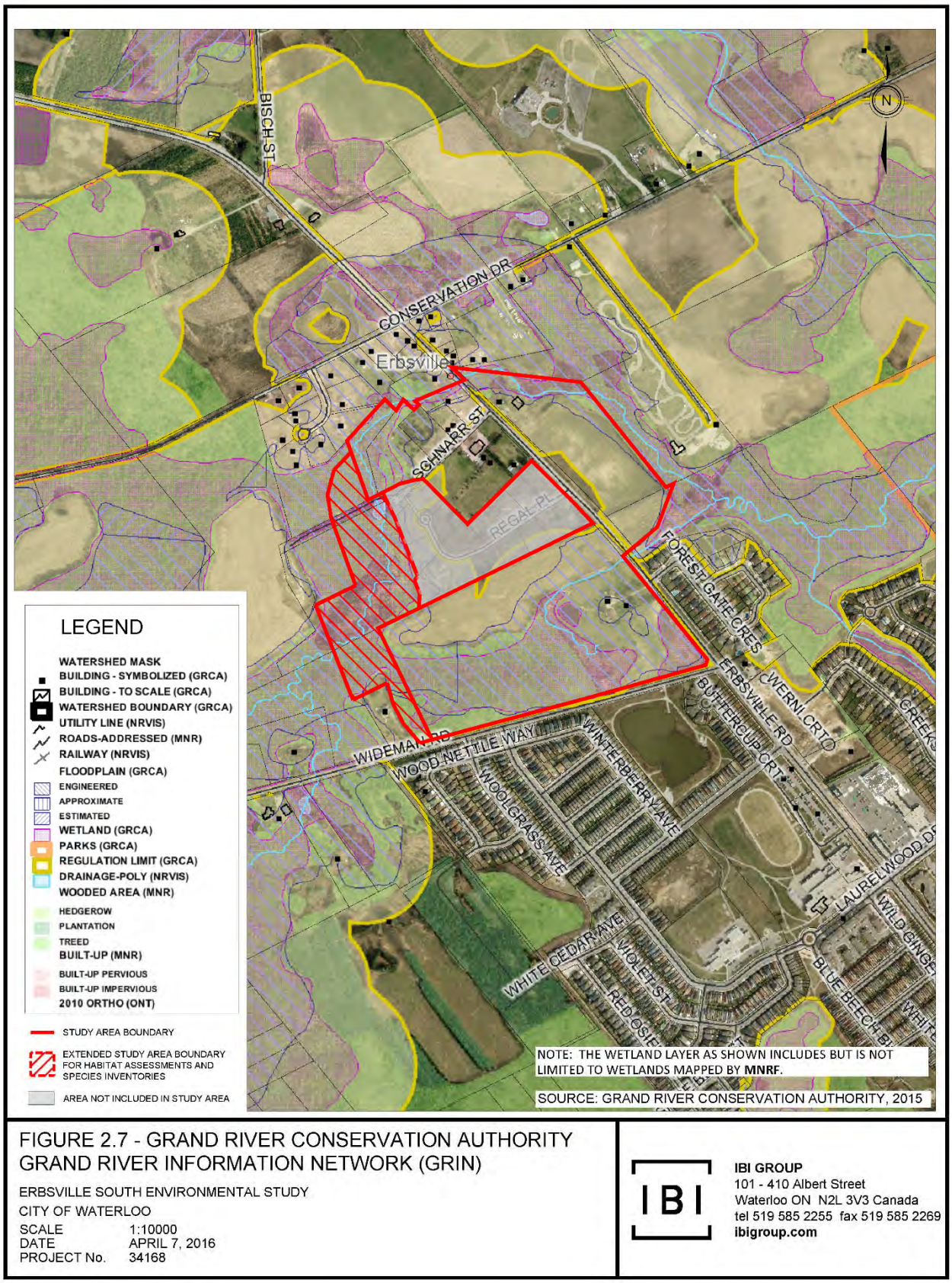

Figure 2-7 GRCA Grand River Information Network (GRIN)

The Grand River Fisheries Management Plan (1998) and its complementary Implementation Plan (2001) must also be taken into consideration when addressing fish habitat. Management strategies outlined in the plan to protect watercourses and fish habitat include:

- *"Rehabilitate fish habitat with the objective of extending the coldwater attributes as far downstream as possible*
- *Determine rehabilitation needs and prepare rehabilitation plans (instream and riparian zones)*
- *Improve water quality, establish stable flows and restore riparian vegetation*
- *Increase baseflow and reduce land use impacts to benefit water quality*
- *Consider modifications to/removal of existing barriers to fish passage*
- *Rehabilitate degraded habitat to restore functional system using the natural channel system approach*
- *Protect groundwater and riparian zones to maintain water quality/quantity*
- *Identification of limitations and options based upon geological constraints*
- *Habitat creation through development opportunities (e.g., innovative stormwater management)."*

2.5 Watershed Studies

2.5.1 Laurel Creek Watershed Study

The Laurel Creek Watershed Study was completed in 1993. The purpose of the study was to carry out a comprehensive assessment of the natural resource features within the watershed, investigate the potential impacts of watershed activities and land use changes on these features, as well as assess flooding and erosion impacts. The study was supervised by a Technical Committee comprised of municipal and provincial agencies headed by the Grand River Conservation as well as a multi-discipline consultant study team. The study developed constraint levels for future land use changes. These included Constraint Level I Areas, which contained significant natural features, where no land use changes were recommended; Constraint Level II Areas, which contain features that have supporting functions, where some land use change could occur provided the function is maintained; and Constraint Level III Areas, which contained the remaining areas where development could occur subject to specific targets developed for storm water management practices in the watershed.

The management strategy for the Laurel Creek Watershed included 29 recommendations. These included the requirement for the undertaking of sub-watershed studies in advance of any development occurring.

2.5.2 Final Subwatershed Management Plan 309/313

As previously noted the *Final Subwatershed Management Plan 309/313* (SWS) was completed in 1996 in accordance with the recommendations of the *Laurel Creek Watershed Study* (1993). The Erbsville South Study Area falls within Subwatershed #309 and most of the subwatershed south of Wideman Road has been developed. As the main purpose of this study is to supplement and update the SWS as it affects the Study area, the key SWS recommendations are listed below:

1. That the Constraint Mapping provided by the Laurel Creek Watershed Study (1993) be revised. The form and function of Constraint Level 1 are to be protected and maintained, the function of Constraint Level 2 lands protected and maintained, while Best Management Practices are to be addressed on all Constraint Level 3 lands. Within the Erbsville Study Area all Provincially Significant Wetlands and ESPAs were classified as Constraint Level 1 lands. The SWS recommendations included Wideman Creek and a 30-metre buffer within the Constraint Level 1 designation. The small wetland at the northwest corner of Wideman Road and Erbsville Road was designated Constraint Level 2 along with a small area east of Erbsville Road.

2. That remediation of riparian Corridors including Wideman Creek be undertaken as development proceeds. This includes buffer plantings and improvement of the Wideman Tributary culvert when Erbsville Road is upgraded.

3. That a Community Trail System be established for passive recreational uses and to channel pedestrian traffic away from sensitive ecological areas.

4. That a Greenspace Management Plan be implemented that includes the following buffers to protect the Greenspace System:

    - Woodland: - 1.5 x the crown radius (trunk to dripline) measured out from the dripline, minimum 7 metres with no significant, vulnerable or rare species.
    - Provincially Significant Wetland - Minimum 30 metres from boundary edge
    - Local Wetlands: - Minimum 10 metres from boundary edge
    - Perennial Stream - Minimum 30 metres from top of bank, both sides
    - Intermittent Stream: - Minimum 15 metres from top of bank, both sides
    - Constraint Level 2 Hedgerows: - Dripline buffer, minimum 7 metres. Temporary buffer during construction of 1.5 x the crown radius (trunk to dripline) or 7 metre minimum from trunk
    - Steep and/or Complex Slopes (10% or greater) - To be determined with Geotechnical Studies

5. That a list of identified unsuitable land uses not be allowed in Constraint Level 2 recharge areas.

6. That the City of Waterloo, Regional Municipality of Waterloo and other agencies implement a Public Education Program that covers such topics as potential environmental impacts of public activities, groundwater protection strategies and terrestrial preservation techniques.

7. That a Stormwater Management Strategy be implemented that maintains existing peak flows, maintains existing infiltration rates and reduces post-development volumes of run-off.

8. That a program of Systems and Post Development Monitoring be undertaken by public agencies and/or stewardship programs and that a During Construction Monitoring program be undertaken by developers that includes three phases: 1) pre-development; 2) during construction; and 3) guarantee period.

As noted previously, the purpose of the ES is to supplement existing environmental information that is contained in the *Laurel Creek Watershed Study* and the subsequent *Final Subwatershed Management Plan #313 and #309* within the Erbsville South Study Area and to determine that the SWS recommendations noted above are still appropriate.

2.5.3 North Waterloo Scoped Subwatershed Study

The North Waterloo Scoped Subwatershed Study was completed in 2013 and addressed the lands immediately to the east of the Erbsville South Study Area including portions of Subwatershed 309. This document provides an important reference for the Erbsville South Environmental Study as it utilized current practices that are also relevant to the Erbsville Study. Information collected particularly along Laurel Creek east of Erbsville Road is also applicable to this study and has been identified in this report. For example, vegetation communities within the Erbsville South study area are connected to a linked system of forests to the northwest and to the east. Likewise the Waterloo North Study recommendations have been reviewed to ensure applicability and consistency within the Erbsville South Study Area.