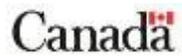


Appendix D:

Cumulative Effects Assessment Report



Canada-United States-Ontario-Michigan Border Transportation Partnership

Cumulative Effects Assessment Report CEAR No: 06-01-18170

Detroit River International Crossing Study City of Windsor, County of Essex, Town of LaSalle, Town of Tecumseh

August 2009

Preface

The Detroit River International Crossing (DRIC) Project is the result of a bi-national transportation improvement study that has been undertaken by a partnership of the federal, state and provincial governments in Canada and the United States. The Partnership is comprised of provincial, state and national transportation authorities from both Canada and the United States including: Federal Highway Administration (FHWA), U.S. Department of Transportation; Transport Canada (TC); Ontario Ministry of Transportation (MTO); and, Michigan Department of Transportation (MDOT).

In 2001, the Partnership jointly commissioned a Planning/Need and Feasibility Study (P/NF) Study, which was completed in 2004. Among other things, the P/NF Study confirmed the long-term need for additional border crossing capacity in the Windsor-Detroit corridor. As a result of this recommendation, the Partnership initiated a formal environmental assessment process for a new or expanded Detroit River International Crossing. An integrated environmental assessment process was developed to meet the requirements of the respective legislation of each jurisdiction, including the *Canadian Environmental Assessment Act* (CEAA), the *Ontario Environmental Assessment Act* (OEAA), and the *U.S. National Environmental Policy Act* (NEPA).

In Canada, the study process was led by MTO. In the U.S., the study was led by the MDOT. The Canadian and U.S. study teams coordinated their work to minimize duplication and to ensure that a single end-to-end solution would be developed. For the purposes of this report, “the Project” is used to describe the Canadian portion of the project.

The Project is located in the City of Windsor and the Towns of Lasalle and Tecumseh, within the County of Essex in southwestern Ontario. In addition, the U.S. portion of the Project extends into the Detroit/Wayne County area of the State of Michigan.

The Project has followed the requirements of the CEAA under the Environmental Assessment (EA) process (Section 14 of the CEAA). All Federal EA’s must include the consideration of the environmental effects of the Project, a determination of the significance of any environmental effects, comments received from the public, as well as technologically and economically feasible mitigation measures.

This Cumulative Effects Assessment (CEA) report documents the likelihood of significant cumulative effects resulting from the Project in combination with other past, existing or reasonably foreseeable future projects and activities.

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1.0 Introduction

Paragraph 16(1)(a) of the *Canadian Environmental Assessment Act* (CEAA) requires consideration of “any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out”. The Canadian Environmental Assessment Agency has developed a *Cumulative Effects Assessment Practitioner’s Guide* and an *Operational Policy Statement on Addressing Cumulative Environmental Effects* to provide direction on cumulative effects.

The *Cumulative Effects Assessment Practitioner’s Guide* defines cumulative effects as “changes to the environment that are caused by an action in combination with other past, present and future human actions”. This Guide defines a cumulative effects assessment as “an assessment of the incremental effects of an action on the environment when the effects are combined with those from other past, existing and future actions”. The sections below outline the steps that were undertaken to assess cumulative effects.

The *Cumulative Effects Assessment Practitioner’s Guide* indicates that the “certainty of whether the action will actually proceed” must be considered. Potential future projects and activities must include those where “there is a high probability the action will proceed” and those where “the action may proceed, but there is some uncertainty about this conclusion”. Past projects are those “actions that are abandoned but still may cause effects of concern”.

In some cases, detailed analysis of the potential effects resulting from other projects was not available for consideration in the Cumulative Effects Assessment (CEA). As a result, the analysis is primarily qualitative and descriptive in nature, drawing on quantitative results wherever possible from environmental assessments for other projects.

In certain cases, other past, existing and future projects and activities were considered as part of the background or baseline conditions during the environmental effects analysis for the Project (i.e. air quality during operations). For the purposes of the CEA, these effects were considered as part of the Project related effects and/or baseline conditions.

2.0 Process

The effects of the Project were considered together with other projects and activities that have been or will be carried out and for which the effects could be expected to overlap with those of the Project. The *Final Federal EA Guidelines* (Feb 2009) identified the need to identify other projects and activities that have been or will be carried out in or around the Study Area, which have the potential to interact with the DRIC Project. Ongoing discussions and consultation with Federal authorities assisted in the development of the identification of other projects and activities, as well refinements to the scope of the CEA. Components and attributes identified in the *Final Federal EA Guidelines* (Feb 2009) were also considered in developing the scope of the CEA.

The cumulative effects assessment framework consisted of the following steps:

- Consider the potential for residual environmental effects
- Issues, assessment and environmental factors scoping
- Identification of interactions with other projects or activities
- Analysis of potential cumulative effects
- Develop any required mitigation, monitoring and follow-up measures and
- Determination of the likelihood of any significant cumulative effects

Step 1: Consider the potential for residual environmental effects of the Project

Residual environmental effects likely to be caused by the Project are documented in the supporting technical reports and summarized in the *Draft CEAA Screening Report (July 2009)*. Although the potential for cumulative effects is inextricably linked to the potential for environmental effects caused by the Project, a separate scoping exercise was undertaken to focus the CEA on reasonably likely cumulative effects related specifically to the Project. Residual environmental effects were considered in developing the scope of the CEA and form the basis for the scope of factors.

Step 2: Scoping: Environmental Components and Other Projects/Activities

Scoping was a consultative process that included the consideration of potential cumulative effects issues and best professional judgement to establish the scope of the assessment (factors and attributes as well as spatial and temporal boundaries). This step focuses the analysis on the potential for cumulative effects that are related to the Project.

Step 3: Identification of potential interactions with other projects or activities

The identification of other past, existing or reasonably foreseeable future projects or activities is another important step in conducting the CEA. Municipal, provincial, federal and private projects and activities were identified and assessed as to whether they would be appropriate to include in the CEA. Information regarding other past, existing or future projects was obtained from the land use evaluation undertaken for the Detroit River International Crossing Study, the Canadian Environmental Assessment Registry, The Ontario Environmental Registry as well as contacts with relevant municipal, provincial and federal departments.

Past, existing and future reasonably foreseeable projects and activities were reviewed and screened to determine which should be included in the consideration of cumulative effects. From this, a determination was made as to whether there was the potential for the environmental effects of such projects to overlap temporally and/or spatially with the residual environment effects of the Project. The projects or activities that exhibited some potential for overlap were included in the CEA.

Step 4: Analysis of potential cumulative effects

The prediction of potential cumulative effects involved qualitative analysis based on agency consultation, best professional judgement, project technical expertise and a review of EA documentation for other projects.

Step 5: Develop any required mitigation, monitoring and follow-up measures.

Where specific mitigation, monitoring and/or follow up is determined to be required, specific strategies to address cumulative effects were developed.

Step 6: Determination of the likelihood of any significant cumulative effects

The determination of the likelihood of any significant cumulative effects was based on the criteria defined Table 1 "Significance Criteria Definitions" as illustrated below.

TABLE 1 SIGNIFICANCE CRITERIA DEFINITIONS

CRITERION	LOW	MODERATE	HIGH
Magnitude	Effect is evident only at or nominally above baseline conditions	Effect exceeds baseline conditions; however, is less than regulatory criteria or published guideline values.	Effect exceeds regulatory criteria or published guideline values.
Geographic Extent	Effect is limited to the Project site/footprint.	Effect extends into areas beyond the Project site/footprint boundary.	Effect is trans-boundary in nature.

CRITERION	LOW	MODERATE	HIGH
Duration	Effect is evident only during the construction phase of the Project.	Effect is evident during construction and/or the operational phase of the Project.	Effects will be evident beyond the operational life of the Project.
Frequency	Condition causing the effect occurs infrequently (i.e. < once per year).	Condition causing the effect occurs at regular intervals although infrequent intervals (i.e. < once per month).	Condition causing the effect occurs at regular and frequent intervals (i.e. > once per month).
Permanence	Effect is readily reversible over a short period of time (i.e. one growing season).	Effect is not readily reversible during the life of the Project.	Effect is permanent.
Ecological Context	Evidence of environmental effects by human activities. Effect results in minimal disruption of ecological functions and relationships in the impacted area.	Relatively pristine area. Effect results in some disruption of non-critical ecological functions and relationship in the impacted area.	Pristine area / not affected by human activity. Effect results in disruption of critical ecological functions and relationship in the impacted area.

3.0 Scoping

The scoping exercise established environmental factors and attributes to be considered in the analysis as well as factor specific spatial and temporal boundaries. Scoping was also undertaken to identify other projects and activities and to establish the potential for interactions with residual effects caused by the Project.

3.1 Scope of Environmental Components and Attributes

Based on the analysis of environmental effects, the Project has the potential to result in residual effects on the following environmental components:

- Air Quality
- Surface Water and Groundwater
- Surface and Subsurface Geology and Soils
- Vegetation, Vegetation Communities and Wetlands
- Fish and Fish Habitat
- Wildlife, Wildlife Habitat and Migratory Birds
- Species At Risk
- Noise
- Indirect Effects

The scope of these environmental components and attributes is further considered in Table 2 (below).

3.1.1 Spatial Boundaries

The spatial boundaries for determining cumulative effects were established for each factor and attribute (Table 2). In general, boundaries were based on the Preliminary Analysis Area (PAA) established for the Project, which included: the Detroit River, the City of Windsor, the Town of LaSalle, the Town of Amherstburg, the Town of Tecumseh, the Town of Essex and part of the Town of Lakeshore. In addition, areas of Detroit and the surrounding communities along the Detroit River and adjacent to the Preliminary Analysis Area were included. See the Key Plan Below. All other projects and activities are also generally found within the PAA. Figure 1 depicts the DRIC Cumulative Effects Study Area (Study Area) as based on the PAA.

3.1.2 Temporal Boundaries

The temporal boundaries for this assessment establish the period of time during which the cumulative effects were considered. The construction phase of the Project is anticipated to commence in late 2009 and require 4 to 5 years of work. Although it is expected that the Project will operate well into the future, the temporal boundary used for the operations and maintenance phase (also identified as the planning horizon for the Project); was extended to the year 2035.

TABLE 2 SCOPE OF ENVIRONMENTAL COMPONENTS AND ATTRIBUTES

Components and Attributes				Rationale	Assessment Boundaries
Description		Included			
Valued Ecosystem Component	Attribute	Yes	No		
AIR QUALITY					
Air Quality	Construction Particulates / Dust/ Emissions	√		Construction work typically occurs in the summer months when the potential for airborne dust is the greatest. Potential cumulative effects may result from several construction related projects in the region; therefore, this attribute was further considered.	Study Area Construction
	Traffic Operations Emissions (NOx, SOx, VOCs, PAHs)	√		Extensive predictive air quality modeling factored in background regional and transboundary sources of emissions in considering the effects on the Project on air quality. As a result, and in general, this attribute was not further considered. However, due to the proximity of the Project to the existing Brighton Beach Power Plant and associated power infrastructure, there exists the potential for cumulative air quality effects related to particulates, dust and emissions; therefore, this attribute was further considered.	N/A Areas adjacent to the proposed plaza location. Operations
	Greenhouse Gases (GHG)		√	GHG contributions to the national total and potential to contribute to climate change were considered in the effects analysis. As a result, this attribute was not further considered.	N/A
SURFACE AND SUBSURFACE GEOLOGY AND SOILS					
Soil	Existing Soils		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible. As a result, this attribute was not further considered.	N/A

Components and Attributes				Rationale	Assessment Boundaries
Description		Included			
Valued Ecosystem Component	Attribute	Yes	No		
	Existing Contaminated Sites		√	Residual effects from the Project are likely to be limited to the project footprint and the potential for interaction with other Project effects is considered negligible. As a result, this attribute was not further considered.	N/A
Geology	Surface Geology		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible. As a result, this attribute was not further considered.	N/A
	Subsurface Geology		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible. As a result, this attribute was not further considered.	N/A
SURFACE WATER					
Local Watercourses	Water quality	√		Potential for small or even negligible changes in surface water quality from Project development, can, at the watershed scale result in cumulative effects; therefore, this attribute was further considered.	Study Area including the Turkey Creek watershed. Operations
	Water quantity	√		Potential for small or even negligible changes in surface water quantity from Project development, can, at the watershed scale result in cumulative effects; therefore, this attribute was further considered.	Study Area including the Turkey Creek watershed. Operations
Detroit River	Water Level and Flows		√	Residual effects from the Project are likely to be limited/negligible and only during the construction phase for the crossing component and unlikely to contribute to cumulative effects. As a result, this attribute was not further considered.	N/A

Components and Attributes				Rationale	Assessment Boundaries
Description		Included			
Valued Ecosystem Component	Attribute	Yes	No		
	Water Quality	√		Potential for small or even negligible changes in surface water quality from Project development, can at the watershed scale result in cumulative effects; therefore, this attribute was further considered.	Detroit River Operations
GROUNDWATER					
	Quantity		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible. As a result, this attribute was not further considered.	N/A
	Water Quality		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible. As a result, this attribute was not further considered.	N/A
VEGETATION, VEGETATION COMMUNITIES AND WETLANDS					
	Vegetation	√		Limited effects on rare vegetation communities through out the project area, threatened, in some cases by development activities, may result in the potential for cumulative effects. Within the Study Area, there are 19 Environmentally Significant Areas (ESAs) identified by the Essex Region Conservation Authority, as well as a total of 56 Natural Heritage Areas and Environmental Policy Areas identified in the Official Plans (collectively referred to as ESAs) for the City of Windsor and the Town of LaSalle. The Project is in close proximity to some identified ESAs and as a result there is a potential for cumulative residual effects and this attribute was further considered.	Study Area Operations (Physical Project Presence)

Components and Attributes				Rationale	Assessment Boundaries
Description		Included			
Valued Ecosystem Component	Attribute	Yes	No		
	Wetlands	√		<p>Limited effects on wetlands, threatened, in some cases by development activities, may result in the potential for cumulative effects; therefore, this attribute was further considered.</p> <p>Within the Study Area, the Essex Region Conservation Authority and the Ontario Ministry of Natural Resources have identified five Provincially Significant Wetlands, one of which is the Ojibway Prairie Wetland Complex. The Project will likely encroach upon the wetland complex and as a result, the potential for other similar impacts on the Provincially Significant Wetlands within the Study Area were also considered.</p>	Study Area Construction/Operations (Physical Project Presence)
	Species at Risk	√		<p>Limited effects on species at risk, which in some cases are threatened as a result of development activities, may result in the potential for cumulative effects; therefore, this attribute was further considered.</p>	Study Area Construction/Operations (Physical Project Presence)
FISH AND FISH HABITAT					
Local Watercourses	Fish	√		<p>Potential for small changes in surface water quality from Project development, may, at the watershed scale result in cumulative effects on fish productivity; therefore, this attribute was further considered.</p>	Study Area including the Turkey Creek subwatershed. Operations
	Fish Habitat		√	<p>Requirement for authorizations for any harmful alteration, disruption or destruction under the <i>Fisheries Act</i> ensures no net loss of productive capacity of fish habitat. This would be required for any planned development as well as for the Project and reduce the potential for any residual effects on fish habitat. As a result, this attribute was not further considered.</p>	N/A

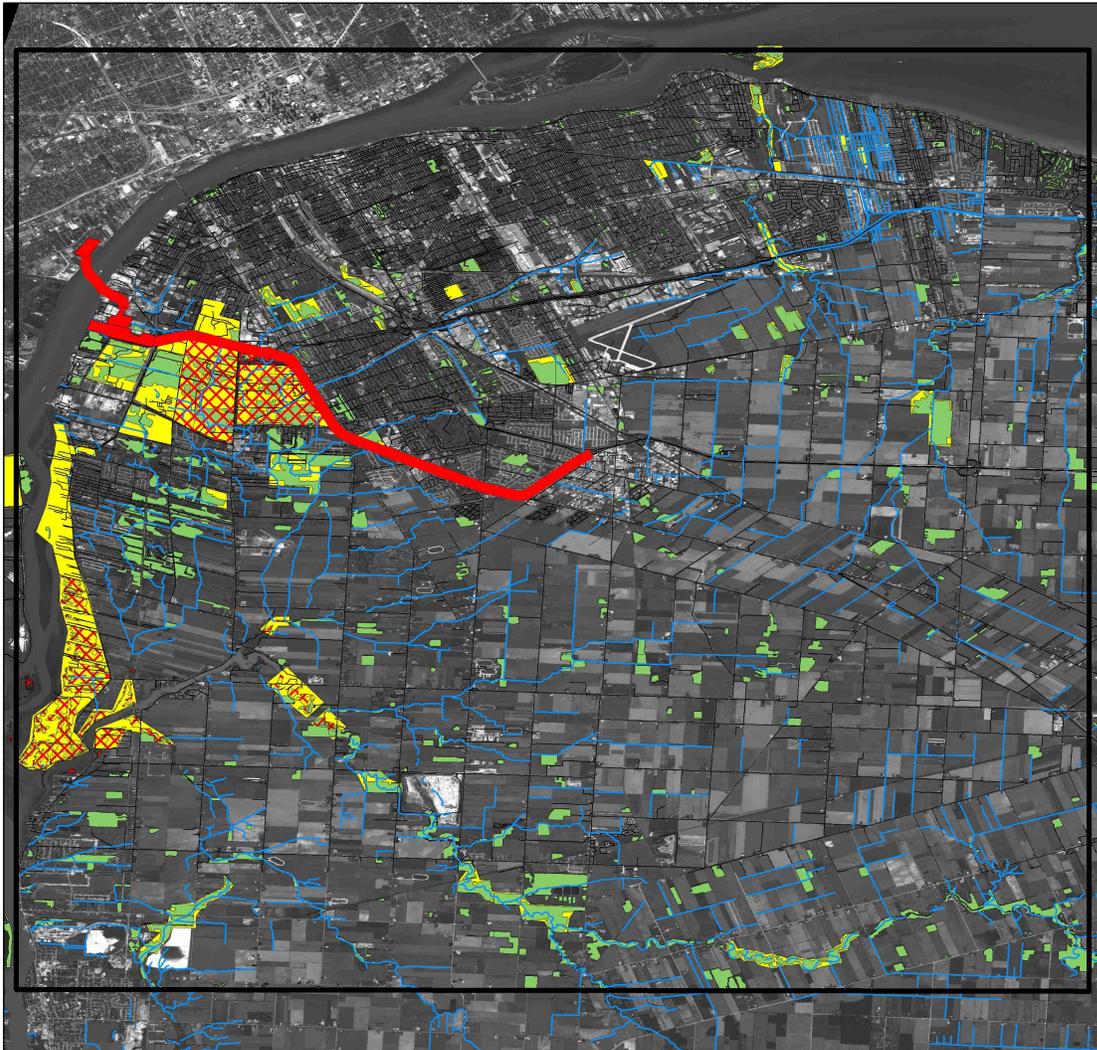
Components and Attributes				Rationale	Assessment Boundaries
Description		Included			
Valued Ecosystem Component	Attribute	Yes	No		
Detroit River	Fish	√		Potential for small changes in surface water quality from Project development, can, at the watershed scale result in a cumulative effects on fish productivity; therefore, this attribute was further considered.	Study Area including the Windsor Area Drainage subwatershed and the Detroit River Operations
	Fish Habitat		√	No in-water works within the Detroit River are proposed for this Project.	N/A
WILDLIFE AND WILDLIFE HABITAT (INCLUDING MIGRATORY BIRDS)					
Wildlife	Amphibians		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible. As a result, this attribute was not further considered.	N/A
	Reptiles		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible. As a result, this attribute was not further considered.	N/A
	Birds (Migratory)	√		Potential for cumulative effects is largely in relation to barriers constructed (i.e. bridge) within migratory flight paths along the Detroit River.	Detroit River Operations (Physical Project Presence)
	Birds (Resident)		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible. As a result, this attribute was not further considered.	N/A

Components and Attributes				Rationale	Assessment Boundaries
Description		Included			
Valued Ecosystem Component	Attribute	Yes	No		
	Mammals		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible. Species dependent on unique ecosystems such as the Ojibway Prairie within the Study Area are included in the analysis for vegetation and wetlands. As a result, this attribute was not further considered.	N/A
	Species at Risk	√		Small effects on, which are threatened, in some cases by development activities, may result in the potential for cumulative effects. As a result, this attribute was further considered.	Study Area Construction/ Operations (Physical Project Presence)
Wildlife Habitat	Amphibians		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible. Species dependent on unique ecosystems such as the Ojibway Prairie within the Study Area are included in the analysis for vegetation and wetlands. As a result, this attribute was not further considered.	N/A
	Reptiles		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible. Species dependent on unique ecosystems such as the Ojibway Prairie within the Study Area are included in the analysis for vegetation and wetlands. As a result, this attribute was not further considered.	N/A
	Birds (Migratory)		√	Potential for cumulative effects is largely in relation to the construction of barriers within migratory flight paths along the Detroit River and was considered within the Migratory Birds attribute of the wildlife component. As a result, this attribute was not further considered.	N/A

Components and Attributes				Rationale	Assessment Boundaries
Description		Included			
Valued Ecosystem Component	Attribute	Yes	No		
	Birds (Resident)		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible.. As a result, this attribute was not further considered.	N/A
	Mammals		√	Residual effects from the Project are likely to be limited to the Project footprint and the potential for interaction with other project effects is considered negligible. As a result, this attribute was not further considered.	N/A
	Species at Risk	√		Small effects on species at risk habitat, which is threatened, in some cases by development activities, may result in the potential for cumulative effects. As a result, this attribute was further considered.	Study Area. Operations (Physical Project Presence)
NOISE AND VIBRATION					
	Noise	√		Construction work typically results in noise caused by the operations of equipment. Potential cumulative effects may result from several construction related projects in the region. As a result, this attribute was further considered. Given the close proximity of E.C. Row Expressway to the Project Area, potential for cumulative effects associated with noise during operations as well as other traffic related noise was considered in the background modelling. As a result, this attribute was not further considered for the operations phase of the Project.	Study Area Construction
	Vibration		√	Residual effects from the Project are expected to be limited and potential cumulative effects were considered negligible. As a result, this attribute was not further considered.	N/A

Components and Attributes				Rationale	Assessment Boundaries
Description		Included			
Valued Ecosystem Component	Attribute	Yes	No		
INDIRECT EFFECTS					
Health and socio-economic considerations			√	The Project is not likely to result in any indirect environmental effects and the potential cumulative effects were considered negligible. As a result, this attribute was not further considered. Extensive air quality monitoring and predictive modeling factored in background regional and transboundary sources of emissions in considering the effects on the Project on air quality. As a result, and in general, this attribute was not further considered.	N/A
Built Heritage and Historical, Archaeological, Paleontological or Architectural Resources			√	The Project is not likely to result in any indirect significant environmental effects on these resources and the potential cumulative effects was considered negligible. As a result, this attribute was not further considered.	N/A
Current Use of Lands and Resources for traditional purposes by Aboriginal persons	Species at Risk	√		Walpole Island First Nations (WIFN) currently manages and promotes the protection of species at risk and unique prairie ecosystems in this part of southern Ontario. As a result, this attribute was further considered.	Study Area. Operations (Physical Project Presence)
	Fisheries	√		Walpole Island First Nation and other First Nations traditionally used the Detroit River, as part of the Great Lakes system, as an important resource. As a result, this attribute was further considered.	Detroit River Operations

Figure 1. DRIC Cumulative Effects Study Area



Legend

	DRIC Project		Study Area
	Road		Natural Heritage
	Rail		Wetlands
	Watercourse		Wooded Areas

0 1 2 4 6
Kilometers



Note - The Ojibway Prairie Wetland Complex, located south of the proposed Windsor-Essex Parkway, consists of multiple wetland pockets located within the boundaries of the area identified on the map and does not comprise the entire hatched area

3.2 Scope of Other Projects and Activities

The assessment of potential effects associated with other projects or activities was qualitative in nature, and involved professional judgment since the same level of information detail was not always available.

3.2.1 Existing and Past Projects and Activities

- Past projects and activities are those “*that are abandoned but still may cause effects of concern*”. In general most existing and past projects and activities were considered as part of the baseline conditions in the analysis of environmental effects. The Study Area is located within and adjacent to urban and industrial areas with a long history of development. As a result the baseline is generally reflective of extensive anthropogenic activity for the most part. Because of the recent nature of some projects, and the potential for continued interaction with effects of the Project, such Projects were further considered in the analysis

3.2.2 Proposed Projects and Activities

Reasonably foreseeable future projects and activities were included, even though in some cases, it is not clear whether approvals will be obtained and the Projects will be implemented. Generally, projects must be at some stage within the development approval or environmental assessment review process in order to assess the potential interactions with the Project. Projects were identified based on but not limited to the following sources:

- City of Windsor
- Town of LaSalle
- Town of Amherstburg
- Town of Tecumseh
- Town of Essex
- Town of Lakeshore
- Ontario Environmental Registry
- Canadian Environmental Assessment Registry

3.2.3 Categories of Projects Considered

Projects which were considered within the scope of the cumulative effects assessment include:

- Infrastructure projects funded under the *Let's Get Windsor-Essex Moving Strategy*
- Other infrastructure projects
- Industrial projects
- Renewable energy projects
- Residential and other urban/rural development projects
- International river crossing-related projects

4.0 Potential Cumulative Interactions with the DRIC Project

The following past, existing and reasonably foreseeable future projects and activities were identified within the Study Area. Projects were grouped based on the type and intent of the Project. Entire groups of projects were then considered for cumulative effects.

The prediction of potential cumulative effects involved tabulating the residual effects associated with the Project as identified in the technical documents and the Provincial EA. The residual effects of other past, existing or future projects or activities with the potential to overlap/interact with the environmental effects of the Project were then considered. The assessment of potential effects associated with other projects or activities was qualitative in nature and involved professional judgment since the level of available information was typically limited. Based on information available for the Project, in combination with these other projects and activities, the potential for cumulative environmental effects was determined.

4.1 Let's Get Windsor-Essex Moving Strategy

The *Let's Get Windsor-Essex Moving* strategy is a \$300-million joint commitment by the Government of Canada and the Province of Ontario to improve traffic flow and reduce congestion at the Windsor-Detroit Gateway. The projects are considered to be short and medium term projects. They are intended to address local concerns and improve traffic and construction of infrastructure improvements necessary to ease border congestion and improve traffic flows.

Roadway infrastructure projects typically have the potential to result in residual noise effects during the construction phase and potential residual air quality effects during both the construction and operation phases. Given the intent of alleviating existing traffic congestion and the nature of the projects as expansions to existing infrastructure, no air quality effects are anticipated during operation; however, the potential for cumulative effects of dust and noise during construction are further considered.

The expansion of infrastructure is anticipated to result in an increased quantity of impermeable surfaces, which has the potential to result in residual effects to local watercourse quality and quantity during operation. As a result, the potential for cumulative effects associated with the operation phase are further considered.

The locations of ESA's within the Study Area were reviewed on a regional scale and the potential interactions with the projects were considered. Based on the physical distance or separation between the identified projects and the ESA's, no potential for interaction with residual effects from the Project were identified.

The following summarizes the current list of projects considered, the scope of the projects, their corresponding locations (Figure A.1) and their present status:

1. **Huron Church Road at Industrial Drive** (Completed 2006)
 - Construction of intersection improvements to extend the northbound left turn lane was completed in 2006 to reduce the congestion related to truck queues waiting to turn.
2. **Intersection Improvements on Highway 3 at Outer Drive and Walker Road** (Completed 2005)
 - Construction of new left and right-turn lanes on Highway 3, a new southbound right-turn lane on Outer Drive, a left-turn lane extension, pavement resurfacing of the intersection and new traffic signals at Outer Drive.

3. **Truck Ferry Road Infrastructure and Signing Improvements (Future)**
 - Improvements to the road infrastructure leading to the ferry terminal.
4. **Highway 401 Widening East of Highway 3/North Talbot Road to West of Manning Road (Ongoing)**
 - Reconstruction and widening of 6 km of Highway 401 from four to six lanes including the construction of a new concrete barrier to separate opposing traffic, drainage improvements, new paved shoulders, bridge replacements and rehabilitations, and interchange improvements at Provincial Road. Construction is presently underway.
5. **Manning Road Widening from Highway 401 to County Road 22 (Future; CEAR 07-01-32608)**
 - Widening of Manning Road (Essex County Road 19) from two lanes to four lanes. Project includes intersection improvements to current standards and improvements to the interchange at Hwy 401.
6. **Manning Road Widening: North of Essex County Road 22 to VIA Rail Line (Completed 2007)**
 - Widening of Manning Road (Essex County Road 19) from two lanes to six lanes.
7. **Huron Church Pedestrian Bridge (Completed)**
 - Construction of a new overhead pedestrian bridge was completed in 2005 to improve the safety for pedestrian crossing.
8. **Howard Avenue/CPR Grade Separation (Fall 2009 - 2011; CEAR 06-01-21081)**
 - Separation of the road from the rail line through the construction of a new rail subway. Involves a temporary shifting of Howard Ave to the west.
9. **Walker Road/CPR Grade Separation (Completed 2008)**
 - Separation of the road from the rail line through the construction of a new rail bridge.

4.1.1 Other Infrastructure Development Projects

Improving and maintaining existing infrastructure is an important component of community planning. The City of Windsor Official Plan provides a 20-year guideline for the physical development of the City, taking into consideration important social, economic and environmental goals.

The Official Plan recognizes the importance of developing a transportation system that balances the use of all modes of transportation and creates an improved street environment. The following past, present and reasonably foreseeable future projects have been identified within the spatial (Figure A.2) and temporal boundaries of the Project. The projects are considered to address local concerns, improve traffic and further improve regional traffic flows. As previously mentioned, roadway infrastructure projects typically have the potential to result in residual noise effects during the construction phase and potential residual air quality effects during both the construction and operation phases. Given the intent of alleviating existing traffic congestion and the nature of most projects as expansions or improvements to existing infrastructure, no air quality effects are anticipated during operation; however, the potential for cumulative effects of dust and noise during construction should be further considered. In particular, the proximity of the proposed Laurier Road Expansion project, as well as the Cabana Road/ Division Road Improvement project to the Windsor-Essex Parkway increases the potential for localized cumulative effects of dust and noise during construction, which are further examined.

The development, expansion and modification of infrastructure is anticipated to result in an increased quantity of impermeable surfaces, which has the potential to result in residual effects to water quality and quantity within local watercourses during operation as well as water quality in the Detroit River. As a result, the potential for cumulative effects associated with the operation phase are further considered. Specifically, the Riverfront Shoreline Repairs Project consists of improvements to the existing Detroit River shoreline. It is anticipated that the shoreline project will meet all regulatory requirements, thereby addressing any potential residual effects associated with the Detroit River. In addition, the proposed works may include shoreline improvements and no potential for interaction with residual effects associated with the operation of the Project were identified.

The locations of ESA's within the Study Area were reviewed on a regional scale and the potential interactions with the projects were considered. No infrastructure projects were identified in areas adjacent to or within designated ESAs, as such no potential for interaction with residual effects from the Project were identified.

1. **Banwell Road Corridor Improvements (Future)**

- Project is currently scoped to include: intersection improvements, the widening of Banwell Road up to six lanes, construction of an interchange at Banwell Road and the EC Row Expressway and the construction of a grade separation between Banwell Road and the CP Rail Line.

2. **Cabana Road/ Division Road Operational Improvements (Future)**

- Project is currently scoped to include: intersection improvements, the widening of Cabana Road up to five road lanes plus bike lanes and the construction of a grade separation between Cabana Road and the CN Rail Line.

3. **Malden Road Improvement Project (Future)**

- Project is currently scoped to include: widening of existing road up to five lanes, intersection improvements, new local roads near the Vollmer Culture and Recreation Complex, and a realignment of the east portion of Bouffard Road.

4. **Provincial/ Division Road Improvements (Future)**

- This infrastructure improvement project is intended to alleviate congestion and improve the capacity and safety of the corridor. Construction priority will be given to the Cabana and Provincial intersection, scheduled to commence within the next 5 years.

5. **McDougall Street Improvements (Past)**

- Project is associated with a \$400 million investment into the redevelopment of the Casino Windsor. The site of the casino expansion is not presently large enough, requiring the reconstruction of McDougall Street.

6. **Riverside Drive Vista Improvement Project (Future)**

- This infrastructure improvement project is intended to improve roadway conditions and reduce traffic speeds, volume and collisions. Project is presently scoped to include: construction or reconstruction of sidewalks or bicycle paths, resurfacing, streetscaping, construction of localized operation improvements and the installation of traffic control and calming devices.

7. Laurier Road Extension (Future) ¹

- Project is currently scoped to include: the construction of a new east-west arterial road (Laurier Road Extension) interconnecting County Road 3 (Malden Road), County Road 7 (Huron Church Line), County Road 9 (Howard Avenue).

8. Riverfront Shoreline Repairs (Future)

- The project is proposed to improve the segment of Detroit River shoreline within the Central Riverfront Park. The focus of the shoreline repairs involves erosion protection works.

9. Channel Realignment, West Cahill Drain, Lasalle Recreation Complex, Town of Lasalle (Completed/Ongoing)

- Works include the realignment of the West Branch of the Cahill Drain, excavation and construction of a stormwater management pond.

4.1.2 Industrial Development Projects

The Windsor-Essex Region is recognized as a significant Canadian automotive centre with 24 auto assembly plants within 160 km and over 500 auto-industry related companies (Windsor-Essex Development Corporation, 2008). Other key industries in the area include: agri-food products/services, agriculture, computer components/systems, distribution/logistics and high tech manufacturing (Windsor-Essex Development Corporation, 2008).

The following past, present and reasonably foreseeable future projects have been identified within the spatial (Figure A.3) and temporal boundaries of the Project. These projects all consist of expansions to existing facilities. Although most forms of industrial-scale construction have the potential to result in residual noise effects, given the proposed locations of future project on existing industrial sites, no such effects are anticipated during the construction phase. In general, the expansion of industrial facilities typically has the potential to result in residual air quality effects during both the construction and operation phases, which are further considered.

The development and expansion of industrial facilities within proximity to large watercourses may have the potential to result in residual effects to the Detroit River surface water quality, which can in turn, affect fish and aquatic Species at Risk during the operation phase. Given the location of the proposed expansion projects in relation to the Detroit River, there exists the potential for localized cumulative effects during operation, which are further considered.

The locations of ESA's within the Study Area were reviewed on a regional scale and the potential interactions with the projects were considered. Based on the separation between the identified projects and the ESA's, no potential for interaction with residual effects from the Project were identified.

1. Brighton Beach Power Plant (Past)

- Existing natural gas fired power plant adjacent to the proposed Plaza site.

2. East Windsor Cogeneration Centre Project (Unknown)

- Project consists of the construction and operation of a natural gas fired cogeneration/combined heat-and-water plant.

3. Chrysler Generating Innovation Project (Unknown)

- Project consists of the construction and operation of an automotive paint facility and the

¹ Clarification regarding the intersection location to be confirmed with Industry Canada.

development, modification and use of equipment that will facilitate the building of vehicle prototypes.

4. **Sterling Marine Fuels Aggregate Storage Facility (Future)**

- Project consists of the development and operation of a roughly 20-acre site as an aggregate storage facility and developing the abutting canal linked to the Detroit River as a dock to receive aggregates and liquid petroleum products. Project is anticipated to include: grading, installation of a conveyor system, dredging of the canal and installation of steel sheetpiling.

5. **Sterling Marine Fuels Site Upgrades (Future)**

- Project consists of the development of 80,000 square feet to accommodate two additional asphalt storage tanks and operating equipment. Project is anticipated to include the enlargement of a dike to accommodate the new tanks and upgrade the natural gas service.

6. **Ojibway Shores – Windsor Port Authority Property (Unknown)**

- Land consists of greenspace next to an existing port slip, adjacent to the proposed plaza site on the south side. The management plan for the property includes the maintenance of a 30 metre vegetated buffer along the western shore, next to the Detroit River and the north side, which abuts the proposed plaza site. The Port Authority has indicated that it does not have any current plans to develop the property.

4.1.3 Renewable Energy Sector Development Projects

The following past, present and reasonably foreseeable future projects have been identified within the spatial (Figure A.4) and temporal boundaries of the Project. Large-scale renewable energy facilities have the potential to result in residual noise effects during the construction phase. Based on the physical distance between projects, no construction phase residual noise effects are anticipated. Given the nature of the projects as renewable energy facilities, no residual air quality effects are anticipated during either the construction or operation phase.

The locations of ESA's within the Study Area were reviewed on a regional scale and the potential interactions with the projects were considered. Based on the physical distance or separation between the identified projects and the ESA's, no potential for interaction with residual effects from the Project were identified.

1. **Helios Solar Star Project (Future)**

- Project consists of the development and operation of a solar farm. Project is anticipated to include: the installation of 46 solar power-producing panel rows and 5736 SunPower Trackers. Each unit will consist of a precast concrete base positioned, with a series of tilting solar panels attached. Project construction activities include: site preparation, grading, construction of open roadside swales, placement of units, trenching of electrical cable and the construction of a chain-link fence. This project is part of a larger project, located on three separate sites.

2. **Naylor Wind Farm (Future)**

- Project consists of the development and operation of a wind energy generating facility. Project is anticipated to include: the installation of 5 wind turbines and an access road.

4.1.4 Residential and Other Urban/Rural Development Projects

The City of Windsor's Official Plan has allocated almost 60% of its presently undeveloped land for future residential use (City of Windsor, 2007). The following past, present and reasonably foreseeable future projects have been identified within the spatial (Figure A.5) and temporal

boundaries of the Project.

Simultaneous subdivision and community development projects typically have the potential to result in dust and noise-related effects associated with construction phases. As a result, the potential for cumulative effects should be further considered.

In general, urban and rural development projects can also result in an increase in the amount of impermeable surfaces, which can have residual effects on water quality and quantity within local watercourses and affect fish community characteristics and capacity. As such, these potential residual effects should be further considered.

The locations of ESA's (including Natural Heritage Sites and wetlands) within the Study Area (identified in Figures A.1 through A.6) were reviewed on a regional scale and the potential interactions with the projects were considered. Of the below listed projects, only four (Commercial Plaza Development, Urban Residential Development, Coco Big Box Development and Ambassador Estates) represent ongoing development applications. Three of these developments are located within existing urban areas, limiting the potential for interaction of any residual effects.

Commercial development is currently proposed by Coco Paving adjacent to the Ojibway Prairie Wetland Complex and the Ojibway Prairie Complex ESA. The development application is for a 420,000 square foot development on a 332 ha parcel of land located on the northwest corner of Matchette Road and Spricewood Ave. Due to the proximity of the proposed development to the Project and adjacent ESA and wetland complex, there exists the potential for cumulative effects on wildlife & wildlife habitat, vegetation & vegetation communities and wetland components.

The Spring Garden Planning Area is a residential development plan in the vicinity of the Ojibway Prairie Wetland Complex. Given that this is only within a preliminary planning stage, preliminary interactions between the Project and this planning area are difficult to predict. However, it is not anticipated that the Spring Garden Planning Area will result in any significant adverse effects on the Ojibway Prairie Wetland Complex. Given that MNR has recently designated the wetland as Provincially Significant, it is anticipated that the protection of the wetland complex would be considered for any future development applications.

The remainder of the projects consist of long-term planning objectives, which could eventually result in the development of presently rural areas. Large-scale residential developments require lengthy, multi-phased planning processes and should take into account environmental effects. Until development applications have been received for those areas, future development remains only an expectation. Given the temporal scope of the cumulative effects assessment, there exists the potential for interaction between the Project and the construction phase of possible future development; however, interaction with the operation phase is not anticipated. Based on the physical distance or separation between the remainder of the projects and the ESA's, no additional potential for interaction with residual effects from the Project were identified.

1. Casino Windsor Improvements (Past)

- Project includes a \$400 million investment into the redevelopment of the Casino Windsor. The project is anticipated to include the construction and operation of a new 800-room hotel, an entertainment center with up to 5000 seats of convention space, and over 1500 parking spaces.

2. Commercial Plaza Development – Todd Lane at Huron Church Road (Unknown)

- Project is proposed to include the development of a commercial plaza with a grocery store, restaurants and a gas station.

3. Urban Residential Developments – South side of Cabana Road, west of St. Clair College (Unknown)

- Project is proposed to include the development of 106 condo units and 11 apartment units.
4. **St. Clair College Expansion (Unknown)**
 - Project is proposed to include the construction of additional student residences, athletic field house improvements, potential construction of an educational facility and corporate training centre.
 5. **Coco Big Box Development – Northwest corner of Matchette Road and Sprucewood Avenue (Ongoing; OMB Case LP080049)**
 - Proposed big box development next to the existing Windsor Raceway and adjacent to the southern portion of the Ojibway Prairie Wetland Complex. Proposed development includes the widening of Matchette Road to accommodate increased traffic.
 6. **Ambassador Estates Residential Development – Northwest corner of Matchette Road and Morton Drive (Ongoing)**
 - Proposed gated condominium community next to the existing Ambassador Golf Club.
 7. **City Centre West Community Improvement Plan (Future)**
 - Future development plan proposed to include the redevelopment of 3.7 ha of vacant land for residential, mixed use and recreational uses.
 8. **Glengarry-Marentette Community Improvement Plan (Future)**
 - Project is proposed to include the redevelopment of the entire 6.4 ha area to low, medium and high profile residential areas with local convenience commercial uses.
 9. **Olde Sandwich Town Community Plan (Future)**
 - The plan is likely to result in the continuation of industrial land uses in the waterfront area south of Watkins Road; areas south of Prince Road will be rezoned to industrial; and, improvements to the waterfront port (existing industrial land uses).
 10. **Spring Garden Planning Area and Secondary Plan (Future)**
 - This plan is likely to result in future residential development within an expansive natural area feature (283 ha).
 11. **Bouffard, Talbot and Howard Planning District – Town of LaSalle (Future)**
 - Plan for future residential development of up to 494 ha of presently vacant land within the Bouffard, Talbot and Howard Planning Districts.

4.1.5 International River Crossing-Related Project

The Windsor-Essex Region is recognized as an international border crossing area between Canada and the United States. It is also a leading transportation hub for rail, truck, air and deepwater shipping, with over 50 trucking companies, 5 air cargo carriers, and 16 major docking facilities on the Great Lakes (Windsor-Essex Development Corporation, 2008). Transborder crossings currently include: the Ambassador Bridge, the Detroit-Windsor Tunnel, the Detroit-Windsor Truck Ferry Service and the twin-track rail tunnel (Windsor-Essex Development Corporation, 2008). Currently, the Detroit-Windsor crossings are estimated to handle at least one third of the total trade between Canada and the United States with over \$300 million in goods crossing the Windsor/Detroit border each day (Windsor-Essex Development Corporation, 2008).

The following past, present and reasonably foreseeable future projects have been identified within the spatial (Figure A.6) and temporal boundaries of the Project. The majority of these projects are associated with expansions to existing facilities. Specifically for this location, any transboundary

infrastructure project requires the crossing of the Detroit River.

In general, most large-scale construction operations have the potential to result in residual noise effects during construction. With respect to the international crossing projects specifically, based on the existing nature of the projects, the industrial nature of the waterfronts on both the Canadian and American sides and the physical distance between the Project and any identified future projects, no interactions of residual noise effects during the construction phase were identified.

Based on the nature of international border crossing projects as transportation corridors, the expansion or construction of new crossings has the potential to result in residual air quality effects during both the construction and operation phases. Given the intent of all identified projects as enhancements to accommodate existing and foreseeable future traffic congestion issues, no interaction of residual air quality effects between the identified border crossing-related projects and the DRIC Project were identified.

The locations of ESA's within the Study Area were reviewed on a regional scale and the potential interactions with the projects were considered. Based on the physical distance or separation between the identified projects and the ESA's, no potential for interaction with residual effects from the Project were identified.

The expansion of infrastructure is anticipated to result in an increased quantity of impermeable surfaces, which has the potential to result in residual effects to the Detroit River quality, fish and aquatic Species at Risk during operation. As a result, the potential for cumulative effects associated with the operation phase should be further considered.

The construction or expansion of physical structures around large watercourses typically has the potential to result in residual effect to migratory birds. As a result, the potential for cumulative effects associated with the operation phase should be further considered.

1. **Existing Ambassador Bridge (Past)**
 - Existing four lane suspension bridge over the Detroit River.
2. **Proposed Ambassador Bridge Enhancement Project (Future)**
 - Proposed expansion of the existing Ambassador Bridge.
3. **Existing Ambassador Bridge and Proposed Ambassador Bridge Enhancement Project (Ongoing)**
 - Proposed Ambassador Bridge Enhancement Project in combination with the existing Ambassador Bridge.
4. **U.S. Portion of the DRIC Project (Future)**
 - Proposed U.S. portion of the international crossing as well as a proposed 200 acre inspection area.
5. **Windsor-Detroit Tunnel as well as Plaza Master Plan and Improvements (Future)**
 - Operational improvements to the Windsor-Detroit tunnel plaza.
6. **Michigan Central Railway Tunnel (Past)**
 - Existing railroad tunnel under the Detroit River connecting Detroit with Windsor used by the Canadian Pacific Railway.
7. **Detroit Intermodal Freight Terminal (Future)**
 - Proposed expansion of the intermodal operations at the Livernois-Junction Yard in the Detroit area; shift of the NS Triple Crown operation from Melvindale and Willow Run to

the Livernois-Junction Yard; and movement of the CP Oak intermodal operation to the Livernois-Junction Yard.

TABLE 3 PROJECT GROUPS RETAINED FOR FURTHER ANALYSIS

Scoped Components	Let's Get Windsor-Essex Moving Strategy	Other Infrastructure Development	Industrial Development	Renewable Energy-Sector Development	Residential and Other Urban/ Rural Development	International River Crossing-Related Projects
Air Quality	X	X	X		X	
Noise	X	X				
Local Watercourses	X	X			X	
Detroit River	X	X	X		X	X
Ojibway Prairie and Wetland Complex					X	
Migratory Birds						X
Species at Risk					X	
Current Use of Lands and Resources by Aboriginal Peoples						

5.0 Summary of Potential Cumulative Effects and Their Significance

This section provides a summary of potential cumulative effects and their significance only for environmental components that have residual effects. Project specific mitigation measures are identified in the Provincial EA and will generally be employed to address potential cumulative residual effects.

All the conclusions in the CEA are considered in light of the existing baseline condition that is reflective of extensive anthropogenic activity. The Project is proposed to be located within an urban area that has undergone development over a long period of time.

5.1.1 Air Quality

Construction projects throughout the Study Area have the potential to result in cumulative effects on background particulate, dust and emission levels. These construction projects primarily include infrastructure expansions and improvements associated with:

- Let's Get Windsor-Essex Moving Strategy
- Other Infrastructure Development

- Industrial Development
- Residential and Other Urban/Rural Development

In general, it is anticipated that the DRIC Project and all other projects will implement standard construction mitigation measures to reduce potential air quality effects. The potential for simultaneous residual air quality effects during construction, within a localized area is limited based on the location of the projects, standard construction phasing and anticipated implementation of standard construction mitigation measures. Overall, based on the analysis, and considering the mitigation proposed for the Project, cumulative effects on air quality during construction are considered negligible and not likely to be significant. As such, no additional mitigation is required.

The proposed plaza is located near the existing Brighton Beach Power Plant (BBPP), a natural gas powered energy facility in Windsor. Maximum air quality contaminant concentrations from the BBPP fall below provincial and federal criteria. Emissions from the BBPP are federally and provincially regulated, which aids to minimize potential residual air quality effects from the facility. The proposed plaza is also located in close to other power and industrial infrastructure and operations.

Vehicles at or near the plaza are occasionally anticipated to affect air quality during the operation phase and the potential for cumulative effects. Potential for cumulative effects was considered in relation to the operation of the BBPP and other power infrastructure which could result in a localized cumulative effect in the area of the plaza. However, based on the air quality modelling, the likelihood for simultaneous spatial and temporal air quality exceedences at the plaza site and BBPP are limited. In addition, the modelling of air quality effects for the Project suggest that relative contributions to air quality will be limited. Project specific effects associated with air quality have been mitigated to the greatest extent possible by incorporating considerations into the conceptual design and location of the plaza within an industrial area.

Overall, cumulative effects during operation are anticipated to be generally localized and intermittent with the potential cumulative increases in exceedences being limited. As a result, based on the analysis, potential cumulative effects on air quality are not likely to be significant. However, potential cumulative effects will be further considered during the detailed design stages and in the development and implementation of idling reduction strategies for the plaza. This plan will consider air quality interactions with BBPP, the adjacent transformer station and other private business stakeholders within proximity to the plaza.

5.1.2 Noise

Construction projects throughout the Study Area have the potential to result in cumulative effects on regional noise levels. These construction projects primarily include infrastructure expansions and improvements associated with:

- Let's Get Windsor-Essex Moving Strategy
- Other Infrastructure Development

In general, it is anticipated that all projects will adhere to local noise by-laws and implement standard construction mitigation measures to reduce potential noise effects. The potential for simultaneous residual noise effects within a localized area is limited based on standard construction phasing and anticipated construction mitigation measures. Overall, based on the analysis, and considering the mitigation proposed for the Project, cumulative effects on noise during construction are considered negligible and not likely to be significant. As such, no additional mitigation is required.

5.1.3 Local Watercourses

Changes in the water quality and quantity resulting from increased areas of impermeable surfaces and associated runoff of storm water were considered from a subwatershed perspective for the cumulative effects assessment. Drainage from the Windsor-Essex Parkway to local watercourses primarily outlets into the upper reaches and municipal drains of the Turkey Creek subwatershed (Drainage from the DRIC plaza and bridge outlet to the Windsor Area Drainage subwatershed associated with the Detroit River and are discussed separately in section 5.1.4 Detroit River).

The following projects throughout the Study Area have the potential to result in cumulative effects on local watercourse surface water quality and quantity:

- Let's Get Windsor-Essex Moving Strategy
- Other Infrastructure Development
- Residential and Other Urban/Rural Development

These projects are anticipated to result in increased areas of impermeable surfaces that could result in changes to drainage quantities. In addition, changes in the quality of stormwater runoff could result in cumulative effects to surface water quality at the subwatershed scale and indirectly affect fish community characteristics and capacity.

With regard to surface water quality and quantity, Enhanced Protection Level stormwater management practices as per the Ontario MOE document "Stormwater Management Planning and Design Manual" dated 2003, will be implemented for the Project to provide quality and quantity treatment for all stormwater runoff. It is anticipated that other projects within the Study Area would also manage any increased levels of surface water quantity and mitigate any potential localized effects to quality. The management of stormwater quantity and quality at both the provincial and municipal levels reduces the potential for substantial effects at the watershed scale. In addition, the spatial distribution of identified projects is such that any cumulative residual effects on surface water quality and quantity can generally be considered dispersed throughout the various subwatersheds.

Based on the analysis, substantive cumulative residual effects of surface water quality or quantity are not likely to be significant.

An increase in the area of impermeable surfaces also has the potential to increase the temperature of stormwater discharged into local watercourses, which could also impact fish community characteristics and capacity. Based on the channelized nature of the existing drains within the urbanized areas of the city and the presence of warmwater fish communities within the Turkey Creek subwatershed which are not anticipated to be sensitive to limited and intermittent increases in surface water temperature. In addition, the use of grassed swales, wetponds, and enhanced ditches, stormwater management options along the Windsor-Essex Parkway is expected to reduce the potential for such increases in surface water temperatures. It is anticipated that the other projects would also be subject to stormwater management guidelines and regulations, reducing the potential for cumulative residual effects at the watershed scale.

Turkey Creek and some of its tributaries also have the potential to support species of Special Concern under the *Species at Risk Act*. The grass pickerel (*Esox americanus vermiculatus*) (ERCA – May 2000), pugnose minnow (*Opsopoeodus emiliae*) (NHIC – 1994) and spotted sucker (*Minytrema melanops*) (ERCA – Nov 1999; NHIC – 1986) were identified as potentially inhabiting the subwatershed. The Species at Risk Registry identifies each of these species as being associated with Lake St. Clair and its tributaries and predominantly inhabiting larger waterbodies with abundant aquatic vegetation. It is anticipated that these species are primarily associated with

the downstream reaches of Turkey Creek, near the outlet to the Detroit River.

Overall, based on the analysis, and considering the mitigation proposed for the Project, cumulative effects on surface water quality, quantity and fish are considered negligible and not likely to be significant.

5.1.4 Detroit River

Changes in the water quality resulting from increased areas of impermeable surfaces were considered for the cumulative effects assessment of the Detroit River. Drainage from the DRIC Plaza and Bridge Project is expected to be captured in the Windsor Area Drainage subwatershed and outlet to the Detroit River.

The following projects throughout the Study Area have the potential to result in cumulative effects on surface water quality in the Detroit River:

- Let's Get Windsor-Essex Moving Strategy
- Other Infrastructure Development
- Industrial Development
- Residential and Other Urban/Rural Development
- International River Crossing-Related Projects

The creation or expansion of any infrastructure, industrial or residential properties are likely to increase the area of impermeable surfaces. The removal of permeable surfaces can generally result in increased surface water temperatures and increased potential for contaminant release into aquatic systems. While these can directly affect surface water quality, they can also impact fish and aquatic Species at Risk.

With regard to surface water quality, Enhanced Protection Level stormwater management practices as per the Ontario MOE document "Stormwater Management Planning and Design Manual" dated 2003, will be implemented for the DRIC bridge and plaza to provide quality treatment for all stormwater runoff. It is anticipated that any additional projects within the Study Area would also mitigate any potential localized effects to Detroit River surface water quality. The management of stormwater quality at both the provincial and municipal levels will likely reduce the potential for substantial effects at the watershed scale. In addition, the spatial distribution of identified projects and the relative size of the Detroit River are such that any cumulative residual effects on surface water quality can generally be considered dispersed. Based on the above, substantive cumulative residual effects of surface water quality are not anticipated to be significant nor are they anticipated to impact Detroit River fish species.

An increase in the area of impermeable surfaces also has the potential to increase the temperature of the managed runoff being discharged into the Detroit River, which could also impact fish community characteristics and capacity. Based on the volume of water in the Detroit River relative to the potential runoff produced from the bridge and plaza site and/or any other identified projects, changes in water temperature in the river are not likely.

In some instances, industrial facilities discharge wastes and/or warmed water into the Detroit River. Such contributions were also considered in the cumulative effects assessment; however, the Federal and Provincial *Environmental Protection Acts* regulate such releases in order to minimize potential residual effects. The treatment of stormwater runoff from the DRIC bridge and plaza sites is anticipated to minimize the potential for residual surface water quality effects to the Detroit River and the proportion of potential contributions to the deterioration of surface water in the river is anticipated to be limited.

The Detroit River has been identified as supporting fish and mussel Species at Risk. No cumulative residual effects on Species at Risk in the Detroit River are anticipated for the following reasons:

- Direct effects on Species at Risk in the Detroit River are not anticipated;
- Future projects with the potential to affect habitat for listed species are anticipated to require federal and/or provincial approval and appropriate mitigation to protect Species at Risk and their habitat under the Fisheries Act and either the *Ontario Endangered Species Act* or *Species at Risk Act*, which require that the habitat for the species not be jeopardized; and
- Cumulative residual effects on surface water quality are anticipated to be negligible and not likely significant.

Mitigation measures proposed for the DRIC Project include the limitation of bridge design to a Cable Stayed or Suspension Bridge crossing, which requires no piers to be placed in the river.

Overall, based on the analysis, and considering the mitigation proposed for the Project, cumulative effects on Detroit River surface water quality and aquatic species are considered negligible and not likely to be significant.

5.1.5 Migratory Birds

The construction or expansion of physical structures across large watercourses has the potential to result in residual effects to migratory birds. Of the projects identified above, only the projects associated with International Crossings have the potential to result in a cumulative effect, largely due to migratory flight path barriers along the Detroit River.

Given that the primary residual effect for the Project is in relation to the physical barrier imposed by the bridge structure(s), both the Canadian and U.S. portions of the bridge structure were considered as one entire unit, thereby capturing any potential cumulative effects resulting from the operation of the U.S portion of the DRIC projects.

Two bridge types are being considered for the crossing: a Cable Stayed Bridge and a Suspension Bridge. Selection of the bridge type will be determined during future design stages of this Project; however, the potential barrier effect for migratory birds varies between the two types.

The lower altitude, Suspension Bridge design option reaches a height of 138 m, compared to the Cable Stayed Bridge design option, which would be nearly twice the height (at its highest point), reaching 250 m. Based on the results of the spring migratory bird survey, the Suspension Bridge design option would present an obstacle to 33% (17,180) of the targets (avian species) recorded by the vertical radar. In comparison, the Cable Stayed Bridge design option would present an obstacle to 68% (35,718) of the targets (avian species) recorded by the vertical radar.

Both bridge designs would present a risk to thousands of migrating birds each season, but available evidence suggests that only a small percentage would strike the structure. Such a mortality rate (conservatively estimated at 0.05%) represents a potentially large number of individuals (based on the spring survey results); however, the mortality rate is anticipated to be negligible at a population level.

The spring migratory bird study also considered the cumulative effects of the existing Ambassador Bridge and the Project. The existing Ambassador Bridge reaches a height of 111 m (to the top of the tower) and presents an obstacle to 26% (13,606) of the targets (avian species) recorded by the vertical radar. The Ambassador Bridge Enhancement Project proposes a new structure adjacent to the existing bridge, which may be taller (potentially 166 m above ground level) and represent an additional barrier for migratory birds. Given the proportional size of the physical obstacle presented by the existing and enhanced Ambassador Bridge and the conservative estimate of the percentage

of avian species, which would then strike the structure, migratory bird mortality is possible; however, the cumulative effect is not likely to be significant.

Overall, the spring migratory bird survey found that the seasonal average passage by avian species was comparable to other studies in eastern North America. The risk to night-migrating passerines would be greatest late in the night or early in the morning as the birds descend to lower altitudes. If best-practice lighting strategies are employed, then this risk can be mitigated to a substantial degree. However, during inclement weather conditions with poor visibility there will always be a greater risk of collisions. In cases where poor conditions in the latter part of the night or early morning coincide with a night with a high migration rate, there remains the possibility of mass mortality events involving hundreds or even thousands of birds. Taller structures are likely to cause more bird deaths, which will be considered within the Detailed Design Plan. Mitigation to address direct effects on migratory birds was considered sufficient to address potential cumulative effects, no additional mitigation is proposed.

A Monitoring and Follow-up Program will incorporate verification of the accuracy of the CEA and determine the effectiveness of the implemented mitigation measures. The Monitoring and Follow-up Program will also incorporate the results of the Bird Migration Radar Study including a second radar survey to be conducted between September and October 2009 to observe the fall migration.

5.1.6 Ojibway Prairie and Wetland Complex

The potential for residual effects on the Ojibway Prairie and Wetland Complex were considered in combination with the potential for environmental effects resulting from commercial development proposed by Coco Paving. Given the localized nature of the potential residual effects resulting from both the DRIC Project and the proposed commercial development, and in consideration of the proposed mitigation, no likely significant adverse cumulative effects are anticipated. In accordance with the *Federal Policy on Wetland Conservation* (1991), the DRIC Project will result in no net loss of wetland area or function.

5.1.7 Species at Risk

The potential for residual effects on Species at Risk were considered in combination with the potential for environmental effects resulting from commercial development proposed by Coco Paving. Given the localized nature of the potential residual effects resulting from both the DRIC Project and the proposed commercial development, and in consideration of the proposed mitigation, no likely significant adverse cumulative effects are anticipated. In accordance with the SARA and OESA, the DRIC Project will not jeopardize the survival or recovery of any Species at Risk.

Fish Species at Risk were considered separately in Section 5.1.3 Local Watercourses and Section 5.1.4 Detroit River.

Ongoing project collaboration with MTO during the Species at Risk permitting processes and in the implementation of the monitoring and follow-up program will ensure that cumulative effects on Species at Risk along the Windsor-Essex Parkway (regulated under the *Ontario Endangered Species Act*) and on the plaza site (regulated under the *Species at Risk Act*) are considered from an overall project perspective.

Overall, based on the analysis, cumulative effects on Species at Risk are considered negligible and not likely to be significant.

5.1.8 Current use of Lands and Resources by Aboriginal Persons

Aboriginal groups were consulted throughout the EA process, during which time Walpole Island First Nations identified an interest in Fisheries and Species at Risk. Additional details about

Aboriginal consultation are available in the Provincial EA. Cumulative effects are not anticipated on the current use of lands and resources by Aboriginal persons.

6.0 Summary

Given the scope of the cumulative effects assessment and in consideration of the analysis and proposed project specific mitigation, it has been concluded that there are no likely significant cumulative effects.

- Potential cumulative effects on air quality will be further considered during the detailed design stages and in the development of a specific Environmental Management Plan for the plaza. The plan will also consider air quality interactions with the BBPP, the adjacent transformer station and other private business stakeholders within proximity to the plaza;
- Monitoring and follow-up program for migratory birds will include consideration for cumulative effects during later project stages;
- Wetland compensation plan for the Ojibway Prairie Wetland Complex will include consideration for cumulative effects during later project stages; and
- Monitoring and follow-up program for Species at Risk will include consideration for cumulative effects during later project stages.

7.0 Key References

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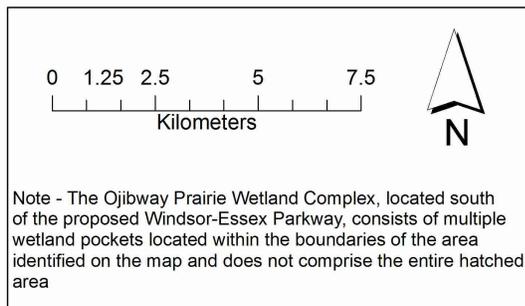
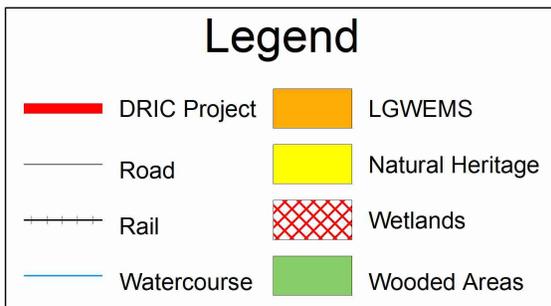
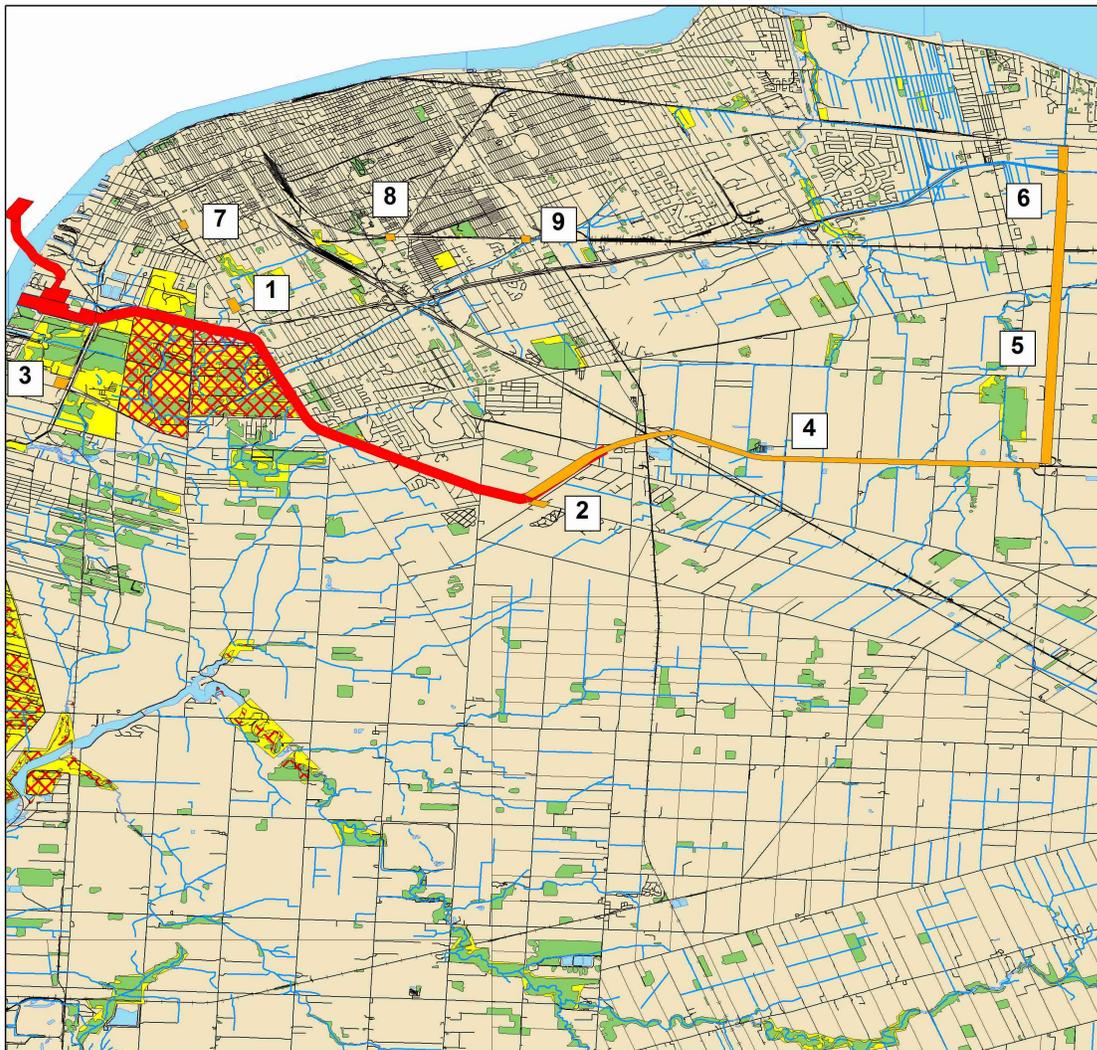
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Appendix A – Spatial Project Interactions

Approximate locations of projects and environmental features

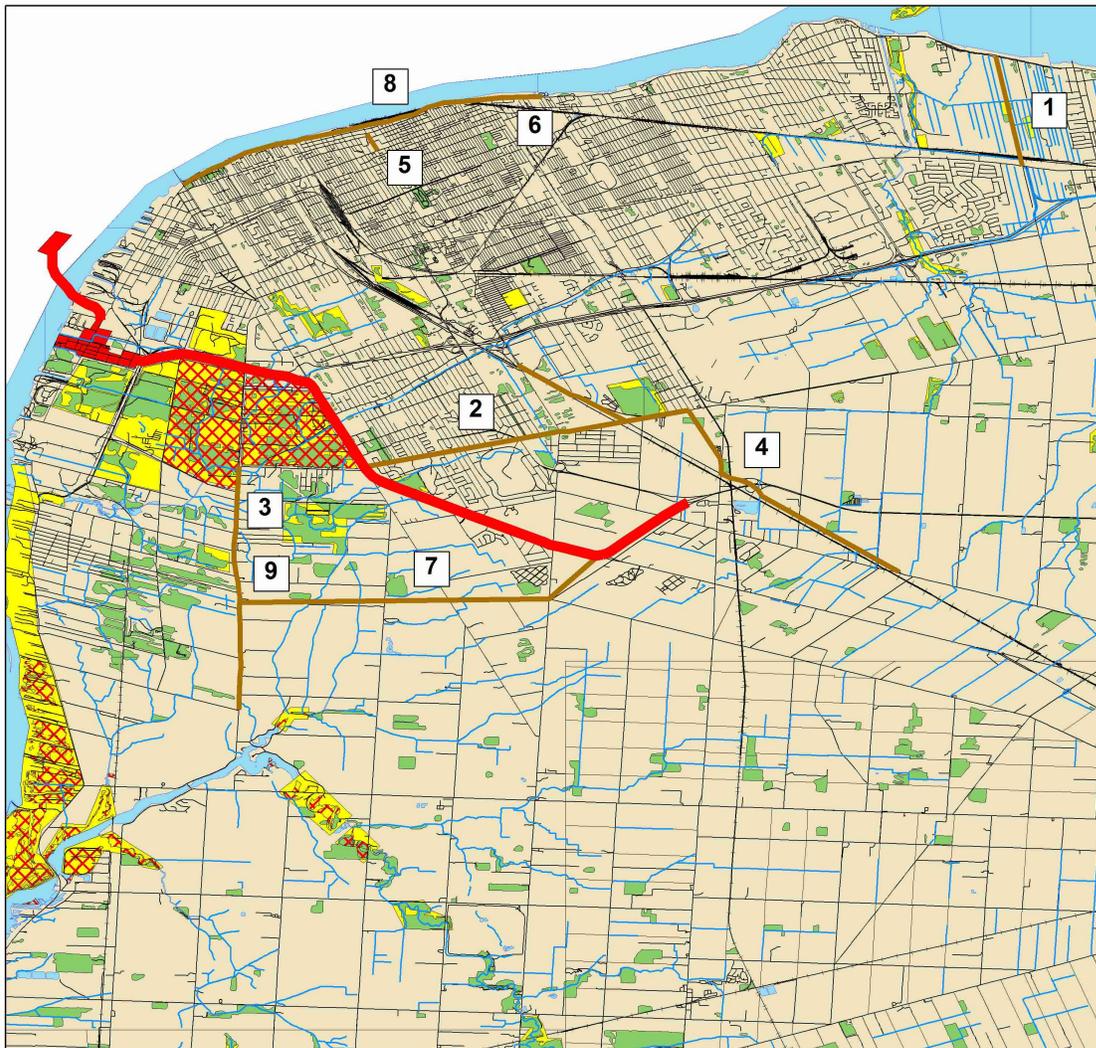
Figure A.1. Locations of LGWEMS Projects



Index of projects identified in Figure A.1

1. **Huron Church Road at Industrial Drive**
2. **Intersection Improvements on Highway 3 at Outer Drive and Walker Road**
3. **Truck Ferry Road Infrastructure and Signing Improvements**
4. **Highway 401 Widening East of Highway 3/North Talbot Road to West of Manning Road**
5. **Manning Road Widening from Highway 401 to County Road 22**
6. **Manning Road Widening: North of Essex County Road 22 to VIA Rail Line**
7. **Huron Church Pedestrian Bridge**
8. **Howard Avenue/CPR Grade Separation**
9. **Walker Road/CPR Grade Separation**

Figure A.2. Locations of Other Infrastructure Projects



Legend

 DRIC Project	 Infrastructure Projects
 Road	 Natural Heritage
 Rail	 Wetlands
 Watercourse	 Wooded Areas

0 1.25 2.5 5 7.5
Kilometers

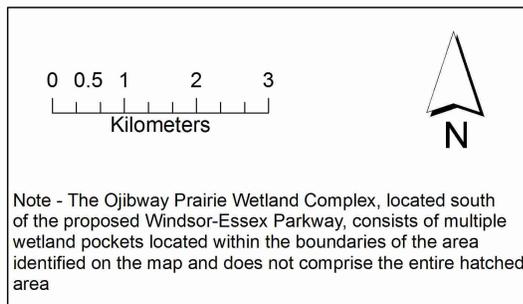
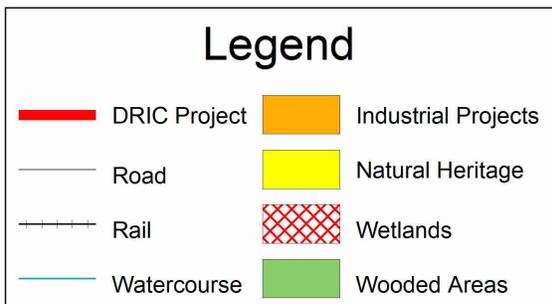
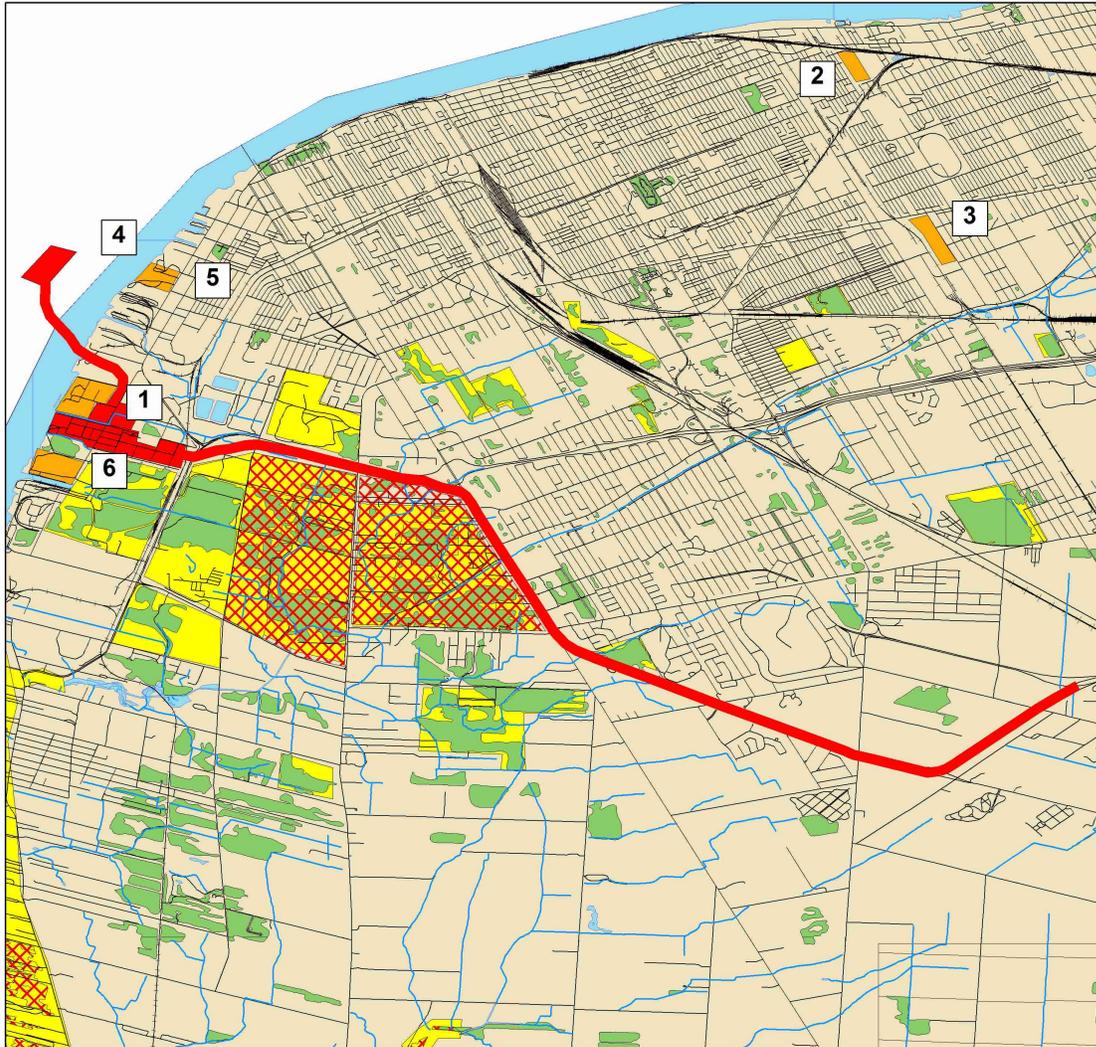


Note - The Ojibway Prairie Wetland Complex, located south of the proposed Windsor-Essex Parkway, consists of multiple wetland pockets located within the boundaries of the area identified on the map and does not comprise the entire hatched area

Index of projects identified in Figure A.2

1. **Banwell Road Corridor Improvements**
2. **Cabana Road/ Division Road Operational Improvements**
3. **Malden Road Improvement Project**
4. **Provincial/ Division Road Improvements**
5. **McDougall Street Improvements**
6. **Riverside Drive Vista Improvement Project**
7. **Laurier Road Extension and the Hwy3/ Hwy 401/ Windsor-Essex Parkway Interchange**
8. **Riverfront Shoreline Repairs**
9. **Channel Realignment, West Cahill Drain, Lasalle Recreation Complex, Town of Lasalle**

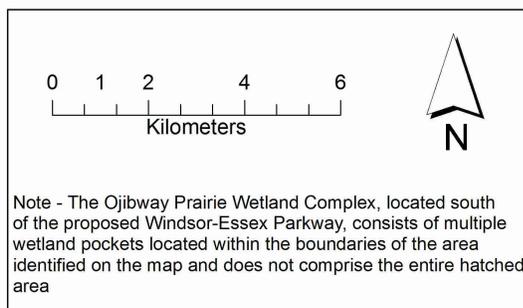
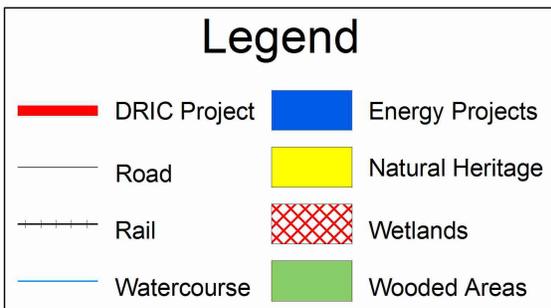
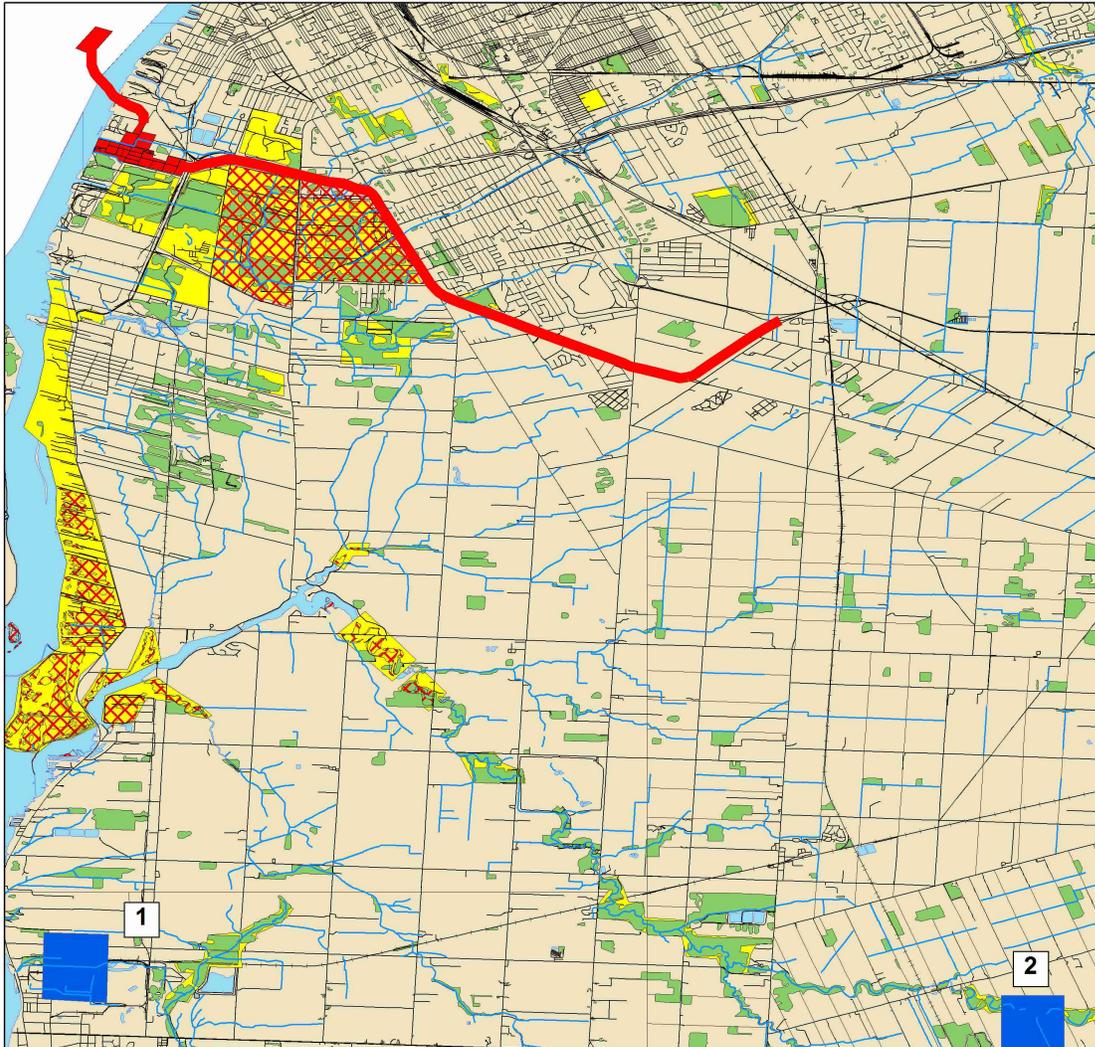
Figure A.3. Locations of Industrial Projects



Index of projects identified in Figure A.3

1. **Brighton Beach Power Plant**
2. **East Windsor Cogeneration Centre Project**
3. **Chrysler Generating Innovation Project**
4. **Sterling Marine Fuels Aggregate Storage Facility**
5. **Sterling Marine Fuels Site Upgrades**
6. **Ojibway Shores – Windsor Port Authority Property**

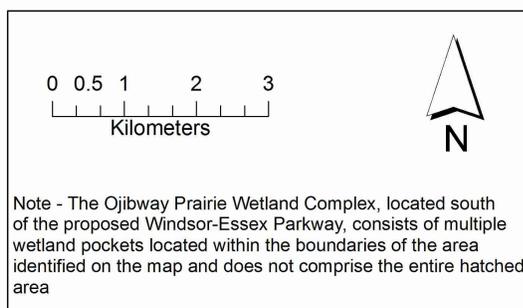
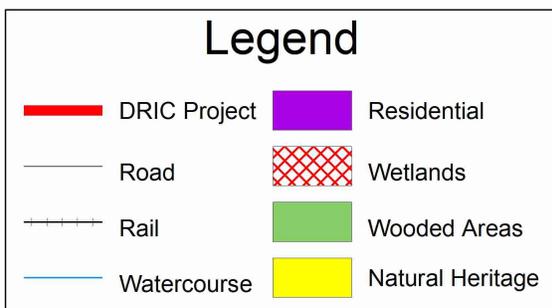
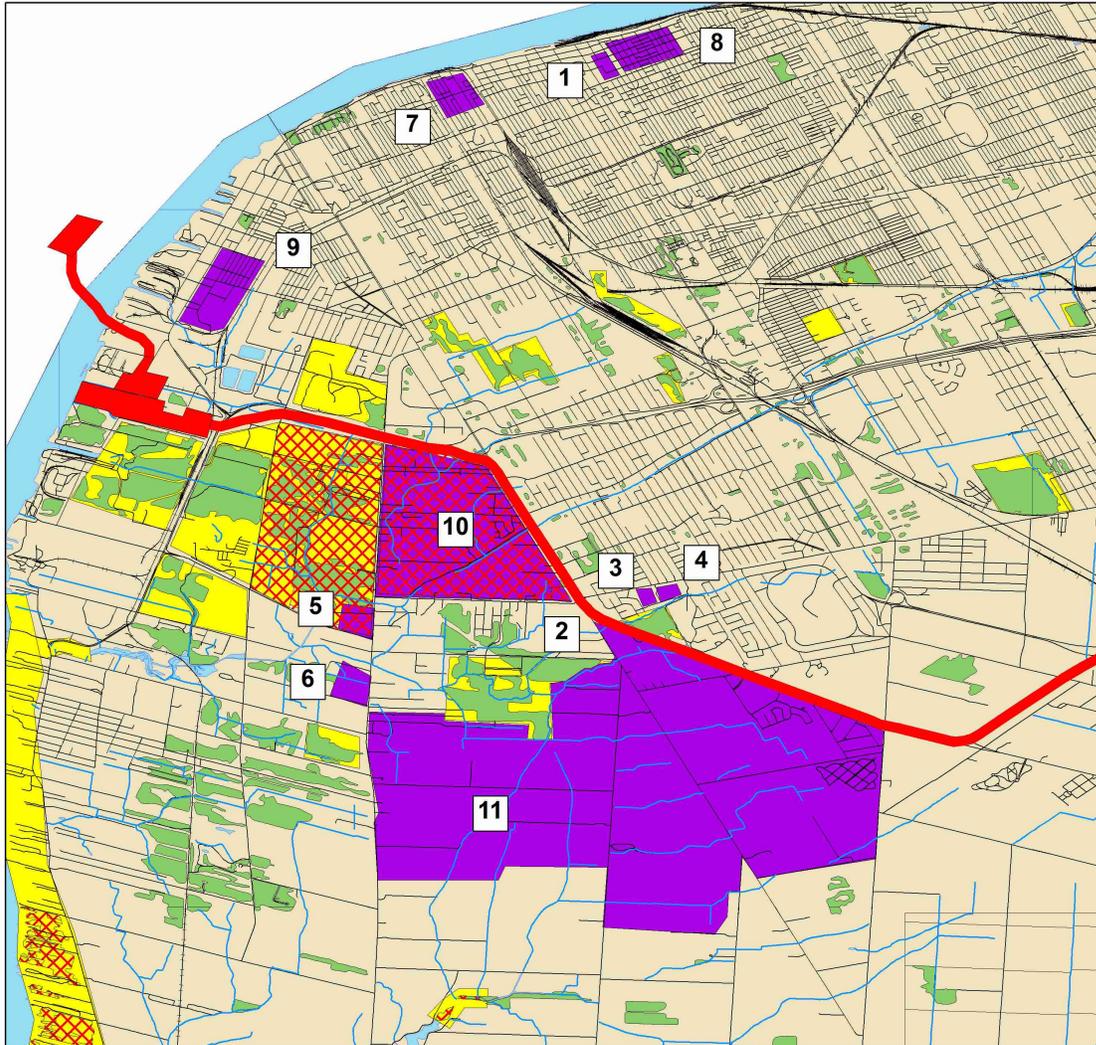
Figure A.4. Locations of Renewable Energy Sector Projects



Index of projects identified in Figure A.4

1. **Helios Solar Star Project**
2. **Naylor Wind Farm**

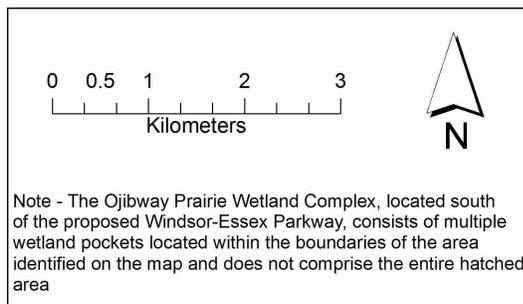
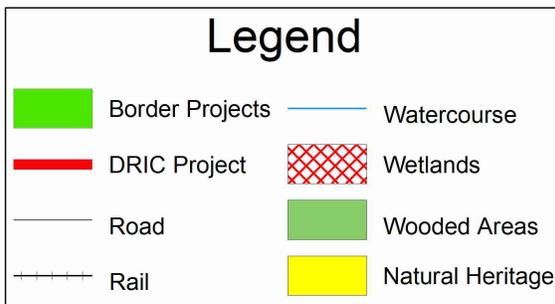
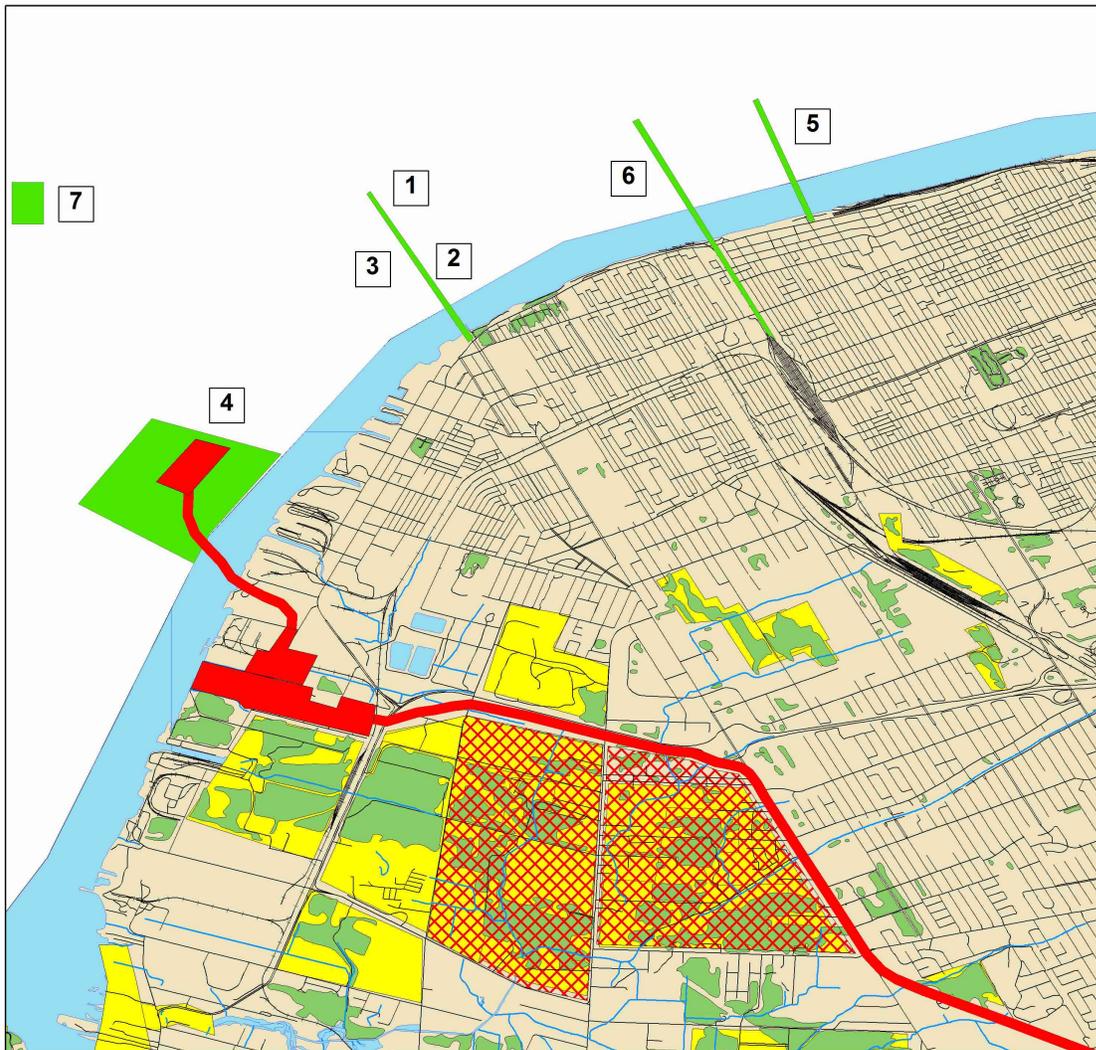
Figure A.5. Locations of Residential and Urban/Rural Projects



Index of projects identified in Figure A.5

1. **Casino Windsor Improvements**
2. **Commercial Plaza Development – Todd Lane at Huron Church Road**
3. **Urban Residential Developments – South side of Cabana Road, west of St. Clair College**
4. **St. Clair College Expansion**
5. **Coco Big Box Development – Northwest corner of Matchette Road and Sprucewood Avenue**
6. **Ambassador Estates Residential Development – Northwest side of Matchette Road and Morton Drive**
7. **City Centre West Community Improvement Plan**
8. **Glengarry-Marentette Community Improvement Plan**
9. **Olde Sandwich Town Community Plan**
10. **Spring Garden Planning Area and Secondary Plan**
11. **Bouffard, Talbot and Howard Planning District – Town of LaSalle**

Figure A.6. Locations of International River Crossing Projects



Index of projects identified in Figure A.6

1. **Existing Ambassador Bridge**
2. **Proposed Ambassador Bridge Enhancement Project**
3. **Existing Ambassador Bridge and Proposed Ambassador Bridge Enhancement Project**
4. **U.S. Portion of the DRIC Project**
5. **Windsor-Detroit Tunnel as well as Plaza Master Plan and Improvements**
6. **Michigan Central Railway Tunnel**
7. **Detroit Intermodal Freight Terminal**