

Appendix H:

Fisheries and Aquatic Environment Secondary Source Summary (Detroit River)



**Transport
Canada**

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**FISHERIES AND AQUATIC ENVIRONMENT
SECONDARY SOURCE SUMMARY**

**DETROIT RIVER INTERNATIONAL CROSSING AND
GATEWAY PLAZA**

ESSEX COUNTY

PROJECT # 1084053

AUGUST 31, 2009



MORRISON HERSHFIELD



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1.0 Introduction

The Detroit River International Crossing (DRIC) Environmental Assessment Report documents the coordinated Environmental Study undertaken by the Border Transportation Partnership, which includes the Ontario Ministry of Transportation (MTO), Transport Canada, the Michigan Department of Transportation (MDOT) and the U.S. Federal Highway Administration (FHWA). The study resulted from the *Planning/Need and Feasibility (P/NF) Study* completed in 2004, which identified the need to address the safe and efficient movement of people and goods in the long-term between Southwestern Ontario and Southeastern Michigan (Environmental Assessment Report W.O. 04-33-002, 2008).

This secondary source summary has been prepared for this project and provides information on fish and aquatic habitat within the Detroit River adjacent to the plaza and bridge locations, project components and potential environmental interactions, recommended mitigation measures, and an assessment of potential impacts to the aquatic environment that may result from the proposed project.

To ensure the constructability of the bridge and ancillary features, Transport Canada requires that the Design-Build tender provide the latitude to the Vendor to determine key design features of the bridge and the construction methodologies to build these design features, including the use of a nearby existing docking facility. A docking facility would allow the Vendor to off-load oversize and over-weight components or move bridge components from land to the bridge site during the erection of the bridge. The duration of the bridge construction project may exceed 5 years; therefore, any existing docking facility that cannot accommodate the Vendor's needs for the entire construction period would not be considered a viable alternative.

As this is a bounded environmental assessment, the extent of impacts from the use of an existing docking facility will not be fully known until the Vendor is selected; therefore, the potential environmental interactions are based on a worst-case scenario determined from reasonably foreseeable construction methodologies and industry practices.

2.0 Background and Approach

Background information for the area was obtained from the Ministry of Natural Resources (MNR) Wheatley Office, Windsor Port Authority as well as various Department of Fisheries and Oceans (DFO) online resources.

The DRIC Plaza occupies a property that has approximately 350 meters of Detroit River shoreline south from Chappus Street, Windsor, Ontario. As illustrated in Figure 1.

MH conducted a site investigation on July 28, 2009 to assess the existing conditions at DRIC Plaza. The site is currently vegetated with various grasses, shrubs and tree species however; motorized vehicles have disturbed the natural habitat with a network



of trails. The shoreline community consists primarily of trees and shrubs that provide minimal shore cover. Substrate observed along the immediate shoreline was comprised of granular material with no observed aquatic vegetation. Concrete remnants were observed along an approximate 4 meter reach of the shoreline. Photos from the site investigation are located in Appendix B.

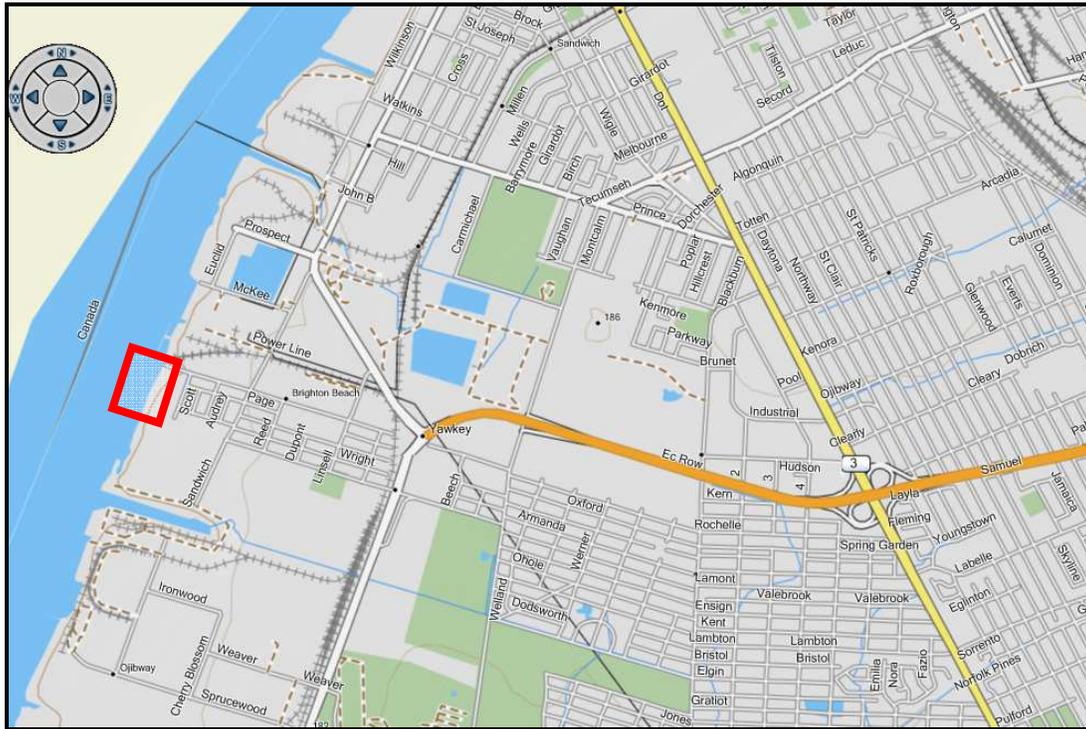


Figure 1: Key map displaying DRIC Plaza shoreline

A site investigation was conducted on August 13, 2009 to assess existing docking structures from La Salle to the Ambassador Bridge Crossing. Refer to Appendix A for a location map of the properties investigated as a potential docking facility for this project.

A total of 12 potential existing facilities were investigated for having the ability to satisfy the Vendor's needs. The following table illustrates general site characteristics for each potential existing docking facility.



Table 1: General site characteristics for potential existing docking facilities

Facility	Location (km from the DRIC Plaza)	Current Use	Key Features
Canadian Salt Co – Ojibway Mine	2.5 km southwest	Transport of salt	Infill pier, mooring dolphins*, overhead conveyor
ADM Windsor Grain Terminal	1.6 km southwest	Transport of grain	Narrow pier, mooring dolphins, overhead conveyor
Detroit-Windsor Truck Ferry	1.1 km southwest	Cross-border transportation of trucks	Dock facility for ferry barge and tug, limited extra docking space
Morterm Limited	0.9 km southwest	Cargo transfer terminal	Three sheet pile berths adequate for large marine vessels, crane onsite, large loading area
Brighton Beach Power	0.3 km northeast	Site is active, dock is no longer in use	Large “T” configuration dock, raised working platform on wood H piles
Southwestern Sales	0.9 km southeast	Transport of aggregates	Service self-unloading vessels**, stone dock on property with tie downs
Canadian Salt Co. – Sandwich Dock	1.3 km southeast	Site active, dock no longer in use	Concrete platform dock, with sheet pile wall design
Coco Aggregates	1.5 km southeast	Transport of aggregate	Concrete platform dock, two mooring posts at either end of the property frontage for large vessels
Sterling Marine Fuels	2.2 km southeast	Transport of petroleum products	Mooring dolphin structure, equipped with fuel transfer piping
Lafarge North America	2.7 km southeast	Transport of aggregate	Services self-unloading vessels, stone dock with tie downs
Adam’s Cartage	3.0 km southeast	Vacant	Sheet pile wall along property shoreline
Essroc Italcementi	3.6 km southeast	Transport of aggregate	Engineered property shoreline

* Mooring Dolphins – large concrete in-water structures anchored to the bottom of the river. These structures are used for tying off large marine vessels away from the shoreline. The docking sites with mooring dolphins have a “T” shaped design, whereby a walkway or lightweight platform connects the dolphins to one another, and a single pier extends from the shoreline to the mooring dolphins.

** Self-unloading vessel - are equipped with conveyers, cranes and/or other devices which allow the transfer of material to and from the ship without the use of a loading dock.



Figure 2: Detroit River Corridor from La Salle to Ambassador Bridge



3.0 Existing Fisheries and Aquatic Habitat

3.1 Fish Habitat

The Detroit River extends about 45 kilometers from Lake St. Clair to Lake Erie. The marine bottom is characterized by steeply sloping sides, and bottom depths of approximately 10 meters in the centre channel. Refer to Appendix D for hydrographic mapping of the site. The substrate includes granular materials of gravel, sand, and silt. The stream morphology due to the size and depth of the river is a uniform run. Fish habitat and cover recorded in the 2007 DFO report indicated various aquatic vegetation species including: Canadian waterweed (*Elodea canadensis*), milfoil (*Myriophyllum sp.*), water celery (*Oenanthe javanica*), pondweed (*Potamogeton sp.*) and cattail species (*Typha sp.*) in areas both up and down stream of the site. The riparian vegetation community provides minimal overhead cover within the reach from an assortment of overhanging trees, and vascular plants. Industrial development and insufficient riparian cover contribute to the marginal fish habitat within this area of the watershed. However, as the river has stable banks and good channel characteristics with a direct flow into two large lakes; it supports a viable fish community. Based on the secondary source material available, the river is considered to support a diverse population of primarily warmwater fish species.

3.2 Fish Species & Aquatic Species

The DFO study completed in 2007 upstream and downstream of the site indicates a diverse, primarily warmwater, fish population, as well as the presence of three COSEWIC (Committee on the Status of Endangered Wildlife in Canada)-listed fish. The COSEWIC-listed fish include; chestnut lamprey (*Ichthyomyzon castaneus*), orangespotted sunfish (*Lepomis humilis*), and an unknown buffalo species (*Ictiobus sp.*). In addition, one fish species on the Provincial *Endangered Species Act* (ESA) was recorded; the spotted sucker (*Minytrema melanops*). Based on secondary source material available there is information which supports that this section of the river does not serve as seasonal spawning or rearing areas for migratory or sport fish species (DFO, 2007).

The summarized results of fish species from DFO (2007) are provided below in Table 1.



Table 2: Fish Species Present as recorded in the 2007 Department of Fisheries and Oceans, Boat Electrofishing Survey of the Fish Assemblages in the Detroit River, Ontario.

Common Name	Scientific Name
alewife	<i>Alosa pseudoharengus</i>
banded killifish	<i>Fundulus diaphanus</i>
black bullhead	<i>Ameiurus melas</i>
black crappie	<i>Pomoxis nigromaculatus</i>
bluegill	<i>Lepomis macrochirus</i>
bluntnose minnow	<i>Pimephales notatus</i>
bowfin	<i>Amia calva</i>
brook silverside	<i>Labidesthes sicculus</i>
brown bullhead	<i>Ameiurus nebulosus</i>
buffalo sp.	<i>Ictiobus sp.</i>
channel catfish	<i>Ictalurus punctatus</i>
common carp	<i>Cyprinus carpio</i>
emerald shiner	<i>Notropis atherinoides</i>
fathead minnow	<i>Pimephales promelas</i>
freshwater drum	<i>Aplodinotus grunniens</i>
gizzard shad	<i>Dorosoma cepedianum</i>
golden redhorse	<i>Moxostoma erythrurum</i>
golden shiner	<i>Notemigonus crysoleucas</i>
goldfish	<i>Carassius auratus</i>
greater redhorse	<i>Moxostoma valenciennesi</i>
hornyhead chub	<i>Nocomis biguttatus</i>
johnny darter	<i>Etheostoma nigrum</i>
largemouth bass	<i>Micropterus salmoides</i>
logperch	<i>Percina caprodes</i>
longear sunfish	<i>Lepomis megalotis</i>
longnose gar	<i>Lepisosteus osseus</i>
mimic shiner	<i>Notropis volucellus</i>

Common Name	Scientific Name
muskellunge	<i>Esox masquinongy</i>
northern hog sucker	<i>Hypentelium nigricans</i>
northern pike	<i>Esox lucius</i>
orangespotted sunfish	<i>Lepomis humilis</i>
pumpkinseed	<i>Lepomis gibbosus</i>
quillback	<i>Carpiodes cyprinus</i>
rainbow smelt	<i>Osmerus mordax</i>
rainbow trout	<i>Oncorhynchus mykiss</i>
rock bass	<i>Ambloplites rupestris</i>
round goby	<i>Neogobius melanostomus</i>
shorthead redhorse	<i>Moxostoma duquesnei</i>
silver lamprey	<i>Ichthyomyzon unicuspis</i>
silver redhorse	<i>Moxostoma anisurum</i>
smallmouth bass	<i>Micropterus dolomieu</i>
spotfin shiner	<i>Cyprinella spiloptera</i>
spottail shiner	<i>Notropis hudsonius</i>
spotted sucker	<i>Minytrema melanops</i>
striped shiner	<i>Luxilus chrysocephalus</i>
troutperch	<i>Percopsis omiscomaycus</i>
tubenose goby	<i>Proterorhinus marmoratus</i>
walleye	<i>Sander vitreus</i>
white bass	<i>Morone chrysops</i>
white crappie	<i>Pomoxis annularis</i>
white perch	<i>Morone americana</i>
white sucker	<i>Catostomus commersonii</i>
yellow perch	<i>Ameiurus natalis</i>
yellow bullhead	<i>Perca flavescens</i>

According to the Species at Risk mapping (Fisheries and Oceans Canada, 2007), the DRIC Plaza shoreline is protected under both the Federal Species at Risk Act (SARA) and Provincial Endangered Species Act (ESA) due to the distribution of threatened mussel species in the area. Based on the biological ranges of Mapleleaf mussel (*Quadrula quadrula*), and the Round Pigtoe mussel (*Pleurobema sintoxia*), it is anticipated that these species are likely to be found within this section of Detroit River. Refer to the Appendix D of this report for the Distribution SAR Mapping for fish and mussel species.

3.3 Terrestrial Community

The MH site investigation (July 28, 2009) on the DRIC Plaza determined the riparian community to be primarily comprised of deciduous tree species including; American Basswood (*Tilia Americana*), White Elm (*Ulmus Americana*), Red Mulberry (*Morus*



rubra), Largetooth Aspen (*Populus grandidentata*), Staghorn Sumac (*Rhus typhina*), as well as grasses, vascular plants and shrub species.

An approximate 4 meter section of the riparian habitat contains large remnants of concrete. This area of shoreline may be evidence of shoreline erosion protection or previous disturbances. Refer to Appendix B.

4.0 Project Components and Potential Interactions

Based on the current plan for the DRIC project, the components and the potential environmental interactions from site work are displayed in Table 3. As the Vendor is not currently selected the full extent of impacts are not confirmed, impacts used for the determination of potential interactions are based on reasonable assumptions developed from construction standard practices. The DFO Pathway of Effects (PoE's) protocol was used to determine the potential interactions and impacts. The Pathways of Effect, Stressors, Mitigation and Residual Effects results are located in Appendix C.

Table 3: Potential Project Aquatic Interactions and Mitigation of Potential Impacts

Site Components	Activities	Potential Aquatic Interactions	Mitigation of Potential Impacts
Site Preparation	Removal of Vegetation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Strip Top Soil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Stockpile Top Soil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Sub-Excavations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Import Earth Fill to Site	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Plaza Construction	Install Utilities	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Sub-Excavations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Delivery of Materials		
	Construction of Buildings		
	Construction of Structures and Ancillary Features		
	Road Construction	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Bridge Construction	Deep Foundation Excavations (Land Based Activity)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Delivery of Materials		
	Placing Bridge Components	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

5.0 In-Water Project Components

A docking facility may be required by the Vendor to allow the transport of oversized and over-weight components from land to the bridge site, or the delivery of materials by water. If the Vendor wishes to utilize an existing docking facility, parameters based on standard marine contracting practices, would need to be considered.



The use of existing near-by docking facilities would be an ideal alternative to provide docking facilities for the duration of the project. The Vendor would need to review the potential docking sites to determine the suitability in respect to structural integrity and accessibility. Construction of a new docking facility on the DRIC Plaza will be restricted, as the existing facilities provide reasonable alternatives.

5.1 Dock Interactions with Fish and Aquatic Habitat

Utilizing an existing docking facility is not anticipated to have impacts on the fish and fish habitat or protected mussel species under the SARA and ESA. Based on this assumption, it is likely that permits from SARA and ESA will not be required for this project.

The Vendor will need to assess the potential existing facilities to determine whether structural reinforcements and/or dredging will be required to upgrade the facility.

6.0 Mitigation Measures

Transport Canada will be restricting all potential Vendors from any in-water construction of a new docking facility to avoid harmful alteration, disruption or destruction of fish and fish habitat (HADD). Accordingly, an existing docking facility will be only allowable in-water structure to be use for this project

6.1 Assessment of Docking Facilities

The primary mitigation strategy to minimize impacts on the fisheries habitat in the Detroit River is the use of an existing, private docking facility near the proposed bridge structure site. To ensure the implementation of the primary mitigation strategy by the Vendor, the docking facilities need to accommodate marine contract vessels. The twelve existing facilities within the study corridor have been assessed to determine their suitability based on McNally Marine Construction standards.

The anticipated parameters required to fulfill the projects needs are as follows. Servicing a heavy-lift construction barge requires the water to be greater than 4.5 meters deep. The barges that are typically used for a project of this size are 46 meters in length and require a tug to guide the barge to the dock; an additional 12 meters of required docking area is required to accommodate the tug. Therefore the potential dock must have a minimum of 58 meters of accessible docking area. In addition to the 58 meters for the barge and tug, an additional 15 – 20 meters would be required to facilitate the movement of materials on and off the barge and/or the tug.¹

The dock would need to support various types of heavy machinery, materials and possibly a dock-mounted crane. If a crane is required, it would require a large area for maneuverability, as well as enough deck space for the movement and storage of other

¹ Personal communication, McNally Marine Construction.



equipment and materials working in proximity to the crane. The working deck would need to be a minimum of 23 meters wide and potentially up to 35 meters wide.

The following docking facilities are listed based on their geographic location starting from LaSalle, heading north to the Ambassador Bridge.

Canadian Salt Corporation

The Canadian Salt Corporation - Ojibway Mine maintains a docking facility to export salt. The “T” shaped loading dock is constructed of placed fill approximately 115 meters long by 18 meters wide. The pier is connected to a mooring dolphin structure with a span of about 260 meters. The mooring dolphins do not provide a working platform; they only serve as an area for vessels to moor. The water depth at the mooring dolphins is 7.3 meters². The function of the dock is to transfer salt by means of a large overhead conveyor which extends the entire length of the pier. The docking facility is actively in use, exporting approximately three times per week. Based on its construction and function, this dock is not considered to fulfill the project requirements. Refer to Appendix B, photo 1-6.

ADM Windsor Grain Terminal

ADM Windsor Grain Terminal has a similar “T” shaped design as the Canadian Salt Corporation facility. The concrete pier structure is approximately 4 meters wide by 67 meters long. This pier is connected to mooring dolphins which provide a 394 meters long mooring area with adequate draft³. The concrete pier structure anchors the mooring dolphins as well as supports the overhead conveyor. The grain conveyor runs the entire length of the pier occupying any usable platform space. Based on the lack of a working platform, the facility is considered to be unsuitable for the project requirements without extensive modifications. Refer to Appendix B, photo 7-10.

Detroit-Windsor Truck Ferry

The Detroit-Windsor Truck Ferry operates and ferries trucks carrying dangerous goods across the Detroit River using a tug and barge. The docking facility can accommodate only a single barge and tug. The ferry service operates continuously during the day with steady flows of transport trucks. Based on the high frequency of usage this terminal is not considered to be suitable for the project needs. Refer to Appendix B, photo 11.

Morterm Limited

Morterm Limited is a large terminal north of the Detroit-Windsor Truck Ferry servicing large vessels with various cargos. The facility has three docking berths each approximately 213 meters in length, with an adequate draft of 9 meters. All three berths are sheet pile design, with a concrete working platform. The platform is capable of

² Personal communication with Canadian Salt Co.

³ Measurements are estimated based on Google Earth.



holding a maximum of 10,000 tons. Due to the nature of the various cargos transferred, a 500 ton capacity crane is onsite with ample deck space for storage and manoeuvrability⁴. Based on the features of this facility it is considered to accommodate the project needs. Refer to Appendix B, photo 12-21.

Brighton Beach Power

The Brighton Beach Power dock currently provides a working platform that is approximately 6 meters wide and 180 meters long⁵. The size of the dock's working platform is insufficient based on the marine contract standards provided by McNally Marine Construction. The adjacent water depth is approximately 6.7 meters, which meets the draft requirements for both the barge and tug. The current use of the dock is minimal since the property no longer receives shipments of coal, which was the former purpose of the existing dock. Based on the current structural design this facility is not considered suitable without extensive modifications which could result in impacts on fish and fish habitat. Refer to Appendix B, photo 28-29.

Southwestern Sales Corporation Limited

Southwestern Sales Corporation Limited is an aggregate company servicing self-unloading vessels up to about 225 meters in length⁶. The property consists of a stone dock extending the entire length of the property with adequate draft and onshore tie-offs for vessels. To accommodate the transfer of material other than aggregate, ramps will be required to access vessels from shore. The privately owned site is actively in use transporting aggregate about once a week. Based on the current design of the facility it is considered suitable to accommodate the project needs. Refer to Appendix B, photo 30.

Canadian Salt Company –Sandwich Dock

The Canadian Salt Company –Sandwich Dock, currently provides a working platform that is approximately 26 meters wide and 58 meters long⁷. The adjacent water depth is about 5.5 meters, which meets the draft requirements for both the barge and tug. This site is actively operating however the company has not been utilizing the dock on the property for about 30 years⁸. Also, the docking facility in the past has only accommodated vessels smaller than a barge. Based on the unknown condition of the dock, modifications may be required. This site is considered unsuitable to meet the project needs. Refer to Appendix B, photo 31.

⁴ Personal communication with Morterm Ltd.

⁵ Measurements are estimated based on a site investigation visual assessment.

⁶ Measurements based on the Windsor Port Authority website.

⁷ Measurements are estimated based on Google Earth.

⁸ Personal communication with Canadian Salt Company.



Coco Aggregates

Coco Aggregates contains a narrow (36 meters long by 10 meters wide) working platform which allows the transfers of aggregates from vessels to the property. The shoreline frontage available for vessel docking is approximately 130 meters with a draft of about 3.5 meters⁷. Based on the assessment criteria this dock is not considered to be suitable for the project needs. Refer to Appendix B, photo 32.

Sterling Marine Fuels

Sterling Marine Fuels is a marine bunkering facility on the Detroit River providing various petroleum products. The marine access on the property can accommodate large vessels at the 305 meter long mooring area, with 8.2 meters of draft⁹. The existing dock is constructed for short term docking for fueling purposes only. As this dock requires modifications it is not considered to be suitable for the project requirements. Refer to Appendix B, photo 33.

Lafarge North America

Lafarge North America is an actively operating cement, aggregate, concrete and gypsum terminal with 244 meters of Detroit River frontage. This terminal can accommodate self-unloading vessels up to 225 meters and provides sufficient draft⁸. The extent of the property shoreline supports a stone dock equipped with tie-downs. To accommodate the transfer of project materials, ramps will be required to access vessels from shore. Based on the assessment criteria, this site meets the project requirements with the use of loading ramps. Refer to Appendix B, photo 34.

Adam's Cartage

The vacant property previously operated by Adam's Cartage includes approximately 106 meters of sheet pile frontage⁷. Based on site investigation the sheet pile wall appears to have sufficiently deteriorated to where it would need substantial reinforcement. In addition, sediment deposition in front of the facility would likely require dredging. As modifications would be required, this location is not considered suitable for the project. Refer to Appendix B, photo 35-39.

Essroc Italcementi

Essroc Italcementi is a cement facility with an engineered frontage of about 240 meters and approximately 57 meters of natural shoreline¹⁰. According to the Windsor Port Authority, the property provides services only for self-unloading vessels. Due to the lack of available information a full assessment could not be completed. Refer to Appendix B, photo 40-41.

⁹ Information based on the Windsor Port Authority website.

¹⁰ Measurements are estimated based on Google Earth.



6.2 Standard Aquatic Mitigation Measures

General recommendations for mitigation measures to protect aquatic habitat while using a dock include:

- Install effective sediment and erosion control measures before starting work to prevent the entry of sediment into the river. Inspect measures regularly during the course of construction and make all necessary repairs if any damage occurs. Avoid working during rainy periods.
- Do not store fuel within 30 metres of the river and all equipment should be refuelled and maintained at a single, designated fuelling/maintenance area well isolated from the river.
- Prevent deleterious substances such as uncured concrete, grout, paint, sediment and preservatives from entering the river.

7.0 Conclusion

The construction of the DRIC project works has potential interactions with the aquatic environment. The three major components of construction include; site preparation, plaza construction, and bridge construction. Facilitating the construction of the bridge may require the use of a docking facility. The following twelve existing sites were investigated to determine their suitability to meet the project needs.

Table 4: Existing Docking Facility Summary

Facility	Location (km from the DRIC Plaza)	Current Use	Specifications	Site Limitations	Suitability Based on Assessment Criteria
Canadian Salt Co – Ojibway Mine	2.5 km southwest	Transport of salt	Infill pier, mooring dolphins, overhead conveyor	Lack of working platform	Unsuitable
ADM Windsor Grain Terminal	1.6 km southwest	Transport of grain	Narrow pier, mooring dolphins, overhead conveyor	Lack of working platform	Unsuitable
Detroit-Windsor Truck Ferry	1.1 km southwest	Cross-border transportation of trucks	Dock facility for ferry barge and tug, limited extra docking space	Limited docking space, operates daily, high truck traffic	Unsuitable
Morterm Limited	0.9 km southwest	Cargo transfer terminal	Three sheet pile berths adequate for large marine vessels, crane onsite, large loading area	N/A	Suitable

Facility	Location (km from the DRIC Plaza)	Current Use	Specifications	Site Limitations	Suitability Based on Assessment Criteria
Brighton Beach Power	0.3 km northeast	Site active, dock no longer in use	Large "T" configuration dock, raised working platform on wood H piles	Limited working platform	Unsuitable
Southwestern Sales	0.9 km southeast	Transport of aggregates	Service self-unloading vessels, stone dock with tie downs	Requires loading ramps	Suitable
Canadian Salt Co. – Sandwich Dock	1.3 km southeast	Site active, dock no longer in use	Concrete platform dock, with sheet pile wall design	Unknown dock condition	Unsuitable
Coco Aggregates	1.5 km southeast	Transport of aggregate	Concrete platform dock, vessel tie downs	Inadequate docking space and draft	Unsuitable
Sterling Marine Fuels	2.2 km southeast	Transport of petroleum products	Mooring dolphin structure, equipped with fuel transfer piping, lacking working platform	Lacks a working platform, requires structural modifications	Unsuitable
Lafarge North America	2.7 km southeast	Transport of aggregate	Self-unloading vessel service, stone dock with tie downs	Requires loading ramps	Suitable
Adam's Cartage	3.0 km southeast	Vacant	Sheet pile wall is deteriorated	Lack of structural integrity, may require dredging	Unsuitable
Essroc Italcementi	3.6 km southeast	Transport of aggregate	Services self-unloading vessels, engineered shoreline	Unknown	Unsuitable

Based on the assessment criteria there are three docks which appear to be suitable in existing form. Transport Canada will ensure that the Vendor will be restricted from constructing a new docking facility in connection with the DRIC project. As, only existing docking facilities will be utilized no in-water works will be performed; accordingly no impacts to fish and aquatic are foreseen.



8.0 References

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APPENDIX A
LOCATION MAP OF EXISTING FACILITIES



NICHOLSON TERMINAL & DOCK CO.

GREAT LAKES STEEL DIVISION NATIONAL STEEL CORP.

DETROIT EDISON CO.

GREAT LAKES STEEL DIVISION NATIONAL STEEL CORP.

ALLIED CHEMICAL CORP.

DETROIT EDISON CO.

DETROIT COKE CORP.

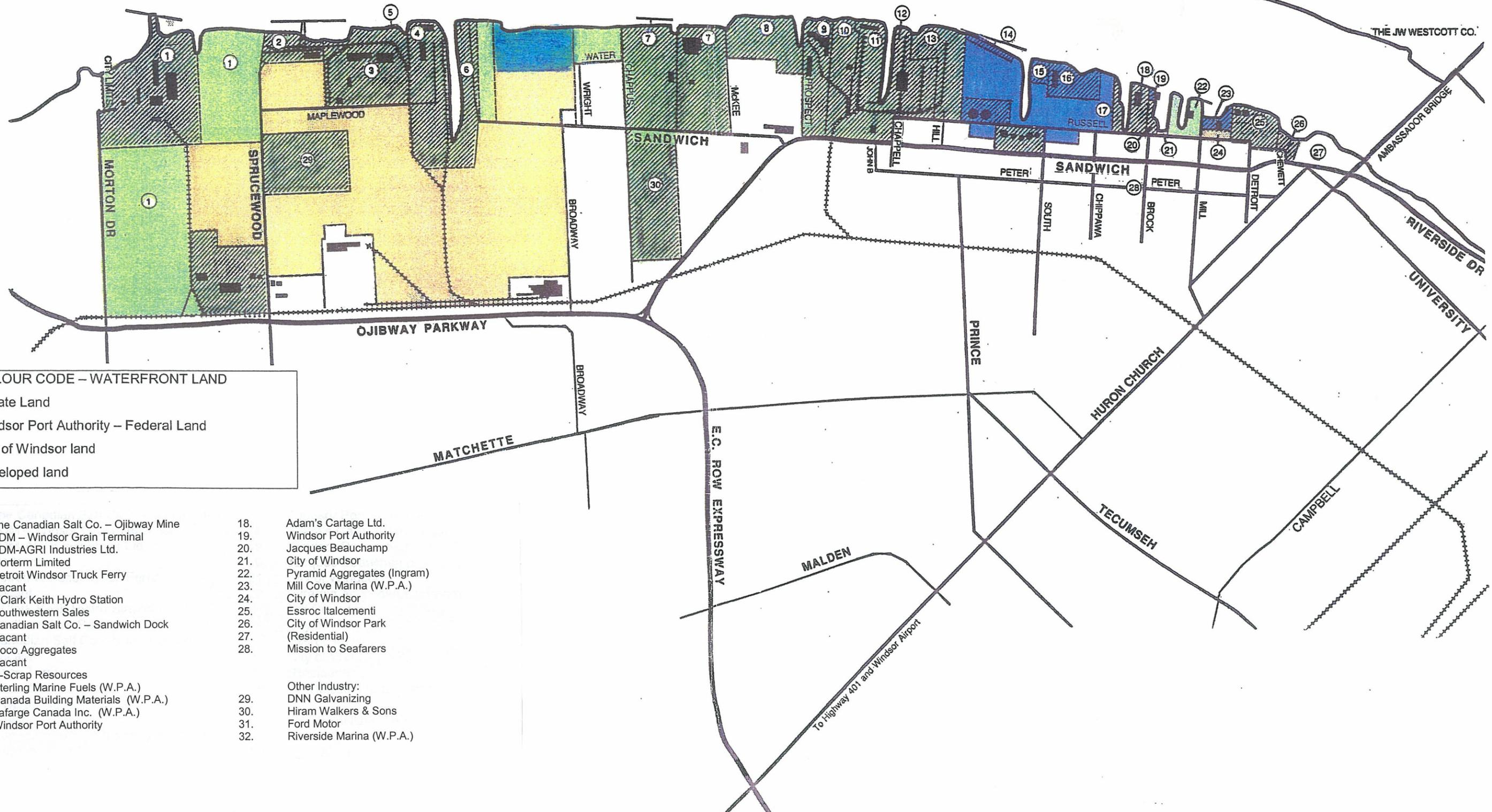
CORPS OF ENGINEERS

REVERE COPPER & BRASS INC.

DETROIT RIVER

DETROIT MARINE TERMINALS INC.

THE J.W. WESTCOTT CO.



COLOUR CODE - WATERFRONT LAND

- Private Land
- Windsor Port Authority - Federal Land
- City of Windsor land
- Developed land

- | | |
|---|---|
| <ul style="list-style-type: none"> 1. The Canadian Salt Co. - Ojibway Mine 2. ADM - Windsor Grain Terminal 3. ADM-AGRI Industries Ltd. 4. Morterm Limited 5. Detroit Windsor Truck Ferry 6. Vacant 7. J Clark Keith Hydro Station 8. Southwestern Sales 9. Canadian Salt Co. - Sandwich Dock 10. Vacant 11. Coco Aggregates 12. Vacant 13. K-Scrap Resources 14. Sterling Marine Fuels (W.P.A.) 15. Canada Building Materials (W.P.A.) 16. Lafarge Canada Inc. (W.P.A.) 17. Windsor Port Authority | <ul style="list-style-type: none"> 18. Adam's Cartage Ltd. 19. Windsor Port Authority 20. Jacques Beauchamp 21. City of Windsor 22. Pyramid Aggregates (Ingram) 23. Mill Cove Marina (W.P.A.) 24. City of Windsor 25. Essroc Italcementi 26. City of Windsor Park (Residential) 27. Mission to Seafarers 28. 29. Other Industry: DNN Galvanizing 30. Hiram Walkers & Sons 31. Ford Motor 32. Riverside Marina (W.P.A.) |
|---|---|

APPENDIX B
PHOTOGRAPHIC RECORD



Photo 1: The Canadian Salt Co. docking facility.



Photo 2: The Canadian Salt Co. infill pier structure with overhead conveyor system

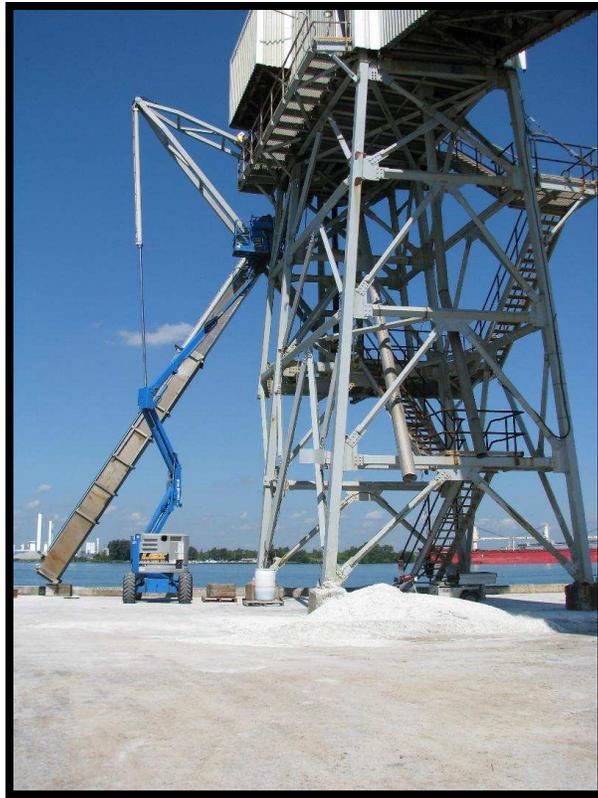


Photo 3: The Canadian Salt Co. conveyor system at end of dock



Photo 4: The Canadian Salt Co. infill pier structure



Photo 5: The Canadian Salt Co. mooring dolphins facing south



Photo 6: The Canadian Salt Co. mooring dolphins facing north (ADM Windsor Grain Terminal in the distance)



Photo 7: ADM Windsor Grain Terminal docking facility



Photo 8: ADM Windsor Grain Terminal conveyor system and supporting dock

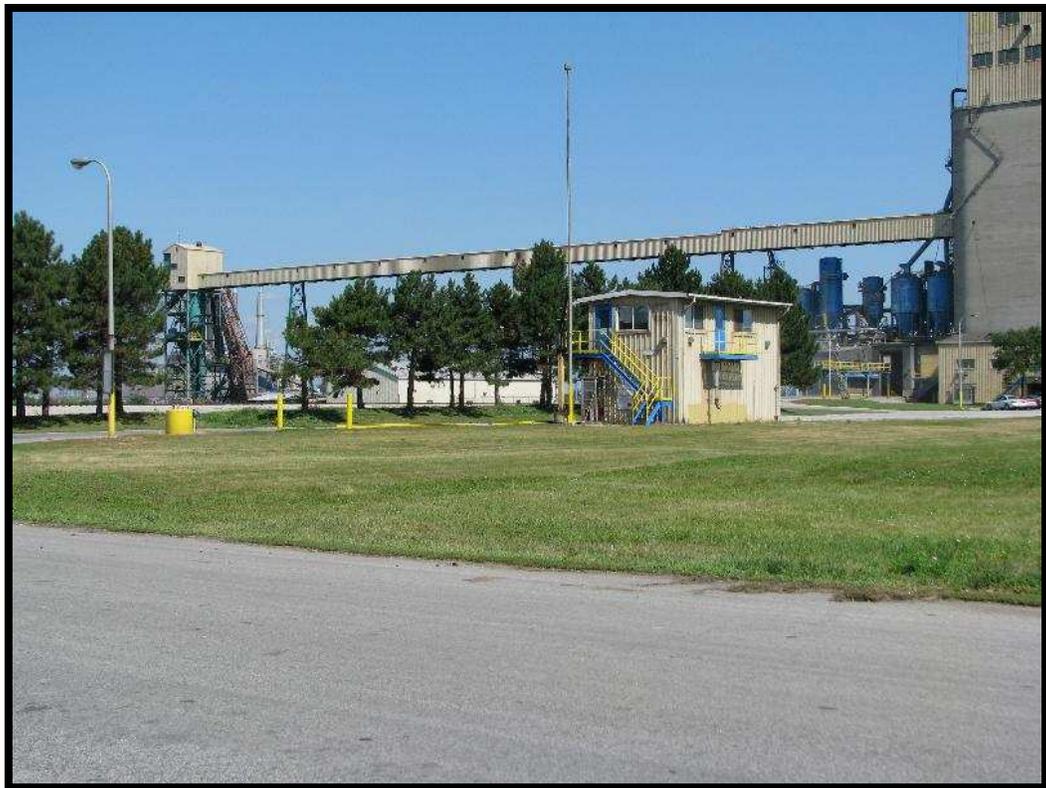


Photo 9: ADM Windsor Grain Terminal overhead conveyor system



Photo 10: ADM Windsor Grain Terminal conveyor structure at the end of the dock



Photo 11: Detroit -Windsor Truck Ferry

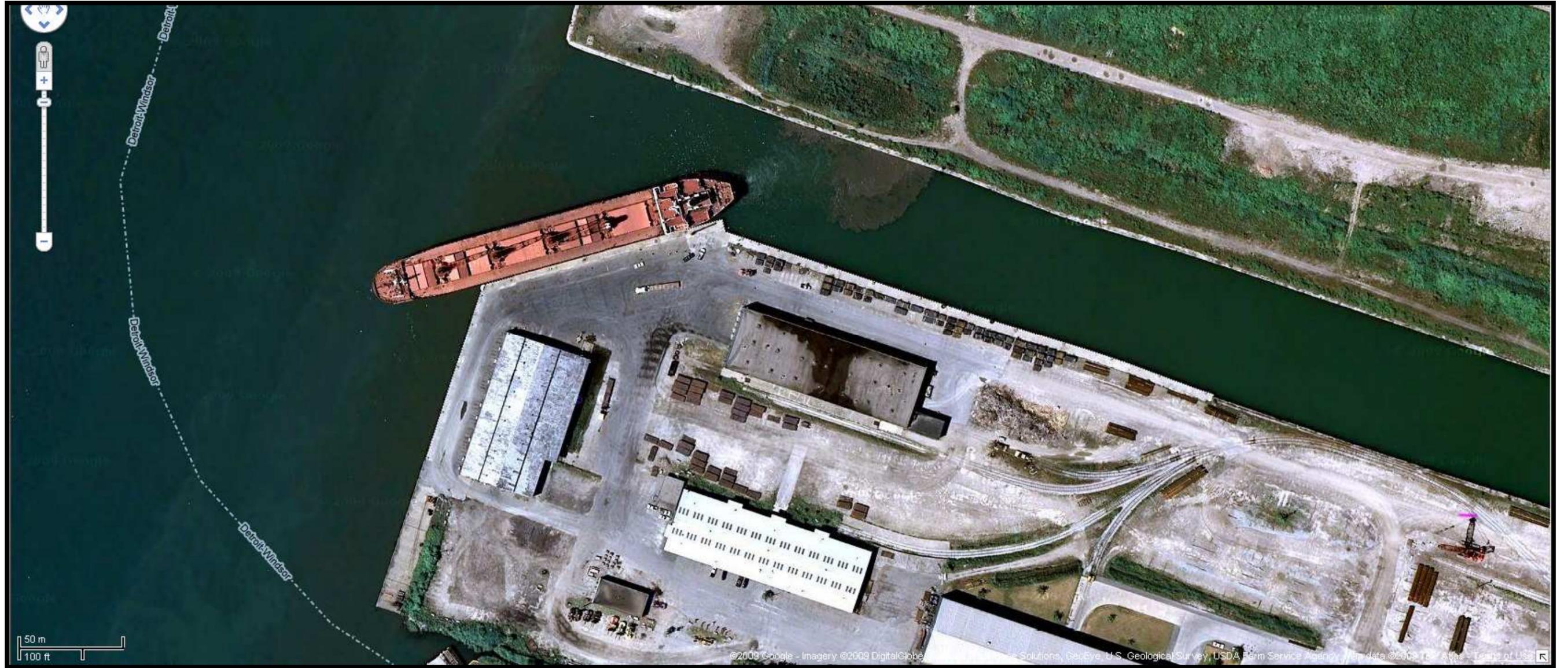


Photo 12: Morterm Limited docking facility



Photo 13: Morterm Limited sheet pile wall facing south towards ADM Windsor Grain

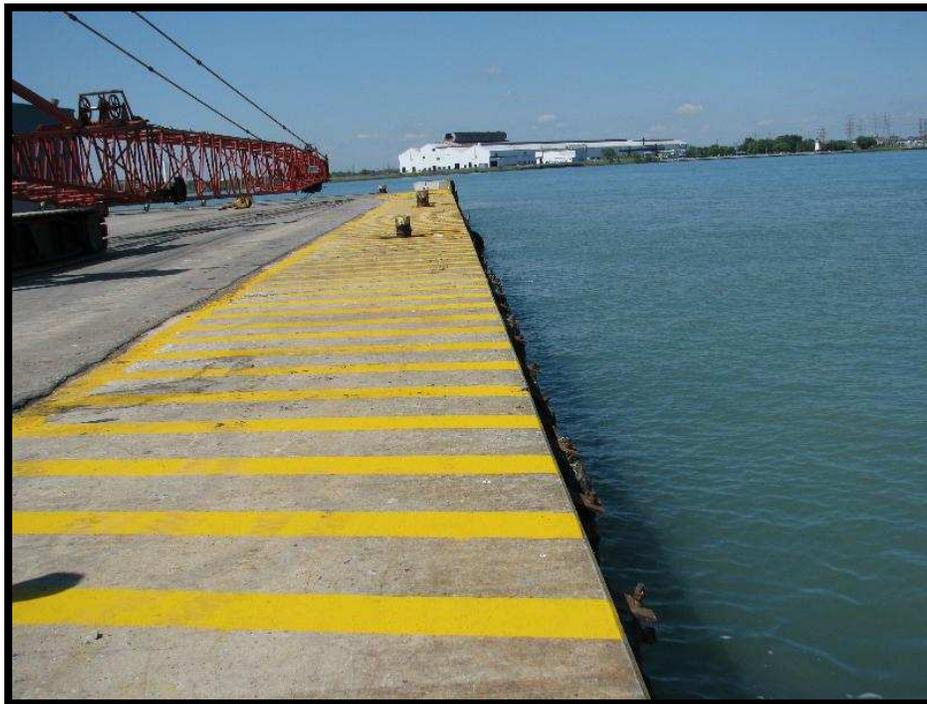


Photo 14: Morterm Limited loading dock

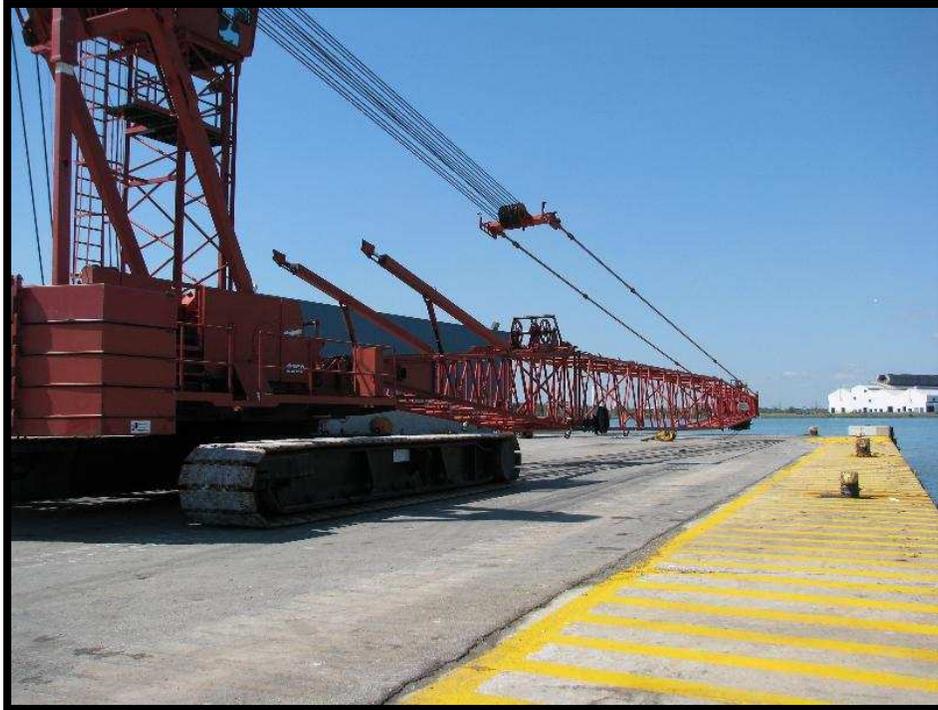


Photo 15: Morterm Limited 500 Ton Loading Crane



Photo 16: Morterm Limited 500 Ton Loading Crane



Photo 17: Morterm Limited entrance of the slip facing north



Photo 18: Morterm Limited loading dock in towards the slip



Photo 19: Morterm Limited slip and sheet pile wall



Photo 20: Morterm Limited loading platform and warehouse facility



Photo 21: Morterm Limited – school of cyprinids (left)



Photo 22: Aerial View of DRIC Plaza Location on the Detroit River, Windsor, Ontario.

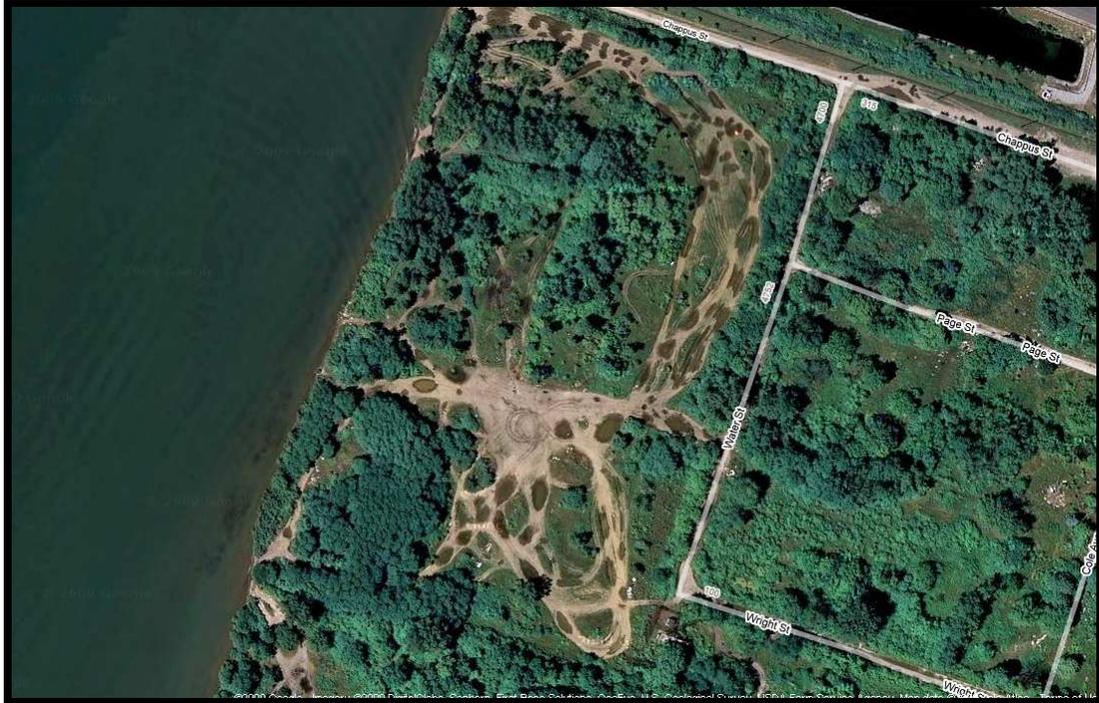


Photo 23: Close up view of the DRIC Plaza Detroit River Shoreline, Windsor, Ontario.



Photo 24: North end of shoreline looking south on the DRIC Plaza property.



Photo 25: Mid-section of the shoreline on the DRIC Plaza property looking south.



Photo 26: Looking towards the U.S. side of Detroit River from the North end of the DRIC Plaza property (colour change in water is assumed shallow shelf edge)

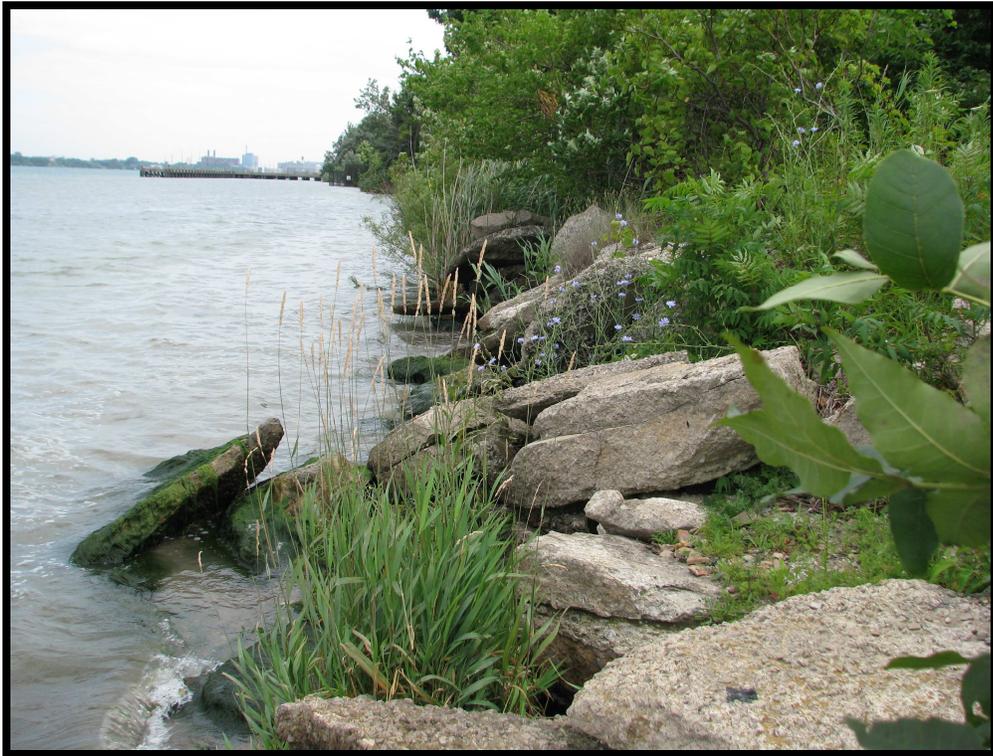


Photo 27: Concrete remnants on the DRIC Plaza property.



Photo 28: Brighton Beach Hydro docking facility



Photo 29: Brighton Beach Hydro Station dock



Photo 31: Canadian Salt Company –Sandwich Dock



Photo 32: Coco Aggregates with small loading dock



Photo 33: Sterling Marine Fuels facility



Photo 34: Lafarge North America



Photo 35: Adam's Cartage (currently vacant) property



Photo 36: Adam's Cartage vacant warehouse



Photo 37: Adam's Cartage sheet pile wall facing south towards Lafarge



Photo 38: Adam's Cartage sheet pile wall facing north facing Ambassador Bridge



Photo 39: Adam's Cartage sheet pile wall



Photo 40: Essroc Italcementi



Photo 41: Essroc Italcementi north end of property (photo taken off of site)

APPENDIX C
PATHWAY OF EFFECTS

Pathways of Effect, Stressors, Mitigation and Residual Effects at Detroit River

Pathways of Effect, Stressors, Mitigation and Residual Effects				
PoE (s)	Stressor (s)	Cause and Effect Relationship	Mitigation	Residual Effects
L1, L3, L4, W1, W4, W5, B2	Alteration of shoreline, riparian and aquatic vegetation (<i>if dock is installed</i>), Use of Industrial Equipment, Change in shade, and change in water temperature	<p>Removal of shoreline, riparian and aquatic vegetation may result in the reduction of nutrients and food feeding (e.g., leaf litter and insects.)</p> <p>Use of industrial Equipment may damage adjacent riparian areas.</p> <p>Placement of clear span bridge could change the thermal regime of the watercourse due to increased shad input</p>	All disturbed riparian vegetation during construction will be restored within 30 days as per contract specifications. Adjacent riparian habitat will be restricted from construction entry to prevent damage.	None.
L1, L2, L3, B2, W1, W4	Bank Stability, exposed soils and change in sediment concentrations	Grading and loss of vegetation can lead to instability of the banks and exposed soils which could increase erosion potential	Exposed soils will be protected during construction according to OPSS 572 to prevent off-site sediment transport into the Detroit River. Adjacent riparian habitat will be restricted from construction entry to prevent damage.	None
L3, B2	Change in base flow, change in water temperature, change in sediment concentrations	Deep excavation of bridge foundation may cause fill with water and will require dewatering.	All water from dewatering operations will be managed using appropriate designed to prevent erosion and/or release of sediment-laden or contaminated water in the waterbody.	None
B2	Oil, grease and fuel leaks from equipment	Use of industrial equipment has the potential to introduce	Conduct refueling and maintenance activities at least	None

		contaminants into watercourse	30 m away from watercourse. Prevent equipment from entering watercourse and from entering areas designated as environmentally significant adjacent to watercourse.	
W1	Change in hydraulics, Change in channel stability, Change in channel morphology	Dock placement has the potential to alter the hydraulics of the watercourse or the natural channel morphology.	Re-stabilize any portion of disturbed marine bottom to pre-construction condition.	None
W6	Input of contaminants	Storm water runoff from the bridge and associated roadways has the potential to introduce contaminants into watercourse	Stormwater run-off will be treated for water quality and quantity in the adjacent ditches	None
L1, L2, L3, L4, B2, W1, W4, W7	Change in sediment concentrations	All construction activities have the potential to cause the erosion of surface materials and the sedimentation of the watercourse	Use MTO standard erosion and sedimentation controls (OPSS 577), store excavated materials in designated locations, use properly installed erosion and sediment control measures (Straw Bale Flow enclosures and Rock Flow Checks SP 577F02) and monitor these during construction will protect channel from overland flows.	None

APPENDIX D
SARA MAPS

Distribution of Fish Species at Risk

Essex Region Conservation Authority (Map 1)

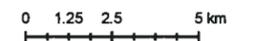
- Protected under SARA (EXP, END, THR)
- To be listed in 1yr+ (END, THR)
- All Special Concern Species (Sch. 1, 3 & Newly Listed)

- Railroads
- River
- Conservation Authority Boundary
- Waterbody
- Wetland
- Urban Area
- First Nation Land Claim



Conservation Authority Fish SAR Listing

Common Name	Colour
Channel Darter	Red
Eastern Sand Darter	Red
Lake Chubsucker	Red
Northern Madtom	Red
Pugnose Shiner	Red
Spotted Gar	Red
Lake Sturgeon (Du 4,5,8)	Orange
American Eel	Purple
Grass Pickerel	Purple
Northern Brook Lamprey (Giks/Upstlaw Pop)	Purple
Pugnose Minnow	Purple
Silver Chub	Purple
Spotted Sucker	Purple
Warmouth	Purple

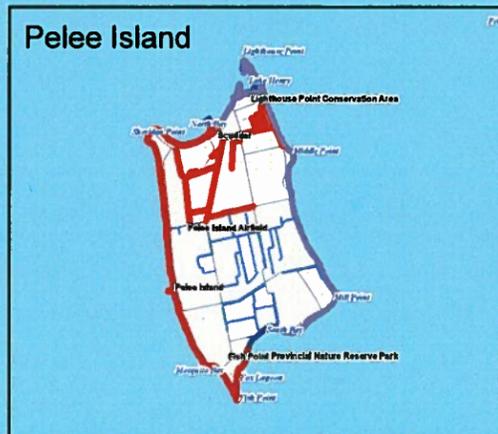
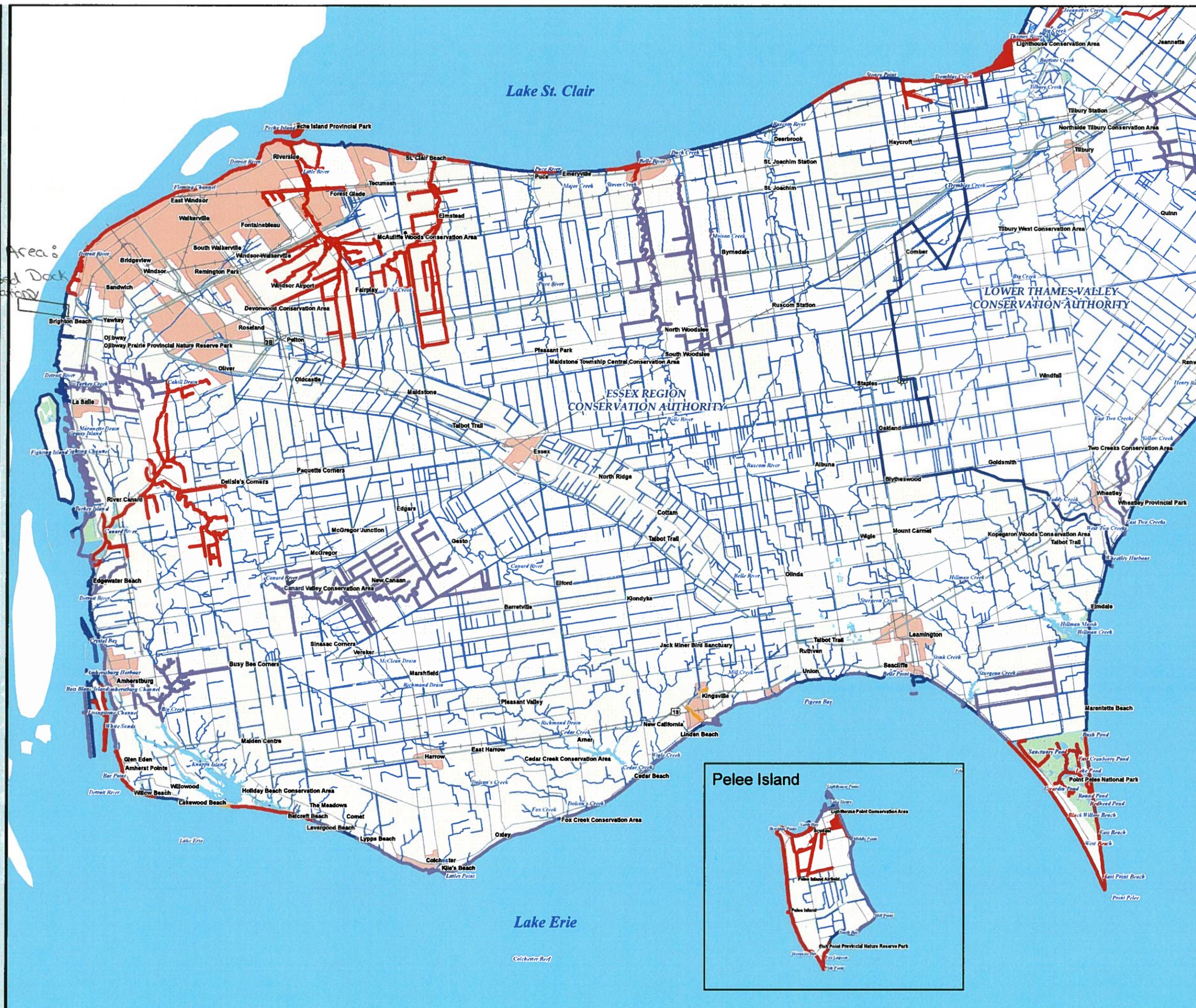


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Base Map Sources: Ontario Ministry of Natural Resources, Natural Resources Canada, Conservation Ontario. Aussi disponible en français.

Map produced by meridianwave consultants inc., November 2008

Study Area:
Proposed Dock Installation



Distribution of Mussel Species at Risk

Essex Region Conservation Authority (Map 1)

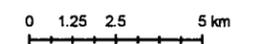
- Protected under SARA (EXP, END, THR)
- To be listed in 1yr+ (END, THR)
- All Special Concern Species (Sch. 1, 3 & Newly Listed)

- Railroads
- River
- Conservation Authority Boundary
- Waterbody
- Wetland
- Urban Area
- First Nation Land Claim



Conservation Authority Mussel SAR Listing

Common Name	Colour
Kidney shell	Red
Northern Riffleshell	Red
Rayed Bean	Red
Round Hickory nut	Red
Round Pigtoe	Red
Salamander (Mudpuppy) Mussel	Red
Snuffbox	Red
Wavy-Rayed Lamprussel	Red
Eastern Pondmussel	Orange
Fawnsfoot	Orange
Mapleleaf	Orange
Rainbow	Orange

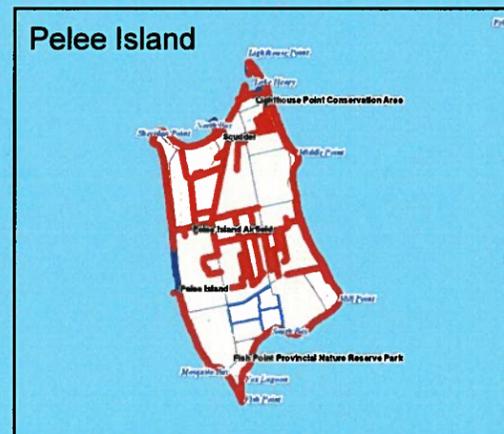
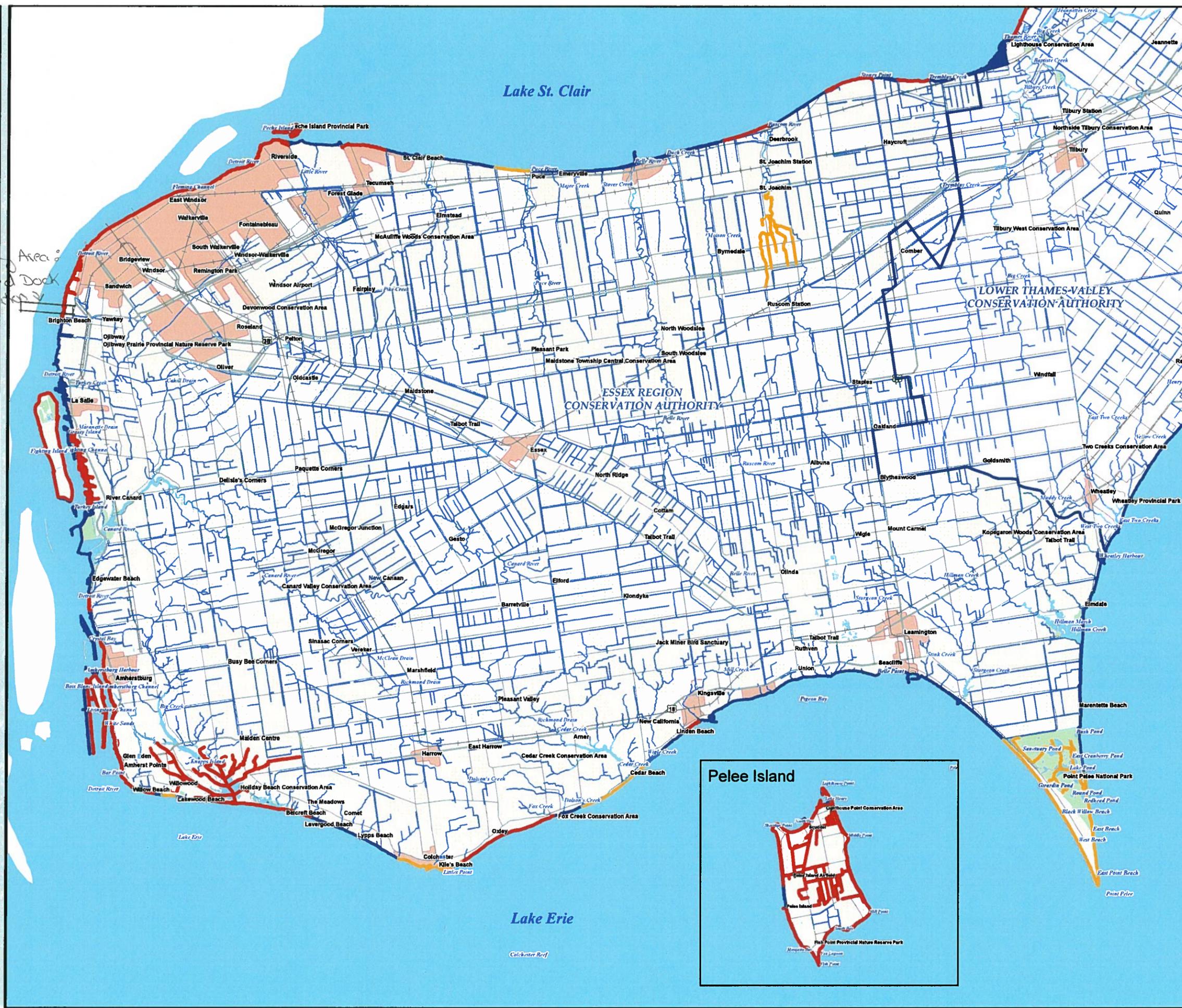


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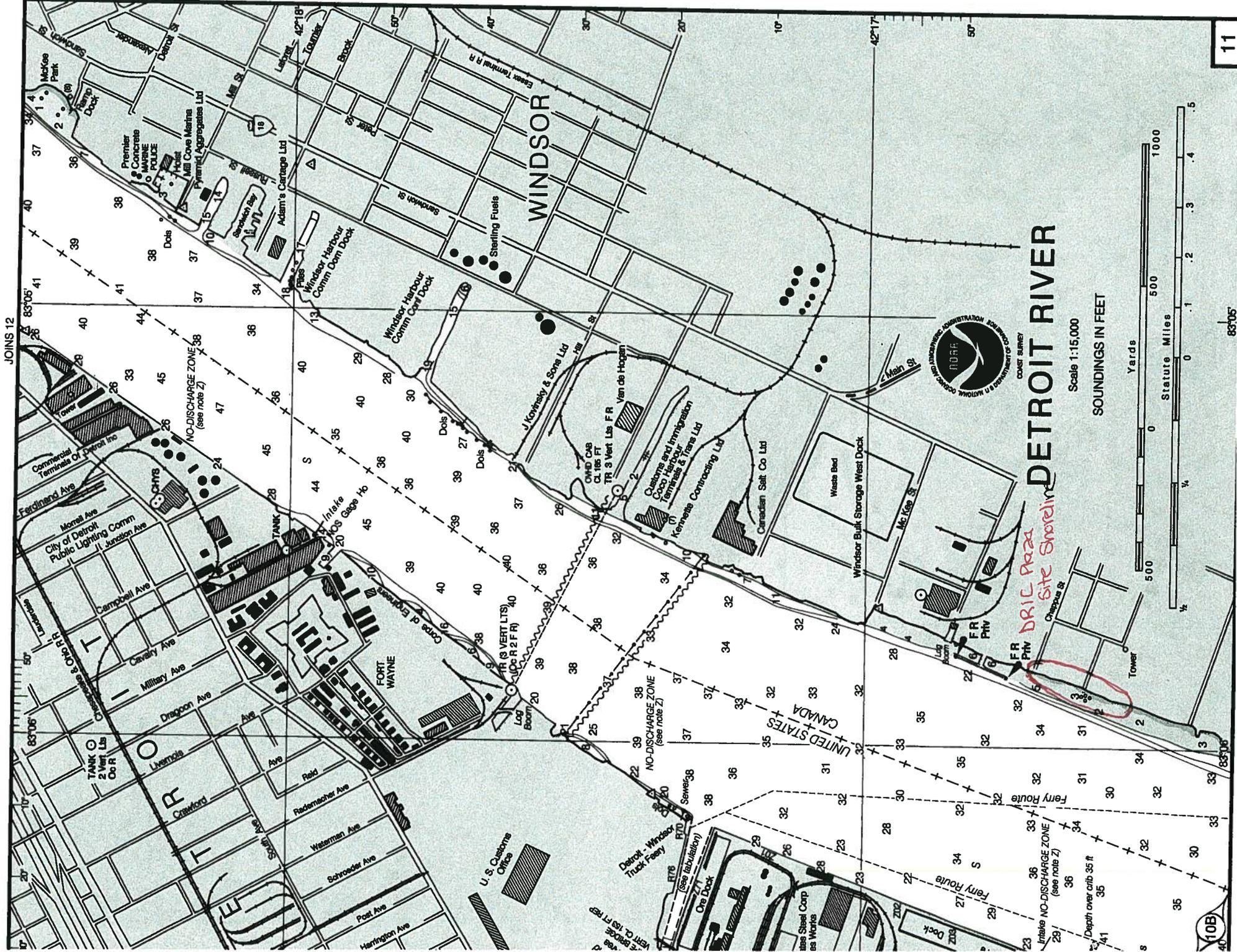
Base Map Sources: Ontario Ministry of Natural Resources, Natural Resources Canada, Conservation Ontario. Aussi disponible en français.

Map produced by meridianwave consultants inc., November 2008

Study Area:
Proposed Dock
Installation



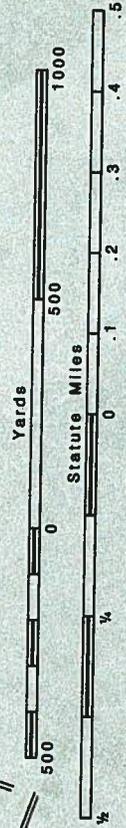
APPENDIX E
HYDROGRAPHICAL SITE MAP



DETROIT RIVER

Scale 1:15,000

SOUNDINGS IN FEET



APPENDIX F
CORRESPONDENCE

Information was requested from the following sources:

- Chatham District MNR Office
- Lake St. Clair Fisheries Unit
- Wheatley Research Facility, MNR

Information was provided by the following sources:

- Wheatley Research Facility, MNR
 - Contacts: Brian Locke & Geoff Yunker

The information included a report from the DFO, as listed in the reference section.

Department of Fisheries and Oceans. 2007. *Boat Electrofishing Survey of the Fish Assemblages in the Detroit River, Ontario*. Canadian Manuscript Report of Fisheries and Aquatic Science.