

**West London Dyke Flood Control  
Structure Master Plan  
Appendix A**

## **Introduction**

The West London Dyke runs along the west bank of the North Branch of the Thames River from Oxford Street to the forks of the Thames River and then along the west bank of the main branch to the west of the Wharncliffe Road Bridge.

Construction began on the West London Dyke in the 19<sup>th</sup> century in order to minimize flood damage in the West London area which was prone to flooding. Historical records indicate that portions of the earth embankments which form the underlying support of the current dyke structure generally consists of material deposited from street sweepings and excess soil from excavation work.



Fig -1 Photo from the 1930's showing the concrete Dyke being formed.

Beginning in the mid 1910's, the City began to undertake reconstruction of the dyke system to include additional placement of fill and a concrete facing as a means of additional protection against erosion. However, it wasn't until after the 1937 flood that the present concrete facing material was placed.

The City of London owns the dyke structure and undertakes minor maintenance activities. Through an agreement with the Upper Thames River Conservation Authority (UTRCA), the UTRCA undertakes major maintenance activities.

## **Background**

In 2004, Stantec Consulting Ltd. undertook a condition assessment of flood control structures within the City of London including the West London Dyke. Approximately 350 m of the dyke structure from the Queens Avenue Bridge to Rogers Avenue was identified as being the highest priority for repair.

In April 2005, Stantec undertook an investigation to determine the requirements to repair this area of the dyke. Based on the investigation that included coring of the structure and geotechnical review by a soils consultant, it was concluded that this section of the dyke has come to the end of its useful life. Therefore, it needs to be replaced rather than repaired.

## General Information

**Existing Structure** - The current dyke can generally be described as a gravity structure consisting of earth fill with a poured in place concrete facing supported by a concrete toe. Large precast concrete blocks are also located along sections of the toe within the river to add additional support and to minimize erosion.

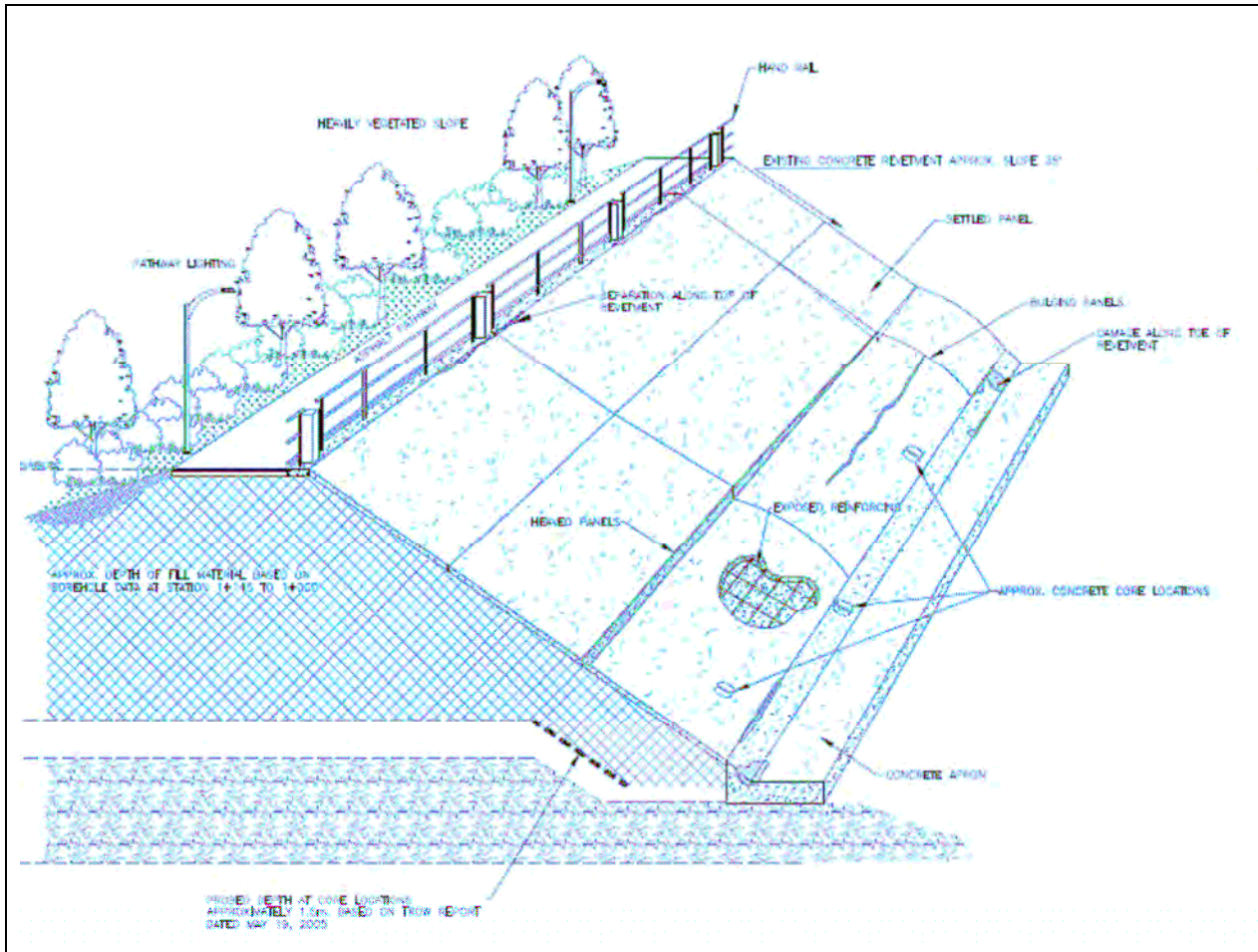


Fig-2 Typical cross section of the existing West London Dyke in the study area

**Current Flood Protection** - The section in the study area at present provides the lowest level of flood protection compared to other portions of the West London Dyke. In general, the elevation of the dyke is between the Regulatory Flood Line (1:250 year flood) and the 1:100 year flood event. On average, the structure is approximately 0.7 m below the Regulatory Flood Line within the project area.

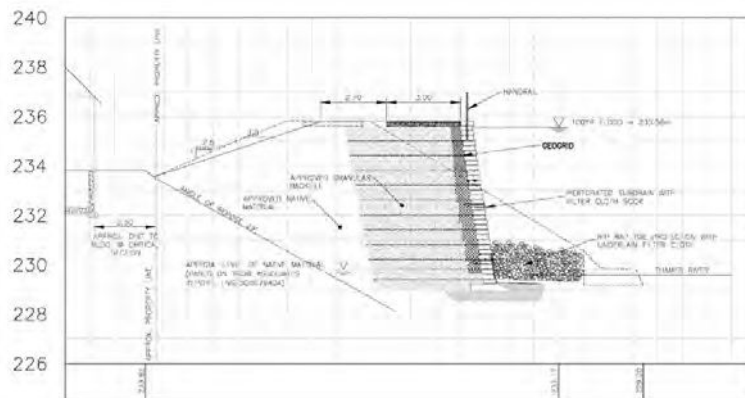
## Preliminary Engineering

### Major Design Considerations

- Provide flood protection to at least the 1:100 year flood level as presently provided and if practical/economical to the 1:250 year flood level;
- Minimize impacts on environment (therefore replacement structure is to be within the existing dyke footprint);
- Provide a design that can work in restricted areas of the dyke within project area and in other segments of the West London Dyke requiring future replacement;
- Given the cost, complexity and potential inconveniences during construction, the major components of the replacement dyke structure should be designed for a life expectancy of 75 years;
- Maintain/enhance recreational use of the dyke;
- Incorporate a pathway structure from the bottom of the Queens Avenue Bridge to the top of the dyke structure; and
- Given the high visibility of the structure and its proximity to the downtown core, aesthetics to be considered in the selection of the preferred structure.

**Design Alternatives for Replacement of the Dyke** - A tabular decision matrix listing the various options for replacement of the dyke structure was prepared (see display board). In total, eleven (11) design alternatives were submitted for review by the City and UTRCA. Based on the decision matrix developed four alternatives were shortlisted for further review. These are:

Option A:  
Pre-cast  
reinforced  
earth  
system;



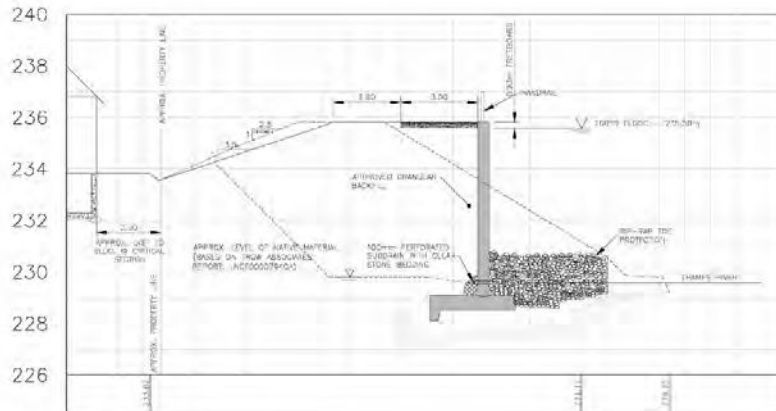


London  
CANADA

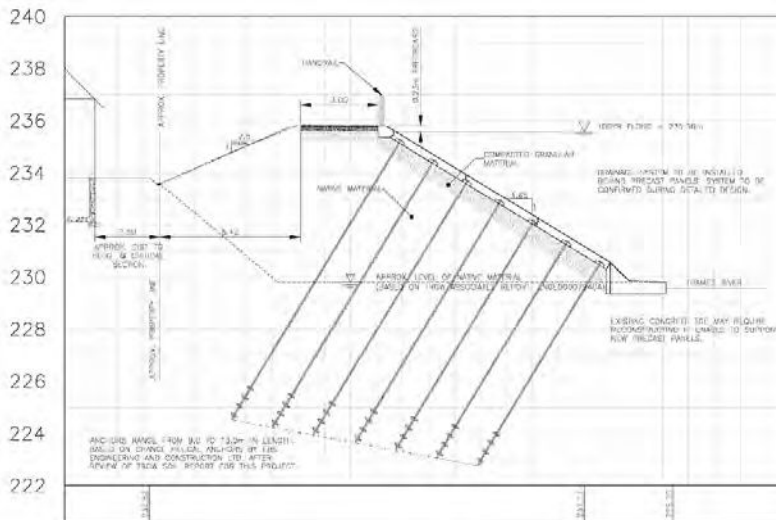
UPPER THAMES RIVER

CONSERVATION AUTHORITY

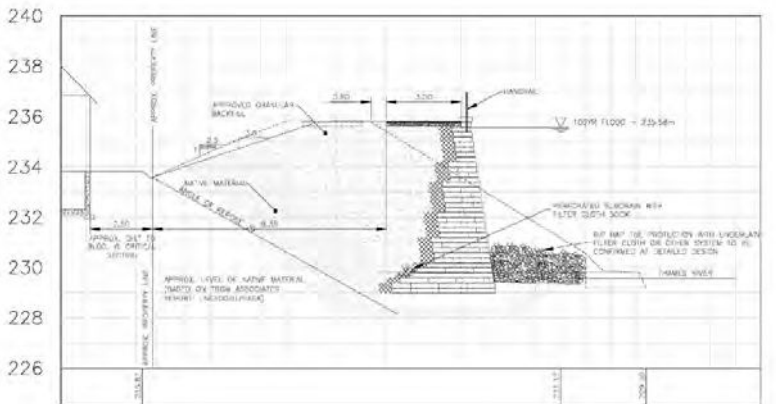
Option B:  
Reinforced  
concrete  
cantilever  
wall  
(retaining  
wall);



Option C:  
Pre-cast  
concrete  
Revetment;  
and



Option D:  
Pre-cast  
concrete  
modular  
block  
structure.



**Shortlisted Design Option Review** - The following were considered in undertaking a comparative analysis of the shortlisted options:

- Capital Cost;
- Aesthetics;
- Function (including the potential to integrate a pedestrian pathway from beneath the bridges to the top of dyke);
- Constructability; and
- Durability.

Table 1 summarizes the rankings for the shortlisted options:

OPTION	A	B	C	D	Weight
<b>Construction Cost*</b>	\$2,100,000	\$2,900,000	\$4,200,000	\$2,500,000	* Based upon a structure to meet the 1:100 year flood
<b>Cost **</b>	20.0	14.5	10.0	16.8	20
<b>Aesthetics</b>	10.0	2.5	5.0	10.0	10
<b>Function</b>	5	10	2.5	5	10
<b>Constructability</b>	10	5	2.5	10	10
<b>Durability</b>	5	10	2.5	5	10
<b>Total Score</b>	50.0	42.0	22.5	46.8	60
<b>Ranking</b>	1	3	4	2	

\*\* Ranking based on inverse ratio of the cost of option divided by the lowest cost option. 1:100 year used as basis as Option C cannot be built to 1:250 year.

Option A was selected as the preferred alternative design by the City of London and UTRCA as it best met the requirements for the project, including consideration for cost, provision of adequate pathway integration, aesthetics, ability to provide either the 100 or 250 year flood level and general constructability issues given the site constraints previously identified. The City of London and UTRCA have decided to have the dyke built to the 250 year flood level.

**Other Considerations**

**Pathway Integration** - The City is considering providing a pedestrian connection along the west bank of the Thames River in order to minimize pedestrian crossings of Queens Avenue and Riverside Drive in this area. Two options (continuous and zigzag) were developed to integrate a pathway from beneath the Queens Avenue Bridge to the top of the dyke. The continuous pathway was selected as the preferred design. The final decision on the pathway will be based upon funding availability and subject to additional investigation to determine the integration of the pathway in the vicinity of the bridge supports and to work completed as part of the Phase IV of the Forks of the Thames Phase Revitalization Project.



**Class Environmental Assessment** - This project falls under the jurisdiction of the *Municipal Class Environmental Assessment, Municipal Engineers Association June 2000* process, as the City of London is the Proponent. The project falls under the category of a Municipal Water and Wastewater Project; as a Stormwater Management Project. Based upon a review of the project schedules, this project should be considered a Schedule A (pre-approved) project. This schedule best fits with this project's work scope which is to replace approximately 350 m of the West London Dyke as it has come to the end of its useful life and needs to be replaced rather than repaired.

**Approvals** - This project may require various permits from local, provincial and federal agencies. Verification as to the required approvals will be subject to the completion of detailed design.

**Total Project Cost**

The project cost estimate to complete this project is presented in Table 2. This includes replacement to the 1:250 protection level and the inclusion of the pedestrian pathway (in the project area).

<b>Description</b>	<b>Replacement Dyke</b>	<b>Pedestrian Pathway</b>	<b>Total</b>
Construction (1:250 year protection)	\$2,300,000	\$220,000	\$2,520,000
Detailed Design & Contract Administration (10.5% of Construction)	\$241,500.00	\$23,100.00	\$151,200
Soils and Material Testing (1% of Construction)	\$23,000.00	\$2,200.00	\$25,200
Subtotal	\$2,564,500	\$245,300	\$2,809,800
Contingency (20% of Subtotal)	\$512,900	\$512,900	\$561,960
<b>Total</b>	<b>\$3,077,400</b>	<b>\$294,360.00</b>	<b>\$3,371,760</b>

**Comments**

Comments are welcome and may be directed to:

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 London ON N5V 5B9  
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 Email: [goldtr@thamesriver.on.ca](mailto:goldtr@thamesriver.on.ca)

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 Wastewater and Drainage Engineering  
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**THE CORPORATION OF THE CITY OF LONDON  
UPPER THAMES RIVER CONSERVATION AUTHORITY  
NOTICE OF PUBLIC INFORMATION CENTRE**

The West London Dyke is 2374 m long and runs along the west bank of the North Branch of the Thames River from Oxford Street to the forks of the Thames River and then along the west bank of the main branch to the west side of the Wharncliffe Road Bridge. The City of London owns the dyke and through an agreement, the Upper Thames River Conservation Authority (UTRCA) undertakes major maintenance activities.

In 2004, the UTRCA undertook a condition assessment of Thames River dykes within the City including the West London Dyke. Approximately 350 m of the dyke north from the Queens Avenue Bridge were identified as being the highest priority for repair. This portion was originally built in the 19<sup>th</sup> century in order to minimize flood damage in the West London area with the present concrete revetment dating to the 1930s.

In 2005 while undertaking the initial stages of a concrete repair program on this section, the UTRCA and the City concluded that a significant portion of this section had come to the end of its useful life and needed to be replaced rather than repaired. Therefore, a preliminary design report was undertaken by an engineering consultant to assist the City and the UTRCA to determine:

- The requirements for the performance of a replacement structure;
- The required life expectancy of the replacement structure; and
- The recommended replacement structure to be used.

The City and the UTRCA have received a draft preliminary design report and based on its findings have arranged for a Public Information Centre. This event is an opportunity for interested persons to learn more about this project and to provide input and comment to the City and the UTRCA. The Public Information Centre details are as follows:

Date: Thursday May 25, 2006  
Time: 4:30– 8:30 p.m.  
Location: Kiwanis Community Centre, 78 Riverside Drive

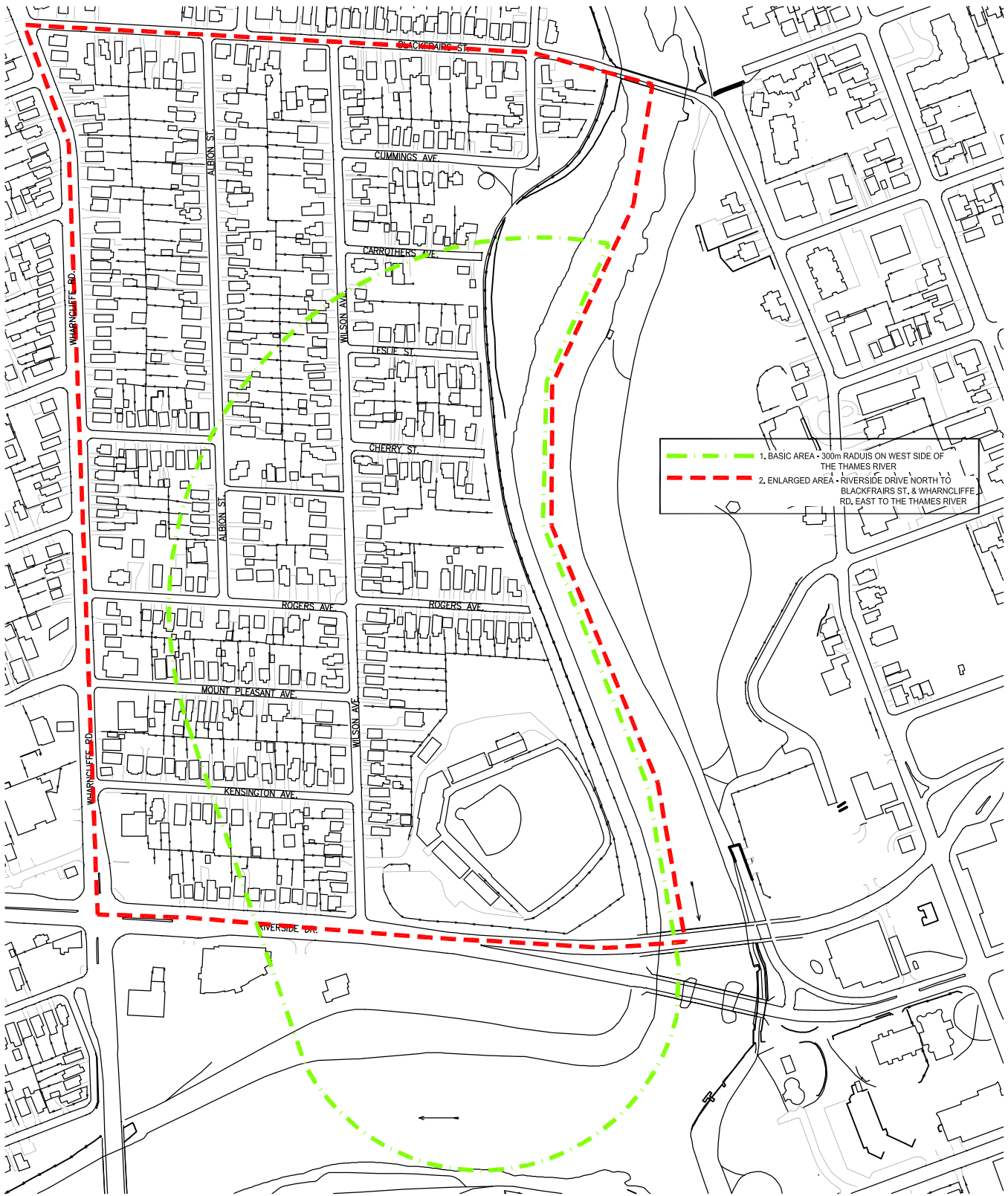
Inquiries are welcome and may be directed to:

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**Stantec**

**Stantec Consulting Ltd.**

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Client/Project

UTRCA  
 WEST LONDON DYKE REVETMENT

Figure No.

2.0

Title

**PROPOSED AREA OF MAIL OUTS/  
 HAND DELIVERY OF NOTICES**

**Send PIC Notice to:**

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Suzanne Shea, Navigable Waters Protection Officer  
Transport Canada – Marine  
201 N. Front Street, Suite 703  
Sarnia, ON N7T 8B1

Neal Ferris  
Ministry of Citizenship, Culture & Recreation  
Archaeology & Heritage Planning  
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London, ON N6E 1L3

Dan Elliott  
Area Supervisor/Officer in Charge  
Aylmer District  
Ministry of Natural Resources  
353 Talbot Street West

Ron Griffiths, Environmental Assessment Coordinator  
Ministry of Environment  
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Erick Boyd, Municipal/Planning Advisor  
Ministry of Municipal Affairs and Housing  
Regional Operations Branch  
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Allan Van Damme, Manager of Engineering  
London Hydro Inc.  
111 Horton Street  
London, ON N6A 4H6

**West London Dykes**

May 16, 2006

Information Centre Notice sent to the following organizations:

Advisory Committee on the Environment, City of London  
Carolinian Canada  
Ducks Unlimited, London Chapter  
Environmental and Ecological Planning Advisory Committee, City of London  
Friends of Oxbow Creek  
Friends of Sifton Bog  
Friends of the Coves  
Friends of Dingman Creek  
Global Action Plan for the Earth  
London Canoe Club  
London Sport Fishery Association Limited  
McIlwraith Field Naturalists  
Middlesex Western Rowing Club  
Natural Outdoor Activity Heritage Conservation Club  
Ontario Federation of Anglers and Hunters, Zone J  
Thames Region Ecological Association  
Thames River Anglers Association  
Thames Valley Trail Association  
Tri County Bass Masters  
Urban League of London  
Western Ontario Fish and Game Protective Association