

Appendix 2.6

Public Information Centre 2



**West London Dyke
Master Repair Plan**
Phases 1 and 2 of the Municipal Class
Environmental Assessment Process

Public Information Centre #2
February 23, 2012



One Team. Infinite Solutions

Presentation Outline

- Introduction
- Problem Identification
- Background
- Guiding Principles
- Project Study Area and Environment
- Project Drivers
- General Evaluation Criteria
 - Natural Environment
 - Socio-Economic Review
 - Engineering (Legal and Technical)
- Review of Alternatives
- Selection of Preferred Alternative
- Anticipated Capital Cost and Project Implementation Schedule
- Next Steps
- Communications/Questions

Introduction

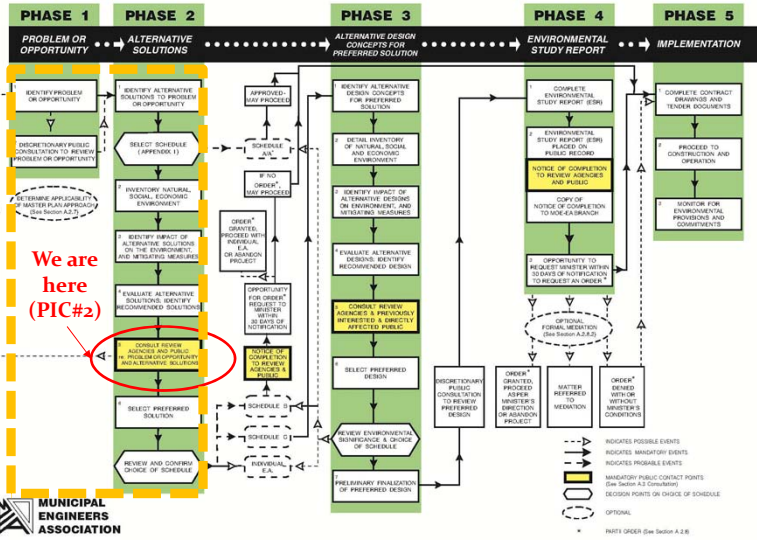
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- This is the second public meeting for the West London Dyke (WLD) Master Repair Plan (MRP)
- The Upper Thames River Conservation Authority (UTRCA) in partnership with the City of London (City) are undertaking this MRP to assist in the overall planning for the dyke and to:
 - Ensure key problems and opportunities are identified
 - Update previous 2007 Amenity Master Plan
 - Provide an overview of the dyke condition, level of protection, and constraints
 - Provide general recommendations and design guidelines
 - Provide for implementation of solutions on a cost effective, sustainable, and timely basis
- This MRP has been undertaken through the MEA Class EA process (Phases 1 and 2 of process)
- This is the second and last Public Information Centre (PIC)



EXHIBIT A.2 MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA



Problem Identification

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Problem Statement for the West London Dyke Master Repair Plan

“The UTRCA and the City of London are undertaking a Master Repair Plan (MRP) covering the next 20-year period to address aging infrastructure, flood protection, public use, and integration of other City initiatives. “

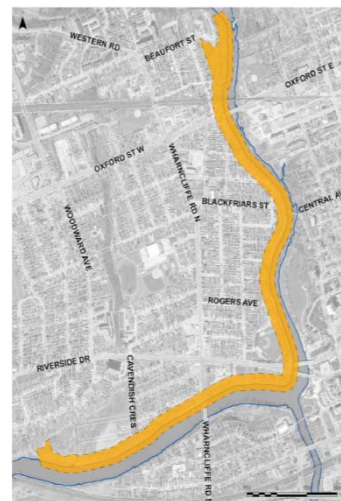
The intent of the MRP is to develop the required strategic plan to allow the UTRCA and the City to have a method for determining when a trigger point for repair and/or replacement of a portion of the dyke is required.



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- The West London Dyke is 2374m long, consists of both a concrete and earthen revetment, and runs along the west bank of the North Branch of the Thames River and along the west bank of the main branch
- The City owns the dyke and the UTRCA undertakes major maintenance activities through an agreement
- The WLD is primarily an engineered structure, which protects life and property during periods of extreme river flows



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- Construction of the WLD began in the late 1880's, and by the early 1900's the dyke had been reinforced, extended and raised at least twice
- The flood of April 1937 overtopped the reinforcements, prompting further raising of the dyke prior to the 1947 flood, in which flooding was less severe (along the North Branch)



- Subsequent floods in March 1977, September 1986, September 1997, July 2000, and April & December 2008 did not breach the dyke
- In addition to serving a critical control function, the dyke is also an integral part of the City's recreational pathway system and is a prominent structure in the downtown core



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- In 2004, a condition assessment of the dyke was undertaken and revealed the need to repair sections of the dyke
- In 2007 an approximate 300 m of concrete revetment between Rogers Avenue and Queens Avenue Bridge was replaced with a near vertical wall to the Regulatory Flood Level (1:250) at an approximate cost of \$3.5 M
- In 2009, a pathway extension below the Queens Avenue Bridge and Dundas Street Bridge was completed and included further dyke replacement at a total cost of \$1.1 M
- Recent inspection work undertaken since 2004 suggests further degradation of the dyke has occurred
- With exception of the Phase 1 work undertaken in 2007, the majority of the dyke is below the current Regulatory Flood Level
- Despite recent replacement work, it is anticipated that over a period of years, additional sections will also need to be replaced or areas enhanced for additional flood protection or to integrate other City initiatives



Guiding Principles

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The following principles were established to guide future requirements relating to repairs/replacement of the West London Dyke:

- Primary purpose of the dyke is to provide flood protection, therefore any changes should consider:
 - Level of flood protection needed, including freeboard
 - Type of flood protection (passive or active)
 - Identification of active flood protection areas and process periodic reviews as part of overall Flood Management Strategy
 - Consideration for climate change impacts
- Recognizing the dyke as a significant feature, identify opportunities to incorporate amenity and functional improvements as per 2007 Amenity Master Plan
- Preference should be for long-term versus short-term solutions
- Identify opportunities to incorporate environmental considerations

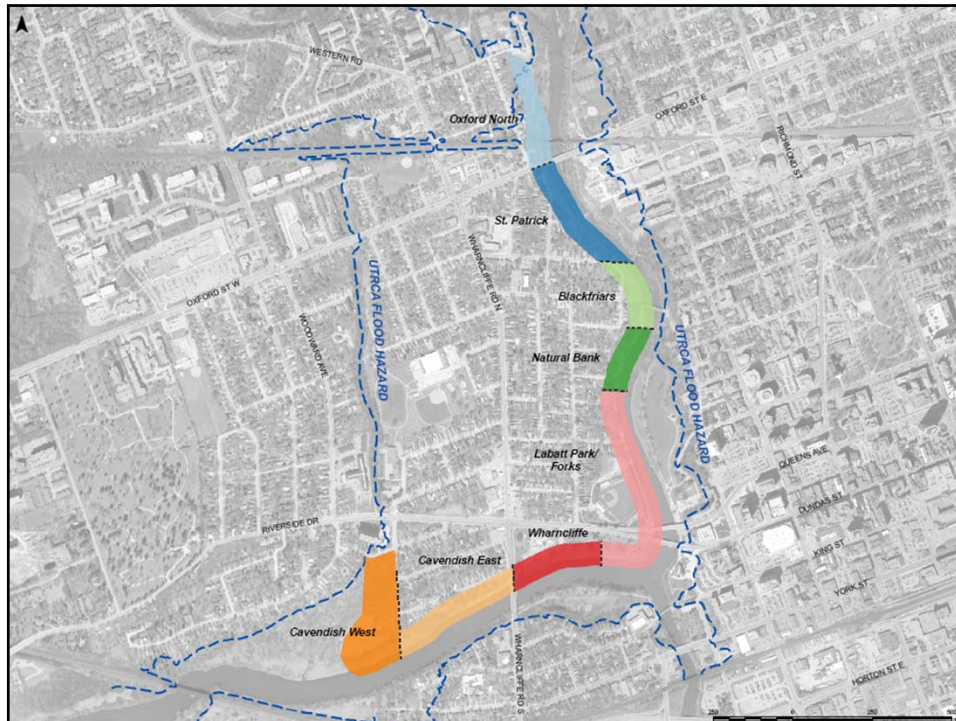


Project Study Area and Environment

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- The subject area generally reaches from the Oxford Street Railway Bridge, south along the west side of the Thames River, to Cavendish Park
- Given the length of the West London Dyke, major differences in the structure, level of flood protection provided, condition and surrounding land use, there is a need to subdivide the dyke into segments as noted in PIC #1
- Following segments were determined:
 - Oxford North
 - St. Patrick's (Oxford to Empress)
 - Blackfriars (Empress to Cummings)
 - Natural Bank (Cummings to Leslie)
 - Labatt Park/Forks (Leslie to Dundas)
 - Wharncliffe (Dundas to Wharncliffe)
 - Cavendish East
 - Cavendish West
- These segments are not intended to represent exact limits for future works. Segments may be further broken down or may overlap to suit staging and other issues

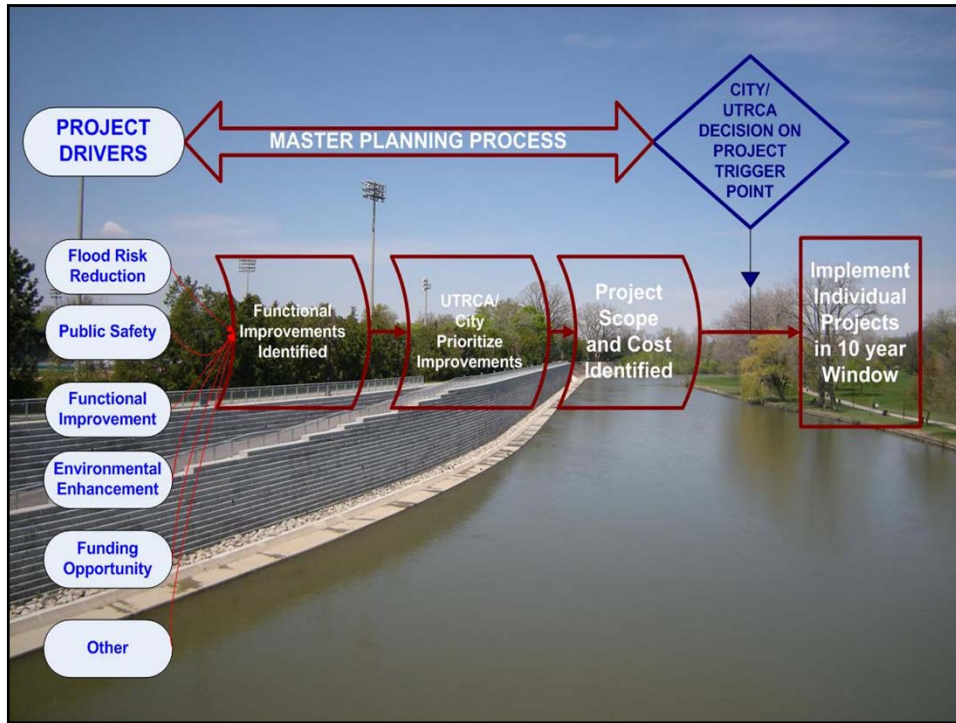




Project Drivers

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- Project drivers are defined as potential reasons to implement or otherwise initiate work
- The following six project drivers were established through consultation with the Project Team and based on the guiding principles:
 - Flood Risk Reduction – reduce risk of flooding, support SPA designation, address policy requirements
 - Public Safety – address aging infrastructure, improve amenities related to safety, river access considerations
 - Functional Improvements – pathway extensions, considerations from Thames Valley Corridor Study and Bicycle Master Plan
 - Environmental Considerations – impacts to existing vegetation and opportunities for enhancement
 - Funding Opportunities – availability of funds to undertake work
 - Other (to be determined through the MEA process) – based on stakeholder input and additional issues noted through planning process
- These same project drivers were noted in PIC #1



General Evaluation Criteria

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- In order to assess the alternative solutions, general evaluation criteria were established
 - Natural Environment: protection of natural and physical elements (i.e., air, water, land, etc.)
 - Social Environment: potential effects on public (landowners, community groups, social elements, historical factors, etc.)
 - Economic: capital and maintenance costs, flood damage impacts
 - Legal: potential land requirements
 - Technical: technical requirements and suitability of each alternative

Natural Environment

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- Study area located within the jurisdiction of Upper Thames River Watershed: Forks Watershed
- West London Dyke is within the Regulated Limit
- A review of the natural environment is a requirement of the EA process
- Purpose for MRP is to characterize the significance and sensitivity of the natural features in the study area, identify potential impacts and recommend measures to mitigate and minimize negative impacts
- Based on current document review, 58 fish species and 23 freshwater mussel species have been recorded within the Forks Watershed of which six species of fish and six species of mussels are designated as Species at Risk (SAR)

Natural Environment

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- Previous vegetation surveys have not indicated any vascular plant species at risk in the area
- 7 potential wildlife SAR are noted, however unlikely that many of these species are actually present within the study area
- Future works may require detailed field review/investigations and implementation of mitigation and protection measures

Socio-Economic Review

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- There are currently 1100 structures located behind the WLD that are within the Regulatory Flood Line (250 year level)
- The area protected by the dyke is a significant cultural base, with construction dating back prior to annexation in 1897
- Land use adjacent to the dyke is primarily residential, with open space areas, limited commercial development, and recreation facilities
- Many heritage features are also present in the area (Blackfriars Bridge and Labatt Park)
- Current City of London Official Plan identifies the areas protected by the dyke as Potential Special Policy Areas
- Economic considerations must balance cost for future works versus maintenance costs versus potential for flood damage
- Cost to replace dyke is est. at \$26.1 M (-10% to +40%) to achieve existing level of protection
- Flood damage estimates suggest potential for ~\$1.1 M to 1:100 year level and ~\$50.9 M to 1:250 year level (2012 CDN)



Engineering Review (Legal and Technical)

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- As part of the MRP, preliminary engineering review was undertaken to determine potential land issues (legal) and performance/legacy issues (technical)
- Land:
 - There is as little as 5 m between existing property lines and top of dyke
 - Land considerations include need for access to and from site, room to place equipment and materials to construct the project, and physical room to place the structure
 - Issues such as temporary haul routes, construction easements, and work in river may need to be considered depending on final design
- Performance:
 - Future replacement projects should consider the major functional, operational, and safety issues as noted for Phase 1 work and updated as necessary to incorporate stakeholder input and policy changes that may occur over time



Engineering Review (Legal and Technical)

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- Performance (Cont'd):
 - Additional technical consideration will also need to address
 - Opportunities for green design
 - Impacts on need for permits and approvals (i.e., work in river, etc.)
 - Impacts relating to climate change
 - Freeboard for new dyke structure
 - Passive versus active flood protection



Engineering Review (Legal and Technical)

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- Legacy:
 - Due to the location of the dyke and previous work completed to raise the structure, there is a risk of impacted soils in the area
 - Future works must consider and budget for removals and/or look to minimize disturbance of these materials



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- As part of the Class EA planning process, reasonable and feasible alternative solutions are to be identified and the net positive and negative effects noted
- Development of alternatives considered:
 - Review of Guiding Principles
 - Review of Environmental Components (Natural, Socio-Economic, Legal, Economic, Technical)
 - Review of existing dyke profile, structure and condition, site constraints
 - Planning Initiatives

The following alternatives have been identified:

- Alternative 1: Do Nothing
- Alternative 2: Replace with Similar Structure (Existing Footprint)
- Alternative 3: Replace with New Dyke to 100 Year Standard + Freeboard
- Alternative 4: Replace with New Dyke to 250 Year Standard + Freeboard



Review of Alternatives

| Option | Impact on Natural Environment | Impact on Social Environment | Impact on Economic Environment |
|---------------|--|---|---|
| 1. Do Nothing | <ul style="list-style-type: none"> • No impact (subject to condition of dyke) | <ul style="list-style-type: none"> • No impact (subject to condition of dyke) from existing, but limited opportunity for amenity and functional improvements | <ul style="list-style-type: none"> • Does not provide protection against Regulatory Flood • Highest anticipated maintenance costs • Does not address current deficiencies with concrete revetment and therefore will not be considered further for those sections • For lower risk areas and areas north and west of dyke, this option will be considered further |



Review of Alternatives

| Option | Impact on Natural Environment | Impact on Social Environment | Impact on Economic Environment |
|---|---|--|--|
| 2. Replace with Similar Dyke (Existing Footprint) | <ul style="list-style-type: none"> Least impact to natural environment (with exception of Do Nothing) as it involves work within the same footprint In-river work may still be required due to site access issues | <ul style="list-style-type: none"> “Status quo” option intended to minimize change to the nearby areas Limited opportunity for amenity and functional improvements | <ul style="list-style-type: none"> Does not provide protection against Regulatory Flood Lower cost than Alternatives 3 and 4 (~\$21.3M in 2012 CDN excluding new sections) |

Review of Alternatives

| Option | Impact on Natural Environment | Impact on Social Environment | Impact on Economic Environment |
|--|--|---|--|
| 3. Replace with New Dyke to 100 Year + Freeboard | <ul style="list-style-type: none"> Would require work outside of the existing footprint In-river work may also be required | <ul style="list-style-type: none"> Opportunity for amenity and functional improvements Land acquisition not anticipated | <ul style="list-style-type: none"> Does not provide protection against Regulatory Flood Lower cost than Alternative 4 (~\$26.8M in 2012 CDN) |

Review of Alternatives

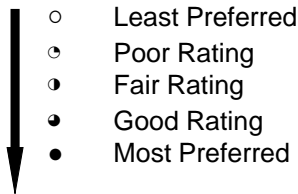
| Option | Impact on Natural Environment | Impact on Social Environment | Impact on Economic Environment |
|--|--|---|---|
| 4. Replace with New Dyke to 250 Year + Freeboard | <ul style="list-style-type: none"> • Would require work outside of the existing footprint • In-river work may also be required | <ul style="list-style-type: none"> • Opportunity for optimal amenity and functional improvements • Land acquisition / easements not anticipated, although exact extent to be confirmed through design based on location of new structure from river | <ul style="list-style-type: none"> • Would provide protection against Regulatory Flood • Highest cost in comparison to other options due to increased height (~\$29.2M in 2012 CDN) • Anticipated to result in lowest overall life-cycle costs when considering long-term maintenance and potential for topping of dyke • Extension of the dyke to the north and west may be required to address additional flood protection requirements |



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- To maintain consistency with City of London Master Plan and Class EA projects, subjective evaluation of each alternative for each segment was based on the following system



- Refer to Display Boards which includes an assessment of the impacts to the environment and qualitative evaluation of each alternative for each segment



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- Based on the preferred selection for each general segment, the preferred alternative, order of magnitude cost, and estimated project implementation period was developed
- In assessing alternatives, it is recognized that segments defined may overlap in terms of preferred alternatives and construction (i.e. one segment may have different solutions and may be constructed over different periods of time)
- Timelines noted are estimated based generally on condition and overall reduction in flood damages. Exact timelines may vary based on other project drivers
- Interim repair works may also help to bridge the timeline between replacement projects



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- Prior to undertaking any future works, additional approvals (i.e., Class EA commitments, field reviews, DFO, UTRCA, etc.) may be required depending on extent of project and will be defined during preliminary design phase



| Segment | Section | Type | Preferred Alternative | Estimated Cost | Implementation Schedule | Priority Ranking |
|-------------------|---|--------------------------------------|-----------------------|-------------------------------|--|---|
| Oxford North | North of south limit of Oxford St. Bridge | Concrete Revetment | Alt. 4 | \$1.8M / (\$771K w/o pathway) | 10 + Years | 8 |
| St. Patrick | Oxford St. to St. Patrick St. | Concrete Revetment | Alt. 4 | \$2.6M | 5 to 10 Years | 4 |
| | St. Patrick St. to Empress Avenue | Concrete Revetment | Alt. 4 | \$2.7M | 5 to 10 Years | 5 |
| Blackfriars | Empress Avenue to Blackfriars St. | Concrete Revetment | Alt. 4 | \$3.0M / (\$2.0M w/o pathway) | 1 to 5 Years | 2 |
| | Blackfriars St. to Cummings Ave. | Concrete Revetment | Alt. 4 | \$2.0M | 1 to 5 Years | 3 |
| Natural Bank | Cummings Ave. to Leslie St. | Concrete Revetment (Naturalized Toe) | Alt. 4 | \$3.2M | 10 + Years | 6 |
| Labatt Park/Forks | Leslie St. to Rogers Ave. | Concrete Revetment | Alt. 4 | \$2.3M | 1 to 5 Years | 1 |
| | Rogers Ave. to Queens Ave. Bridge | Modular Block Wall with Geogrid | Alt. 1 | N/A | 10 + Years (work completed in 2007/08) | --- |
| | Queens Ave. extending south to Forks | Natural Bank with Gabions | Alt. 4 | N/A | 10 + Years | 9 (assumed to coincide with Wharncliffe segment work) |



| Segment | Section | Type | Preferred Alternative | Estimated Cost | Implementation Schedule | Priority Ranking |
|----------------|---|---------------------------|-----------------------|-------------------------------|-------------------------|------------------|
| Wharncliffe | From Forks to Wharncliffe Rd. Bridge | Natural Bank with Gabions | Alt. 4 | \$4.0M / (\$2.9M w/o pathway) | 10 + Years | 9 |
| Cavendish East | Wharncliffe Rd. Bridge extending west | Concrete Revetment | Alt. 4 | \$2.5M | 10 + Years | 7 |
| | From termination of concrete revetment extending west to City Works Yard | Natural Bank/Berm | Alt. 4 | \$2.5M | 10 + Years | 10 |
| Cavendish West | From City Works Yard extending north, the west along adjacent property limits | Vegetated Berm | Alt. 4 | \$1.1M | 10 + Years | 10 |



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- Collect and Review Agency Comments
- Collect and Review Public Comments
- Review and Confirm Solutions and Identify Potential Future Requirements (Class EA Commitments/Schedules for each Project)
- Prepare Project File
- Advertise Study Completion and Post for 30-Day Review
- Finalize Master Plan



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- GENERAL EVALUATION CRITERIA
 - NATURAL ENVIRONMENT
 - SOCIO-ECONOMIC REVIEW
 - ENGINEERING (LEGAL AND TECHNICAL)
- REVIEW OF ALTERNATIVES
- SELECTION OF PREFERRED ALTERNATIVE
- ANTICIPATED CAPITAL COST AND PROJECT IMPLEMENTATION SCHEDULE
- **COMMUNICATIONS**
- QUESTIONS

Thank you for your participation in the Master Plan process. We would be pleased to answer any questions you have this evening or you may feel free to contact us at your convenience.

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**West London Dyke Master Repair Plan
Municipal Class EA**

Public Information Centre
February 23, 2012

Attendance Sheet

| <u>Name</u> (please print) | <u>Mailing Address</u> (please print) | <u>Interest in Project</u> (i.e. <u>property owner,</u> <u>business owner,</u> <u>agency</u>) | Would like to receive further information about this project (yes/no) |
|-------------------------------|--|---|--|
| B. Krichkef | | | |
| G. MITSIS. | | | |
| P MITSIS | | | |
| J Gordon | 60 Blackfriars St | | |
| GRAYDON KNIGHTS | 10 OAKWOOD DRIVE LONDON | | |
| Robert Austin | 49 Riverview Ave | property owner | yes |
| Barb+marcel Goulet | 5 Leslie St., London | property owner | yes |
| ADY BRYANT | COUNCIL | | |
| John Proye | 6 St Andrew | owner | yes |
| C Kelsoy | u u u | u | u |
| Debbie Dine | 52 Forward Ave | owner | yes |
| J Johnston | 10 Carrothers | owner | yes |
| CHRIS NAINES | | | |
| | | | |

**West London Dyke Master Repair Plan
Municipal Class EA**

Public Information Centre #2
Thursday February 23, 2012

COMMENT SHEET

| |
|--|
| Name: Christine Kelsey |
| Mailing Address: 6 Saint Patrick St. |
| Interest (i.e. property owner, agency): Property Owner |
| Comments: |
| Many people walk up and down the revetment at the end of St. Patrick for fishing, boating, + enjoying sitting by the water. |
| I hope this public access will remain part of this area of the dyke. |
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Please place comments in the comment box provided or submit comments to the following:

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michele.oxlade@stantec.com

West London Dyke Master Repair Plan Municipal Class EA

Public Information Centre #2

Thursday February 23, 2012

COMMENT SHEET

| |
|--|
| Name: |
| Mailing Address: |
| Interest (i.e. property owner, agency): |
| Comments: |
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