

DATE October 23, 2009**PROJECT No.** 09-1121-0016 (2000)**TO** John Sawama, P.Eng., City of Kingston**FROM** B.G. Sullivan, Golder Associates Ltd.**EMAIL** bsullivan@golder.com**SUMMARY OF ENVIRONMENTAL PLANNING STAGE 1, CITY OF KINGSTON EA STUDY
THIRD CROSSING OF THE CATARAQUI RIVER, KINGSTON, ONTARIO**

INTRODUCTION

Golder Associates Ltd. (Golder) was retained by J.L. Richards and Associates (JLR) on behalf of the City of Kingston to conduct a Geo-environmental study for the City of Kingston's proposed Cataraqui River Crossing Environmental Assessment (EA) Project. The geo-environmental study has a two level approach in terms of the environmental considerations review. This technical memorandum presents findings for the first level of approach (Stage 1 geo-environmental work) which involved a desktop review of existing available environmental information, to identify potential issues of environmental concern to be considered as part of Phase 1 and Phase 2 of the Ontario Municipal Class EA process.

METHODOLOGY

The purpose of the Stage 1 geo-environmental work was to document and to identify existing and former operations/activities within the EA study area in terms of their potential environmental condition that should be part of the evaluation of the following alternative options:

- Retain the status quo (do nothing);
- Increase the capacity of the La Salle Causeway;
- Increase the capacity of Highway 401 from Montreal Street to Kingston Road 15; and,
- Construct a new crossing between the La Salle Causeway and Highway 401 by means of a bridge or tunnel.

The work was completed using existing available information, which assisted in evaluating whether potential environmental concerns are present within the study area. The following sources were reviewed for historic site information:

- Ecolog ERIS environmental risk information database;
- Historical fire insurance plans (1915, 1947 and 1963);
- Limited air photos; and,



- Available environmental reports including:
 - *Phase I Environmental Site Assessment, Proposed Wellington Street Extension, City of Kingston, Ontario, prepared by XCG Consultants Ltd.;*
 - *Application of the Canada-Ontario Decision-Making Framework for Contaminated Sediments in the Kingston Inner Harbour, Chapter 1: Literature Review, prepared by Environmental Sciences Group, Royal Military College, Kingston, Ontario; and,*
 - *Transportation Study, Bridge Crossings of the Cataraqui River, City of Kingston, Township of Pittsburgh, County of Frontenac, Ministry of Transportation of Ontario, June, 1992, prepared by Totten Sims Hubecki Associates (1991) Limited.*

Information collected from the above resources was evaluated and potential sources of contamination were ranked as high, medium or as low based on the nature of the activities at each location. Examples of sites or issues that would be graphed into each of the three categories are as follows:

High Ranking

Gasoline service stations, motor vehicle repair shops, dry cleaners, heavy industrialized land use, coal gasification plants, waste disposal sites, spills of large or unknown quantities, presence of fuel and/or chemical storage tanks, federal contaminated sites, sites with spills reported to have a confirmed environmental impact.

Medium Ranking

Construction and renovation companies, Ontario Regulation 347 waste generators, light industrial facilities, foundry and/or metal works, rail ways, transport industries, printing and engineering activities, sites with spills reported to have a possible environmental impact.

Low Ranking

Warehouses, commercial storage facilities, sites licensed for pesticides use, lumber companies, wood and coal yards, quarries, parking lots, sites registered on National Pollutant Release Inventory, sites with Certificates of Approval on air, industrial wastewater and municipal sewage and waterworks, site with spills reported to have no anticipated environmental impact.

Issues of potential environmental concern were then included on the map in Figure 1 - Areas of Potential Environmental Concern. Subsequently, this technical memorandum was prepared to summarize potential contamination issues within the EA study area.

RESULTS AND RECOMMENDATIONS

The results of the Stage I geo-environmental works are mapped on Figure 1. The issues of potential environmental concern are marked either with a point or a polygon on the map which represents a potential source of soil and/or groundwater contamination that existed or currently exists in the general vicinity at that point such as a gas station or a dry cleaner. This point is usually (some exceptions exist) located based up on the address, street intersection, or textual description and thus may not indicate the exact location of possible impacts due to the spatial precision of the databases reviewed.

The review of available information showed that there are 287 high ranking sites, 270 medium ranking sites and 206 low ranking sites in the EA study area. Historically the lands on the western shore of the Cataraqui River were heavily industrialized, particularly south of Belle Island. Less industrial and commercial development has occurred on the eastern shore of the Cataraqui River. Probable sources of soil and groundwater contamination due to large scale historic activities include but are not limited to:

FACILITY	LOCATION (MAP ID)	CONTAMINANTS
Frontenac Lead Smelter	Southwest of the former Belle Park Landfill (E001)	lead, copper, zinc, polycyclic aromatic hydrocarbons (PAHs)
Former Davis Tannery property and Arcom waste disposal facility	Southwest of the former Belle Park Landfill (E002)	chromium, copper, lead, zinc, arsenic, salt
Mcleod's Tannery	Emma Martin Park (E007)	metals, chlorinated solvents, PAHS, petroleum hydrocarbons (PHCs)
Kingston Coal Gasification Plant	Bounded by King Street, Queen Street, Ontario Street and Place D'armes (E003)	black coal tar (PAHs)
Anglin Bay rail yards and shipbuilding operations	Anglin Bay (E004)	PAHs, PHCs, metals
Former Belle Park Landfill	Belle Park (E005)	PAHs, polychlorinated biphenyls(PCBs)
Federal dredged sediment disposal site	North shore of the Belle Park Landfill (E006)	river sediments
Katings Pasture waste disposal site	North of Cataraqui Street to Montreal Street and west of Rideau Street (E008)	domestic waste

Due to many decades of developed industry there are numerous sites of environmental concern throughout the EA study area. Particular attention should be paid to the following areas/corridors, should an additional crossing of the Cataraqui River be further pursued under Phase 3 and Phase 4 of the Ontario Municipal Class EA process as these areas have the highest densities of potential environmental impact:

- Downtown area bounded by south - west - north - east: Brock Street, Barrie Street, North Street and Ontario Street (Area 1);
- Cataraqui Street - Orchard Street - River Street area (Area 2);
- Joseph Street between Montreal Street and Patrick Street (Area 3);
- Segments of Montreal Street that are (Area 4):
 - in the downtown area specified above (Segment 1);
 - between Raglan Road and James Street (Segment 2);
 - between Stephen Street and Railway Street (Segment 3);
 - between John Counter Boulevard and Drennan Street (Segment 4); and,
 - between Weller Avenue and Sutherland Drive (Segment 5);

- Belle Park and vicinity (Area 5); and,
- Areas bounded by Hickson Avenue, Harvey Street, Elliott Avenue - John Counter Boulevard corridor and Montreal Street (Area 6).

Sites with potential environmental concerns within each of these highest densities areas are grouped and shown graphically on Figure 2. Please note that the areas highlighted in Figure 2 do not necessarily indicate that the entire area is contaminated. Rather, only specific locations within these areas are contaminated or potentially contaminated. Percentages of the total number of high, medium and low ranking sites in each area of highest densities of potential environmental impact are shown in the following table.

Areas (as defined above)	High Ranking Sites		Medium Ranking Sites		Low Ranking Sites		
	Number	Percentage	Number	Percentage	Number	Percentage	
Area 1	108	43%	85	34%	57	23%	
Area 2	34	55%	17	27%	11	18%	
Area 3	9	60%	3	20%	3	20%	
Area 4	Segment 1	included in Area 1					
	Segment 2	10	83%	0	0%	2	17%
	Segment 3	9	36%	10	40%	6	24%
	Segment 4	6	75%	2	25%	0	0%
	Segment 5	5	50%	1	10%	4	40%
Area 5	8	89%	0	0%	1	11%	
Area 6	13	17%	42	56%	20	27%	

Excavation activities for the bridge or tunnel alternative in these areas specified above, should either option be pursued further under Phase 3 and Phase 4 of the Ontario Municipal Class EA process, will have a higher potential to encounter impacted soil and groundwater than in other parts of the EA study area. The management of impacted materials may result in increased construction costs, health and safety concerns and potential project delays. Should an additional crossing of the Cataraqui River be pursued further under Phase 3 and Phase 4 of the Ontario Municipal Class EA process, a full Phase I ESA and possible Phase II ESA, where appropriate, should be carried out to evaluate the risks/costs for design and construction provisions.

Based on email correspondences and telephone calls between Golder and Mr. Paul MacLatchy from the City of Kingston, the fill material along the western shoreline of the Cataraqui River is also an issue of potential environmental concern. According to Mr. MacLatchy, the fill material was deposited between the mid 1800's and mid 1900's, and is located between the Canadian National (CN)/Canadian Pacific (CP) railway tracks and the western shoreline of the Cataraqui River from approximately Place D'Armes in the south to Drennan Street in the north. The area associated with the fill material of unknown origin is shown in the polygon in both Figure 1 and Figure 2.

Sediment contamination in the Kingston Inner Harbour (KIH) is a potential constraint that needs to be considered as the EA study progresses as well. The environmental report that Golder reviewed: *Application of the Canada-Ontario Decision-Making Framework for Contaminated Sediments in the Kingston Inner Harbour* (the Application report), indicated that there have been numerous previous studies on sediment quality in the KIH area.

Chapter I of the Application report briefly summarized sediment quality studies in the KIH from 1972 to 2007. Previous studies have found surface sediment contamination exceeding the provincial [Protection and Management of Aquatic Sediment Quality in Ontario (PSQGs)] and federal [Canadian Council of Ministers of Environment (CCME) sediment quality] guidelines, reflecting historical industrial activities in this area. The main parameters of concern are arsenic, chromium, copper, lead, mercury, zinc, PCBs and PAHs, with chromium being the most widespread and abundant contaminant. Little sediment contamination is found north of Belle Isle. However, there is limited data on spatial coverage of sediment contaminant (inorganic and organic) concentrations with depth for the KIH. The approximate location of sediment contamination is shown on Figure 1, based on the limited information obtained from the Application report.

LIMITATIONS

This technical memorandum was prepared for the exclusive use for the City of Kingston and is intended to provide the City of Kingston with an assessment of the current environmental conditions for the EA study. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third parties. Should additional parties require reliance on this report, written authorization from Golder will be required. Golder disclaims responsibility for consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

The technical memorandum is based on data and information collected by Golder during the Stage 1 portion of this EA study in accordance with Phase 1 and Phase 2 of the Ontario Municipal Class EA process. It is based solely on a review of historical information and data obtained by Golder as described in this technical memorandum and as reported herein. No assurance is made regarding the accuracy and completeness of these data. No site visit was undertaken in preparing this technical memorandum and no soil, water, liquid, gas, mould, product or chemical sampling and analytical testing at or in the vicinity of the site was conducted as part of this assessment.

In evaluating the EA study area, Golder has relied in good faith on information provided by Ecolog ERIS, historical fire insurance plans, limited air photos, other reports and City of Kingston information provided to Golder as noted in this technical memorandum. We assumed that the information provided is factual and accurate. We accept no responsibility for any deficiency, misstatement or inaccuracy contained in this technical memorandum as a result of references indicated.

If new information is discovered during future work, including but not limited to, site visits and assessment, excavations, borings or other studies, Golder should be requested to re-evaluate the conclusions presented in this report and to provide amendments as required.

CLOSING

We trust this report provided the information required. Should you have any questions, please do not hesitate to contact us with any questions or concerns.

Yours truly,

GOLDER ASSOCIATES LTD.

B.G. Sullivan, CET
Senior Due Diligence Assessor A

Don Plenderleith, P.Eng.
Associate

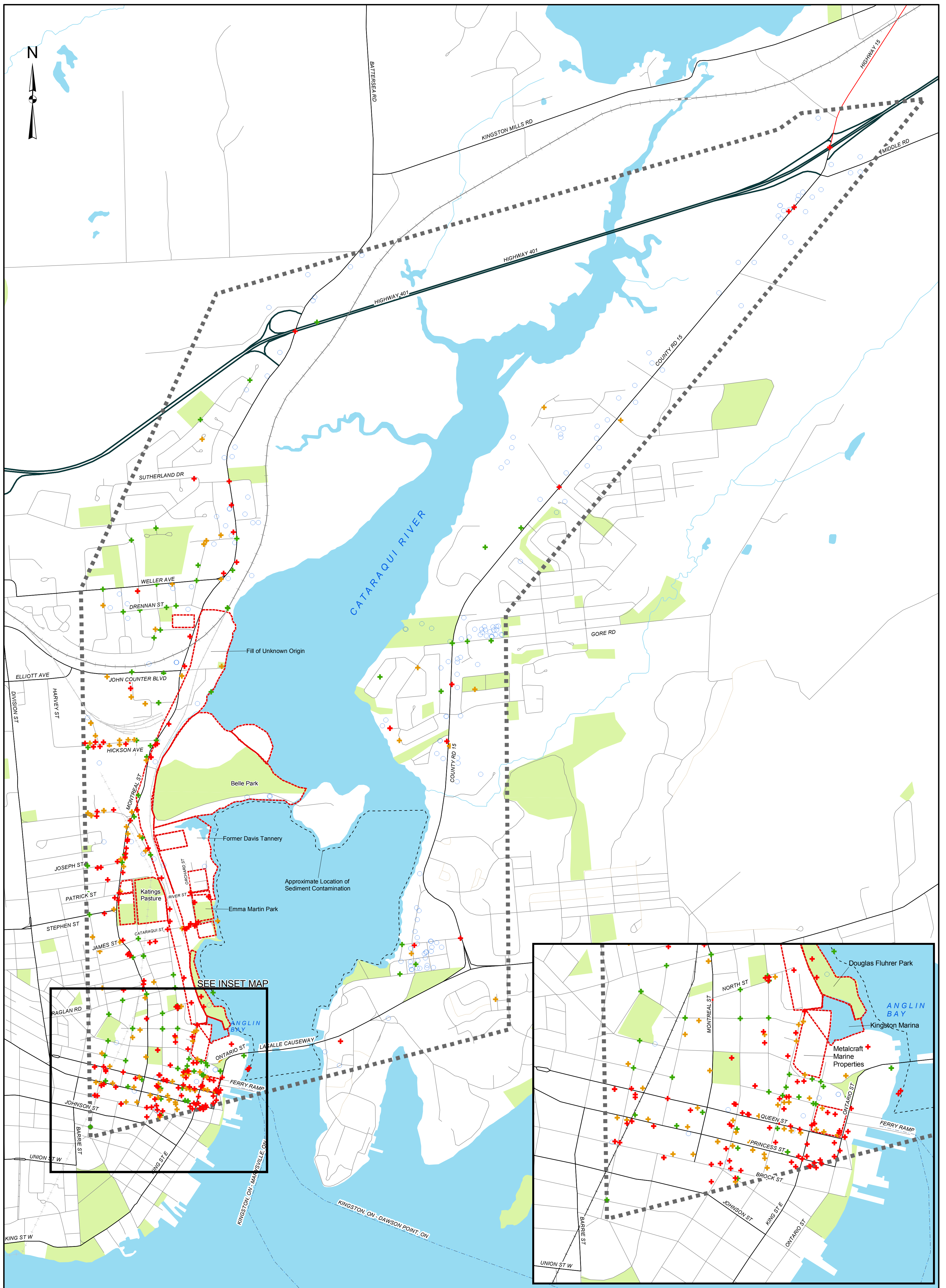
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Attachments: Figure 1: Areas of Potential Environmental Concern
Figure 2: Areas of Highest Densities of Potential Environmental Impact

FIGURE 1:

Areas of Potential Environmental Concern



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Rankings

- + **High** (Examples include gasoline service stations, garages, motor vehicle repair shops, dry cleaners, heavy industrialized land use, waste disposal sites, presence of fuel and/or chemical storage tanks, federally contaminated sites and sites with spills reported to have a confirmed environmental impact).
- + **Medium** (Examples include construction and renovation companies, Ontario regulation 347 waste generators, light industrial facilities, foundry and/or metal works, railways, transport industries, printing and engraving activities and sites with spills reported to have a possible environmental impact).
- + **Low** (Examples include warehouses, commercial storage facilities, sites licensed for pesticide use, lumber companies, quarries, sites registered on National Pollutant Release Inventory, sites with certificates of approval on air, wastewater, and municipal sewage waterworks, sites with spills reported to have no anticipated environmental impact, and wood and coal yards).
- o Water Well (MOE Water Well Information System)

NOTE:

This figure is to be read in conjunction with the accompanying Golder Associates Ltd. report No. 09-1121-0016

REFERENCE:

Digital base map data supplied by DMTI Spatial Inc. CANMAP, 2007
 Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 18

- Expressway
- Major Road
- Local Road
- Ferry Route
- Main Rail Line
- Sidetrack Rail Line
- Abandoned Rail Line
- Approximate Location of Sediment Contamination
- Park / Golf Course / Recreation Area
- Study Area




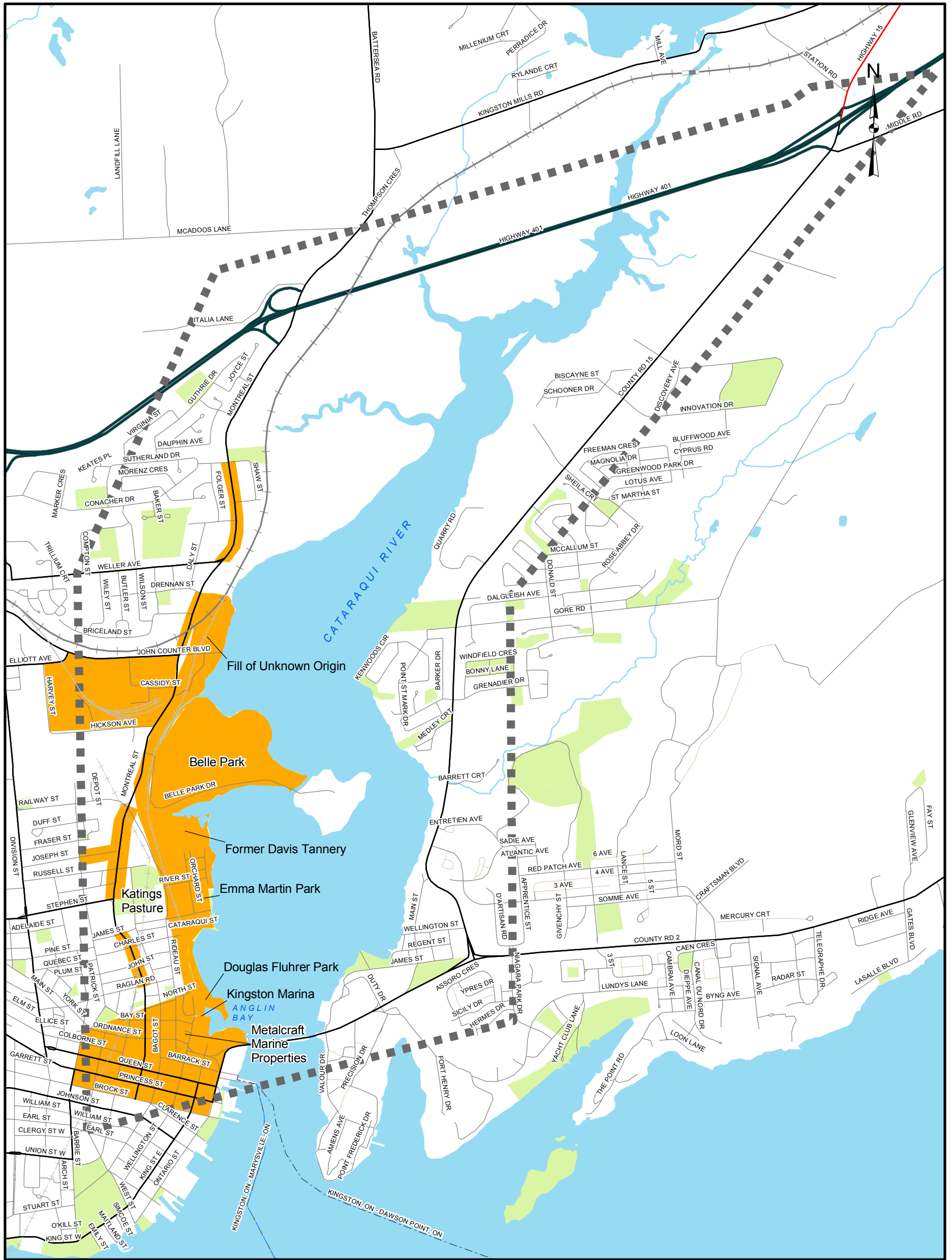
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CATARAQUI RIVER CROSSING EA			
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AREAS OF POTENTIAL ENVIRONMENTAL CONCERN			
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FIGURE 2:

Areas of Highest Densities of Potential Environmental Impact



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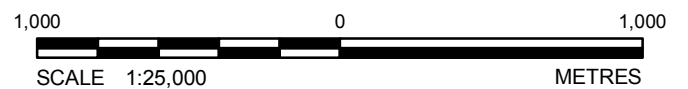
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 Golder Associates Ottawa, Ontario	PROJECT No.	09-1121-0016	SCALE AS SHOWN
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	GIS	BT	21 AUG 2009
	CHECK	BGS	20 OCT 2009
REVIEW	DHP	20 OCT 2009	REV. 0
			FIGURE: 2