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Basic Impact Analysis

BLACK RAPIDS LOCK 13 RECAPITALIZATION

Rideau Canal, Ottawa,

June 10, 2015



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1. PROJECT TITLE	Black Rapids Lock 13 Recapitalization	
2. PROJECT LOCATION (Park, Site, Canal, NMCA)	Rideau Canal National Historic Site	
3. PROJECT SITE(S)	Black Rapids Lock 13, Ottawa	
4. PROPONENT	Jean-François Charron	
5. PROPONENT CONTACT INFORMATION	Project Engineer, Project Manager 34 Beckwith Street South Smiths Falls, Ontario, K7A 2A8 613-283-7199 (ext. 248) Cellular 613-284-7832	
6. PROJECT DATES	Commencement: 2015-10-13	Completion: 2016-05-15
7. INTERNAL PROJECT FILE #		
8. PROJECT DESCRIPTION	<p>The purpose of this project is to maintain the lock in such a way to ensure the integrity of the structure. This project is critical to ensuring continued stability of the structure for the purpose of maintaining the commemorative integrity of the structure, allowing for effective water level management, recreation, and public safety.</p> <p>At Black Rapids lock station, the timber gates are showing signs of decay, masonry on the lock walls is in need of repair and the hydraulic operating system requires upgrades to ensure reliable operation of the lock.</p> <p>Design for the lock will start in July 2015. New lock gates will be fabricated off-site in 2015. On-site prep and construction will start in October 2015 to May 2016.</p> <p>The locks will be dewatered in order to facilitate the work.</p> <p>The lower lock gates will be replaced with new steel gates. The new gates will be fabricated off-site, then transported to the site by truck. A mobile crane will be used to remove the existing gates and to install the new gates.</p> <p>The upper lock gates will be replaced with new wooden gates. The new gates will be fabricated off-site, transported to the site by truck and then assembled. A mobile crane will be used to remove the existing gates and to install the new gates.</p> <p>The lock walls require modification in order to accept the new steel gates. New concrete will be placed by concrete pump truck, portable concrete pump, or by mobile crane complete with concrete bucket.</p> <p>Deteriorated masonry will be removed by chipping with pneumatic or electric chippers, and replaced with either concrete or new stone to match existing. If concrete work is being done during cold weather (less than 5°C), the work area will be enclosed with temporary hoarding and heated with propane or diesel portable air heater.</p> <p>Once the locks have been dewatered, existing hydraulic lines, valves and cylinders will be removed. The existing mechanical/electrical trenches will be steam cleaned and new stainless lines and control wiring will be installed into the trenches. New cylinders will be installed and the hydraulic skid inside the control room (the mechanical unit that contains the fluid tank, pumps, valves, etc.) will be replaced.</p> <p>This project will involve:</p> <ol style="list-style-type: none">(1) Replacing the lower lock gates with new steel gates.(2) Replacing the upper lock gates with new wooden gates.(3) Repairing masonry on the lock walls within the lock chamber(4) Upgrading the hydraulic system by replacing hydraulic lines, valves and power unit.	





9. ENVIRONMENTAL COMPONENTS LIKELY TO BE AFFECTED

This project will be taking place at Black Rapids Lock on the Rideau Canal Waterway, in Ottawa, Ontario. The area surrounding the lock is manicured lawn with a few deciduous trees and conifers, commonly found in urban regions.

Black Rapids lock station includes a single lift lock, a lockmaster house that was built in 1914, and a large concrete overflow dam. Both the lock and the grounds are designated as level one cultural resources.

The site is a cultural landscape flanked by small natural wooded areas and emergent cattail marshes. The area surrounding the lock (work area) is manicured lawn with occasional mature tree, including Silver maple, Black willow, Eastern white pine, White birch, and spruce spp.

18 avian species were present during a site visit in April 2008: Red-winged blackbird, Belted kingfisher, Canada goose, Song sparrow, American robin, Mallard, Blue jay, Black-capped chickadee, Common merganser, Ring-billed gull, American crow, Rock dove, Woodpecker spp., Common grackle, European starling, Eastern phoebe, Turkey vulture, and Yellow-rumped warbler. 3 Mammals were observed: Groundhog, Eastern Grey squirrel, and footprints of Raccoon. No reptile species were observed during the April site visit, though they may be present at the site later in the season (Baldwin, 2008)

31 species of aquatic plants were found in the reach between Hogs Back and Long Island in the Rideau Canal biodiversity project in 2001 (Canadian Museum of Nature, 2007). The Rideau Canal biodiversity project found 20 species of fish in the same stretch of the Rideau river (Canadian Museum of Nature, 2007).

No Species at Risk or Species at Risk proposed Critical Habitat identify in the project area.

10. IMPORTANT EFFECTS IDENTIFIED

Air Quality

Potential for dust pollution during transportation of materials and construction activities.

Release of dust during saw cutting and chipping of concrete along lock walls

Slight reduction in air quality, due to exhaust emissions (and fugitive dust) from the operation of heavy equipment used for project construction. Please note that heavy equipment/vehicle exhaust emissions contain contaminants which include, but not limited to: carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxide (SO₂), fine particulate matter (PM 2.5, PM10), polycyclic aromatic hydrocarbons (PAHs), benzene, 1,3-butadiene, formaldehyde, acetaldehyde and volatile organic compounds (VOCs). Most of these substances are designated as toxic under the Canadian Environmental Protection Act (CEPA)

Minor potential for noise pollution

Increased noise may disturb nearby wildlife.

Soil Quality

Minor potential for accidental spills from equipment and/or refueling that could lead to soil contamination.

Potential for soil compaction due to heavy equipment, Potential soil/water contamination due to accidental fuel spill.

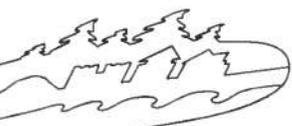
Potential for water contamination due to releases of suspended sediment and turbid water, and alkaline cement leachate from the proposed concrete works: Concrete wash-water is frequently highly alkaline and has a very high content of suspended sediments. Although cured cement generally has a lower pH than its uncured state, it is also alkaline, and can also impair water quality when fine concrete debris, or water in extended contact with cement surfaces, is released to water bodies. The effects of high pH on fish may include death, damage to outer surfaces like gills, eyes, and skin and an inability to dispose of metabolic wastes. Fine sediments can clog fish gills, smother habitat and impair feeding ability.

Wildlife and Vegetation

Minor damage could be caused to surrounding turf/or vegetation

Short term potential for impacts to wildlife during construction activities

Attraction of avifauna and wildlife to garbage food sources



**Cultural**

Operation of heavy equipment on soft soil, or excavation (though none is planned for this project), may have impacts on archaeological resources.

Repair work on heritage resources that is not done in compliance with the Cultural Resources Management Policy could have a negative impact on the cultural resources at Black Rapids lock station.

Socio-economic Resources

Construction work may temporarily restrict visitor use and enjoyment of the lock station. Access to land east of the lock will be impacted during construction activities as pedestrian access over the lock gates will be closed during construction.

Health and Safety

Potential danger to pedestrians and Rideau Canal staff using the lock station and trails during construction.

Potential for impairments to workers health during construction. Safety risk associated with project activities (e.g. working near water, use of power tools, etc.).

11. MITIGATION MEASURES

See appendix # 3

12. IMPACT SIGNIFICANCE

Following the application of mitigation measures, environmental effects are not expected to be significant as they are small magnitude, short duration, and confined to the immediate work area. Impacts would be considered to be of low concern. Provided that the work is done in compliance with the conditions of this BIA and the Cultural Resources Management Policy, the project is not expected to have adverse impacts on the commemorative integrity of the Rideau Canal.

Residual Effects

Taking the implementation of mitigation measures into consideration, no adverse environmental effects are expected to persist after the project activities are completed. Construction impacts will either be mitigated or be temporary in duration and low in magnitude. Therefore no residual effects are expected.

Cumulative Effects

Cumulative effects are changes to the site that caused by this project in combination with other past present and future initiatives. Given that the project is limited to within the national historic site and will occur within a short time period, there are a few opportunities for this project to interact with other activities in the area. A review of EA files does not indicate any other proposed projects at Black Rapids lock station. Our project for the Black Rapids Dam Rehabilitation will have no potential impact. The City of Ottawa Prince of Wales Drive Widening Project may be occurring at the same time as this project; however, the only potential impact would be that access to and from the lock station could be controlled by temporary traffic lights or traffic-directing personnel if construction is occurring in this section of Prince of Wales at the same time.

13. SITE INSPECTION

Site inspection not required

Site inspection required

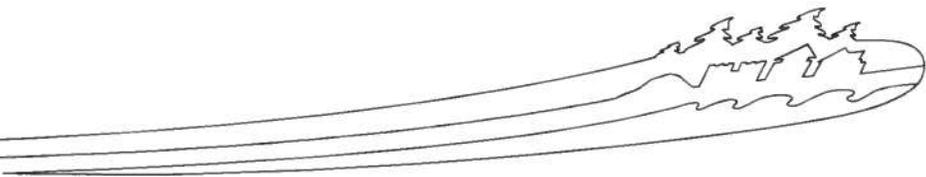
Site Inspection program details

Harry Szeto, 613-283-7199 ext. 274

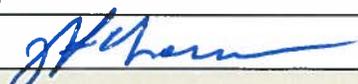
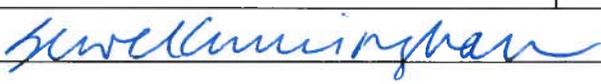
14. EXPERTS CONSULTED (Including PC Experts)

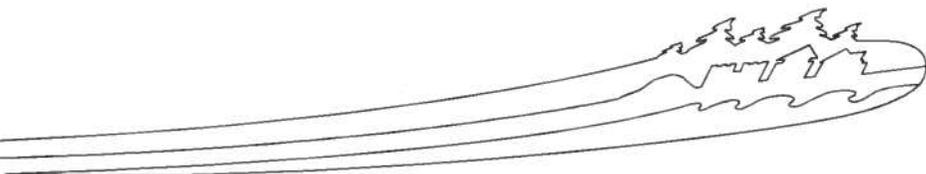
Department/Agency/Institution

Paul Couture (2010)



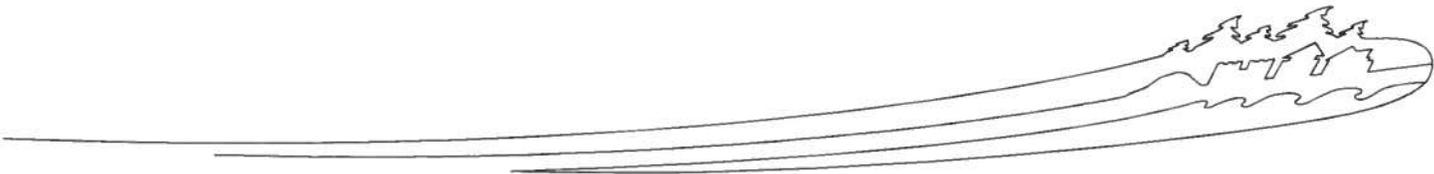


Contact Information	CRM Expert, OSC, Parks Canada Agency, Cornwall Ont. 613-9938-5901
Date of Request	2010-04-14
Expertise Requested	CRM
Response	No CRM Concerns
Department/Agency/Institution	Stuart Niven
Contact Information	Sr. Habitat Biologist, DFO, Great Lakes, P.O. Box 1000, Prescott, Ont., K0E 1T0
Date of Request	2010-04-27
Expertise Requested	Fisheries Habitat/EA
Response	No Fisheries Habitat Concerns
15. PUBLIC PARTICIPATION	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes
16. DECISION	
Taking into account implementation of mitigation measures outlined in the analysis, the project is:	
<input checked="" type="checkbox"/>	Not likely to cause significant adverse environmental effects.
<input type="checkbox"/>	Likely to cause significant adverse environmental effects.
SIGNATURES AND APPROVAL	
EA Author	
Name: Harry Szeto	Title: Environmental Assessment Officer (Rideau Canal)
Signature 	Date 2015-06-24
REVIEW BY	
Name: Jean-François Charron	Title: Project Engineer/Project Manager
Signature 	Date 2015-06-26
DECISION APPROVAL	
Name: Jewel Cunningham	Title: Director, Ontario Waterways Unit
Signature 	Date 2015-06-30





17. REFERENCE LIST
Baldwin, M. 2008. "Environmental Assessment Screening Report for Installation of Shore-Based Power for Boaters at Narrows, Black Rapids, Poonamalie, and Lower Brewers, Lock Stations, Rideau Canal." Parks Canada.
Canadian Museum of Nature 2007. The Nature of the Rideau River. www.nature.ca/rideau
Couture, P. April 2010. Personal Communication with Senior CRM Advisor for Parks Canada.
Parks Canada. 2005. "Rideau Canal National Historic Site of Canada Management Plan"
Parks Canada. 2007. "Rideau Canal and Trent-Severn Waterway National Historic Sites of Canada: Policies for In-Water and Shoreline Works and Related Activities"
Watson, K. 2009. www.rideau-info.com/canal/history/hist-canal.html
Brooks, R. April 2010. Personal Communication with Parks Canada Archaeologist
18. ATTACHMENTS LIST
See Appendix # 4 & 5
19. ADDITIONAL CONSIDERATIONS / COMMENTS
N/A





Appendix 1: Effects Identification Matrix (use and include when useful)

EFFECTS IDENTIFICATION MATRIX														
Use the following matrix to identify if your project may have potential impacts on components of the environment		Components of Environment and Mandate Elements Affected by Environmental Change												
		Natural Resources					Cultural Resources		Visitor Experience					
		Air	Soil	Water	Flora	Fauna	Historic Value	Character defining elements	Viewscape	Visitor appreciation & access	Recreational /other opportunities	Public Safety	Unique character & connection to place	
Phases	Examples of Associated Activities													
Project Components	Construction/Preparation	Supply and storage of materials	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Clearing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Removal/Replacement	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Disposal of waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Blasting/ Drilling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Dredging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Drainage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Excavation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Grading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Backfilling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Use of machinery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Transport of materials/ equipment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Building of fire breaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Use of Chemicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Set up of temporary facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Operation/Implementation Decommissioning	Waste disposal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Wastewater disposal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Use/Removal of temporary facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Use of Chemicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Active fire stage		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Prescribed burn cleanup		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Planting		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Culling		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Vehicle Traffic		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Other...		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		





Appendix 2: Species at Risk Considerations (use and include as required)

SECTION A: POTENTIAL ADVERSE EFFECTS ON SPECIES AT RISK (SAR)	
If a project has potential for adverse effects on a species at risk, or its critical habitat, the following information must be provided:	
1. SARA NOTIFICATION	
Will the potential adverse effects on a species at risk or its critical habitat go beyond lands administered by Parks Canada?	
<input checked="" type="checkbox"/> No	SARA notification not required.
<input type="checkbox"/> Yes	Notify Environment Canada for terrestrial species, and Fisheries and Oceans Canada for aquatic species.
Nature of Notification	Response
2. SAR MITIGATION MEASURES	
Identify all feasible measures that will be taken to avoid or lessen potential impacts of the project on any species listed in SARA (its individuals, the residences of the individuals or the critical habitat of the species ¹). Measures are to be consistent with applicable recovery strategies and action plans. E.g. Conditions recommended by an animal care committee or by a recovery team as SAR mitigation measures.	
3. SAR MONITORING	
Describe how any potential adverse effects on a listed species, or its critical habitat will be monitored. Monitoring methods must be compatible with recovery strategy or action plan for these species.	
SECTION B: SARA AUTHORIZATION	
To make an environmental assessment report into a SARA authorization, include the following information: NOTE - Please consult Parks Canada's SAR permitting training to determine when an authorization is required, if it can be issued, and what must be posted on the SARA registry. If this authorization relates to an activity that may affect critical habitat please immediately contact the National Manager, Species Conservation and Management, Natural Resource Conservation Branch.	
1. POSSIBLE ALTERNATIVES	
Outline all reasonable alternatives considered (alternatives to project; alternative means of carrying out project) to reduce impact on the species. <i>Include a brief explanation of the rationale for the chosen option being considered the best solution for the species and why the other alternatives are not appropriate or are less favoured options for the species.</i>	
<i>Questions that might be of use analyzing various options:</i>	
<ul style="list-style-type: none"> • What are the possible effects of the various alternatives to the project, including no action? • Is this the best solution? • Is there another way to carry out the project? 	
<i>Include other factors such as relative costs, socio-economic issues, and public comments where appropriate.</i>	
2. SIGNIFICANCE	
Identify whether activities would jeopardize survival or recovery of the species by referring to the COSEWIC ² assessment, and, if available, to the recovery strategy or action plan that identifies population and distribution objectives for the species. For example:	
<ul style="list-style-type: none"> • Indicate whether the project will increase mortality or decrease fertility (will the activity affect a key stage of the life cycle of the species?) • In some cases you can refer to experience with similar activities and whether they resulted in any death or important sub-lethal effects. 	

¹ SARA is meant to have broad application so includes consideration of impacts to the individual members, residences, and critical habitat of a species.

² COSEWIC – Committee on the Status of Endangered Wildlife in Canada. Multi-disciplinary expert committee which assesses species status in Canada.





Appendix # 3 Mitigation Measures

Safety Standards

- The Canadian Occupational & Safety Regulations will be strictly adhered to during all stages of work perform, in order to ensure safety of staff and others at all times.
- Meet or exceed the requirements of all applicable federal and/or provincial health and safety legislation, regulations, and permits.
- Ensure all workers wear protective gear (for example, safety work boots, hard hats, etc.) in accordance with the Occupational Health and Safety Act and regulations.
- Restrict public access to active work areas to minimize potential accidents.
- Implement pedestrian control plan to prevent land access to the work site.
- Minimize construction timing to reduce the period of visual disruption.

Work Restriction Periods; Migratory Bird Nesting and Fish Spawning Periods

- Do not schedule removal of vegetation between April 15 – August 01 to avoid destruction of active migratory bird nests, breeding, migration/staging, hibernation or nursing periods. (Note: work can continue following the identify mitigation measures until May 15, 2016)
- No in-water work permitted between March 31-July 15. (Note: work can continue following the identify mitigation measures until May 15, 2016)
- Contact Harry Szeto (harry.szeto@pc.gc.ca, 613-283-7199 ext. 274, Rideau) for more detail.
- Conduct disruptive (i.e. noise generating) activities outside of breeding season, sensitive migration, hibernation, or nursing periods.

Cultural Resources

Commemorative Integrity refers to the condition or state of national historic site when the site has retained the heritage value for which it was designated.

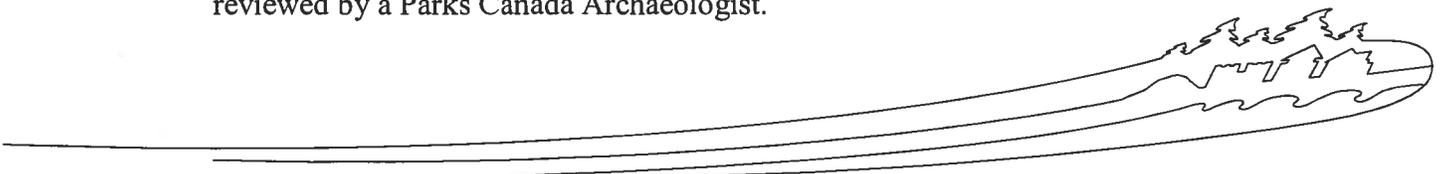
- Rehabilitated works are to be designed to respect the principles identified in the **Parks Canada Cultural Resources Management Policy**, in particular, Appendix 2: **Application of Commemorative Integrity to National Historic Sites:** 1) The resources directly related to the reasons for designation as a national historic site are not impaired or under threat: This element refers to the protection of cultural resources of national historic significance, which is an important element of Parks Canada's mandate. The priority is to conserve cultural resources that are critical to the commemorative integrity of Rideau Canal National Historic Site over the long term and to avoid or mitigate significant threats from natural processes or human action or inaction, using sound heritage conservation practices.
- **General Standards for Preservation, Rehabilitation and Restoration**, Conserve the heritage value of the Rideau Canal, Do not remove, replace or substantially alter its intact or repairable character-defining elements. Do not move a part of Rideau Canal if its current location is a character-defining element. Maintain character-defining elements on an ongoing basis. Repair character-defining elements by reinforcing their materials using recognized conservation methods. Replace in kind





any extensively deteriorated or missing parts of character-defining elements, where there are surviving prototypes. Make any intervention needed to preserve character-defining elements physically and visually compatible with the historic place and identifiable on close inspection.

- **Additional Standards Relating to Rehabilitation** 10) Repair rather than replace character-defining elements. Where character-defining elements are too severely deteriorated to repair, and where sufficient physical evidence exists, replace them with new elements that match the forms, materials and detailing of sound versions of the same elements. Where there is insufficient physical evidence, make the form, material and detailing of the new elements compatible with the character of the Rideau Canal. 11) Conserve the heritage value and character-defining elements when creating any new additions to the Rideau Canal or any related construction. Make the new work physically and visually compatible with, subordinate to and distinguishable from the Rideau Canal. 12) Create any new additions or related new construction so that the essential form and integrity of the Rideau Canal will not be impaired if the new work is removed in the future.
- **Additional Standards Relating to Restoration** 13) Repair rather than replace character-defining elements from the restoration period. Where character-defining elements are too severely deteriorated to repair and where sufficient physical evidence exists, replace them with new elements that match the forms, materials and detailing of sound versions of the same elements. 14) Replace missing features from the restoration period with new features whose forms, material and detailing are based on sufficient physical, documentary and/or oral evidence.
- Cultural resources should be distinguishable from, and not overwhelmed by, effects to conserve, enhance and present them. New work of all kinds will be distinguishable from the work of the past. New work will be sensitive to the historic character of the resource or resource of which it forms a part and will not overwhelm those resources. Reconstructions and reproductions of past forms should not be confused with what is genuinely the work of the past. Reproductions and reconstructions will be suitably marked so as to distinguish them from the original and, in the case of national historic sites, will not be used when they impair the commemorative integrity of those sites.
- If any undocumented cultural resources are found during the project, such as, an archaeological resource or piece of machinery that has been identified as an object of historic significance to the Waterway, work shall cease. Contact Rachel Brooks (rachel.brooks@pc.gc.ca 613-938-5762) and Harry Szeto (harry.szeto@pc.gc.ca, 613-283-7199 ext. 274, Rideau) for more detail.
- If any excavation work is done, the area must be examined and reviewed by Park's Canada archaeologist: Rachel Brooks, prior to the commencement of the excavation.
- Any changes or additions to the original project that involve excavation should be reviewed by a Parks Canada Archaeologist.





- Should any pre-contact or historic archaeological materials be found during any construction activities within the original Rideau River footprint; Parks Canada Underwater Archaeology Service, (613) 993-2125, and Rideau Canada National Historic Site of Canada Office – Contact: Harry Szeto (harry.szeto@pc.gc.ca, 613-283-7199 ext. 274), should be contacted immediately.
- In the event that human remains are encountered during construction activities, both Parks Canada, Harry Szeto (harry.szeto@pc.gc.ca, 613-283-7199 ext. 274, and the Registrar or Deputy Registrar of the Cemeteries Regulation Unit of the Ministry of Small Business and Consumer Relations, (416) 326-8393, should be notified immediately.

Species At Risk (SAR)

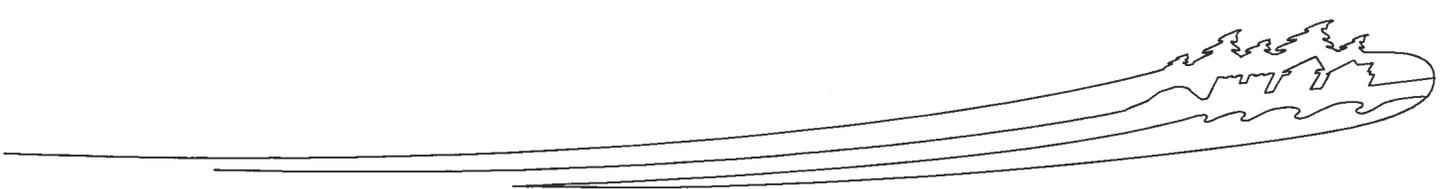
- Should work-related activities have potential to negatively impact SAR, Contact Harry Szeto (harry.szeto@pc.gc.ca, 613-283-7199 ext. 274, Rideau) or Eileen Nolan (Eileen.nolan@pc.gc.ca, 705-750-4959, Trent) for more detail.

Noise Restrictions

- Adhere to local noise by-laws, notify residents of planned activities that may cause disturbance and schedule them to avoid sensitive time periods and ask them to stay clear of site.
- Conduct work during normal business hours and in accordance with local noise bylaw.
- Monitor and mitigate public complaints by keeping a record of complaints and addressing issues raised by the public should they arise.

Sediment Control

- Prior to commencement of work, install sediment and erosion control measures.
- These measures shall be maintained throughout the project lifespan to prevent entry of sediment into the water.
- All sediment and erosion control measures shall be inspected daily to ensure they are functioning properly and maintained and upgraded as required.
- In the event the sediment and erosion control measures are not functioning, the supervisor shall order the work stopped. No further work shall be carried out until the sediment control plan is adjusted to address the sediment problem.
- Erosion and sediment control measures shall remain in place and maintained until project activity is completed and the site has been stabilized.
- Remove accumulated sediments prior to removing erosion control measures.
- Avoid intercepting aquifers; avoid unnecessary disruption of active tile drains.
- Maintain surface drainage, ponding, existing soil and ground cover conditions, etc. in groundwater recharge areas.
- Following completion of work, and prior to removal of sediment and erosion control measures all disturbed surfaces and shorelines shall be stabilized and re-vegetated with native species only, as soon as possible.
- Direct surface runoff away from work areas and into adequately vegetated areas.





Erosion Control

- Avoid activity during wet weather conditions and ensure that a consistent access route is used and maintained throughout vegetation clearing.
- Maintain effective surface drainage, ensure work does not promote flood hazards or create undesired obstructions to drainage into natural water bodies.
- Direct runoff and overland flows into adequately vegetated areas, away from water bodies, working areas and areas of exposed soils.
- Stabilize slopes afterwards as appropriate for local site conditions; possible methods include: grading to a stable slope, hard and soft designs or combinations of designs using riprap, crib walls, revetments, erosion control blanket, brush bundles and replanting with native species.
- Implement mitigation measures in accordance with any requirements and recommendations stipulated by authorities under the Fisheries Act.
- Should conditions at the work site indicate that there are unforeseen negative impacts to fish or their habitat, all work shall cease until the problem has been corrected and/or DFO are consulted.

Staging Area

- An emergency spill kit shall be kept at the site and deployed immediately should a spill occur. In the case of a spill contact your supervisor, Ontario Spill Action Center shall be notified immediately at 1-800-268-6060, all provincial and federal regulations are to be adhered to. Maintain an adequate supply of clean up materials on-site.
- All equipment used for the purpose of vegetation removal shall be maintained to avoid leakage of fuels and liquids and stored and operated in a manner that prevents any deleterious substances from entering the water.
- Store all oils, lubricants, fuels and chemicals in secure areas on impermeable pads.
- Refuelling of equipment and maintenance shall be conducted off slopes and away from water bodies on impermeable pads or buried liners to allow full containment of spills at a recommended distance of 30 meters from any watercourse.
- No tools, equipment, temporary structures or parts thereof, used or maintained for the purpose of this project, shall be permitted to remain at the site or enter the water after completion of the project.
- Upon completion of the work all debris shall be completely removed and the area restored to its original state or better. Repair all damages to property due to project activities. Replace riparian trees, shrubs and other deep root vegetation. Stream banks and shorelines fully restored and re-vegetated to near original soil materials and contours where this activity does not conflict with the purpose of this project, restore





area with fast-growing, low maintenance, diverse native species adapted to the project area to enhance the local plant community.

Watercourses

- Existing stream flows shall be maintained; no barriers or culverts shall divert or interfere with natural watercourses. Ensure work does not promote flood hazards or create undesired obstructions to drainage into natural water bodies.
- Ensure navigation is not disrupted, clearly mark silt curtains for boaters (day and night).
- Installation of any buoys to mark navigation channels must comply with Canadian Aids to Navigation Standards and the Private Buoy Regulations.
- If using cofferdams, consider installing piping to allow for sufficient water flow downstream and avoid flooding upstream.
- Where require, use clear span or pontoon bridges for temporary crossings, where possible, avoid locating temporary bridges at steam bends, avoid fording watercourses.

In-water Work/Pumping of Water

- Pump water into settling pond or into adequately vegetated areas to filter any sediment before draining into waterway.
- During in-water work, if pumping water into settling basin or land-based bladder, any fish in area to be dewatered must be captured alive and immediately released live upstream of the work area. This must occur prior to commencement of pumping and in such a fashion as to minimize or eliminate any stress to the fish.
- Avoid intercepting aquifers and maintain surface drainage, ponding, existing soil and ground cover conditions, etc, in groundwater recharge areas.
- If pumping water into settling basin or land-based bladder during in-water work, fish in area to be dewatered must be captured alive and relocated outside cofferdam or work area before commencement of pumping.
- Implement mitigation measures in accordance with any requirements and recommendations stipulated by authorities under the Fisheries Act (note that dewatering fish habitat for extended periods of time may result in a harmful alternation disruption destruction (HADD) of fish habitat)
- Should conditions at the work site indicate that there are unforeseen negative impacts to fish or their habitat, all works shall cease until the problem has been corrected and/or any required input can be obtained from Department of Fisheries and Ocean (DFO).
- Any equipment operating in water bodies must be cleaned prior to entering the water and inspected daily for leaks; never leave equipment in the water overnight, refuel equipment off slopes and away from water body/aquatic habitat.





Stockpiling

- Do not stockpile on high-risk areas with unstable slopes; keep site clearing to a minimum to maintain vegetative cover and windbreaks.
- Implement wet weather restrictions for construction activity.
- For sloped rock revetments, establish a slope no greater than 2:1 (horizontal; vertical).
- Re-grade immediately upon completion of project and site cleanup.
- Avoid stockpiling during dry and windy periods and limit size of stockpiles to avoid anaerobic conditions.
- Install a tarpaulin on stockpiles and haulage trucks as appropriate.
- Instruct workers and equipment operators about dust control methods. Monitor dust conditions visually and take actions to suppress dust as necessary.
- Maintain consistent access route where possible.
- Maintain effective surface drainage. Ensure work does not promote flood hazards or create undesired obstructions to drainage into natural water bodies.
- Undertake misting, created localized wind barriers, use tarps to cover loads, or implement other methods particularly during dry, dusty conditions to avoid generating airborne or surface dust and particulates.

Heavy Equipment & Machinery

- Use new or well-maintained heavy equipment and machinery, preferably fitted with fully functional emission control systems/muffler/exhaust system baffles, engine covers, etc.
- Check equipment and machinery prior to entering site to ensure they are clean; if not, clean them before entering site.
- Minimize vehicle idling and minimize vehicle traffic on exposed soils.
- Ensure refuelling and handling of contaminants are located off-site where possible, and well away from critical wildlife habitat.
- Refuel equipment off slopes and away from aquatic habitats/water bodies.
- Avoid fording watercourses or operating equipment within water bodies below the normal water level (N/A for lock/dam maintenance). Any equipment operating in water bodies must be cleaned prior to entering the water and inspected daily for leaks; never leave equipment in the water overnight.
- Stabilize high traffic areas with clean gravel surface layer or other suitable cover material, minimize vehicle traffic on exposed soils.
- Instruct workers and equipment operators on dust control methods and take actions to suppress dust as necessary.





Spill Response Procedure

- Once a spill (regardless of severity) has been identified, it is the responsibility of the Site Supervisor to ensure that the MOE is notified through its Spills Action Centre (1-800-268-6060); Parks Canada - Harry Szeto (harry.szeto@pc.gc.ca, 613-283-7199 ext. 274) will also be notified. In addition, any spill which is greater than 5L must be reported to the appropriate Provincial authority and to the NCC.
- Proper spill control equipment/items (spill kits, MSDSs, absorbents, containers, caution sign/tape, etc) will be readily available in areas where large quantities of hazardous materials are to be stored.
- In case of small spills less than 2 feet in diameter, a trained employee shall quickly control the spill by securing the spill source, whether it be by standing up a tipped-over container or using absorbent pads to soak up spilled material. The spilled material shall then be secured in a container and disposed of in accordance with the recommendations stated on the MSDSs or as directed by a member of MOE.
- In the case of medium size spills (2 to 6 feet in diameter), immediate action shall be taken to contain the spill by up righting a container or covering it with a lid. In the event that the spill cannot be quickly contained, MOE's Spill Action Centre shall be alerted immediately and the area should be evacuated at that point. The area outside of the spill area shall be evaluated to determine if any equipment (engines, generators, power equipment, etc.) needs to be turned off. Once the spill area has been evacuated, it should not be entered back into. When emergency responders have arrived and successfully contained the spill, the employee should be in position to provide prompt assistance from outside the spill area by providing them with MSDSs, absorbents, and containers.
- For larger spills (over 6 feet in diameter) where a continuous flow of hazardous chemical is observed at the source of the spill and cannot be stopped, or in cases where the spill involves a flammable liquid, the area should be evacuated immediately and the Spills Action Centre should be alerted immediately. Specific information shall be provided as to the location, and the type and approximate quantity of chemical spilled. The supervisor/employee shall make available MSDS information for the emergency responders to use, and advise them of the location of any power sources that will need to be shut off. The emergency responders shall also be informed of the location of any absorbents, containers or other spill control equipment that is available. It is a point of emphasis to our employees that in such scenarios they may not re-enter the premises until the area has been deemed all clear by the emergency response team. The worker shall cooperate by providing any information that is necessary for reporting to their supervisor and emergency responders.

Waste Disposal

- Implement construction, renovation, and demolition (CRD) waste measures for solid, non-hazardous material generated during construction, demolition, and/or upgrades as per Chapter 9 of the PWGSC document entitled, *The Environmental Responsible Construction and Renovation Handbook (PWGSC, 2000)*.





- Waste generated will be disposed according to regulations (i.e. O. Reg. 102/94 and O.Reg. 558/00, R.R.O. 1990, 347).
- A solid waste management program will be implemented for typical debris handling and disposal.
- Comply with the requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials and regarding labelling and the provision of material safety data sheets acceptable to Labour Canada.

Concrete Usage

- All concrete, sealants or other compounds used for this project shall be utilized according to the appropriate Product Technical Data Sheet, stating guidelines and methods for proper use, and provided by the manufacturer of the product. Refer to following web link for additional guidelines for working with concrete around water:
<http://www.env.gov.bc.ca/wld/BMP/concrete.html>
- As concrete leachate is alkaline and highly toxic to fish and other aquatic life, ensure that all works involving the use of concrete, cement, mortars, and other Portland cement or lime-containing construction materials (concrete) sediments, debris, concrete, concrete fines, wash or contact water do not deposit, directly or indirectly, into or about any watercourse. Concrete materials cast in place must remain inside formed structure. Provide containment facilities for the wash-down water from concrete, from concrete delivery trucks, concrete pumping equipment, and other tools and equipment. All concrete wash water will be disposed of offsite in a location where it will not enter subsurface drains, water bodies or storm drains. Prevent water that contacts uncured or partly cured concrete during activities like exposed aggregate wash-off, wet curing, or equipment washing, from directly or indirectly entering any watercourse or storm water system. Maintain complete isolation of any watercourse or storm water system. Maintain complete isolation of all cast-in-place concrete and grouting from fish-bearing waters for a minimum of 48 hours if ambient air temperature is above 0°C and for a minimum of 72 hours if ambient air temperature is below 0°C isolate and hold any water that contacts uncured or partly cured concrete until the pH is between 6.5 and 8.0 pH. Use only non-toxic biodegradable form stripping agents.
- As concrete leachate is alkaline and highly toxic to fish and other aquatic life, ensure that all works involving the use of concrete, cement, mortars, and other Portland cement or lime-containing construction materials (concrete) will not deposit, directly or indirectly, sediments, debris, concrete, concrete fines, wash or contact water into or about any watercourse.
- Flow downstream of dam must not be altered and remain constant throughout duration of repairs.





- Designated areas will be established to allow concrete trucks to wash out after unloading and discharge their contents no closer than 30 meters from the watercourse or wetland area. The concrete sediments will also be disposed at an approved dumpsite with submission of a “Property owner’s release”.
- Concrete debris from the barge shall be placed into an enclosed container daily, or more frequently if required, in order to ensure that no debris escape or remain at the site.
- Take proactive measures to prevent any construction debris and deleterious substances from entering the water body, such as, dirt, concrete dust/debris and other debris.
- Concrete debris and dust generated as a result of various concrete work shall be removed in a way that will ensure material does not enter the waterway, platforms and or tarpaulins shall be erected as a safeguard to capture additional debris.
- Spoil/aggregate, or any stockpiled material shall be stabilized a minimum of 30 meters from the shoreline, and removed from the site, in accordance with all federal, municipal and provincial regulations.
- Install a tarpaulin/cover on stockpiles and haulage trucks/trailers as appropriate.





Appendix # 4 Project Description

20. Black Rapids Lock 13 Project Description, Scope and Methods of Construction

Project Description

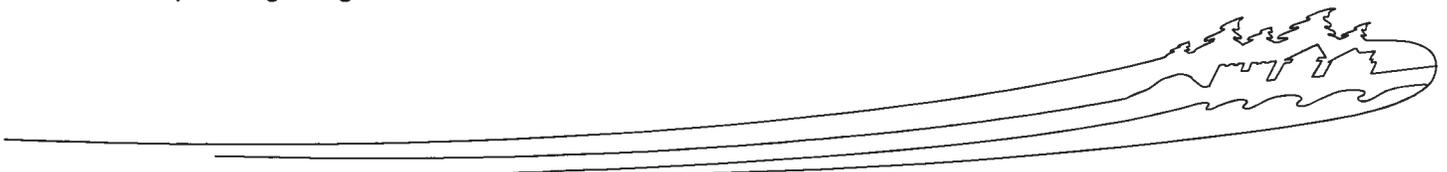
This project involves replacement of the lower and upper timber gates at Black Rapids Lock 13, repairs to masonry walls in the lock chamber and at the lower wing walls and upgrades to the hydraulic operating system for the lock. The lower timber gates will be replaced with steel gates while the upper ones will remain stacked timber gates.

Schedule

It is anticipated that detailed design review will be completed by end of July, 2015 which will be followed by tender call in August. Construction will take place between October 13, 2015 and May 12, 2016.

Methods of Construction

- Presently, the masonry joints near the log checks at the lower wing walls are in poor condition. The masonry joints at the lower wing walls will be repointed with mortar below the water line shortly after the canal closes for navigation on October 13, 2010. This work will be performed by a diver.
- Stop logs will be installed at the upper and lower log checks and the lock will be dewatered.
- The hydraulic lines for the lower gate set will be drained and disconnected. The lower timber gate set will be removed using a crane and the gates will be removed from site for disposal.
- The concrete gate quoins will be excavated (chipped out) using pneumatic chipping hammers. The gate quoins are the rounded surface of the canal walls which are formed to match the rounded heel post on the gates. Steel anchors and reinforcing steel will be installed and then forms will be installed for new quoins to suit the new steel gates. Concrete will be poured for new gate quoins. Forms will be removed after the concrete has cured for five days.
- The concrete mitre on the gate sill will be excavated using pneumatic chipping hammers. Steel anchors and reinforcing steel will be installed and then forms will be installed for the new mitre. Concrete will be poured for new gate sill mitre. Forms will be removed after the concrete has cured for five days.
- Note: If concrete work is done during cold weather (less than 5 deg. C) the area will be enclosed in a tarp and heated using propane or diesel-fired heaters.
- Stone repairs and repointing of masonry will be completed at the lower end of the lock chamber and at the wing walls.
- New steel gates will be installed including new or overhauled hydraulic cylinders for operating the gates and sluice valves.





- New hydraulic lines will be run to the gate and sluice valve operating cylinders.
- Hydraulic valves will be replaced.
- Hydraulic system will be refilled with biodegradable oil and system will be commissioned (tested).
- Stop logs will be removed at upper and lower end of lock.
- Site will be reinstated, i.e. clean-up and re-sod damaged areas.

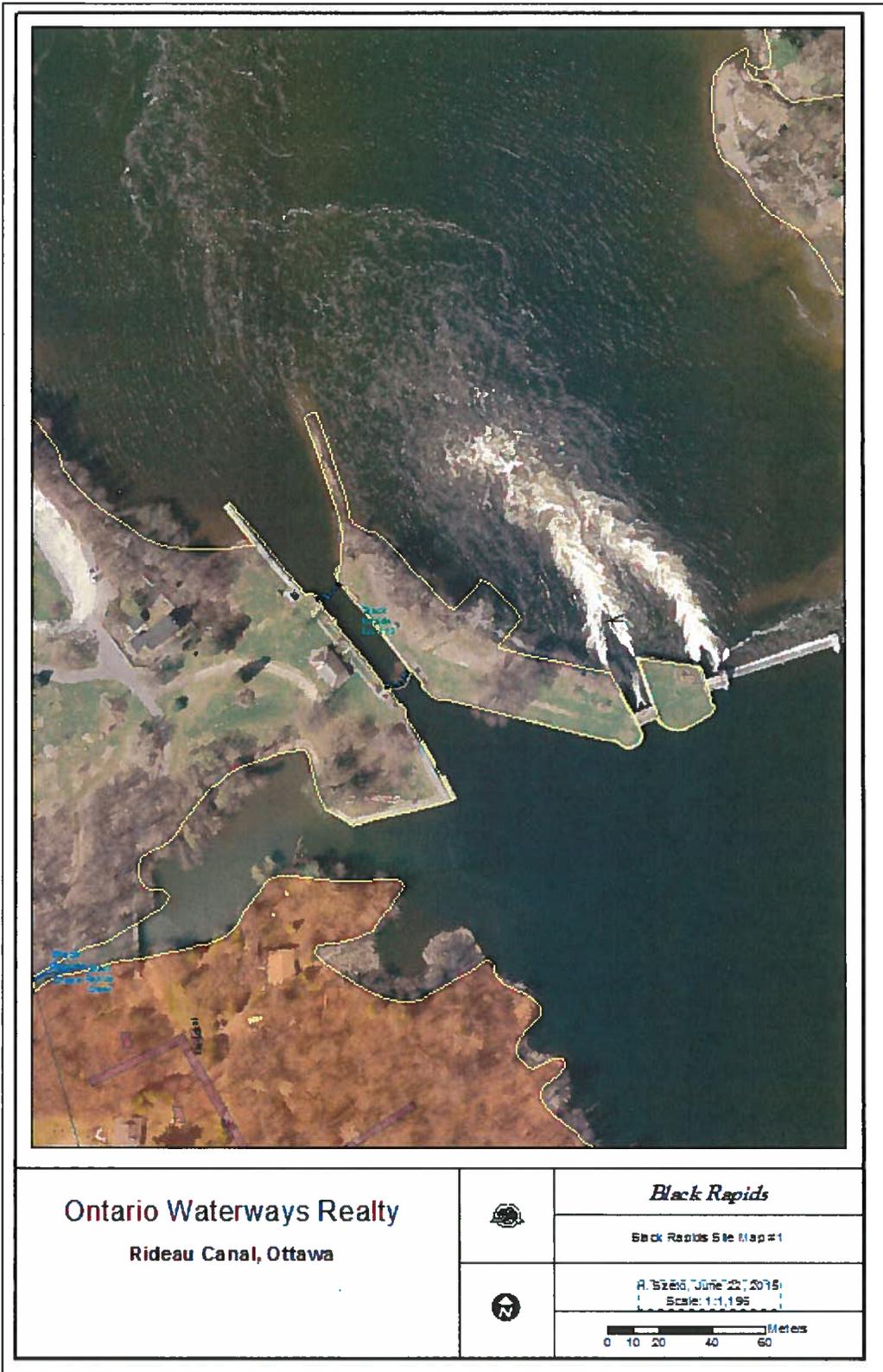
Note: Masonry repointing on lower wing walls will be completed before moratorium on in-water work starts on March 15, 2016. All other work will be done "in the dry".





Appendix # 5 Site Maps







Ontario Waterways Realty Rideau Canal, Ottawa		<i>Black Rapids</i>
		Black Rapids Site Map #1B
		A. Sizem, June 22, 2015 Scale: 1:574
		 0 4.75 9.5 19 28.5 Meters





Ontario Waterways Realty
Rideau Canal, Ottawa



Black Rapids

Black Rapids Site Map #2



A. Szabo, June 23, 2015
Scale: 1:287

0 2.25 4.5 9 13.5 Meters





Ontario Waterways Realty
Rideau Canal, Ottawa



Black Rapids

Black Rapids Site Map #3



A. Szabo, June 22, 2015
Scale: 1:191

