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Opening Remarks:

Good morning,

It is a great pleasure to be here this morning and to share with you, in words and pictures, some of the history of the Rideau Canal.

This presentation is intended as an introduction to the waterway, an overview, looking at some highlights of its remarkable design and construction history and then to talk briefly about its influence and evolution over the past 176 years.

In any discussion of the Rideau Canal – whether it is historical or contemporary – it is difficult to separate the canal itself – the engineering works and the navigation channel – from the environment through which it passes. Each profoundly influenced the other. This reciprocal relationship will be one of the themes of my presentation.

I face a rather daunting task here this morning, to present you with a summary of the canal's rich history in 50 minutes or so. I am fortunate, however, to be able to rely on an arsenal of paintings, plans and photographs that will provide you with a sense of the waterway – its past and present – far better than my words ever can.

Most of the watercolours from the construction and early operations periods that you will see were done by Thomas Burrowes. This remarkable man served in the Sappers and Miners as a corporal but he resigned from the service before canal construction began. He joined the Rideau Canal project as a civilian employee and worked for 20 years – 1826 to 1846 – on the Rideau serving variously as overseer, surveyor and clerk-of-the-works and after the canal's completion as an area superintendent based at Kingston Mills. He was for the most part a self taught surveyor and artist.

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- Traveling Rideau Canal today, it is difficult to imagine that this waterway was built as a key component in the Anglo-American struggle for North America that began with the War of Independence

in the 18th century and continued well into the 19th century. The canal was built for war.

- During the War of 1812-1814, Great Britain's most testing moments came in Upper Canada – present day Ontario – because it was against Upper Canada that the Americans concentrated most of their land and naval forces. The greatest challenge Britain faced was keeping her forces in this remote colony adequately supplied. Every piece of equipment imaginable had to be hauled around or dragged up the rapids of the St. Lawrence River to Prescott and then loaded aboard larger ships and sailed to Kingston – then the largest and most strategically important town in the province.
- The St. Lawrence supply line was slow and extremely expensive but the underlying worry was its vulnerability to an American blockade. This thought haunted British leaders and prompted them to look at an alternate link between Montreal and Kingston. The logical choice appeared to follow up the Ottawa River and then down an old canoe route along the Rideau and Cataraqui Rivers. It was a longer route by

some 50 miles and required numerous portages around rapids, swamps and heavy forests but even so it was deemed preferable the St. Lawrence River.

- By 1814, plans were underway to begin some basic improvements along this interior route but the war ended and the plans shelved. The military, however, continued to see merit in this interior route and for the next ten years they lobbied their government on the need to canalize a link between Kingston and the Ottawa River.
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- Now, in first half of the 19th century canal building was on the minds of more people than British military planners. This was the canal building era in North America. In the United States there was a frenzy of canal construction that saw thousands of miles of canals cut across the landscape. In 1815, there was a total of 15 miles of canals in the US – 25 years later there were 3,300 miles of canals.

- In 1817, construction began on the famous Erie Canal¹ – the canal that would link Lake Erie to the Atlantic Ocean via the Hudson River and New York City.
- News of the Erie Canal created shock waves in colonial Canada. The business interests saw it as an economic threat to the St. Lawrence River trade and the British saw its military potential – to transport men and supplies into the heart of the Great Lakes in the event of war.

- In response to the challenge from the Erie Canal, several canal projects were accelerated in Canada. These included the Lachine Canal that bypassed the rapids at Montreal Island and the Welland Canal that joined Lake Ontario with Lake Erie through the Niagara Peninsula.
- The pivotal moment for the Rideau project was the appointment of the Duke of Wellington to the British Cabinet in 1825. Wellington was a firm believer in the Rideau strategy and once in Cabinet he soon persuaded his colleagues to allocate funds for work to begin on the Rideau Canal. At the same time, the British Parliament approved a budget to upgrade the fortifications at Kingston. Wellington viewed both projects as inextricably linked and vital components for the defence of Upper Canada. I will return to the subject of fortifying Kingston a little later.
- It should be noted that the approval of the Rideau project was based on some very preliminary surveys and, it must be added, on an

optimistically low² cost estimate.

- In March 1826, 46 year-old **Lieutenant-Colonel John By of the Royal Engineers** was appointed superintendent for the Rideau Canal project. John By was not only supervisor of construction, he was responsible for finalizing the route and for developing the plans and specifications of the canal, which, whether he realized it or not, was soon to become the largest and most expensive construction project yet undertaken by the Royal Engineers.
 - By arrived in Canada in the summer of 1826, and he was not here long before he reconsidered the entire scale of the canal. The approved estimates were based on a canal with locks 20 X 108 feet with 4 feet depth similar to the Lachine Canal. Colonel By, however, was intrigued with the changes he saw on the inland lakes and rivers of Canada.
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- Change was in the air and the air was filled with billowing smoke, the sounds of thumping paddle wheels and the toot of steam whistles. Capable of carrying and towing large cargoes at steady speeds and with great reliability, steamboats were changing the character of inland navigation in Canada. By was convinced that a canal designed to accommodate this new technology would well serve both the military and commercial needs of Canada for many years to come. And with this in mind, he set about designing what was likely the first steamboat canal in the world.
- One of his fundamental design concepts was to avoid, as much as possible, excavating channels. Surveys indicated that the route contained extensive stretches of limestone bedrock or Precambrian granite often with only a thin overburden. By calculated that any attempt to excavate long channels through such ground would quickly bankrupt the project. Instead, he adapted his design to the geographic realities of the landscape. His idea was to incorporate the lakes and rivers into his canal system not simply use their water to fill a canal cut.

- This approach may not appear out of the ordinary today, but in 1826 it was very different. John MacTaggart, a civil engineer and clerk-of-the-works described it very well: “ *The Rideau Canal, when constructed, will be perfectly different from any other in the known world, since it is not ditched or cut out by the hand of man. Natural rivers and lakes are made use of for this Canal, and all that science or art has to do in the matter, is the lockage of the rapids or waterfalls. . . .*” To surmount this difficulty,” he continued, “ *dams are proposed . . . by which means the rapids and waterfalls are converted into still water*”
- What MacTaggart described here – the use of dams to create a navigable depth – was known as the still water or slack water system.

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- The principles of this design were well known and they had been applied in a limited fashion on number canals in the past but these were nowhere near the scale By proposed. He intended to apply this design along the entire 200km waterway. This transfer of engineering technology from Europe to North America and the scale of its

application was one of the criteria cited by the UNESCO World Heritage Committee in their designation of the Rideau Canal as a WHS.

- Even if geography permitted, this design would have been impractical in much of Europe and the United States. The design involved extensive flooding and, in populated regions, this would necessitate financial compensation to landowners that would cripple the project. In the wilds of eastern Upper Canada, however, compensation to landowners was not deemed a major problem – although it turned out to be more of an issue than first thought.
- Another unique feature of this canal was that unlike most other canals there would be no tow paths: vessels navigating the Rideau Canal would require self-propulsion oars, sail or steam engine.
- **So it was that geography offered the opportunity for the application of the slack water design, a design, however, that demanded bold engineering in concept and execution and on a scale not yet seen on**

either side of the Atlantic.

- Initially, By proposed a canal system large enough to accommodate lake steamers – with massive locks 50 feet (15m) wide by 150 feet (46m) long and a depth of 10 feet (3m). His superiors, however, who were increasingly nervous about escalating cost estimates, insisted on a more modest scale.
- With this restriction By was forced to re-design the canal to handle river steamers. His locks, however, were still the largest yet seen in North America – 33 feet (10m) wide by 134 feet (41m) long sill-to-sill and with 5 feet of water over the sills. These locks would accommodate vessels up to 110 feet (33.5m) in length.
- The Rideau locks were based on a traditional design but they were substantial structures and built to exacting standards. The walls were rubble stone masonry faced with dressed stone; they were 8 feet (2.5m) thick at the bottom & 5 feet (1.5m) thick at the top plus 2 feet of

clay puddle. The walls were thickened at both upper & lower gates; The depth or height of the lock varied, of course, depending on the change of elevation required – the average Rideau lock is about 8 feet or 2.5m deep.

- What really set the Rideau Canal apart from its contemporaries were the extensive use dams – both in number and size. The plan was to construct high dams wherever possible to create extensive still water impoundments. Although a high dam was more difficult and costly to build, it was less expensive compared to building three or four low dams, each with at least one lock to bypass it.
- Not all sections of the waterway needed high dams and in other sections they were not practical because low river banks would not contain an impoundment.
- In all over 50 dams were built on the system; 9 of these were large keywork stone arch structures – built when this type of dam had yet to be attempted in Britain, France or the United States. Four of the

stone arch dams were overflow types and 5 were high dams – at least 23 feet or higher.

- Of all the engineering works on the canal, the dam at Jones Falls was the most challenging to build and represents the single most remarkable achievement on the canal. It was 62 feet, (27m) high and 400 feet across the top radius – considering its height and breadth it was the largest dam in the world. At its base the stone work was 27½ feet thick – narrowing to 21 feet at the top. On the upstream face it was sealed with several feet clay puddle plus an apron of earth extending out more than a 100 feet.
- Not every stone arch dam was a success. At the Hogs Back lock site, Colonel By planned to build a 50 foot high stone arch dam but on three occasions the partially completed structure was washed away by flood waters. Finally, he was forced to change the design and a timber crib dam was built as the 6th high dam on the canal.
- Today all six of the high dams survive but only two remain visible –

Jones Falls and Long Island – the rest are covered by infill.

- The original plans called for all masonry dams to be the overflow type – even the high dams. However, witnessing the severity of spring floods in Canada and the erosion this caused on the downstream side of the dams, the design was modified. The high dams were raised several more feet so there would be no overflow with water levels regulated by weirs. Even the lower overflow dams were modified with the addition of weirs to better manage the spring run off.
- Here are pictures of a few lockstation plans before they were modified to include weirs.

The Building of the Rideau Canal

- While the Rideau Canal was designed by the British military and financed by the British Treasury, nearly all the construction work was contracted out to civilians.
- In December 1826, newspapers carried ads calling for bids to build sections of the Rideau Canal. By had divided the project into 23 sections and contractors could bid on one or more of these but they could not take on more work than could be completed in two years. By the summer of 1827, 18 contracts were awarded and work was underway.
- Now, the use of multiple contractors working at 23 isolated sites spread across 200 kilometres of rugged countryside might not seem the best way to manage the project. However, in British North America the Royal Engineers were accustomed to managing large projects with private contractors and besides, By had little alternative because

he did not have anywhere near the manpower for the military to undertake the work alone.

- He maintained supervision of the work with the assistance of two, sometimes three, Royal Engineer officers along with several civilian engineers, a clerks-of-the-works and overseers. He also relied on his own tireless energy travelling the line in canoe, inspecting, encouraging and chastising the contractors.
- There were also rank and file soldiers under his command. Two companies of Sappers and Miners, 162 men in all were stationed at various sites along the canal works to guard supplies and to keep the peace in the work camps. On several occasions these artisan soldiers became directly involved with the construction work but this was an exception not the norm.
- Not long after construction was underway supply problems surfaced. Initially, the army's commissariat department was expected to provide the work sites with basic food stuffs, tools, boots, clothing and bedding – but the plan never worked satisfactorily. Despite hiring

dozens of teamsters to haul freight and several hundred French Canadian voyageurs – many on loan from the Hudson Bay Company – to transport supplies by canoe into the Rideau interior there were chronic shortages at many of the work sites that soon threatened to bring the project to a halt.

- The military never did solve this problem, in the end it was the more experienced Canadian contractors that developed a workable logistical infrastructure – using their experience from the logging business. They used their own suppliers to get their camps stocked with necessary food and equipment and most stores were hauled to the work sites on skids and sleighs during the winter when travel was easier. And, as in the logging industry, they did not hesitate to cut new roads through the forests to expedite the supply issue. All of this additional work by the contractors added to the costs.
- Another source of provision were the local farms and small settlements near the Rideau where pioneer farmers rapidly increased production to take advantage of a cash return on their produce.

The Workforce

- During the height of the construction season it is estimated that there were between 3000 and 4000 workers scattered among the 23 work sites. It was a transient workforce and the records that survive give us only a glimpse into their lives. For the most part, it consisted of Irish immigrants and French Canadians plus artisans recruited from the British Isles.
- Many of the Irish labourers were former share croppers, recently displaced by sheep & cattle in their homeland. Some had work experience on other canal projects in either Canada or the United States while others came to the Rideau camps directly off the immigrant ships. Most were unskilled and worked as pick and shovel labourers. They were the largest segment of the workforce – possibly as high as 50% of the total.

- The French Canadians comprised perhaps 40 %. While most were labourers, others were skilled stone masons with experience in construction work in Montreal and other centres. Also, many French Canadians were employed as axmen or canoe men. Canoes were the chief mode of transportation and communication throughout the construction period and the requirements for tree felling was endless.
- From the British Isles the Scotch was the most identifiable group comprising perhaps 10% of the workforce. Most were specialized quarry men or stone masons. The majority had apprenticed on canals in Scotland and they were actively recruited to come to the Rideau.
- If you were a contractor, you would hire either Irish or French Canadian workers because trouble inevitably followed if both groups were at the same work site.
- Living conditions at the work camps were predictably squalid. Frequently there were women and children at the camps because many Irish workers were accompanied by their families. Such people

often built rough cabins near the work camps where they raised a few crops to get themselves through the winter when the works were closed. Others travelled to Bytown to see out the winter with their fellows in that growing community.

- During the first years of construction many of the Irish – men, women and children – suffered terribly. Often weak and sick from their voyage, these people were ill prepared to deal with the cold Canadian winter; hundreds lived in hovels or caves near the canal works at Bytown.
- For many who made their way to the Rideau works, their short lives were marked by dislocation, transience and hard labour punctuated by violence and alcoholism. There was some concerted effort by the military to supply these people with proper clothing and blankets to help them through the winter but often such items were sold or traded. Experience was a harsh teacher and as the years passed there was a discernable improvement in the condition of the Irish workers as they gained experience and skills.

- Throughout the construction period there were acute labour shortages and this helps explain why wages on the Rideau works were above the average for the period and why deductions for food, clothing and other necessities were low. If the pay was late, food in short supply or the whiskey ran out the men did not strike, they left. Such action delayed the project, added to the cost and could easily bankrupt the contractor; both the military and the contractors went to some effort to ensure that the men were paid promptly, that food was plentiful and supplies available at a reasonable cost.
- Nonetheless, work on the canal was brutally hard and very dangerous. Twelve, sometimes 14 hour days, six days a week was typical. Tree and stump removal, drilling and blasting, excavation of lock pits and channels, quarrying and the incessant pumping-out of the lock pits were all done by hand – the technology employed on the Rideau was surprisingly primitive. Added to this were the dangers from blasting and other accidents, the plagues of flies and mosquitoes and the crowded, unsanitary living conditions that bred disease were all part of

working life building the canal. Death and injury were common and there was scant medical care available even if a worker could afford it and little or no compensation for an injured worker or his family.

- Malaria, sometimes called “ swamp fever” or “ ague” , was the worst affliction suffered by those who toiled on the Rideau works. The disease appeared in late summer throughout the construction years. It attacked indiscriminately – workers, soldiers, contractors, engineers – Colonel By got the disease and he nearly died from the attack. In the summer of 1828 all work in the southern half of the canal came to a halt because so many workers were sick and most of the remainder had fled.
- We do not know the number who died from malaria through the six years of construction but it could have been as high as 500 and this does not account for the deaths of the women and children who lived on or near the camps. Overall mortality during the construction period is estimated at a 1000 lives.

- Besides the costs in human suffering, the impact of Malaria was another factor pushing up costs – costs that were beginning to attract the attention of the Lords of the Treasury in far distant London.

Completing the Canal

- Colonel By was well aware that the project was behind schedule and over budget but the work pressed on.
- Besides the supply issues and labour shortages that I mentioned, there were other problems facing the canal builders. Locating good stone close to the work sites was a recurring problem in the southern sector of the system. The normal practice was to open a quarry – either limestone or sandstone – close to the work site because moving large quantities of stone was very expensive. If good stone could not be located nearby there was little choice but to pay the higher transportation costs.
- Another issue was paying compensation to those who lost land

from flooding or expropriation. Frequently landowners mysteriously appeared claiming title to a piece of swampy ground and indignantly demanding compensation. This was costly and time consuming business because many claims were exaggerated or fraudulent.

- There were also difficulties with the contractors. A number went bankrupt and simply abandoned their sites leaving the work incomplete. A number of others had their contracts terminated because their work was not up to standard. Out of the 18 contractors who successfully bid on the project, only four completed their work to Colonel By' s satisfaction.
- Not surprisingly, the project encountered numerous engineering challenges. There were the dam failures at Hogs Back for example. Many problems arose because the initial surveys were done hurriedly, often in swamp or dense forest, and details were missed which necessitated design changes on the spot.
- At Newboro, the highest point on the system, the plan called for the excavation of a simple channel a mile and a half long, 46 feet

wide and 13 to 20 feet deep to connect the headwaters of the Rideau and Cataraqui systems. The survey, however, missed the fact that channel would have to be dug through Precambrian granite. This proved the undoing of two contractors and then the site was hit with severe outbreaks of Malaria. Two years in succession and the workers who did not succumb to the disease refused to return to the site.

- Colonel By was forced to put Newboro under direct military control and he ordered one company of Sappers and Miners to assist at the works. In order to attract a new workforce he increased wages, built a hospital right at the site and promised the workers free medical care. Even with these efforts the excavation at Newboro fell further behind schedule. Eventually By redesigned this section of the canal building two additional locks so the channel was not required to be so deep. And the costs were spiraling upwards.
- Despite the delays and cost overruns, all the engineering structures along the canal were completed by the fall of 1831 – the work had taken less than 6 years. And the following spring, May 24, 1832,

Colonel By, his family and various dignitaries left Kingston on Lake Ontario aboard the steamboat *Pumper* and five days later arrived in Bytown on the Ottawa River. The canal was open to navigation as it would be every year for the next 176 years.

- There is a rather somber post script to the construction story: Three months after his first trip through the canal, Colonel By received orders to return to England where he faced two Parliamentary enquiries concerning cost overruns. The final cost of construction was £822,000 – some 60% higher than the approved estimates. By, had kept detailed records of the work and associated costs and he was exonerated of any wrong doing. Nonetheless, he believed there was a stain on his record.
- Unfortunately, By was caught in a political struggle between the Tories with close ties to the army and Reform party. Even though he was cleared, the Reform government refused to grant him any public recognition; in fact, when the army proposed that By receive an award, the government blocked it.

- By was terribly disappointed and in 1833, in failing health, he retired to his home in Sussex. He died in 1836 at age 56 just four years after he left Upper Canada.

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- In the time that remains we will look at a number of points concerning the impact of the canal on the Rideau region and to highlight a few factors that contributed to the survival of the waterway down to the present day.
 - First, however, I want to give you a bit of background concerning the fortifications in Kingston harbour.
 - Kingston possesses an excellent natural harbour situated as it is at the mouth of the Cataraqui River; in addition it is located at the confluence of Lake Ontario and the St. Lawrence River. Before the coming of the railways, this place was of immense military and commercial importance – it was the gateway to the Great Lakes.

- The French recognized its significance and built a post here in 1673; a British garrison was established in 1783.
- During the War in 1812, the dockyards and the harbour were of critical importance to the war effort in Upper Canada and the British built a number of temporary defensive works around the harbour.
- When the British government approved funding for the Rideau Canal in 1825, it also allocated monies for the construction of extensive fortifications in Kingston Harbour to defend the dockyards and the southern terminus of the canal. But as the bills for the canal kept mounting, work on the Kingston defences was scaled back.
- In 1832, the year the canal was completed, work began on the new Fort Henry. This fortification was unprecedented in terms of its scale, design and cost anywhere in British North America west of Quebec City. Fortifications in Upper Canada usually consisted of a simple blockhouse and some earth works – so Fort Henry was extraordinary. Despite its impressive size and cost, Fort Henry was never designed to defend the harbour on its own. The Royal

Engineers planned a network of inter-connected, supporting batteries and redoubts around the harbour to augment the fort. But these were never built.

- It was not until the mid-1840s, when the Oregon boundary dispute raised the threat of war with the United States, that the British allocated funds to upgrade the Kingston harbour defences. This involved adding the ditch towers on the east and west glacie of Fort Henry, rebuilding Fort Frederick and the construction of the Market Battery plus the three Martello Towers around the harbour. Impressive as these new defences were, they were not as extensive as was originally designed.
 - Today only the Market Battery is gone, leaving 5 elements of the historic Kingston Fortifications clearly evident on the harbour landscape. Here, more than anywhere else, the observer understands that the Rideau Canal had a serious military intent. Furthermore, this link between the canal and these surviving defences explains why the World Heritage designation included these magnificent 19th century fortifications.
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Returning now to the canal

- The construction of the Rideau Canal and the opening of navigation 176 years ago held far-reaching implications for both the natural and human history of the Rideau corridor – much of which is still evident as a heritage landscape today.

Turning first to the human history:

- I think I am on fairly safe ground to say the City of Ottawa exists because of the Rideau Canal. Before the canal builders arrived, the place consisted of a few pioneer farm lots but it was mostly scrub bush and cedar swamps; there was a bustling village across the river at Wrightsville, now Gatineau but not Ottawa.
- The arrival of the Royal Engineers in 1826 changed everything. Bytown, as it was known, was construction and administrative headquarters of the canal and the population expanded rapidly. Colonel By bought property and his engineers laid out the streets of the new town – today the street names speak to the British military

influence of the capital: Wellington, Dalhousie, York, Clarence, and Sussex for example.

- If the Royal Engineers had not claimed the headlands just to the west of Ottawa Locks as part of the military reserve lands – there is no doubt that the Parliament of Canada would not be located there today.
- Besides Ottawa, the construction of the canal and the opening of navigation had an immediate and dramatic impact on Rideau interior as well. Settlement and economic growth followed closely on the heels of the canal builders up and down the Rideau Corridor.
- The canal was now the gateway into Upper Canada for goods and people travelling in bound and for agricultural produce and natural resources out bound.
- Beginning in 1835, North America experienced a great wave of immigration mainly from the British Isles and for those heading for Upper Canada the Rideau was the main entryway. Over a 12 year period, an estimated 30,000 immigrants a year passed through the Corridor by steamer or, more commonly on immigrant barges

towed by steamers. Thousands of these people decided to go no further than the Rideau area and by 1848 the corridor population was of nearly 40,000. – over 3 times what it was in 1825.

- The single most important economic activity in the Corridor following the completion of the canal was lumbering. Sometimes to the dismay of the Royal Engineers the mortar was barely dry on the newly constructed locks when large rafts of squared timber - red pine, elm & especially oak - were floated, towed & piked through the system on their way to Bytown or Kingston – most of it destined for Royal Navy dockyards.
- Under pressure from the lumber interests and steamship companies, the canal operated 24 hours a day seven days a week so as not to delay the movement of traffic. Frequently lock men worked 60 hour shifts under the light of whale oil lamps to pass the great lines of barges, rafts & steamers through the system. Most of the bulk cargo was carried in large open barges towed by steamers or steam tugs each tug pulling 6 to 10 barges – although one lockstation journal recorded a tug with 24 barges in tow. On

several occasions lockmasters were fined by local authorities for working on the Sabbath – but the fines were paid and canal remained open. So intense was the traffic that during the operating seasons of 1844 through 1846, revenues from lockage fees exceeded operating costs – the canal turned a profit. This has not been repeated in 162 years.

- In 1848, things changes. Canal traffic dropped significantly. Timber and other wood products from the corridor kept the canal busy but there no immigrant barges or bulk manufactured products coming through bound for Kingston. That year marked the opening of the St. Lawrence River canals that bypassed the rapids between Cornwall and Prescott. Now the trip from Montreal to Kingston was done in 2 to 3 days via the St. Lawrence compared to 5 to 6 days on the Ottawa River-Rideau route. Also, the cost was less because there were fewer lockages on the St. Lawrence.
- 1848 marked the end of the Rideau Canal as an integral part of the national transportation system. It remained of local importance in the corridor but nowhere else.

- In 1855 the British military transferred the canal to the government of Canada on the understanding that in the event of war the canal would revert back to military control. But even this role was losing its importance as the railway era was dawning.
- Over the next hundred years or so the canal served as a bulk carrier for corridor businesses, farms and manufacturing concerns but this traffic gradually declined. There was one bright spot, however; beginning in the 1880s steamboats carrying tourists started to appear on the waterway and this traffic increased year by year. Also fishermen and other vacationers began to visit the area in increasing numbers which had some direct benefits for the canal. But it was not until the 1950s, that recreational boat traffic started to add significant numbers to the canal lockages.
- If the construction of the canal had a profound impact on the human history of the corridor; the same can be said for its ecological imprint as well. In just six years a natural landscape and its ecosystem, where the hand of man was scarcely evident, was

transformed into an engineered landscape. The extensive use of dams in the slack water design flooded and altered virtually every section of the route. Throughout the system water levels increased from a few inches to over 40 feet. The canal builders transformed forests and fields into drowned lands, rivers into lakes or still reaches, ponds into wetlands, along with the dozens of rapids, waterfalls and other natural features that disappeared beneath the rising waters.

- Today the stumps of the drowned forests remain just under the surface of a number lakes and rivers waiting to catch the bottom end of a motor if the unwary boater strays out of the marked channel.
- The impact of canal construction can be viewed as very destructive to the ecology of the area but over the years nature has adapted and covered the scars and indeed, made use of new opportunities. Many of the wetlands along the Rideau created by

the canal builders are now classified as some of the most important wetland habitats the province.

- The drowned lands in the southern part of the canal created a remarkably rich large-mouth-bass fishery that benefitted many local communities starting in the late 19th century. Guiding fishermen, boat building, excursion cruises, and tourist hotels and lodges were some of the benefits associated with the fishery.
- To conclude this presentation I want to make a few observations about why Rideau Canal, of all the canals built in North America in the canal-building era, survives to the present with majority of its engineering structures intact and operational.
- One obvious reason is that the original was so well constructed. It not only survived but it has opened to navigation every season for 176 years. The canal stands as a fitting monument to those who built it.
- Another reason is more prosaic – with the opening of the St. Lawrence River Canals the national importance of the Rideau – in commercial terms – vanished. This meant as other canals

underwent expansion and modernization to improve their commercial viability there was no reason to invest in the Rideau because it just was not important enough to warrant major investment.

- A third reason is because of the slack water design and all the water management requirements that are involved. This meant that you could not simply shut it down and walk away as was done with so many other North American canals once their economic viability was in decline or gone.
- Ironically, one of the greatest threats to the heritage of the Rideau Canal arose in the mid-1960s as recreational boat traffic was reaching unprecedented numbers. The federal Department of Transportation that operated the Rideau Canal, announced plans to modernize the waterway to make it more efficient'. This involved installing electrified, hydraulic gate opening mechanisms, removing many of the old historic buildings along the canal and where required, replacing the stone masonry locks with concrete ones. Several Rideau lockstations underwent electrification but when the Department announced that Chaffeys Lock was on the list all hell

broke loose. Under the leadership of Don Warren, the residents of Chaffeys Locks and adjacent areas took on the Department of Transport. Mr Warren was raised at Chaffeys Lock, his father had been lockmaster there and the Warren family had lived in the area before the canal went through. These local people recognized the unique heritage values of the canal before most others did and they fought to preserve those values. In a campaign that went on for several years it gradually gained more supporters including media and political support. The end result was that in 1972, the administration of the Rideau Canal was transferred from the Department of Transport to Parks Canada with the dual mandate of operating the canal but also protecting and presenting its heritage values and historic resources.

- Let me close with the following observation: We know that this military canal was never used in war and that the Kingston Fortifications never witnessed a shot fired in anger .- but it can be argued that the building of the Rideau Canal along with the Kingston defences

expressed a determined resolve to defend British North America and thus, in its day, these places contributed to a peaceful coexistence with our neighbour to the south. These places are among the foundation stones of our country and now their significance is shared with all people.