

# **Petro-Tourism: Canada's First Commercial Use of Natural Gas\***

**Andrew Fox<sup>1</sup>**

Search and Discovery Article #70218 (2016)\*\*

Posted August 22, 2016

\*Adapted from oral presentation given at AAPG 2016 Annual Convention and Exhibition, Calgary, Alberta, Canada, June 19-22, 2016

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## **Abstract**

Decades before Abraham Gesner's invention of kerosene and the drilling of Canada's first commercial oil well at Oil Springs in southwest Ontario, natural gas seeping from Silurian aged carbonates was a major tourist attraction at Niagara Falls. The Burning Springs, located upstream from the Horseshoe Falls competed with the spectacular cataracts for the attention of tourists. The gas springs were first discovered in the late 18th Century during the excavation of a mill located along the Niagara River. A few decades later entrepreneurs recognized a commercial opportunity as tourists began to flock to Niagara Falls in the 1820's. For a small fee, gas from the spring that was collected in a barrel, would be ignited, much to the “delight and amazement of everyone”. In order to enhance the mystique of the Burning Springs the owners of the attraction created legends of aboriginal fire worship to rival the burning springs at Delphi, Greece, and the Caspian Sea area. During the mid-1800's the Burning Springs was a must see stop for tourists visiting Niagara Falls. Among the curious visitors to Niagara Falls were early geologists, such as Charles Lyell, who recognized that the gas at the Burning Spring likely emanated from “bituminous matter” bedded within fossiliferous carbonates. The Burning Springs was so successful by the 1880's that the owner claimed he was earning more than \$50,000 per year from the enterprise. Soon the gas stopped flowing and the Burning Spring was moved to another location where the attraction was transformed into a wax museum that still featured a burning spring fed by piped natural gas.

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# Petro-tourism

Canada's first commercial use of natural gas



Frederic Edwin Church (1826–1900) Niagara, 1857. Oil on canvas. Corcoran Gallery of Art, Washington, DC

**Andrew Fox**  
**MEG Energy Corp**

Presenter's notes: Good afternoon and thanks for attending this session.

I am sure many of you are confused by the title of this presentation but I hope to tell you about Canada's earliest natural gas operation.

Here is a wonderful painting of Niagara Falls by the 19<sup>th</sup> Century American artist, Frederic Church

# Niagara Falls



Height from the top of the Falls to river below: 57 m (118')  
The Horseshoe Falls are 670 m (2,200') wide  
Average flow (present day): 110,000 m<sup>3</sup>/minute (4 million cf/minute)

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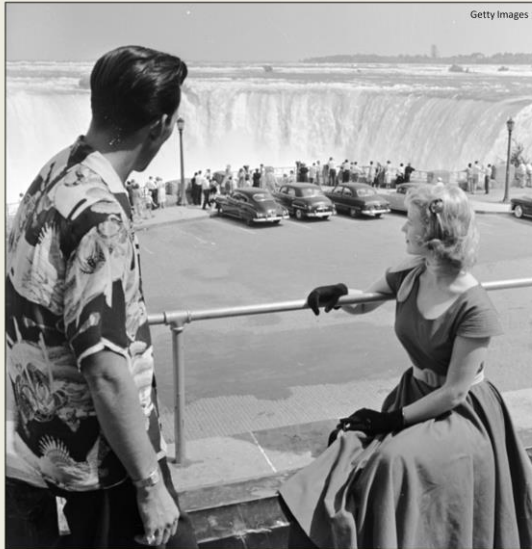
Presenter's notes: Niagara Falls are situated on the Niagara River between lakes Erie and Ontario.

Here is a classic view of the famous water falls at Niagara.

On the right are the Horseshoe Falls and on the left the American Falls. Niagara may not be the tallest falls in the World but its location and volume of water flowing over it make it spectacular sight

The flow of water over the Falls is highly managed for hydroelectric generation on both sides of the border. But obviously flow has to be maintained for the tourists.

# Niagara Falls: tourism and romance



**Honeymoon Capital of the World**



**1953 Film Noir**  
***"A raging torrent of emotion"***

Presenter's notes: Niagara Falls is best known for tourism. It was considered the Honeymoon Capital of the World. During the 50's and 60's it was the place to go for newly married couples.  
On the right is the movie poster for Niagara starring Marilyn Monroe. It was billed as a raging torrent of emotion.

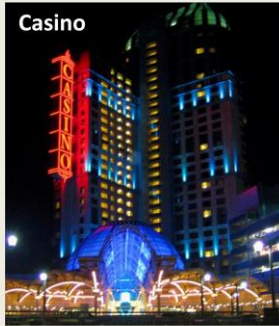
# Niagara Falls: heroes and entrepreneurs

Daredevils



Clifton Hill Wax Museums

Casino



Presenter's notes: Niagara is known for those that survived going over the Falls but also those who didn't. Its wax museums are legendary and provided many of my friends with summer employment. More recently a casino has been developed to bring in gamblers.

# Niagara Falls: humour



Trump, Cruz and Bush

Presenter's notes: Niagara provides a back drop for humour, usually using the old barrel gag.  
Generally it implies negative consequences.



# Niagara Falls: power and industry



OPG Sir Adam Beck Stations 1 & 2

Niagara Falls, NY was home to the first large-scale AC electric generating plant in the world (1895)



Cyanamid Plant 1930



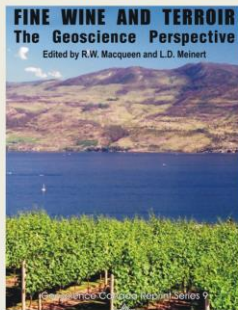
Love Canal Superfund Site

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Presenter's notes: Niagara is also a centre of hydroelectric power generation and historically attracted heavy industry into the region. That industry often generated its own problems after the factories were closed as some of us remember the Love Canal toxic waste site. But most industry is now gone leaving tourism as the mainstay of the regional economy.



## Niagara Area: wineries

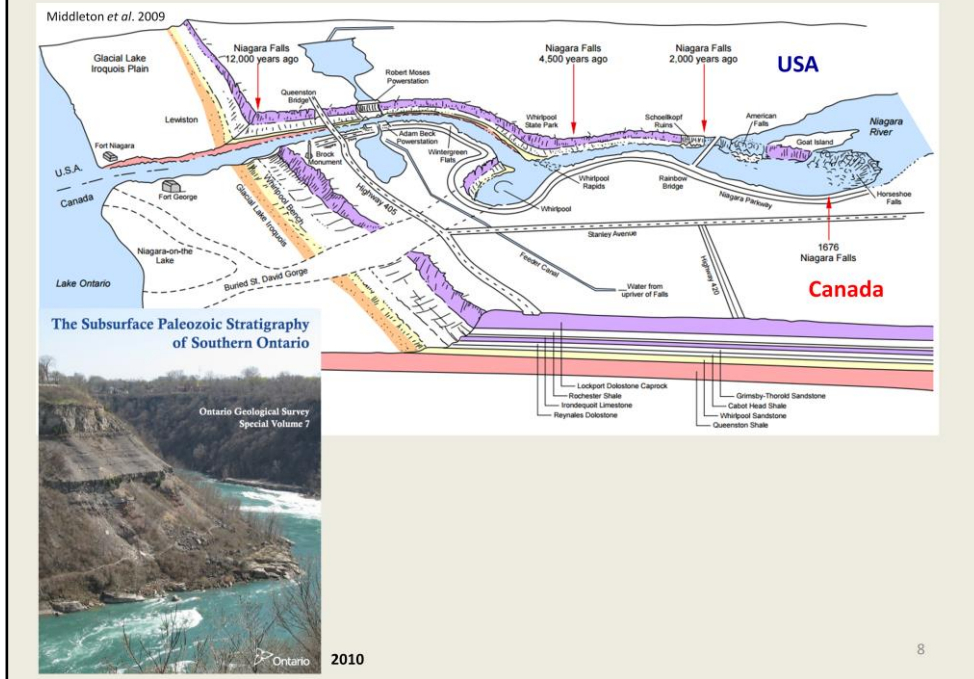


Presenter's notes: Niagara is now noted for its wines.

The region is now considered to be one of the top cool-climate grape growing regions in the World.

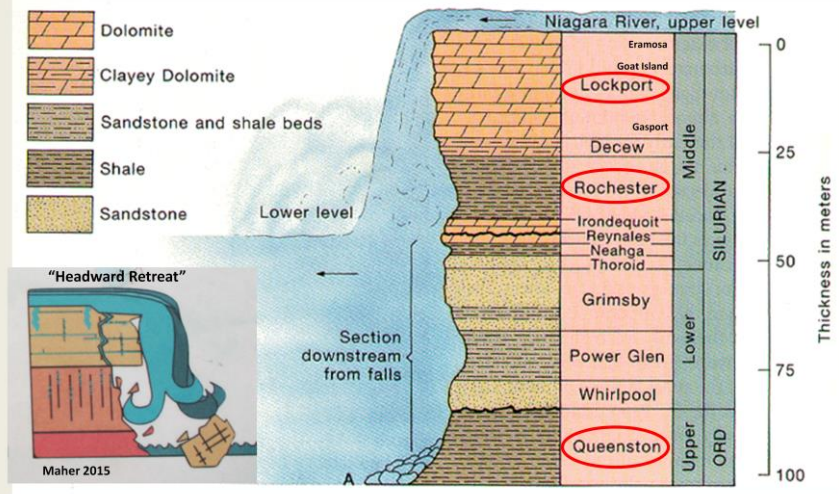
Geologists have had a long association with wine. The link between geology and wine is something that needs to be continually studied as we see with publications like this from the Geological Association of Canada.

# Niagara: a world class geological locality in the heart of North America



Presenter's notes: The Niagara River is also a world class geological locality located in the heart of Eastern North America. Many field trips take participants along the Niagara Escarpment and down into the Niagara Gorge that has been eroded by the retreating Niagara Falls. The Escarpment and Gorge, along with numerous stone quarries provide some of the best exposures of Ordovician and Silurian rocks. Great summaries of the stratigraphy are provided by scientists on both sides of the border.

## Niagara Falls: Ordovician and Silurian Stratigraphy



Modified from: Hudson Valley Geologist Blog

Niagara Falls has receded seven miles in 12,500 years.

Historically recession has been 1 to 1.5 m per year

Currently it is 0.3 m per year

Source: NPC

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Presenter's notes: The Paleozoic stratigraphy facilitates the retreat of the Falls from the edge of the Escarpment.

Softer Rochester and Queenston shales are preferentially eroded by the back wash of the Falls.

This undermines the more resistant capping Lockport dolomites causing them to collapse. This process is repeated over and over again.

The Falls have retreated 7 miles from the edge of the Niagara Escarpment over 12,500 years.

However this was not the view in the past.

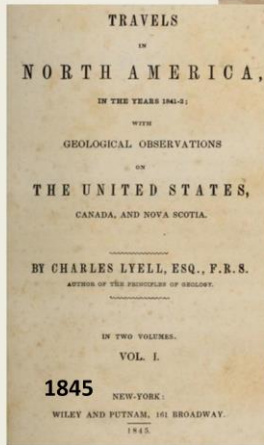
## Niagara Falls: emerging geological theories

### Observations from early visitors to Niagara Falls

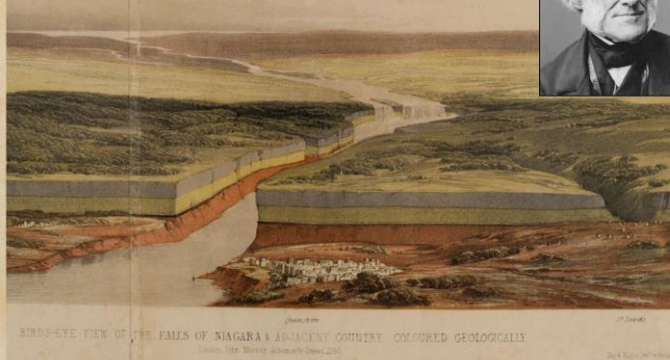
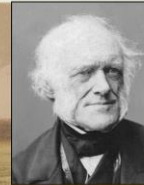
- Early commentaries referred to the recession of the Falls from its original site down river at the edge of the Niagara Escarpment. Erosion at the Falls was being observed by the local residents.
- Robert McCauslin (1789) recognized that the Falls were retreating at a rate slower than would be allowed “if we suppose the world to be 5,700 years old”.
- MacLay (1790) calculated that it took 55,440 years to recede to its current position.
- Mitchell (1809) recognized the erosion mechanism at the Falls as well as fossils in the limestone (which were “erroneously been called Wasp’s nests and honeycombs”)

Presenter’s notes: Niagara Falls provided early observers with a new view of time that seemed to contradict the “Young Earth” model that was entrenched at the end of the 18<sup>th</sup> Century. Erosion was being observed by local residents. Other visitors were drawing some revolutionary conclusions for the time.

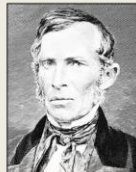
# Niagara: a laboratory for 19<sup>th</sup> Century geological thought



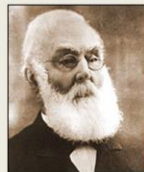
*"The falls of Niagara afford a magnificent example of the progressive excavation of a deep valley in solid rock."*



Amos Eaton



Ebenezer Emmons



James Hall

**"Pioneers of Paleozoic stratigraphy in the eastern US"**  
Brett *et al.* 1995

Hall also systematically studied the regression of the Falls between the 1840's to 1890's

Presenter's notes: Niagara also became a laboratory for 19<sup>th</sup> Century geologists such as Charles Lyell as well as Eaton, Emmons and Hall from New York State who were considered to be the pioneers of North American Paleozoic stratigraphy..

Lyell visited Niagara Falls in 1841 and was accompanied by James Hall who was to become the first state paleontologist of New York. Lyell documented his trip there in his famous 1845 publication.

Lyell included this lovely diagram showing the stratigraphy exposed along the Escarpment and into the Niagara Gorge with the Falls in the background.

# Niagara Falls and Natural Gas?

What is the connection?

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Presenter's notes: So what is the connection between Niagara and Natural Gas?



## Niagara Falls: a precursor to natural gas production?

In 1794 a natural gas spring was uncovered during the excavation of the original Bridgewater Mill one mile upriver of the Falls

- Small amounts of sulphurous gas bubbled to the surface
- This gas could be collected and then ignited
- “It did not deserve the name of the burning Spring” (Mrs. Simcoe 1795)

**However...**

Presenter's notes: Quite by accident a gas spring was discovered in the late 18<sup>th</sup> Century. Chroniclers of the day made note of its existence and for some it wasn't that impressive at all. Mrs. Simcoe was the wife of John Graves Simcoe who is a hero in Canada and a villain in the US. But further development of this phenomenon was interrupted by a major event in 1812.

## Niagara Falls: A precursor to natural gas production?

In 1794 a natural gas spring was uncovered during the excavation of the original Bridgewater Mill one mile upriver of the Falls

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**However war interrupted any further developments**



Battle of Queenston Heights, October 1812

***“The acquisition of Canada this year, ..., will be a mere matter of marching; ...” Thomas Jefferson 1812***

The Bridgewater Mill was destroyed by retreating American troops in July 1814

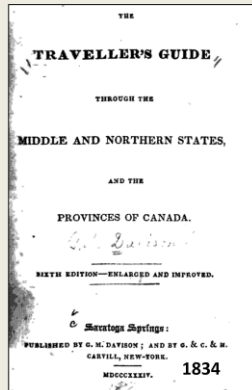
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Presenter's notes: The War of 1812 or the War of Southern Aggression started when America decided to take over the British colonies of Upper and Lower Canada (now Ontario and Quebec).

Many of the key battles of the War were fought in the Niagara area usually with the British and First Nations prevailing over the terribly organized Americans. Often there was collateral damage such as the burning of the Bridgewater Mill by retreating American troops.

## Niagara Falls: A new era of tourism

- After the War of 1812 tourism at Niagara Falls picked up again
  - Interest in former battlefields
  - The Erie Canal and the railways facilitated travelling
- Two local entrepreneurs recognized a commercial opportunity with the gas spring
- In 1817 Richard Langslow wrote about seeing the Burning Spring in the ruins of the Bridgewater Mill.
- The gas spring was capped by a barrel with a corked pipe sticking out of it. The gas was released and then ignited to the wonder of paying customers.



**BURNING SPRING.**

About half a mile north of Lundy's Lane, and within a few feet of the rapids in the **Niagara** river, is a **Burning Spring**. The water is warm and surcharged with sulphuretted hydrogen gas. The water rises in a barrel, which is covered, and the gas escapes through a tube. On applying a candle to the tube, the gas takes fire, and burns with a brilliant flame until blown out; and on closing the building for a short time in which the spring is contained, and afterwards entering it with a lighted candle, an explosion may be produced. A small fee for the exhibition is required by the keeper of the spring.

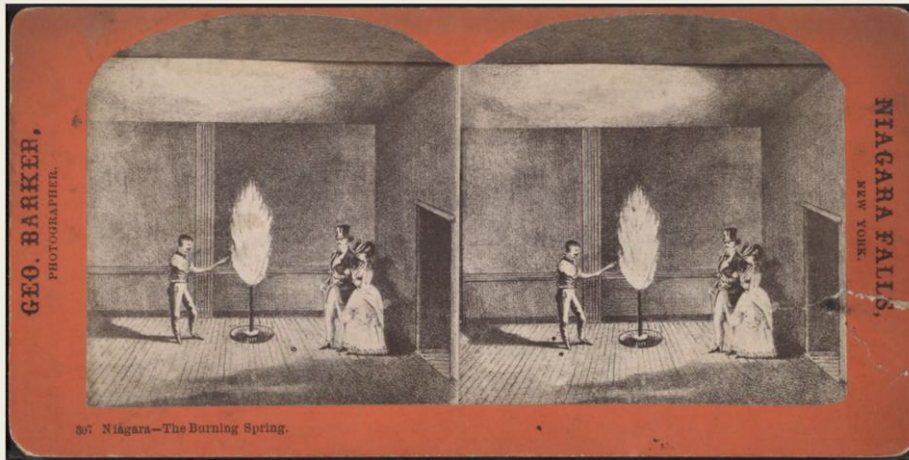
Presenter's notes: Eventually Peace prevailed and Niagara became a big draw for tourists. There was interest in former battlefields and new transportation networks made journeys easier and quicker.

The new owners of the Bridgewater Mill, Samuel Street and Thomas Clark, saw an opportunity with the now named Burning Springs.

They capped the spring with a barrel to collect the slow stream of gas and then released it through a pipe and ignited it to the amazement of paying customers.

Many 19<sup>th</sup> Century tourist guides mentioned the Burning Springs. Even Charles Lyell made mention of visiting them in his Travels in North America book.

## Niagara Falls: a new attraction to rival the Falls



George Barker (ca. 1880s)

Stereoscope

Presenter's notes: So a gentleman could impress his lady with the spectacle of the igniting Burning Springs. Clearly these were simpler times because my wife is never impressed when I light the BBQ in such a manner.

## Burning Springs: evolution of an attraction

THE CELEBRATED  
**BURNING  
SPRINGS!**

A Great Natural Curiosity situated on the Niagara River, one and one-half miles above the

**HORSESHOE FALL**

ON THE CANADA SIDE.

This Spring is annually visited by thousands, charmed at once with the sight. The Spring is charged with Sulphuretted Hydrogen Gas, and when ignited burns with a brilliant flame. The Gas is composed from a bed of Coal, Iron Ore, and Sulphur. Sulphur, Iron and Magnesia are the Mineral properties of the water.

**IT IS AN INDIAN DISCOVERY.**

accidentally found by them eighty years ago, shown as a curiosity over fifty years. Close to the Burning Springs is a

Pure Sulphur Spring,

but not containing any gas, but its water is of a high Medicinal quality. The drive to the Springs is one of the most delightful around Niagara, being a continuation of Rapids all the way, passing

**Cedar Island, Cynthia & Log Islands.**

Arriving at the Springs, there is a stretch of the fastest Rapids above the Falls, on either side, running at the rate of twenty-seven miles per hour. All visitors are willing to say that the trip is a complete success, and that the Springs are among the best sights at Niagara.

P. S. CLARK, Proprietor Burning Springs,  
NIAGARA FALLS.

**A new development!**

**Marketing is a contest for people's attention**

Seth Godin

Presenter's notes: But a simple burning spring would not suffice to get the attention of tourists.  
A new history was invented in order to get more tourists to see the Burning Springs.  
Now the Spring was discovered by the First Nations.

# Fire Worship



Temple of Apollo at Delphi



Ateshgah (Fire Temple) of Baku, Azerbaijan  
Zoroastrian and Hindu Fire Worship



Burning Bush from Exodus 3

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**Why not create another legend?**

Presenter's notes: Along with the change in the spring founders, why not introduce the concept of fire worship to make things really exciting and dramatic. Burning gas springs were not a new phenomena.

Famous and exotic gas springs such as the Temple at Delphi in Greece and the Fire Temple of Baku were well known to readers in the 19<sup>th</sup> Century. Perhaps the story of the Burning Bush in Exodus was referring to a gas spring.





Scene from the Burning Springs Wax Museum



"Many a war ceremonial, and many a feast of thanksgiving for bountiful harvest or plentiful hunting was observed under the spell of the Burning Spring." Museum advertisement

"This is an example of a Niagara attractions which represented Aboriginal heritage. The wax museum places Father Hennipen and the Maid of the Mist together at the spring, the historical figure gives authority to the myth. The legend of the Maid becomes anchored in the missionary's time, the forces of civilization meet those of the primitive." Bredin 2004

Presenter's notes: Entrepreneurs at Niagara created aboriginal myths like virginal and usually semi-clothed maidens being sacrificed over the Falls in order to ensure good harvests and hunts.

The Burning Springs proprietors were no different implying aboriginal fire worship at the Springs.

Displays such as the one in the upper right placed real figures in history like Father Hennepin (the first European to see the Falls) with the invented Maid of the Mist and the Burning Springs in order to gain legitimacy in the eyes of tourists.

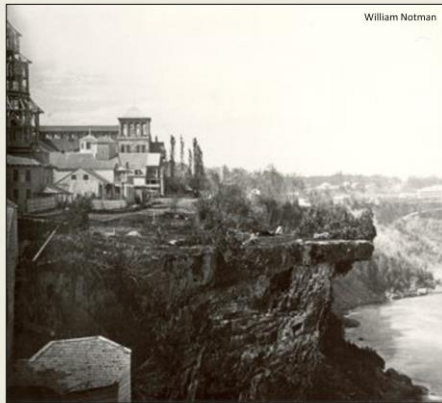
## Niagara Falls: “A den of inequity”

**The tourist trade at Niagara Falls became sordid. Merchants and hucksters used any means to separate tourists from their money.**

As early as 1856, Frederic Church, the American landscape artist, started a movement to preserve the natural beauty of the Niagara River.

His supporters included F.L. Olmstead, the designer of New York’s Central Park, and Lord Dufferin, the Canadian Governor-General.

Politicians on both sides of the border delayed any action until the 1880’s.



Presenter’s notes: By the mid 1800’s Niagara’s tourist trade had developed a very poor reputation. Tourists were swindled by almost every possible means.

The river bank by the Falls was chock a block with hotels and dubious attractions. Access to the Falls was often restricted by more enthusiastic owners.

Battles between guides even resulted in murder in 1870

Frederic Church, the famous American landscape artist began to petition the powerful to protect the Falls and the river around it.

These were the days of visionary people who recognized that the natural world was being destroyed for the sake of Progress.

It was the beginning of the Parks movement in North America.

Church enlisted the support of Lord Dufferin who was Governor General of Canada to influence the governments of Ontario and Canada to create a park on the Canadian side of the border.

But nothing happened for nearly 30 years.

# Niagara Falls: the creation of the Park

1887.

NIAGARA FALLS PARK.

Chap. 13.

## CHAPTER 13.

An Act respecting the Niagara Falls Park.

[Assented to 23rd April, 1887.]

WHEREAS, in pursuance of *The Niagara Falls Park Act, Preamble*, the Lieutenant-Governor in Council did approve of certain lands selected by the commissioners for the purposes set out in the preamble of the said Act; and a map of the park, showing the boundaries thereof and the lands taken, was submitted to the Lieutenant-Governor and approved in Council, and copies duly certified and authenticated were filed and deposited in the office of the registrar for the county of Welland, and in the office of the Commissioner of Crown Lands; and whereas the prices to be paid for the said lands have been ascertained and determined, and it is expedient to make provision for the payment thereof, and for the means required to establish, maintain, improve, and develop the said lands, as and for a public park:

Therefore Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. The Park shall be called "The Queen Victoria Niagara Falls Park," and this Act may be cited as *The Queen Victoria Niagara Falls Park Act, 1887*.

"At the outset it should be recorded, as an interesting historical fact, that the conception of rescuing the environments of Niagara from the vandalic desecration of the preceding half century..."

The Commissioners of the Niagara Falls Park 1889

Lands along the bank of the Niagara River (including the Burning Springs location) were expropriated by the Government of Ontario in order to protect the natural state of the riverbank and to control and regulate the tourist trade.

Naturally the business owners wanted compensation for their loss

## Burning Springs: compensation for expropriation

## REPORT

OF THE COMMISSIONERS FOR NIAGARA FALLS PARK, 1887.

To the Honorable ARTHUR S. HARDY, O.C., M.P.P.

Secretary of the Province of Ontario.

SIR.—The Commissioners beg to report that the Arbitrators in the references made to them for the valuation and payment of lands taken for the Niagara Falls Park, have made their awards in all cases except two, one being the case of Mr. J. T. Bush, where a second reference became necessary.

This case has been heard, and although the Commissioners have not yet received the award, they have no reason to fear that the amount will be in excess of that originally awarded. The second case is that of the Thorold, St. Catharines and Suspension Bridge Road, respecting which provision has been made in the Act about to be submitted to the Legislature, providing for the contingency that had arisen in this case, which the Commissioners have every reason to believe will not alter the amounts already awarded.

The amounts awarded to the respective proprietors and the amounts offered by the Commissioners, are as follows:—

DOWNEY NAME	Amount	Valuation of offices and Contingencies	
		\$	¢
Bush	24,000	27,000	
Lyman Moore	2,000	1,675	
Tracy	1,000	1,000	
Tracy, John	1,000	1,000	
Robinson, Eli	2,500	2,500	
Brumage	1,000	1,000	
Brumage, W	10,000	11,250	
Brumage	14,000	16,000	
Buchanan, W O	14,000	16,000	
Wood, Peter	14,000	16,000	
Norton, W	2,000	1,475	
Markes, P S	2,000	1,475	
Buchanan, Estate of	10,000	11,250	
Davidson, S S	10,000	11,250	
Davidson, Elin	10,000	11,250	
Davidson, Elin	10,000	11,250	
Gladstone, Mrs	8,500	6,500	
Clark	10,000	10,000	
Nucklin	10,000	10,000	
Clark, Southern	500	400	
Vanderbilt	500	400	
Bent	500	400	
	405,887	200,000	

From the above tabulated statement it will be seen that the total amount awarded is \$402,867, as against \$290,569 offered by the Commissioners, the difference between the two amounts being \$103,298. This large difference is chiefly

confined to five out of twenty-three cases brought before the Arbitrators. In these five cases the principal evidence rested on the incomes the proprietors derived from charges made to the public visiting the Falls.

Report of the Commissioners of the Niagara Falls Park 1887

The Commissioners wanted to give Sutherland Macklem, proprietor of the Burning Springs and (soon to be renamed) Cynthia Islands, \$26,175 as compensation for the expropriation. Macklem wanted \$245,000

He claimed a yearly income of \$56,378.79 over seven years from tourists.

Macklem testified that he had the following ticket sales in 1884:

- June - 3,527
- July - 5,913
- August - 9,282
- September - 5,529

An arbitrator increased the compensation to \$100,000 to reflect the loss of his business.

\$56,000 (1884) = **\$1.4 million** in 2015

\$100,000 (1887) = **\$2.5 million** in 2015

[www.DaveManuel.com](http://www.DaveManuel.com)

Presenter's notes: The Commissioners offered the owner of the burning Springs about 26,000 dollars but he wanted an order of magnitude more. Mr. Macklem claimed the Springs earned him \$56,000 per year which is worth \$1.4 million in today's dollars. An arbitrator awarded him \$100,000 which is estimated to be worth \$2.5 million in 2015 dollars. Naturally the Commissioners of the Park were horrified. Mr. Macklem did well on his investment.

## Burning Springs: compensation for expropriation

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The amounts awarded to the respective proprietors and the amounts offered by the Commissioners, are as follows:—

OWNER'S NAME	Awarded	Valuation of offer made by Contractor
	\$	\$
Bush	24,000	22,500
Lyman Moore	1,000	1,653
Tracy	1,000	7,000
Trush, John	1,000	1,000
Brundage, E. B.	1,000	2,700
Brundage, W.	1,000	3,200
Brundage, J. W.	1,000	11,200
Buchanan, W. O.	1,000	1,000
Newton, W.	1,000	1,000
Newton, W.	1,000	1,000
Clark, F. S.	1,000	1,000
Buchanan, Estate of James	1,000	1,000
Davis, Basil	100,000	1,000
Prospect House	100,000	1,000
Gladwin, Mrs.	100,000	2,100
Bucklin	100,000	100,000
Bucklin	100,000	100,000
Vanderbilt	100,000	100,000
Beit	100,000	100,000
	401,887	250,500

From the above tabulated statement it will be seen that the total amount awarded is \$402,867, as against \$290,569 offered by the Commissioners, the difference between the two amounts being \$103,298. This large difference is chiefly

confined to five out of twenty-three cases brought before the Arbitrators. In these five cases the principal evidence rested on the incomes the proprietors derived from charges made to the public visiting the Falls.

Report of the Commissioners of the Niagara Falls Park 1887

The Commissioners wanted to give Sutherland Macklem, proprietor of the Burning Springs and (soon to be renamed) Cynthia Islands, \$26,175 as compensation for the expropriation. Macklem wanted \$245,000

He claimed a yearly income of \$56,378.79 over seven years from tourists.

Macklem testified that he had the following ticket sales in 1884:

- June - 3,527
- July - 5,913
- August - 9,282
- September - 5,529

An arbitrator increased the compensation to \$100,000 to reflect the loss of his business.

\$56,000 (1884) = **\$1.4 million** in 2015

\$100,000 (1887) = **\$2.5 million** in 2015

[www.DaveManuel.com](http://www.DaveManuel.com)

**In the meantime the Burning Spring had run out of gas as early as 1884!**

Presenter's notes: In the meantime the Spring had run out of gas three years earlier. One heck of a deal.

## **Burning Springs: The End?**

24

Presenter's notes: Was this the end of the Burning Springs?



## Burning Springs: New Locations

1924

1905



1890's

25

Presenter's notes: Not at all. Burning Springs just moved to a new location.

I was asked how this could happen. I told them that clever entrepreneurs can do anything!

First the Burning Springs attraction moved just up the Hill from the original site. Gas had to be piped in to keep the Spring burning.

It then moved to an area just above the Falls called the Falls View where it flourished for a while.

# Burning Springs: a moveable phenomena?

After expropriation it moved to multiple locations

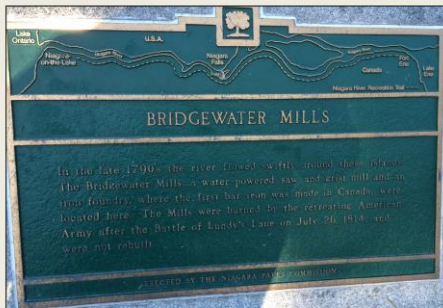
- Late 1880's up the hill above the original spring
- 1905: moved up to the Falls View area
- 1924: a new building and museum
- 1969: wax museum fire
- Closed in the late 1980's and demolished in 1993
- Present Day Fallsview Marriott was built on the site



26

Presenter's notes: By the 1960's and 1970's this part of town was pretty dodgy. The area was overshadowed by the more exciting Clifton Hill Area. The event that I remember was the Wax Museum Fire in 1969. It was big news in Niagara Falls. Apparently bigger than John Lennon and Yoko Ono visiting Niagara the same day. By the late 1980's the Burning Springs shut down and was eventually replaced by a hotel complex.

# Burning Springs: present day



## Bridgewater Mills

*In the late 1790's the river flowed swiftly around these islands. The Bridgewater Mills, a water-powered saw and grist mill and an iron foundry, where the first bar iron was made in Canada, were located here. The Mills were burned by the retreating American Army after the Battle of Lundy's Lane on July 26, 1814 and were not rebuilt.*  
(historical plaque text)



## Dufferin Islands



**No mention of the Burning Springs at the original site**

27

Presenter's notes: So what is left of this attraction? Not much.

There is a plaque commemorating the Burning of the Bridgewater Mill.

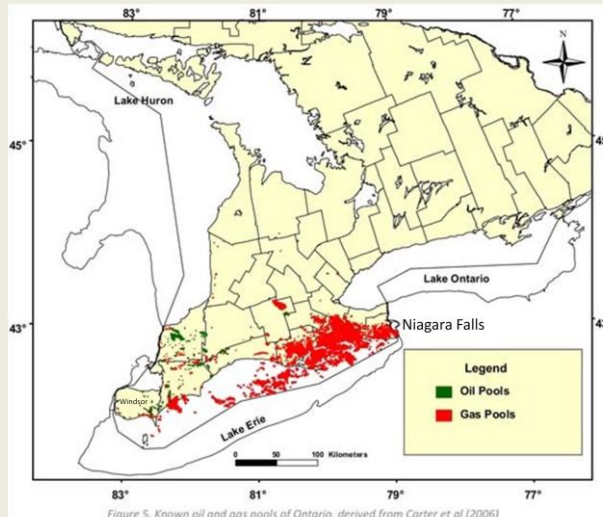
The Dufferin Islands are still there.

There is a road that leads to the original Burning Springs site but no mention of the Burning Springs itself.

But it was the precursor to something much bigger...

# Natural gas in Southern Ontario

- The first commercial natural gas well in Canada was completed in Essex County (Windsor) in 1889.
- World's first gas storage project was in Welland County (Niagara) in 1915

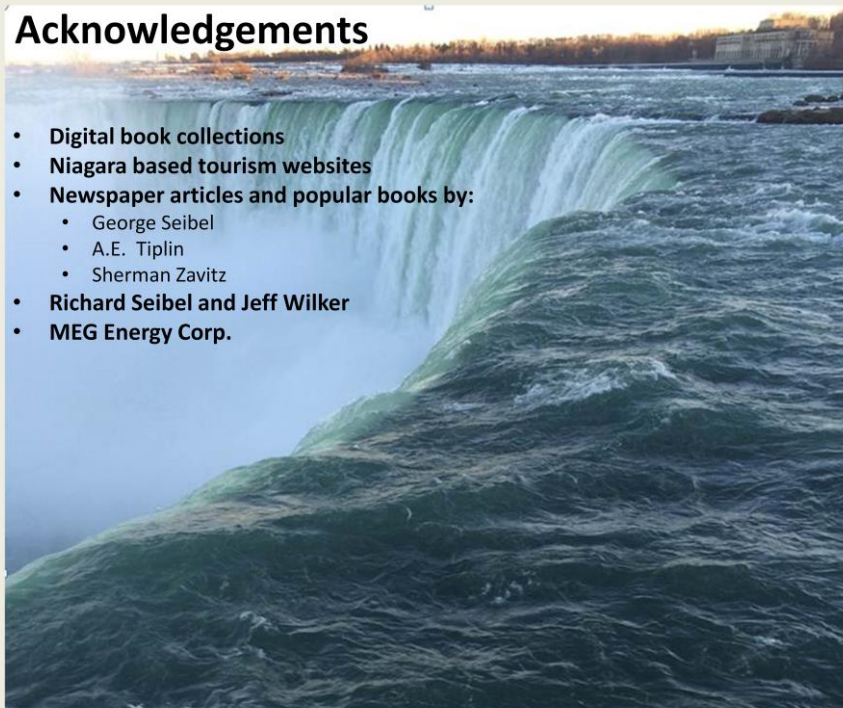


28

Presenter's notes: Commercial Oil and Gas was eventually found and developed in the Paleozoic of Southern Ontario. Canada's first commercial gas well was completed in the Windsor area near the end of the 19<sup>th</sup> Century. The World's first gas storage project was located near Niagara in Welland County. But the Burning Springs came first.

# Acknowledgements

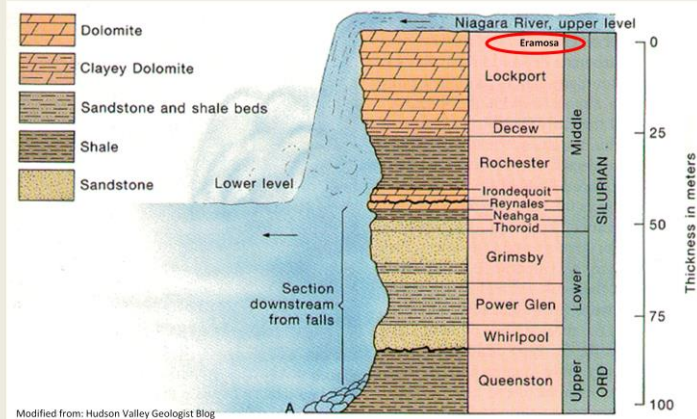
- Digital book collections
- Niagara based tourism websites
- Newspaper articles and popular books by:
  - George Seibel
  - A.E. Tiplin
  - Sherman Zavitz
- Richard Seibel and Jeff Wilker
- MEG Energy Corp.





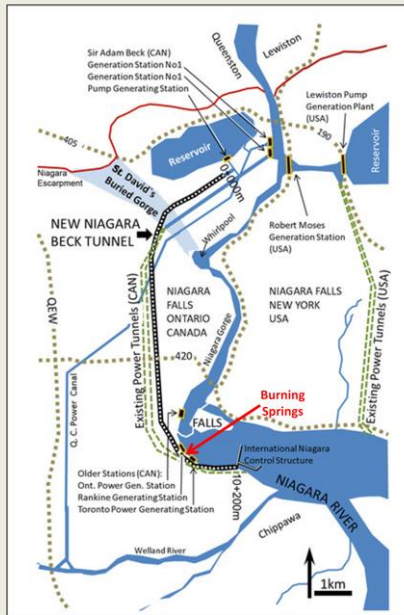
# Burning Springs: possible source of hydrocarbons

- “There are a strong indications at this Spring of a bed of coal near.” Steele 1840
- “The bituminous matter supplying this gas is probably of animal origin...” Lyell 1845
- Organic-rich dolostone of the **Eramosa Formation**
  - Likely bed rock material at the Burning Springs Site
  - “distinctive petroliferous odour on broken samples” (Brunton 2009)
  - Organic content up to and in excess of 3% (Powell *et al.* 1984, Ryder *et al.* 2014)

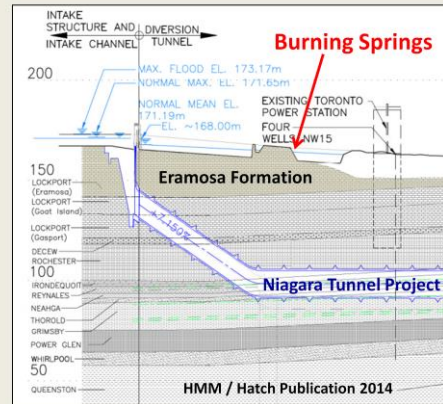




# Burning Springs: Possible Source of Hydrocarbons



**Niagara Tunnel Project (OPG)**



Presenter's notes: **Tunnel Facts:**  
 10 km long  
 14.4 m in diameter