



**Welcome**





An AltaGas Company **AltaGas**

# ABOUT ALTON NATURAL GAS STORAGE

**Alton Natural Gas Storage** will help provide Nova Scotians with affordable and reliable natural gas year-round. The facility will consist of underground salt caverns to store natural gas until it is needed for heating homes, businesses, hospitals, universities and potentially for gas-fired power generation.



## **Alton Natural Gas Storage will consist of:**

-  Underground natural gas storage caverns
-  Lateral gas pipeline linking the Alton facility with the Maritimes and Northeast Pipeline
-  Water pipelines from the cavern facility to the tidal Shubenacadie River
-  Gas facilities

The project has received all major environmental approvals. Construction at the site, which included clearing, facility pads and roads, started in 2008 and drilling the caverns started on August 20, 2014.

Construction is completed on the water transmission pipeline running from the tidal river site to the cavern site. We are in the process of finishing construction of the electrical stations at the river site and the pumping facility at the cavern site.



## **NEXT STEPS**

Alton Natural Gas is awaiting approval from the Province of Nova Scotia to complete the river site facilities.

Once approval is received, tidal water from the Shubenacadie River will be cycled through the cavern to dissolve the salt in the deposit. The combination of tidal water and additional salt, called brine, is cycled back up the well, leaving a cavern for natural gas storage.

Additional work will include lateral gas pipeline and gas facilities.

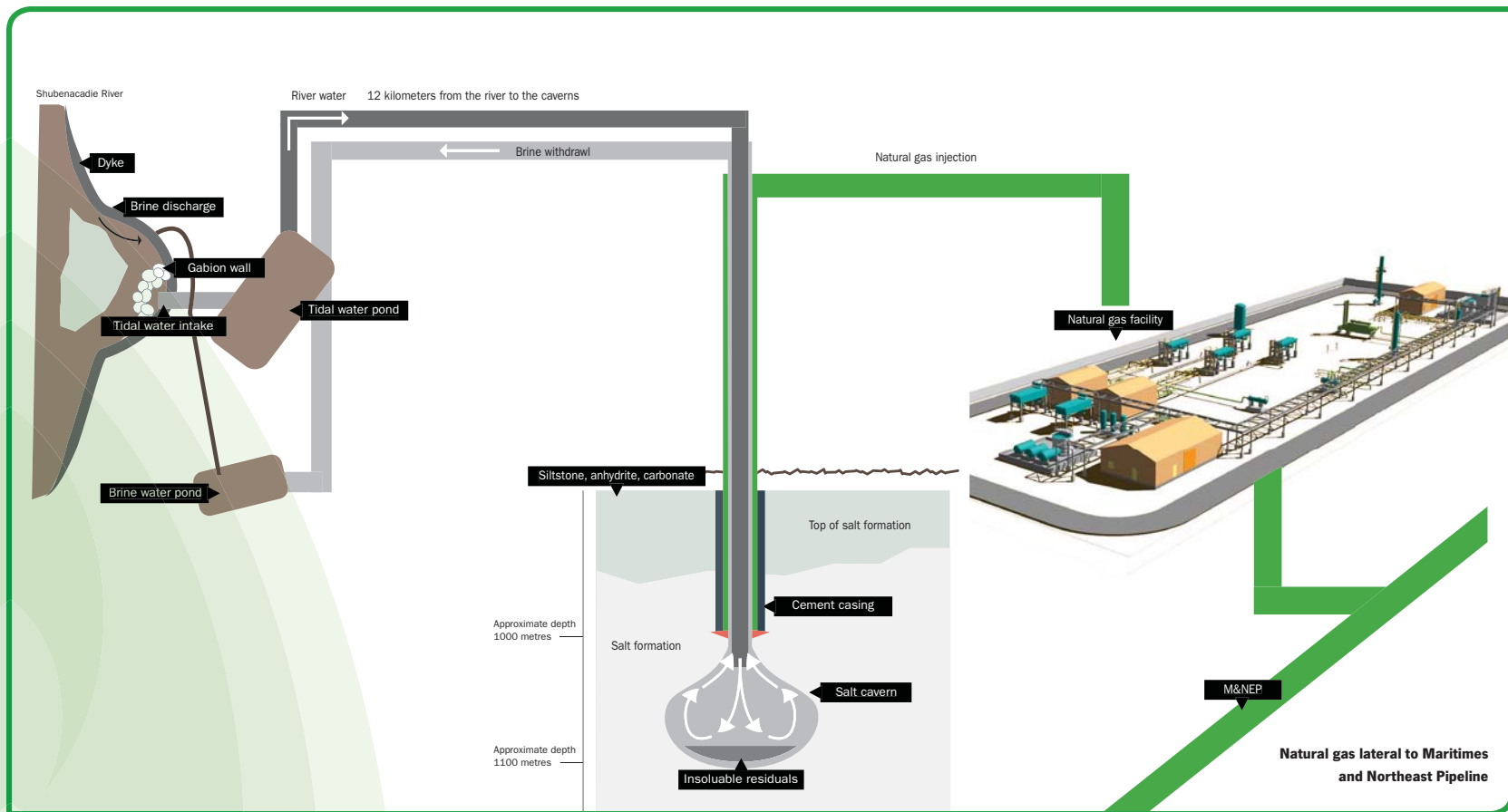
# PROJECT BENEFITS



## Storage of natural gas benefits all Nova Scotians

- Provides Nova Scotians with affordable, safe and reliable natural gas year-round.
- Provides protection against unsure offshore natural gas supply (i.e. businesses, hospitals, schools, universities).
- Investing more than \$130 million of private sector money into the project.
- Creating approximately 70 jobs during water facility construction and 120 during natural gas storage facility and pipeline construction.
- Creating approximately 8-10 permanent full-time jobs on-site during operations and 10-12 full-time jobs for service industries.
- Bringing access to natural gas closer to the local communities.
- Decreasing natural gas price volatility for Nova Scotia gas customers.
- Projected to save Nova Scotia natural gas users over \$17 million per year.
- Contributing to the overall economic growth of the province and community (income, property and sales taxes).
- Allowing for the potential development of other energy-related projects in the province as a result of storage.
- Aligned with the Nova Scotia Environmental Goals and Sustainable Prosperity Act.
- Reducing greenhouse gas emissions by providing more opportunities for gas-fired power generation and reducing our reliance on coal.

# PROJECT & FACILITIES OVERVIEW



Proposed Alton Natural Gas Storage Project

# COMMUNITY



**Cook Inlet Natural Gas Storage Project; Kenai, Alaska;  
in service since April 2012**

**Alton Natural Gas Storage** is committed to meaningful consultation and open dialogue with our neighbours, communities, First Nations and other Aboriginal communities in the vicinity of the project. Since 2006, we have been meeting with landowners, community members, Aboriginal peoples and leaders about Alton Natural Gas Storage. We have recently taken steps to increase communications and engagement with all stakeholders.

## **Community Liaison Committee (CLC)**

The community liaison committee (CLC) will encourage two-way communication with the community, and facilitate input and engagement on project activities. We have received several nominations, but are looking for more members. If interested, ask a member of our team how you can be part of the CLC.



## **Alton Project Support Community Survey**

Survey conducted by Corporate Research Associates

**250** local residents contacted in January 2015

**81%** support the use of natural gas

**66%** indicate support for the project

**27%** are completely supportive

# COMMUNITY INVESTMENT



## Brookfield Fire Department

The Brookfield Fire Department provides fire protection, emergency services and health and safety education to the community of Brookfield and the surrounding area.

Alton Natural Gas Storage has provided the department with a contribution to purchase six 50 foot lengths of discharge hose.



## Brookfield Junior B Elks Hockey Club and Truro Atom AA Bearcats

Alton is a sponsor of the Brookfield Junior B Elks Hockey Club and the Truro Atom AA Bearcats. The sponsorship funds are used to support basic needs such as equipment, ice rental and travel costs.



At Alton Natural Gas Storage we strive to be responsible corporate citizens by giving back to the local community. We measure our success by the social value we create and the legacy we leave. We see great value in continuing to strengthen our existing relationships and in building new ones.

## NSLC Adopt-a-Stream

NSLC Adopt-a-Stream is a program that helps community groups improve the quality of aquatic habitat for fish and other wildlife in and around Nova Scotia waterways. Alton is a proud partner with the NSLC Adopt-a-Stream program to refurbish a natural fish run in the Brookfield area. The project will be completed in May 2015.



In 2014, Alton Natural Gas Storage has contributed to local programs and initiatives in the Brookfield and Stewiacke areas.

## Stewiacke Fire Department

The Stewiacke Fire Department provides emergency services to Stewiacke and surrounding communities. Alton has provided funding to help the department purchase new life-saving equipment.



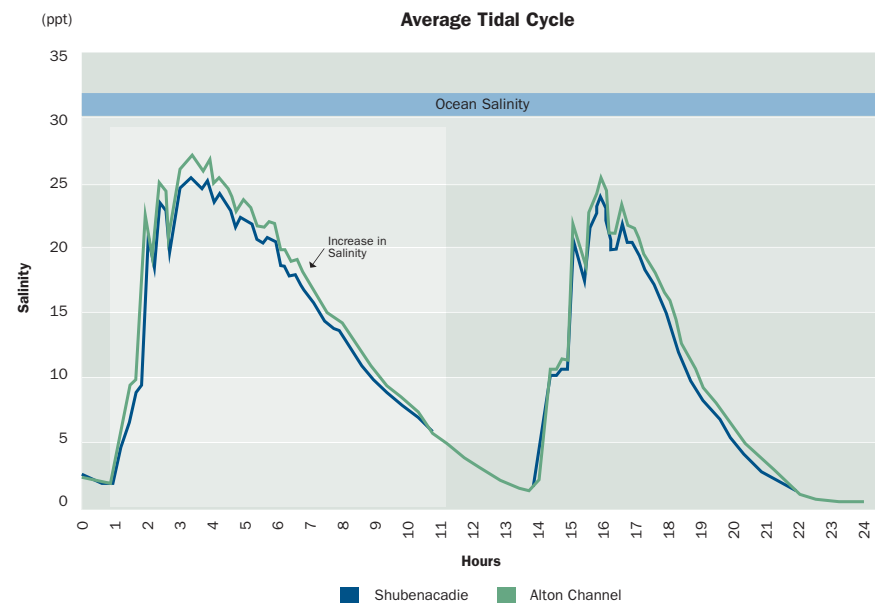
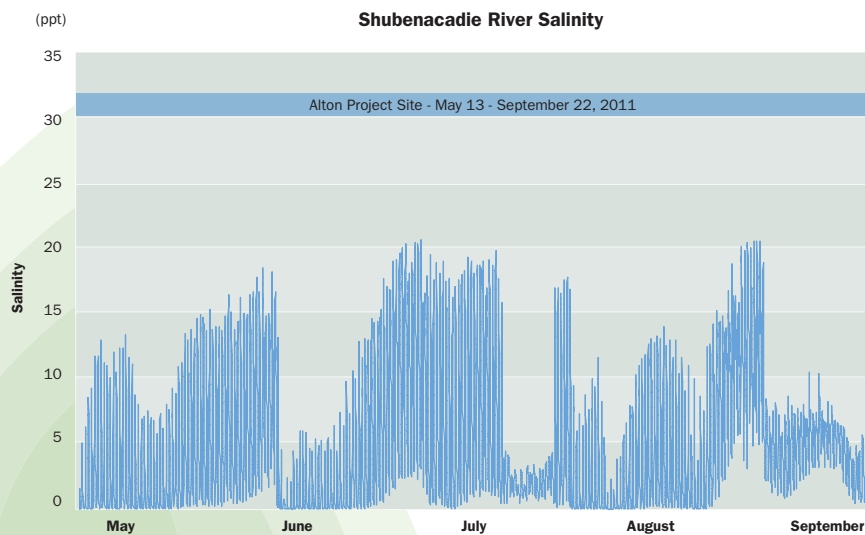
## South Colchester Minor Hockey Association

Alton Natural Gas Storage has partnered with the South Colchester Minor Hockey Association to create a skating development program for young hockey athletes.



# SALINITY LEVELS

## Salinity in the Alton Channel will mirror the natural salinity of the Shubenacadie River



- The Shubenacadie River naturally experiences a range of salt concentrations with each tidal cycle.
- All organisms living in a tidal river are accustomed to range and changes in salt levels.

- A monitoring plan was developed with DFO and Environment Canada to ensure salinity is within naturally occurring levels.
- Continuous salinity monitoring.

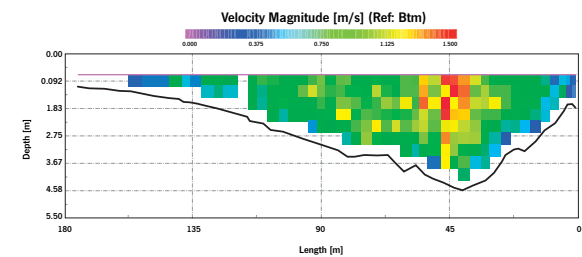
# PROTECTING FISH HABITAT

## Alton Natural Gas Storage has or will undertake the following measures to protect fish habitat:

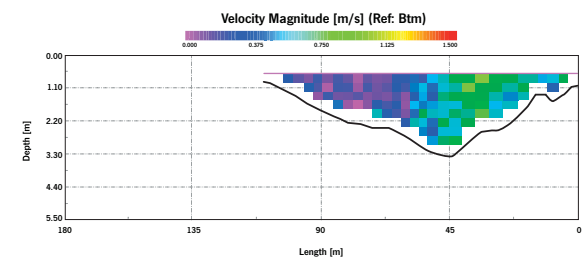
- Continuous salinity monitoring. Data is fully accessible to DFO and Environment Canada.
- Refrain from brining when large numbers of striped bass eggs are present; release of brine can be stopped immediately.
- Water intake will occur through a gabion wall to minimize the chances of drawing in fish and small organisms.
- An observational well is located within the water intake so that organisms will be detected if drawn in.
- Sampling at the water intake and brine discharge site for the presence of any species, their numbers, and life stage.
- Acoustic tagging of Atlantic salmon smolt and adult striped bass to monitor their use of the constructed channel.



RECORDING EQUIPMENT



HIGH FLOW RATES



LOW FLOW RATES



# PROTECTING THE RIVER AND FISH HABITAT



## Monitoring has established a comprehensive ecological knowledge of the Shubenacadie River



### RIVER MONITORING

#### 2005 - 2007

Preliminary independent studies by Jacques Whitford, Martec, Matrix, Soltech, Thaumass and Department of Fisheries and Oceans (DFO).

#### 2008 - 2014

Dalhousie University researchers examined hydrodynamics of the river, river salinity, inventory of fish species present and the wider food web.

Detailed monitoring plan during operations was approved by DFO and Environment Canada for river salinity and species.

### STRIPED BASS

The primary interest of the 2008-2014 river monitoring was early life stages of striped bass (eggs, larvae and juveniles).

They are considered the most sensitive to changes in salinity and most at risk to impingement. By highly studying the most sensitive species and designing the project to minimize impact on them all other species are safeguarded.



Three stages of striped bass eggs and a three day post hatch striped bass larva.

### OTHER SPECIES

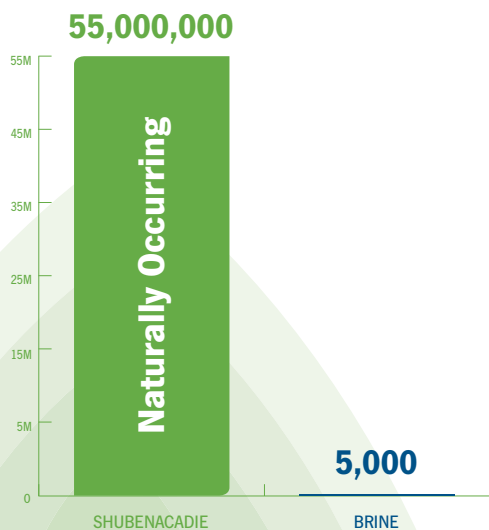
Data also collected on a number of other species including:

- American eel
- Gaspereau/American shad
- Atlantic Tomcod
- Atlantic silverside
- Smelt
- Threespine stickleback
- Northern pipefish
- Winter flounder
- Killifish
- Cunner
- Mummichog
- Grass and Sand shrimp
- Mysids
- Copepods, Amphipods

# TIDAL SHUBENACADIE RIVER

## Water/Brine

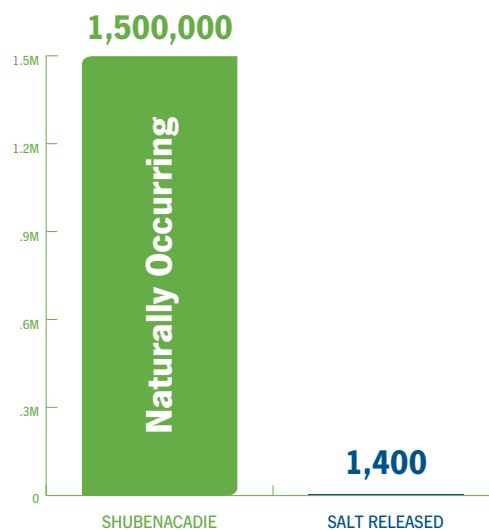
CUBIC METERS PER TIDAL CYCLE



- Approximately 55 million cubic meters of water enters the Shubenacadie River per tidal cycle.
- Up to 5,000 cubic meters of brine is released into the Shubenacadie River per tidal cycle.

## Salt

METRIC TONS PER TIDAL CYCLE



- Approximately 1.5 million metric tons of salt enters the Shubenacadie River per tidal cycle.
- Up to 1,400 metric tons of salt will be released into the Shubenacadie River per tidal cycle.



# GAS STORAGE CAVERNS



**Auxiliary Building at Cook Inlet Natural Gas Storage Facility;  
Kenai, Alaska**

- Extensive geomechanical studies have been completed on core samples to verify cavern stability and safety.
- Wells have been drilled to a depth of approximately 1,000 meters.
- Caverns will be created by solution mining using tidal river water.



- Wells have two cemented internal pipes to protect the environment.
- Gas will be stored in the caverns.
- Redundant safety valves will be installed on the wells.

# GAS STORAGE OVERVIEW



**Engine-Compressor Unit, 2370 Horsepower at Cook Inlet  
Natural Gas Storage Facility; Kenai, Alaska**



- Gas storage allows you to mitigate against high winter gas prices by purchasing and storing in the summer.
- Natural gas emits less carbon dioxide and less nitric oxides than coal, fuel oil or wood.
- Natural gas storage is utilized extensively in North America, with 446 facilities, storing 133 billion cubic meters of gas.
- The first natural gas storage field in Canada was developed in the early 1900s in Ontario.
- In Canada, the first natural gas salt cavern storage project was started in 1963 in Saskatchewan.
- History of safe natural gas storage operations.

# GAS STORAGE FACILITIES SAFETY



## Gas storage is designed, constructed and operated to stringent standards of CSA Z341, 'Storage of Hydrocarbons in Underground Formations'.

- 🔥 The Alton Natural Gas Storage Facility will be designed with redundant safety controls.
- 🔥 Gas facility has emergency shutdown valves.
- 🔥 Aboveground storage facilities are being equipped with fire detection, gas monitors, isolation systems, emergency shut-down devices, and automated fire extinguishers.
- 🔥 100% of gas pipeline welding will be x-rayed.
- 🔥 All natural gas piping and equipment are pressure tested.
- 🔥 Before the facility is operational, an Emergency Response Plan (ERP) will be established to ensure public safety.
- 🔥 The ERP will be tested and updated annually.
- 🔥 Alton will work with local emergency responders including the local fire departments to ensure familiarity with facilities and proper training on the ERP.