



# Corridor News

VOLUME 5, ISSUE 3

JUNE 30, 2011

## SPECIAL POINTS OF INTEREST:

- Part 2 of the educational Oil and Gas Primer Series
- Corridor's Call Before You Dig Information

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### Corridor's Safety Slogan

*"At work, rest and play: safety first every day."*

## Penobsquis Family Fun Day (Submission from the Organizing Committee)

Let it be known how devoted the folks of Penobsquis are to their community. The rains came on Saturday, June 18, for Penobsquis Family Fun Day and so did the People!

Even though the weather was not the best, a large group showed up to attend the events of the 5<sup>th</sup> Annual Penobsquis Family Fun Day. A popular site at various times of the day was rain coats, rubber boots and umbrellas and those that were not prepared for the weather didn't let a little bit of rain bother them.

Canoer's paddled, Frogs jumped, the "Royal Wedding Parade" marched on, eggs were tossed and scrambled, children bounced and tugged, Contrast played steadfast, the haystack was "sweat" and the "Royal Feast" was delectable.

Many other events took place throughout the day with the exception of the Fireworks. The Committee decided to save them for New Brunswick Day. Mark August 1<sup>st</sup> on your calendar and come to the Fire Hall at dusk and enjoy the Fireworks show!



The Royal Wedding: The Moffett Family



"Mrs. Dunster's Cup" Family Fun Division Winner was "Rudy's Rug Rats".  
Back Row: Rudy Graves, Jesse Secord, Travis Soucoup and Paul Secord. Front Row: Eules Vanderlaan (Captain) and Ed Murray (Chairman Family Fun Day Committee).



Ms. NewBrunswick, Tiffarah Gosman, presents Jessica Williams with a new bike.



Canoer Trophy Steven Moffett and Andrew McLean

## Sponsorship Update

Corridor received six sponsorship requests from Penobsquis and the surrounding areas since the last newsletter. Sponsorship funding was awarded to the following organizations: Ducks Unlimited; Belleisle Community Pool Association Inc.; Sussex Middle School; Sussex Classics Bantam A Girls Basketball; Havelock Lions Club; Penobsquis Family Fun Day; Kiwanis Club of Sussex; Sussex Canada Day; Sussex and District Chamber of Commerce; Maritime Paint Horse Club; and Beaverbrook Art Gallery. A request from the Atlantic Balloon Fiesta is still under review.

## Seismic Update

Seismic exploration is a necessary first step to evaluate the hydrocarbon potential of an area. The Cornhill area has been mapped by government and university geologists, but the hydrocarbon potential of the area remains poorly understood. This is mainly because the study of surface outcrops in this area has revealed little about the geology deep in the Earth. The one deep well drilled in the area (Cornhill No.3 well) was drilled only to 944 m depth by the Department of Natural Resources in 1973. Natural gas, that is being produced by Corridor in the McCully area, occurs at depths greater than 2000 m. The deep geology in the Cornhill area is unknown at this time, and the seismic line in the Cornhill area proposed by Corridor will provide information to better understand the deep geology.

The proposed seismic line is 12.3 kilometers long, and is located to pass through the Cornhill No. 3 well. As you will recall from last month's newsletter, this well is important because it provides much needed information from below the Earth's surface to guide the analysis of the seismic data. The seismic work is completed in a number of phases (or steps) using different equipment.

The types of equipment anticipated to be used to complete the work are described below:

Line Clearing – Two methods are common in the seismic industry to construct a trail suitable for seismic surveying: 1) chain saw; and 2) mulcher. Mulchers are desired as they produce a narrow, even trail easily traveled by workers, four-wheel ATV's, and tracked drilling units. Corridor proposes to use a line clearing method called *low-impact or avoidance line clearing* where large merchantable trees are avoided. The result is a line that meanders through the forest.

GPS Surveying – The source and receiver points (see below) are placed on the ground by people on foot with GPS receiver equipment. The GPS surveyors may also use four-wheel ATV's on the seismic trail.

Source Point Drilling – Once the source points are placed on the ground (every 60 m along the trail), a drilling unit with wide rubber tracks is used to drill a 7 cm (3 inch) diameter hole about 6 m (20 feet) into the ground. Each source point is loaded with a small 1 kg explosive charge. The drill hole is filled with drill cuttings to cover the charge, and a drill plug is installed about 1 m (3 feet) below the surface. The tracked drilling units are about the size of a pick-up truck. The tracks are wide and composed of rubber to minimize ground disturbance.

Recording – Geophones are installed in the ground by forcing a spike on the bottom of the geophone about 7 cm into the ground. The geophones and associated wires are transported to the seismic trail using a helicopter, and the equipment is placed at specific intervals along the line. The geophones and wires are placed and connected by workers on foot. These workers are assisted by several individuals on four-wheel ATV's. The recording truck is placed near the trail on a suitable intersecting road.

Clean-up – All geophones, wires and survey markings are removed from the trail and the trail is returned to its natural state.

In addition to the seismic work at Cornhill, Corridor is considering conducting seismic work in the Elgin area. The work would be completed in the vicinity of the 2 wells that were drilled by Apache and Corridor in 2010. More details on this work will be provided as plans develop.

## Drilling and Completions Update

Following Apache's decision not to proceed to Phase 2 of the farm-in option, Corridor has begun to finalize its drilling and completion plans for the remainder of 2011 and the early part of 2012. As we are still very optimistic about the potential for the Frederick Brook Shale, Corridor will be proceeding with the ongoing evaluation and appraisal of this exciting natural gas opportunity in New Brunswick over the next year.

### Drilling

Corridor plans on drilling two new wells in the latter half of 2011 in the Elgin area in close proximity to the previously drilled wells by Apache and Corridor. We are preparing the regulatory applications for these new wells, anticipating receipt of all required approvals to commence drilling operations in Q4 2011. Each well will take approximately 45 days to drill and case. More details will be available once the planning is complete and the new Phased EIA is submitted for both these wells. Corridor is still planning to drill the Sally Brook well, which will be a shallow wildcat exploration well located near the Lewiston Road north of McCully and west of Cornhill. This shallow well (600 m) will test the geological structures in the local area and is planned to be abandoned as soon as drilling is completed (no fracture stimulation). More details on this well have been provided in previous newsletters and the start date for this well is now moved to late summer of 2011.

### Completions

There will be small workover activities taking place periodically across the McCully field in the upcoming months. Most of these activities will be very short in duration (1 – 2 days each) with minimal to no flaring planned as these wells are already tied into the McCully Gas Plant. Corridor has no plans for hydraulic fracture stimulation activities this year. However, we are planning for the eventual stimulation of the two new wells in Elgin using the propane hydraulic fracturing technique employed at McCully and Elgin in 2009. This technique uses liquefied propane instead of water as the base fluid for the hydraulic fracturing process and proved to be reasonably successful in the program in New Brunswick in 2009. We will share more details as this program evolves.

## Production Operations Update

Production Operations are running normally. The annual scheduled McCully Gas Plant turnaround that occurred from May 25 to 28 was successful. Preventative maintenance was conducted on mechanical equipment as well as plant optimization. A number of local contractors as well as several mechanical professionals and the full complement of Corridor Production staff were on site for the duration of the shutdown. Because of the focused and professional work ethic demonstrated by all participants, there were no personnel injuries or spills during the shutdown.

## Safety and Environment Update

Since the last newsletter, the HSE Team has been providing field support to both Production Operations for the shutdown and other ongoing activities and the Completions Team for work conducted at the G-36 (Landry) Well Pad.

Corridor's Corporate Emergency Response Manual has been revised and the updated manual is in the process of being distributed. Corridor's Annual Emergency Response training exercise will be conducted in the early fall of 2011.

Corridor's HSE Department is continuing with its work associated with progressing forward the Old Harry regulatory application to the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) to drill one exploration well within Corridor's Exploration Licence 1105 in the Newfoundland and Labrador offshore area.

Corridor is pleased to report that there have been no environmental incidents or injuries related to any of its field operations since the last edition of the newsletter.

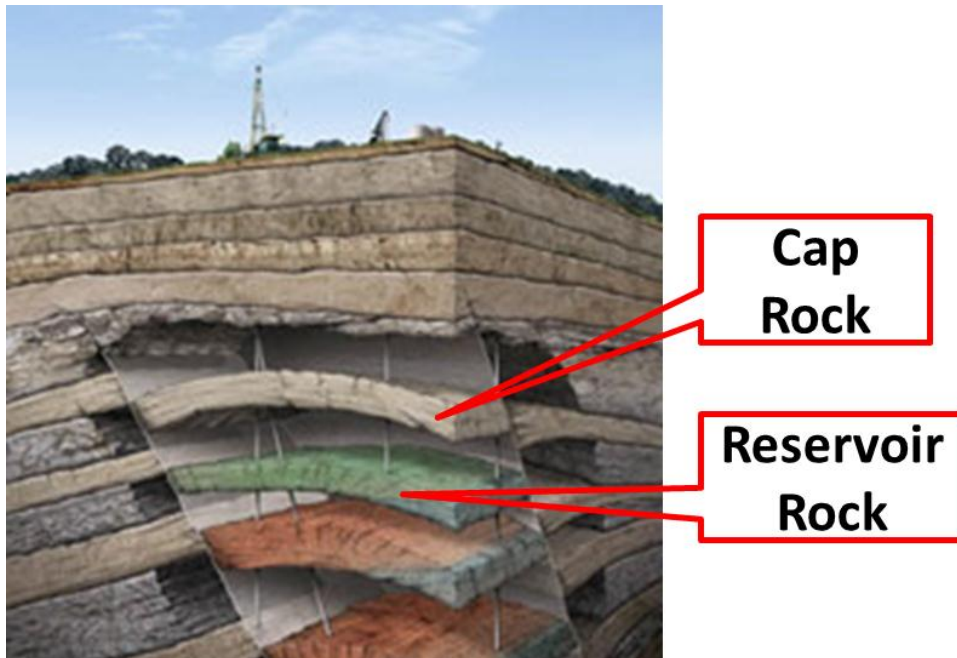
## Part 2: Oil and Gas Reservoirs by Don LeBlanc, Chief Reservoir/Production Engineer

In this instalment of the Introduction to the Petroleum Industry Series, I will describe the conditions that need to be met before an oil and gas reservoir can exist. The following will be described:

- A) What is a Reservoir;
- B) Reservoir Rock Properties;
- C) Reservoir Fluids;
- D) Reservoir Traps; and
- E) Reservoir Drives.

### A) What is a Reservoir?

A reservoir is subsurface body of rock having sufficient porosity and permeability to store and transmit fluids. A reservoir is also bounded on top by an impermeable layer of rock, called the cap rock, that traps the oil or gas in the reservoir and does not allow fluid to migrate out of the reservoir. The following figure is an illustration of a reservoir.

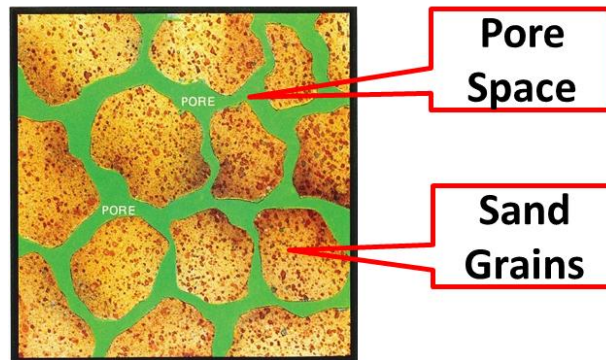


When I started in this industry over 30 years ago, a reservoir rock was normally sandstone (similar to beach sand) or carbonate (limestone, chalk) and shale was the cap rock. Today, shale has been found to be a reservoir as well.

### B) Reservoir Rock Properties

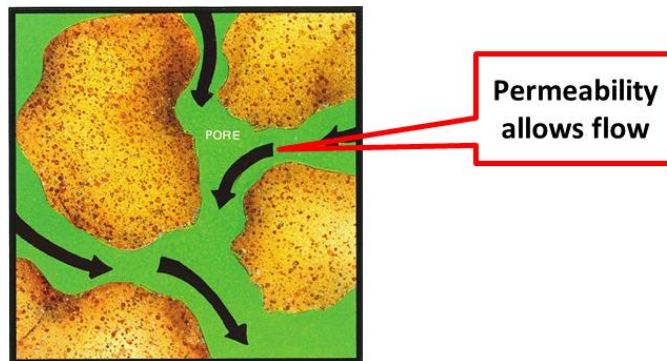
In order to be labeled a “reservoir”, the rock must have a number of properties. The most important reservoir rock properties are porosity and permeability. Porosity represents the rock’s storage capacity and permeability is a measure of the rock’s capability to allow the oil or gas to flow through the rock.

Porosity is the percentage of the rock’s volume that is void, or pore, space that can contain fluids. This is similar to a sponge’s capability to hold water – the water exists in the pore space of the sponge.



Porosity in conventional sandstone reservoirs is typically in the range of 12% to 25% and can be up to 40% in carbonate reservoirs. For unconventional reservoirs like McCully, porosity is normally between 4% and 8%. In a shale reservoir, porosity is normally less than 4%.

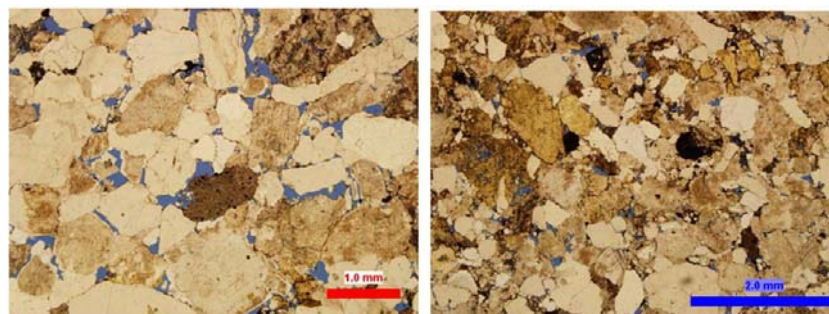
Permeability is a measure of the rock's ability to transmit fluids, measured in a unit called darcies or millidarcies.



Permeability in conventional sandstone reservoirs is typically greater than 10 millidarcies and in fields like the Nova Scotia Sable offshore gas fields, can be greater than 1000 millidarcies. For unconventional reservoirs like McCully, permeability is normally less than 0.1 millidarcies. In a shale reservoir, permeability is normally less than 0.001 millidarcies.

Common materials like peat have a permeability of 1000 to 10,000 millidarcies making it a good planting material allowing water to migrate around the plants, where granite has a permeability of 0.001 to 0.0001 millidarcies making it a good material for countertops since water cannot easily flow through it.

The picture below on the left shows a conventional sand containing good porosity (blue sections) and permeability and the picture on the right shows a sand from the McCully field.



Porosity = 12.9%, Permeability = 15.8 mD

Porosity = 6.0%, Permeability = 0.07 mD

**C) Reservoir Fluids**

All oil and gas reservoirs initially contain water which is then displaced with hydrocarbons. The hydrocarbons in a reservoir can be made up of one or more of the following:

**Dry Gas**

Essentially a light hydrocarbon mixture predominantly composed of methane and may contain ethane, propane and butane. McCully contains a dry gas which is over 90% methane.

**Wet Gas or Gas Condensate**

A gas in the reservoir that produces a large amount of hydrocarbon liquids, called condensate, at surface as the pressure and temperature of the gas is reduced. In Nova Scotia, the Sable offshore gas field contains a wet gas.

**Volatile Oil (density: 0.7-0.8 grams/cc)**

This type of oil normally contains very large amounts of dissolved gas. The oil will quickly evaporate when exposed to atmosphere. Gasoline is a volatile liquid. The Cohasset and Panuke fields contain volatile oil. The Old Harry geological structure offshore in the Gulf of St. Lawrence may contain this type of oil. Corridor has offshore exploration licences covering the Old Harry Structure.

**Conventional Crude Oil (density: 0.8-0.92 grams/cc)**

This type of oil constitutes the majority of oil reservoirs throughout the world. This is the characteristic dark brown or black crude that is normally labeled as crude oil. This type of oil is produced from the offshore Newfoundland oil fields.

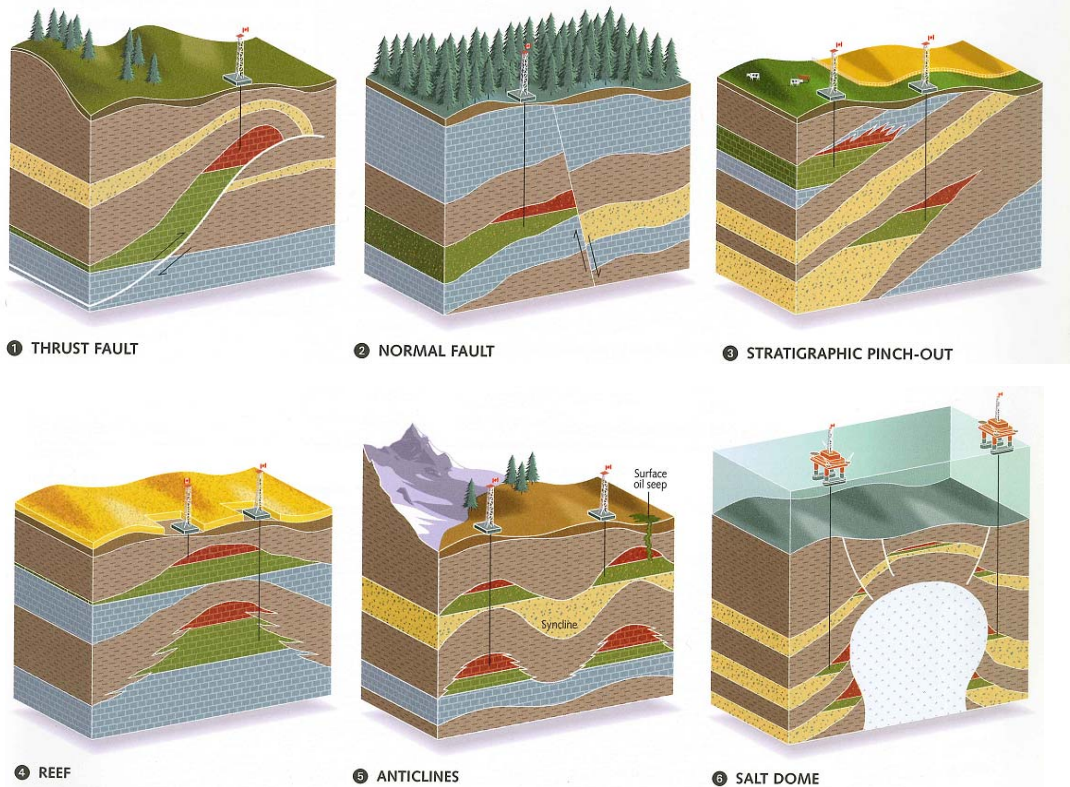
**Heavy Oil (density: >0.93 g/cc)**

This is a very thick, viscous oil. The most common example is the Alberta oil sands.

**D) Reservoir Traps**

A trap is an essential component of a petroleum system. In order for the oil and gas to accumulate and form an oil or gas field, it is necessary to trap the fluids in the reservoir rock. A reservoir is a configuration of rocks suitable for containing hydrocarbons (in other words, containing porosity and permeability) and which is sealed by an impermeable formation (cap rock) through which hydrocarbons cannot migrate.

Traps are described as structural (deformed structures such as folds and faults) or stratigraphic (areas where rock types change, stratigraphic pinch-out). The following six diagrams show some of the most common traps in the oil and gas industry.

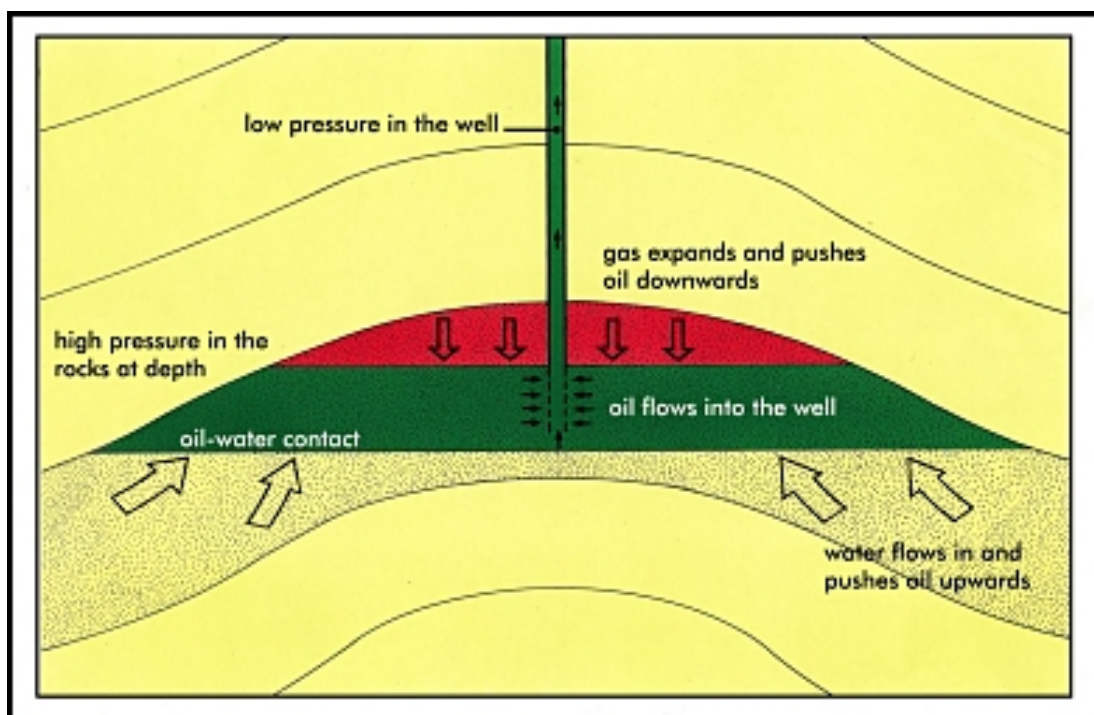


### E) Reservoir Drives

The reservoir drive is the mechanism that “pushes” the oil or gas out of the reservoir. Pressure is the natural driving force in oil and gas production. When the only force used to produce the oil or gas is the reservoir’s pressure, this is referred to as “natural drive” and the recovery mechanism is called “natural depletion”.

During natural depletion, oil will be pushed into the well and up to the surface by the pressure naturally contained in the reservoir. In a gas reservoir, expansion of the gas as pressure reduces in the reservoir drives the gas from the reservoir to the surface.

Once the natural pressure has been reduced, water or gas may be injected into the reservoir to recharge and maintain the reservoir’s pressure. This technique is called secondary recovery.



The McCully field is being produced using natural depletion. Gas is being produced by expansion of the gas in the reservoir as the pressure in the reservoir is reduced. This is also how the Nova Scotia Sable gas fields are being produced. In Newfoundland and Labrador, the Hibernia oil field began production using natural drive and as the pressure in the reservoir is being reduced, water and gas are being injected to maintain the pressure.

*Note: People are encouraged to send any requests for topics to be addressed by the Chief Reservoir/Production Engineer to Corridor via email at [info@corridor.ca](mailto:info@corridor.ca) or by calling toll free at 1-888-429-4511. All questions will be addressed in future articles.*

## Upcoming Activities

- The next newsletter will be published on August 31, 2011.
- The next meeting of the Community Liaison Committee is scheduled for Tuesday, September 13, 2011, from 7:00-8:00 PM at the Penobsquis WI Hall.
- Due to the limited field activities, other than normal Production Operations, the McCully Joint Health and Safety Committee meetings will be deferred until such time that field activity increases.

## Penobsquis Family Fun Day Fireworks *(from the Organizing Committee)*



Due to poor weather conditions on Penobsquis Family Fun Day the fireworks were postponed and will be lighting up the sky at dusk on August 1, New Brunswick Day, at the Penobsquis Fire Hall. EVERYONE please come out and enjoy the show!

## Call Before You Dig

**Corridor resources inc.**

Be safe and call before you dig.

Please provide two business days in advance of the proposed ground disturbance

**WARNING**  
NATURAL GAS PIPELINE

PLANNING TO DIG OR CROSS CALL US FIRST  
1-800-880-5705

**Corridor resources inc.**

- The New Brunswick Pipeline Act, 2005, requires anyone proposing to undertake ground disturbance near a pipeline to determine the location of the buried pipeline and to advise the pipeline operator before any ground disturbance.
- Corridor's "Call-Before-You-Dig" program provides guidance to landowners and other third parties on actions to be taken before undertaking any ground disturbances within 30 metres of the transmission pipeline Right of Way (RoW) and within 20 metres of the gathering system pipeline RoW.
- The "Call-Before-You-Dig" line, **1-800-880-5705**, is operated on a 24 hour/7 days a week basis and calls to the number are answered by one of the answering service personnel. This person will provide information about the location of Corridor's pipelines. The information and excavation request will be forwarded to a Corridor representative, who will follow up with the caller to discuss the ground disturbance and inspect the location of the proposed ground disturbance. Corridor will notify the landowner of any special requirements for working in the area near the pipeline.
- Written permission from Corridor is required prior to any ground disturbance.
- Corridor has posted signs along the pipeline route with the "Call-Before-You-Dig" information and phone number.

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Phone: 1-888-429-4511  
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We want to hear from you!

Please send any suggestions or comments to:

Dena Murphy  
Health, Safety & Environment Manager  
Phone: 1-888-429-4511  
E-mail: [info@corridor.ca](mailto:info@corridor.ca)

Corridor is an Eastern Canadian oil and gas company engaged in the exploration for and development and production of petroleum and natural gas onshore in New Brunswick, Prince Edward Island and Québec and offshore in the Gulf of St. Lawrence. Corridor currently has natural gas reserves and production in the McCully Field near Sussex, New Brunswick and discovered crude oil reserves in the Caledonia Field near Sussex, New Brunswick in 2008. In addition, Corridor has contingent resources and discovered shale gas resources in Elgin, New Brunswick.

### Corridor Mission Statement

Corridor Resources is focused on the exploration and development of oil and gas in Eastern Canada. Corridor is dedicated to safe work practices, environmentally responsible operations and the highest level of business integrity. With a strong leadership team supported by devoted employees and contractors, Corridor aims to create shareholder value by expanding its reserves and production while fostering successful partnerships in the communities in which we live and work.