UNIVERSITY OF NEW BRUNSWICK SAINT JOHN

ATLANTICA CENTRE FOR ENERGY

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Natural Gas 101

Be Informed!

A.M.A.N.B.
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UNB

October 2, 2015

UNB Saint John

Natural Gas Development in New Brunswick: Issues, Challenges and Opportunities

Be Informed!

Time	Agenda Item
9:30	Welcome & Overview : What we will cover today Colleen Mitchell
9:40	Issues and Challenges in the Natural Gas Industry Craig Arbeau, P.Eng.
10:25	Natural Gas Opportunities for New Brunswickers
10:35	Summary of information and reference material
10:45	Discussion and Wrap-Up
11:00	END

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Key Points to Cover
(Specific to New Brunswick)

- What is Hydraulic Fracturing
- How is it Done
- Where is the Resource
- What are the Risks
- Why Develop the Potential Resource

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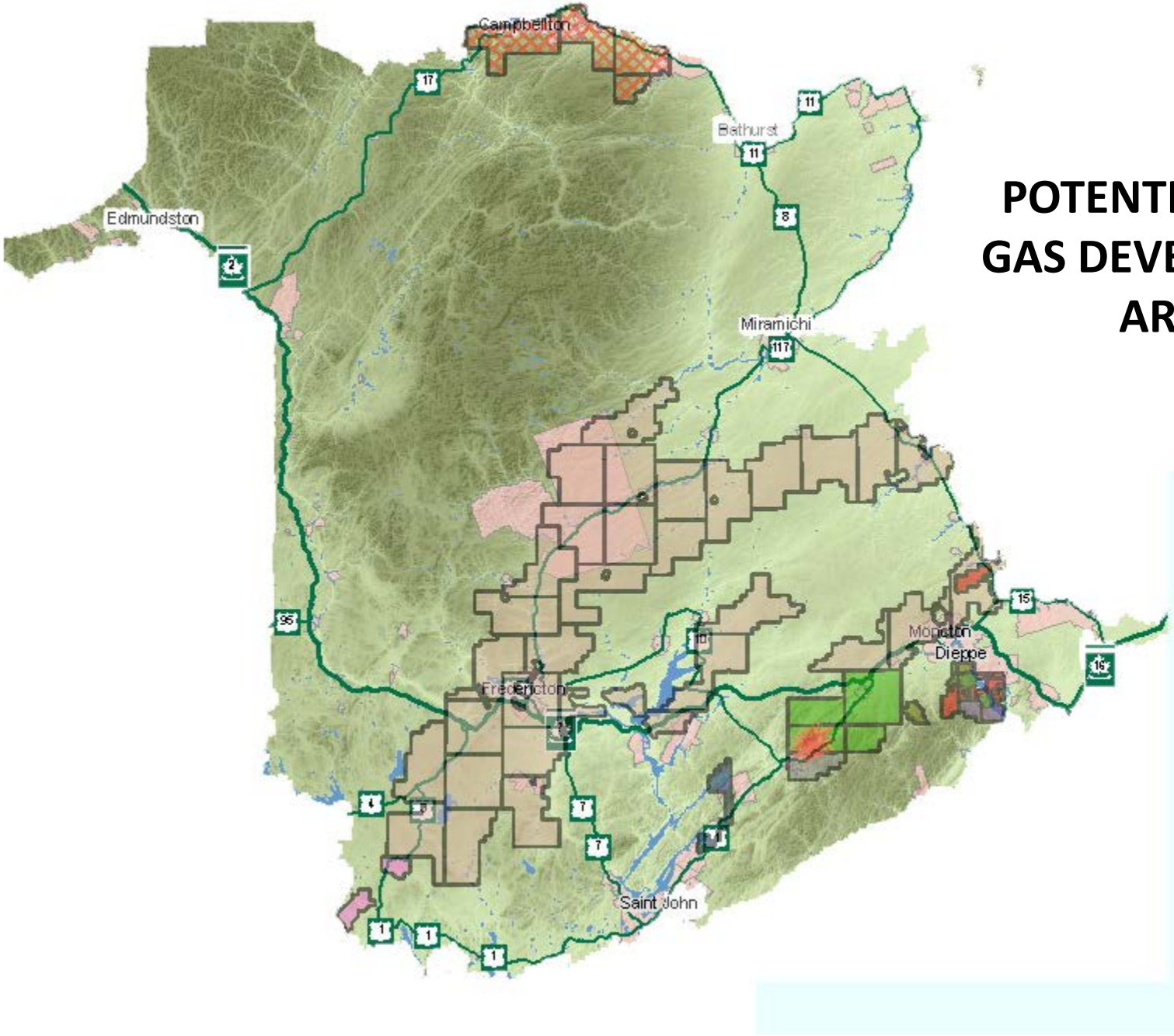
POTENTIAL SHALE GAS DEVELOPMENT AREAS



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Region	Area (KM)	Thickness of Shale	Tcf of Gas
Marcellus	**246,050**	**250**	**1500**
Horn River	**10,870**	**150**	**700**
Barnett	**12,950**	**182**	**327**
Montney	**10,350**	**150**	**250**
Canadian Utica	**5,000**	**150**	**70**
New Brunswick	**1,000**	**500**	**70**
Fayetteville	**23,300**	**60**	**55**

UNB Saint John

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  Environment, Health, Economy

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Craig Arbeau, P.Eng.

From Miramichi, NB

Experience in:

Saskatchewan, Manitoba, BC,

Alberta and New Brunswick

UNB Saint John

Responsible Development of New Brunswick's Natural Gas Industry

Craig Arbeau, P.Eng
Field Operations Manager (NB)

October 2, 2015

Outline

- Shale Gas in New Brunswick Context
- What is Fracture Stimulation?
- Information on impacts on Health, Water and Environment
- Waste Water Disposal
- Regulatory Compliance
- New Brunswick Shale Gas Potential

SHALE GAS IN NEW BRUNSWICK CONTEXT

History of Natural Gas and Oil in New Brunswick

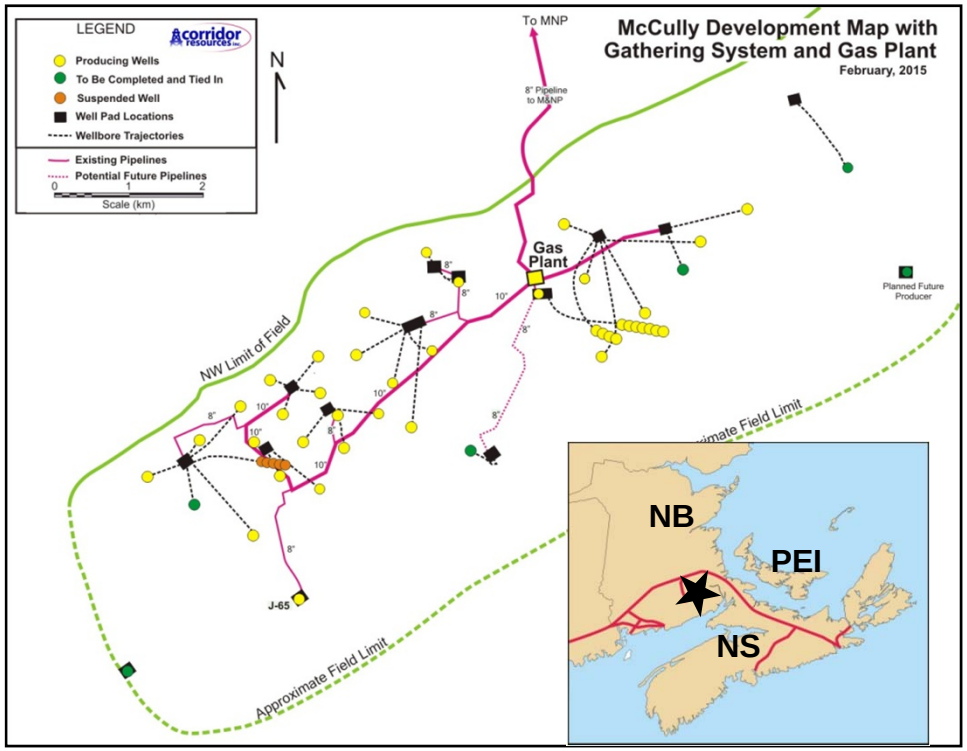
Natural Gas and Oil Industry in New Brunswick*:

- **First oil well drilled at Dover in 1859**
- 300 oil and gas wells were drilled in NB by 2010
- Since 1990, 40 oil wells drilled and 40 natural gas wells
- 32 natural gas and 18 oil wells are currently producing
- **Since 1990, 49 wells have been hydraulically fractured for oil and gas in NB**

**Source: CAPP*

Corridor Resources

- Investing in NB since 1998
- 195,000 acres of licenses
- Produced 51 Billion cubic feet to date from McCully Field, mostly from the Hiram Brook sandstone formation
- 15% annual decline; to maintain production more drilling (and fracturing) is required



NEW BRUNSWICK'S SHALE GAS POTENTIAL

Frederick Brook Shale Resource Potential

- Corridor Frederick Brook lands hold an estimated **67 trillion cubic feet (TCF)** of original-gas-in-place (OGIP) (GLJ best estimate*).
  - For a sense of scale, Canada consumes about 3 TCF of gas annually

***** See Disclaimer and forward looking statements

WHAT IS FRACTURE STIMULATION?

Generalized Steps in Natural Gas Development

Before explaining what hydraulic fracturing is, it should be made clear that it is only one step in many for Oil & Gas development. The following is a general overview of the steps in the progression of developing an oil & gas play.

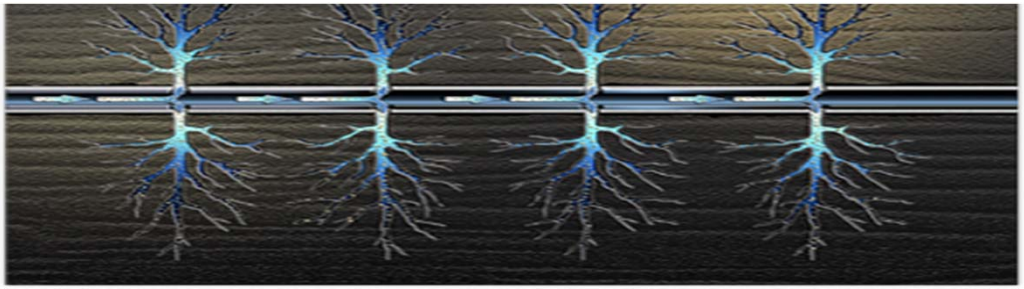
Stage 1	1. Geological Mapping	2 – 3 weeks
	2. Preliminary (Regional) Surveys	2 – 3 weeks
	3. Seismic Testing	4 – 6 weeks
Stage 2	4. Drilling	1 – 3 months
	5. Completion (which includes Hydraulic Fracturing)	1 – 2 weeks
	6. Well Production Testing	1 – 2 weeks
Stage 3	7. Production Tie-in	2 – 4 weeks
	8. Production	20+ years

Note that most activities, including hydraulic fracturing are very short duration compared to the producing life of a well.

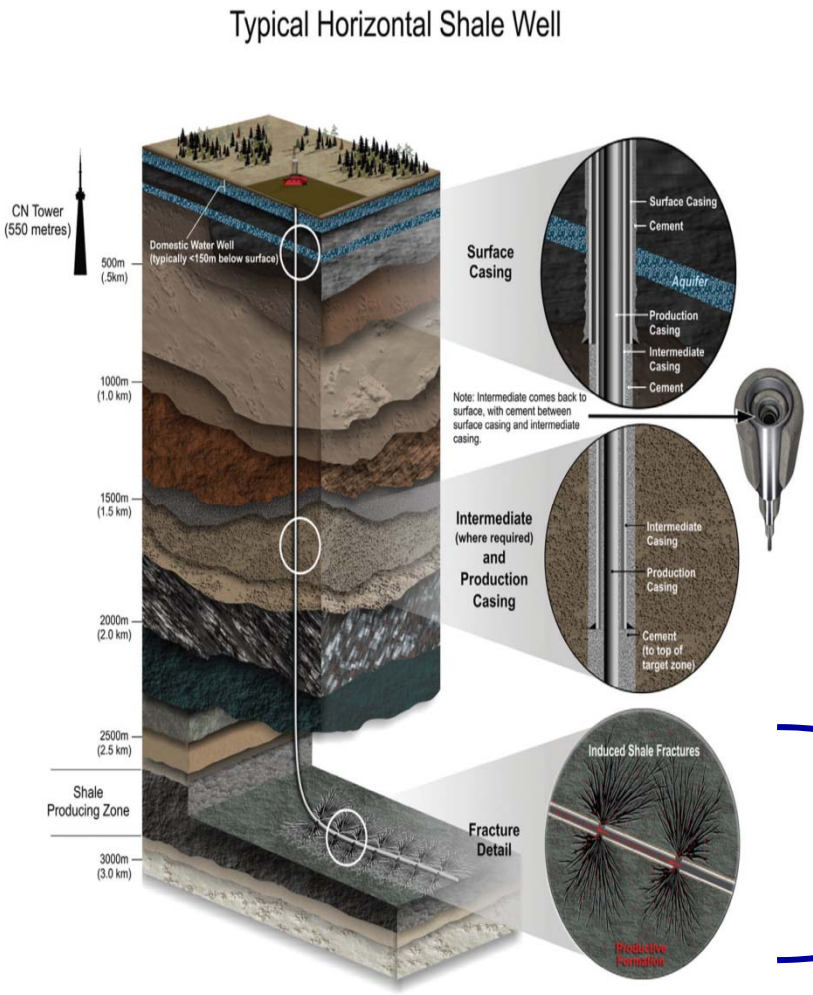
Fracture Stimulation

Process of transmitting pressure by fluid or gas to create fractures or to open existing cracks in underground rock. These cracks are then usually filled with sand to maintain an open pathway for oil and gas to travel to the wellbore. **Wells are usually fractured only once - this is not a continuous operation.**

- 1947 Standard oil – first treatment – Kansas (Commercial by 1950)
- Currently over 85% of new wells completed in this manner
- Can increase production up to x 1000
- Over 2,000,000 wells have been Fracture Stimulated worldwide
- Over 175,000 wells have been stimulated in Canada



Fracture Stimulation in NB



- Ground water is 100-300m deep
- Frederick Brook fracture treatments depth - 1500m - 4000m
  - This is a 1.2 - 3.9 kilometer barrier
- Groundwater aquifers are protected from fracturing fluids and hydrocarbons using cement and multiple steel casings

Fracture geometry:

- Frac height =30m - 100m
- Frac width = 1mm -3mm
- Frac length = 100-300m

Facts about Fracturing

- The crucial point to note is that many studies have concluded contamination of groundwater from hydraulic fracturing is not physically plausible.

- Groundwater is only at risk from a poor well construction (rare), which is a wellbore integrity risk and not related to shales or fracturing a well

- The petroleum industry has been drilling wells for over 100 years and **all wells**, **fractured or not**, have and will have this same risk

- Canadian industry best practices and the evolution of technology and completion design over the years have minimized this risk

There is a 100 year history of safe groundwater protection

INFORMATION ON THE IMPACTS ON HEALTH, WATER AND ENVIRONMENT

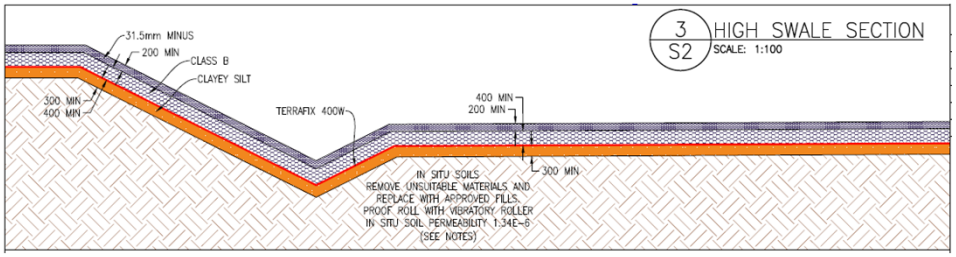
Corridor HSE Standards

Corridor Resources has a long track record of safe and responsible operations in New Brunswick.

- Corridor follows these industry rules and standards (among others):
  - Work Safe NB
  - New Brunswick's Rules of Industry
  - Pipeline Act
  - CSA standards
  - CAPP guides
  - Industry best practices
- In-house standards and manuals include:
  - Well bore integrity plan
  - Safety manual
  - Emergency response manual
  - Environmental management plan
  - Green house gas and fugitive emission reduction plan
  - Security plan
  - Water management Plan
  - Noise assessment & mitigation plan
  - Chemical management plan
  - Runoff management plan
  - Waste management plan

GROUNDWATER PROTECTION

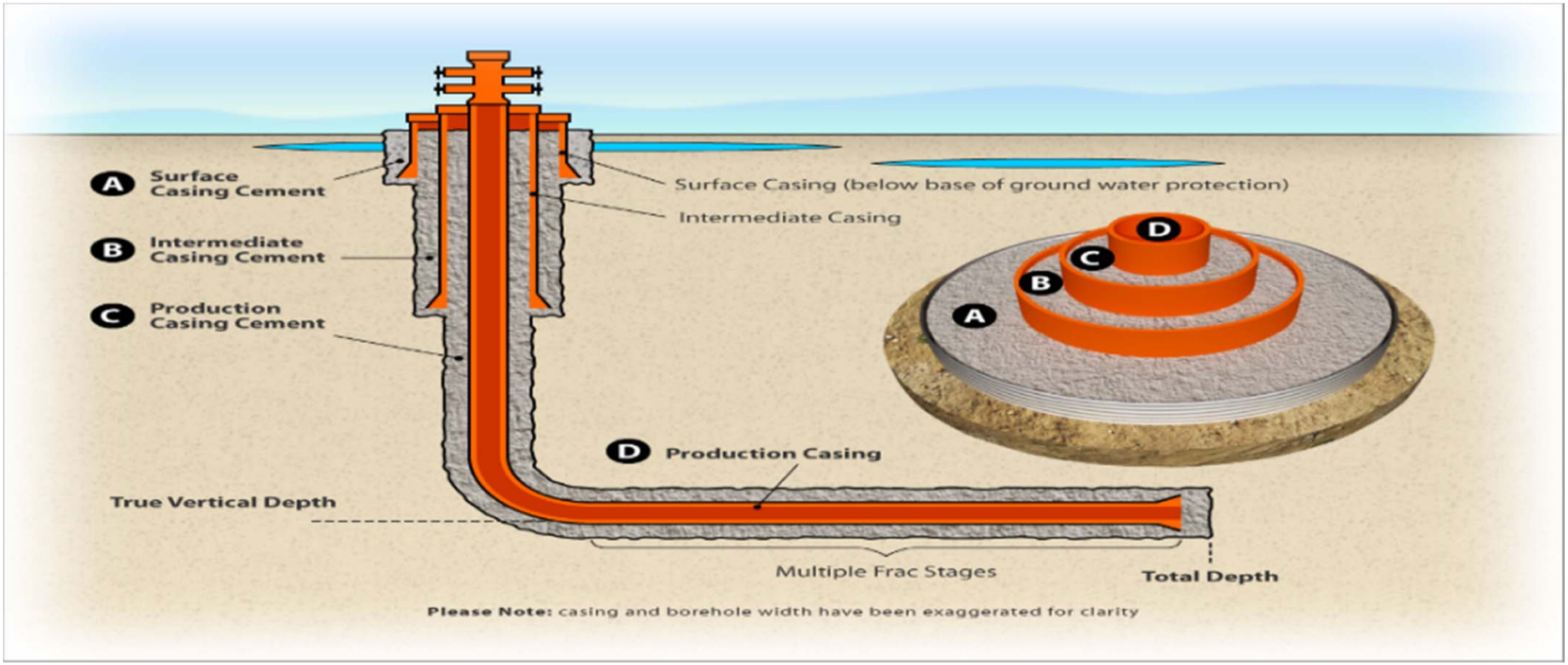
Constructing a New Well Pad (to protect environment)



- New well pad construction approximately $100,000 per Acre.
- Typically 100m X 100m (2.5 Acres)
- New well pads are engineered to specific requirements.
- Only certain materials are permitted. Soils must be compacted to a specified standard.
- Geotextiles are employed to reduce potential for downward migration of fluids.
- Contoured grading, drainage ditches and catchment ponds are used to control rainwater run-off.
- Engineered berms are constructed around fluid storage tanks for secondary containment.

Wellbore Integrity

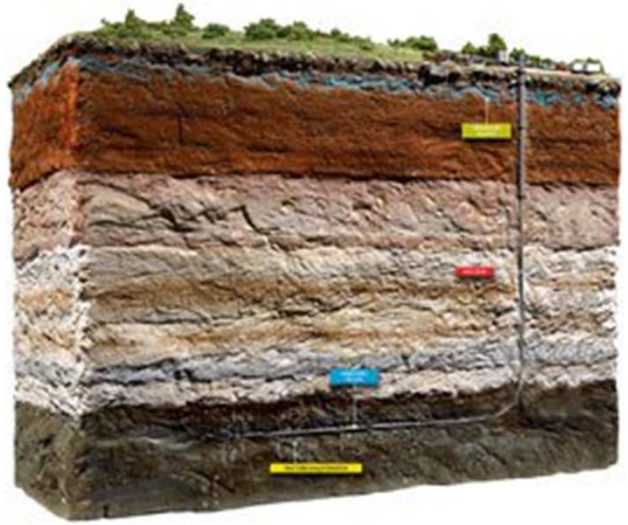
The most important step for making a successful well and ensuring ground water protection is properly cementing the wellbore.



Groundwater is protected by multiple layers of steel and cement

Groundwater Protection

- Physics and data show that direct contamination of groundwater through the fracturing process via kilometers of rock is virtually impossible
- Due to Gravity and the Laws of Physics, fracture fluids will not move kilometers upward:
  - Fracture fluids do not leak upward into water table
  - Producing shale wells creates an area of low-pressure fluid
  - Low pressure fluid cannot move into the surrounding higher pressure rock



CHEMISTRY OF FRAC FLUIDS

Chemistry of Fracture Fluids

- Fracture fluids are composed of 99.5% water and sand, with the remaining 0.5% being additives
- Frederick Brook Shale will require 6 additives at most
- Similar to products found in your household that are commonly released directly into the groundwater through household septic systems

Additives for Future Shale Fracture Stimulations

Similar to what is found in your household

Ingredient	Common Name	Frac Fluid use	Common use
Gellant	Cellulose polymer	Water viscosifier (thickener) to suspend sand	Thickener for cosmetics and household products.
Gel Breaker	Sodium borate salt	Gel breaker to lower viscosity for efficient cleanup	Laundry detergent and pharmaceuticals
Gel Breaker	Cellulase/Hemicellulase	Gel breaker (enzyme) to lower viscosity for efficient cleanup	Used in commercial food processing, laundry detergents, and pharmaceuticals.
Friction Reducer	Polyacrylamide	Minimizes friction between fluid and pipe	Flocculant for water treatment, soil conditioner for farming
Flowback Enhancer	Surfactants	Promotes the return of fluid from the formation to the wellbore	Cosmetics
Bactericide	DBNPA (amide)	Kills bacteria in mix water	Cooling tower treatment
Pre-Frac well treatment	Hydrochloric Acid	Cleans and dissolves scale	Cleaner (muriatic acid), stomach acid

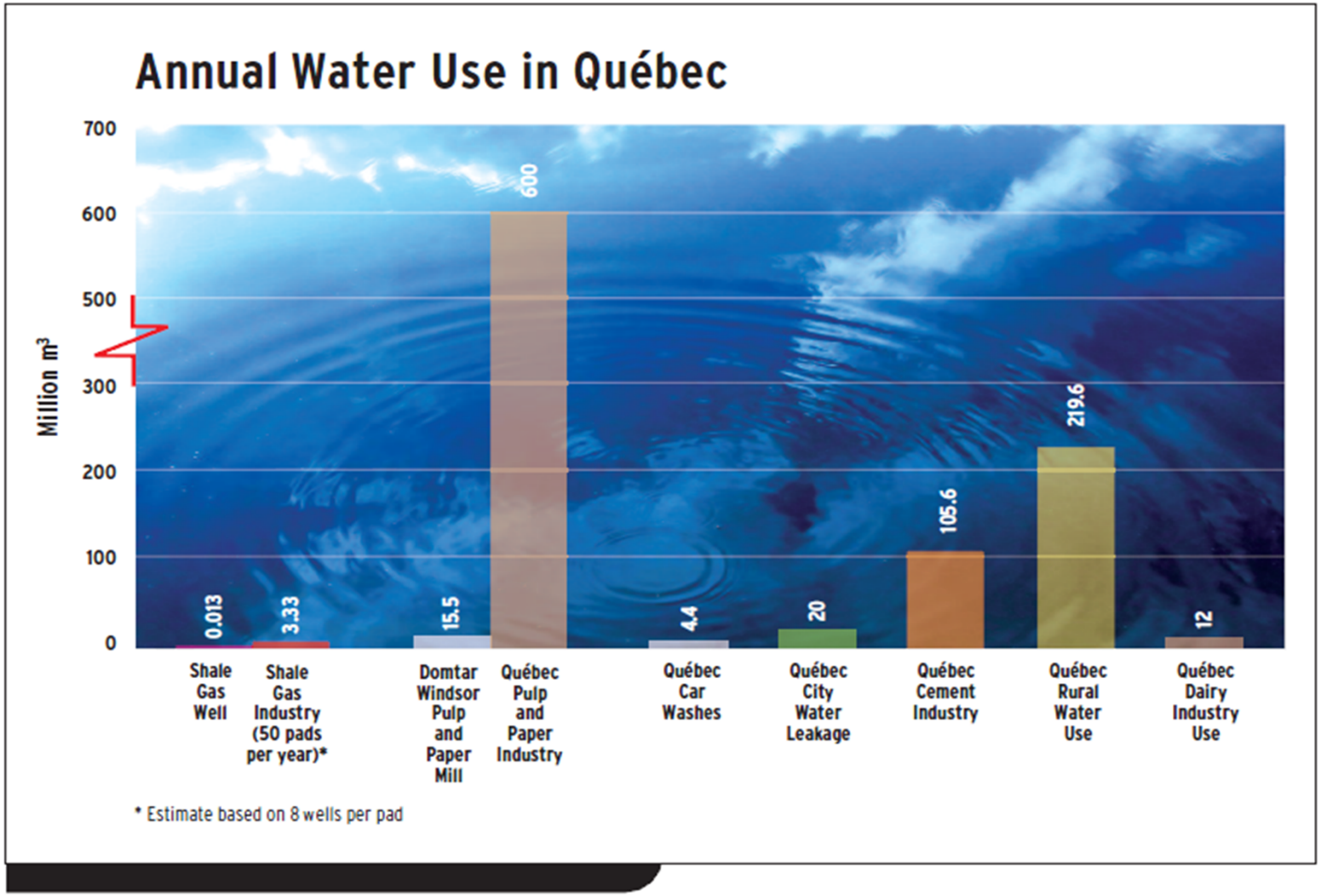
Public disclosure is mandatory in New Brunswick as well as in other jurisdictions. The full list of chemicals used in each hydraulically fractured well can be found at www.fracfocus.ca.

FRACTURING WATER SOURCE AND USAGE

Fracturing Water Usage

- Industry experience shows that all commercial shale fracturing is completed with water
- Relative to other uses, water demands related to fracturing are small

Projected Quebec Fracture Demand Compared to Other Users



Source: "*Water use in Utica Shale Gas Development" dated August 2012 Questerre Energy Corporation*

NB Source and Supply

- For comparison, other sources of water in New Brunswick include:
  - One New Brunswick golf course uses enough water in 2 weeks to fracture one shale well
  - Pulp and paper industry in New Brunswick consumes an average of 66,500,000 m^3 of water annually*
    - A 150 well per year shale program is estimated to use 3-5%**of that amount.
  - 80,000,000,000 m^3 of rain falls on New Brunswick each year

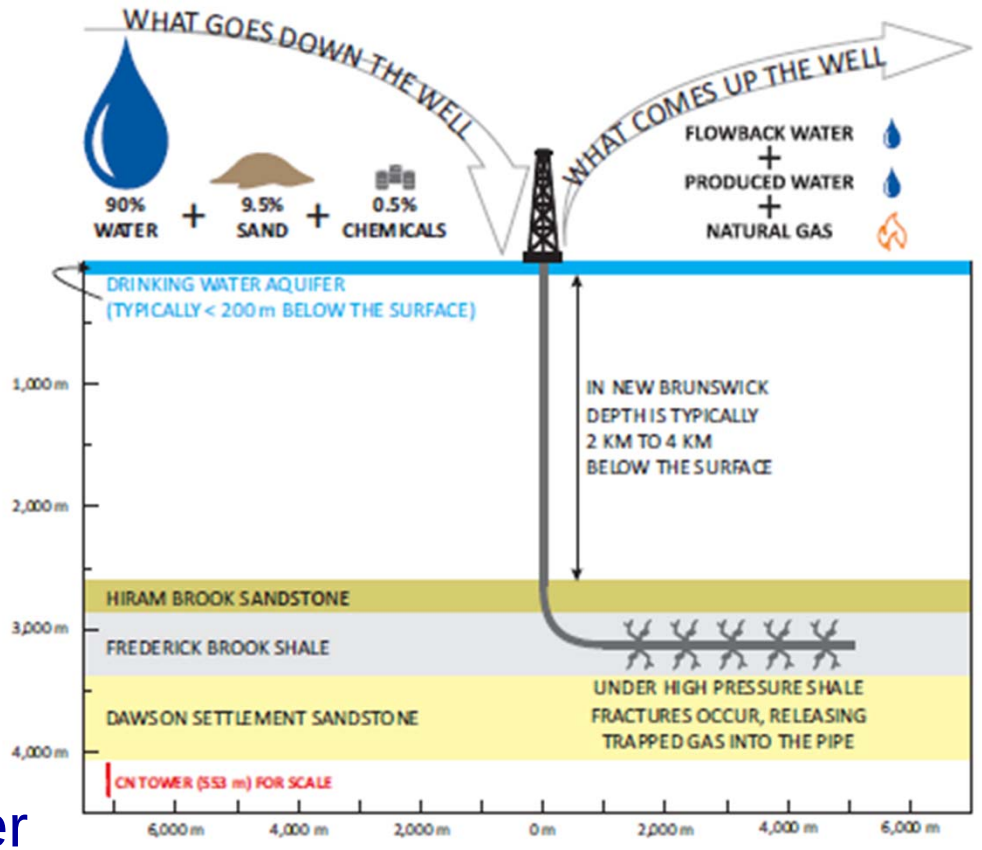
**Source: JD Irving, Limited, Sustainability Report 2013*
*** calculation assumes water volumes of 10,000-20,000 m3 per well*

WASTE WATER DISPOSAL

Recovered Fracturing Fluids

Two Sources:

- Flowback Water
  - Closely resembles the composition of the fracture fluid and traces of sediments (rock)
- Produced Water
  - After several weeks, the recovered water resembles the natural deep salty formation water



"Each can be treated using conventional and existing technology"

Source: "Wastewater from natural gas development: Treatment options for New Brunswick and Nova Scotia". Atlantica Centre for Energy, Spring 2015.

Recovered Fracturing Water Can be Treated

- One of the main concerns is salinity – flowback water comes back with the approximate salinity of sea water
- It is a relatively simple process with proven technology to remove any chemicals and solids and treat the water to standards where it can be released
- There are many industrial and municipal wastewaters with more detrimental effects that are treated and released daily (e.g. sewage, pulp and paper, landfill leachate, etc)
- The real barrier to this safe process is the social acceptance of this treated water due the misperception that fracture fluids cannot be treated or disposed of in a safe and responsible manner

New Brunswick Water Treatment and Disposal Issues

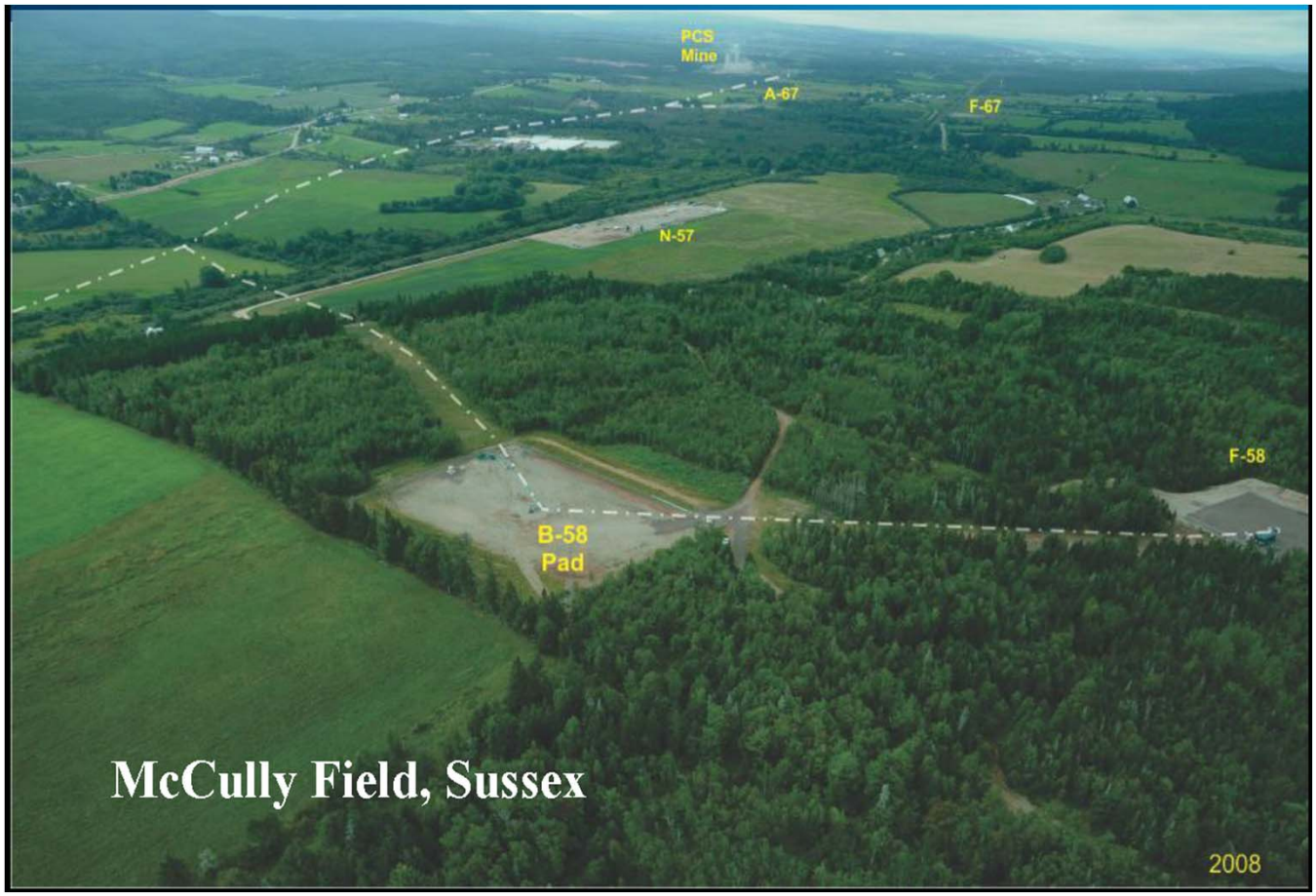
- Currently, there are no approved facilities for NB oil and gas industry to locally treat and dispose of flow back fluid.
- Recovered fracture fluids are being treated and released to the environment all across North America
- Similar industrial waters are being safely treated and disposed of in New Brunswick on a daily basis.
- Facilities and technology exist, though none are approved for our industry!
- For this industry to be commercially viable in New Brunswick, approvals for local water treatment and disposal that meet the same standards of similar industrial waters are needed!

SURFACE FOOTPRINT

Surface Footprint

- Pad drilling is the drilling of multiple wells from one surface area (well pad).
- Pad drilling has greatly reduced the surface footprint
- Pads also increase the efficiency of drilling, fracturing, and well tie-ins
- Well pads are restored to their original condition following the abandonment of the wells

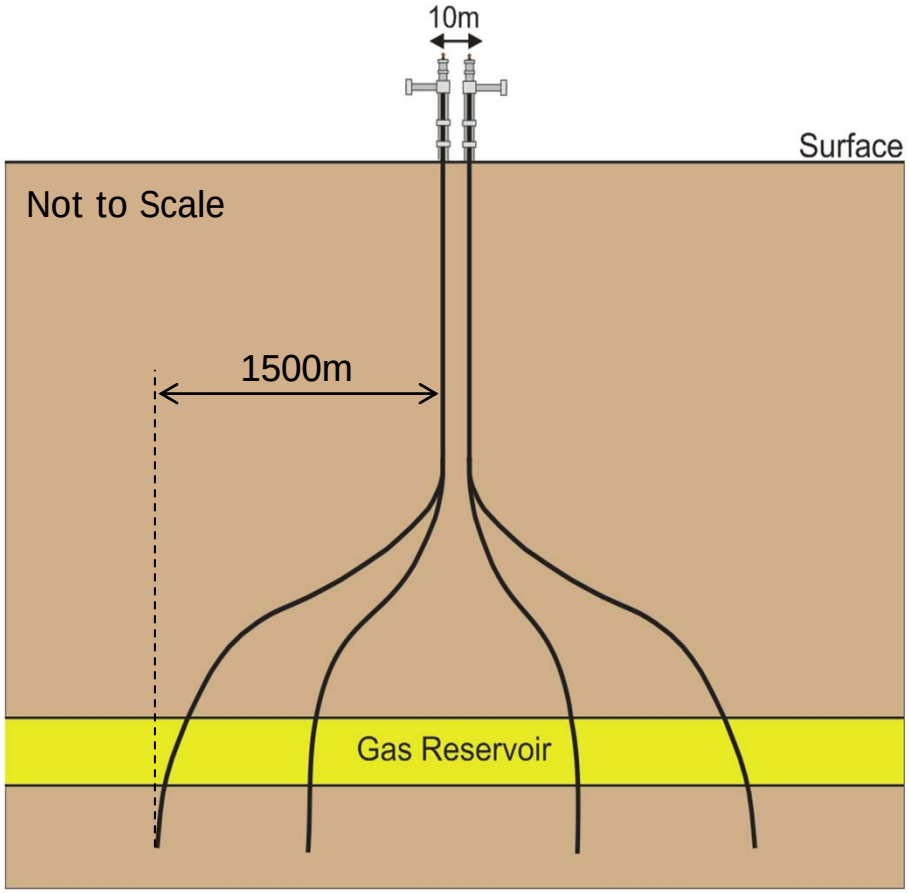
McCully Field Multi-Well Well Pads



A McCully Well Pad is the approximate area of a baseball field

- Picture shows approximately 1,500 acre area; with 24 acres used by the 5 well pads
- Buried pipelines connecting the well pads (white dash line)
- McCully's 11 multi-well pads, gas plant and access roads only use 73 acres

Multiple wells are drilled from each well pad



- Reduce environmental footprint – one well pad versus four (in this example).
- Reduced cost for upstream company
  - Fewer well pads
  - Less pipeline infrastructure
- Flexibility in placing well pads to reduce disruption to local residents.

Six Well Pad

REGULATORY COMPLIANCE

New Brunswick Regulations

Requirement	British Columbia	Alberta	New Brunswick
Well construction requirements - double walled barriers	Not specified	Any new wells can be either doubled walled or may be single walled with increased monitoring and reporting requirements	Initial well in a new setting must have double walled steel barriers (two layers of steel) throughout the well
Setbacks for oil and gas wells	Dwellings – 100 m Schools – 100 m Hospitals – 100 m	Dwellings – 100 m Schools – 100 m Hospitals – 100 m	Dwellings – 250 m Schools – 500 m Hospitals – 500 m
Well water monitoring and testing near oil and gas activities	All well water must be tested before and after: Seismic testing – no requirements Drilling – no requirements Hydraulic fracturing – within a 200 m radius only if fracturing within 600 m of surface	Not specified	All well water must be tested before and after: Seismic testing – within a 200 m radius Drilling and hydraulic fracturing – within a 500 m radius from the well pad
Geological assessment prior to hydraulic fracturing	A Risk Assessment is required if fracturing operations are shallower than 600 m from the surface	A Risk Assessment is required if fracturing operations are within 100 m of groundwater	Companies must prepare an assessment to evaluate the geological formation's ability to prevent fluid migration and protect groundwater
Shallow hydraulic fracturing	Allowed with Risk Assessment	Allowed with Risk Assessment	Hydraulic fracturing is not allowed shallower than 600 m
Water use in hydraulic fracturing – preferred water sources	Options for water sources are provided, but preference of water source is not stated	Preference of water source is not stated	1) recycled wastewater (most preferred); 2) ocean water; 3) non-potable groundwater; 4) captured run-off water or rainwater; 5) lakes or watercourses; 6) potable groundwater (least preferred)
Fracture fluid disclosure to the regulator	All fracture fluid contents must be disclosed, but descriptive information can be limited for proprietary reasons	All fracture fluid contents must be disclosed, but descriptive information can be limited for proprietary reasons	All fracture fluid contents must be disclosed
Air quality monitoring	Companies must follow provincial emission reduction legislation	Companies must follow provincial emission reduction legislation	Companies must prepare, adopt and follow emissions management and greenhouse gas reduction plans
Noise level limits	Measured at the external wall of the nearest dwelling: Daytime – n/a Nighttime – 40 decibels	Measured at the external wall of the nearest dwelling: Daytime – n/a Nighttime – 40 decibels	Measured at the external wall of the nearest dwelling: Daytime – 50 decibels Nighttime – 40 decibels
Security and emergency planning	Companies are required to submit an emergency response plan	Companies are required to submit an emergency response plan	Companies are required to submit an emergency management program

Where New Brunswick's rules are more stringent than other jurisdictions

Where New Brunswick's rules are similar to other jurisdictions

Source: Exploring Natural Gas in New Brunswick, GNB

SOCIAL ACCEPTABILITY

Acceptance Will Be Earned

- Corridor has earned the trust of the Sussex area community
- The trust of the majority of remaining New Brunswickers will be gradually earned with education, time, and good stewardship
- Jobs and wealth creation accelerate acceptance
- Perceived risks diminish as safety is proved and the public becomes familiar with the project
  - Point Lepreau nuclear power
  - Confederation Bridge

NEW BRUNSWICK SHALE GAS BENEFITS

Benefits of Industry

- Royalty revenues are only one component of total benefits received from an active oil and gas industry
- Other revenues received by Province include lease rentals, property taxes, sales taxes and corporate income taxes
- Other benefits to the Province include:
  - job creation and increased economic activity
  - Cheaper gas supply for NB suppliers* (incl. PCS) and consumers (lower heating costs)
  - Support for charities and community initiatives
  - cleaner burning fuel – reduces C02 emissions

**see Atlantica Centre for Energy NB & NS Supply and Demand report 2015 - 2025*

Increased Economic Activity from Industry

Example of local services Corridor uses on a regular basis:

- Food and lodging, trailer rentals
- Diesel fuel and gasoline
- Local Fire Departments
- Fuel trucking
- Electricians
- Consumables
- Site preparation and excavation
- Sanitation and solid waste services
- Welding and fabrication
- Pipe valve and fittings
- Mechanical repair services

2014 Capital Program
Local Benefits Example

	Total $ Spent	$ Spent in NB	%
2014 Capital program	$25.0M	$6.5M	26%
2014 Operating expenses	$3.5M	$2.8M	80%

- Approx. 103,000 Man Hours in 2014 or 53.6 Full Time Equivalent (FTE)* jobs
- Total 2014 NB FTE Jobs – 11 (plus 8 full time NB Staff)
- Majority of workers and equipment are imported from the west. A mature oil and gas Industry **could provide up to 80%** of spending in local benefits to New Brunswick, as new companies are born to service the industry.

**** 5 Days/week x 48 weeks x 8 hr/day = 1920 hr = 1 FTE + 8 Full time NB Staff.***

Anticipated Costs of a Small Development

Breakdown of costs associated with a small 10 well per year development (for example purposes):

Stage 1	1. Geological Mapping	Internal costs
	2. Preliminary (Regional) Surveys	Minimal costs
	3. Seismic Testing	up to $8,000,000
Stage 2	4. Drilling	up to $75,000,000
	5. Completion (which includes Hydraulic Fracturing)	up to $100,000,000
	6. Well Production Testing	up to $1,000,000
Stage 3	7. Production Tie-in	up to $3,000,000
	8. Production	Operating Expenses

For a small development, up to $187,000,000 of capital spent annually. Using the 80% discussed earlier equates to **~$150,000,000** spent each year in New Brunswick.

A small shale gas project is significant for the New Brunswick economy.

References

NBREDA http://nbnaturalgas.ca

Disclaimer

Forward Looking Information Disclosure

- This presentation contains certain forward-looking statements and forward-looking information (collectively referred to herein as "forward-looking statements") within the meaning of Canadian securities laws. All statements other than statements of historical fact are forward-looking statements. Forward-looking information typically contains statements with words such as "anticipate", "believe", "plan", "continuous", "estimate", "expect", "may", "will", "project", "should", or similar words suggesting future outcomes. In particular, this presentation contains forward-looking statements pertaining to the following: the potential and characteristics of Corridor's properties; Corridor's and Anticosti Hydrocarbon L.P.'s business plans and strategies, including strategic priorities; potential for LNG export; pipeline projects and capacity; natural gas production; potential regional supply basins; prices (including premiums) of natural gas; reserves and resources; support and treatment under governmental regulatory regimes; and exploration and development plans.
- Undue reliance should not be placed on forward-looking statements, which are inherently uncertain, are based on estimates and assumptions, and are subject to known and unknown risks and uncertainties (both general and specific) that contribute to the possibility that the future events or circumstances contemplated by the forward-looking statements will not occur. There can be no assurance that the plans, intentions or expectations upon which forward-looking statements are based will in fact be realized. Actual results will differ, and the difference may be material and adverse to Corridor and its shareholders. Forward-looking statements are based on Corridor's current beliefs, including the agreements governing the Anticosti Hydrocarbon L.P. as well as assumptions made by, and information currently available to Corridor, including information concerning anticipated financial performance, business prospects, strategies, regulatory developments, future natural gas and oil commodity prices, exchange rates, future natural gas production levels, the ability to obtain equipment in a timely manner to carry out development activities, the ability to market natural gas successfully to current and new customers, the impact of increasing competition, the ability to obtain financing on acceptable terms, the ability to add production and reserves through development and exploration activities and the terms of agreements with third parties. Although management considers these assumptions to be reasonable based on information currently available to it, they may prove to be incorrect. Unknown risks and uncertainties include, but are not limited to: risks associated with oil and gas exploration, substantial capital requirements and financing, prices, markets and marketing, government regulation, third party risk, environmental, hydraulic fracturing, dependence on key personnel, co-existence with mining operations, availability of drilling equipment and access, risks may not be insurable, variations in exchange rates, expiration of licenses and leases, reserves and resources estimates, development and/or acquisition of oil and natural gas properties, trading of common shares, seasonality, competition, management of growth, conflicts of interest, issuance of debt, title to properties and hedging. Further information regarding these factors and additional factors may be found under the heading "Risk Factors" in the Annual Information Form for the year ended December 31, 2014. Readers are cautioned that the foregoing list of factors that may affect future results is not exhaustive.
- The forward-looking statements contained in this presentation are made as of the date hereof and the Company does not undertake any obligation to update publicly or to revise any of the included forward-looking statements, except as required by applicable law. The forward-looking statements contained herein are expressly qualified by this cautionary statement.

Oil and Gas Disclosure

- The term "boe" refers to barrels of oil equivalent. All calculations converting natural gas to crude oil equivalent have been made using a ratio of six mscf of natural gas to one barrel of crude equivalent. Boes may be misleading, particularly if used in isolation. A boe conversion ratio of six mscf of natural gas to one barrel of crude oil equivalent is based on an energy equivalency conversion method primarily applicable at the burner tip and does not represent a value equivalency at the wellhead.

Disclaimer (cont'd)

Resources Disclosure

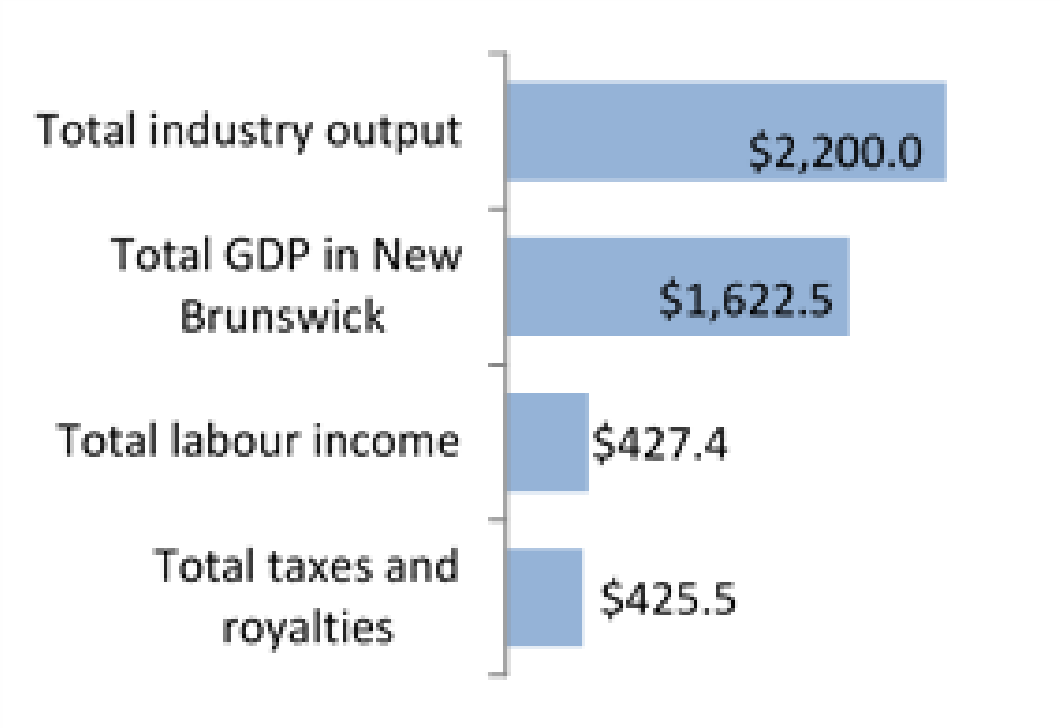
- "discovered resources" is equivalent to "discovered petroleum initially-in-place, and refers to that quantity of petroleum that is estimated, as of a given date, to be contained in known accumulations prior to production. The recoverable portion of discovered petroleum initially-in-place includes production, reserves, and contingent resources; the remainder is unrecoverable.
- "undiscovered resources" refers to those quantities of petroleum that are estimated, on a given date, to be contained in accumulations yet to be discovered. The recoverable portion of undiscovered petroleum initially-in-place is referred to as prospective resources, the remainder as unrecoverable. Undiscovered resources carry discovery risk. There is no certainty that any portion of these resources will be discovered. If discovered, there is no certainty that it will be commercially viable to produce any portion of the resources. A recovery project cannot be defined for this volume of undiscovered petroleum initially-in-place at this time.
- "discovered unrecoverable petroleum initially-in-place", the equivalent of "discovered unrecoverable resources", refers to that portion of discovered petroleum initially-in-place which is estimated, as of a given date, not to be recoverable by future development projects. A portion of these quantities may become recoverable in the future as commercial circumstances change or technological developments occur; the remaining portion may never be recovered due to the physical/chemical constraints represented by subsurface interaction of fluids and reservoir rocks;
- Resources do not constitute, and should not be confused with, reserves. Actual reserves and resources will vary from the reserve and resource estimates, and those variations could be material**. There is no certainty that it will be economically viable to produce any portion of the resources.**
  - The resources assessment referred to in Slides #6, #11 & #16 was completed by GLJ Petroleum Consultants Ltd. effective June 1, 2009, as modified on March 25, 2014, setting forth certain information regarding discovered unrecoverable resources of Corridor's interests in the Frederick Brook shale formation. The best estimate is the value that best represents the expected outcome with no optimism or conservatism. **There is no certainty that it will be commercially viable to produce any portion of these discovered resources.**
  - The reserves estimates referred to in Slides #2 & #3 was prepared by GLJ dated February 18, 2015 with an effective date of December 31, 2014 setting forth certain information relating to certain natural gas, crude oil and natural gas liquids reserves of Corridor properties, specifically the McCully Field and the Caledonia Field, and the net present value of the estimated future net reserves associated with such reserves.
  - The resources assessment referred to in Slides #6 and #7 was prepared by Sproule Associates Limited effective June 1, 2011, as modified November 19, 2013 and updated effective as of April 30, 2015 setting forth certain information regarding total petroleum initially-in-place of the Macasty shale formation on Anticosti Island. The best estimate reflects the probability that the quantity actually in place is equal to or greater than the estimate is 50%. These resources are reported as Bboe to reflect uncertainty of hydrocarbon type across the island. A recovery project cannot be defined for this volume or undiscovered resources. **There is no certainty that any portion of these resources will be discovered. If discovered, there is no certainty that it will be commercially viable to produce any of these resources.**
  - For further information on Corridor's resources and reserves, see the Annual Information Form for the year ended December 31, 2014.

WHAT IS THE OPPORTUNITY?

1. What could be the economic impacts?
2. How will it benefit New Brunswickers?

ECONOMIC IMPACT

Estimated five-year cumulative economic impact from the growth of the shale gas industry in New Brunswick ($M)



Source: Potential New Brunswick Energy Infrastructure and Natural Resource Investment

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Potential Economic Impact: New Brunswick

	Gas processing Facilities	*Exploration and production phase*					Five-year totals
		2016	2017	2018	2019	2020	
New wells per year		15	20	30	50	75	
Total investment ($M)	$300.0	$150.0	$200.0	$300.0	$500.0	$750.0	$2,200
GDP at basic prices							
Direct impact ($M)	$59.3	n/a	n/a	n/a	n/a	n/a	
Direct & indirect impact ($M)	$122.2	$109.2	$145.6	$218.4	$364.0	$546.0	$1,506
Total impact (direct, indirect and induced) ($M)	$141.8	$116.9	$155.9	$233.8	$389.7	$584.5	$1,623
Labour income							
Direct impact ($M)	$28.2	n/a	n/a	n/a	n/a	n/a	
Direct & indirect impact ($M)	$62.5	$25.0	$33.3	$50.0	$83.3	$124.9	$379
Total impact (direct, indirect and induced) ($M)	$70.6	$28.2	$37.6	$56.3	$93.9	$140.8	$427
Jobs - full-time equivalent (FTE)							
Direct impact	360	n/a	n/a	n/a	n/a	n/a	
Direct & indirect impact	785	279	372	558	930	1,395	
Total impact (direct, indirect and induced)	915	329	438	657	1,096	1,643	

- **$100 million of annual tax/royalty revenue pays for:**
  - The salaries of more than 1,400 **nurses**
  - The salaries of more than 1,500 **school teachers**
  - The salaries of 650 **doctors**
  - Over half of the total paid to New Brunswick families each year through Social Assistance

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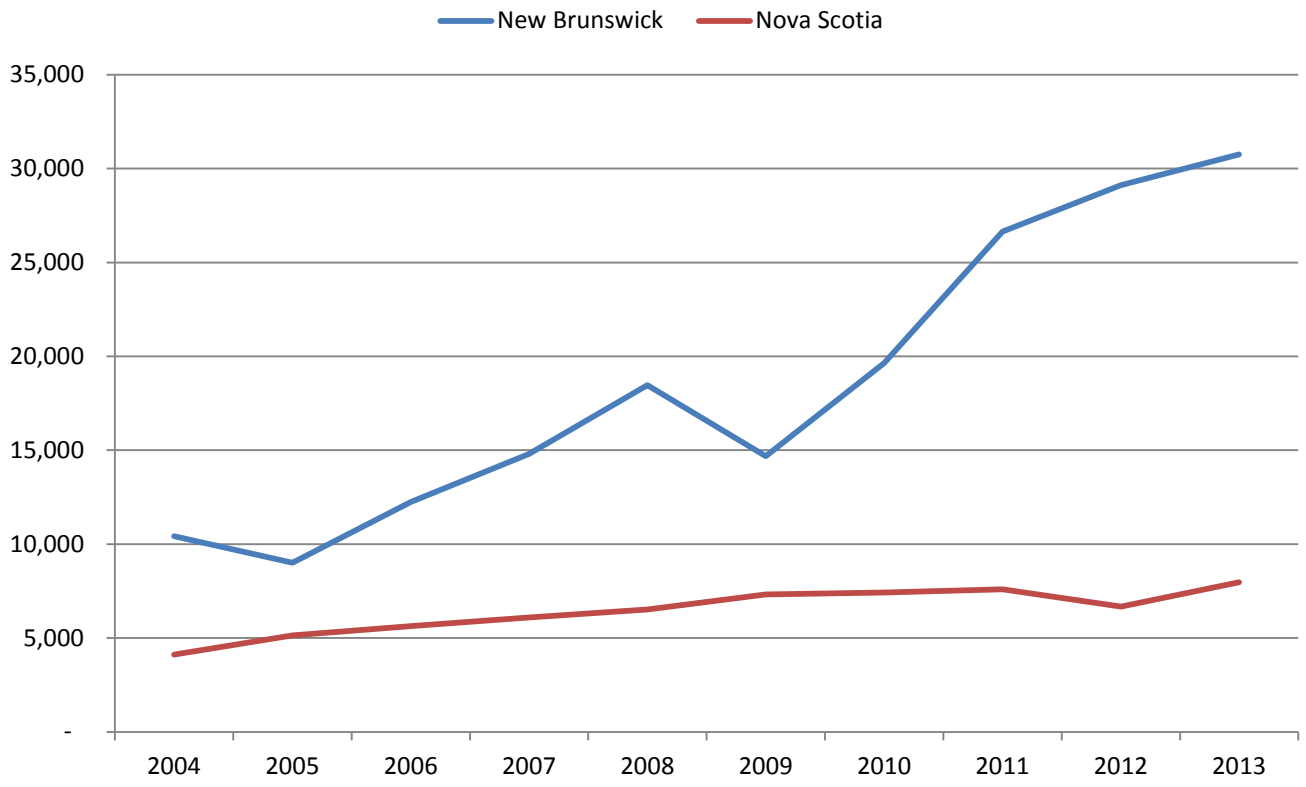
World LNG estimated January 2015 landed prices

Source: Waterborne Energy, Inc. Data in $US/MMBtu

Natural gas and NGLs energy use in New Brunswick and Nova Scotia, final demand (terajoules)



Source: Statistics Canada CANSIM Table 128-0016.

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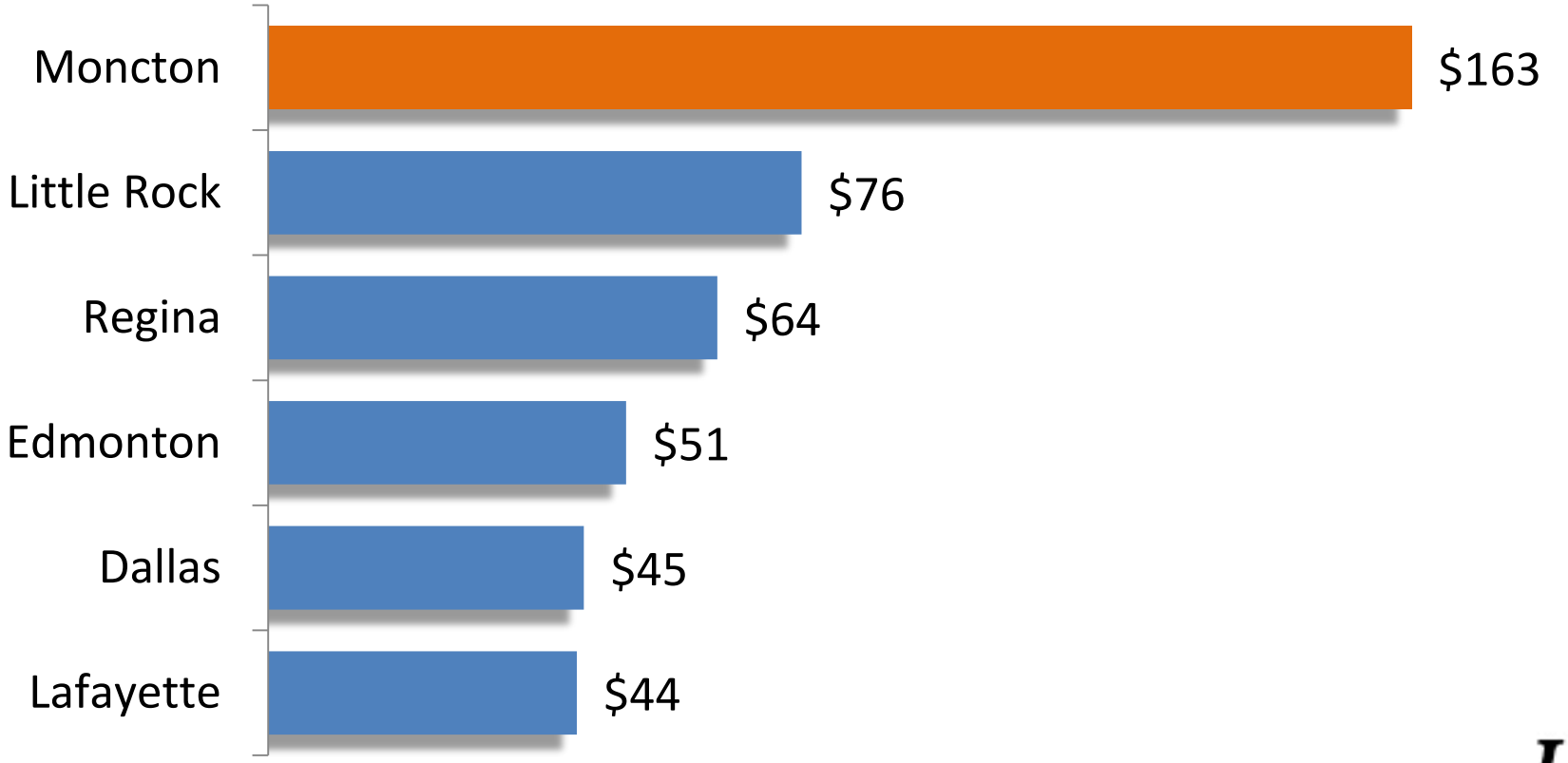
ANNUAL NATURAL GAS COSTS $000s (2014 ESTIMATE)
METAL FABRICATION FACILITY

Based on monthly gas consumption of 28,895 m3



Source: KPMG Competitive Alternatives 2014.

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BENEFIT TO NEW BRUNSWICKERS

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Energy use, final demand (terajoules) - New Brunswick and Nova Scotia
Source: Statistics Canada CANSIM Table 128-0016.

					% Change	
	NB	NS	NB	NS	NB	NS
	2005	2005	2013	2013	2005-2013	
Total primary and secondary energy	170,206	180,372	151,173	147,795	-11%	-18%
Total coal	n/a	1,252	n/a	n/a	n/a	n/a
Natural gas	6,383	1,343	19,238	5,493	**+201%**	**+309%**
Gas plant natural gas liquids (NGL's)	2,627	3,796	11,510	2,478	**+338%**	-35%
Primary electricity, hydro and nuclear	52,704	42,521	45,483	37,559	-14%	-12%
Coke	n/a	n/a	n/a	n/a	n/a	n/a
Total refined petroleum products	101,819	130,114	73,992	101,293	**-27%**	-22%
Motor gasoline	37,114	43,008	35,283	39,697	-5%	-8%
Diesel fuel oil	34,178	30,662	24,009	26,605	-30%	-13%
Light fuel oil	10,487	28,724	7,159	24,482	-32%	-15%
Heavy fuel oil	17,464	16,729	4,637	4,616	**-73%**	-72%

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In Atlantic Canada

Greenhouse gas emissions are

down 26% over the past ten years

(versus 4% nationally)

PROVIDING LONG TERM ENERGY COST STABILITY

- Almost all of New Brunswick's large industrial companies use natural gas.
  - Shipped through the pipelines (M&NE, Brunswick Pipeline, Emera)
  - Direct access (Potash Corp.)
  - Via compressed natural gas (CNG)

- Many small and medium-sized businesses, as well as institutions such as schools and hospitals have converted to natural gas.

- Local supply of natural gas provides long term energy price stability.

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SUPPLY CHAIN OPPORTUNITIES

Energy Supply Chain (# of Firms*)
New Brunswick vs Saskatchewan

Industry group:	New Brunswick	Saskatchewan
Conventional oil and gas extraction	5	502
Non-conventional oil extraction	1	17
Oil and gas contract drilling	6	220
Services to oil and gas extraction	9	1,114
Oil and gas pipeline and related construction	18	199
Mining and oil and gas well machinery wholesalers	6	112

**This does not include hundreds of firms that support the sector including construction, engineering, legal, human resources, finance and other business services.*
Source: Canadian Business Patterns (2014). Statistics Canada.

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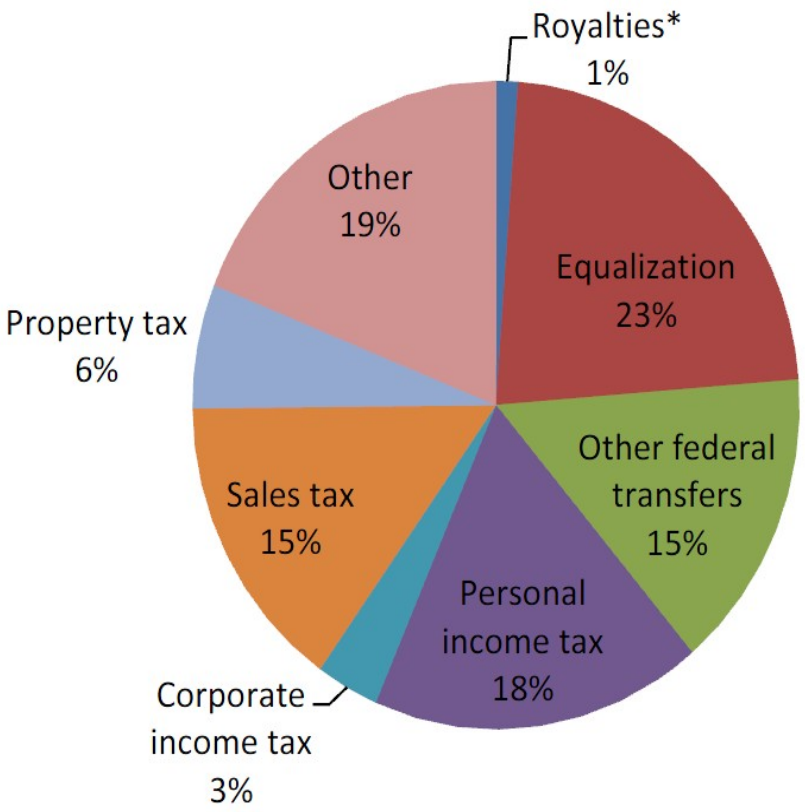
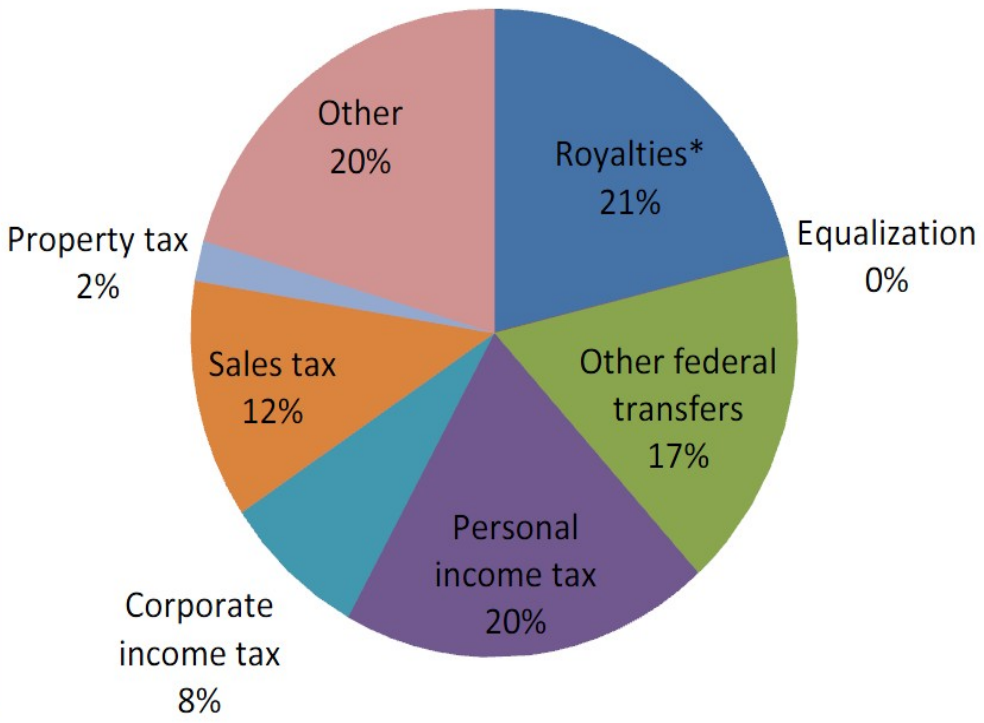
Provincial Government Revenue by Source

New Brunswick

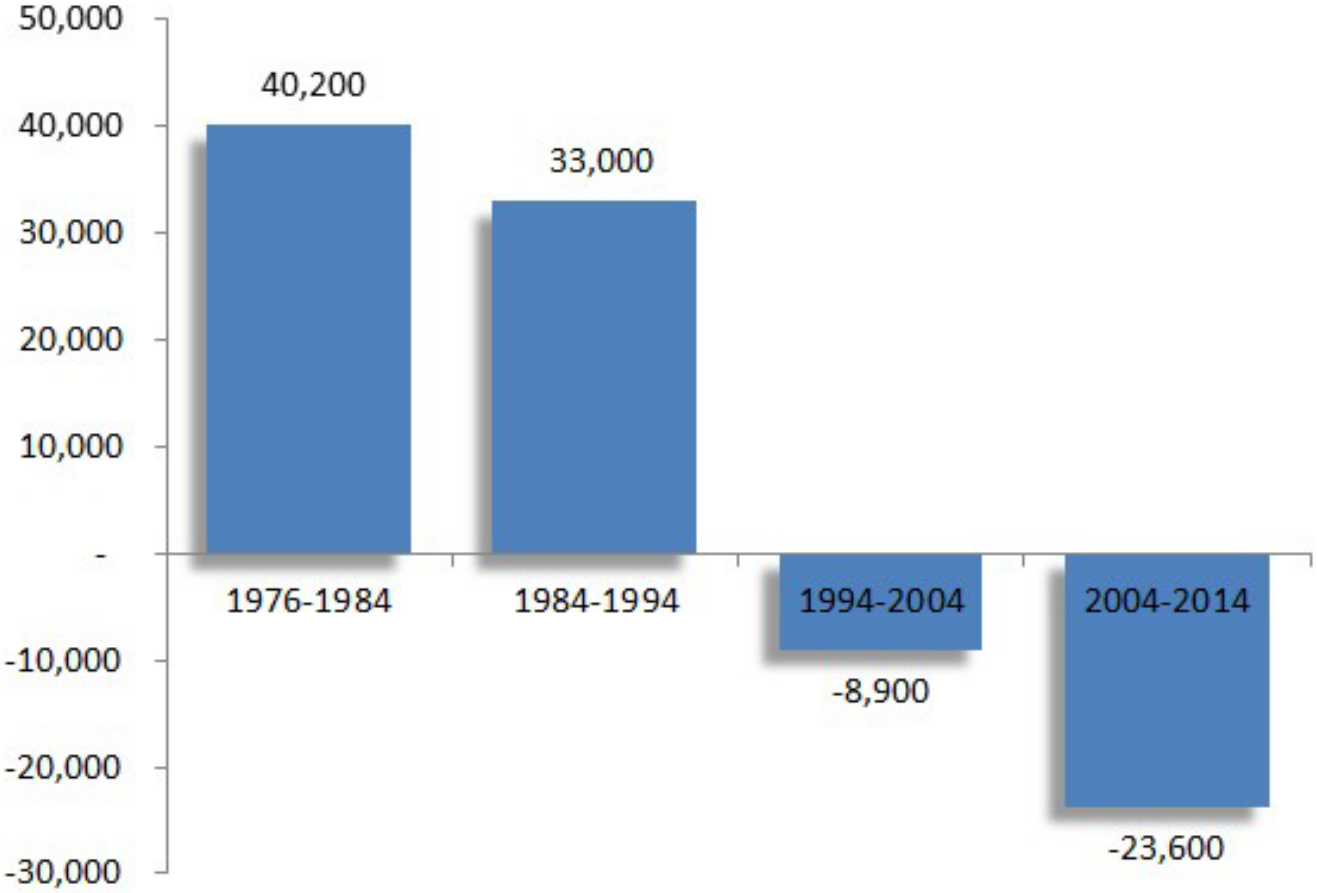


Saskatchewan



Increase in the Size of the New Brunswick Labour Market by Decade

25 to 44 years



Source: Statistics Canada CANSIM Table 282-0002.

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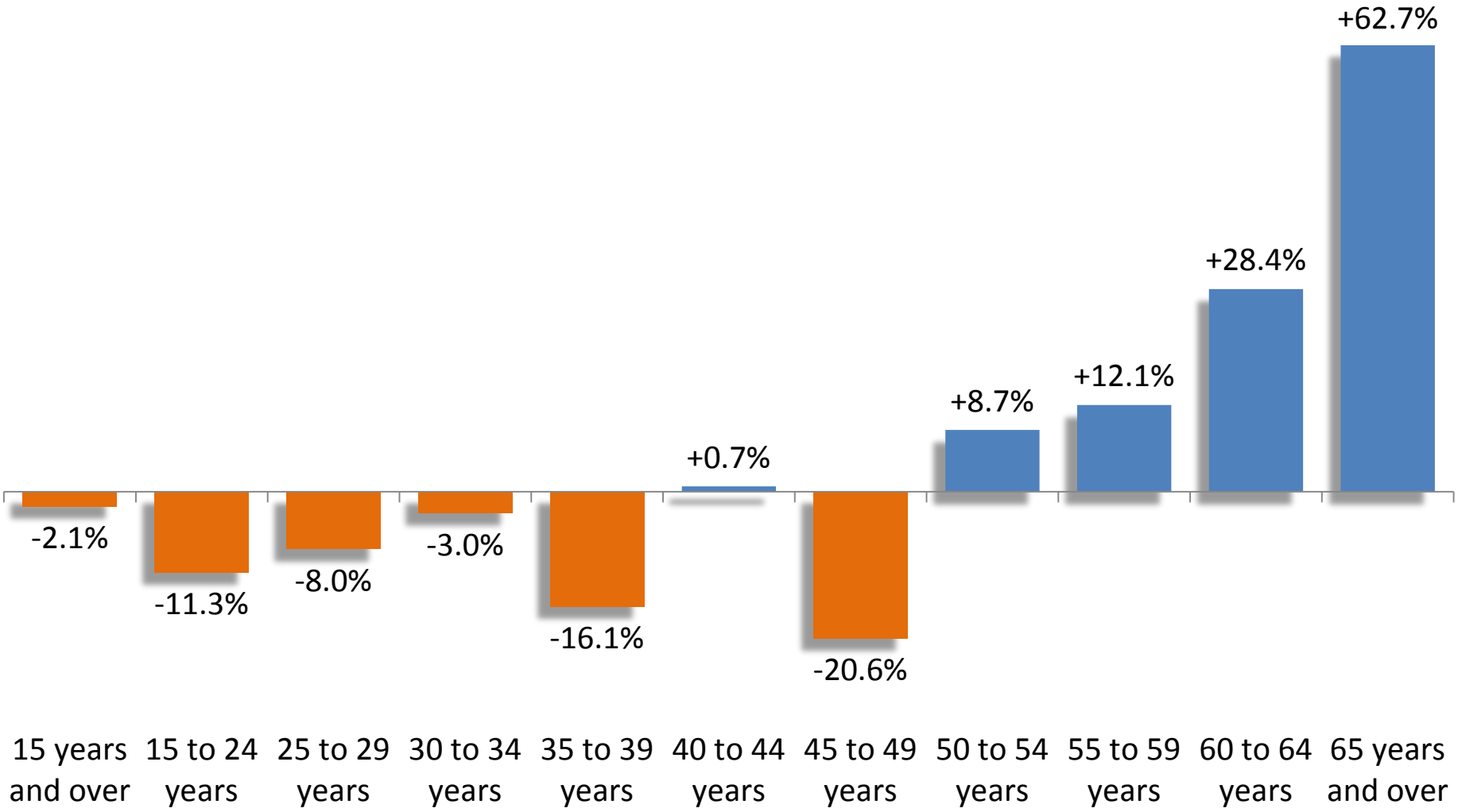
Percentage change in total employment by age group in New Brunswick (2009-2014)



Source: Statistics Canada CANSIM Table 282-0002.

Key Points We Covered (Specific to New Brunswick)

- How is Hydraulic Fracturing Done

Explore	Drill	Produce
Years	Weeks	Decades

- 49 in New Brunswick
- 215,000 in Canada

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Key Points We Covered (Specific to New Brunswick)

- There are Risks,
  by proceeding AND by not proceeding
- Groundwater is 100- 300 metres below the surface
- Shale gas resource is 2 – 4 **kilometers** below the surface
- Water used is 20,000 m^3
- Annual Rainfall 80 billion m^3
- NB natural gas use is up 539%, GHG emissions are down 26%

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Key Points We Covered (Specific to New Brunswick)

- Benefits include establishing an industry with 1600 jobs and $1.6 billion over five years
- Establish a support industry of local suppliers
- Potential resource (At Corridor) is 67 TCF
- Sable offshore was 3 TCF

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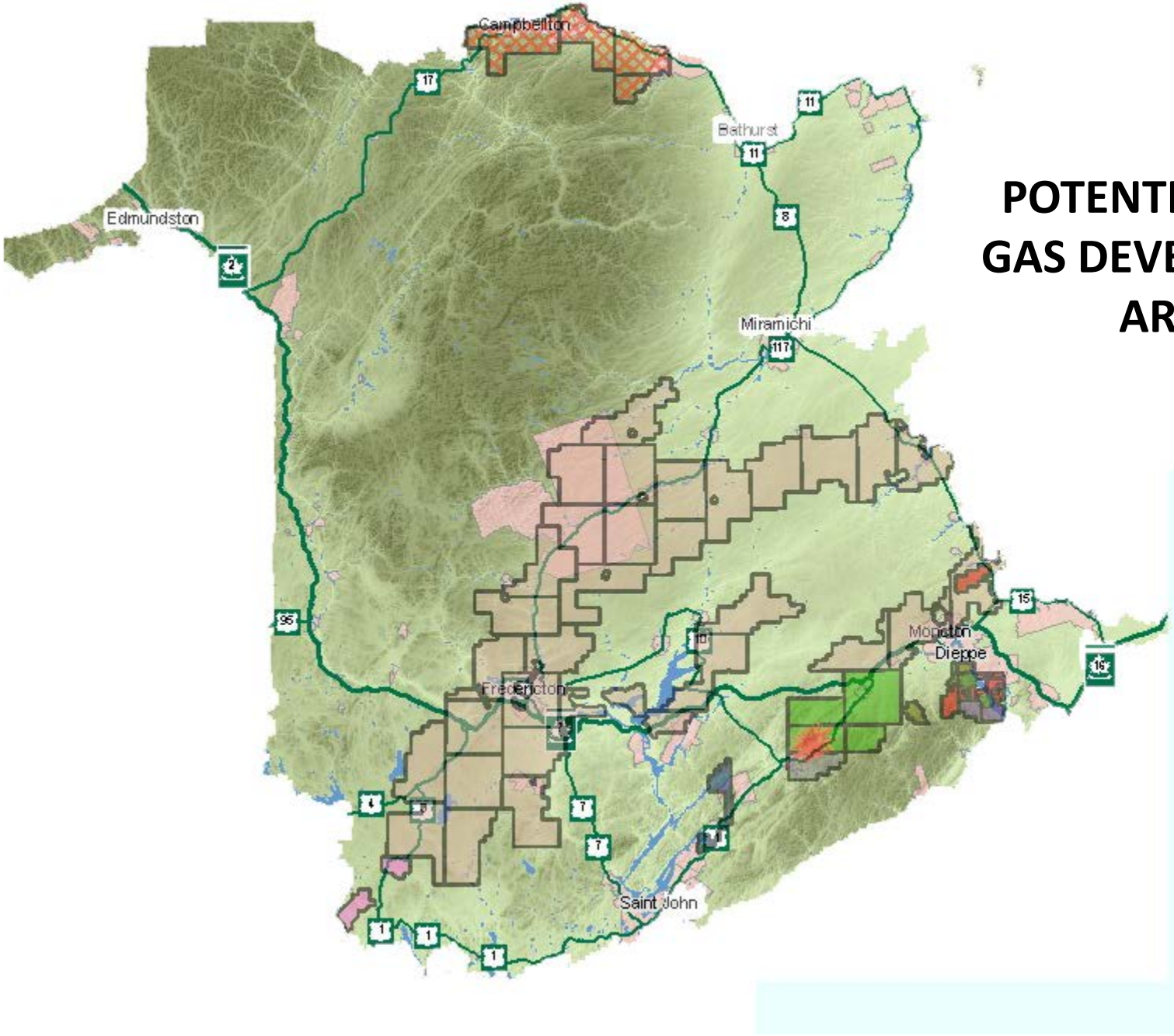
POTENTIAL SHALE GAS DEVELOPMENT AREAS



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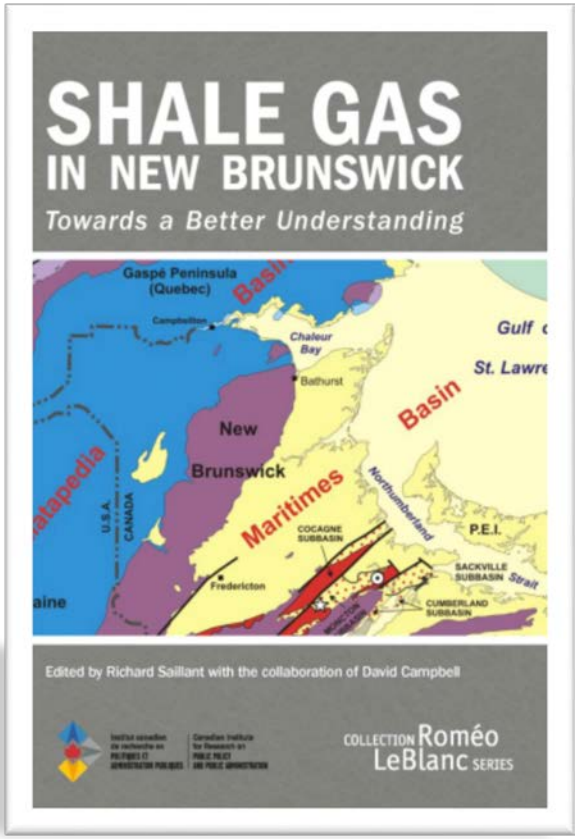
OTHER RESOURCES:

- Environmental Protection Agency (EPA)
- Canadian Council of Academics
- Geological Survey of Canada
- UNB
- NBEI
- MIT



- Overview: Richard Saillant
- Economics: David Campbell, Chief Economist
- Geology: Adrian F. Park, UNB
- Potential impacts on water resources: Tom Al, UNB
- Inter-generational issues: Craig Brett, Mount Allison University
- First Nations: Stephen Wyatt, Université de Moncton and Janelle Baker, McGill

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DISCUSSION