Recognition of Meeting on Ta'an Kwäch'än and Kwanlin Dün First Nations Traditional Territory

Good Reasons for a Frack Free Yukon

Presented by

Yukoners Concerned About Oil & Gas Exploration & Development

October 9, 2013

Whitehorse, YT

Select Committee of the Yukon Legislature, on

Hydraulic Fracturing

Presentation Outline

1. Fracking – Effects on Economy, Environment, Water, Land, and Air
1. A Cautious View of Shale Gas Development
2. The Process of Hydraulic Fracturing
3. Impacts on Land: Yukon, Alaska and Yukon River
4. Effects on Human Health
5. Communities, & Local, & Traditional Economies
6. Conventional and Unconventional-a Difference
7. Green Energy Plan

Video: Prospect of Shale Gas in Ireland (or Yukon)

Deborah Rogers, Senior Natural Gas Advisor for the U.S. Dep. Of the Interior

Long time economic specialist and financial analyst for natural gas in the banking sector. She summarizes after presenting at a 2013 Oil & Gas conference in Ireland.

http://youtu.be/R9oRsKVlzCo

How Does Fracking Work?

1. **New** or unconventional method to extract natural gas from Shale Rock.
2. Horizontal drilling and pumping water, chemicals, and sand to extract methane.
3. 6 years old, high volume, slick water, long lateral, multi well pads, grid spaced.
4. NOT the same as conventional oil & gas extraction.

Following video highlights fracking basics and problems:

The New Brute-Force Fracking: Basics on the Ground in B.C.

http://youtu.be/vo0qHcpMf_Y

Negative Impacts of Fracking

1. Fresh water: 100 million litres/well - typical
2. Storage of contaminated water
3. Well casings not reliable: 35% of wells are leaking (Society of Petro. Eng.)
4. Leakage of methane into the atmosphere: 100 times more powerful GHG than CO_2
5. Water contamination:

   - Hundreds of additives in frack water - glycol, benzene, diesel, sulphuric acid, etc.

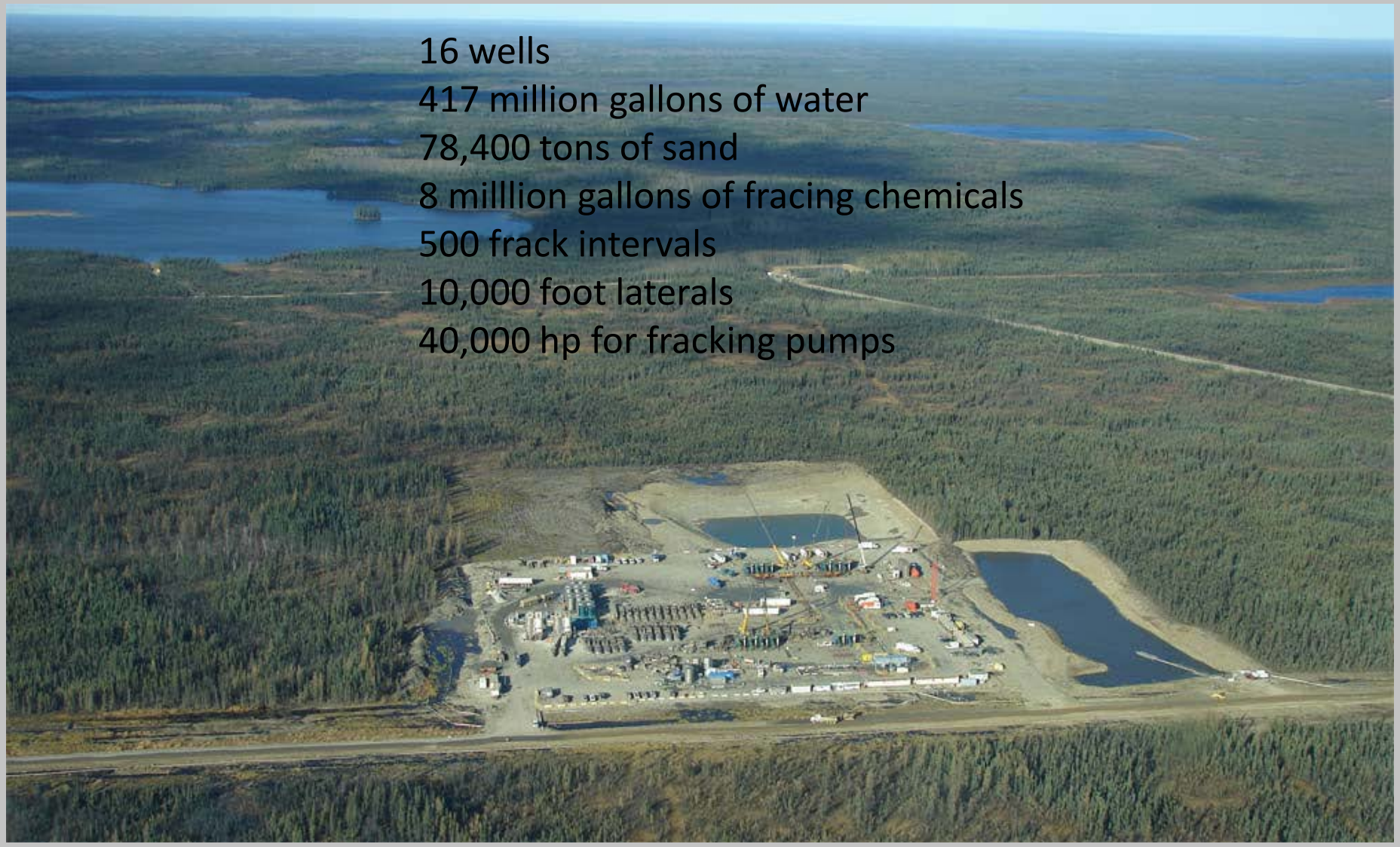
   - Deep earth contaminant pathways to water

Following I min. video highlights water use in N.E. B.C…

Fresh water becoming toxic frack fluid in N. E. B.C. equals approximately one the Yukon Southern Lakes, Damien Gillis presents:

http://youtu.be/gDxqHc8SFy0

One of the World's Largest Frack Jobs, Encana, Horn River Area, N.E. British Columbia



Figures as obtained from Encana

Frack Fluid Quantities, Example Horn Basin

- 100 000 wells, 10 frack sequences each
- 10 million litres each frack sequence or re-frack
- Equals 10 trillion litres, (Lake Laberge, 10.8)
- Equals 200 million 50 ton water truck loads
- 1000 truck loads additives per day over 6 years
- Some rules for disclosure, but with loopholes (fracfocus)

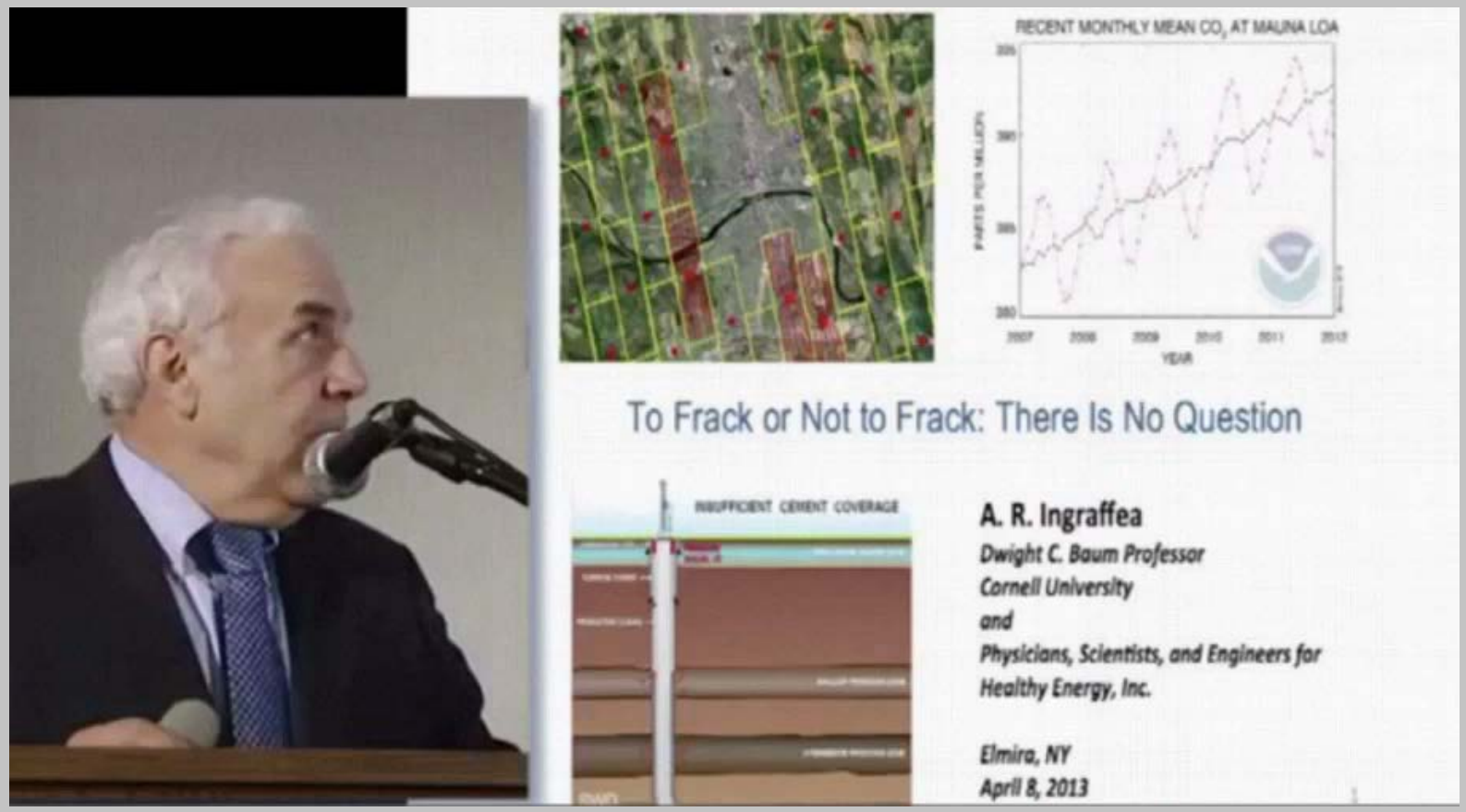
Based on only 1% additives, not counting silica, no pro-rating or eager updating of quickly expanding industry figures. Recycling of parts of about 30% return flow has been omitted as industry information is inconsistent.

Effects on the Environment: Water

- Water diversion from wetlands, streams, lakes, aquifers [trillions of litres]
- Water contamination for thousands of years
- Effects on drinking water
- Water baseline testing re. fracking is specific – it hasn't been done.
- Direct methane pathways to surface water.
- Methane tests are not routine but crucial.

Video explains: What is Fracking?

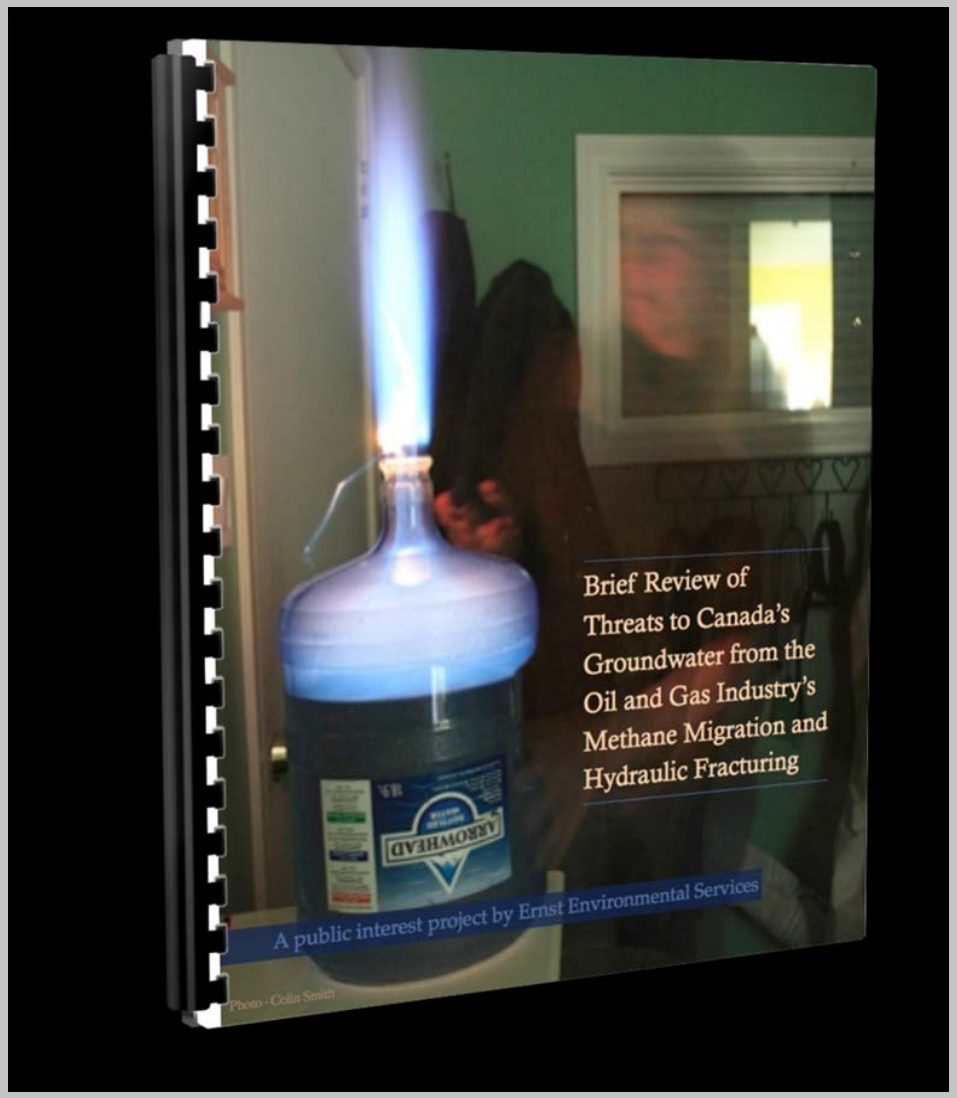
Dr. Tony Ingraffea:
The Certainty of Pollution



http://youtu.be/q1RFWgbmVHI

Water Impacts

Jessica Ernst (Rosebud, AB),
-Worked for gas industry
-Has assembled methane groundwater studies for gas fracking areas in Alberta and Saskatchewan.



Following 2 min. video touches on poll. pathways through fissures

Deborah Rogers on Water Contamination Pathways in a Shattered Geology

http://youtu.be/M3qZwL-XU9U

Effects on the Land

Well Pads in N.E. B.C.

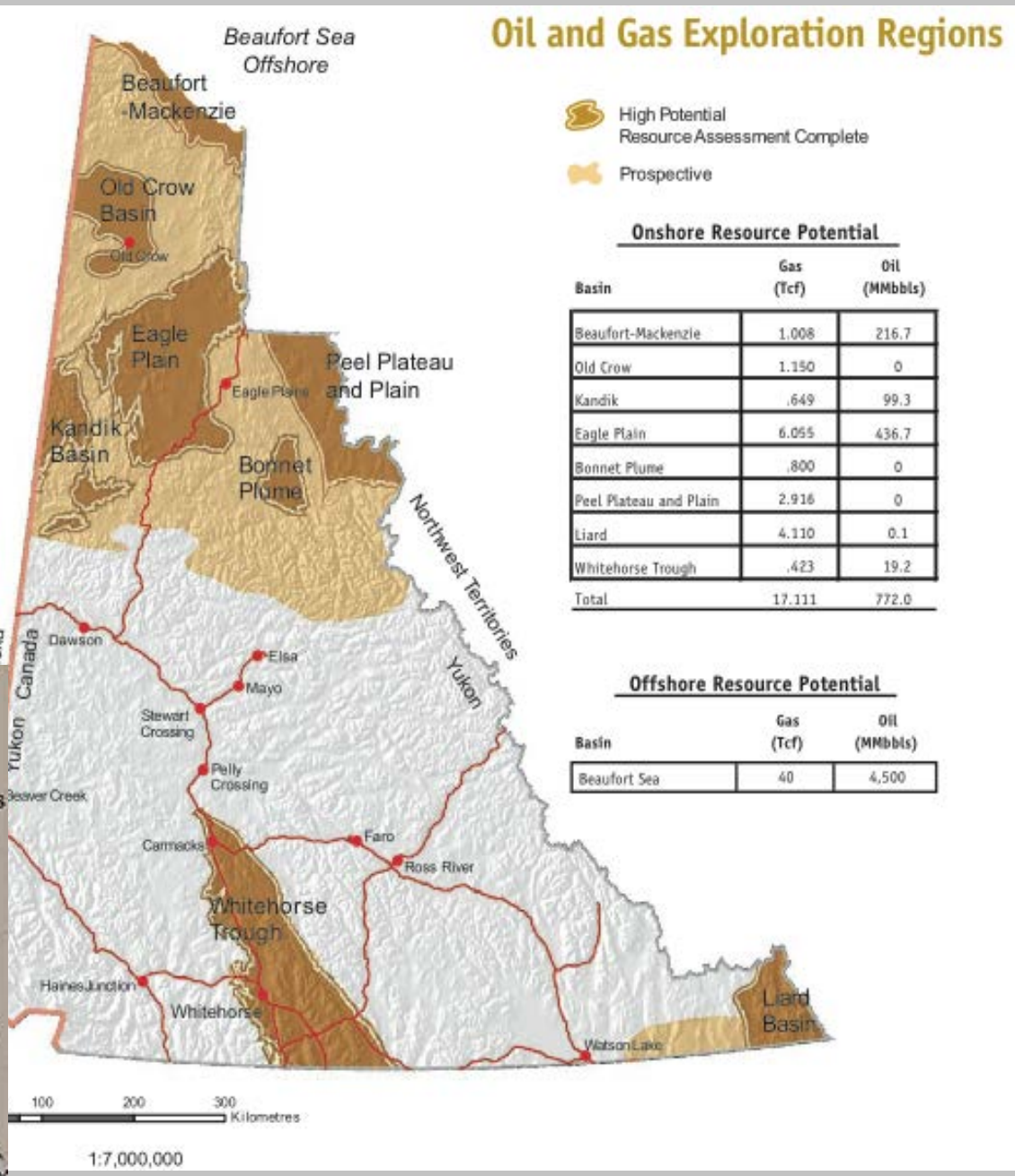
Satellite photo
Ft. Nelson area
2010

multi well pad construction
about 120 meters base each

Early Phase of
Full Spatial Build Out

Full Spatial Build Out
of Wyoming Jonah field

Yukon Geological Survey Studies say Yukon Oil & Gas Geology is Unconventional



Onshore Resource Potential

Basin	Gas (Tcf)	Oil (MMbbls)
Beaufort-Mackenzie	1.008	216.7
Old Crow	1.150	0
Kandik	.649	99.3
Eagle Plain	6.065	436.7
Bonnet Plume	.800	0
Peel Plateau and Plain	2.916	0
Liard	4.110	0.1
Whitehorse Trough	.423	19.2
Total	17.111	772.0

Offshore Resource Potential

Basin	Gas (Tcf)	Oil (MMbbls)
Beaufort Sea	40	4,500

Effects on Land

- Infrastructure: well pads, roads, gravel pits, water dug-outs, evaporation/storage pits, stream crossings, fuel storage, waste/sewage
- Disposal of fracking fluids (60-80% stays in ground) 20%-40% flows back and is discarded… down bore holes, abandoned wells, into domestic water treatment plants or perhaps recycled.
- Spills/leaks, vehicle accidents, traffic, congestion
- Emissions of radio-activity
- Earthquakes affect wells and create fissure interconnections

- All have negative impacts on wildlife, vegetation

Effects on the Environment: Land

Mining Frack Sand

Wisconsin

http://fracsandfrisbee.com/2012/02/01/sand-mine-photos/

Effects on the Environment: Air/Atmosphere

- Flaring of methane and other gases
- Leakage of methane and other gases
- Equipment and truck exhaust
- Radioactive nuclides, gases, - e.g. radon
- Particulate matter - silica dust
- Frack chemical fumes/emissions
- Major impacts on global warming

Video: Changing Homelands Changing Lives

Changing Homelands
Changing Lives

http://www.youtube.com/watch?v=nAgDrSofN40

Effects on Human Health

Industry ignores studies

by respected physicians:

S. Steingraber, “Living Downstream”
Adam Law
Theo Colborn, endocrine disrupt. Exp.
Marian Loyd-Smith and
hundreds of other doctors
speak out against fracking

Sandra Steingraber, PH.D., environmental cancer specialist

Effects on Communities & Local Economies

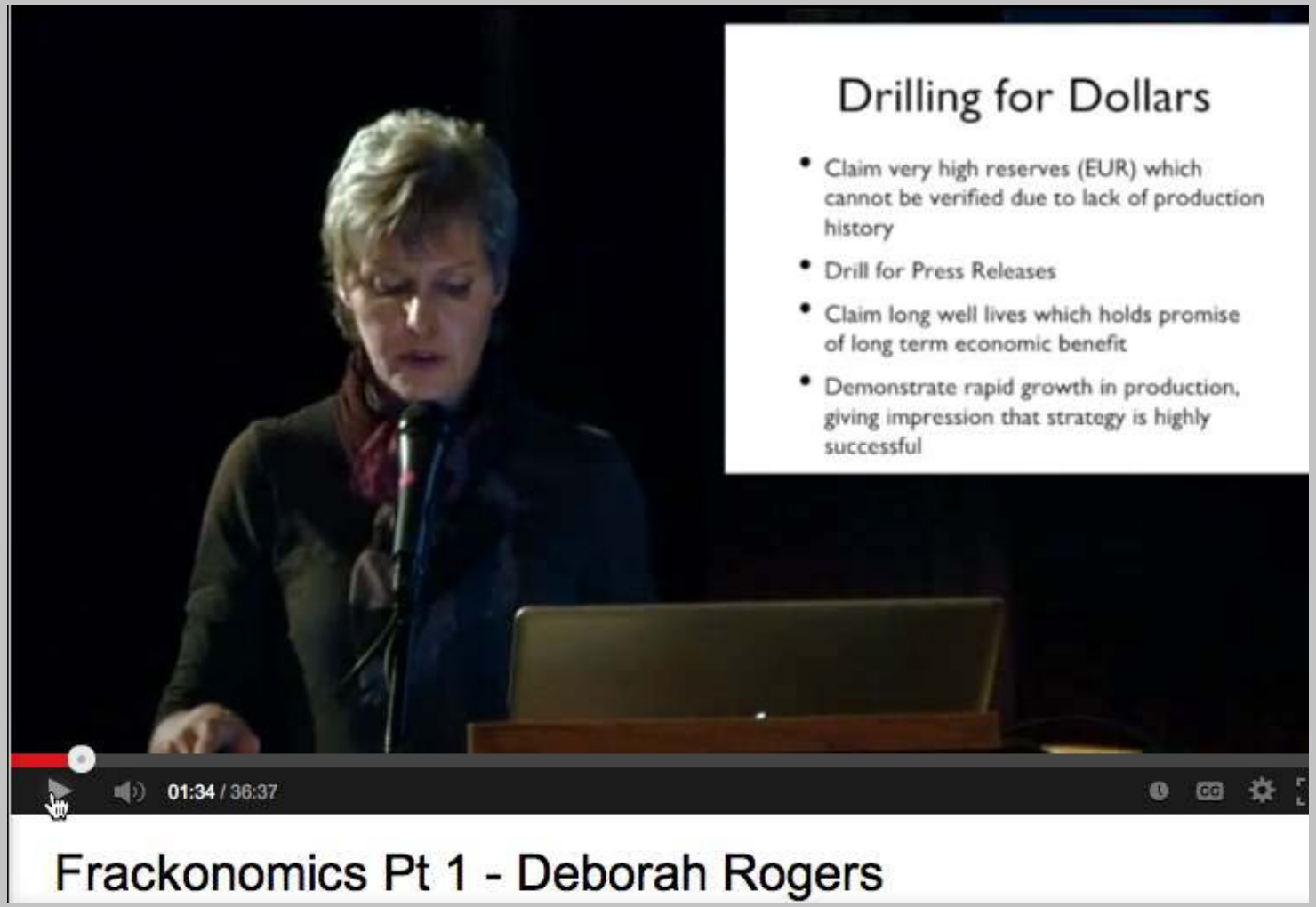
- Boom & Bust: Frack wells last between hours, weeks – years, declining quickly
- Few jobs, net energy dead end, investor losses.
- Poor job quality. Outside workers have little/no investment in the environment.
- Damage to community: e.g. roads
- Degraded landscape will cause declines in tourism, agriculture, hunting, fishing…

Dr.Janette Barth- Economist, Pepacton Institute (Independent Research)

From: To Frack or not to Frack
See www.shaleshockmedia.org

Video: Resource vs. Reserve

The Economics of Fracking



http://youtu.be/F2elo1xU-fw 2012, New York City

Industry Tactics Used to Promote Development

- Public relations experts – “green washing”
- Industry spends billions on advertising & lobbying
- American Natural Gas Alliance (2009) as well as CNOOC/Nexen/NCY (25 July 2012) hired PR firm Hill & Knowlton, based on their historic success of lobbying cigarettes as a wellness strategy to governments.

Following 3 x 1 min. videos highlight some of the spin …

Dr. Ingraffea Explains Industry's PR Methods

http://youtu.be/uwO9rf0hJDQ

Next Video: Communication Training for Shale Gas Promotion

Media & Stakeholder Relations Hydraulic Fracturing Relations Initiative 2011, Oct.31/ Nov.1 Houston/Texas

“It Does Not Matter What The Facts Are!”

Reported by CNBC network

“Chesapeake has got nearly 100 people whose sole jobs are to deal with community relations. We have got people going out and speaking in the community every night.”

http://youtu.be/OfZzm0OX1Dw

Next video: Jessica Ernst in Whse

Jessica Ernst on Synergy Consultation

In Alberta and B.C., development goes ahead during consultation.

http://youtu.be/DN2cTAtnUxw

Conventional vs. Unconventional, A Difference Deserving Attention

Unconventional Resources and Hydraulic Fracturing

The Transition to Unconventional Resources

Enabled by three key innovations:

- Horizontal wells.
- Multi-stage hydraulic fracturing.
- Multi-well pads.

The supply of North American natural gas and oil is now largely dependent on unconventional resources.

- Decline in conventional resources in Western Canadian Sedimentary Basin and elsewhere in North America.

NOTE: to extract these resources currently requires hydraulic fracturing

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Supplies largely dependent on unconventional resources

Conventional Gas vs. Unconventional Gas

Canadian Production

Year	1980	2011	2020 (Cont. low price)	2020 (Price recovery)
Production average (billion cubic feet/day)	7	14.4	14.1	19.6
Conventional natural gas	100%	86%	50%	48%
Unconventional natural gas	0%	14%	50%	52%
Total annual natural gas production (tcf)	2.6	5.3	5.1	7.1

Source: CAPP 2012

Continued low price case – assumes price remains below $4/GJ.

CAPP disagrees, most of natural gas is conventional.

Natural Gas Fact Book, Canadian Assoc. of Petroleum Producers

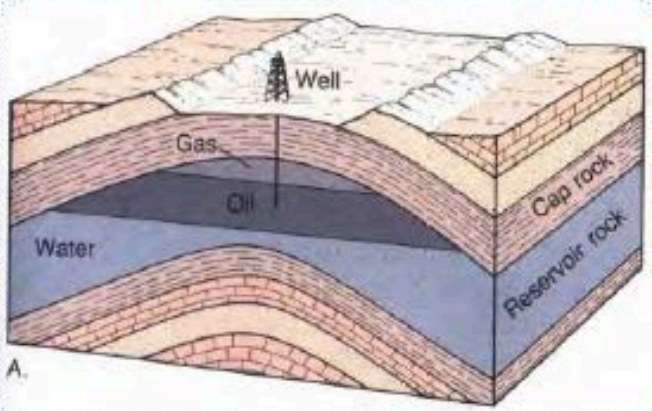
Conventional Resources and Reserves, Require 1,2,3, and 4

Unconventional Resources and Hydraulic Fracturing

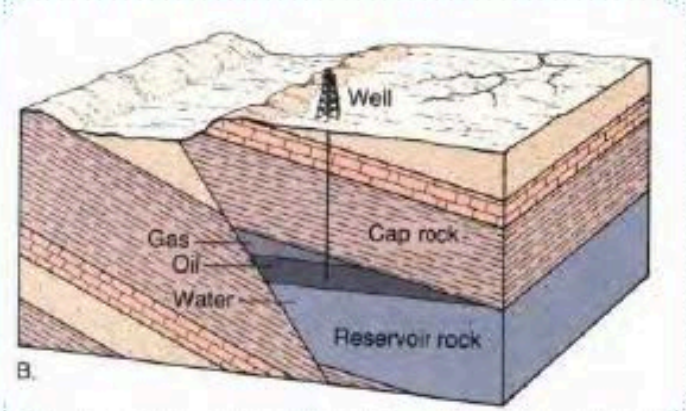
Conventional Resources

- Conventional oil or gas accumulations are trapped in structures in the rock.
  - Requires: (1) Source, (2) Migration, (3) Trap, and (4) Reservoir.
- Majority of historic production has come from conventional deposits.
- These deposits were typically accessed by vertical wells.

Traps/Seals



Fold



Fault

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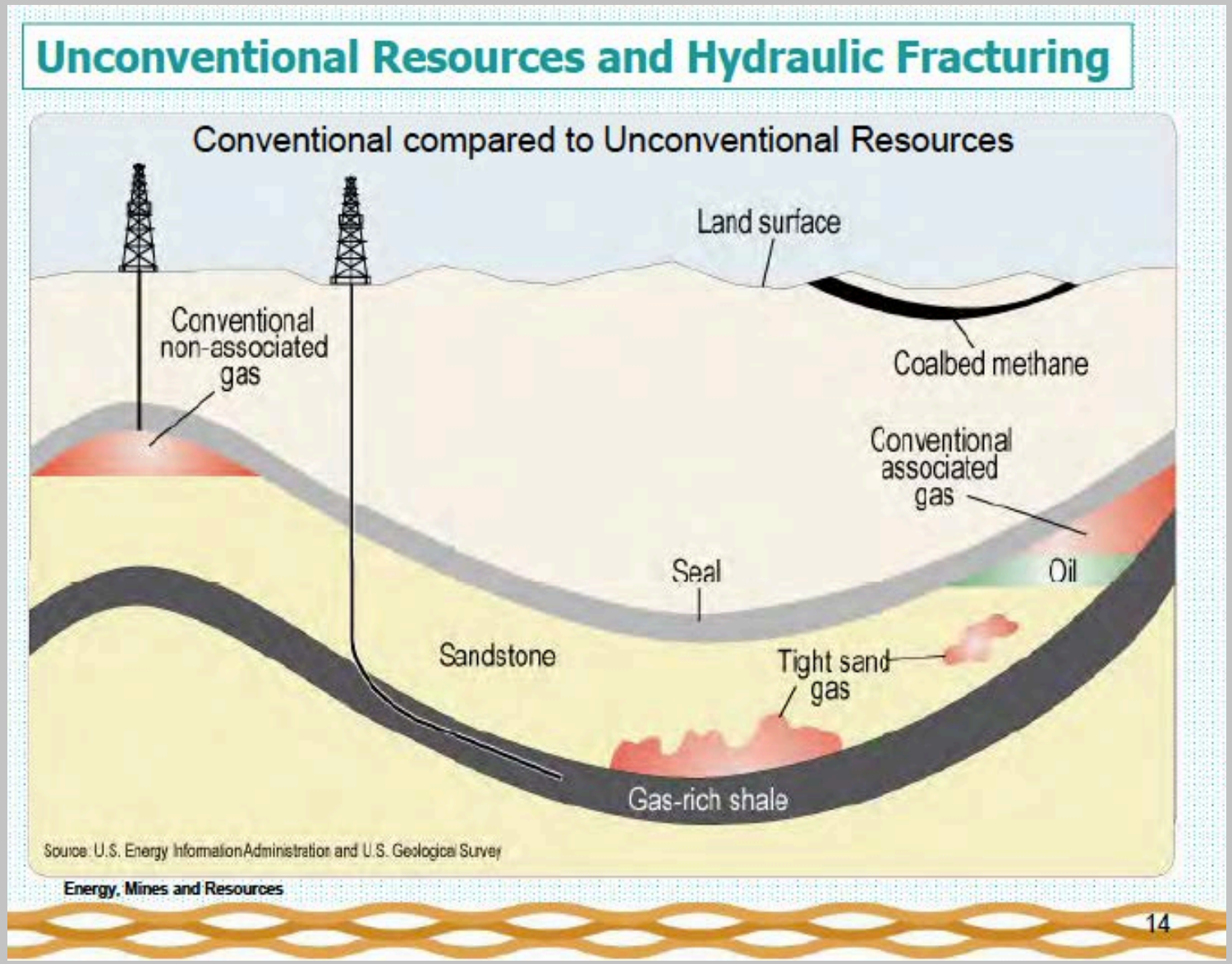
EMR Presentation to Select Committee

Unconventional Gas is Extracted from Shattered Source Rock



EMR Presentation to Select Committee

Trapped Reservoir Pools/Porosity are as Different to Source Rock as an Egg is to a Chicken; Not Similar as Stated by EMR.

Context - Introduction

- Material presented is introductory; detailed presentations on any topic can be delivered at any time to the Select Committee.
- Yukon *Oil and Gas Act (YOGA)* - focused on developing resources in a safe and environmentally responsible manner, and ensuring optimal value for the resource.
- Unconventional oil and gas development – similar to conventional and can be effectively managed with existing legislation (*YOGA*/regulations).
- Hydraulic fracturing – considerable debate amongst Yukoners continues.

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EMR Presentation to Select Committee

No Industry Alternative to Fracking in Shale

Within its interim O+G guidelines, the YWB had taken an approach in assessing O+G projects that is fully consistent with its methods and approaches for all classes of undertakings governed under the Water Act. Proposed project activities that require water for operations and/or deposit wastes that may affect water resources are evaluated based upon the proposed technological and engineering approaches within local and regional physical environments. Through this assessment approach, the Board allows for various technological methods to be proposed and licensed, provided that the risks to water resources associated with the specific technologies can be managed to an acceptable level. The Board then maintains no specific *a priori* position on 'Hydraulic Fracturing' as a method of O+G formation stimulation, since the evaluation of that method will be conducted only within the context of a proposed project. Further, since 'Hydraulic Fracturing' is but one specific method of a rapidly evolving set of technologies for formation stimulation, the Board chose to issue its guidance in a sufficiently general manner allowing for future industrial innovations and government policies.

Water Board Speaking Notes to Select Committee 30 Sept 2013.

Third line from the bottom: "Hydraulic Fracturing is but one specific method … " No evidence is provided or known for this key statement.

Following video: Dr. Ingraffea questions industry hype re. fracking

Dr. Ingraffea: Promises of Industry

http://youtu.be/l9yaxgcK76k

June 28 2013

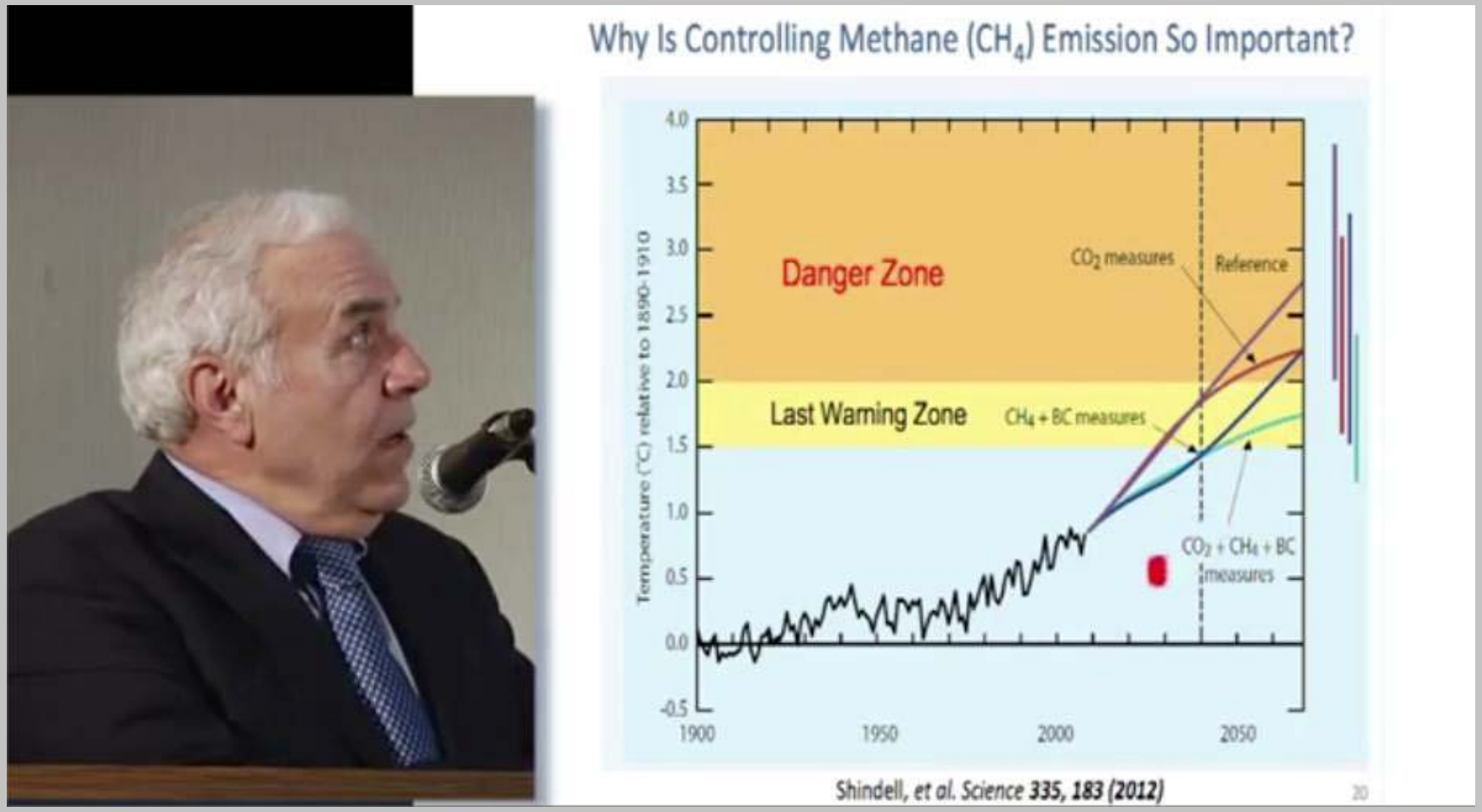
Council of Yukon First Nations Resolution – Frack Free

“Be it resolved that the Council of First Nations calls on the Yukon Govt. to prohibit fracking in the Yukon and declares our traditional territories to be frack-free.”

This resolution was passed by full consensus of the general assembly of those present.

Many Frack Free Resolutions and Frack Stop Measures have been passed in the Territory …

Optimism About Renewable Energy



http://youtu.be/0T6-sFnk-nY

Honouring the Promises

For example:

- UMBRELLA FINAL AGREEMENT
- MOTIONS:
  - "*conduct a full and rigorous scientific review of any proposed oil and gas project at each of the following stages of oil and gas development: exploration, production and reclamation*" (Minister Cathers, EMR, November 2012

- CONSULTATIONS

Peer Reviewed Papers, Reports, Resources

- Canadian Petroleum Association Fact Book:
  http://issuu.com/capp/docs/natural_gas_fact_book/64?e=1293643/1197275
- Scoping Study of Unconventional Oil and Gas Potential, Yukon:
  http://ygsftp.gov.yk.ca/publications/miscellaneous/Reports/YGS_MR-7.pdf
- "New Solutions" Special Issue, Peer Reviewed Papers on Health Impacts:
  http://www.prendergastlibrary.org/wp-content/uploads/2013/03/New-Solutions-23-1-Binder.pdf
- Texas R.R. Commission: Frack Road Damage exceeds Oil & Gas Revenue:
  http://energypolicyforum.org/2013/06/02/will-the-eagle-ford-shale-bankrupt-local-communities/
- W. Koop Report 2010, Cumulative Shale Gas Impacts in N.E. B.C.:
  http://www.bctwa.org/FrkBC-EnCanasCabin-Nov9-2010.pdf
- Methane Contamination Pathways. into Marcellus Waters Hydrol. Modeled.:
  http://onlinelibrary.wiley.com/doi/10.1111/j.1745-6584.2012.00933.x/abstract
- U of Colo./NOAA Measure ~ 9 % Fugitive Gas Emissions in Utah Frack Field:
  http://cires.colorado.edu/news/press/2013/methaneleaks.html
- "Energy Autonomy", Hermann Scheer, Renewable Planner, US, Ontario …
  http://www.amazon.ca/

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