

**From:** Louise Lanteigne [mailto:]  
**Sent:** July 11, 2012 2:02 PM  
**To:** DGR Review / Examen DFGP [CEAA]  
**Subject:** Comment regarding case # 06-5-17520

Hello

Currently the Joint Panel EA review of Ontario Power Generation's proposed Deep Geological Repository at the shores of Lake Huron is allowing for public comment and I would like to share my views on the matter. This letter is in regards to case 06-5-17520.

Please accept my comments and forward them to the panel on my behalf. I submitted it by way of Power Point Presentation.

Thank you kindly for your time.  
Louise Lanteigne  
Waterloo Ont

Submission to the Joint Panel EA review of Ontario Power Generation's proposed Deep Geological Repository at the shores of Lake Huron. Case 06-5-17520.

As submitted by Louise Lanteigne on July 11, 2012

<personal information removed>

## Land-Use Planning

Traditionally, the underlying belief of planning is that collective rationality can be brought into the way our cities are built rather than leaving it up to individuals in the marketplace where inefficiencies may prevail especially with respect to long-term thinking (Makuch, 2004).

## Land-Use Planning And Private Development Bias

Planning is a highly charged financial process - development or redevelopment can mean big bucks for private individuals.

Private interests may have deleterious implications despite the benefits they may bring about and thus must be reconciled with the interests that the public has for appropriate development that takes into consideration other values such as environmental protection and not overburdening municipal services (Swaigen, 1993).

## What Needs To Be Addressed

The technology, laws and regulations, and practices for containing, responding to and cleaning up spills lag behind the real risks and associated costs.

## Nuclear Systems are leaking

Radioactive tritium has leaked from three-quarters of U.S. commercial nuclear power sites, often into groundwater from corroded, buried piping, an Associated Press investigation shows

Tritium, has leaked from at least 48 of 65 sites, according to U.S. Nuclear Regulatory Commission.

Source: Ageing Nukes: A four-part investigative series by Jeff Donn, Associated Press

<http://www.ap.org/company/awards/aging-nukes>

## Many Leaks Have Happened

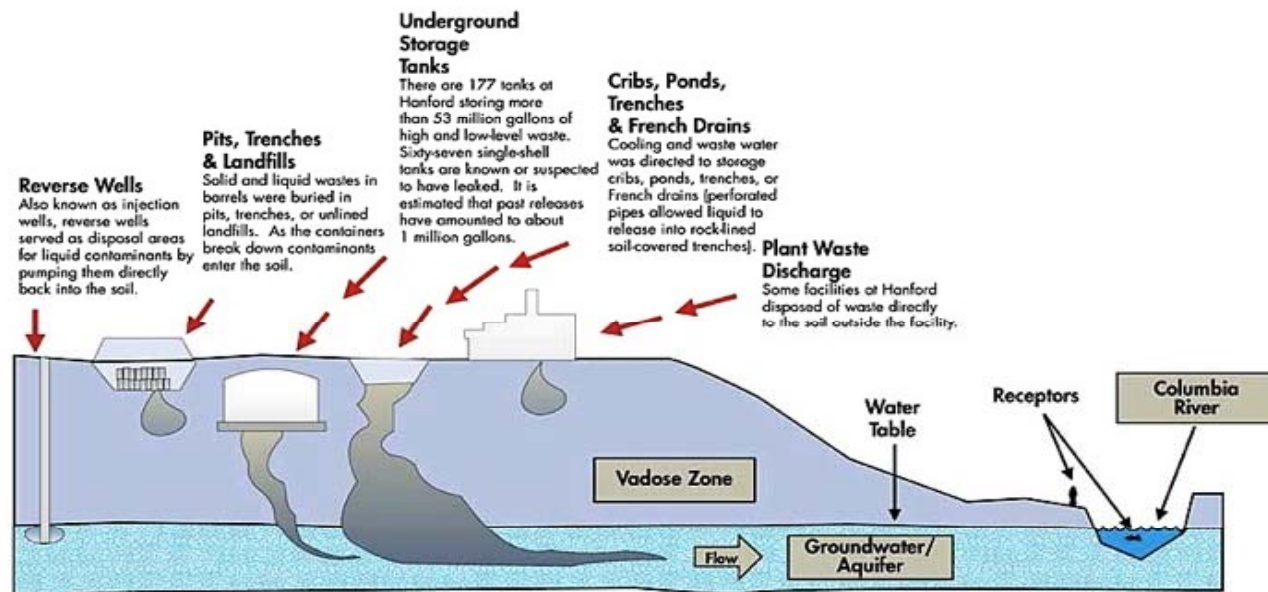


US based nuclear sites have suffered more than 400 accidental radioactive leaks during their history.

Source: Union of Concerned Scientists. September 2011

[http://www.ucsusa.org/nuclear\\_power/nuclear\\_power\\_risk/safety/nrc-and-nuclear-power-safety-annual.html](http://www.ucsusa.org/nuclear_power/nuclear_power_risk/safety/nrc-and-nuclear-power-safety-annual.html)

# Remediation Can Be Very Expensive



The new price tag for completing the remainder of Hanford nuclear reservation cleanup, plus some post-cleanup oversight, is \$112 billion.

Source: The Tri-City Herald article New Cost for Hanford Clean Up by Annette Car Feb. 9 2012  
<http://www.mcclatchydc.com/2012/02/09/138402/new-estimate-of-hanford-cleanup.html#storylink=cpy>



## Is Remediation Even Possible?



Many contaminated aquifers cannot not be reclaimed because fixing the damage is “too costly” or “technically infeasible.”

## Complacency To Monitoring Poses Risks



It's assumed that the monitoring rules and requirements are in place and are protective but nobody knows for sure unless someone gets sick or complaints are issued.

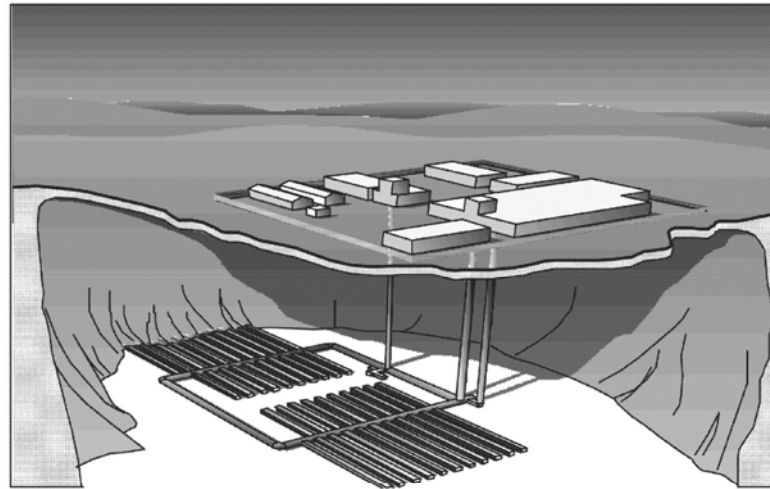
## First Nations Paid the Price for Ontario's Lack of Reasonable Monitoring regarding Mercury Dumping



58.7% of Grassy Narrows and White Dog First Nations people have been poisoned by Mercury.  
33.7% have been diagnosed with Minimata Disease.

Contamination violated Aboriginal Treaty Rights.

## Long Term Data is Lacking



Once waste is underground, there are few ways to track how far it goes, how quickly or where it winds up. There is plenty of theory, but little long term data to prove how well these systems actually works. Bedrock aquifers and bedrock fractures exist but risks of these are often underestimated.

## Unreasonable economic burden

The actual costs to monitor and maintain long term nuclear storage for the required 10,000 to millions of years, needs to be based on sound science and a reasonable economic model to insure funding will be there to complete the set tasks to avert public risks for future generations.

Is the financial scheme to support this project, based on current proven need or is this based on projected needs analysis on the premise that Ontario will actually want to use nuclear power in the future?

# Current Cost of Power per Kilowatt Hour in Ontario

Source: Brochure titled Let's Cut Some Real Wastes as published by Ontario Clean Air Alliance, the Canadian Association of Physicians for the Environment & Canadian Federation of Students-Ontario.

Energy conservation and efficiency: 2.3 to 4.6 cents

Water power imports from Quebec: 5.8 cents

Wind : 11.5 cents

Nuclear – new and re-build 19-37 cents\*

\*These numbers do not include the costs of decommissioning old reactors, long term storage of wastes or risks of accidents.

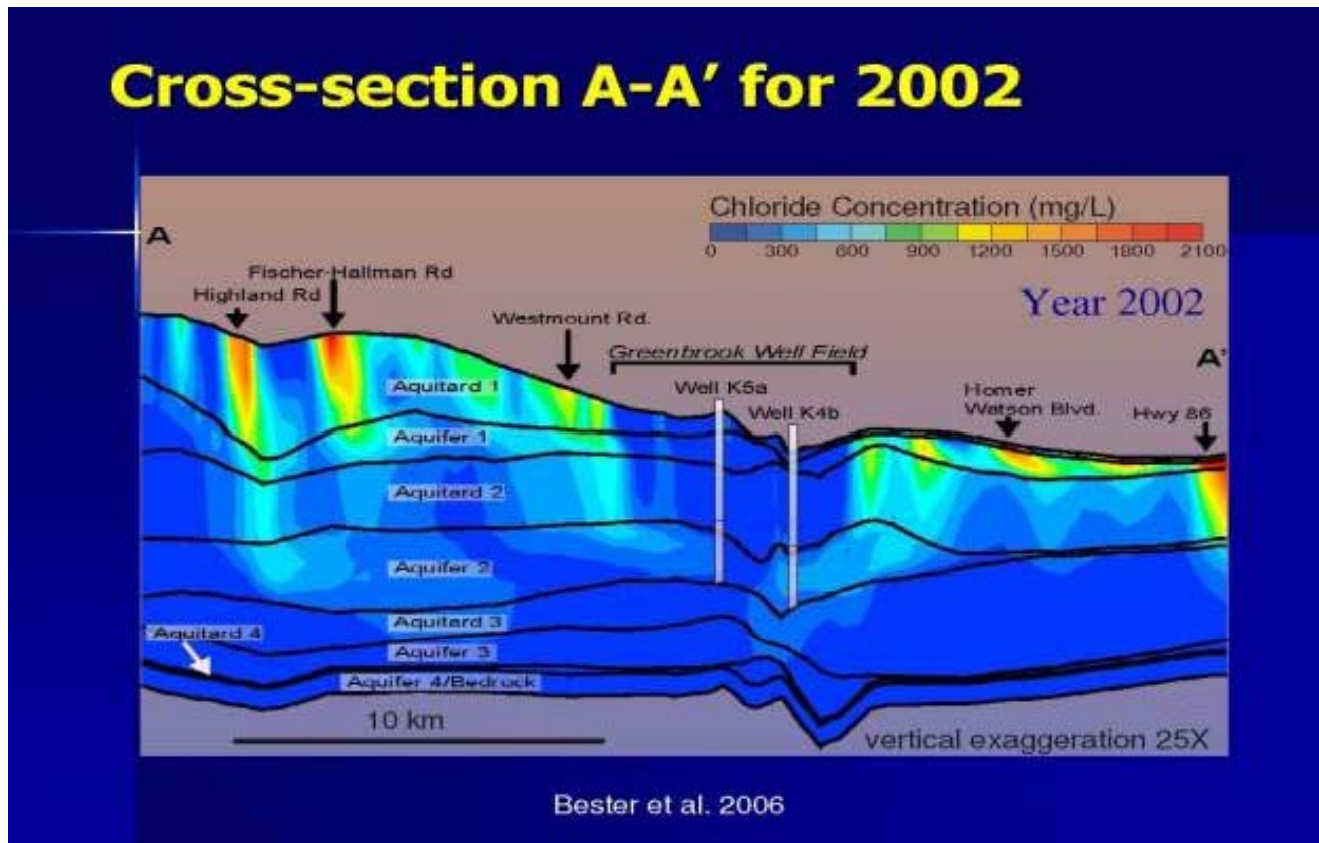
For further information view: Toronto Star, Nuclear power too costly, Ontario Clean Air Alliance argues, John Spears, Business Reporter March 20 2012 <http://www.thestar.com/business/article/1149273--nuclear-power-too-costly-ontario-clean-air-alliance-argues>

Data Modelling can indicate that injectate would be confined in the injection zone, but the reality of the hydrogeological situation is far more complex in this area.

Chloride Levels in Waterloo illustrates how water is drawn to wells regardless of surface topography. Currently watersheds are only delineated based on surface topography not draw down influences.

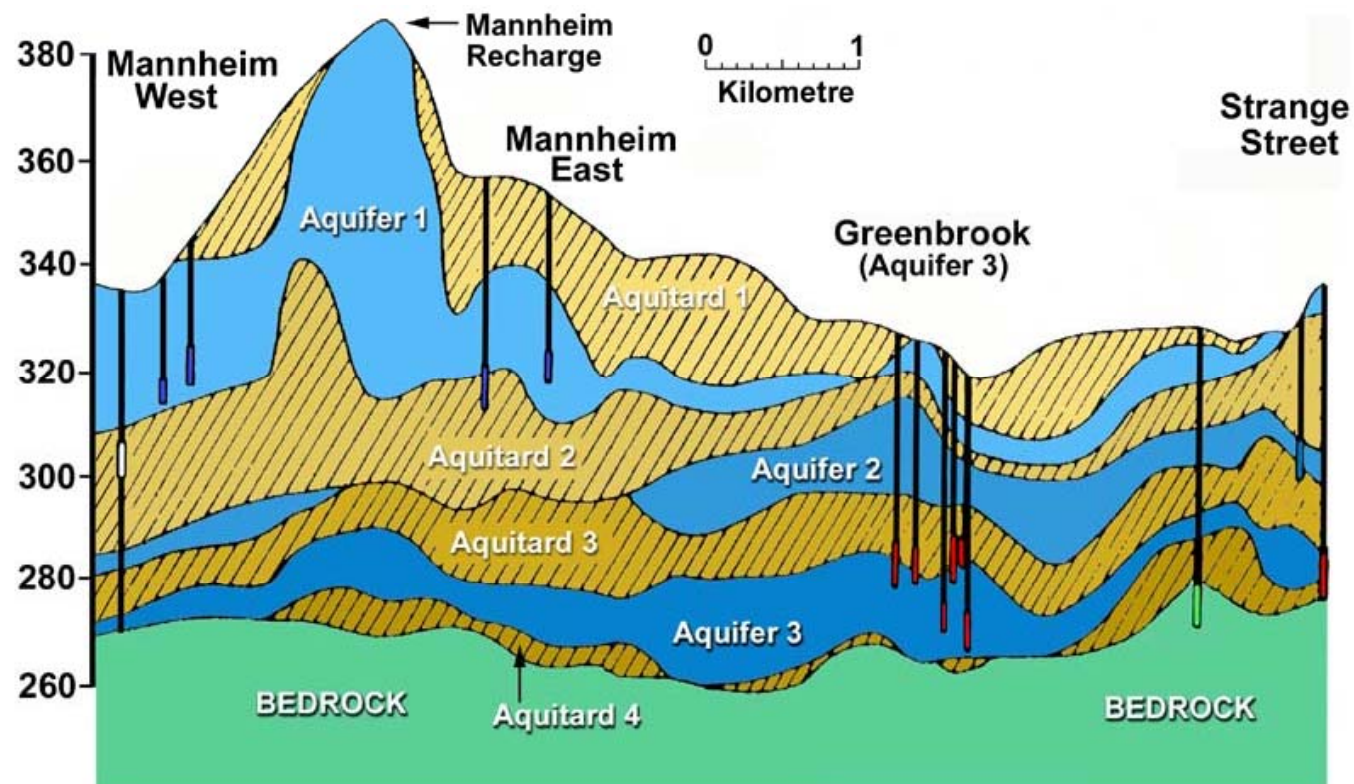
[http://research.ires.ubc.ca/projects/ISM/include/Torontopdfs/Stone\\_ISM\\_May2008.pdf](http://research.ires.ubc.ca/projects/ISM/include/Torontopdfs/Stone_ISM_May2008.pdf)

## Cross-section A-A' for 2002





Topography does not prevent aquifer connectivity as shown in this cross section of Waterloo Moraine. Clay is not impervious either: It only slows rate of infiltration. Our wells still recharge in spite of clay.



## Modflow has it's flaws: Use more geology

Many hydrology firms use Modflow programs to study aquifers but the program assumes aquifers are self contained and this poses a risk.

Data input is often subjective which is why mandatory testing standards and methods are needed to clarify processes to explain where the numbers came from and how they came to the results. Make sure the data being used is current.

Modflow works better when supported with localized geological data including sediment type to better understand actual hydrological connectivity.

## Bore Hole Data isn't Enough!

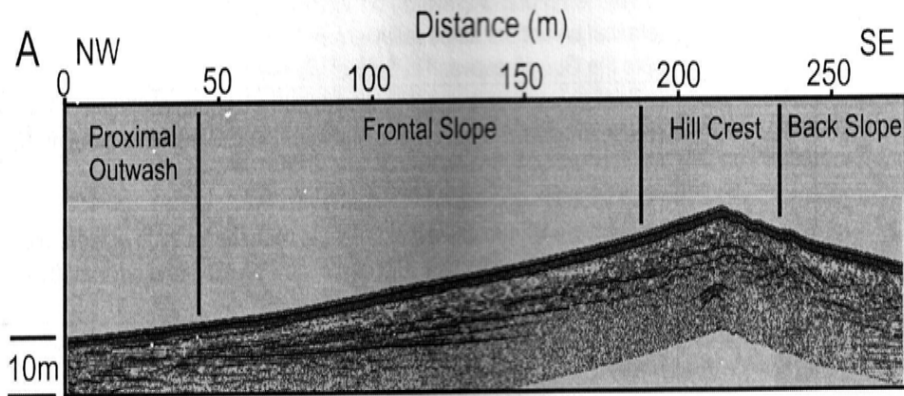
Often times bore hole testing does not go deep enough to monitor for potential impacts to aquifer systems and holes are too widely spaced.

Test times often fails to have regard for seasonal variants including spring thaw data and with climate change, year to year modeling is needed to properly assess delta water levels because trends from one year no longer apply to the following year. Trends in Waterloo Region Weather station indicate drought year/ flood year scenarios

Using bore hole data, outwash till formations can appear to reflect consistent clay coverage but this poses a serious risk to aquifer systems.

Ground Penetrating radar profiles can help mitigate the risks by illustrating the sediment distribution of outwash till areas

# Example: The Arkell Research Station in Guelph

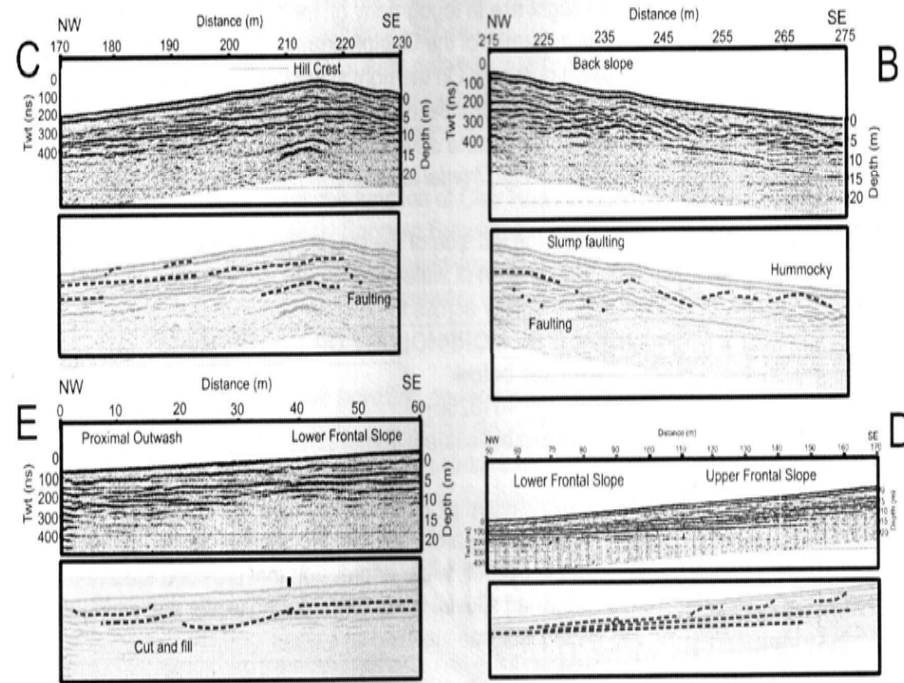


- Using standard bore hole testing, this area appears to be covered in a consistent clay layer.

- GPR profiles identifies this area as a shallow outwash aquifer. The clay is discontinuous. They are like shingles with many spaces of infiltration in between.

- This area gathers up to 7% of Guelph's potable water supply and it recharges cold water trout streams.

- The GPR profiles for the Arkell Research Station were provided by the Canadian Geological Survey of Canada.



# International Joint Commission

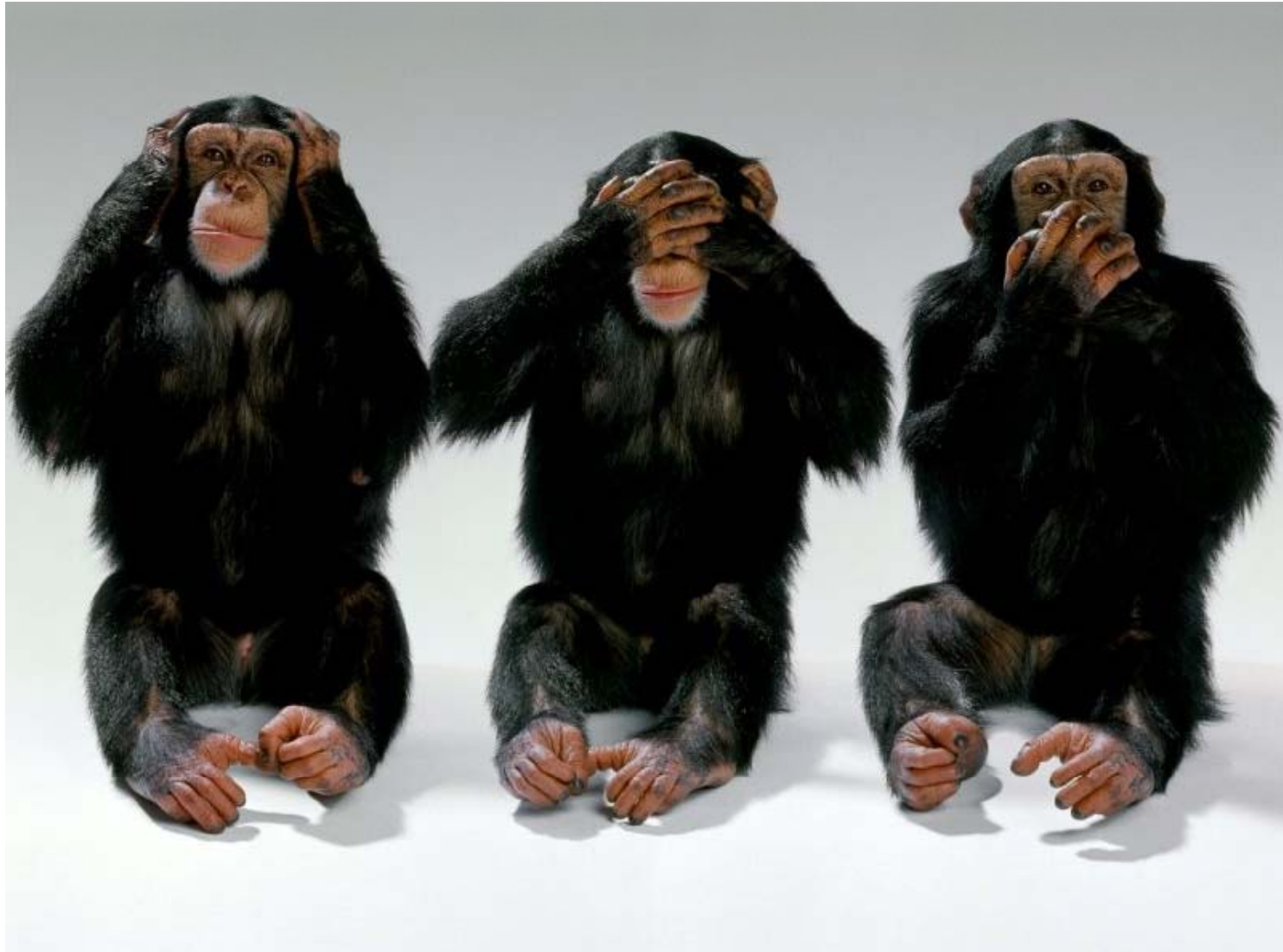


It is clear that human and ecosystem health in the Great Lakes basin cannot be protected without protecting ground-water resources.

[http://www.ijc.org/rel/news/2011/110308\\_e.htm](http://www.ijc.org/rel/news/2011/110308_e.htm)

## **REGARDING ENGINEERING FIRMS**

There is no money in discovering bad geology...or is there?



# Problems With Engineering Firms

Engineering firms are not held liable for their work in creating environmental impact studies after they've signed off on it. The risk transfers to the firm who purchased their data. If issues arise due to poor environmental studies, they are not held liable for any of the the work they did.

Firms like this stand to profit from remediation if things do go wrong. There is no reasonable incentive for engineering firms to do a the job right to prevent long term risks.

*Rubber Stamps are not enough. If there is a lack of fiscal accountability there is no guarantee of good work!*

## Engineering Firms Continued:

Studies for this Nuclear Power Storage facility appear to be limited to a rather specific layer where the boreholes were lucky enough to go through some solid chunks. Are findings consistent with alternative geological data? (Geologic Survey of Canada, USGS etc.)

Currently there is no mandatory criteria for what constitutes as a reasonable test times or methods to secure best management practices are reasonably applied. Are test times and methods used reasonable or do they reflect biased, outdated data and/or unclear formulas? Will this data be peer reviewed?



## If monitoring and peer review data costs extra hold industry accountable to those costs.

Place a levy on these firms to cover for additional costs associated with long term independent monitoring as a way to protect the public interest.

Make them pay for independent peer reviewed studies to make sure the science they are using is reasonable.

Hold Engineering firms accountable for the work they produce by holding a check worth the value of their services. If problems happen as a result of a blatantly poor environmental assessment, cash that check!

# Proposed Highland Quarry In Melancthon And Risks to Proposed Nuclear Storage

# Highland Mega-Quarry Proposal facts

Proposed project size: 2,316 acres

Width: 5km

Amount of rock reserved: 1,000,000,000 tonnes

Depth of Quarry below water table: 200 feet

Water to be pumped per day: 600,000,000 litres

Over 500 wells will be working in perpetuity to re-inject water into aquifers under the quarry.

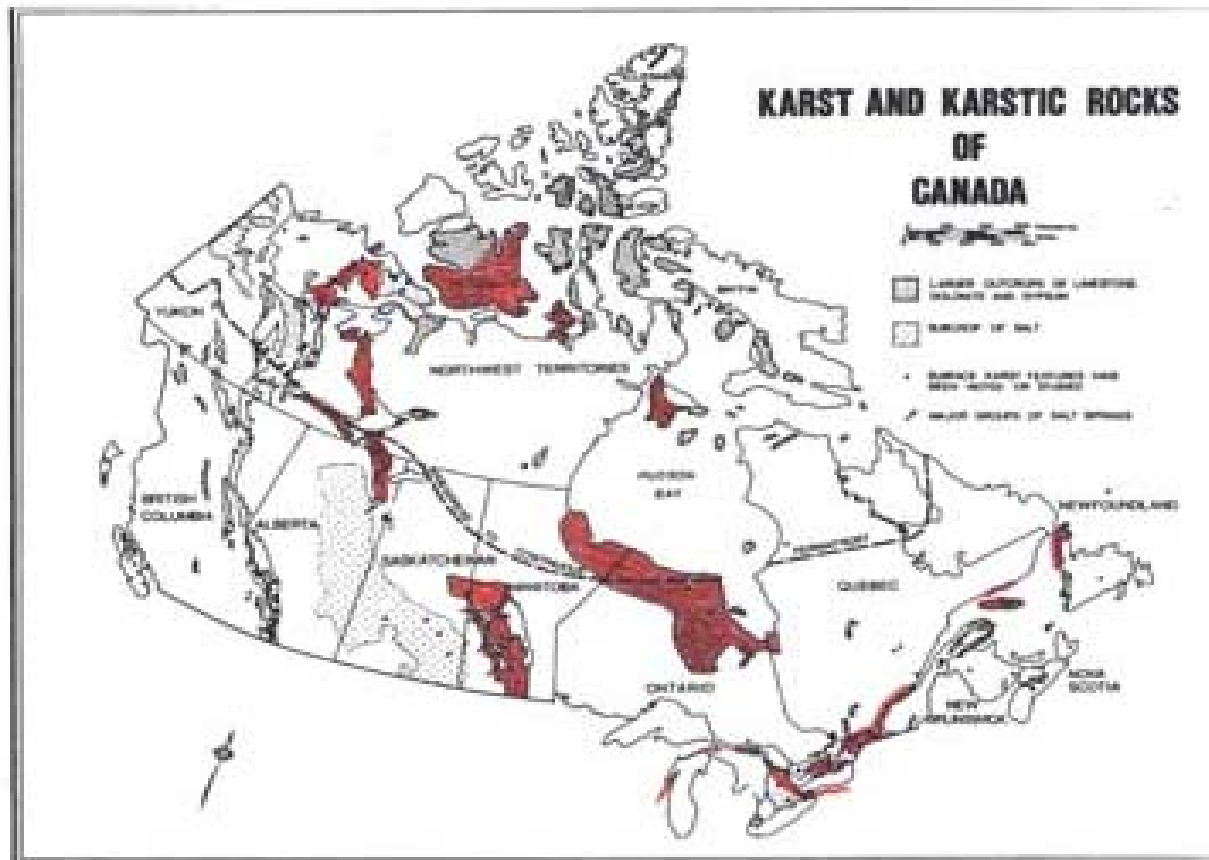
Source: In the Hills magazine, Melancthon Mega Quarry by the Numbers by  
Tim Shuff July 16, 2012

<http://www.inthehills.ca/2011/06/back/melancthon-mega-quarry-by-the-numbers>

# The Proposed Mega Quarry and Proposed Nuclear Storage both impacted by KARST

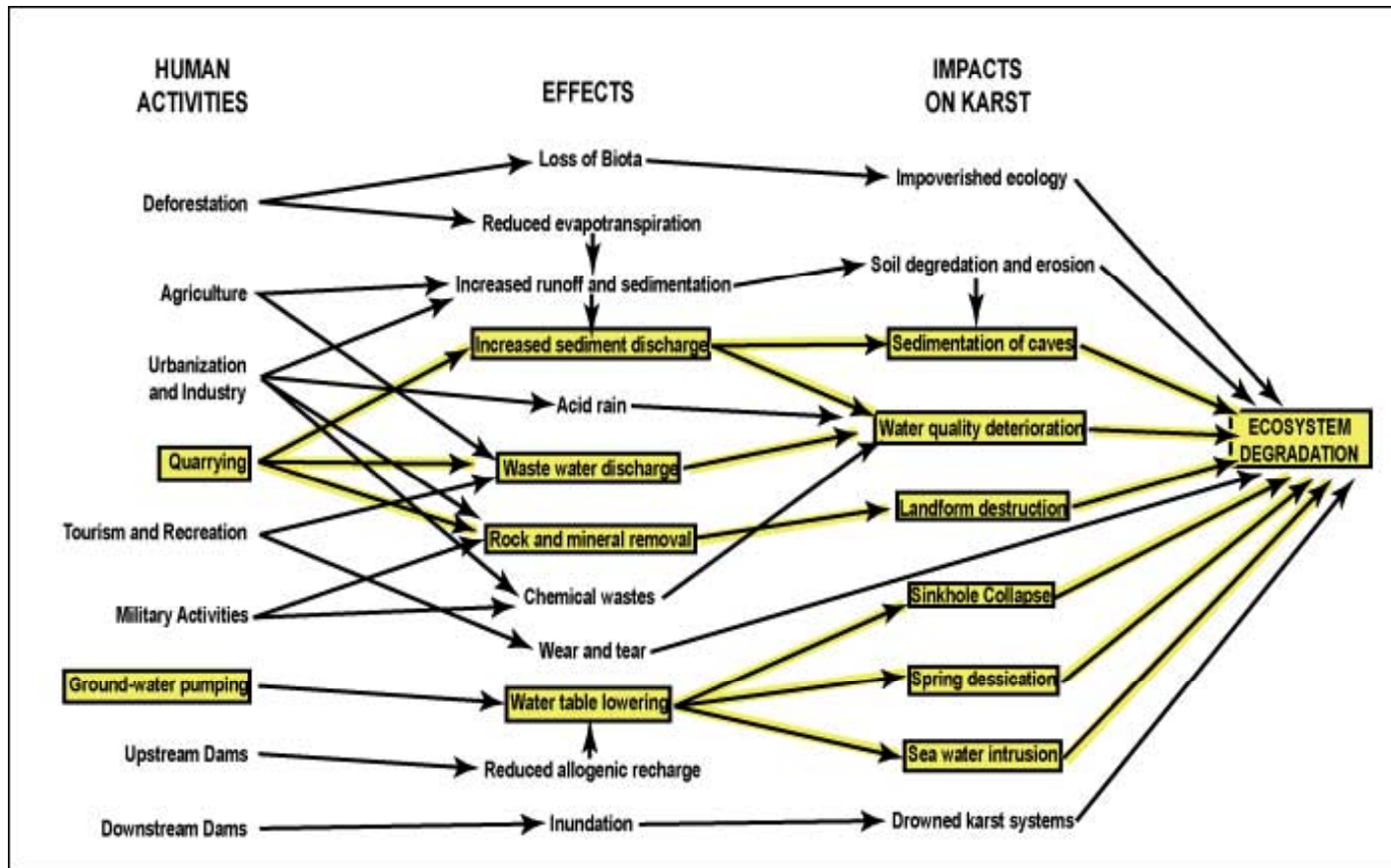
Map from a presentation by Dr Derek Ford, Professor Emeritus from McMaster University, Environmental Geography and Geology, February 2012

[:http://www.couchconservancy.ca/ONCWebsite/htm/Among%20ourselves.htm](http://www.couchconservancy.ca/ONCWebsite/htm/Among%20ourselves.htm)



# Quarries in Karst Increases Earthquake and Contamination risks

Source: [pubs.usgs.gov/of/2001/ofr-01-0484/ofr-01-0484so.pdf](http://pubs.usgs.gov/of/2001/ofr-01-0484/ofr-01-0484so.pdf)

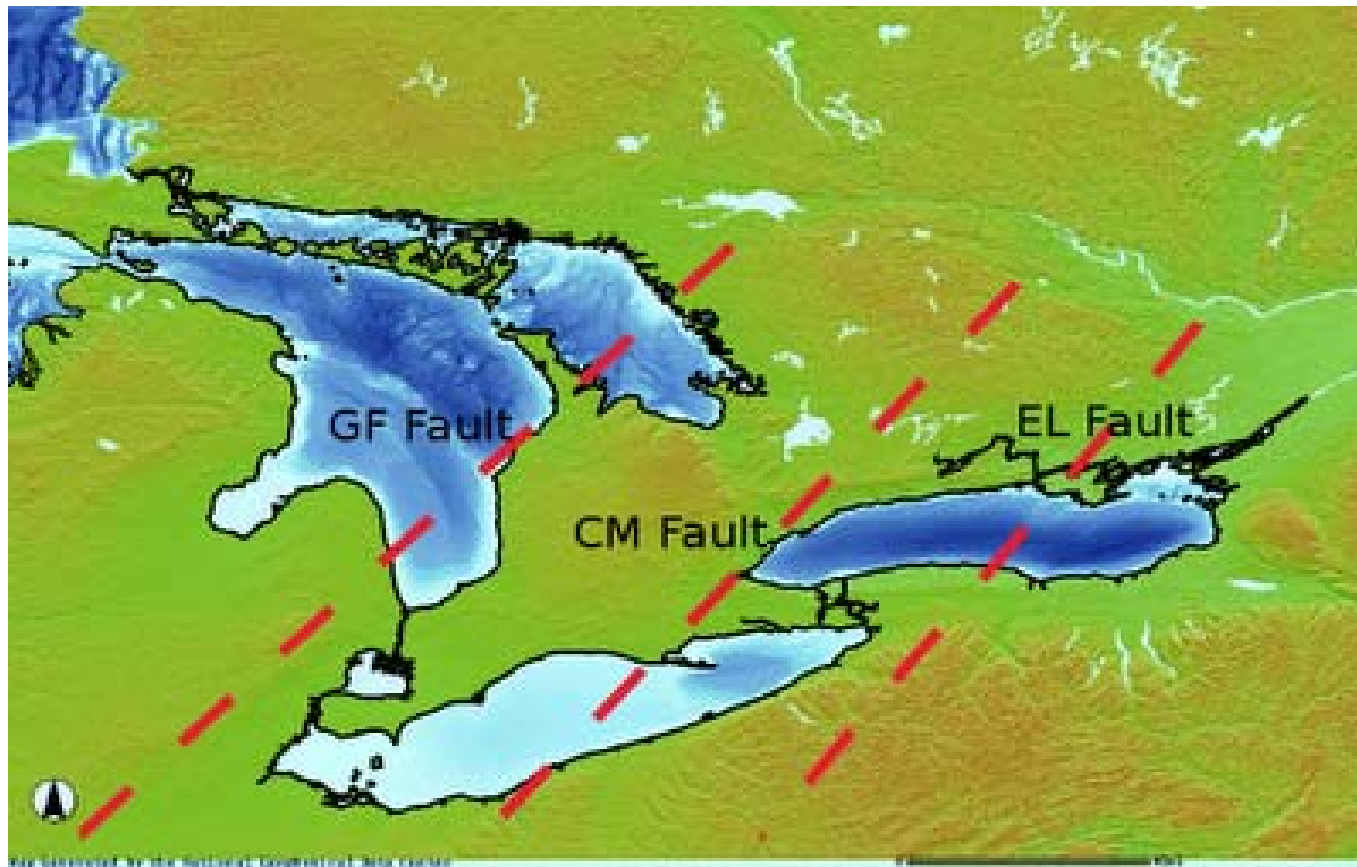


## Regarding Megathrusts

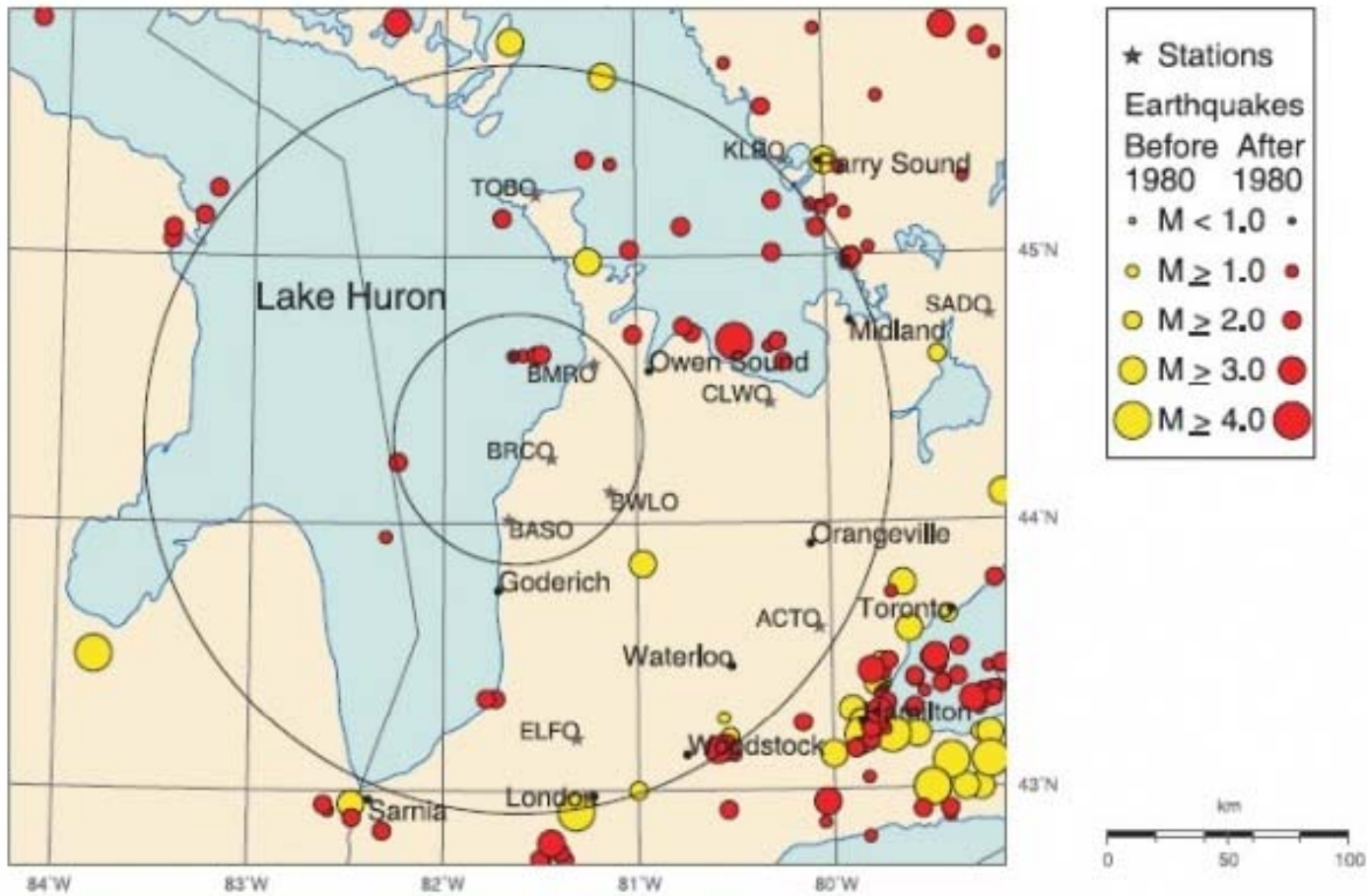
There are fault zones that have severe implications on the seismic hazard of nuclear facilities located on them, as well as deep geological waste repositories including this proposed nuclear storage project.

More effort should be undertaken to properly map these megathrusts, mainly by processing the available seismic data in Lake Huron.

These cold-joint megathrusts are clearly visible in deep seismic reflection data. The leading one is the Grenville Front (GF) fault, the middle one is the Central Metasedimentary (CM) fault, and the third is the Elzevir (EL) fault.

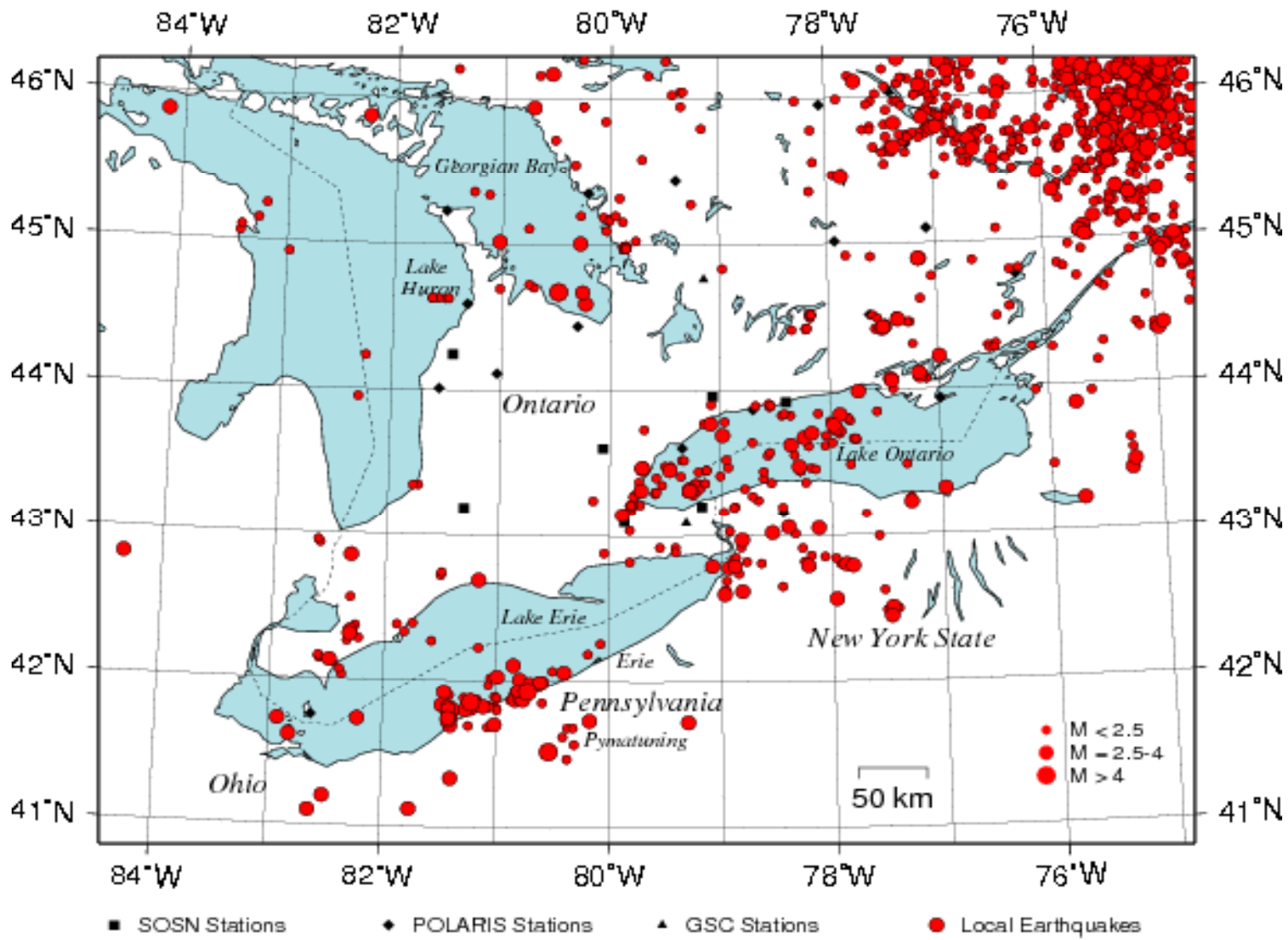


# Current Seismic Risks





### Seismicity Map For Period 1992-2009



# Recommended Reading

Negative impacts of grouting on the underground karst environment

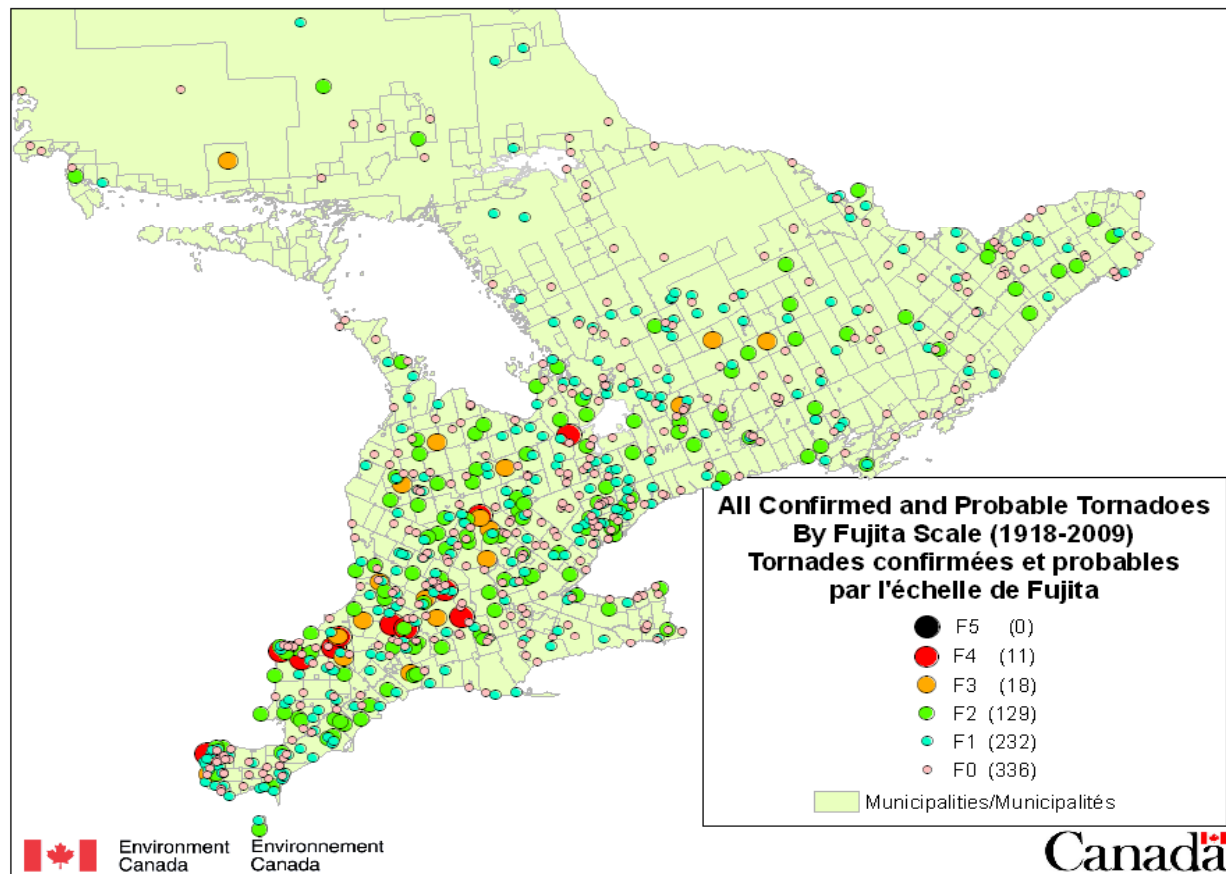
Ognjen Bonacci, Sanja Gottstein, Tanja Roje-Bonacci

For more information outlining various ways man made earthquakes can be created, please visit this link:

<http://www.wired.com/wiredscience/2008/06/top-5-ways-that>

.

The frequency of tornadoes in Ontario is expected to increase with climate change. Are we planning for it?



## The Biggest Risk of All: Political Interference hampering sound science.

Prime Minister Harper mandated 2 year approvals for environmental assessments by the Canadian Nuclear Safety Commission.

"There is no analysis or rationale that can be produced by the government to defend the two-year arbitrary time line,"

Liberal Natural Resources critic David McGuinty

## Political Interference continued:

Two-thirds of recent environmental assessments by the Canadian Nuclear Safety Commission, including those involving storage of radioactive waste, have taken more than two years to complete, say new numbers released by the agency.

Most nuclear reviews don't meet Harper's two-year limit

Source: MIKE DE SOUZA, POSTMEDIA NEWS JUNE 1, 2012

<http://www.canada.com/Most+nuclear+reviews+meet+Harper+year+limit/6716437/story.html>

# Harper fired Linda Keen

Source: CBC NEWS Nuclear safety watchdog head fired for 'lack of leadership': minister

<http://www.cbc.ca/news/canada/story/2008/01/16/keen-firing.html>



When the chief of the Canadian Nuclear Safety Commission suggested that one shouldn't run nuclear plants without necessary safety equipment, she was fired.

## Political Interference Continued:

With Bill C-311, the Nuclear Safety Control Act undermined. Environmental assessments will be moved to the Canadian Nuclear Safety Commission, which is a licensing body not an assessing body -- so there is a built-in conflict.

First Solution is to Stop the Problem  
We Must End Nuclear Power Generation  
and stop generating nuclear wastes.





## There are no guarantee safe storage

There is no moral ethical or scientifically valid evidence to show that we can reasonably monitor or manage the safe disposal of radioactive wastes for 10,000 to millions of years.

It is unreasonable to assume we could design such a system without flaws or adverse consequences to future generations when current evidence shows systems are failing in less than 100 years at an alarming rate.

We need guidelines to strictly prohibit the placement of Nuclear storage away from water, food and geological risks.

- Prohibit the placement of long term new nuclear storage facilities along the Great Lakes basin to protect these shared water resources and human populations for the long term.
- Only 6% of Ontario's land mass is suitable for A1 farming so prohibit placing long term nuclear storage units in proximity to farmlands or their watersheds in order to secure Canada's long term food security.
- Designated appropriate storage areas based on low hydrogeological connectivity and assume hydrological fractures exist. The further the distance of the storage units from growth areas and aboriginal communities the better.

# Where We Need To Invest



## Green Energy is Do-able Now

“Renewable energy sources, accessed with commercially available technologies, could adequately supply 80% of total U.S. electricity generation in 2050 while balancing supply and demand at the hourly level.”

National Renewable Energy Lab US:

[http://www.nrel.gov/analysis/re\\_futures/](http://www.nrel.gov/analysis/re_futures/)

The expected resource potential of Canada, electricity generated by geothermal energy could replace approximately 10 nuclear power plants and provide up to 10% of Canada's current total electricity generation.

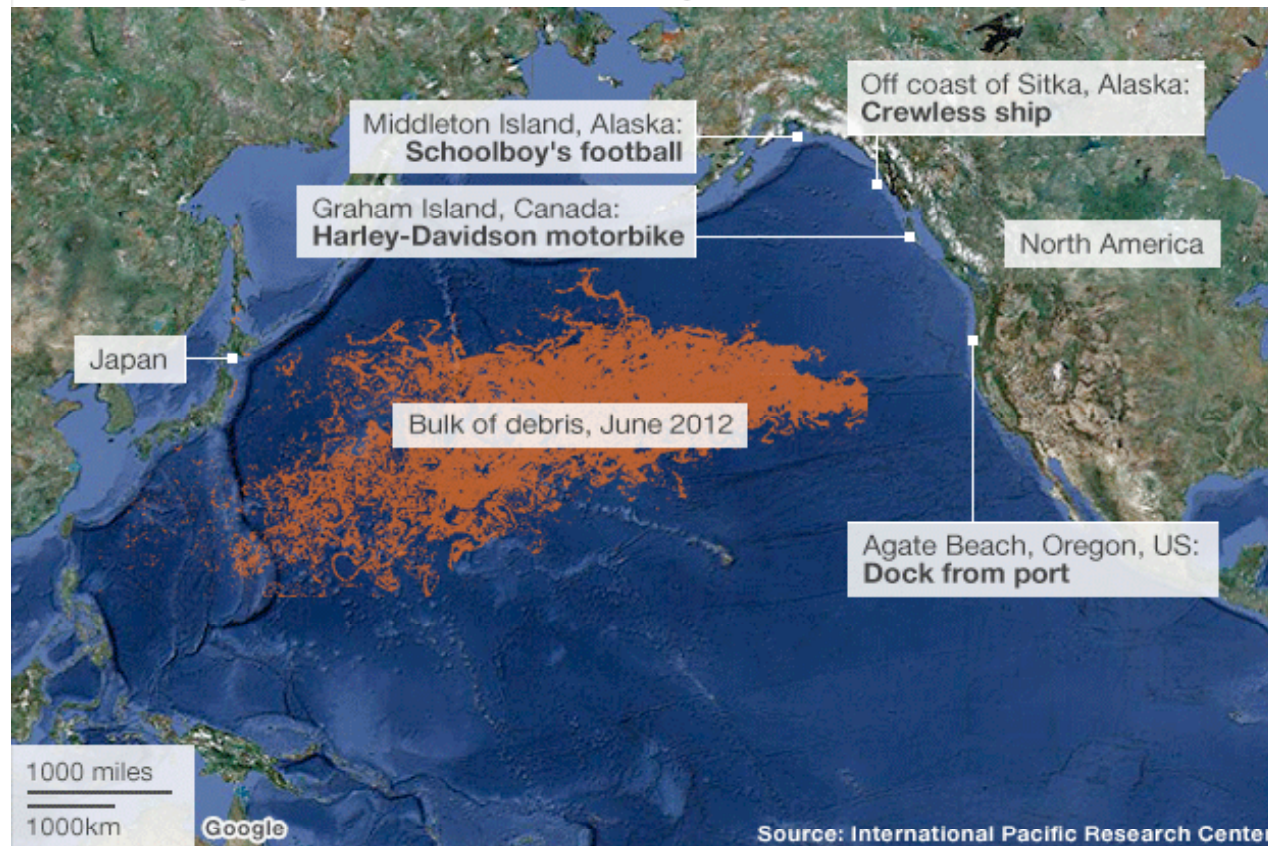
Canadian Geological Survey <http://www.globe-net.com/articles/2011/september/16/canada-is-awash-with-clean-geothermal-energy-resources/>

If you think there is a lack of public support for nuclear power today,,,



...how will public perception change when this arrives?

How far the Japanese tsunami debris has spread



## In Conclusion

To place long term Nuclear storage in Karst, along aquifers, farmlands, the Great Lakes and fault lines is not reasonable.

This area is in proximity to significant seismic risks that will only be aggregated by the proposed Melancthon Mega Quarry and other subsurface geological changes brought on by projects such as this.

With the unreasonable, non-scientific 2 year deadline for approvals, as mandated by Harper Government, it's not reasonable to assume such a short review period can secure the prevention of long term ecological, sociological or economic risks associated with this proposal.

## Conclusion Continued:

In the absence of a National Energy Strategy, it is premature to commit Ontario taxpayer dollars to a venture like this when there is no proven need or proven plan in place to show that this project is economically feasible or beneficial for the province over the long term.

Data shows cheaper, cleaner energy options exist that create more jobs and more economic prosperity for residents. This is outlined in numerous reports including Tide Canada's A New Energy Vision for Canada found online here:

<http://tidescanada.org/energy/newenergy/>

Why are we spending so much in tax payer dollars supporting a private firm using an antiquated system of energy supply that binds Canadians to have to store toxic wastes in perpetuity? It is not reasonable. Time to simply cut bait and drop nuclear. It's cheaper in the long run.



For this project at this location:  
Just say no.

