

Please provide your contact information. This information and your comments will be publicly available.

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My comments pertain to:

- Sandpiper Pipeline Project
- Line 3 Replacement Project
- Both Projects

Pipelines are the safest way
to transport oil.

we need jobs!

From: [jerry and Shirlee maertens](mailto:jerry.and.Shirlee.maertens)
To: [*COMM Pipeline Comments](#)
Subject: Fw: Sandpiper Pipeline Project Comments
Date: Wednesday, May 25, 2016 2:10:59 PM

To: Minnesota Department of Commerce

Sandpiper Pipeline Project Comments

EAW and Scoping EAW

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According to the EAW, the Sandpiper project is a pipeline from the Bakken oil fields of North Dakota to Superior WI through Minnesota. Superior is not the end point as is stated. It appears that Enbridge has plans for another pipeline to move all this oil from Superior to Illinois and places further east. If this is so, should not all these segments be considered as one project? The EIS definitely should consider more straight-line routes with fewer wetlands to the final destination and not just the Enbridge “preferred” route to Superior.

We continue to hear that the Bakken oil and other extractions are essential to continue to provide the U.S. with adequate petroleum products. In other words to satisfy our U.S. needs without relying on foreign oil. At the same time that the industry is saying this out of one side of their mouth they are lobbying Congress out of the other side and have successfully put enough pressure on congress to lift the cap on U.S. oil exports. So! One can ask Who is all this oil extraction really for? In other words the petroleum industry can extract oil to its heart's content, ship it to other countries, and jeopardize our environment with their numerous spills, breaks, and leaks over their many miles and miles of pipelines.

Also there are a number of pipelines proposed to move Bakken Oil. The Dakota Express

appears to be further ahead in the review process and this will go to Illinois. Another pipeline is proposing oil go to the Gulf Coast. Enbridge has another proposal to move Bakken to Canada. After congress lifted the cap on oil exports, a large facility is being proposed to move Bakken to the west coast for exporting. If all these proposals come to reality, the capacity to move crude from the Bakken would be fantastic. It would also allow the industry to move it where they would get the greatest return in profits.

In determining whether or not a “certificate of need” for the Sandpiper is needed by anyone other than Enbridge, a complete and thorough study should be conducted to determine the amount of oil needed for U. S. purposes, where it will go, and how many pipelines are needed to provide transportation of this “needed” oil. Exportation of oil is not a U. S. need, nor should it be defined as a need in the EIS.

The bottom line is the EIS should question whether or not the Bakken oil should even be extracted. A recent E. A. Kort et.al (University of Michigan) Study of the Bakken oil field gas emissions indicate that large amounts of Ethane are being emitted in addition to the methane. The report states “Emissions of this magnitude impact air quality via concurrent increases in tropospheric ozone. “ Obviously these concerns need to be addressed in the Sandpiper EIS.

Gerald Maertens



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P.1

Martin Malecha

EIS Scoping Hearing – Risk of Spills and Consequences

ships or ~~the~~ RR

1. Risk Assessment. We know spills will happen.
 - a. 2005 – 2015 all pipeline companies reported 1,981 oil spills in the United States
 - b. Specifically Enbridge: 2005 – 2015 Enbridge reported 178 crude oil release incidents in the United States, including the 2010 spill of over 20,000 bbl into the Kalamazoo River System. WisDNR_SPL3_Draft_EIS_Vol_1_Feb2016.

are not did hulls
So ~~the~~ spill,
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environment
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~~That is the reported spills. And if they were disclosed, were they disclosed accurately? Just last Saturday Detroit Free Press article reported that an Enbridge pipeline in the Hiawatha National Forest in the Upper Peninsula around 1980 leaked 5 bbl of oil, of which 4 were cleaned up according to the company. When Enbridge contractors revisited the site in 2011, they found high levels of petroleum related chemicals in the land and the water table. They removed 825 tons of soil, and requested permission to install groundwater monitoring wells. As stated by the chairman of the Michigan Sierra Club, either Enbridge knew about the extent of the contamination in the national forest for more than 30 years and didn't clean it up, or it didn't know about the spill's effects for more than 30 years — and either answer is troubling. So this is an important topic. Decades after pipeline spill, contamination could remain. <http://www.freep.com/story/news/local/michigan/2016/05/07/enbridge-line5-oil-spill-hiawatha-national-forest/83507225/>, accessed 9 May 2016~~

2. Who Will Do The Assessment. Will it be done by qualified risk assessment professionals with ecological expertise? That is the best way to get an accurate evaluation. For the EIS itself:
3. Will the EIS look at areas that might be especially adversely affected in the event of a spill:
 - a. Population centers, hospitals, long term care facilities, vulnerable populations such as senior citizens or those ~~suffering from~~ ^{with} disabilities.
 - b. Drinking and industrial water intakes.
 - c. Federal and state listed threatened and endangered species.
 - d. ~~Tribal lands, plus~~ The pristine Minnesota lakes used for wild rice harvesting
 - e.
4. In the event of a spill, will the EIS look at what needs to be Enbridge's response:
 - a. What equipment is in place: vacuum trucks, boats, booms, skimmers, haz-mat gear
 - b. What manpower will be available in response to a spill? What training will these responders have? Without sufficient trained personnel, a spill response will be ineffective at best.
 - c. Will the response be tailored to the type and toxicity of the oil in the pipeline?
5. Seasons
 - a. Will the EIS cover all of these issues for both summer and winter and the seasons in between? The damage a spill can cause will vary greatly if the spill happens in the middle of the summer or during the dead of winter. ~~Will the spill response, including equipment and personnel, and training, cover all of these situations?~~ ^{and the appropriate response to a spill}
6. Environmental Impacts Resulting from Spills: Will the EIS cover:

p.2

Martin Malecha

- a. Air Quality: We know there were instances of toxic chemical levels in the vicinity of the Kalamazoo spill that were multiple times in excess of the maximum Federal safe levels.
 - ~~b. Agriculture: that has to include the effects of a spill on wild rice harvests by Minnesota natives.~~
 - c. ~~Federally and State Listed~~ ^{In addition to} Endangered and Threatened Species. Will the EIS cover these, ~~and what impact a spill would have on them?~~
 - d. Fish and wildlife. Will the EIS look at the effects a spill would have on fish, amphibians, reptiles, birds, mammals?
 - e. How about invasive species – those that could be introduced into areas as part of a spill response? It may seem minor, but as anyone who has had to deal with buckthorn in their backyard hedge knows, invasive species can be a real problem
 - f. Recreational Resources. A spill could affect the recreational use of the area, especially lakes and streams.
 - g. How about socioeconomic effects of a spill. Both disruption of use of the land, as well as decrease in property values for those located near the spill.
 - h. Soil and Topography. A spill will have differing effects depending on the soil type and topography at the spill site. Will the EIS include that when reviewing spill consequences?
 - i. Vegetation. Will the EIS look at the impacts of a spill on vegetation? How will the effect of a spill on vegetation vary depending on the season? How will different cleanup operations affect vegetation? *And then we have water:*
 - j. Water
 - i. Groundwater: will the EIS look at what aquifers might be affected by a spill? How about public water supply wells? And private wells? How long would disruptions of water supplies last? Will the EIS cover that? It needs to.
 - ii. Lakes and Streams: What lakes and streams would be adversely affected by a spill? How long would the damages last? How would this affect aquatic life? How would this affect human use of the resource? Recreational use, tourism?
 - iii. Wetlands: Which wetlands, how will they be affected by the spill, how will they be affected by the cleanup efforts?
7. Cost of a Spill Response. Will the EIS examine whether Enbridge should be required to have substantial funds in escrow to be used for pipeline spill response, recovery, and compensation of affected parties. Clean up costs in Kalamazoo, MI have exceeded \$1.2 billion as of June 2015, and only about half of that was covered by insurance, according to FERC documents filed by the company.

From: [Ann Manning](#)
To: [*COMM Pipeline Comments](#)
Subject: Pipeline Comments - Sandpiper and Line 3
Date: Wednesday, May 25, 2016 11:03:05 PM
Attachments: [comments on scoping process for EIS Sandpiper and line 3.pdf](#)

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To: Jamie MacAlister
Environmental Review Manager
MN Department of Commerce
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From: Science & Environmental Health Network
Ann Manning, Associate Director

Date: May 25, 2016

Subject: Sandpiper/Line 3 Environmental Impact Statement

We urge you to do due diligence and conduct a robust scoping process for Enbridge's proposed Sandpiper pipeline and Line 3 'replacement' project. This scoping process should take into account the cumulative impacts of approving these two projects on communities, tribal lands, our lakes and rivers, climate and future generations. The Sandpiper pipeline and the installation of a new pipeline purportedly to replace Line 3 would carry a maximum of 1.4 million barrels of oil per day (bpd) across Minnesota. This oil transported through our state carries a significant increase in several risks that must be comprehensively evaluated.

We believe that if a robust scoping process is undertaken you will have the grounds to make a wise decision. A thorough review will demonstrate that this route is the worst possible route for toxic fracked and tar sands oil and the permit should be denied.

SEHN is a 20-year-old organization, dedicated to understanding the links between the environment and health for people and the planet. We call on the Minnesota Department of Commerce to ensure that a robust and thorough scoping process is conducted, taking into account the risks and potential impacts of these pipeline expansions on water, communities, climate and future generations.

Oil and Water Don't Mix

The pipeline corridor would cross water and land in northern Minnesota that contain great biodiversity. The route would include 137 public lands, 76 public waterways, and the headwaters of the Mississippi River. At particular risk are the primary wild rice beds and fisheries in Minnesota used in perpetuity by the Anishinaabeg people and protected by federal treaty. Pipelines pose a serious threat to natural resources essential to the culture and survival of these people as well as raise numerous ethical issues for the State of Minnesota, especially for future generations who have no voice in this process. Enbridge has had over 800

spills in 10-years, including the Kalamazoo Spill in 2010, and the risk is too great for our lakes and our people.

A recent National Academy of Sciences report says that cleaning up a tar sands spill in a waterway is significantly more difficult and potentially up to 14.5 times more expensive than cleaning up a non-tar sands oil spill. After the 2010 Enbridge Line 6B tar sands spill in Michigan, it's clear that even a small rupture or spill in the Mississippi River would be devastating. So too, a spill would be devastating to our lakes, rivers and streams. The DOC needs to scrutinize how spills would be cleaned up and paid for; assess the permanent damage to waterways and the impacts to Minnesota's economy; seriously evaluate the threat to the Anishinaabeg culture and wild rice rights; and give special attention to protecting the rights of future generations.

Climate change requires keeping fossil fuels in the ground

Future generations are at grave risk from constructing new permanent fossil fuel infrastructure. If we build infrastructure like pipelines we guarantee that we will not make the rapid transition to sustainable energy sources that are essential for a livable future. If we are to prevent runaway climate change and catastrophic threats to climate, then we must leave fossil fuels in the ground. Climate change must be factored into the scoping process.

There is no compelling public need for these pipelines. It is time to transition to a Living Sustainable Economy.

SPECIFICALLY WE ASK THAT YOU DO THE FOLLOWING:

- 1) Conduct a thorough and complete review to evaluate the cumulative impacts** of this pipeline on the community, climate, water and particularly future generations. Too often cumulative impacts are ignored or not sufficiently considered. Our State Statute 116D.02, Subd 2 DECLARATION OF STATE ENVIRONMENTAL POLICY is clear that the State must act to protect the health of our natural world and for humans of current and future generations. Subd 2: 1, 2, 3, & 7 especially call for action by the State to protect our health and wellbeing.

- 2) Consider health effects of crude oil exposure.**
Crude oil is a mixture of chemicals ranging from benzene, toluene, ethylbenzene, and xylenes to polycyclic aromatic hydrocarbons (PAHs) and other hazardous chemicals, including heavy metals.ⁱ

Health effects of exposure to crude oil depend on the chemistry of the oil, dose, duration, and route of exposure (inhalation, ingestion, or through the skin). Adverse impacts can be acute and chronic as well as direct and indirect. Vulnerability to adverse effects is influenced by age, pregnancy, and underlying health status.

The most common acute effects after exposure to oil spills are respiratory, eye, and skin symptoms, headache, nausea, dizziness, and fatigue.ⁱⁱ Chronic effects include psychological disorders, persistent respiratory tract symptoms and reduction in lung function. Genotoxicity and alterations in hormones have also been described.ⁱⁱⁱ No long-term studies have examined for cancer as a result of exposure to crude oil spills although benzene and some PAHs, components of crude oil, are known carcinogens. Some organic compounds in crude oil (e.g. toluene) can also cause birth defects. Crude oil can also cause birth defects in laboratory animal tests.^{iv}

Long-term indirect effects of a crude oil spill also result from strains on the fabric of a community.^v Loss of access to safe drinking water, traditional food sources, recreation, struggles over where to place blame, unresponsive authorities, and growing suspicion and cynicism can each have adverse health consequences that may never be resolved.

- 3) **The EIS needs to take into account the fact that there are lower standards for management of pipelines in areas considered of *low consequence*.** This would include standards for maintenance, monitoring, and emergency response plans. This effectively builds in *higher risk*. The problem with this kind of policy is that it specifically results in environmental injustice to the **Anishinaabeg and higher risk of catastrophic spills** as it puts this pipeline through northern Minnesota BECAUSE it has lower population density and therefore is of “low consequence.” This results in the chance of a disastrous spill being much higher and areas like White Earth will be subject to higher risk, which is a violation of environmental justice.
- 4) **Set a precedent by choosing the best environmental alternative.** The EIS process is currently biased toward the applicant. State agency processes are often designed to ignore *the best alternative*. This reduces public trust in the process and wastes taxpayer’s money. Given today’s climate emergency, the recent Paris Climate Agreement and common sense, it would clearly suggest that denying any pipeline permit is the best environmental alternative. A wise decision would identify the best

environmental alternative and choose it as a matter of policy. Do not lock future generations into a bad decision.

- 5) Identify and address ethical issues in the EIS.** We will focus on a few that may not be covered by others. The ethical dimensions of this proposed pipeline go far beyond the boundaries of Minnesota. This decision affects the region, at least two countries and the entire planet as well as affecting many generations. From a planetary standpoint, we have reached the limits of our boundaries with fossil fuel and the resulting climate change. The rights of future generations must be taken into account as well as the facts of our planetary limits. To paraphrase Bill McKibben, this is not the economy vs. the environment. This is physics and physics will win. We simply can no longer subsidize this energy source. "Energy subsidies are projected at US\$5.3 trillion in 2015, or 6.5 percent of global GDP, according to a recent IMF study. Most of this arises from countries setting energy taxes below levels that fully reflect the environmental damage associated with energy consumption."
<http://www.imf.org/external/pubs/ft/survey/so/2015/NEW070215A.htm>

Once a pipeline is built, it's hard to eliminate or reduce the subsidies, yet the environmental concerns remain and are likely to increase with every passing year. Impacts on local ecosystems and the local communities that depend on them result in even more local environmental and economic justice considerations once the building of the pipeline and the inevitable spills are considered.

Again, we urge you to do a thorough and comprehensive EIS and trust if done well, you will reject this pipeline.

ⁱ Levy B, Nassetta W. The adverse health effects of oil spills: a review of the literature and a framework for medically evaluating exposed individuals. *Int J Occup Environ Health*. 2011. 161–7. Available from: <http://>

ⁱⁱ O'Callaghan-Gordo C, Orta-Martinez M, Kogevinas M. Health effects of non-occupational exposure to oil extraction. *Environ Health*. 2016;Apr 26;15:56. doi: 10.1186/s12940-016-0140-1.

ⁱⁱⁱ Levy B, Nassetta W. The adverse health effects of oil spills: a review of the literature and a framework for medically evaluating exposed individuals. *Int J Occup Environ Health*. 2011. 161–7. Available from: [http:// www.ncbi.nlm.nih.gov/pubmed/21618948](http://www.ncbi.nlm.nih.gov/pubmed/21618948).

^{iv} de Soysa T, Ulrich A, Friedrich T, Pite D. Macondo crude oil from the Deepwater Horizon oil spill disrupts specific developmental processes during zebrafish embryogenesis. *BMC Biol*. 2012;May 4;10:40. doi: 10.1186/1741-7007-10-40.

^v Campbell D, Cox D, Crum J, et al. Later effects of grounding of tanker Braer on health in Shetland. *British Med Jour*. 1994; 309:773–774

SANDPIPER/LINE 3 EIS SCOPING COMMENTS

By

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The following statements are my comments and recommendations on the draft scoping EAW and draft scoping decision document for Sandpiper and Line 3 pipeline projects.

GENERAL COMMENTS:

1. With passage of Minnesota Statute 116D.10 the Minnesota Legislature instructed the executive branch of state government to take special pains to plan for the state's energy and environment future. Our state government units with the greatest responsibility reviewing and approving energy related projects including the Public Utilities Commission (PUC) and the Department of Commerce (DOC) have failed to comply with this statute by not producing this profoundly important report in a timely manner. This administrative failure to comply with state statute now has potentially crippling consequences for energy and environment decision-making by these same agencies.

Had this "*Energy and Environment Strategy Report*" been properly prepared in a regular and timely manner as required by this statutory mandate the agencies now confronted with making critically important long-range choices about crude oil pipelines could have relied on this report to guide their decision-making. The scope and level of detailed analysis required by the Energy and Environment Strategy Report would have provided precisely the depth and breadth of information needed to determine whether the fossil fuels to be transported in the proposed pipeline projects were consistent with Minnesota's long-term environmental and energy goals and vision.

Such a proactive state energy and environment plan could have anticipated the consequences of the shale oil boom in North Dakota and have been better prepared to anticipate crude oil transportation infrastructure demands of the industry.

The Minnesota Department of Employment and Economic Development (DEED) fulfilled that department's duty under these statutes by preparing a 2015 report entitled "*The Effects of North Dakota Oil Production On Minnesota Economy*" (see link to report at:

<http://stmedia.startribune.com/documents/Final+DEED+14+April+2015.pdf>). In this report DEED anticipates the downstream ripple impacts of the Bakken Shale Oil boom on the Minnesota economy and includes the prospects for increased crude oil transportation across Minnesota by both tanker trains and pipelines. In spite of this report the Departments of Commerce and the Public Utilities Commission staff failed to heed the warnings of their sister agencies and anticipate the potential infrastructure, energy and environmental consequences of boom and bust dynamics in the shale and tar sands oil fields on Minnesota.

Lacking these forward looking state level energy and environment plans pipeline companies looking to profit from transporting burgeoning crude oil supplies in North Dakota to market were free to take full advantage of the situation. As a result Minnesotans and state regulatory agencies find themselves in a reactionary mode having to respond to industries preferred methods and routes for transporting this crude oil such as the proposed Sandpiper and Line 3 pipeline projects.

The introductory language in the opening statement and the provisions of clause #2 of Minnesota Statute 116D.10 are most instructive and are shown here:

“116D.10 ENERGY AND ENVIRONMENTAL STRATEGY REPORT.

On or before January 1 of each even-numbered year, the governor shall transmit to the energy and environment and natural resources committees of the legislature a concise, comprehensive written report on the energy and environmental strategy of the state. The report must be sufficiently comprehensive to assist the legislature in allocating funds to support all of the policies, plans, and programs of the state related to energy and the environment,”

*Clause (2):” a concise, comprehensive description and assessment of the policies and programs of all departments and agencies of the state responsible for issues listed in clause (1), including a **concise discussion of the long-term objectives of such policies and programs; existing and proposed funding levels; the impact of each policy and program on pollution prevention, emergency preparedness and response, risk assessment, land management, technology transfer, and matters relating to the availability and conservation of crude oil and of refined petroleum product and other energy sources; and the impact of each on relations with the other states, the federal government, membership in national organizations, and funding of programs for state environmental protection and energy issues**;* (Bolding and underlining added for emphasis. Provisions of many other clauses in MN Statute 116D.10 are also applicable.).

And lack of adequate legislative funding for this report cannot be offered now as an excuse for not preparing this critical report by these agencies when neither the PUC nor the DOC has ever requested funding to prepare this report. DEED found the necessary funding to prepare their report on economic development implications of crude oil production changes and the DOC and PUC should have sought similar funding.

Because this level of future energy and environmental planning and strategizing is so critical to the decision-making on these pipeline projects it is not only procedurally incumbent but a statutory requirement that the Sandpiper/Line 3 EIS be properly scoped to fill this strategic energy and environment planning void. The MEPA law and EQB rules that require applicants to adequately fund environmental review for their projects can presently be used to ensure the necessary funding and procurement of the outside expertise necessary for this expanded scope of the EIS. While the time-frame for preparing the plan now must conform to that prescribed for a mandatory EIS, the resources necessary to compress the planning process are at hand.

And the additional funding for the EIS need not be so large as to meet the entire and somewhat encyclopedic requirements of provisions of 116D.10 to address all energy and

environment related issues related to the projects at hand. But the EIS must instead be properly scoped to address the global, national and state roles in and wisdom of crude oil as a long-term world energy source. In making this assessment the EIS can examine the government's long-term commitment to crude oil transportation infrastructure represented by these pipeline projects. This assessment can be made against the backdrop of a comprehensive world view of sustainable energy policy and appropriate measures needed to achieve climate change goals while environmental protection strategies.

To accomplish this Minnesota's citizens request and Minnesota Statute 116D.10 demands that the PUC and DOC take a much broader public interest stance in reviewing pipeline projects than they have thus far. The statutes and long term public interest do not sustain the DOC's myopic and narrow interpretation of public interest and need for these pipeline projects as evidenced in the record to date. Prior to the 2015 Appeals Court ordered for an EIS for these pipeline projects the PUC and DOC staffs have focused public need determinations on evidence of either market "push" (oil well production) or demand "pull" (domestic and/or foreign consumption) for crude oil to base public need determination and recommendations to the Public Utilities Commission. To support the PUC's legally errant issuance of a Certificate of Need the DOC (and PUC) staff have (and continue to) merely looked to see if the pipeline companies had shipper bids or contracts for certain minimum volumes of crude oil to make efficient use of or likely provide adequate debt service for the proposed pipeline's.

The language in the Draft Scoping EAW is couched entirely in terms of the industries need to satisfy oil production and shipper demand. No assessment or representations are made regarding domestic or foreign consumer demand on which a public interest need for the project could be judged. On page 29 the Scoping EAW has the following statements explaining the project purpose:

"Williston Basin production exceeds the currently available pipeline capacity, causing frequent periods where shippers are not able to transport the desired volumes of crude oil through the existing pipeline system. Instead, shippers have turned to other transportation modes, primarily rail, to transport Bakken crude oil to refineries in the Midwest and other areas...NDPC is proposing the SPP to help address this need by providing an additional 225,000 bpd of capacity..."

And this statement concludes that section on project purpose;

"As a result of its open season, NDPC secured shipper commitments for 155,000 bpd, which NDPC maintains is a sufficient volume to support the commercial viability of the SPP."

By adopting this misguided interpretation of "public need" the DOC and PUC staffs have actually cast the PUC into the crude oil transportation industry as something of a *business planning advisor* or *corporate financial investment advisor* rather than a guardian of the public interest for fossil fuel energy transportation and use in Minnesota and the careful guarding against avoidable environmental consequences of these activities.

Enbridge and North Dakota Pipeline Company LLC do not need the DOC or PUC staff to function as business or financial advisors on these pipeline projects; these companies have and can afford their own advisors. To the contrary, what the public and the ***Public*** Utilities Commissioners need is competent energy and environmental policy advice from these state agencies on these pipeline projects. To provide this level of advice to the PUC **in the public interest** will require a fundamental paradigm shift on the part of DOC and PUC staff as they prepare this EIS. A major re-drafting of the scope of the EIS will be required to demonstrate the DOC's and PUC's willingness and intention to make this shift toward serving the public's rather than private or industry interests.

In their current state of “regulatory capture¹” the PUC and DOC staff will certainly find it difficult if not impossible to make the required paradigm shift without outside support and oversight. But staffs of these agencies can demonstrate their willingness to make this shift by fortifying themselves with outside, objective support and on-going course-correcting mechanisms. These mechanisms include some major EIS scoping changes as well as structural, procedural, and operational measures that include:

- A. **Redrafting the project purpose.** From the outset, the EIS must have a properly stated public interest purpose for the project that does not prejudice or bias the selection and/or evaluation of alternative routes for the pipeline. The current draft Scoping EAW and Draft Decision Document adopt the industries' preferred private project purpose that does prejudice alternative selection limiting options to only those routes that terminate in Superior Wisconsin. The redrafted public interest purpose for the Sandpiper project must necessarily be to transport Bakken sourced crude oil to pipeline hubs or refineries in the mid-continent region. Then all alternative routes meeting this broader project purpose can be considered in the EIS. This, of course must then include the possible co-location of Sandpiper in the same corridor as the Dakota Access pipeline through the Dakotas and Iowa. It is apparent that the DOC has been attempting to pre-maturely eliminate this alternative route for what can only be interpreted as political reasons.

This route may indeed be eliminated for political reasons but only after it has been fully and completely evaluated as an alternative route on practical engineering feasibility, environmental and economic basis in the EIS. The scoping process for the EIS can not be used to pre-maturely and unjustifiably eliminate any reasonable alternative routes such as the Dakota Access route because doing so would be to blatantly allow the environmental review process to be used to mask or conceal biased political forces that favor other routes. MEPA does not allow political filters to eliminate project alternatives before these alternatives are evaluated in an EIS.

- B. **Disclosing and Correcting Procedural Harm Done to Citizens Attempting to Propose Alternative Routes** – At several early public scoping meeting held in Hinckley, Little Falls, Crookston, Thief River Falls, Bemidji and Park Rapids DOC staff distributed an informational sheet providing citizens with detailed instructions on how to propose alternative routes for the proposed pipeline. (A marked up copy of that informational

¹ <http://law.emory.edu/ecgar/content/volume-1/issue-1/essays/regulatory-capture.html>

sheet is enclosed as an attachment to the email submitting these comments for the record)

The information on these sheets was grossly accurate and was seriously misleading such that any citizens relying on this information were severely and adversely impacted in ways that may be irreparable if the scoping process proceeds on the proposed schedule. The information sheet imposed inappropriate conditions and limitations on the process for citizens hoping to propose alternative routes in several ways including:

1. The sheet stated that any alternative routes proposed must “accomplish the stated purpose and need” of the project which in the Draft Scoping EAW was to deliver crude oil to Superior Wisconsin. This was a project purpose statement DOC staff later announced (but only when challenged by a member of the public) was subject to change in the Draft EAW and the EIS. So citizens attending these early public meetings hoping to propose alternative routes were limited by this project purpose to proposing pipeline routes to a destination which was later acknowledged by DOC staff as a potentially moving target.
2. The information sheet actually informed a citizen planning to suggest an alternative route that they would be “required to make a presentation” to support their proposal at some subsequent public hearing, a requirement that is not true under MEPA, and;
3. The information sheet also made reference to certain minimum criteria and data requirements imposed on persons other than the applicant in order for these person’s proposed alternative routes to qualify for further consideration in the EIS process. These rules, which are may be operational in PUC Certificate of Need and Route Permit legal proceedings such as contested case hearings are not operational under MEPA or EQB rules for preparing and EIS. The information on these sheets imposed such high bars for documenting the viability and impacts of any prospective alternative routes as to be totally prohibitive and prejudicial.
4. The sheet in a section labeled “*The life of your alternative-Step by Step*” made the absolutely outlandish claim that “*If your alternative is included (in the PUC’s permit decision) the pipeline MUST be CONSTRUCTED IN THAT LOCATION.* (emphasis added). This statement can not be supported in any statute or rule; no pipeline company can be compelled by a permit to build a pipeline along alternative routes evaluated in an EIS. These alternatives routes are evaluated in an EIS process to determine if an environmentally better route exists and if so, the “no action” alternative becomes the viable for permitting agencies rather than an order to construct in an alternative location.

The draft scoping document must take special note of these errant procedures and false instruction sheets that many citizens were forced to rely on in the scoping process. At this writing and to the author’s knowledge the damage

done to the validity of the public scoping process at these early meetings has not been repaired nor has any attempt been made to repair this damage. It is true that when these errors were pointed out to DOC staff at the Park Rapids scoping meetings new information sheets with several important corrections were produced and distributed at that and subsequent scoping meetings. However, no effort has been made by DOC to notify attendees at the scoping meetings prior to the Park Rapids meetings that they had been misinformed. Consequently, the public attending these earlier meetings have not been provided proper notice nor have they been provided the correct information or opportunity necessary for them to fully participate in the scoping process for this EIS. The EIS must evaluate and propose remedial measures to address and remedy these procedural mistakes.

- C. **Restructuring of the current Memorandum of Understanding (MOU)** must be undertaken to elevate the MPCA and MDNR to peer level status rather than their current “advisory” and subordinate status. These agencies must be granted of all funding and resource requirements necessary for these them to perform as full and equal partners with DOC staff in EIS preparation. Prior to the MOU the MPCA and MDNR written communications provided a window for the public to witness deliberations and discussions between agencies in the form of comment letters in the record. However, the MOU as presently drafted precludes the public access to and transparency of these inter-agency communications. Full transparency and public access to these inter-agency deliberations is one of the most important functions of the environmental review process under MEPA. Robust and vigorous disagreement in the writing of these science-based documents adds to the credibility of the final documents, especially when the public is aware of how arguments for certain positions fail and others succeed. But, by virtue of provisions in the MOU the public is now barred from learning of any and all possible disputes or disagreements between these agencies on such important matters as scope of work, methodologies used, data selected or eliminated, consultant selection, and whose arguments ultimately prevailed in final decisions and the reasons why they prevailed in the EIS. DOC staff has attempted to justify their arbitrary control of decision-making under provisions of the MOU on the unsupported basis that the PUC will ultimately hold only the DOC responsible for content of the EIS. The DOC claims the PUC would not and could not hold either the MPCA or the MDNR responsible for their particular contributions to the EIS.

No such position has been publically adopted or even voiced by the PUC Commission as a whole nor has this position been publically expressed by any individual PUC Commissioners. DOC’s insistence on retaining final arbiter status in the Tri-Agency group described in the MOU is an untenable position. Peer reviewed science in the preparation of the EIS must be restored by rewriting the terms of the MOU making that peer review process functional.

- D. **The MOU should be expanded** to include necessary provision and funding for full participation by experienced EQB staff to better inform and guide the member agencies on the finer points of EQB rules and environmental review procedures. Clearly, DOC staff continue to make serious procedural and

content errors in the MEPA process and EQB staff on-going guidance would be vital to preventing important if not fatal errors in the process.

- E. **Collaboration with Neighboring Impacted States** - This new Tri-agency EIS Partnership (TEP) should immediately enlist the collaboration and effective participation of the several neighboring states impacted (or potentially impacted) by these projects in the scoping and preparation of this EIS. The states potentially impacted include at least the Dakotas, Wisconsin, Michigan, Iowa and Illinois. Full funding for the participation of these states should be included in the EIS funding mechanism.

- F. **The geographic scope of the EIS** (or EIS's) will have to be adjusted to reflect the entire pipeline size of the projects to include all components of the system necessary to transport the crude oil from its source to the ultimate crude oil destination or destinations, whether it be a refinery or export terminal. Connected actions such as expanded pumping capacity or adding or increasing pipeline downstream from the proposed project and its alternatives must be included in this broader project scope. New oil supplies provided by the proposed project that require either extended service or replacement of existing pipelines such as Enbridge's Line 5 should also be included in the EIS. Pipelines downstream from Superior Wisconsin that require extended life, expansion of size, increased pumping capacity or other upgrades in order to accommodate the new crude oil volumes generated by the proposed project must have the impacts of these actions included in the EIS.

Both Sandpiper and Line 3 as proposed would have possible implications for re-purposing or may have life-extending future reliance on Enbridge's 63-year old Line 5 pipeline through Michigan and the Straits of Mackinac. Recent reports from Michigan indicate this aging pipeline may undergo serious re-evaluation and risk assessments that could have consequences for the viability of the planned uses and routes of Sandpiper and/or Line 3. Coordination and collaboration with the state of Michigan would be essential to ascertain information on the future of Line 5 that is vital to the alternative configurations and routes of the proposed pipelines here in Minnesota. See article on Line 5 at: <http://www.wdio.com/news/proposed-study-could-require-shutdown-of-enbridge-pipeline-in-straits-of-mackinac/4121918/?cat=12319>

The cumulative impacts and/or cumulative potential effects of all these connected and cumulative actions and impacts as defined in Minnesota Rule 4410.0200 must be scoped into the EIS regardless of whether the Minnesota PUC or other state agency has authority or control over them.

- G. **Cumulative impacts and/or cumulative potential effects** are defined in MN Rule 4410200 in sufficiently broad terms as to encompass the future replacement of other aging pipelines in the Enbridge system in addition to Line 3. Pipelines of similar vintage and life-expectancy in the Enbridge US Highway 2 pipeline corridor are nearing their design life expectancy and replacement of these lines is reasonably indicated based on historic

development and forecasted trends. (See applicable language in MN Rule 4410.0200 subp. 11a “Cumulative Potential Effects”). As replacement of these aging lines are likely to face similar impediments to their replacement in this same corridor the EIS as Line 3 the EIS must anticipate the possible relocation of these additional pipelines into any new pipeline corridor or corridors established for Sandpiper and/or Line 3. Anticipating these reasonably foreseeable future pipeline relocations will add significant risk factors to human and natural environment not yet scoped into the current EIS. The scope of the EIS must be revised accordingly.

H. **Jurisdictional or political boundaries are inappropriate geographic limitations** for the EIS because the narrow boundaries prejudice the available route alternatives that may or are likely to have lower environmental impacts and avoids assessing impacts of the entire project that may occur in other states. So the EIS must evaluate the impacts and alternatives to the entire project, not just segment of the project that happen to fall in Minnesota. Consequently, the impacts and alternatives to the project can not be limited to those that may occur within the geopolitical boundaries of Minnesota. Minnesota’s human and environmental resources do not exist in a bubble, air water and ecosystem resources do not respect political boundaries. MN Rule 4410.0200 Subp. 11a explanation of cumulative potential effects in quite clear on this issue.

I. **To facilitate incorporation of the entire multi-state scale** of the actual projects into the EIS’s the TEP should enlist the immediate collaboration and effective participation of several federal agencies. Federal agencies with considerable interest, expertise (and pertinent data) in inter-state national and international energy and environment policy and in the environmental review process must be included in the scoping and preparation of an EIS of this magnitude and importance. The federal agencies should include at very least the US Army Corps of Engineers (both St. Paul and Omaha Districts), the US Fish and Wildlife Service, the US Environmental Protection Agency and the Bureau of Indian Affairs. Funding for the full participation of these agencies should be included in the EIS funding mechanism. Simply having meetings with or consulting with these agencies periodically will not suffice to provide for their full participation in the EIS as is required here.

2. **The relationships, collaboration and coordination with state and federal environmental** planning and management is not only appropriate for a full and robust EIS process 116D.10 and by EQB rules but is made mandatory by other provisions of Minnesota Environmental Policy Act in 116D.03.

Minnesota Statute 116D.03 ACTION BY STATE AGENCIES

Subdivision 1. Requirement.

The legislature authorizes and directs that, to the fullest extent practicable the policies, rules and public laws of the state shall be interpreted and administered in accordance with the policies set forth in sections 116D.01 to 116D.06

Subd. 2. Duties. All departments and agencies of the state government shall:

(1) on a continuous basis, seek to strengthen relationships between state, regional, local and federal-state environmental planning, development and management programs;

(2) utilize a systematic, interdisciplinary approach that will insure the integrated use of the natural and social sciences and the environmental arts in planning and in decision making which may have an impact on the environment; as an aid in accomplishing this purpose there shall be established advisory councils or other forums for consultation with persons in appropriate fields of specialization so as to ensure that the latest and most authoritative findings will be considered in administrative and regulatory decision making as quickly and as amply as possible;

And in an especially pertinent clause #5 Minn. Statute 116D.03 requires all state agencies to:

*(5) recognize the worldwide and long range character of environmental problems and, where consistent with the policy of the state, **lend appropriate support to initiatives, resolutions, and programs designed to maximize interstate, national and international cooperation in anticipating and preventing a decline in the quality of the world environment;***

:

3. Citizen groups and members of the Minnesota Environmental Quality Board have recently taken particularly pointed and public note of the DOC's loss of the public trust in their environmental review procedures and suggested the Department take special measures to restore this trust². The Tri-Agency EIS Partnership (TEP) should immediately invoke provisions of MN Statute 116D.03 Subd. 2, (clause 2) to create both a special "advisory council or councils" and a "interested citizen forum" to provide extraordinary access to objective expertise and extraordinary access and transparency for the EIS writing process. Advisory panels of experts with members specifically selected for their knowledge and experience in assessing crude oil pipeline impacts and how the public interest is served by the intricacies of crude oil economics, and such matters as shipper tariffs along with the economics of tight oil production, transportation, refining and consumption in both domestic and foreign markets.

"Public Interest Forums" and "EIS process observers" should be identified to represent and report matters of public interest in the process of preparing the EIS. The purpose of these forums and role of process observers would be to provide the extraordinary access and transparency to citizen group representatives needed to establish or restore the public trust in the process and members of the TEP. The EIS writing process involves myriad discretionary decisions on a day to day basis most of which are not guided or prescribed by procedural rules. Many of these

² See Minnesota Environmental Quality Board May 18th 2016 meeting on-line archive.

discretionary decisions can significantly alter the outcome and final product of the process. DOC has demonstrated a propensity for consistent and persistent project-favoring bias in both prescribed and discretionary decision-making throughout the history of this project's review. Despite DOC staff assurances to the contrary the public still does not trust DOC's ability to eliminate this obvious bias. The "public interest forums" and "public process observers" are reasonable mechanisms DOC could readily adopt to begin restoring the public trust. These forums and observers could allow citizen representatives to witness in real time the DOC's promised objectivity and consensus process as each of these decisions are being made in the EIS process. Failure on the part of DOC to adopt these suggested measures or other equally effective measures to provide the on-going transparency and public access to the process will only underscore the citizens growing skepticism and distrust in DOC's willingness and ability to perform this EIS writing function objectively in the public interest.

SPECIFIC COMMENTS

4. The following statement is found in Section 6. Project Description on Page 30 of EAW: "*As a result of its open season, NDPC secured shipper commitments for 155,000 bpd, which NDPC maintains is a sufficient volume to support the commercial viability of the SPP*". Are these "put-or-pay" contracts that are being used by the applicant as representation of growing demand for pipeline transport of Bakken crude oil still a valid measure of the market need for this project? Or are these contracts a biased indicator of market "push" by virtue of the fact that shippers signed these contracts during the upswing in shale oil production several years ago. The EIS should employ sufficiently sophisticated crude oil production and consumption market analysis to assure the public is well served by market forces at play when "put or pay" contracts might force shippers to utilize pipeline infrastructure at contract rates that could force the shippers to operate at a loss. It would be difficult to justify how the public interest could be served by a government action that knowingly allowed a pipeline company to hold contract shippers hostage to these "put or pay" contracts when to do so could seriously damage the shippers future financial viability.
5. The EIS must re-examine the dynamics of boom and bust nature of shale oil and/or tar sands oil production to provide an objective prediction of future "push" (production) and "pull" (consumption) demand for pipeline shipping for this crude oil. NDPC completed its open season in January 2014 and the world oil supply/demand circumstances have experienced drastic swings in the two year period since shippers made commitments to this project.
6. The EIS must examine the impact of excess, (overbuilt and underutilized or even mothballed) pipeline system shipping capacity has on consumer petroleum based energy prices (i.e. fuel prices)? Minnesotan's may already be paying for overbuilt pipelines (such as the existing Koch Brother's Wood River Pipeline) that are no longer used but may continue to weigh on consumer fuel pricing by virtue of certain

FERC approved tariffs pipeline companies are allowed to pass along to shippers and refiners and that ultimately impact the consumer. What are the chances that the Bakken Oil boom will either continue to bust or burn out before the Sandpiper pipeline has lived out its projected life span of 50-60 years? Will this pipeline become an economic drag on consumers and the economy because it may not be needed twenty years from now but has instead become yet another stranded infrastructure asset of the fossil fuel age like the Wood River pipeline? This question should be addressed in the EIS. The EIS must address the question from the public interest standpoint whether similar capitol, land and government subsidies (including eminent domain powers) proposed for long-term commitment to fossil fuel transportation infrastructure such as pipelines might better be invested renewable energy sources and infrastructure.

7. The public has a very poor understanding of the various FERC (Federal Energy Regulatory Commission) tariff rates pipeline companies are allowed to assess certain shippers, refineries or other users of pipelines. And the public also has a very poor understanding of how these tariffs are reflected in consumer costs for petroleum based energy or products. A brief description of purpose of these FERC tariffs in the EIS would be most helpful to the public's understanding and acceptance of these pipelines. For example, it is asserted by some that pipeline companies are allowed to request FERC approval of these tariffs based on certain guaranteed profit margins after capitol and operational costs are covered. And, it is also asserted that pipeline companies are allowed to factor in various anticipated costs of pipeline leaks and spills including costs of lost of customer product (oil), spill clean-up and remediation costs and possibly even costs of any administrative or court-imposed damages or fines that may be assessed against the pipeline company. If pipeline companies are allowed to externalize any of the costs of oil spills or leaks including punitive fines or assessments for damages through the system of tariffs the public may take quite a different view of the risks these pipeline pose, what risks the companies are willing to take and what corporate level responsibility pipeline companies have for the construction and operation of pipelines.
8. The EIS should include both tables and maps of historic releases of oil from all Lakehead and/or Enbridge (including all subsidiaries) crude oil pipelines beginning at a continental scale down to state or county scale. Maps should document each release of one barrel or larger using "bubble size" graphics to represent the volume scale of the release at the location of the release. Maps on the Minnesota, North Dakota, Wisconsin, Michigan and Illinois scale should show releases from all crude oil pipelines. These data, presented in easily understood graphic form are important for meeting the cumulative impact requirements showing social impacts of all "past actions" by this industry on the human and natural environment consistent with the continental and interstate scale of the proposed project.
9. All historic pipeline crude oil releases portrayed per above item should be broken down into method by which the release was discovered including those discovered

by system leak/spill monitoring of line pressure drop, smart pig detection of anomaly, aerial or ground-level surveillance by company (employees or contractor) reported by the public, discovered by routine or targeted integrity digs and all other methods. Statistical analysis of these data should be performed to provide reliability or failure assessments or characterizations of each method of release discovery. This reliability assessment should then be used to extrapolate or predict numbers of as-yet-undiscovered oil release sites per pipeline mile in the Enbridge system in Minnesota and adjoining states across which crude oil from Sandpiper or Line 3 oil will ultimately be transported. These data are necessary to meet the impacts-of-all-past-action requirements of cumulative impact assessments in the EIS. These historical data are necessary to calibrate or ground truth risk assessment models and worst case release spill/leak scenario models employed in the EIS.

10. How are Line 3 (and other foreseeable pipelines potentially abandoned in addition to Line 3) abandonment costs or environmental liabilities being factored into the scope of the EIS? How are these pipeline abandonment costs represented in FERC tariff rates allowed to the project proposer and how, if at all, are these costs passed on to the consumer, whether foreign or domestic? What financial assurance provisions will be necessary to assure abandoned pipelines in the Enbridge system do not become orphans should Enbridge subsidiaries or parent company no longer exist as financially viable and capable entities? The EIS must address these reasonably foreseeable future cumulative actions.
11. Are the Line 3 abandonment costs and liabilities good predictors of the future costs and liabilities of Sandpiper's ultimate abandonment costs given that its preferred route has much in common with Line 3's present corridor along U.S. Highway 2? Common factors include such things as having been routed through low lying terrain, bog and wetland ecosystems where removal and cleanup of undiscovered historic leaks may appear to do as much or more environmental damage than leaving the abandoned pipe in place. These life-of-project issues must be addressed in the EIS?
12. Construction and removal/restoration impacts of temporary emergency access roads or pad-ways made necessary to respond to spill or leak sites must be compared between the several system route alternatives? Impacts of worker and equipment access for routine or targeted integrity digs along the pipeline corridor that are non-emergencies must be compared between preferred and alternative routes?
13. The EIS must compare long term site cleanup and remediation differences between alternative routes through disturbed/alterd (agricultural or developed) regions of the state versus the undeveloped, undisturbed regions of the proposed route? What is the likelihood that cleanup and or remediation of leaks or spills in undeveloped regions would be more damaging to the environment than leaving the spilled product to degrade naturally over time? Ease of access and relatively lower impacts of active remediation (land-farming) of oil contaminated soil using conventional in-

place farming practices along alternate routes through agricultural regions of the state should be evaluated and compared to similar predictable activities along the proposed route that are not amenable to conventional farm type soil tillage?

- 14. Is the Granting of Powers of Eminent Domain Still Appropriate for All Crude Oil Pipelines? What is the Monetary Value of These Powers and Are These Public Subsidies to the Pipeline Industry Still Warranted?** When legislation was passed granting pipeline companies powers of eminent domain the presumption was that the petroleum products transported in these pipelines were so essential to the domestic energy and economic needs of the nation as to warrant granting of these powers in the general public interest. Ever since the development of shale and tar sands oil became economically feasible, the function of many domestic pipelines has shifted dramatically. Pipelines that used to transport crude and refined oil to the interior of the continent are now being reversed. And new pipelines such as Sandpiper and Line 3 are proposed to ship oil and refined products from near the center to the perimeters of the continent. Is exporting domestic oil still in the broader public interest when the petroleum energy it contains not consumed domestically? The EIS should address whether the economic benefits to the nation (apart from energy benefits) of such pipelines are still in the public's long-term interest? The practical or demonstrable public interest purpose of the pipeline in both national energy versus economic needs must be clearly established in the EIS for the project to qualify for powers of eminent domain.

To do this, the EIS should estimate the economic value of eminent domain powers potentially granted to the pipeline company. Other states that do not grant eminent domain powers can serve as data sources to compare costs of land-owner easements obtained both with and without such powers. These data and analyses will be important to Minnesota citizens and reviewing agencies in making the critical determination of the public need for these projects. These findings will also be extremely valuable for state agencies making recommendations to the legislature for possible updating of existing assumptions and criteria for granting eminent domain powers that are more suitable for the rapidly changing petroleum energy circumstances of today's world.

- 15. Questioning the Public Interest Value of Exporting Domestic Oil** - Is the value of this pipeline's use as a means for exporting domestic oil to foreign markets considered a public value or a private value just for corporate profit? The EIS should be a document that helps the public understand this project's role in this broader world energy and economic context? This is a critically important question for Minnesotans to be asking before placing the state's human and natural resources at risk. The EIS needs to explain these cost/benefit dynamics that play out on a global scale in plain language that the common person can understand. The EIS writers must be both willing and able to take on these challenging questions by employing special experts and accessing pertinent literature on the topic. There is growing evidence that large investors with both land and ocean-based crude and refined product storage capacity are taking advantage of low oil

prices and high production to accumulate these products in large quantities. The EIS should explore and explain to the public the economic principles of “contango” and “backwardation” on crude oil supplies, shipment and storage. These economic factors should be used to explain to the public what role the crude oil proposed to be transported by Sandpiper and Line 3 is likely to play in the global oil markets. Carefully weighing any public interest benefits from these market forces against the human and natural resource risks posed by these projects is one of the most important functions this EIS can provide.

16. **Coercive Influence of Potential Eminent Domain Powers** -The pending (but not yet granted) authority of eminent domain powers has allegedly been used by the applicant and its representatives to unfairly coerce reluctant landowners into signing easement agreements they might not otherwise have signed had these powers not existed or been misrepresented. This is a potentially harmful socio-economic and political impact of pipeline right-of-way procurement that is poorly understood and should be examined in the EIS. And an offshoot of this phenomenon is the fact that the applicant, once these easements were procured by this alleged land-owner duress then misrepresented the high percentage of landowner easement agreements as local “support” for the project. This percentage of local support represented this way is a powerful argument with the media, the general public and with elected officials who in turn use this information to put pressure on regulatory reviewers of the project and can inappropriately influence review and permitting outcomes. The EIS should include a discussion of the negative socio-economic implications of these activities including assessing the stress placed on family units and disturbance of community cohesion from these misuses and misrepresentation of eminent domain powers.
17. **Coercive Influence of Local Tax Windfalls** - Are the promises or prospects of major property and product tax revenues being unfairly or inappropriately used by the applicants to influence local units of government (counties) to support a project that has yet-to-be-determined risks for the human and natural environment? Are the long-term diminishing tax benefits being accurately represented in the record? These socio-economic factors should be addressed in the EIS in a way that clarifies how these tax revenues diminish over time. The EIS should also examine the negative impacts on community cohesiveness when local elected official in counties suffering from low employment and waning property tax revenues are enticed to impose undisclosed long-term risks to human and natural resources in their communities in return for jobs and revenues promised by the proposed projects.
18. **Adverse Impacts of Boom and Bust Employment on Hospitality Industry** -The socio-economic impact sections of the EIS should describe the economic trade-offs between temporary and permanent jobs, initial vs. long term tax revenue to local government units from pipeline construction and operation. Other socio-economic issues such as the adverse impacts of transient labor competing for lodging and restaurant space with tourists and possibly disrupting long-standing patterns of return visits that many tourist businesses like resorts rely on should be described.

Once quantified, the available methods for mitigating these temporarily disruptive impacts on local tourist and hospitality economies that can have long-term effects should be addressed in the EIS

19. **Combating Effects of Regulatory Capture** - Writers of the EIS need to be insulated from the pressures of “regulator capture” and “political hostage taking” tactics politicians have employed to adversely impact the accuracy of the EIS process. For decades, politicians have been waging an on-going pressure campaign on regulatory agencies by threatening budget priorities and threatening to alter agency authorities and launching investigations into individual agency employees seen as too aggressive in addressing issues involved with pipelines. The EIS writing team will need to take advantage of independent panels of experts, advisory panels and councils as provided for in Minnesota Statutes 116D to adequately insulate them from these political influences on all sides of the issues about to be addressed in the EIS. A special section of the EIS should be devoted to both describing the influence of the “regulatory capture” phenomenon as it relates to this particular project and the countermeasures employed by the responsible governmental units preparing the EIS documents. Failure to both disclose and appropriately address this issue in the EIS will, in and of itself, be a clear indication of the existence and powerful influence of the regulatory capture phenomenon.
20. How can the process used for writing this EIS utilize special measures designed to avoid the chilling effect of individual employee’s integrity being challenged by industry friendly legislators that we’ve read about in the newspapers lately? Again, the use of independent panels of experts provides both the reality and just as importantly the appearance of objectivity in the EIS preparation process.
21. If the EIS writers choose not to utilize independent panels of experts the EIS writers should include a discussion of what other special measures or steps were taken to guard the process from these obviously negative political influences?
22. What method of assessing probabilities of pipeline leaks or ruptures of different magnitudes? Will a historic performance review of existing pipelines in North America be used to develop spill/leak probabilities such as was used by the U.S. Environmental Protection Agency for the Pebble Mine in Bristol Bay Alaska mine pipeline system? Or will some other predictive model be used to project the number and magnitudes of pipeline leaks and spills be used? Or will both of these or other methods be used to prepare the risk assessment for this project? The EIS include a discussion of which method was chosen and why?
23. Do the existing breakout and storage tanks in the Enbridge system, especially those located at the Clearbrook pumping station have secondary containment structures with impervious liners? Will other proposed breakout or storage tanks associated with Sandpiper and Line 3 have secondary containment and impervious liners? There seems to be some discrepancy regarding the applicable rules for these storage features for pipelines which may only have to comply with federal containment

standards which do not require impervious liners. Minnesota petroleum storage tanks standards require impervious liners but it appears that petroleum storage tanks associated with pipelines are held to Federal Standards but not state standards. If this is so, will there be a risk assessment performed specifically on the storage tank component of the proposed pipeline system? And if so, will this be designed as a cumulative impact assessment of existing tanks (whether Enbridge or other ownership) at these locations?

24. Some protective coatings used on pipelines are sensitive to photo degradation, with these coatings being especially sensitive to ultra-violet light components of sunlight. With much of the pipe proposed for use in construction of the Sandpiper project being held in unprotected storage yards across Minnesota the EIS should disclose the nature of the coatings on this pipe and provide assessments of any states of deterioration predicted or existing for this stored pipe. A determination of suitability of this pipe for use should be made by independent experts having knowledge of and experience with this particular type of pipe and protective coatings used. If necessary, field data should be collected, analyzed and reported in the EIS to verify manufacturer specifications and actual condition of these pipes and pipe coatings.
25. EAW makes several unsupported assumptions, assertions or conclusions that should be revised to indicate the actual circumstances or impacts of certain activities. Specific examples include:
 - a. From P. 13 Project Description: *“The use of pipeyards would result in no impact to sensitive environmental features.”* This is an unsupported conclusion.
 - b. Contractor yards are indicated a needed impact assessments but above mentioned pipeyards seem to be exempted from review. Why?
 - c. From Section 6. Project Description | Page 30: *“Williston Basin production exceeds the currently available pipeline capacity, causing frequent periods where shippers are not able to transport the desired volumes of crude oil through the existing pipeline system. Instead, shippers have turned to other transportation modes, primarily rail, to transport Bakken crude oil to refineries in the Midwest and other areas The region, therefore, needs more oil pipeline capacity to reduce the use of trains and trucks for oil transport.”*

This assertion that pipeline can or will reduced oil shipment by rail is very much in dispute and should not be stated here as accepted fact. Instead a more detail analysis of the actual inter-relationships between rail and pipeline shipment of crude oil and the market factors that influence shipper choices should be developed in the EIS.
26. Additional Temporary Workspace description omits a certain category:

“Construction works space description and impacts may need to be revised to include discussion of expanded workspace widths needed when steep terrain

dictates construction of a terrace or a series of terraces necessary for creating the level ground needed for certain pipeline construction equipment and activities”

27. From 6. Project Description | Page 31: “*NDPC requested electric service for the SPP pump station at the Clearbrook West Terminal from Clearwater-Polk Electric, a distribution cooperative and member-owner of Minnkota Power Cooperative, Inc. Permitting and environmental review of the Minnkota Transmission Line Project will be conducted pursuant to Minn. Stat. Ch. 216E and Minn. R. Ch. 7850; therefore, the impacts of the Minnkota Transmission Line Project are not discussed further in this EAW.*”

Impacts of this component of the overall project cannot be scoped out of the EIS for the pipeline project. It is a feature that is project dependant and would not exist were it not for this project. Power demands for pipeline pumping stations can represent significant local electrical load demands that have important electricity distribution and infrastructure consequences system wide. Description of the impacts of this connected and cumulative action and its alternatives must be included in the EIS. Similarly, availability and impacts of electrical power supplies for any and all alternative routes must be included in the EIS.

28. EAW Section 8. Permits and approvals required:

- a. The granting of eminent domain powers to the applicant is a form of significant indirect financial assistance that should be described and explained in the EIS.
- b. Secondary containment for above ground petroleum storage tank permits in Table 8-1 on p. 35?

29. **Procedural History and Route Changes** – It is apparent that the applicant’s preferred route has evolved through a series of revisions in response to a wide variety of comments and inputs from numerous sources. These route revisions have resulted in minimization, mitigation or avoidance of a certain but as yet undocumented number and scale of potential adverse or undesirable impacts for this route. None of alternative routes suggested for consideration in the EIS have not had benefit of this detailed scrutiny and have not been similarly adjusted or refined. The alternative route comparison methodology must account for the obvious lack opportunity for alternative route refinements which could have made significant competitive improvements in these routes? Could specialized spatial analysis GIS programs for routing linear utilities be utilized to normalize and weight routing criterion to balance these inequities?

30. The draft scoping documents omit any mention of Watershed Restoration and Protection Plans in Section 9 on Land Use Plans. Comment letters from the MPCA and local planning units have pointed out that pipelines would be considered inconsistent with goals of WRAPS.

31. **Groundwater Resources Susceptible to Contamination** -The basic instructions in the EAW form in Section 10 on Geology, Soils and Topography instruct the RGU to disclose that the presence of shallow unconfined aquifers be identified with maps. Section 10 of the DEAW could be substantially improved with maps and tables showing locations where the proposed project would cross zones of groundwater resources highly susceptible to pollution from surface land use activities (See MPCA and Minnesota Health Department groundwater susceptibility maps). These maps are already available in the contested case hearing and public meeting records for this project. Special design or mitigation measures warranted by the projects planned crossing of susceptible unconfined groundwater aquifers should be included here. Several areas of unconfined sand aquifers are presently being used for agricultural irrigation but the Draft EAW seems to indicate this is not the case. This needs to be corrected. Susceptibility of groundwater resources along all alternative routes will need to be objectively compared to those along the preferred route.
32. It should be noted here that federal designation of High Consequence Areas (HCA's) may not be the appropriate data set for use in selecting as setting for worst case scenarios. For example, the Pinelands aquifer in Hubbard County does not seem to appear on the list of HCA's in the vicinity of the proposed Sandpiper/Line 3 route but this aquifer, far and away, would imperil more water resources and regional economic activities that most any other area should the aquifer become contaminated by spilled oil. The Pinelands aquifer vicinity should be considered a high priority setting for performing worst case scenario studies for the proposed pipeline routes.
33. In Section 3.1.2 on page 6 of the Draft Decision Document environmental criteria for evaluating alternative routes are listed. This list should include several iconic waters and recreational features along the proposed route including Itasca State Park, the Headwaters of the Mississippi River, the newly developed LaSalle Lake Recreation Area.
34. In Section 3.3.1 the railroad alternative is proposed based on the presumed project purpose of delivering crude oil to Superior Wisconsin. The project purpose destination has been and continues to be challenged as incorrect from the public interest perspective. This and all other alternative technologies evaluated in the EIS must be scoped to deliver the crude oil to pipeline hubs or refineries in the mid-continent area consistent with the public purpose of the proposed pipelines.
35. Section 4.4.1.10 on page 18 of the DSDD lists data sources for existing contaminated sites. This list does not include the pipeline company's records of anomalies and results from integrity digs in or along the existing pipeline corridors. The company may possess information not yet reported to regulatory sources for several reasons. This data set should be requested from the pipeline company for assessment of construction in contaminated soil area impacts as well as a means of assessing cumulative impacts of all past, present and reasonably foreseeable future

actions. These data will be useful in assessing pipeline abandonment as well as new pipeline construction impacts in the EIS.

36. **Inclusion of maps showing locations of wild rice lakes and high transparency lakes** here relative to locations of the proposed and alternative pipeline routes would be responsive to citizen input of concerns for assessing impacts on these high value water and waters that are Native American food resources. Also, for the EIS to only address water bodies *crossed* by the project eliminates from assessment many important and potentially impacted water bodies within one mile of the pipeline. The EAW form specifically requires inclusion of impaired or special designation waters within one mile of the project
37. **Assessing Impacts of Past and Present Pipeline Actions in Minnesota** - Pre-project site conditions needs to include extensive inventory and maps of known historic spill and leak sites that would potentially be disturbed by removal or abandonment of Line 3 and predictions of how many undiscovered leaks sites that may be encountered based on historical frequency of finding such sites when other abandoned pipelines have been removed, excavated or examined for other reasons. Relying on the MPCA's inventory of such sites alone ignores available data that company may have. These data should be shared with the RGU as disclosure of impacts from pre-site conditions that only the applicant or other data bases may have. Similar company data for Line 81 should be listed.

In assessing cumulative impacts of the proposed project, the EIS must add the impacts predicted from the currently proposed projects to all impacts of past and present pipeline projects to all reasonably foreseeable future actions in the same impacted regions.

38. **Frack Sand Mining Impacts in Minnesota** -North Dakota's shale oil field development relies on fracking to release the crude oil. Minnesota is a principle supplier of the special sand needed for this fracking activity and the mining of the sand has some serious potential for adverse human and natural resource impacts. Further expansion, acceleration or contraction of fracked oil wells in North Dakota may place greater or lesser demand on sand mining and transportation here in Minnesota. These impacts are related and/or connected actions of these pipeline projects that should be addressed in the EIS.
39. **Certain electrical power lines located in proximity to pipelines can have adverse impacts** on impressed current cathodic protection mechanisms. Whether by virtue of "stray voltage" or unintended induced electrical currents (they may be different physical phenomenon associated with pipelines) these effects can interfere with the cathodic protection in ways that accelerate corrosion leading to pipeline leaks and/or ruptures. Since the preferred route and possibly some of the alternative routes proposed for Sandpiper and Line 3 have electrical power lines including high voltage power lines in or along the proposed corridors this threat to pipeline corrosion protection should be fully explored and factored into pipeline failure risk

assessments performed in the EIS. The locations of known or suspected pipeline anomalies as well as the locations of historic record of leaks and ruptures along the entire Enbridge system should be evaluated for coincident location of power lines that may have been factors in the pipeline failures. Any past or presently planned corrective actions Enbridge has for addressing this power line/cathodic protection interaction should be requested from the company and described in the EIS.

Comparisons of alternative routes that might avoid or reduce exposure of cathodic protection systems deployed on the planned pipelines should be discussed in the EIS. Any mitigating measures or alternate corrosion protection technology that has been developed by the pipeline industry or others should be discussed in the EIS and the availability and appropriateness of applying these mitigation measures or alternate technologies should also be described in the EIS.

40. **Work Space** – Workspace needs for pipeline construction can vary significantly depending on soils, slopes water courses and other factors. Steep side slopes can be challenging for pipeline construction equipment requiring leveling of working spaces along either side of the line. Since the steeper topography along significant sections of the proposed route would require considerably wider work space than nearly all of the alternative routes being considered, the difference in average or site specific work space should be discussed in the EIS. The different work space demands of the alternative routes should relate to different levels of unavoidable adverse impacts of these routes.
41. **Induced Motorized Uses of Pipeline Rights of Way** - Pipeline rights of way, especially through forested regions present opportunities for motorized access, (whether authorized or not) into previously un-roaded forest, wetland and bog regions. Owner/operators of all terrain vehicles, off-road motor cycles and off road trucks are attracted to these new travel lanes for a variety of recreational purposes including joy riding, sight-seeing, hunting, camping mud-running and others. These pipeline rights of way often lead to secondary impacts to sensitive plant communities and valuable animal habitat from these motorized uses facilitated by the pipeline. Most of these uses are unauthorized but are very difficult to prevent because they take place in remote areas. The proposed pipeline route should be compared to the alternative routes insofar as their likelihood to present attractive opportunities for clandestine environmental damage from such motorized uses. Pipelines through agricultural lands where that may not be as attractive for such motorized vehicle abuse and where such abuses would be much more easily detected by landowners or passers by should be examined in the EIS.
42. Pipeline ruptures that result in sudden releases of large amount of crude oil have a certain sequence of events that are very important in determining the total volume of oil that escapes containment. Pipeline rupture response sequences at control and monitoring stations are not instantaneous even under ideal conditions. Shut down sequences for pump station engines, pipeline valve closings whether automatic or manual, shut-off valve spacing and drain-down times for oil stranded in the pipe on

either side of a rupture can vary depending on pipe size and down slope distances and all can factor into the ultimate quantity of spilled oil. Oil spill risk assessments and worst case scenarios developed in the EIS should be based on volumes of oil that take these operational shut-down and drain down sequences into account and provide a detailed discussion of what factors were considered, what assumptions were made and why those particular assumptions were used.

43. Loss of horizontal drilling mud referred to as frack-outs should be addressed. A separate risk assessment and worst case scenario for a frack-out incident should be included in the EIS. Constituents of fracking fluids and their impacts on stream, lake or wetland sites where should be evaluated.
44. Worst case spill/leak scenarios must be robust and dynamic enough to represent short and long term impacts of a wide variety of receptor targets in the human and natural environment. The nearby impacts as well as those at whatever distance downstream or down wind of the release site should be modeled. Winter and summer, high and low flow as well as under ice conditions should be developed. The scenarios must address the common and unique constituents of each of the types of crude oil proposed to be shipped in Sandpiper and Line 3. All phases of the different oils including the insoluble liquid and/or gas fractions, soluble liquid and gas fractions. Organic fractions including chemical and biological breakdown byproducts should be address. The model should be capable of addressing crude oil constituents at attenuate over time and those constituents like heavy metals that do not attenuate but can only be diluted. For non-attenuating constituents the model should be designed and run to predict the furthest downstream point at which these constituents can still pose threats, especially to downstream drinking water supplies. The Grand Forks/East Grand Forks waters supplies from the Red and Red Lake Rivers that may be most susceptible (by virtue of downstream distances and lack of alternate water supplies) should be considered a strong candidate for this particular modeling.

If any of the crude oil contain mercury in any form the consequences of mercury contamination and the potential acceleration or exacerbation of mercury methylation rates in the impacted waters should be examined. This would be especially important in marsh or bog type aquatic settings were high organic content and frequent anoxic conditions suitable for high rates of mercury methylation are most likely.

The fate of sulfur of various kinds should also be evaluated from at least two perspectives. Introducing additional sulfur into aquatic environments is known to facilitate higher rates of mercury methylation where sulfur can be the limiting factor on occurrence of certain chemosynthetic organisms associated with methylation. Minute increases in sulfur are associated with lower wild rice stand density and productivity. A spill scenario involving a high value wild rice lake such as Lower Rice Lake that involved a spill of a higher sulfur containing crude would be particularly useful in the EIS.

Appendix: The following is a print copy of oral comments made by Willis Mattison at an EIS Scoping meeting in Park Rapids, Minnesota on May 3, 2016. These comments are intended to add to and augment other written comments submitted to the Department of Commerce staff by email attachment on May 26, 2016

Oral Comments of Draft Scoping EAW for Sandpiper and Line 3 Pipeline EIS

1. From the outset, the Public Utilities Commission and the Department of Commerce have had an image issue with a public that already has a high degree of distrust for government in general. Environmental Impact Statements are science based documents that purposely structured to force project applicants, proponents, politicians and permitting agencies to take a HARD look at the down sides, even the dark sides of projects like pipelines. Having state agencies with no clear mission statement that includes protection of the human or natural environment is a stretch of credibility, bordering on a total disconnect for even a neutral observer in this process.
2. To avoid creating or fueling existing public cynicism and doubt agencies responsible for preparing the EIS must not only avoid actions that inappropriately bias the outcome of the decision making process but they must also take serious steps to avoid even the appearance of such bias.
3. PUC and DOC staff do not have extensive experience reviewing pipelines under the MEPA rules briefly identified during the introductory remarks at the opening of this meeting so it behooves your staff to carefully study the MEPA guidance documents provided by the EQB staff to avoid some of the well-known pitfalls for EIS writers. Some of the pitfalls the guidance documents warn about have serious consequences for the objectivity and adequacy of the EIS document, can threaten the entire process, and lead to an outcome that is unfair to citizens, the pipeline company, and anyone else who may have high expectations for certain benefits from this project.
4. On page 28 of the 2010 Guide to Minnesota Environmental Rules for preparing environmental impact statements EQB staff explain the rules for excluding project alternatives from inclusion in an EIS. Here, the EQB staff admonishes RGU's "*must not be overly restrictive in defining the project's purpose and need because the proponents will often claim nonessential elements as part of a projects purpose thus eliminating alternatives that should be included.*" In spite of this admonition by EQB staff DOC has chosen to adopt Enbridge's private project purpose statement from their permit application as the public purpose for this project. The company would much prefer that all alternative routes suggested by the public or other agencies and accepted for inclusion in the EIS must pass through Superior Wisconsin. Clearly, the only public need for this project is to ship Bakken Crude oil from North Dakota to pipeline hubs or refineries in the Midwest. And even this "public need" is theoretical or simply the project proposer's claimed need until this need is actually proven to regulators in the current EIS and the PUC's subsequent Certificate of Need process.

So, for environmental review document to be properly scoped Enbridge's preferred Sandpiper route should be viewed as just one of a number of alternative means or methods for meeting this theoretical or claimed public need. For the draft scoping document to adopt the company's corporate purpose as the project's public purpose prejudices the EIS. This narrower project purpose would eliminate from further consideration several so-called system alternatives including SA-04 and SA-05 that would meet the public need but fails to meet the applicant's corporate desire to cut costs. This narrow project purpose also would inappropriately if not illegally preclude from the EIS an alternative pipeline route that would follow a corridor currently being permitted for the Dakota Access pipeline.

This is precisely what the EQB guidance warns against, allowing a project's proponents to claim nonessential elements as part of a project's purpose in order to eliminate alternative routes that should be included in the EIS. Such prejudicial drafting of project purpose language in the current scoping document undermines the public's confidence that the EIS can be written with the necessary detached objectivity required by MEPA. This project purpose statement must be re-written to remove the prejudicial language from the draft scoping documents.

5. Under MEPA law and rules prejudicial Actions by project proposers are also prohibited. But Enbridge is allowed to publically and proudly brandish the fact that landowner easements are 95% complete and miles of pipe is already stockpiled along the company's preferred route casting doubt on the voracity and objectivity of the EIS process which is supposed to take a serious look at all reasonable alternatives. The draft scoping document should have had an explanation of factors leading the applicant to take such enormous financial risks in purchasing easements and pipes for their preferred route before all alternatives were examined including the No Action alternatives required by state law. DOC and PUC staff cannot ignore the public perception created by this multi-million dollar gamble by the company. Clearly, PUC and DOC staff must know the public is wondering what kind of industry friendly atmosphere Enbridge encountered early in this projects planning phase that would have given the company the kind of confidence it needed to take these high-stakes gambles? The EIS should contain some historical and regulatory documentation that could provide citizens the assurance that the MEPA provisions prohibiting such prejudicial and presumptive actions by the applicant from influencing any part of the project review process were fully and transparently understood by the agencies, were fully explained to the applicant and made abundantly clear to the public.

Early public meetings provide an opportunity to shape the environmental review for the project. This is your chance to propose alternative routes that should be studied in the environmental review. If you think there's a better route for a pipeline project, then propose your alternative.

Pipeline projects requiring a route permit can only be built on the route designated by the Commission, and a route can only be selected if it is considered at a public hearing. The permit applicant's proposed route is automatically accepted; however, an alternative can only be considered at the hearing if it is accepted by the Commission before the hearing is publicized. This insures that the public is informed of all route alternatives under consideration prior to the start of the hearing process.

Any person (meaning any individual, organization, government agency, and so on) can suggest an alternative route or route segment. An alternative route or route segment is a location other than the one proposed by the applicant; it must accomplish the project's stated need and purpose. In this instance, an *alternative route* would completely replace the applicant's proposed route. An *alternative route segment* would leave the proposed route to avoid a specific impact and then return to it – substituting for only a portion of the proposed route.

Tip for Suggesting an Alternative

Information is provided on the back side of this sheet to help you propose an alternative route or route segment. If you have any questions, don't hesitate to contact the Environmental Review Manager. Suggestions must meet the requirements found in Minnesota Rule 7852.1400, must be received by **Thursday, May 26, 2016**, and specifically identify the project.

The Life of Your Alternative: Step-by-Step

1. An applicant applies for a routing permit to construct a pipeline. This application includes a proposed route.
2. You suggest an alternative to all or a segment of the proposed route providing the required information within the appropriate timeframe.
3. The Commission determines if your alternative will be considered at the hearing.
4. The environmental impacts of your alternative – as well as the proposed route and other suggested alternatives – are analyzed and made publicly available prior to the hearing.
5. You are required to make a presentation at the hearing supporting your alternative.
6. The public, including the applicant, has the opportunity to comment on all alternatives.
7. An Administrative Law Judge prepares a report that includes recommendation on alternative routes.
8. If the routing permit is approved, the Commission's permit decision might include your suggested alternative.
9. If your alternative is included, the pipeline must be constructed in that location.

1. Provide a Map

Providing a map is not only helpful to highlight an anticipated impact or mark a suggested alternative — it is required (Minn. R. 7852.1400, subp. 3(A)). To be useful maps must be of proper scale. At the wrong scale, a map will not provide enough detail to assist in pinpointing an impact or alternative. For example, the line created by a felt tip marker on a state highway map can cover entire cities and highways.

Use a county, township or city map depending on your alternative. You can also use free online mapping resources such as Google Maps, Google Earth, or similar websites. These maps can be zoomed and printed to provide appropriate levels of detail. If you are having trouble locating a map at the proper scale, contact the Environmental Review Manager.

2. Suggest an Alternative Route or Route Segment

Explain the reasons for suggesting an alternative. You do not need to provide the same level of detail or analysis in your explanation(s) as the applicant provided; however, your explanation(s) must be able to stand independently so others do not need to “fill in the blanks” to understand it.

Your alternative must be accompanied by a description of the environmental conditions along it, and its anticipated environmental and human impact (Minn. R. 7852.1400, subp. 3(B)). Do your best. Your explanation must discuss: 1) an anticipated impact created by the proposed route; 2) your alternative route or route segment and its impacts; and 3) how your alternative route or route segment mitigates the anticipated impact you identified.

These individual parts, taken as a whole, generally provide the information needed to fully understand your suggestion, determine if the alternative meets the required criteria, and, ultimately, if it will be accepted by the Commission for inclusion in the public hearing. If more information is needed, you will be requested to provide that information and will have 10 days to respond that request (Minn. R. 7852.1400, subp. 4).

Remember, if accepted, you are expected to present your alternative at a public hearing (Minn. R. 7852.1400, subp. 1).

3. Submit the Suggestion on Time

Alternatives must be post-marked or received electronically by **Thursday, May 26, 2016** (Minn. R. 7852.1400, subp. 3(C)).

For help submitting an alternative route or route segment, or to ask questions, don't hesitate to contact the EERA Environmental Review Manager. This is the staff person most familiar with a project.

Jamie MacAlister, Environmental Review Manager
Energy Environmental Review and Analysis
Minnesota Department of Commerce
85 7th Place East, Suite 500
Saint Paul, MN 55101-2198

(651) 539-1775
jamie.macalister@state.mn.us

From: [johnny may](#)
To: [*COMM Pipeline Comments](#)
Subject: Scoping EIS comment for Sandpiper (13-473 & 13-474) and Line 3 Replacement (14-916 & 15-137)
Date: Thursday, May 05, 2016 11:30:10 AM

Dear Ms. MacAlister,

The safest way to transport the energy needs of our country are by new safe pipelines. I have many relatives in Michigan and I would never put them at risk. I have worked and visited Michigan many times. When I work in a state I spend a lot of money on rent food shopping entertainment fuel etc. Multiply that by hundreds or thousands of pipeline construction workers paying taxes in Michigan. The country needs the pipeline. Michigan needs the money. I need the good paying job. Win Win Win...

Sincerely,

johnny may
2301 Case Ford Rd
Heber Springs, AR 72543
mayjohnny17@yahoo.com

From: [Dan McCorry](#)
To: [*COMM Pipeline Comments](#)
Subject: Sandpiper and Line 3 EIS
Date: Tuesday, May 24, 2016 8:40:55 AM

It seems to me that letting the DOC be charge of the EIS for the Sandpiper and line 3 pipelines scoping is not in the best interest of the people of the state of MN. The DOC is charged with bringing new commerce to the state of MN. While a majority of the jobs will be temporary there will be unknown taxes for the counties. Enbridge is at the present trying to get their taxes in the state lowered.

I feel it would be better to have an impartial independent consultant in charge of the EIS. This should not be decided by the DOC or the PUC alone. It should be decided by all of the groups involved in the pipeline controversy.

Also please be sure to not let the DOC & Enbridge decide what is the best route. There were other routes submitted but I feel they were not given the proper unbiased review but a review that favored Enbridge not the people and environment of MN.

The siting of these pipelines should be in the best interest of the people and environment of MN not what a company wants or gives them the most profits.

Dan McCorry
eroldmil@live.com

From: [Mehrkens](#)
To: [*COMM Pipeline Comments](#)
Subject: Enbridge line 3 project comments
Date: Thursday, May 26, 2016 9:04:17 AM

To whom it may concern,

I am a landowner/farmer who has Enbridge pipeline running thru some of my property. Over the years, I have had a very good working relationship with Enbridge. Whenever work has been done by Enbridge on my property, I am always contacted before, the work is completed in a timely manner, and the land is restored as much as possible to its original state. If an issue ever occurred, Enbridge resolved it very quickly and in a friendly manner. Overall I have had nothing but good experiences with Enbridge.

Thank you.

Kyle Mehrkens
Thief River Falls, MN
Mehrkens@wiktel.com

Ingrid Kimball

From: K and K Trucking <kktrucking@outlook.com>
Sent: Thursday, May 26, 2016 3:10 PM
To: *COMM_Pipeline Comments
Subject: Pipeline Support

We at K & K & Trucking, have found working with the pipeline Oneok has been a very positive experience. They are always willing to work with us and were proud to have them as our customer. As a land owner they have always been informative and respectful of our property and accessing and providing information of happenings has always been appreciated.

Thanks,
Dayna Melvie
K & K Trucking, Inc.

From: [Kasy Meyers](#)
To: [*COMM Pipeline Comments](#)
Date: Tuesday, May 24, 2016 12:26:13 PM

Please do not pollute the Mississippi river with a gas pipeline. Inevitably there will be some sort of leak, there always is. This is not just our river but a source for many other states as well as home to much wildlife. Keep our river clean! Thank you -Kasy Meyers

Sent from my iPhone

Please provide your contact information. This information and your comments will be publicly available.

Name: CHARLES R. MILLER Phone: 218-259-0571
Street Address: 11780 HALL RD
City: GOODLAND State: MN ZIP: 55742
Email: chumiller@frontier.net

My comments pertain to:

- Sandpiper Pipeline Project
- Line 3 Replacement Project
- Both Projects

As a member of the Goodland Township board, our Township has the following concerns.

The currently used technology to detect leakage and spill analysis on oil pipelines is not good enough to detect the smallest leaks. Over time these small leaks can amount to large spills into the ground and ground water.

Therefore, the chaining or abandoning old pipelines is not adequate. These pipelines should be removed and any spills cleaned up.

As water is one of our most needed resources, it should be protected at all costs. Therefore, our water resources should not be endangered by the oil pipelines. Who pays and how is our water going to be cleaned up, when a spill happens?

The oil pipelines should be routed in an area that has few water resources.

The establishment of pipelines should be considered in the big picture. When looking to site a pipeline, it should be part of the big, long range plan. It should be considered as only a part of the whole plan. The whole plan needs to be address, not only the small part.

From: [Robert Miller](#)
To: [*COMM Pipeline Comments](#)
Subject: Scoping EIS comment for Sandpiper (13-473 & 13-474) and Line 3 Replacement (14-916 & 15-137)
Date: Friday, May 06, 2016 6:10:04 AM

Dear Ms. MacAlister,

My name is Robert Miller and I would like to take this opportunity to comment on my support for this project. This project will replace an existing and aging line that has been in place for around 50 years. I have been in the pipeline construction industry for over 30 years and I have seen firsthand the need for replacement of old lines. There is perhaps no more important thing that can be done to protect the environment and the people near these old lines than to vigilantly maintain and regularly replace aging infrastructure such as the one being discussed here. I have been involved in the replacement of several old lines and I know well and can assure of the thorough procedure for insuring the cleaning and safety of the old pipe before it is removed. It will then be replaced with new pipe that is much better than the original. Not only because it is new, but it is made with better materials and technology and more thorough testing to assure it's integrity than those that were available when the original pipe was manufactured. The work done on existing right-of-ways will naturally have very little impact due to the fact that these areas are already cleared and maintained. The work done to insure environmental integrity and safety during the construction process itself is quite extensive and frankly very impressive. From the separation and segregation of topsoil from subsoil, to the to the measures taken to protect not only flowing waters, but standing water as well. It is well known that there is no safer or more efficient way to transport products such as oil, natural gas, water, etc., than by pipeline. Beyond the limited environmental impact, there is something else that must be considered. That is the incredible positive economic impact that this project will have for the communities along the route as well as the counties, the state, and the nation as a whole. Not only will this project create good jobs for those who are employed directly to work on the pipeline itself, but it will also have a tremendously positive impact on local businesses such as lodging, grocers, restaurants, clothiers, etc. Every type of business along the route will see a tremendous increase in patronage which will create jobs and expand the tax base extending from the local to the national level. I have spoken to many local business people who have told me how thankful they are that we have come to their communities and in some cases, saved their business from collapse. There will be a large influx of skilled professional workers from all over the country that not only help to support the local economy, but the economies of their home areas due to the support they provide their families whom they must leave to do these types of construction projects. Local talent is always used as much as possible on these projects. But due to the highly skilled nature of many of the positions, most notably welders, they must often be sourced from other areas because there is rarely any available locally. I am a welder myself, and a member of Pipeliners Local Union #798. We are the most highly skilled group of professional pipeline constructors in the world. It is our utmost priority to see that every project we build is done to the highest level safety and durability as is possible. We want to take care of the land we cross as if it were our own. And we want to be confident that what we build is the best and safest it can possibly be. As pipeline constructors, we take the ultimate pride in leaving everything behind in better condition than we found it. I ask you to please approve this project, not only for the tremendously positive impact it will have, but to prevent the tragic environment that is probable by not replacing this aging line. Thank you for the opportunity to provide my input on this subject.

Sincerely,

Robert Miller
1967 Ruffed Grouse Rd
Valliant, OK 74764
robbie798@yahoo.com

Jamie MacAlister
Environmental Review Manager
Energy Environment Review and Analysis
MN Department of Commerce
85 7th Place East, Suite 500
St. Paul MN 55101



May 26, 2016

Line 3/Sandpiper Scoping Comments from MN350

Dear Ms MacAlister,

We the undersigned 171 citizens affiliated with MN350 and other organizations hereby contribute our comments to the scope of the Line 3 and Sandpiper pipelines. For clarification, the word "EIS" in the following document refers to both the Line 3 and Sandpiper pipeline EIS document.

STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION

Beverly Jones Heydinger Chair
Nancy Lange Commissioner
Dan Lipschultz Commissioner
Matt Schuerger Commissioner
John A. Tuma Commissioner

In the Matter of the Application of Enbridge Energy, Limited Partnership, for a
Certificate of Need for the Line 3 Replacement Project in Minnesota
From the North Dakota Border to the Wisconsin Border
OAH Docket 11-2500-32764
MPUC PL-9/CN-14-916

In the Matter of the Application Enbridge Energy, Limited Partnership, for a
Routing Permit for the Line 3 Replacement Project in Minnesota
From the North Dakota Border to the Wisconsin Border
OAH Docket 11-2500-32764
MPUC PL-9/PPL-15-137

In the Matter of the Application of North Dakota Pipeline Company LLC for a
Certificate of Need for the Sandpiper Pipeline Project in Minnesota
OAH Docket No. 8-2500-31259
PUC Docket No. PL-6668/CN-13-473

In the Matter of the Application of North Dakota Pipeline Company LLC for a Pipeline Routing
Permit for the Sandpiper Pipeline Project in Minnesota
OAH Docket No. 8-2500-31260
PUC Docket No. PL-6668 / PPL-13-474

Table of Contents:

1. The Private/Public Purpose of the Project
2. Overall EIS Process Questions
3. Narrow Unlimited Extraction argument in the DSDD
4. System Alternatives/ Alternative Routes
5. Alternative Technologies
6. Pipelines versus Rail Transportation of Oil
7. Pipeline versus Rail Safety of Transport
8. Climate Change must be considered throughout
9. Likelihood of additional “replacement” lines being placed in the same corridor
10. Minnesota’s choice of a corridor
11. Use of Line 3/Sandpiper oil by Minnesota refineries
12. Significant environmental impacts
 - a. Water Impacts
 - b. Wetland Impacts
 - c. Soils and Geology
 - d. Vegetation, Fish, Wildlife, and Threatened and Endangered Species.
 - e. Rights of Future Generations
 - f. Historical preservation
 - g. Socioeconomics
 - h. Environmental Justice/ Treaty Rights
 - i. Cultural Resources
 - j. Air Quality & Noise
 - k. Tourism
 - l. Climate Change Impacts
 - m. Weakness of Pipeline Federal Oversight Agency
 - n. Risk of Spills and Consequence Study
 - o. Spill Response Plans
 - p. Pipeline Integrity Issues
 - q. Construction Impacts
 - r. Landowner rights
 - s. Economics
 - t. Pipeline Abandonment Impacts
 - u. Overall Cumulative Impacts
 - v. Land Use
 - w. Health effects of crude oil exposure
 - x. Ethical decision

1) Private/Public Purpose of the Project

- a) The EIS must evaluate the true purpose of the project, and whether it is a private or a public purpose given the powers of eminent domain that are awarded if the company is awarded a certificate of need and route permit. The public purpose is to transport oil

from Western North Dakota or Alberta, Canada to refineries in the Chicago area and beyond, presumably to satisfy domestic consumer demand. One of the Minnesota Public Utilities criteria is to supply an adequate, reliable and efficient energy supply to the “applicant, applicant’s customers, or to the people of Minnesota and neighboring states”. The private purpose of the project is to transport crude oil from the Bakken formation in North Dakota or Alberta, Canada to the existing company owned terminals in Clearbrook, MN and Superior, Wisconsin.

- b) As the amount of oil coming into the Midwest from North Dakota and Alberta has increased, the EIS must analyze, via EIA data and other sources, what has happened to refinery utilization rates. As refinery utilization rates have changed, what has happened to US consumption? In other words, are Americans consuming additional refined products or are the products being exported?
- c) The EIS must examine why a private entity (the pipeline company) is being granted the powers of eminent domain. And if the crude oil is (or the refined products are) ultimately exported, is the pipeline’s use for exporting domestic and Canadian oil to foreign markets considered a public use or a private use for corporate profit?
- d) The applicant’s customers are also private entities- refineries and other processors of crude oil. The EIS must examine if their need to make a profit constitutes a public purpose. Likewise, is the delivery of oil to a refinery that exports a percentage of its refined products a private or a public good?

2) Overall EIS Process Questions

- a) The EIS process must incorporate an Expert Advisory Council as authorized by Minn. Stat. § 116D.03, subd. 2(2), which states that each state department and agency shall “utilize a systematic, interdisciplinary approach that will insure the integrated use of the natural and social sciences and the environmental arts in planning and in decision making which may have an impact on the environment; as an aid in accomplishing this purpose there shall be established advisory councils or other forums for consultation with persons in appropriate fields of specialization so as to ensure that the latest and most authoritative findings will be considered in administrative and regulatory decision making as quickly and as amply as possible.”
- b) The EIS must be a collaborative interagency process with full tribal participation as sovereign nations.
- c) The Memorandum of Understanding that exists between the Department of Commerce and the Minnesota DNR and PCA raises issues of grave concern with citizens, as it grants ultimate decision making to the DOC, without mention of how disputes or differing opinions among the agencies would be resolved. The selection of system alternatives for comparative analysis in the EIS, for example, is a decision where conflict has arisen in

the past. The EIS process must ensure PCA, the DNR and the tribes have an equal voice and decision making capabilities, as do the expert advisors mentioned above.

- d) The timeframe discussed in the EIS must match the expected life of the proposed Project. As some Enbridge pipelines are now 65 years old^[1], and still in operation, and the effects of carbon dioxide released into the atmosphere last thousands of years, a timeframe of at least 100 years must be used for the environmental scoping period.
- e) The EIS must have transparency in the analysis so that everyone can see the data and analysis methods and interested parties must have access to the work throughout the EIS process. Highly developed analysis methods must be used that cover the full scope of the impacts of the pipeline.
- f) A Request for Proposal process must be used to select the contractor for the EIS with full agency input.
- g) The EIS must consider connected and phased actions per Adm Rules 4410.2000 Subp 4 “Multiple projects and multiple stages of a single project that are connected actions or phased actions must be considered in total...multiple selections of future elements..” must be logical in relation to the design of the total system or network and must not be made merely to divide a large system into exempted segments.”
 - i) These pipelines are proposed to move oil from Western North Dakota (Sandpiper) or Canada (Line 3). Oil will move through those areas on pipelines into Minnesota and continue on through Chicago and beyond. Additional pipelines (or rail or barges) will be required to transport the oil across other states to get to these destinations. The pipelines in other downstream states are connected to these pipelines. Hence they are connected actions, according to the EQB Guide to Environmental Review rules. (pg 9)
 - ii) The EIS must consider the impact in adjoining states and be done in conjunction with the Wisconsin and Federal EIS. Routing pipelines through Superior has a potential impact on Lake Superior, and the St Croix National Scenic riverway. The section in Minnesota is but one piece of a much larger project and must be treated as such. The EIS must consider the other portions of these pipelines in MN, WI, ND or Canada as one project, “regardless of ownership or timing (parts 4410.1000 and 4410.2000, subparts 4)” (from the EQB Guide, pg 9).
- h) The EIS must consider the possibility that Line 3 and Sandpiper are also phased actions, according to EQB rules, if they are both installed in a new proposed corridor. (also see 4410.0200, subpart 60)
- i) By the EQB Guide, the EIS must consider the incremental effects of this project in addition to other projects “within the environmentally relevant area” that might “reasonably be expected to affect the same environmental resources”, including future projects actually planned or for which a basis of expectation has been laid, regardless of

what person undertakes the other projects or what jurisdictions have authority over the projects. The EIS must consider the cumulative potential effects of these pipelines and other projects in the area.

- j) On the Enbridge proposed route, these pipelines will go along side existing pipelines for hundreds of miles. For line 3, this means adding another pipeline to a corridor with seven existing pipelines north of Clearbrook. For both Sandpiper and Line 3 lines this means adding these lines along four Koch pipelines in another section. These cumulative potential effects must be considered in the EIS. The EIS also needs to consider corridor fatigue which is already acknowledged by Enbridge and the cumulative impact of these projects - the greater potential and likelihood of a spill when multiple lines are in place and the cumulative exposure to natural disasters, whether it is forest fires or earth movements.
- k) As Tom Watson has testified, another cumulative impact of these pipelines is the colocation of the pipelines with overhead high voltage transmission lines east of Park Rapids. The EIS must include The INGAA Foundation, Inc. Criteria for Pipelines Co-Existing with Electric Power Lines cites data that would put Enbridge's proposed route in the high risk category. This report was published in October of 2015.
- l) The EIS must also recognize these pipelines will have a cumulative effect on climate change. Expanding pipeline infrastructure represents a long term commitment to fossil fuels and burdening the public with both the expense of subsidizing and paying for the pipeline (through gas and oil prices) and additional crude oil tanks as well as living with the changes in climate induced by use of the pipeline infrastructure.
- m) The EIS must take into account the EQB Guide to Environmental Rules: "Directives that cumulative potential effects be analyzed in EAWs, EISs, and AUARs:
 - (1) Although it has long been the practice to include such impacts to some extent in review documents, the rules formerly did not explicitly include requirements to do so. The directives appear at rule parts 4410.1200, 4410.2300, item H,...which states: "Environmental, economic, employment, and sociological impacts: for the proposed project and each major alternative there shall be a thorough but succinct discussion of potentially significant adverse or beneficial effects generated, be they direct, indirect, or cumulative."

3) Narrow Unlimited Extraction argument in the Draft Scoping Decision Document (DSDD)

- a) The EIS must consider the market and economic factors at work on oil extraction rates beyond pipeline/rail availability. The DSDD states: "The No Action Alternative assumes transport of Bakken oil will continue by other means including, rail, interstate highways and other pipeline systems." (3.8 No Action Alternatives) This paragraph does not consider the range of oil extraction that might ensue if the world's oil production continues to exceed demand, depressing the price of oil, but only assumes the maximum level of oil that the proposed pipelines would carry will continue to be extracted. The EIS must also take the growing number of US and Alberta Canada oil

industry firm bankruptcies into account, and the availability or tightening of bank lines of credit on future oil extraction in the Western North Dakota and Alberta, Canada.

4) System Alternatives/ Alternatives Routes

- a) The EIS must highlight and adhere to the prohibitions in the Minnesota Environmental Policy Act. Chapter 116D.04 Subd.6. Prohibitions states “No state action significantly affecting the quality of the environment shall be allowed, nor shall any permit for natural resources management and development be granted, where such action or permit has caused or is likely to cause pollution, impairment, or destruction of the air, water, land or other natural resources located within the state, so long as there is a feasible and prudent alternative consistent with the reasonable requirements of the public health, safety, and welfare and the state's paramount concern for the protection of its air, water, land and other natural resources from pollution, impairment, or destruction. Economic considerations alone shall not justify such conduct.”
- b) Members of the public have submitted eight alternative routes thru Minnesota, which need to be analyzed in the EIS. Since the additional North Dakotan Bakken and Canadian tar sands oil that is proposed be transported on the Sandpiper pipeline is bound for states beyond Minnesota, the oil proposed to be transported in the Sandpiper/Line 3 pipelines does not need to go through Clearbrook or Superior.
- c) The EIS must contain a thorough environmental analysis of each alternative route, with content from the public and state agencies with environmental expertise, and must be the basis of any decision on pipeline routing, must these brand new pipelines be deemed by the PUC to be needed. System alternatives must be considered along with route alternatives. Alternatives SA-04 and SA-03 (without the spur) must be included at a very minimum. Protection of Minnesota’s remaining highest quality waters, air and environment, tribal rights and the public’s right to use and enjoy the commons are of utmost importance, even greater than Enbridge’s stated need to go through Clearbrook and Superior.
- d) The EIS must compare system route alternatives based on water bodies/drinking water sources crossed and construction impacts of temporary emergency access to spill or leak sites, or for routine maintenance integrity digs.
- e) The EIS must compare long term site cleanup and remediation differences between alternative routes through disturbed/alterd (agricultural or developed) regions of the state versus the undeveloped, undisturbed regions of the proposed route. Preparers of the EIS must evaluate that if cleanup and or remediation of leaks or spills in undeveloped regions would be more damaging to the environment than leaving the spilled product to degrade naturally over time, that that fact must be noted in the choice of the best route. When comparing the proposed route to alternative routes, preparers must consider the ease and low impacts of active remediation (land-farming) of spilled

oil with conventional farming practices along alternate routes through agricultural regions.

- f) In addition, the EIS must acknowledge the route favored by Enbridge has been fine tuned to go around areas where problems were found while no fine tuning was done on the alternative routes before they were compared to the one favored by Enbridge, in the previous flawed PUC/ALJ process. The prospect of fine tuning the proposed alternative routes must be considered and allowances made for these fine tunings when considering these system and route alternatives.
- g) Should an expansion of the Calumet refinery in Superior, WI be an alleged reason for the need for this pipeline to go through Superior, the EIS must note such a claim was made prior to the Alberta Clipper construction^[34], but there was no major refinery expansion.
- h) The EIS must independently evaluate whether Enbridge's claim that it cannot rebuild Line 3 in its present location is accurate. The environmental impact of rebuilding in place must be evaluated against rebuilding in any new corridor. Rebuilding in place would also allow for discovery and removal of oil soaked soil underneath the pipeline. The environmental impact of cleaning up this oil must be considered in the EIS.
- i) Line 3 could be routed in Canada to their East or West Coast, depending on whether it is for export, or use in the Canadian St Lawrence Seaway refineries.
- j) The EIS must analyze whether Line 3 could be routed through Clearbrook, then down the MPL pipeline corridor to the Twin Cities and then utilize the current idled Wood River pipeline. This would involve negotiations with the Minnesota Pipeline Company, but apparently some agreement was worked out to share the MPL pipeline corridor to Park Rapids.
- k) The EIS must fully consider the No Build option. The world's scientific community has pointed out emphatically and repeatedly the utmost importance of moving as rapidly as possible from the use of fossil fuels, in order to minimize further climate change impacts. Last year, the CEO of BP in their World Energy Outlook 2035, wrote "That brings us to the environmental challenge... The most likely path for carbon emissions, despite current government policies and intentions, does not appear sustainable."
- l) The EIS must analyze the impact of further climate change impact, over the assumed lifetime of this new pipeline (50-65 years) and the societal economic cost of responding to weather related disasters.
- m) The EIS must evaluate transportation alternatives that are in place or being developed, such as mass transit systems, driverless cars, natural gas vehicles, electric vehicles as well as hybrids.

5) Alternative Technologies

- a) The railcar discussion in the DSDD calculates the number of railcars as if the oil quantity to be moved would be at the pipeline maximum amount. The EIS must include other

factors that affect oil extraction, and hence transportation, such as oversupply of oil worldwide, price volatility, bankruptcies, the Dakota Access pipeline under construction and oil companies' shrinking access to lines of credit.

- b) NDPC figures cited in the DSDD on the number of railcars must be independently verified in the EIS. In particular, the ability of Canadian heavy crude to be moved by rail with much less or no diluent (versus pipeline, i.e. railbit) must be considered, significantly affecting quantities and hence reducing the price of shipping and volume by rail.
- c) Also, as noted, the EIS must consider availability of other pipelines to ship oil that will affect oil quantity on these pipelines.
- d) The EIS must consider the ability of pipeline companies to restrict the Reid Vapour Pressure on pipelines via the FERC tariff system, as this has the potential to direct the highest volatile oil onto the rail system. The Enbridge FERC Tariff FERC ICA Oil Tariff, FERC No 41.10.0, found on the Federal Energy Regulatory Commission (FERC) website, www.ferc.gov must be used as a reference.
- e) The EIS must consider the information cited in the Star Tribune that Northern Tier refinery has announced plans to maximize use of North Dakotan oil and has stated they are using trucks to bring in the oil as they have found certain wells are ideal for their refinery.^[33] They also use Line 81, Line 4 or Line 67 oil for their feedstock. The EIS must consider the free market choice used by refineries and shippers in selecting a mode of transportation for their feedstock, regardless of any assumed safety record of one mode or another.

6) Pipelines versus Rail Transportation of Oil

- a) As noted above, the EIS must note shippers operating in a free market have discovered both options (rail and pipeline) and neither one will go away despite safety concerns all around. The Koch Refinery (Flint Hills) has said "oil by rail is here to stay" in a FERC filing. The EIS must recognize rail transport of oil will continue to exist alongside pipelines.
- b) The EIS must consider most crude oil by rail is bound for the East and West Coast, or to barge loading locations where there are no pipelines.
- c) The EIS must note oil by rail is more flexible and faster (4 days to the Gulf Coast versus 25-40 by pipe).
- d) Even Enbridge operates a oil by rail loading facility in North Dakota.
- e) The EIS must acknowledge oil by rail doesn't require long term "take-or pay" contracts like Sandpiper requires. The EIS must analyze the numerous restrictions to ship by pipeline, as listed in the FERC Oil Tariff NO 41.10.0. as a potential deterrent for some shippers to ship by pipeline.
- f) The EIS must acknowledge there are at least 13 rail unloading terminals that have been built on the East Coast at hundreds of millions of dollars each. Facilities exist on the

West Coast. The EIS must examine the likelihood these facilities will be abandoned or underutilized.

- g) The EIS must acknowledge oil transported by rail is built-in storage; once loaded it does not have to be unloaded and reloaded at every major pipeline hub, as oil by pipeline does. When the oil storage facilities are operating at near full capacity, lack of availability and cost of storage is an issue for pipeline transport.
- h) The EIS must acknowledge heavy tar sands oil from Canada can be shipped on rail with far less diluent than the 20-30% dilution required on pipeline. Diluent is expensive and not readily available in Canada. Using less diluent would be a cost savings to shippers using rail.
- i) The EIS must acknowledge oil by rail delivers exactly what was shipped and is not contaminated by intermixing with other oils in pipeline storage tanks and on pipelines.
- j) The EIS must acknowledge Enbridge's lawyers have repeatedly stated before the PUC that Sandpiper will not reduce rail traffic.
- k) The EIS must acknowledge the rail congestion experienced in the winter of 2013 has not reoccurred and the likelihood of its reoccurrence been greatly reduced by significant BNSF capital improvements, and reduced shipments of coal, iron ore pellets and other consumer goods.
- l) The EIS must analyze the economic interest the railroads have in continuing to attract oil by rail shipments, and the likelihood that this will be a factor in maintaining an oil by rail presence in the Minnesota.

7) Pipelines versus Rail Safety considerations

- a) The EIS must independently document the problems associated with transport by rail or pipelines, instead of just repeating pipeline industry talking point that pipelines are safer than rail. It must also address the root problem of how to make the Bakken crude oil less volatile and acknowledge the diluents used to thin Canadian heavy oil are also very volatile.
- b) The EIS must acknowledge railroads routinely transport extremely hazardous materials, including very volatile petroleum products like propane, gasoline, nuclear waste and ethanol.
- c) The EIS must address how to most effectively reduce the volatility of crude oil where they are extracted, and analyze the restrictions other states, like Texas, have put in place to restrict the volatility of oil by rail or pipeline.
- d) As railroad crew sizes have been cut back to one person per unit train (Lac Megantic) and track maintenance has been deferred, rail incidents have gone up. The Kalamazoo pipeline incident was also deferred maintenance by Enbridge. The profit driven motive of any industry to defer maintenance must be included in the EIS.
- e) The EIS must note deaths from pipelines related incidents have occurred in Minnesota, such as the fiery death of two Enbridge employees in Clearbrook in 2007 and the death

of a man in the Crookston pumping station in Nov of 2009. Although the fiery rail explosions have received much attention, there is far less public visibility of deaths and injuries that have occurred due to pipeline related incidents.

- f) Pipelines companies have the capability to restrict the volatility of oil they accept. The EIS must include the FERC Tariff filing referenced above with the summer volatility restrictions and note since railroads do not restrict volatility, this could force the highest volatility oil onto rail transport.
- g) The EIS must consider the various factors (amount of oil spilled, potential loss of human life, maintenance as a factor, etc) in analyzing the safety of oil by rail versus pipeline, such as noted in the following article:

<http://thinkprogress.org/climate/2015/02/18/3624116/how-would-you-like-your-oil-spilled-today-sir/> PHMSA data details “U.S. pipelines spilled three times as much crude oil as trains over that eight-year period [2004-2012].”

8) Climate Change must be considered throughout the EIS

- a) The EIS must consider the growing number of studies in which economists have examined the use of policies aimed at reducing CO2 emissions by limiting the supply of fossil fuels. Supply-side policies include limiting exploration, extraction, and delivery infrastructure as a way to address climate change goals. Building additional pipeline infrastructure could impede society’s ability to reduce CO2 emissions. References include
 - i) Lazarus, M., P. Erickson, K. Tempest, "Supply-side climate policy: the road less taken," Stockholm Environment Institute, Working Paper 2015-13, October 2015.2) This article notes: “A key insight driving these new approaches is that the political and economic interests and institutions that underpin fossil fuel production help to perpetuate fossil fuel use, and even to increase it. From this emerging vantage point, continued investment in fossil fuel exploration, extraction, and delivery infrastructure makes global climate protection objectives much harder to achieve, and must therefore be handled with care and, in many cases, reduced or avoided.”
 - ii) Auffhammer, M. "It just doesn't add up. Why I think not building Keystone XL will likely leave a billion barrels worth of bitumin in the ground," Energy Institute at Haas, 2014, <https://energyathaas.wordpress.com/2014/03/24/it-just-doesnt-add-up-why-i-think-not-building-keystone-xl-will-likely-leave-a-billion-barrels-worth-of-bitumen-in-the-ground/>
 - iii) Erickson, P. and M. Lazarus, "Impact of the Keystone XL pipeline on global oil markets and greenhouse gas emissions," Nature Climate Change, Published online: 10 August 2014. DOI: 10.1038/NCLIMATE2335.
- b) The EIS must take account of the possibility that increasingly stringent climate policies (including carbon prices or limits on carbon emissions) will cause the owners of coal, oil,

and natural gas to accelerate production. Construction of infrastructure that makes faster extraction possible only encourages "green paradox" behavior.

- i) Sinn, H.-W., "Public policies against global warming: a supply-side approach," *International Tax and Public Finance*, 15 (2008), 360–94. DOI:10.1007/s10797-008-9082-z.
 - ii) Sinn, H.-W., *The Green Paradox: A Supply-Side Approach to Global Warming*, (Cambridge, MA: MIT Press, 2012). <https://mitpress.mit.edu/books/green-paradox>.
 - iii) Sinn, H.-W., "The Green Paradox: A Supply-Side View of the Climate Problem," CESifo Working Paper No. 5385, 2015, Ifo Institute, Center for Economic Studies, Munich, Germany. https://www.cesifo-group.de/ifoHome/publications/working-papers/CESifoWP/CESifoWPdetails?wp_id=19160937.
- c) The EIS must note U.S. President Obama denied the Keystone XL pipeline, connecting Canadian oil sands with U.S. refineries and ports, after noting he would approve it only if it "does not significantly exacerbate the problem of carbon pollution" (The White House 2013).
 - d) The EIS must consider the number of companies that have reduced their involvement in the Canadian tar sands oil fields. "The 2°C scenario highlights the fact that a part of the world's fossil fuel resources cannot be developed. Total's growth strategy takes this into account In today's challenging production environment, we are prioritizing our projects and focusing on moderately priced production and processing last assets that meet the highest environmental and safety standards. On that basis, in 2015 we decided to reduce our exposure in Canada's oil sands, which are particularly expensive to develop and operate. We also confirmed that we do not conduct oil exploration or production operations in the Arctic ice pack."
 - e) The EIS must consider the changing public perspective on addressing climate change. <http://thehill.com/policy/energy-environment/277259-climate-deniers-its-time-to-stop-denying>

9) Likelihood of additional "replacement" lines being placed in the same corridor

- a) Since Lines 1 and 2 are older than Line 3, their age and likely replacement must also be considered in the EIS if a new route is ultimately chosen in Minnesota. The EIS must consider the cumulative effect of their placement in the same corridor as Sandpiper/Line 3. The cumulative effect of a Line 4 replacement must also be discussed in the EIS as this pipeline has been running at reduced pressure for many years. As discussed above in the section on the EIS process, phased and cumulative effects must be included in a robust EIS.

10) Minnesota's choice of a corridor

- a) The EIS must evaluate the State of Minnesota's preferred path for a crude oil pipeline corridor, should one be deemed necessary, with full agency, tribal and stakeholder involvement.
- b) The EIS must include whether our state agencies have the right to decline a route if the route is a poor choice for Minnesota.
- c) What has the state learned from the existing corridor regarding spill clean-up, accessibility to the lines without environmental damage, end of pipeline life costs, environmental fragility? If the area is so fragile that future disturbance (leaks, routine integrity digs, reburial, ultimate removal) does more damage than simply leaving a mess in place, the EIS must evaluate whether or not a new pipeline corridor should be built in a similar environment.
- d) To minimize environmental damage, the EIS must evaluate accessibility to the pipelines as a factor in the swift removal and cleanup of leaks.
- e) The EIS must acknowledge the regions of the most permeable soil, the most fragile and cleanest waters, and the wild rice beds in Minnesota, and analyze the advisability of establishing a new pipeline corridor in those locations, given our existing MEPA law.

11) Use of Line 3/Sandpiper oil by Minnesota refineries

- a) The EIS must independently analyze whether the oil transported in Line 3 has been used significantly by Minnesota refineries. In particular, the EIS must note Enbridge documents attributing the normal allocation of the "Pine Bend Special" heavy oil to lines 4 and 67, indicating Line 3 is not a main supplier of Minnesota refineries.^[32] The Competitive Toll Agreement, found on Enbridge's Web site, lists the type of oils typically found on each pipeline.
- b) The Energy Information Agency publishes detailed information of the quantity and types of oil used by each refinery, so this information would be available to the agency performing the EIS.

12) Significant Environmental Impacts

- a) Water Impacts
 - i) The EIS must include the information found in the National Academy of Sciences Dilbit Study downloadable [here](#). Some key points are:
 - (1) In comparison to other commonly transported crude oils, many of the chemical and physical properties of diluted bitumen, especially those relevant to environmental impacts, are found to differ substantially from those of the other crude oils. The key differences are in the exceptionally high density, viscosity,

and adhesion properties of the bitumen component of the diluted bitumen that dictate environmental behavior as the crude oil is subjected to weathering (a term that refers to physical and chemical changes of spilled oil).

- (2) Spills of diluted bitumen into a body of water initially float and spread while evaporation of volatile compounds may present health and explosion hazards, as occurs with nearly all crude oils. It is the subsequent weathering effects, unique to diluted bitumen, that merit special response strategies and tactics . . . In cases where traditional removal or containment techniques are not immediately successful, the possibility of submerged and sunken oil increases. This situation is highly problematic for spill response because 1) there are few effective techniques for detection, containment, and recovery of oil that is submerged in the water column, and 2) available techniques for responding to oil that has sunken to the bottom have variable effectiveness depending on the spill conditions.
 - (3) The majority of the properties and outcomes that differ from commonly transported crudes are associated not with freshly spilled diluted bitumen, but with the weathering products that form within days after a spill. Given these greater levels of concern for weathered diluted bitumen, spills of diluted bitumen must elicit unique, immediate actions in response.
 - (4) Broadly, regulations and agency practices do not take the unique properties of diluted bitumen into account, nor do they encourage effective planning for spills of diluted bitumen.
 - (5) In light of the aforementioned analysis, comparisons, and review of the regulations, it is clear that the differences in the chemical and physical properties relevant to environmental impact warrant modifications to the regulations governing diluted bitumen spill response plans, preparedness, and cleanup.
 - (6) In recent years, many of America's worst oil spills have involved tar sands oil. In 2010, more than 800,000 gallons of tar sands oil was spilled into the Kalamazoo River in Michigan, resulting in immediate negative health impacts for nearby residents, sunken oil, and an ongoing remediation effort that continues to locate sunken oil more than five years later. All told, the cost of cleanup has exceeded \$1 billion and long-term contamination of the river is expected due to the difficulty of removing the sunken. There was also a tar sands spill in Mayflower, AK in April of 2013, where "but volatile organic compounds (VOCs) of up to 29 parts per million (ppm) on the day of the spill" were reported according to this NAS report.
- ii) The EIS must include an analysis of water impacts and the Project's full compliance with the Clean Water Act and the new Clean Water Rule. The surface watersheds, rivers, streams which the pipeline route potentially crosses or is in proximity to must be enumerated, with a baseline analysis of their current water quality (including aquatic life) noted. The quality of these waters must be discussed relative to the overall water quality in the state. Recreational uses of these waters, such as fishing and swimming quality and populations that depend on these attributes must be

enumerated. The social and economic cost of impairment of these uses must be discussed. The Project's proximity to drinking water intakes, and the number of people who depend on these water bodies for their drinking water source must be noted.

- iii) The EIS must consider the percentage of the world's and the USA's fresh water held in the Great Lakes and the impact of increased tar sands refining, or tar sands shipping on those lakes. Impacts on water use by refineries, and increased discharge of pollutants into the lakes must all be considered. Localized air pollution (sulfur dioxide, carbon monoxide, heavy metals) and other health risks of increased refining of tar sands, including airborne petcoke, also need to be considered. Lake Superior's slow refresh rate in the event of a spill must also be considered.
- iv) The EIS must clearly evaluate (through text and maps) the links between the proposed pipeline, underground aquifers, and distance from the Project to groundwater sources. There must be a baseline analysis done of the current state of these underground aquifers. The numbers of people and animals who depend on these aquifers for their drinking water must be noted.
- v) The EIS must evaluate the potential for water degradation due to hydrostatic testing, and for soil disturbance, topsoil removal and erosion resulting from pipeline construction and persisting until vegetation grows back must also be considered. The EIS must analyze the movement of aquatic invasive species and polluted water between major watersheds caused by hydrostatic testing of pipelines due to water being gathered at one point and discharged at another.
- vi) The impact of a major spill of crude oil, containing benzene (water-soluble carcinogen) must be considered in an EIS. John Stansbury of the University of Nebraska adapted his modeling study done for Keystone XL^[2] to a Minnesota scenario, and found that a benzene plume that exceeded EPA allowable levels for drinking water would exist for 280 miles if a large crude oil spill (150,000 barrels) occurs in the Mississippi.
- vii) The EIS must include an analysis of the proposed Project's potential impacts on water resources during periods of extended drought and record heat, especially during periods of hydrostatic testing.
- viii) The proposed Project must be evaluated in light of the increased risk of damage due to heavy flooding events and related waterbody scouring at waterbody crossing locations.
- ix) The EIS must include provisions for protecting surface water bodies at crossing points and along the entire route of the proposed pipeline. The impact of clearing the rights of way of woody shrubs and trees with loss of their ability to control erosion of the river banks must be considered.
- x) Previous Enbridge violations of rules for the discharge of contaminated water used in hydrostatic pressure testing of pipelines, such as occurred during the original Alberta Clipper installation and the Line 6B (Michigan) replacement, must be cited in the EIS and independent monitoring must be proposed to try to ensure such violations do not re-occur. In 2013, Enbridge paid a \$425,000 fine to avoid litigation over 15

discharges in 2010 which violated its discharge permit, including one that flowed into the Mississippi. “The reason that it’s concerning, I’d say, is the sheer number of violations,” said Kevin Reuther, legal director of St. Paul-based Minnesota Center for Environmental Advocacy...“It’s as if Enbridge wasn’t even trying to comply with its water discharge permit ... that it’s cheaper to cause whatever environmental damage they want and pay a fine later.”^[3] Also in 2013, a similar incident was discovered during Line 6B replacement in Michigan, when self-reporting by Enbridge of violations did not occur.^[4]

- xi) The environmental impact of underwater frac-outs while drilling under water bodies must be quantified and considered in the EIS. Additives used in the drilling must be disclosed so the impact on aquatic life can be assessed. This topic was extensively covered in Paul Stolen’s direct testimony in the Sandpiper docket at the PUC.^[5] Winter construction of pipelines needs to be evaluated against the environmental consequence of potential underwater body frac-outs, seen or unseen, that cannot be cleaned up due to surface ice.
- xii) The EIS must consider the United States Geological Survey and scientists from Virginia Tech have discovered elevated rates of arsenic in the underground aquifer at the world National Crude Oil Spill Fate and Natural Attenuation Research Site near Bemidji, Minnesota. They found “potentially significant arsenic groundwater contamination... Carefully measured samples from the field reveal that arsenic concentrations in the hydrocarbon plume can reach 230 micrograms per liter — 23 times the current drinking water standard of 10 micrograms per liter.”^[6] The potential for exacerbation of this problem must be analyzed.
- xiii) The EIS must evaluate the impacts of process water demand for oil sands mining in Canada (four to six barrels of water to produce one barrel of oil sands) and contamination of that water.
- xiv) Specific project requirements (especially drilling techniques) must be implemented for the protection of the Mississippi, (and rivers feeding into it), the Red River, the St Louis River, the Straight river and any Wild and Scenic Rivers and their related tributaries/upstream segments, flood plains, LaSalle Lake and other sensitive resources.
- xv) Once significant amounts of oil get into water, no company can clean it all up. There is no “away”. Polluted water flows through the watershed to a river and then to an ocean. The EIS must acknowledge the limits to effective remediation of major oil spills and attempt to qualitatively and quantitatively assess the lasting financial, ecological and cultural costs of major oil spills of crude oil of all types.
- xvi) The EIS needs to consider the comments from Bob Merritt, who lives near Hackensack, MN: “My main issue has been that the groundwater and groundwater-surface water interactions have been totally ignored. I had specialized training in that realm. Groundwater and surface water interchange constantly. A lake or stream can receive groundwater in one location while feeding (recharging) the groundwater in another location of the same source. The ground is where the pipes are to be placed; out of sight, out, of mind. But even a 1% leak can cause a major

catastrophe, particularly in glacial outwash plains that dot the proposed alignment. The Straight River area is particularly susceptible because of the major irrigation wells that pump from 50 to 100 million gallons per day. The attenuation model Enbridge and DOC espouse is not relevant in this type of situation. There are at least 31 high capacity irrigation wells in 1/2 mile of the pipeline alignment in the Straight River basin (we usually consider 1 mile radius) that will completely alter a small leak, mixing it within the water column and distributing the product on the aquifer materials. The oil is also sprayed onto the highly permeable soils, moving it down gradient towards the Straight River, RDO's processing wells and Park Rapids wells. The "natural attenuation process" never gets started because of the major irrigation. Line 3 will contain significant heavy metals such as arsenic, bromide, cadmium, cyanide, lead, mercury, nickel and radium. These toxic chemicals are concentrated under the attenuation model and cannot be treated. They remain in the groundwater and surface water environments. The Straight River basin was recently named a groundwater management area. They are studying it closely and we have major studies going back to the 70's which DOC completely ignored. We have major studies of that area going back to the 70's. USGS and DNR hydrologists and hydrogeologists who completed studies in the 80's are still on staff. Their expertise cannot be supplanted by some consultant in some office outside of the area. Enbridge employed Barr Engineering (Ray Wuolo) to debunk the map and tried to piggyback the USGS Bemidji study site to show that attenuation will fix the problem. I can show by the USGS statements and hydrogeology that the studies at the Bemidji site (where the natural attenuation model was developed) does not apply to the Straight River Basin. The new DOC environmental director was with Barr during their consulting contract to Enbridge. How can he be impartial?"

xvii) In Kim Chapman's Direct testimony in the Sandpiper docket he indicates water impacts in the EIS must include hazardous floodplains; important aquifers; drinking water; and readily contaminated locations.

b) Wetland Impacts

- i) The environmental value of wetlands in their respective watersheds must be discussed in the EIS, and all wetlands along the various proposed routes must be listed, along with the overall miles of wetlands on the proposed routes. Potential adverse impacts on wetlands functions must be discussed in relationship to the water bodies they help purify.
- ii) The proposed areas of construction zones and rights-of-way for wetland crossings must be identified and the environmental consequence of construction on the specific wetlands along the proposed routes must be discussed in the EIS.
- iii) A thorough conceptual wetland monitoring plan, including prairie pothole and bottomland hardwood forested wetlands must be developed for all affected wetlands along the route in the EIS. Detailed information about which wetland areas would be

revegetated, and which wetland areas are considered of “special concern and value” must be included.

- iv) The EIS must request equal wetland mitigation commitments for connected actions, including additional proposed pipelines, and follow the Clean Water Act and the new Clean Water Rule.
 - v) In the original Alberta Clipper docket, 07-465, Enbridge e-filed a Fen Management Plan on November 18, 2009, which included on page 37 a proposed monitoring program over five years for hydrology and over ten years for vegetation, with results provided to the Minnesota Department of Resources (DNR). The cover letter e-filed with this plan indicates that the DNR approved the Fen Management Plan on November 13, 2009. Compliance or non-compliance with this plan must be analyzed in the EIS. The Illinois DNR has documented fen damage caused by pipeline construction.^[7]
 - vi) Any change in flow of water because of the project in the respective wetlands within the watershed, or in or out of the watershed must be noted in the EIS.
 - vii) The EIS must include the findings from the FINAL RESTORATION PLAN AND ENVIRONMENTAL ASSESSMENT FOR THE JULY 4, 2002
(1) ENBRIDGE ENERGY, LIMITED PARTNERSHIP OIL SPILL NEAR COHASSET, MINNESOTA, dated Nov 2005 regarding the impacts of a medium spill near Cohasset, MN on an existing wetland. The USFW, DNR, PCA, Leech Lake and Enbridge coauthored this report indicating permanent damage to a wetland.
 - viii) The EIS must include the importance of wetlands to tribal communities because they nurture many critical resources. As stated in the Restoration plan and environmental assessment for the Cohasset spill, “The entire subsistence cycle of hunting, fishing, and gathering depends upon the region’s water system, which itself is intricately connected to the region’s vast wetland resources. Traditional knowledge recognize that these wetlands are not only vessels of life for a vast array of plant and animals, but are an integral part of the traditional life.”^[8]
- c) Soils and Geology
- i) The EIS must fully consider how the following soil-related conditions impact or are impacted by pipeline construction and operation: drought, increased soil temperatures over the pipeline, permeable soil, increased risk of soil subsidence and instability, high water tables, wetlands and difficulty of revegetating the pipeline right-of-way in drought conditions.
 - ii) The EIS must discuss the relative merit of building a pipeline in various types of soils, and the environmental consequences of each. The proposed route is over very permeable soils, glacial outwash plains and many wetlands.
 - iii) The EIS must address the likelihood of pipeline frost heaves, and resurfacing of the pipelines due to any other force. The environmental and human impact of exposed

- pipelines must be discussed in the EIS as this is an unresolved issue and irritant to landowners on current pipeline routes.
- iv) The EIS must examine the risk of seismic activity in the area of the proposed Sandpiper/ Line 3 routes
 - v) Kim Chapman's Direct testimony in the Sandpiper docket indicated the following topics must be considered in the EIS: erodible slopes, steep contours, landslide hazard, geological surveys, special interest surface features, permeable soils, erodible soils, hydric soils, and prime agricultural soils
- d) Vegetation, Fish, Wildlife, and Threatened and Endangered Species
- i) The EIS must assess the project's impact on wild rice lakes. Paul Stolen's direct testimony in the Sandpiper certificate of need docket cites wildlife concerns need to be addressed over a ten mile impact zone.
 - ii) As part of the proposed Project, Enbridge must commit to native seed mixes at the time of reclamation, replanting trees in "temporary" cleared forest acreage and to inspect all disturbed areas after the first growing season to determine revegetation success and to perform noxious weed and invasive species control.
 - iii) The Department must work with appropriate international, federal, and state agencies, and tribes to develop plans and procedures necessary to comply with the Endangered Species Act (ESA). Minnesota is home to the Canadian lynx, the gray wolf, the Poweshiek skipperling, Dakota Skipper, and the Northern long-eared bat which are on the endangered species list, as well as the Bald eagle, which has been on the list in the past. Nesting areas must be considered. We also value our disappearing moose population, common loons, pollinators, the Monarch butterfly, warblers and red-shouldered hawks, which are diminishing in numbers. Thirty rare bird species are endangered or of special concern in Minnesota. Loss of habitat means diminished populations.^[9] Permanent and temporary forest loss due to Sandpiper/Line 3 construction will be over 2000 acres, per Enbridge's application. The EIS must evaluate the validity of this number. The EIS must evaluate habitat fragmentation and its effects on rare species, pollution flow paths, and effects of pollutants on natural features.
 - iv) The EIS must analyze the risks to fisheries and fish, designated trout streams and vegetation due to construction, operation of and spill from a pipeline. The EIS must identify fish populations already at risk, including walleye, ciscoe and other species that may be affected by the proposed routes.
 - v) The EIS must provide a Biological Assessment and Biological Opinion in an appropriate timeframe to allow public comment.
 - vi) The EIS is required by the Endangered Species Act (ESA) to evaluate the impacts of the proposed Project in Canada; these activities may also be cause for certification under the Pelly Amendment of the Fisherman's Protective Act of 1967, and may diminish the effectiveness of the Western Hemisphere Convention and the Migratory

Bird Convention. The effect of migratory bird habitat destruction from increased tar sands extraction must also be considered.

- vii) The EIS must address the impact of temporarily disrupted habitat connectivity during construction activities and provide mitigation measures, including native plant restoration and invasive species treatment.
 - viii) The Department must work closely with United States Fish and Wildlife Service (USFWS) and the Minnesota Department of Natural Resources respectively in developing conservation plans to help avoid or minimize potential Project impacts to birds and incorporate these conservation measures into the EIS.
 - ix) The EIS must include provisions that ensure compliance with the Migratory Bird Treaty Act (MBTA) or prevention of the take of migratory birds (including those resulting from oil sump pits and other contamination related to oil production). The potential impacts to migratory birds of power lines, noise from blasting and operation of pump stations, and loss of habitat resulting from blasting and ripping of rock outcrops used for nesting and foraging must also be addressed.
 - x) Some additional things to consider from Kim Chapman's Direct testimony in the Sandpiper docket are core wildlife habitats, eagle nests, Audubon bird areas, priority conservation areas, high quality conservation areas, state scientific and natural areas, county land and parks, other protected areas
- e) Rights of Future Generations
- i) The EIS must consider State Statute 116D.02 Subd. 2.State responsibilities. "In order to carry out the policy set forth in Laws 1973, chapter 412, it is the continuing responsibility of the state government to use all practicable means, consistent with other essential considerations of state policy, to improve and coordinate state plans, functions, programs and resources to the end that the state may:
 - (a) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations"
- f) Historical preservation
- i) The EIS must also discuss compliance with the Antiquities Act of 1906; Historic Sites Act of 1935; Executive Order 13007; the NHPA of 1966; as amended, the Archaeological and Historic Preservation Act of 1974; the Native American Graves Protection and Repatriation Act of 1990; and the Archaeological Resources Protection Act of 1979. Executive Order 11593 also provides necessary guidance on protection and enhancement of cultural resources.
 - ii) In the original Alberta Clipper docket, Mr Hartman (DOC) noted, "The Applicant shall work with the State Historic Preservation Office (SHPO) at the Minnesota Historical Society prior to commencing construction to determine whether an archaeological survey will be necessary for any length of the proposed route...The Permittee shall contract with a qualified archaeologist to complete such surveys, and will submit the results to the PUC, and SHPO." Mr Hartman also noted that such a survey was missing from the docket. An EIS for Line 3 and Sandpiper must include this requirement.
- g) Socioeconomics

- i) The EIS must analyze the expected impact on petroleum prices of the Project's facilitation of additional tar sands oil in scenarios where supply exceeds demand in Minnesota, the Midwest, the US and globally. In particular, it must evaluate whether low petroleum prices deter implementation of renewable fuel sources and delay taking actions to address climate change.
 - ii) The EIS must provide an analysis of how construction of crude oil infrastructure may delay the state, national and global adoption of clean energy , and disincentivize energy efficiency, energy conservation, and renewable power utilization.
 - iii) The EIS must address whether additional oil arriving in Superior, Wisconsin creates demand for tar sands shipping across the Great Lakes, such as the current plans to ship crude oil out of Milwaukee and the previous proposal to ship oil out of Superior.
- h) Environmental Justice/ Treaty Rights
- i) The EIS must include an environmental justice analysis. In particular, tribes must be consulted about a new corridor, removing the old Line 3 pipeline from their ceded and reservation land, and on the avoidance of all 1855 and other treaty land.
 - ii) Agencies working on the EIS must properly consult with tribes to address their concerns, engage in official consultation, protect tribal resources, and consider tribal agencies' involvement as cooperating agencies. This must include an equal seat at the table for development of an EIS.
 - iii) The EIS must evaluate alternative routes to avoid the sovereign White Earth territory encompassed by the boundaries of the White Earth Reservation as identified in the 1855 and 1867 Treaties, and respect their usufructuary rights to hunt, fish and gather.
 - iv) The EIS must consider the additional stress on indigenous people again facing more loss of their rights, and loss with potential despoilment of their lands from this Project. "For example, for Indigenous people who have been dispossessed of their lands and culture, the nostalgia for a past where former geographical and cultural integration was both highly valued and sustainable is an ongoing painful experience..."It is a disconcerting fact that, besides nostalgia, still other symptoms of place pathology in present Western culture are strikingly similar to those of the Navajo: disorientation, memory loss, homelessness, depression, and various modes of estrangement from self and others."^[10]
- i) Cultural Resources

- i) A tribal consultation plan is needed and must be disclosed in the EIS to address the presence of cultural sites, hunting, fishing and gathering rights and tribal members' use of resources.
 - ii) The EIS must discuss the federal government's trust responsibility and address potential impacts to and proposed mitigation for resources that are culturally important to tribes.
 - iii) The EIS must detail a clear process regarding the inadvertent discovery of cultural resources.
 - iv) The process, or lack thereof, of tribal consultation on abandoning pipelines and not reburying surfaced pipelines through tribal lands must be addressed in the EIS.
- j) Air Quality & Noise
- i) The EIS needs to evaluate the temporary air quality impacts from construction-related emissions (especially fugitive dust emissions) when building the proposed pipelines.
 - ii) The EIS needs to study the increased air emissions resulting from the storage of additional crude oil transported by this Project in floating roof tanks in Clearbrook, Superior, Chicago and tanks in other places where shippers and refineries for this oil are located.
 - iii) The EIS needs to analyze the increased air pollution caused by the extra coal-fired electricity generated to power the pipelines' pumps.
 - iv) EIS needs to estimate noise levels that would be generated by construction equipment in the those pipeline areas that have nearby residences.
 - v) The EIS needs to discuss noise generated by the pumps used to power the Project.
 - vi) The EIS should analyze the effect on Minnesota's air quality from the climate change induced fires from drought and heat conditions in Alberta, as tar sands oil extraction, transportation has contributes to climate change.
- k) Tourism
- i) The EIS must analyze the significance of clean, swimmable and fishable water to the tourism industry in the affected counties and the potential impact of impairment of waters due to a spill, or release of any chemicals during construction, testing and operation of the Project.
 - ii) The EIS must assess the potential impact on tourism at state parks affected by the proposed routes, including Itasca State Park if there is a spill. There are over 550,000 annual visits to Itasca State Park, very near the Applicant's proposed pipeline route. This park is part of the commons, available to the public to enjoy and cherish. The commons are the basis for our economy, and government has a public trust duty to protect the commons. The precautionary principle is the best decision making tool to protect the commons and we believe supersedes the right of a small subset of the oil industry to maximize profit.
 - iii) The EIS must quantify the current economic health and economic importance of the northern Minnesota tourism industry on an equal level with the alleged economic benefits of building pipelines and transporting oil.
- l) Climate Change Impacts

- i) The EIS must examine the potential for pipe movement within the soil, exposed pipes, and loss of support underneath the pipelines due to the impact of extreme weather events associated with climate change, such as intense flooding or periods of extreme drought.
- ii) The EIS must fully consider the impact of drought on pipeline construction and operational impacts, including the increased risk of wildfires caused by construction, increased soil temperatures over the pipeline, increased risk of soil subsidence and instability, use of water for hydrostatic testing and the much greater difficulty of revegetating the pipeline right-of-way in drought conditions.
- iii) The EIS must note the pumps upper temperature rating; with climate change, those heat levels have already been exceeded in northern Minnesota and will continue to be an issue.
- iv) The EIS must assess extraterritorial or trans-boundary impacts such as increased greenhouse gas emissions due to the extraction, transportation and refinement of the crude oil. This analysis must address the foreseeable climate change impacts from these GHG emissions. In Canada, impacts such as clear-cutting of forests, destruction of peat bogs and other ecosystems, and mining and drilling activities must be considered, along with wetland disturbances, loss of animal and marine habitat, including large volumes of toxic wastewater left in perpetuity. The climate change induced drought and heat conditions in Alberta Canada also have already increased the forest fire season, with smoke plumes reaching Minnesota. It must further assess the effects of increased tar sands oil processing on affected communities and migratory species, including loss of available water and closed forest canopy.
- v) The EIS must include greenhouse gas and climate change guidance from the Council on Environmental Quality (CEQ).
- vi) The EIS must include petroleum coke (petcoke) production and consumption in the life cycle impacts of tar sands crude oil production, as well as increased petcoke production in U.S. refineries associated with refinement of this oil.
- vii) The EIS must analyze increased risk to certain pipeline components, such as O rings in the pig trap doors, due to climate change and transportation of the thick dilbit. The Office of Pipeline Safety has data on pipeline component failure in hot summer months, and incidents and concerns during heavy rainfalls and also on frost heave events.^[11] During heavy flooding in Canada in 2013, Enbridge was forced to shut down its pipelines. The recent forest fires have also forced a shutdown of Enbridge's pipelines. PHMSA published a notice in the Federal Register^[12] in April of 2015 stating that heavy flooding can erode underground support for the lines, and cause pipelines under streams and rivers to become exposed.
- viii) The EIS must assess the direct, indirect, and cumulative impacts, including GHG emissions, that the Project and each alternative would have on climate change over their life cycles. Increases in mining and/or drilling, additions to pump stations, new or upgraded refineries, increased oil transport, and effects on end use must be included. The EIS must analyze GHG emissions resulting from future additional tar

sands production in Canada, due to the causal link between construction and operation of the pipeline and additional tar sands production.

- ix) Climate change is predicted to cause adverse ecological and human health effects, including water shortages, coastal flooding, increased risk of wildfires and stronger hurricanes, new pests and insect-borne diseases, and disruption of habitats. The EIS must describe the extent of the contribution that oil shipped through this line will have qualitatively and quantitatively in Minnesota, nationally, and globally to these adverse effects.
 - x) Climate change is here, and already is impacting wildlife and its habitats. The National Audubon Society has predicted over half of North America's birds will lose half of their habitat. The Center for Biological Diversity^[39] is calling the loss of habitat along with climate change and pollution, the "sixth mass extinction". The IPCC AR5 states "a large fraction of species faces increased extinction risk due to climate change during and beyond the 21st century, especially as climate change interacts with other stressors (high confidence)."^[40] These impacts to wildlife also impact humans. The link between human mental health and nature is well documented. The loss of nature and place has come to be termed "solastalgia" and is associated with declines in human mental health ultimately leading to loss of productivity and contributions to society^[13]. The loss of wildlife, habitats and human mental health impacts associated with climate change must be considered in the EIS.
 - xi) The EIS must consider Minnesota is a member of the Midwestern Regional Greenhouse Gas Reduction Accord, (read about it [here](#) or [here](#)) a regional agreement among six American governors and one Canadian premier to target greenhouse gas reductions. The central component of this agreement is the eventual enactment of a cap-and-trade scheme, perhaps supported by low-carbon fuel standards and other supplemental policies.
 - xii) The EIS must consider Governor Dayton and Lt Gov Tina are proposing a state High Ambition coalition, in conjunction with the Paris Climate agreement in Dec 2015. See the MPR article [here](#)
 - xiii) Discussion of climate change impacts is not possible without examination of the "well to wheel" atmospheric carbon loading distinction between U.S. conventional crude supply and that of either the Tar Sands or Bakken crude supply. Multiple evaluations find that Tar Sands crude contributes on the order of 20 percent more carbon loading than conventional crude.^[38] The nature of Bakken crude, on the other hand, is cloaked in secrecy. Deborah Gordon, who directs the Carnegie Endowment's energy and climate program said, "The biggest surprise for us was the lack of transparency in oil data. Despite two years of attempts the team was unable to secure any information on U.S. oil from the Bakken formation." The EIS must justify the use of any fuel source that negates EPA efforts to increase efficiencies and reduce emissions thereby aggravating climate change impacts. The EIS must demand an independent evaluation of Bakken crude supply and justify its transport.
- m) Weakness of Federal Oversight Agency

- i) The EIS must include a discussion of the weaknesses of existing Pipeline Hazardous Materials and Safety Administration (PHMSA) regulations and oversight of pipeline safety. Jeffrey Wiese, PHMSA's associate administrator for pipeline safety says his regulatory process is "kind of dying" and cites the "very few tools [he has] to work with."^[14] The monetary penalties he can levy are not a deterrent to a company with huge revenues, such as Enbridge. And he has cited the slow regulatory progress and created a YouTube channel to ask pipeline companies to voluntarily improve their safety regulations.^[15] His agency cannot keep up with the with the rapid change in pipeline construction, and the rapid escalation of tar sands crude oil transport.
 - ii) With construction of new pipeline projects, and increased flow rates on other pipelines, the EIS must analyze whether the local arm of the PHMSA, the Minnesota Office of Pipeline Safety, is adequately staffed to protect water resources from spills. Minnesota would also benefit from a clearer delineation of responsibility for construction and maintenance oversight. The current structure leaves important pipeline activities that could affect the environment without direct in-person oversight, including welding, hydrostatic testing water discharge and the resurfacing of pipelines above ground or in eroded soil conditions.
- n) Risk of Spills and Consequence Study
- i) The EIS must include a proper risk assessment study done by qualified independent risk assessment professionals with ecological expertise on the impact of a major pipeline spill. It is astounding that Minnesota has never conducted a spill risk assessment, given over two million gallons of oil have already been spilt on our soil^[16] and the quantity of crude oil, and especially diluted bitumen oil that flows through our state. As Line 3 will likely transport both heavy oil, dilbit and the lighter synthetic crude oil, both heavy and light types of oil must be considered in this study. The study must include, but not be limited to, an assessment of valve placement along the pipeline and the possibility of deploying external leak detection systems in areas of particularly sensitive environmental resources.
 - ii) We concur that the EIS must reference the Exponent^[17] and 2011 Battelle study referenced in that report^[18] studies for the risk assessment, referenced in Paul Stolen's Direct Testimony in the Sandpiper certificate of need docket. The Exponent study uses state-of-art computer modeling to simulate the transport and fate of spilled tar sands oil along the path of the proposed route, through numerous ecosystems. The Exponent study does note the need to obtain additional information on the chemistry of the oils as this information will be needed for developing cleanup and remediation plans.^[19]
 - iii) The EIS must evaluate whether Enbridge must be required to have substantial funds in escrow to be used for pipeline spill response, recovery, and compensation of affected parties. Clean up costs in Kalamazoo, MI have exceeded \$1.2 billion as of

June 2015, and only about half of that was covered by insurance, according to FERC documents filed by the company.

- iv) The EIS must assess the potential economic costs such as reduced property value, reduced agricultural production, and job losses in the agriculture, tourism, and other related sectors from a spill.
- v) The EIS must ensure that liability for damage caused by pipeline spills is clearly delineated. And in particular, as a limited partnership is organized to limit liability, who is liable if the partnership operating these pipelines in Minnesota files for bankruptcy after a major spill?
- vi) The EIS must contain a review of Minnesota and other states' crude pipeline spills in history including:
 - (1) The July 2002 Cohasset, MN spill - 6000 barrels^[20]
 - (2) The Marshall, MI Enbridge pipeline spill - 20,000 barrels^[21], 30 to 50 homes evacuated
 - (3) The Grand Marsh, WI Enbridge pipeline spill - 1,000 barrels
 - (4) The Mayflower, AK Exxon Pegasus pipeline spill - 12,000 barrels, 22 homes evacuated
 - (5) What impacts remain on the environment remain years after these spills? The Cohasset spill resulted in a permanent change from a forested/scrub-shrub wetland to a marsh-type wetland and resulted in more than 11 acres of oil soaked peat being removed and deposited in a landfill. The Marshall spill left 35 miles of the bottom of Talmadge creek and the Kalamazoo river oil soaked. People were forced to leave their homes permanently, as also was the case in Mayflower, AK when their foundation walls became soaked with oil. The recent Yellowstone River spill in winter resulted in water traveling downstream many miles as the leak occurred under the ice in winter, resulting in benzene concentrations in the drinking water of Glendive, Montana.^[22]
- vii) The EIS must include both a heavy and light crude oil spill risk assessment into the Mississippi and Big Sandy River, the port of Superior, Upper Rice Lake, Hay Creek; Straight River aquifer; Pine River and the Whitefish Chain, Spire Valley, the Kettle River, and the western tributary to the St. Croix Nat'l Scenic Riverway. The EIS must include high consequence areas, including worst case discharges, as defined in Federal statute.
- viii) The EIS must reference the Draft Environmental Impact Statement Sandpiper Pipeline and Line 3 Replacement Projects, Douglas County, Wisconsin, http://dnr.wi.gov/topic/EIA/documents/Enbridge/SPL3_Draft_EIS_Vol_1.pdf, last accessed May 23, 2016.)
- ix) The EIS must look at areas that might be especially adversely affected in the event of a spill
 - (1) Population centers, hospitals, long term care facilities, vulnerable populations such as senior citizens or those suffering from disabilities.
 - (2) Drinking and industrial water intakes.

- (3) Federal and state listed threatened and endangered species.
- (4) Tribal lands, plus the pristine Minnesota lakes used for wild rice harvesting
- x) The EIS must carefully analyze Enbridge's spill response before the next spill
 - (1) What equipment is in place: vacuum trucks, boats, booms, skimmers, haz-mat gear
 - (2) What manpower will be available in response to a spill? What training will these responders have? Without sufficient trained personnel, a spill response will be ineffective at best. The first responders must know the chemical properties of the oil that is spilt.
 - (3) Will the response be tailored to the type and toxicity of the oil in the pipeline? Heavy and light weight crude behave very differently in water.
 - (4) The EIS must consider Enbridge's spill response in all of Minnesota's seasons. The damage a spill can cause will vary greatly if the spill happens in the middle of the summer or during the dead of winter. Will the spill response, including equipment and personnel, and training, cover all of these situations?
- xi) Environmental Impacts Resulting from Spills: The EIS must cover:
 - (1) Air Quality: We know there were instances of toxic chemical levels in the vicinity of the Kalamazoo and Mayflower spill that were multiple times in excess of the maximum Federal safe levels.
 - (2) Agriculture: that has to include the effects of a spill on wild rice harvests by Minnesota natives.
 - (3) Federally and State Listed Endangered and Threatened Species. Will the EIS cover these, and what impact a spill would have on them? Many species are already under stress from climate change and loss of habitat.
 - (4) Fish and wildlife. Will the EIS look at the effects a spill would have on fish, amphibians, reptiles, birds, mammals?
 - (5) How about invasive species – those that could be introduced into areas as part of a spill response? It may seem minor, but as anyone who has had to deal with buckthorn in their backyard hedge knows, invasive species can be a real problem.
 - (6) Recreational Resources. A spill would affect the recreational use of the area, especially lakes and streams.
 - (7) How about socioeconomic effects of a spill. Both disruption of use of the land, as well as decrease in property values for those located near the spill.
 - (8) Soil and Topography. A spill will have differing effects depending on the soil type and topography at the spill site. The EIS must include that when reviewing spill consequences.
 - (9) Vegetation. Will the EIS look at the impacts of a spill on vegetation? How will the effect of a spill on vegetation vary depending on the season? How will different cleanup operations affect vegetation?

xii) Water

- (1) Groundwater: will the EIS look at what aquifers might be affected by a spill? How about public water supply wells? And private wells? How long would disruptions of water supplies last? Will the EIS cover that? It needs to.
- (2) Lakes and Streams: What lakes and streams would be adversely affected by a spill? How long would the damages last? How would this affect aquatic life? How would this affect human use of the resource? Recreational use, tourism?
- (3) Wetlands: Which wetlands, how will they be affected by the spill, how will they be affected by the cleanup efforts

o) Spill Response Plans

- i) The EIS must analyze the company's and our state's preparedness for a major spill. All of Enbridge pipelines in Minnesota have had spills. It is critical to prepare with adequate spill response materials and properly trained personnel within reasonable proximity of all segments of the pipeline and all ancillary facilities. The Kalamazoo spill required 150,000 feet of boom, 48 skimmers, 43 boats, 175 heavy spill response trucks, and 2000 workers.^[23] Is there oversight of whether Enbridge can supply this level of equipment on short notice to northern Minnesota? Enbridge resisted PCA oversight of their spill response plans in the 2014 legislature and successfully lobbied against pipeline inclusion in most of the new spill response law requiring oversight, training of first responders and mandated actions at 1, 3 and 8 hours after a spill.
- ii) Spill Response plans must have required, not optional, independent state regulatory oversight, with worst case discharges identified. An agency not funded by Enbridge must provide the oversight. The Office of Pipeline Safety receives funding from the pipeline companies, and cannot be viewed as independent, as employees often graduate to industry jobs. The company must also have regular practice drills, overseen by independent agencies, with first responders and regulatory overseers participating long before the next major incident.
- iii) Federal regulations do not require disclosure of the type of oil involved in a spill, and emergency response teams don't know what they're dealing with. Tar sands safety and spill response standards are no more stringent than for conventional crude.
- iv) Basic science also comes into play for [spill] preparedness. Scientists need long term ecological information in areas with significant petroleum development or transport to serve as a baseline, or benchmark for understanding spill effects. "You don't necessarily need to know every single thing about every species, but you need to understand which are the crucial pieces for your ecosystem", said Deborah Glickson, a senior program officer with the National Research Council's Ocean Studies Board.^[24] An EIS must provide an assessment that takes this frame of analysis into account.

p) Pipeline Integrity Issues

- i) The EIS must disclose practices that will ensure pipeline integrity, both on small leaks and large ruptures. A PHMSA Leak Detection Study^[25] states small leaks (around 1% of flow) are actually defined as those that cannot be found by internal leak detection systems. [PHMSA report here](#) Pages 4-28, 4-29 "On a 100,000

BBL/day pipeline, this means that leaks of the order of ~ 1,000 BBL/day are invisible to these LDS.” LDS = Leak Detection Systems, BBL = barrels per day. Pipelines in Minnesota are running up to 800,000 barrels per day. To translate barrels into gallons, multiply by 42.

- ii) The industry recognizes small leaks cannot be detected. A 1% leak on a pipeline that can transport 760,000 barrels per day is a leak of 7,600 barrels in one day. Enbridge personnel have stated their pipelines are “not leaking, they are weeping”. Photographic evidence documents oil residue around a visible older pipe in northern Minnesota^[26]. Enbridge Line 2 leaked 3,000 barrels of oil in January 2010 near Neche, North Dakota. “The accident, Enbridge claimed, was too small to have registered in its pipeline monitoring system.”^[28]The recent Keystone 1 spill leaked 2 drops a minute, leaked 17,000 gallons, found by a farmer in March 2016. On November of 2013, a hole the size of a quarter leaked over 20,000 barrels in North Dakota, found by a farmer.
- iii) The PHMSA Leak Detection Study also lists the ways pipeline leaks are most commonly found, and statistically shows humans on the ground are much more likely to find a leak than a pipeline control room operator, or a leak detection system. “For hazardous liquid pipelines, SCADA or CPM systems by themselves did not appear to respond more often than personnel on the ROW [right of way] or members of the public passing by the release incident.” from pages 2-10, 2-11 In Minnesota, young people painting equipment in Cass Lake have found a leak.^[27] A forest fire revealed a leak that had gone undetected.
- iv) The EIS must analyze pipeline integrity issues on recent newly built pipelines. There needs to be an analysis of the cause of the severe external corrosion on sections of the Keystone 1 pipeline despite that pipeline being only three years old. Enbridge’s Flanagan South pipeline is also having integrity issues despite being less than a year old.
- v) The EIS must analyze the inherent risks in co-locating pipelines near high voltage power lines, such as stray voltage impacts and impacts from other companies’ pipelines, such as in the MinnCan corridor.
- vi) Visible evidence of pipeline displacement, brought about by natural causes, is abundant in Minnesota. Originally buried pipeline segments now sit above ground (please visit Enbridge line 4 near 3170 Ditchbank Road, Cloquet or the Enbridge ROW east of Clearbrook where several lines are exposed). Natural events such as frost heave or thaw, seismic activity, scouring, subsidence, and slope erosion are among the natural events which potentially impose pipeline loads outside normal design parameters. The additional risk of catastrophic failure and subsequent spills must be treated with elevated attention. With these considerations in mind the EIS must impose deeper trenchless crossings of all rivers, increased pipe wall thickness at all river crossings, the review of its watercourse crossing execution plan, a strain

based design of pipeline at all sites with elevated risk of displacement, and review of the site selection plan.

- vii) The EIS must provide an assessment of the safety risks associated with diluted bitumen pipelines, including the effects of higher internal temperatures and of corrosion rates. Line 3 will be transporting dilbit in the future. “Understanding different oil types and how they behave in certain environments is also key for future spill response....”^[29]
- viii) The EIS must include an analysis of new large diameter pipeline integrity issues, and include information from PHMSA via FOIA Requests. PHMSA reports welding issues on new large diameter pipelines and there have been a high number of integrity digs on the new Enbridge Flanagan South pipeline and the Transcanada Keystone1 pipeline has had many leaks and spills.
- q) Construction Impacts
 - i) We note and concur with Paul Stolen’s comments in his direct testimony in the Sandpiper Need docket at the PUC about the issues with 1) the large potential for topsoil loss (production impacts, lack of awareness of landowners of their rights, and increased erosion) soil compaction, wind and water erosion, potential permanent loss of forest habitat in areas temporarily cleared, and the need for independent inspection. He also commented on human factors that can affect the environment, such as the need to prevent clearing too far ahead ahead of the pipe laying crew in order to minimize erosion.
 - ii) We note and concur with the potential for large topsoil disturbance on pipeline routing on hillsides, due to the need to create level staging areas for heavy equipment.
 - iii) The EIS must provide an analysis of impacts associated with ancillary facilities and connected actions, including staging areas, access roads, construction camps and storage.
- r) Landowner rights
 - i) The EIS must examine the statement and authority of potential eminent domain powers of the applicant or its representatives to unfairly coerce reluctant landowners into signing easement agreements. The applicant then represents the high percentage of landowner easement agreements as local “support” for the project, when the support may be resignation to a perceived inevitable result. This local support is a powerful argument with the general public and elected officials that put pressure on regulatory reviewers of the project and may be unfairly influencing outcomes.
 - ii) We concur with Paul Stolen that landowners must have the right to request topsoil removal separately from the lower subsoils (parent material). They must be aware of their option to request this, and have the right to protect their soil.
 - iii) The EIS must address whether and how Enbridge - landowner disputes are resolved, via an independent confidential mailing to existing landowners.
 - iv) We strongly believe landowners have the right to request removal of the old Line 3 from their land. We believe there has not been full disclosure of how much oil is

leaking from this old pipeline, and given its “weeping” qualities, seriously doubt the inert gas will stay inside the purged line.

s) Economics

- i) The adequacy of available or planned crude oil storage in Cushing, Oklahoma and the Gulf Coast area must be addressed in the EIS, given existing reported growing deficiencies of storage area. The impact of these pipelines on a growing storage problem due to an oversupply of oil must be addressed in the EIS. While the recent Canadian forest fires and disruptions of supply in Nigeria have temporarily reduced worldwide production, China’s filling of their strategic Oil Reserve has also artificially increased demand.
- ii) The EIS must evaluate the impacts of the proposed Project on oil production and oil prices within the U.S. There have been many articles stating increased Canadian tar sands and US shale oil production have caused oil prices to drop to the point of crippling these same industries, as Saudi Arabia has continued to produce more than their OPEC quota. Iran may be also adding up to another million barrels a day on the world market supply. Russia is also increasing their output. Market forces are at play, and they are squeezing the higher production cost oil out of the market. Canadian and Bakken oil wells have higher production costs than do Saudi Arabian wells. The Muse Stancil report submitted to the Sandpiper need docket must be countered with DOC independent analysis; there is a tremendous economic downturn taking place in the high extractive cost industries.
- iii) The EIS must examine the demand for refined petroleum products in Minnesota, the region and in the US over the ten year period between 2004 and the present, according to EIA statistics, despite population increases.^[35] Vehicle Miles traveled are down per capita, young people are delaying the age at which they apply for a driver’s license, and electric and driverless vehicles are coming onto the market. Battery storage is improving. Innovative companies like Tesla, Nissan and BMW already have electric vehicles Apple is researching innovative new products and the Chevy Bolt with a 200 mile battery capacity is expected to come on the market in 2017. Driverless cars are poised to come on the market, reducing the need for individual car ownership. All of these innovations will have an impact on gasoline fuel consumption.
- iv) The EIS must analyze the effect of worldwide economic depressions on the use of refined petroleum products, and the possibility of the current low price of oil on continued oil company bankruptcies.
- v) The EIS must compare past gasoline and other refined products demand predictions cited by the DOC - EERA in past pipeline projects (particularly the Alberta Clipper) of the last ten years to actual consumption (i.e. Vehicle Miles traveled and population growth estimates as relating to future consumption) Where those predictors accurate

in projecting future demand? What has occurred in per capita use of refined product consumption in Minnesota?

- vi) The EIS must include a section on the impact on homeowners' property values with pipelines on their land and potential reduced tax benefits to counties based on Enbridge's recent filing at the Minnesota Tax Court.
- vii) The EIS must disclose how farmers will be impacted by the proposed Project changes, including loss of trees, topsoil loss, improper drainage and pipelines rising to above ground levels. The original Alberta Clipper document shows how farmers in Thief River Falls area, for example, have repeatedly complained about their treatment by Enbridge.
- viii) The EIS must disclose how many permanent jobs will be created, and the extent of local union labor employment. The EIS must cite the definition of a "job" to Enbridge ; is it a one year job, or a permanent job year after year? Also jobs not filled locally by union employees must be delineated. At the end of the project, a report on actual local union employment versus non union must be issued.
- ix) The EIS must examine the dynamics of boom and bust nature of shale and Canadian heavy oil production and subsequent world oversupply to provide an objective prediction of future economic impacts. What are the chances that the Bakken Oil boom will either continue to bust or burn out before the Sandpiper pipeline has lived out its projected life span of 50-60 years? Will this pipeline become a drag on consumers and the economy because it may not be needed twenty years from now but has instead become yet another stranded asset of the fossil fuel age like the Wood River pipeline?
- x) The EIS must examine the literature on the ability of dying of declining industries to maintain their equipment over the life span of their capital investments. As society shifts of necessity (due to climate change) and cost considerations to renewable energy, will pipeline companies be able to maintain their equipment from now? Reference the following article that cites : <http://www.alternet.org/environment/we-could-be-witnessing-death-fossil-fuel-industry-will-it-take-rest-economy-down-it>
- xi) Also, the divestment from fossil fuel movement has really grown and individuals, institutions have divested over 3.4 trillion dollars from the top 200 holders of fossil fuel assets. Over \$1 trillion claimed by oil and gas companies is stranded assets, never to be profitable.
<http://www.financialpost.com/m/wp/blog.html?b=business.financialpost.com/news/energy/nearly-us1-trillion-in-zombie-projects-stranded-in-oil-fields-around-the-globe-says-goldman-sachs>
- t) Pipeline Abandonment Impact
 - i) If the proposed replacement line 3 is built, Enbridge is proposing that the existing line 3 be permanently abandoned "in place" (i.e., left in the ground) as defined by the Pipeline Hazardous Materials Safety Administration (PHMSA - Section 457

[Abandoning a Piping System], of the ASME B31.4-2012 [Pipeline Transportation Systems for Liquids and Slurries]).

- ii) Enbridge, in its Minnesota certificate of need permit application [31] to replace Line 3 (originally built in 1962) notes that the company's "...extensive integrity data on [the pipeline]... shows a high number of integrity anomalies – specifically, corrosion and long seam cracking.... experienc[ing] a number of failures during its more than 50-year history. As a result, Line 3 requires a high level of integrity monitoring and an extensive ongoing integrity dig and repair program to maintain safe operation of the line.approximately 4,000 integrity digs in the U.S. alone are currently forecasted for Line 3 over the next 15 years to maintain its current level of operation. This would result in year-after-year impacts to landowners and the environment, and would likely result in repeated impacts to the same landowners and environmental features....Enbridge concluded that the replacement of Line 3 is the optimal solution to restore Line 3 to its historical operating capabilities.
- iii) That Enbridge acknowledges that existing Line 3 has experienced such extensive deterioration that it is too impractical to maintain - raises major concerns about potentially serious environmental consequences that need to be thoroughly assessed regarding the abandonment of this 54 year old pipeline in the ground.
- iv) The EIS must evaluate whether Enbridge's proposal to fill the existing Line 3 pipeline with an inert gas is realistic given the weakened state of the 54 year old pipeline and the likelihood of it having pinhole leaks. Furthermore, these holes that could increase in size due to increasing pipe deterioration.
- v) The EIS must address the potential that an abandoned pipeline in place can lead to its further long-term structural deterioration - that could lead to some measure of ground subsidence [32].
- vi) The EIS must quantify any erosion that has resulted from the existing line 3 pipe channeling runoff or exacerbating wind erosion, which effects are greater in highly erodible lands. Extrapolate these findings into the future for the abandoned line 3.
- vii) The EIS must conduct a field study of residual contaminants in existing Line 3. The study must assess the nature and quantity of residual contaminants for the range of operating conditions and products in line 3.
- viii) The EIS must consider the Office of Pipeline Safety data[31] and the amounts of oil delivered to landfills due to contaminated soil found underneath the existing Line 3 during repairs and integrity work. An EIS must consider and attempt to quantify the extent and amount of unrecovered oil that will be left in place if the existing line 3 is left in place, and who will ultimately pay for any necessary clean-up.
- ix) An independent analysis must be done on how often oil contaminated soil has knowingly been left in the ground due to other infrastructure inconvenient to disturb located in the vicinity of the leaking Line 3, such as under the railroad bed near Cass Lake, and other pipelines, etc.
- x) The EIS must address landowner concerns and future costs associated with the abandonment of the existing Line 3. These costs potentially may be very high. This includes unresolved current water drainage issues, inadequate cover of presently

and future exposed pipelines, sinkholes as the pipe corrodes, and pipeline removal. We note our comment under landowner rights that landowners must have the option to have existing Line 3 pipeline completely removed from the owner's land.

- xi) The EIS must accurately map the placement of the existing line 3 relative to the other pipelines in the mainline corridor. Then the EIS needs to quantify the relative separation of this line from the other pipelines in this Enbridge corridor. For the length of existing line 3 - test Enbridge's claim that they cannot remove this line safely. In Grand Rapids, for example, Line 3 is not sited between other pipelines, but at the edge of the corridor, or is sited by itself.
- xii) Related to sections x and xi - soil erosion and slope stability concerns for pipeline removal are similar to those for pipeline construction [33]. Consequently, if the trench used to remove an existing pipeline can also be used for the replacement - ground subsidence will not occur [34]. Consequently, the EIS must identify those segments of existing Line 3 where there is adequate room in the Enbridge pipeline corridor for the Line 3 replacement to be laid within the same trench used to remove the existing Line 3.
- xiii) The EIS must investigate the existing Line 3 pipeline crossings, including the potential for its continued presence to interfere with roadways, railways, other pipelines, powerlines, and communications lines that it crosses.
- xiv) The EIS must address the environmental damage caused by the the disposal of the oily, rusty water used to flush out the abandoned Line 3. Concerns that need to be addressed are the displacement of water and possible invasive species and pollution from one watershed to another watershed over 300 miles away.
- xv) The EIS must address the previous multiple violations of Enbridge or its contractors in hydrostatic water testing, both in Minnesota during the Alberta Clipper construction and in Michigan on Line 6.

[31] Enbridge Energy: Certificate of Need Application for the Minnesota Public Utilities Commission - Line 3 Replacement Project, MPUC Docket No. PL-9/CN-14-916, April 2015

[32] For example, their case file 1200670. Leaks occur under repair sleeves. Soil was contaminated 18 inches below the bottom of line 3.

[33] Wis DNR: Draft Environmental Impact Statement, Sandpiper Pipeline and Line 3 Replacement Projects, Douglas County, Wisconsin, Feb, 2016 (page 4-19)

[34] Wis DNR: Draft Environmental Impact Statement, Sandpiper Pipeline and Line 3 Replacement Projects, Douglas County, Wisconsin, Feb, 2016 (page 4-20)

u) Overall Cumulative Impacts

- i) The EIS must evaluate the total cumulative impact of the Sandpiper, Line 3 and potential subsequent new pipelines, such as replacements for Enbridge Lines 1, 2 and 4. Line 4 has been operating at reduced capacity for over 10 years, just as Line 3 has been operating at reduced pressure before it's replacement was announced. It is entirely possible that Enbridge will propose siting these new pipelines in the same corridor they propose for Line 3 and Sandpiper. The EIS must account for the lack of an overall Enbridge plan of pipeline replacement visible to Minnesota, such as an Integrated Resource plan developed by X-Cel.
 - ii) In the Clearbrook - Park Rapids corridor, Line 3 and Sandpiper will run along the MinnCan pipeline routes. This pipeline corridor will either become very crowded, or yet another pipeline corridor cutting across Minnesota will be proposed. Paul Stolen's Direct Testimony in the Sandpiper docket documented the increased occurrence of frac-outs in this area of Minnesota, and indicated a need for environmental analysis of this phenomenon, particularly in this corridor.
 - iii) Oil from Line 3 is proposed to flow into Superior, WI and will exceed pipeline capacities downstream, thus foreseeably causing other pipelines to be built. Enbridge is already proposing a Line 66 from Superior to the Chicago area. The cumulative impacts on the environment of building a new and larger Line 3 cascade downstream to other states as a result.
 - iv) Speculating on the potential for future projects that would displace similar impacts from the proposed Project is contrary to NEPA and impermissibly narrows the scope of the EIS analysis by excluding consideration of trans-boundary, indirect, and cumulative impacts.
 - v) The EIS must examine impacts (including wildlife, threatened and endangered species, and environmental justice) both in the United States and Canada, pursuant to international treaties.
- v) Land Use
- i) The EIS must analyze the proximity of park and conservation lands and the environmental impact and social impact of the Project on the public's free use of these lands. The EIS must also identify easements, including conservation easements along the proposed route.
 - ii) The EIS must address state and federal Wildlife Management Areas to ensure lands for wildlife habitat well into the future.
 - iii) The EIS must analyze the impact of Right of Way clearing of the forest and the potential impact of unauthorized off-road use by vehicles, which can in turn cause damage to exposed pipelines. "Mudding" (the practice of riding pickup trucks over the land) for example, can damage exposed pipe coating.
- w) Health Effects
- i) The EIS must consider the components of crude oil, including benzene, toluene, ethylbenzene, and xylenes to polycyclic aromatic hydrocarbons (PAHs) and other

hazardous chemicals, including heavy metals. Benzene and some PAHs are known carcinogens.

- ii) The EIS must analyze how human health can be affected by the type of oil, and the length of the exposure. Humans can be exposed through their skin or lungs or consumption. Health effects of exposure to crude oil depend on the chemistry of the oil, dose, duration, and route of exposure (inhalation, ingestion, or through the skin). After effects can be chronic or acute, and depend on overall health and age. In-utero children can also be affected.
- iii) Children in Mayflower, Arkansas were sent home from school with flu-like symptoms, only to be re exposed in their homes. The EIS must consider the cardiovascular, dermal, GI, neurological, ocular, renal and respiratory symptoms were found in hundreds of Kalamazoo, Michigan and Mayflower, Arkansas residents in the vicinity of the spills. The EIS must also analyze the long term effects of large crude oil spills, with residents having long term but unresolved suspicion after unusual rashes and cancers.
- iv) The EIS must include information concerning the toxic effects of exposure to crude oil such as is found this in article <http://www.amfs.com/news/articles-from-our-experts/effects-of-crude-oil-exposure/>

Lori Andresen as
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Patricia Keefe
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Terry Hokenson
Lee Lewis
Joy Nelson
Gayathri Ramanathan
Noah Shavit-Lonstein
Kate Jacobson
S Mattson

Sally Downing

Ruth Lindh

Kurt Kimber

Endnotes

[¹] Line 1 was installed around 1949 under the Lakehead Pipeline Company name, Enbridge's predecessor.

[²] John Stansbury, "Analysis of Frequency, Magnitude and Consequences of Worst-Case Spills From the Proposed Keystone XL Pipeline", 2011 available online

[³] David Shaffer, "Enbridge Pays Fine Over Pipeline Testing Violations", Star Tribune, July 23, 2013, last accessed 9/21/2015 at <http://www.startribune.com/enbridge-pays-fine-over-pipeline-testing-problems/217118231/>

[⁴] David Hasemyer, "Mich. Officials Step Up Scrutiny of Enbridge After Water Law Violations", InsideClimate News, July 9, 2013 last accessed 9/21/2015 <http://insideclimatenews.org/news/20130709/mich-officials-step-scrutiny-enbridge-after-water-law-violations>

[⁵] Direct Testimony of Paul Stolen, Minnesota Public Utilities Commission, Sandpiper Need Docket 13-473, Document No. 201411-104748-02

[⁶] The Press Release can be found here:

<http://www.usgs.gov/newsroom/article.asp?ID=4110#.VgCcKpfVo20>, last accessed 9/21/2015.

[⁷] <http://www.dnr.illinois.gov/programs/nrda/pages/lakehead.aspx>

[⁸] DRAFT RESTORATION PLAN AND ENVIRONMENTAL ASSESSMENT FOR THE JULY 4, 2002 ENBRIDGE ENERGY, LIMITED PARTNERSHIP OIL SPILL NEAR COHASSET, MINNESOTA, Prepared by: U. S. Fish and Wildlife Service, Minnesota Department of Natural Resources, Minnesota Pollution Control Agency, Leech Lake Band of Ojibwe, Enbridge Energy Limited Partners, August, 2005, pg 20.

[⁹] Direct Testimony of Paul Stolen

[¹⁰] Glenn Albrecht, "Solastalgia: A New Concept in Health and Identity", pg 43 Glenn is a is an environmental philosopher who works in the School of Environmental and Life Sciences at the University of Newcastle.

[¹¹] O rings failed on Line 4 trap doors in July 2009, 2010 and 2013.

[¹²] <https://www.federalregister.gov/articles/2015/04/09/2015-08148/pipeline-safety-potential-for-damage-to-pipeline-facilities-caused-by-flooding-river-scour-and-river>

[¹³] Connor, L., et al, Environmental Change and Human Health in Upper Hunter Communities of New South Wales, Australia, EcoHealth 1 (Suppl. 2), 47–58, 2004.

[¹⁴] Marcus Stern and Sebastian Jones, "Exclusive: Pipeline Safety Chief Says His Regulatory Process is 'Kind of Dying'", Inside Climate News. Sept 11, 2013

[¹⁵] Ibid.

[¹⁶] John Myers, "State Records show many Minnesotan pipeline ruptures", Duluth News Tribune, 8/8/2010. <http://www.duluthnewstribune.com/content/state-records-show-many-minnesota-pipeline-ruptures> last accessed 9/25/2015. The amount of oil spilt in the 1991 Grand Rapids spill is incorrectly stated as 630,000 gallons - the original Enbridge estimate. In fact, the amount was later adjusted to "upwards of 1.7 million gallons" <http://www.apnewsarchive.com/1991/Company-Revises-Minnesota-Oil-Spill-Upward-to-1-7-Million-Gallons/id-2d06afe9e6c0712a86b91309d7c4932b> last accessed 9/25/2015

[¹⁷] "Third-Party Consultant Environmental Review of the TransCanada Keystone XL Pipeline Risk Assessment." Exponent, April 26, 2013.

[18] "Studies for the Requirements of Automatic and Remotely Controlled Shutoff Valves on Hazardous Liquids and Natural Gas Pipelines with Respect to Public and Environmental Safety", ORNL/TM-2012/411, done by Oak Ridge National Laboratory, Managed by UT Battelle for the DOE.

[19] Exponent study, page ix.

[20] DRAFT RESTORATION PLAN AND ENVIRONMENTAL ASSESSMENT FOR THE JULY 4, 2002 ENBRIDGE ENERGY, LIMITED PARTNERSHIP OIL SPILL NEAR COHASSET, MINNESOTA, Prepared by:

U. S. Fish and Wildlife Service, Minnesota Department of Natural Resources, Minnesota Pollution Control Agency, Leech Lake Band of Ojibwe, Enbridge Energy Limited Partners, August, 2005. The report concluded "the Incident caused long-term injuries to wetland vegetation and wildlife habitats. It has also been determined that the Incident caused injury to air resources."... "injured natural resources and services have not been returned to their baseline condition, nor will they be fully returned in the future." , pgs ii, 10.

[21] National Transportation Safety Board Accident Report, Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall Michigan, July 25, 2010, NTSB/PAR-12/01

[22] Lauren Gambino, The Guardian, 1/24/2015,

<http://www.theguardian.com/environment/2015/jan/24/yellowstone-river-oil-spill-pipeline> last accessed 9/25/2015

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[24] Jyllian Kemsley, "Oil Spill Lessons", Chemical and Engineering News, July 8, 2015

[25] Kiefner & Associates, Inc. 585 Scherers Court (614) 888-8220 Worthington, Ohio 43085

www.kiefner.com 0339-1201 Dr. David Shaw, Dr. Martin Phillips, Ron Baker, Eduardo Munoz, Hamood Rehman, Carol Gibson, Christine Mayernik U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration Final Report No. 12-173, Leak Detection Study - DTPH56-11-D-000001

[26] Photo available on request kathy@mn350.org .

[27] Case number 1186036 at Minnesota Office of Pipeline Safety Incident occurred 7/28/2010

[28] David Ball, "Unpaid fines, leaks and spills at volumes beyond worst case scenarios for Enbridge Inc." Vancouver Observer, 2/18/2013 last accessed 9/22/2015 at

<http://www.vancouverobserver.com/sustainability/unpaid-fines-leaks-and-spills-volumes-beyond-worst-case-scenarios-enbridge-inc>

[29] Jyllian Kemsley, "Oil Spill Lessons", Chemical and Engineering News, July 8, 2015

[30] Mary Denomy Direct Testimony, PUC Docket 13-153, pgs 16, 18, 20.

[31] For example, their case file 1200670. Leaks occur under repair sleeves. Soil was contaminated 18 inches below the bottom of line 3.

[32] Enbridge Pipelines, Competitive Toll Settlement, July 1, 2011, Table 2, pg 6

[33] David Shaffer, "St Paul Park Refinery switches focus to Bakken oil", Star Tribune, 6/21/2015 "For Northern Tier energy, some of the most interesting crude-purchasing opportunities are in the Bakken. Since late 2012, the company has operated a cost-saving trucking venture in North Dakota to collect crude at the wellheads. From that business, Northern Tier has discovered that some North Dakota wells produce crude whose distinct qualities make it optimal for the St Paul Park refinery. Now, the company is working to identify wells with the best-suited crude."

[34] Northland News Center, "Part 1: Potential \$6 billion Expansion For Murphy Oil", 8/6/2007,

<http://www.northlandsnewscenter.com/news/local/15293896.html> last accessed 9/23/2015

[35] Direct Testimony of Mary Denomy.

[36] Bob Garfield, "Exxon's History of Climate Change Research", 9/18/2015

http://www.onthemedias.org/story/climate-research-exxon/?utm_source=local&utm_medium=treatment&utm_campaign=daMost&utm_content=damostviewed accessed 9/23/2015

[37] Arabella Advisors, "Measuring the Growth of the Fossil Fuel Movement", September 2015, pg. 1, available at: <http://www.arabellaadvisors.com/research/measuring-the-growth-of-the-global-fossil-fuel-divestment-and-clean-energy-investment-movement/> Last accessed 9/23/2015

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[39] http://www.biologicaldiversity.org/programs/biodiversity/elements_of_biodiversity/extinction_crisis/

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Testimony of Kevin Whelan, Executive Director, MN350
May 9, 2016, St. Paul, MN

Thank you for taking my testimony.

My name is Kevin Whelan, I am a Minnesotan, a father, a longtime organizer for labor and economic justice and currently serve as Executive Director of MN350, and organization dedicate to winning a just transition to a clean energy economy in time to prevent catastrophic climate change.

Much of the testimony that you have heard and much of the research planned in scoping an Environmental Impact Statement concerns what will happen when these pipelines eventually leak, break, or corrode, as human-made products very often do. The danger these incidents pose to our waters, communities and health indeed deserve careful scrutiny.

I would like to urge you to consider something else, however—the environmental, social, and economic costs we will pay if the Sandpiper and Line 3 pipelines are built and work exactly as planned.

On days when they work perfectly, these pipelines would facilitated the extraction, refinement, and burning of millions of gallons of crude oil. Any honest Environmental Impact Statement should include within its scope the contribution this oil will make to global warming and the chaotic climate change it is already beginning to cause.

Such an analysis should run from wells to wheels—measuring and quantifying the impact that the extraction process, refining process, transportation, and burning of this fossil fuel. In the case of these pipelines, the especially large and deadly emissions in fracked oil, including large scale burning of gas into the atmosphere, and the unusually energy intensive nature of tar sands oil production should be

carefully considered.

Minnesota law supports, indeed requires an analysis of this scope. The Minnesota Environmental Policy Act Chapter 116 D.03 Subp2 -section (5) calls on state agencies to: "recognize the worldwide and long range character of environmental problems and, where consistent with the policy of the state, lend appropriate support to initiatives, resolutions, and programs designed to maximize interstate, national and international cooperation in anticipating and preventing a decline in the quality of the world environment."

The State of Minnesota is signatory to the "Under 2 MOU, a global compact among cities, states and provinces worldwide to limit the increase in global average temperature to below 2 degrees Celsius." This pact recognizes the scientific consensus for the need to transition to clean energy rapidly enough to prevent catastrophic global warming. Indeed, as you all know, the official consensus of the entire global community, reflected in the historic Paris accords signed last year, is that only by holding global warming to 1.5 degrees or less can truly catastrophic changes be prevented.

One concept that scientists use to quantify the changes we have to make to prevent catastrophic climate change is a "carbon budget". The New York Times explained it this way ("Paris Climate Talks Avoid Scientists' Idea of 'Carbon Budget'" Nov. 28, 2015):

"The scientists argue that there is only so much carbon — in the form of exhaust from coal-burning power plants, automobile tailpipes, forest fires and the like — that the atmosphere can absorb before the planet suffers profound damage, with swaths of it potentially becoming uninhabitable."

Unfortunately, despite fine words and treaties, the world and our nation are racing to exceed this carbon budget even as the effects of catastrophic climate change

become more visible in the form of extreme weather events, loss of native species, fires, and rising sea levels.

There can be no question that investing billions of dollars and lending some of Minnesota's most precious land and waters to build new crude oil pipelines will facilitate the production of additional fossil fuels, further exceeding the carbon budget that we can safely spend before severe damage turns into unimaginable catastrophe.

An accurate Environmental Impact Statement must attempt to calculate the amount of carbon that these pipelines will deliver into our atmosphere during their lifetimes. Such a clear-eyed look will present a challenge for economists involved—how can one ethically or rationally calculate the cost, or these pipelines' percentage of a cost—of destroying the very fabric of life in our state and on our planet, very likely within the lifetimes of children born today or their children?

Simply because these costs are hard to calculate, however, does not mean they are zero or should be ignored.

We are the last generation of adults that can prevent truly catastrophic climate change. Around the world, many bodies like those assembled by the Department of Commerce are going to have to make the right choice, again and again, to cancel projects that exceed our comparatively tiny remaining carbon budget and accelerate the transition to a clean energy economy. For the sake of our state and our children, I hope that they do, and you do.

Thank you.

For more information contact:

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May 26, 2016

Jamie MacAlister
Environmental Review Manager
Minnesota Public Utilities Commission
85 7th Place East, Suite 500
Saint Paul, MN 55101

VIA U.S. MAIL

*Re: Scoping Comments on the Line 3 and Sandpiper EAWs and Draft Scoping
Decision Documents*

Dear Ms. MacAlister:

On behalf of Minnesota Center for Environmental Advocacy and Friends of the
Headwaters, I submit the Scoping Comments and attached exhibits on the enclosed
disc.

Please do not hesitate to contact me should you have any questions or concerns.

Sincerely,

/s/ Kathryn Hoffman
Kathryn Hoffman

KH/km

Enclosure

Ingrid Kimball

From: Melodee Monicken <mmonicken@gmail.com>
Sent: Thursday, May 26, 2016 2:29 PM
To: *COMM_Pipeline Comments
Subject: Sandpiper and Line 3 Commentary

Most of my concerns are discussed in other documents submitted by intervenors, but these are particular concerns and questions regarding the scope of the Environmental Impact Statement on the Sandpiper and Line 3.

1. WHY HAS THE DOC MADE THESE PREMATURE CHOICES?

The Environmental Assessment of the Bull Moose Transmission Line Project has had an approval process separate from the pipeline approval process, despite the fact that the transmission line serves Enbridge's proposed route for Sandpiper and Line 3. The PUC is legally obligated to include associated facilities in the EIS. To place these actions on separate tracks reinforces the public's suspicion of corporate bias.

Why did the DOC hire Cardno? And where is the RFB tracking this decision? Lame excuses like "they were already around so we handed it to them" will not suffice. Cardno/Enbridge has a poor record and a direct conflict of interest.

It's incomprehensible to me that the Department of Commerce has hired them since Cardno's history of concealing its conflict of interest is well known. Given the directives in NEPA law, Cardno should not have been selected, and the appropriate RFB process should have been employed in hiring the expertise and experience of a company with stellar credentials.

2. WHERE IS THE NAS STUDY ON DILBIT AND HOW WILL IT BE INCORPORATED INTO THE EIS?

This EIS should be monitored and supervised by scientists and specialists with the credentials and experience warranted by a project this large. Someone from the NAS study on the impact of diluted bitumen on water should be involved on the draft EIS.

The EIS process must incorporate an Expert Advisory Council. And, according to law, each state department and agency shall "utilize a systematic, interdisciplinary approach that will insure the integrated use of the natural and social sciences and the environmental arts in planning and in decision making which may have an impact on the environment; as an aid in accomplishing this purpose there shall be established advisory councils or other forums for consultation with persons in appropriate fields of specialization so as to ensure that the latest and most authoritative findings will be considered in administrative and regulatory decision making as quickly and as amply as possible."

3. WHERE IS THE CONSIDERATION OF HIGH-VOLTAGE TRANSMISSION LINE?

These pipelines are co-located with overhead high voltage transmission lines east of Park Rapids. The EIS must include The INGAA Foundation, Inc. Criteria for Pipelines Co-Existing with Electric Power Lines cites data suggests accelerated pipeline corrosion, data that would put Enbridge's proposed route in the high risk category.

4. HOW ARE THE CURRENT OIL SPILL SITES AND SCENARIOS DEFICIENT?

Since the current spill modeling is relying on dated and biased NDPC data, new spill sites and scenarios should be developed near the Mississippi Headwaters, in the Pine River watershed, and near Big Sandy Lake.

The spill scenarios should include the likelihood of groundwater contamination in the Straight River aquifer. The NAS study on bitumen and the Battelle block valve study should be incorporated into the modeling.

Along with ignition damages and slow leaks that go undetected, the impact of methane, hydrocarbons, and ethane on humans and the environment should be part of the EIS.

The economic and environmental damages for oils spills must be compared to the coverage/limits in Enbridge/NDPC insurance policies.

5. WHERE IS THE SERIOUS CONSIDERATION OF A “NO BUILD” OPTION AND ALTERNATIVE ROUTES?

The NO BUILD alternative must be part of the EIS on both the Sandpiper and Line 3 as there is substantial evidence that production will continue to decline in both the Bakken and Alberta.

The draft EIS must contain a thorough environmental analysis of SA-04 and SA-03 (no spur) with extensive input and field work from the state’s environmental agencies and other specialists/scientists with the experience to analyze the collected data.

The EIS must compare system route alternatives based on comparable water bodies/drinking water sources crossed, emergency access, construction impacts, and the issues around short and long-term remediation.

6. DOC/PUC PROCESS AND INTEGRITY:

The PUC has allowed Enbridge to construe their application for a route from Clearbrook to Superior as to narrow the PURPOSE of these projects, limiting the consideration of reasonable alternatives.

Private needs and corporate profit are Enbridge purposes, NOT public purposes. The Clearbrook to Superior route is just one means of transporting oil and tar sands to markets in Illinois.

Minnesota has no obligation to facilitate expansion of Enbridge infrastructure in Superior. And doing so violates state and federal law.

DOWNSTREAM IMPACTS:

The pipeline EIS should also examine the impact of more pipeline infrastructure near the Great Lakes and the increased risks to downstream drinking water, Minnesota wetlands, animal habitat, public and private lands.

Melodee Monicken
Park Rapids, MN

Scoping Comment: for Sandpiper & Line 3 Replacement EIS:

From – Robert Morgan
4864 Hay Creek Road
Fort Ripley, MN 56449
218 829-1192
rmjkurtz@brainerd.net

My comments pertain to both Sandpiper pipeline & Line 3 replacement projects.

Subject: In addressing the economic assessment [of the EIS] of the preferred and the alternative pipeline routes, **the values / costs of each and all proposed actions shall consider a wide range of resource and labor expenditures**. These include but should not be limited to:

Value of uncontaminated land, waters and natural wildlife habitat [Priceless ??].

Value of inexpensive petroleum products to consumers [while adhering to Best Management Practices].

Value of the direct material and labor expenses to the pipeline company to acquire right-of-way and install the stated pipelines and bring them to operational capacity.

Value of the safe operation [and ease of spill recovery] of pipelines in various landscapes [soil, hydrology, vegetation, human activity].

Value of long-term high quality water resources in a world with diminishing water quality.

Value of previously disturbed landscape that can serve multiple human activities [ie. agriculture and corridors of commerce such as transportation of vehicles, power, and petroleum products].

Value of proximity access or alternative corridors; such as origin to destination, construction & maintenance crews, community fire and security staff, and material support from nearby urban service centers.

Values that are based on most likely scenarios – not necessarily those touted by Enbridge's promotional brochures, such as increased national security or meeting future energy needs. {Several of the alternative corridors (or combinations) could provide the same or improved benefits as listed for the preferred route.

These are not necessarily the costs/ valuations/ prices provided by Enbridge or other petroleum/ mineral affiliates that respond primarily to a business market, but includes an economic benefit-assessment of adjacent communities, regional area governments, and state regulatory agencies that may be involved in permitting, directing, monitoring or in some manner of responding to the operation and safety of stated pipelines {Project lifetime public benefit vs project public liability}.

End of report: RM



Comment Form: Scoping
Energy Environmental Review and Analysis

Please provide your contact information. This information and your comments will be publicly available.

Name: ROBERT MORGAN Phone: 218-829-1192
Street Address: 4864 HAY CREEK RD
City: FT RIPLEY, MN State: MN ZIP: 56449
Email: _____

My comments pertain to:

- Sandpiper Pipeline Project
- Line 3 Replacement Project
- Both Projects

SEE ATTACHED - 2 PAGES

Points to address in creating an EIS for the proposed Enbridge pipeline project.

I grew up on a small farm in central Minnesota in a home without hot running water and associated utilities that are taken for granted by most MN residents in the 21st Century. About age 6, I had my earliest close encounter with the work involved extracting groundwater. Many times my brothers and I had to pump water for hours by hand for our cows and other farm animals. We took turns pumping that steel handle up and down to lift gallons of cold, clear water over 100' to the surface. When the pump rods and leathers needed repair, I helped pull the rods and could see at a young age how difficult it was to obtain water. It is, and always will be, one of the most precious commodities needed by humans.

I am opposed to the toxic contamination of the wide swath of northcentral Minnesota lake country as proposed in the planned transit of crude oil by the Enbridge pipeline corporation. The extreme disturbance on an intact, high quality water resource is unwarranted when reasonable alternative options for resource procurement exist.

Proclamations of funding for Clean Water and responsible stewardship:

Governor Dayton and other public officials are currently promoting the protection of our state water resources – promising to make millions of dollars of funding available “to clean up” or modify damage to lakes, rivers, and other wetlands. It is ironic that we need to spend such great sums to deal with water contamination that we could have prevented; how about we stop the degradation by making better initial decisions affecting quality water resources that benefit us all.

Values vs cost:

The purpose of an EIS is to fully analyze the potential impact of the design and operation of the proposed pipeline on the landscape and the community resources through which it passes. As a corporation, Enbridge has criteria other than the above to which they are focused - like the profits to financial stakeholders. There is a long history of entities, such as Enbridge, using selected dialog in their statements and reports to convince jurisdictional administrators to approve their actions. There were scientists hired associated with the Trans-Alaska pipeline whose direction/mandate was to collect data that justified getting the pipeline and corridor approved – not being directed to lie, just to focus on information that increased the likelihood that the project would be approved by administrators.

The pipeline companies often claim they can clean up contaminated water so it has only a few parts per million of toxins; what is the cost to people's health – compared to what - the bottom line of profits for faceless corporations ?? And using the fear factor of health of people that may be hurt by an oil train explosion – an interesting a tradeoff but misses the point of basic protection for safe original water sources !! I worked in Alaska a few years and saw how the pipeline changed the landscape and the resident communities; can we learn from our errors. Every year there are many oil spills that the

general public is unaware of - or does not even comprehend how they adversely affect humans, let alone the food chain. We can and we should do better in siting, design, and operating these lines.

Fossil fuel exploration and processing is inherently difficult; it is only a matter of when there will be an oil leak or other disaster. It is better to spend several millions or billions to choose alternatives that give us the most confidence that procedures are executed properly !

Let us address the so called "emotional response" of citizens speaking against the Enbridge proposal -- it may seem that those people speaking up against the proposed Sandpiper route are somehow mesmerized by the threat of having the northcentral lake landscape despoiled and exposed to toxic spills. A closer analysis will indicate that it is the oil consortiums that are covering for the excessive greed of their stakeholders. The discussions of how much the alternative options or environmental protection required is the "emotional response" to the greed of those who seek mainly to benefit financially with minimal regard for local communities and water quality.

It is a privilege to have options to cheap oil products; in Minnesota, it should be a right to have access to abundant, clean water.

Thank you,

Robert Morgan
4864 Hay Creek Road
Ft Ripley, MN 56449

From: [Ellen Morrow](#)
To: [*COMM Pipeline Comments](#)
Subject: Fwd: Proposed pipeline
Date: Wednesday, May 25, 2016 6:51:56 AM

Subject: Proposed pipeline

I am writing to say that as life long citizens of Minnesota, we are very opposed to the pipeline going through Minnesota's headwater area. We strongly urge both a very thorough and rigorously scientific environmental impact statement. We further urge that one of the alternate routes suggested be substituted for the proposed pipeline through the headwaters. We believe the inevitable leaking pipelines may do irreparable damage to many lakes and streams in this remaining pristine area of MN and likely will damage the water supply for generations to come. Please, please do not let this project continue without the utmost scrutiny, as well as major consideration of an alternate route.

Thank you,
Ellen and Chuck Morrow
579 Lincoln Ave.
ST. Paul MN 55102

"Be kind whenever possible. It is always possible." -
Dalai Lama
Sent from my iPad

Jeff Mosner

This has become a divisive issue in this community and around the state. But I think there is something we all desire. **A thorough process that moves forward to a decision.** This is the 3rd public hearing you have held in Park Rapids on this Pipeline. My hope is that you truly listen, and carefully consider the suggestions brought forth.

This hearing is about your role as the Responsible Governmental Unit for an EIS on an oil pipeline, something you have no experience doing. As you know, whether you retain that role will be determined on May 18th by the EQB.

If you do end up the Responsible Governmental Unit for this process, you need to be thorough. My dad, used to tell me that “any job worth doing, is worth doing right”. You cannot treat this EIS as you would another CEA.

So, here are my suggestions:

First and most important you need to admit that you are going to need help. And while you may think that asking the public for their input suffices, the fact is, few in this room know what makes up a thorough EIS. So first off, you should compile a list of outside experts that would comprise an advisory panel to assist in what will be an extremely complex task. These experts should have extensive experience in executing a proper EIS, pipeline construction, risk analysis, hydrology, economics, geology and chemistry who understand the risks of hydrocarbon contamination. I suggest you ask the intervening parties for viable candidates for this panel.

Second, I mentioned economics. You do need to include a “no build” option in the analysis. Governor Dayton has set goals that if followed, will move us away from our reliance on dirty fossil fuels toward clean sources of energy. Someone needs to look at the economics of building yet another pipeline corridor across Minnesota in a market of slowing global demand for oil and rising supply. The US is awash in oil as evidenced by the price of oil being the lowest it's been in 11 years. No wonder congress just gave in to the oil lobby allowing the export of our crude to foreign markets. An objective analysis needs to be done to determine if the benefits of another pipeline corridor is worth jeopardizing our precious water resources.

The other reason you need to include the no build option is from an environmental stewardship perspective. Earlier this year, 165 nations (including the US) signed an agreement in Paris to limit the amount of GHG we are emitting to our atmosphere. The extraction of oil, especially through hydraulic fracturing and the steaming of tar sand oil (the two types proposed to cross our state) add enormous amounts of GHG to our atmosphere. *According to a new study published Friday in the Journal of Geophysical Research, Oil and gas production in North Dakota's Bakken formation is the key culprit in a worldwide rise in atmospheric levels of a potent greenhouse gas that also contributes to ozone formation near the Earth's surface. This study found that emissions measured over the Bakken, are 10 to 100 times larger than producers have been reporting to regulators.* Someone other than Enbridge (whose only goal is profit) needs to take a very hard look at the global costs and benefits of our continued and growing reliance on these dirty fuels.

And last, you need to include the “system” alternate routes – routes that end in Superior as well as routes going more directly to Illinois which is where most of this oil is heading. If this is indeed a “public utility” giving Enbridge the right to usurp a landowner's land, then the State should be allowed to determine best route.

I am reminded of what PUC Commissioner Tuma recently said “We're talking about a lot of oil going through this state. We need to get this right.” And I will add that if you don't get this right, you risk delaying the process further by opening yourself up to more litigation. I think we all can agree that is not in anyone's best interest.

Pastor Robert Munneke
PO Box 197 Aitkin, MN 56431
218/851-2483 (mobile) 218/927-3516 (home)
dmunneke@embarqmail.com

February 26, 2016

Bill Grant
Deputy Commissioner Department of Commerce
Minnesota Department of Commerce
85 7th Place East, Suite 500
St. Paul, MN 55101

Dear Commissioner Grant:

I would like to take this opportunity to comment on the proposed Enbridge Sandpiper and Line 3 Project. Among my concerns:

- The proposed route is through some of the most pristine water areas in Minnesota
- Pipelines always leak

The North Central Minnesota life and economy is rooted in the homes and cabins on the lakes and streams. This is the source of jobs, taxes, and the good life.

However, it all goes away if there is oil in the water. Please note: The proposed route will carry not only oil, but extremely toxic chemicals to break down the tar sands. We do not need this in our lakes and streams!

Please ensure that a complete EIS is done for all suggested routes.

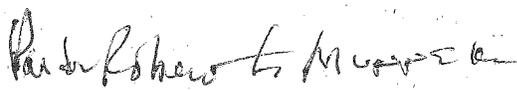
- The EIS and routing decision needs to comply with the Appellate Court ruling
- Oversight of the EIS process needs to be conducted by personnel who have experience in EIS
- Work the PUC/DOC is doing at the present is in violation of the court ruling

I was recently in Michigan and was exposed to research pertaining to the Enbridge leak at Kalamazoo. This situation was handled badly by Enbridge in design and construction, as well as in handling the crisis.

Unfortunately, Enbridge is not a good corporate citizen, and Minnesota is asking for trouble with the Enbridge proposal. At the very least, a new route away from the water resources need to be planned.

Enclosed is research data. Many thanks for your consideration of these concerns.

Very truly yours,

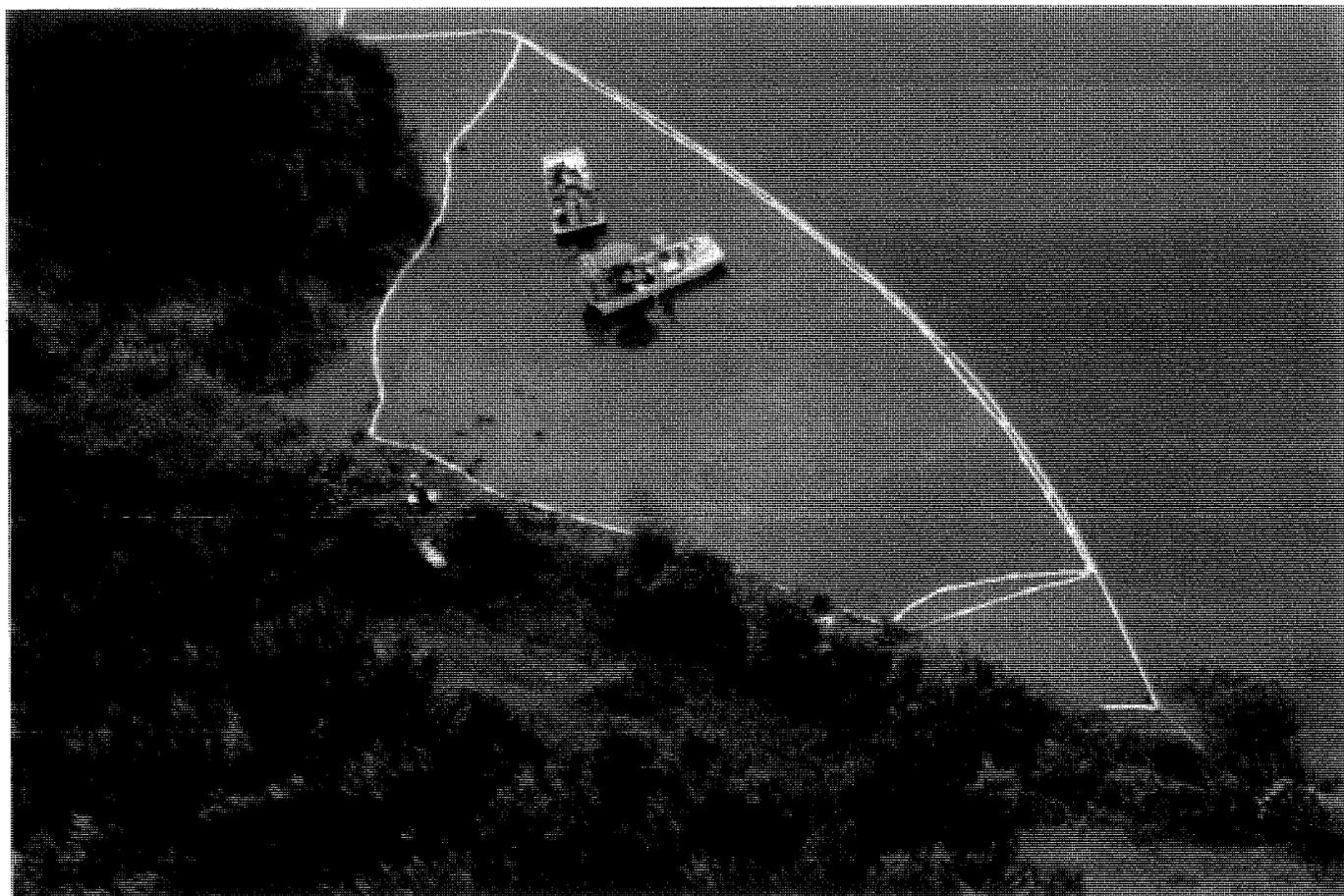

Pastor Robert L. Munneke

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MAR 03 2016

MAILROOM

Enbridge Oil Spill: Five Years Later, Michigan Residents Struggle To Move On



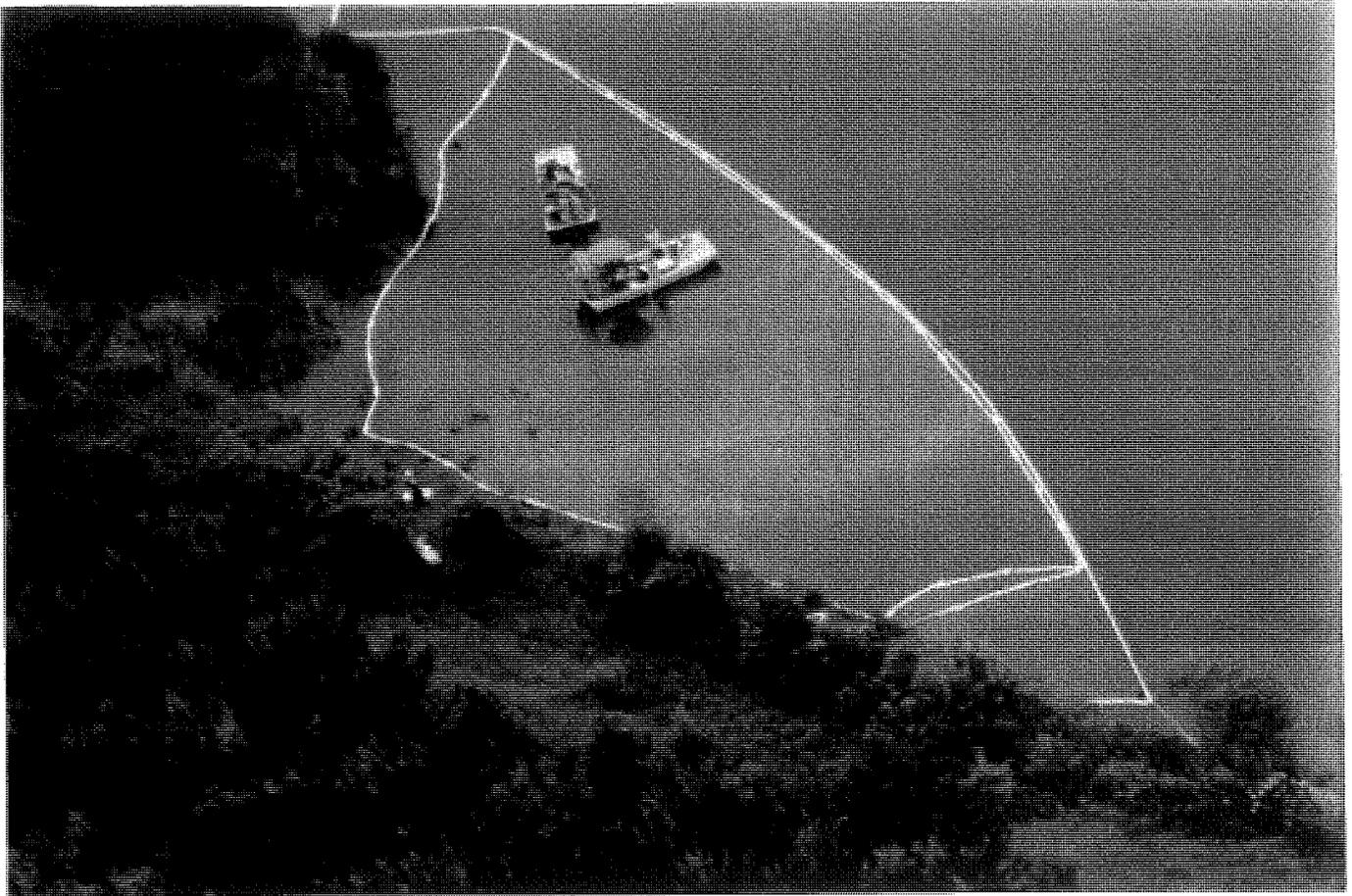
Workers in the Kalamazoo River contain a sheen of oil that spilled from Enbridge Inc.'s pipeline on July 25, 2010, in the biggest inland oil spill in U.S. history.

Photo: U.S. Environmental Protection Agency



Crew members in 2011 flush oil from a contaminated part of the Kalamazoo River following a July 25, 2010 oil spill.

Photo: U.S. Environmental Protection Agency



Workers in the Kalamazoo River contain a sheen of oil that spilled from Enbridge Inc.'s pipeline on July 25, 2010, in the biggest inland oil spill in U.S. history.

Photo: U.S. Environmental Protection Agency



Crew members in 2011 flush oil from a contaminated part of the Kalamazoo River following a July 25, 2010 oil spill.

Photo: U.S. Environmental Protection Agency

Previous

Next

On the Kalamazoo River this weekend, Michigan residents will kayak down the sparkling waters and cast their lines for smallmouth bass. The relaxing summer day will bear little resemblance to July 25, 2010, when a ruptured pipeline spewed a million gallons of crude oil into a nearby creek.

Five years and billions of cleanup dollars after the [worst inland oil spill](#) in U.S. history, the river is largely revitalized. Resuscitated wetlands hug the river, while three new boat launches and man-made rapids draw paddlers, fishers and weekenders.

“We’re looking forward to promoting it as a destination, instead of it being a liability,” said Brad Wurfel, a spokesman for the Michigan [Department of Environmental Quality](#), the agency leading the spill response for the state. “We’re proud of the cleanup effort here.”

Yet for many residents in southern Michigan, it feels like the spill never ended. Some say they worry the beautiful landscape belies the danger of chemicals and crude oil still lurking in the water. For others, the anniversary dredges up painful reminders of the day they were evacuated and their lives upended by the stench of oil and the noise of cleanup crews.

"It's been a very traumatic time," said Michelle Barlund-Smith, who lived in Battle Creek during the spill and moved away due to the disturbance. "It was horrendous. It was just a solid river covered in oil."



Workers in 2011 clean submerged oil in Morrow Lake, on the Kalamazoo River, following the worst inland oil spill in U.S. history.

Photo: U.S. Environmental Protection Agency

The 2010 accident was disastrous not only because of how much oil spilled but also because of the type of crude running through Enbridge Inc.'s pipeline. Diluted bitumen, a particularly toxic crude from the Canadian [oil sands region](#), is so thick and tarry that it must be thinned with volatile chemicals before it can flow through pipelines. Even then, the oil is too dense to float in the water, like conventional oil does when spilled. Instead, diluted bitumen sinks to the bottom, making it harder for workers to remove and retrieve.

"The Kalamazoo River still isn't clean," Anthony Swift, who directs the Natural Resources Defense Council's Canada Project, [told](#) OnEarth magazine. "The EPA reached a point where additional cleanup might do more harm than good. Much of the river is still contaminated."

Canadian crude oil spilled into the river for 17 hours before Enbridge workers could shut down the line.

Timeline of major events in Kalamazoo River oil spill



Alex Mitchell | amitch5@mlive.com By Alex Mitchell | amitch5@mlive.com

on July 20, 2015 at 8:01 AM, updated July 20, 2015 at 10:53 PM

KALAMAZOO, MI -- The five-year anniversary of the **Kalamazoo River oil spill** is July 25, marking the official date that Enbridge Energy's 6B pipeline ruptured in the Talmadge Creek and sent 843,000 gallons of diluted bitumen, also known as crude tar sands oil -- into the tributary of the Kalamazoo River.

The oil would eventually travel about 39 miles down the Kalamazoo River before being contained in Morrow Dam in Kalamazoo County's Comstock Township. Subsequent cleanup efforts would be further complicated by the fact that some of the heavy crude oil sank to the river's bottom, meaning cleanup efforts required extensive dredging of the riverbed.

Enbridge, a Canadian-based oil giant, completed remedial efforts in fall 2014 that had been ordered by the U.S. Environmental Protection agency. In addition to removing the oil, the effort included rehabilitating damage caused to the ecosystem and wildlife affected by the spill. So far, Enbridge has paid about **\$1.2 billion** to clean up the tar sands oil, not including more than \$80 million in state and federal fines to date. While cleanup of the river is complete, Enbridge is still required to monitor the river for additional unnatural sheen or oil particles through 2016 under the supervision of the Michigan Department of Environmental Quality.

Below is a timeline of major events that occurred from the time of the spill to now.

2010: Enbridge Energy's 6B pipeline, a 30-inch steel pipeline that runs from Griffith, Ind., to Sarnia, Ontario, sustains a 6-foot rupture that begins leaking crude oil into the Talmadge Creek near Marshall at some point during the evening. At **5:58 p.m.**, **an alarm went off at Enbridge's pipeline control center in Edmonton, Alberta**, indicating a drop in pressure at the Marshall pump station on the 286-mile pipeline, which would go on to leak 843,000 gallons of crude oil before the leak was stopped. Just before 9:30 p.m., Calhoun County **911 dispatchers begin receiving calls from concerned residents**, who report a smell of natural gas near the spill site off Division Drive and Old 27 in Marshall Township. Three area firefighters traveled to the scene to investigate the smell, but were unable to determine the cause or source.

July 26, 2010: At 11:16 a.m., a Consumers Energy employee called the Enbridge control center to alert them of the oil spilling into Talmadge Creek, which feeds into the Kalamazoo River. **The company's regional manager was contacted at 11:30 a.m.** and company crews are dispatched to the site at

11:45 a.m., where they lay booms to try to contain the oil. Officials from Calhoun and Kalamazoo counties officially launch their responses that afternoon. The response would later include **placing booms as far west as Morrow Lake** and its dam in Comstock Township in hopes of containing the spill within a roughly 39-mile stretch from where the spill initially occurred.

July 27, 2010: A state of emergency is declared by Kalamazoo County officials. That afternoon, state officials begin advising the public and nearby residents to avoid the area due to high levels of benzene that had been released in the area. **Experts warn the chemical**, used to help move thick tar sands oil through the pipeline, can cause leukemia and anemia — among other side effects — after prolonged periods of exposure. **President Barack Obama promises a swift response** from federal officials.

July 28, 2010: Michigan Gov. Jennifer Granholm declares the spill area a **"state of disaster."** With numerous booms already in place throughout the river, Kalamazoo County emergency management workers begin preparing to place additional precautionary booms west of Morrow Lake to contain the spill, which had already stretched east to Galesburg. State and county officials debate whether to extend a **no-contact order** for the affected portion of the river, which forbade swimming, boating, wading or fishing on the river from near Marshall to Morrow Dam in Comstock Township because of public health concerns.

July 29, 2010: The Calhoun County Health Department advises **residents of about 30 to 50 homes north and northwest of the oil spill site to evacuate their residences**, although several homeowners in the immediate area had already been urged to evacuate their houses days earlier and were put up in nearby hotels at Enbridge's expense. Enbridge would soon announce it would **buy the homes of homeowners who believed their property values declined as a result of the spill**. In order to qualify, a home had to be located within 200 feet of either side of the Kalamazoo River from the spill site in Marshall Township downstream 30 miles to just east of Morrow Lake and had to be on the market prior to the incident. The company also offers to work with residents who felt the appraised value of their homes had been lowered by the spill. U.S. EPA officials confirm the spill was **effectively halted upstream of Morrow Lake and its dam**.

Aug. 10, 2010: A roughly **100-foot section of the 6B pipeline where the rupture occurred is removed and sent to Washington, D.C.** for examination by federal authorities. After multiple back and forth discussions with the U.S. EPA, oil begins flowing through the pipeline again **on Sept. 27**.

Sep. 30, 2010: U.S. EPA officials announce initial cleanup of the oil spill is complete, with roughly 760,000 gallons of crude oil having been captured.

April 5, 2011: Enbridge Energy Partner's annual report shows the company **spent \$550 million to cleanup the oil spill in 2010**, which contributed to the company posting a net loss of \$137.9 million at

the end of the year. This was the first time the company reported a loss in at least five years.

July 19, 2011: U.S. EPA announces **over 90 percent of the spilled oil has been removed from the Kalamazoo River**, but notes oil found in 200 acres in the Morrow Lake, Mill Pond and Ceresco Dam areas during an assessment of the river in the spring is mixed with the sediment at the bottom of the river. Enbridge is given a deadline to clean those areas by Aug. 31. **Enbridge would miss that deadline**, with a company spokesman saying at the time that the scope of the work had expanded and that Enbridge was "not willing to sacrifice quality of the cleanup work to meet a certain date."

Sept. 27, 2011: Enbridge announces the cost of the oil spill cleanup has reached about \$700 million, **exceeding the company's \$650 million insurance policy it had for the pipeline in the event of a rupture**. Soon after, it is announced that remedial efforts **will extend into 2012** due to difficulties caused by removing submerged tar sands crude oil from the river's bottom. Residents are urged by EPA officials to be patient as work continues into the Galesburg area and overbank rivers affected by flooding during the spill.

April 18, 2012: Three miles of the Kalamazoo River — from Perrin Dam to Saylor's Landing in Calhoun County — **are reopened for public use for the first time since the spill occurred**.

May 10, 2012: Enbridge announces a plan to **entirely replace its 6B pipeline** in an attempt to make the line more structurally sound and increase oil volume able to flow through the pipe.

May 21, 2012: The National Transportation Safety Review Board **releases 158 documents and 58 photos to provide a factual basis for the board's conclusion of what caused the spill**. The documents include a timeline of the spill response, the work and service history of the pipeline and more than 74 interviews with pipeline operators and first responders. The following day, the Michigan Department of Community Health releases a report stating **drinking water remained virtually uncontaminated as a result of the spill**.

June 11, 2012: A final health study released by MDCH concludes that **contact with submerged oil will not cause long-term health effects or pose a higher than normal risk of cancer**, although it notes contact with the oil may cause temporary side effects such as skin irritation.

June 21, 2012: **The remainder of the river is re-opened to the public**, with the exception of a 1,000-foot stretch near Morrow Lake in the Morrow Delta, which remains closed due to the need for continued remedial action.

July 10, 2012: The National Transportation Safety Review Board releases its final analysis, which notes that **Enbridge and federal regulators missed numerous opportunities to prevent or lessen the impact of the oil spill**. According to that report, the Canadian pipeline company knew five years before the pipeline ruptured that there were cracks in the section of pipeline that eventually failed. Federal regulators never fully reviewed or questioned the company on its spill response plan. And once the spill

happened, Enbridge employees and spill responders acted like a troop of Keystone Cops, NTSB Chairwoman Deborah A. P. Hersman said at the time.

March 14, 2013: Enbridge is ordered by the U.S. EPA to do **additional dredging along the Kalamazoo River** in sections of the river above Ceresco Dam in Calhoun County and in Morrow Lake in Comstock Township. "The dredging activity required by EPA's order will prevent submerged oil from migrating to downstream areas where it will be more difficult or impossible to recover," EPA officials said at the time.

July 2, 2013: Enbridge is forced to **halt cleanup work on Morrow Lake after Comstock Township officials request a site application** for a dredge pad the company had set up in the area to allow for contaminated sediment to be dewatered before being hauled away to an approved landfill. Township officials said Enbridge had selected the wrong site for the pad and didn't follow proper procedures to receive approval from the township. While a number of area residents and businesses express concern, **Bell's Brewery owner Larry Bell -- who would later file a lawsuit against the company --** becomes a key figure in the debate over the dredge pad location, which he said he felt was being placed too close to his production facility within the township. The decision is eventually **forwarded to the township's zoning board of appeals.**

Aug. 8, 2013: Enbridge requests an extension of the EPA's Dec. 31, 2013 deadline to complete **dredging of the river** due in part to its ongoing negotiations with Comstock Township. That request would later be denied, leading to Enbridge missing the deadline.

Feb. 18, 2014: Enbridge receives approval to **move forward with plans to dredge Morrow Lake** after receiving approval from the Comstock Township Planning Commission to place its dredge pad at Benteler Industries, which sits to the north of the lake at 9000 E. Michigan Ave.

Feb. 21, 2014: Enbridge receives a permit from the Michigan Department of Environmental Quality to **remove the Ceresco Dam**, despite some local protests to save the dam. "The Ceresco River Restoration project will have significant benefits for the Kalamazoo River by improving the fishery, removing the navigation hazard of the dam and providing other ecological benefits," a news release from the DEQ said at the time.

June 4, 2014: A finalized public health assessment from MDCH concluded that **no long-term harm to people's health is expected from contact with chemicals in the river's surface water** during recreational activities such as wading, swimming, or canoeing. A separate report in August concludes breathing air near the oil spill also caused no long-term health effects.

Oct. 9, 2014: Enbridge completes its cleanup and restoration of the Kalamazoo River. All sections are now opened for public use. Subsequent filings with the Securities and Exchange Commission would show **the company spent \$1.21 billion on the total cleanup effort.**

Dec. 9, 2014: Enbridge settles a class-action lawsuit filed against it by people living along the Kalamazoo River. Terms include payments to people living within 1,000 feet of the river, donations to certain organizations that benefit the community or support recreation on the river, and a general fund to reimburse people who incurred expenses because of the July, 2010 oil spill.

May 13, 2015: The Michigan Attorney General's Office announced a **\$75 million settlement with Enbridge over the oil spill.** "This settlement will help to restore affected waterways and wetlands, as well as provide improved access for families to enjoy the beauty of the Kalamazoo River," Attorney General Bill Schuette said.

June 8, 2015: Enbridge is ordered to pay an **additional \$4 million to fund multiple restoration projects along the Kalamazoo River** as part of a "natural resource damage" settlement the company reached with tribal, state and federal officials. With oversight from the MDEQ, Enbridge will continue to monitor the affected areas of the Kalamazoo River and its overbanks for visible or submerged oil. Monitoring of the river is currently showing little to no sheen in most areas, meaning monitoring of the river will conclude at the end of 2016 if those results hold.

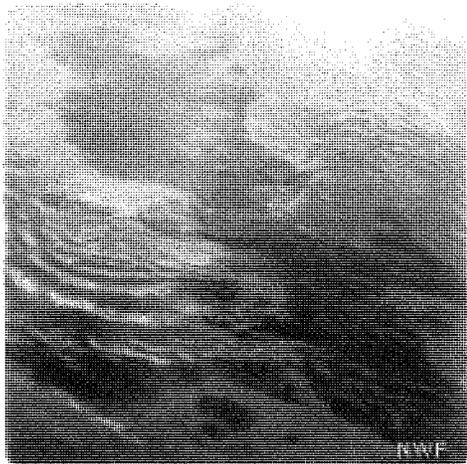
*Alex Mitchell is a reporter for the Kalamazoo Gazette. Email him at amitch5@mlive.com or follow him on [Twitter](#).***MORE:**

- **Signs of historic Kalamazoo River oil spill nearly gone 5 years later**
- **Database: Compare U.S. pipeline spills since 1995**
- **Monitoring for oil continues on Kalamazoo River**

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Growth of Tar Sands Across the Midwest - National Wildlife Federation

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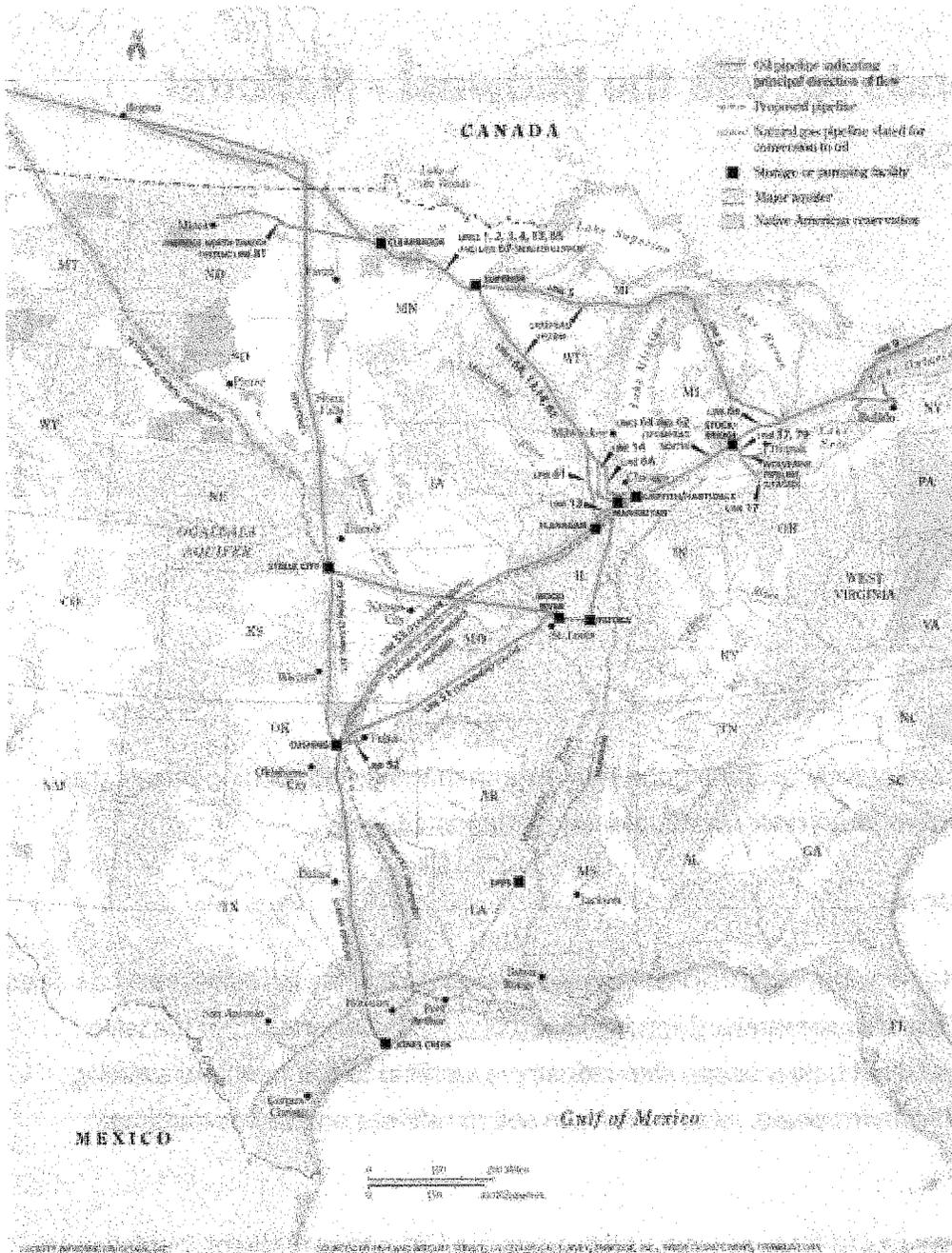
The Midwest and Great Lakes are quickly becoming the hub for transporting and refining one of the worlds dirtiest and most destructive fossil fuels on the planet: tar sands oil.

The Enbridge Pipeline Boom

Pipelines in the area are nothing new, but over the last several years the region's infrastructure has seen a dramatic transformation: a Canadian company, Enbridge Incorporated, is undertaking a massive expansion of their system in the Great Lakes basin, also industry is working to link new and existing pipelines to reach the Gulf and Atlantic coasts, where they can sell to refiners on the international market.

If Enbridge is successful, not only would it cause pain at the pump for Midwestern drivers, but it would lay the groundwork for an explosion of new tar sands development in Canada, boosting carbon emissions and pushing our planet toward the brink of climate catastrophe. This increase in crude also exposes the already threatened Great Lakes to larger and more toxic pipeline spills. Plans are also being drawn up transport millions of gallons of tar sands oil via tanker and rail, an even riskier option than pipelines.

Map of Pipeline Expansion



Not Just a Climate Threat

In the summer of 2010 [Enbridge](#) was responsible for the largest and costliest inland oil spill in U.S. history, when a pipeline rupture sending over a million gallons of tar sands into the Kalamazoo River system poisoning people and wildlife for miles around. This disaster underscored the weakness of our state and federal safety regulations, but also showed how unprepared the industry is to respond to a toxic spill: almost three years later the river remains polluted despite Enbridge spending nearly \$1 billion on the cleanup.

*Watch this story about Beth Wallace, an NWF employee whose hometown was impacted by the spill, and whose **life was changed forever**:*

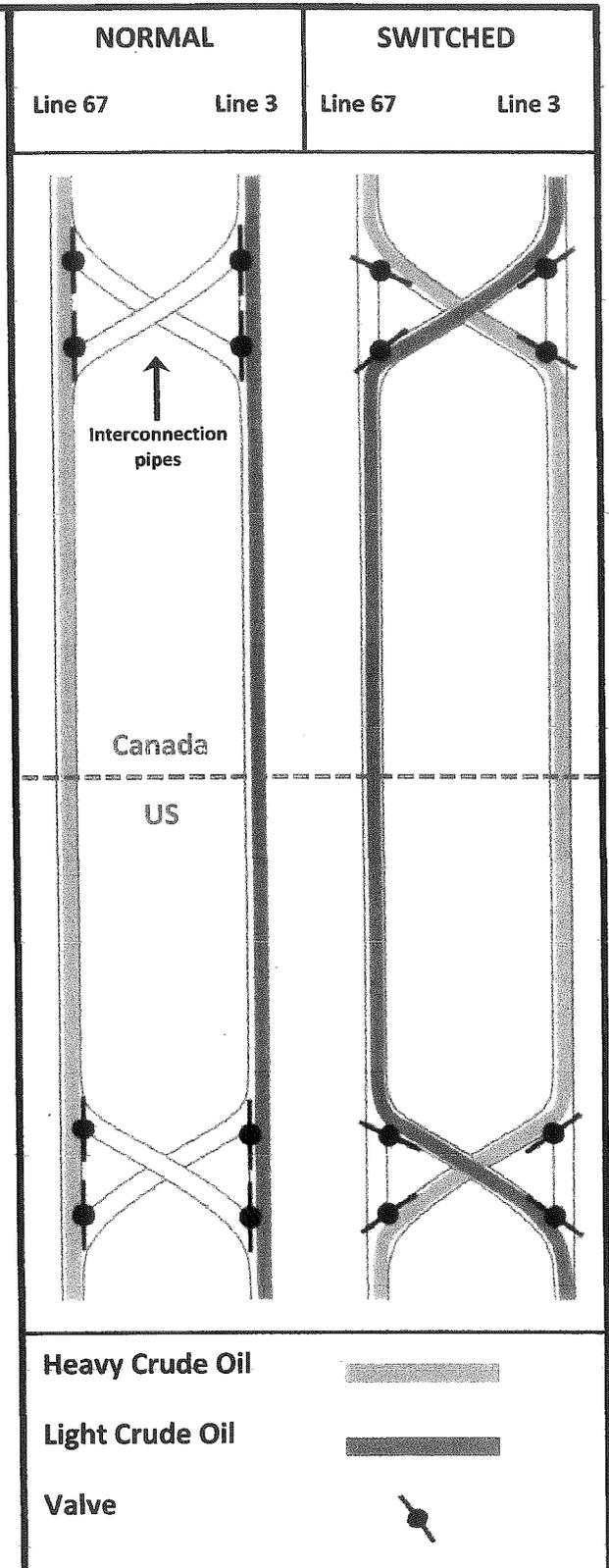
The the disaster in the Kalamazoo River was of the largest tar sands oil spills ever in the Midwest, and one of many pipeline accidents in Michigan. Enbridge is responsible for hundreds of oil spills in the last decade.

National Wildlife Federation is working to stop tar sands expansion projects that will put our resources, communities and wildlife at risk, and we are also pushing for comprehensive pipeline safety reform, a process made harder by the huge gaps in oversight and accountability for the industry.

- The health and future of the Great Lakes region, which provides drinking water to millions of people, is at grave risk from tar sands oil pipeline expansions. The report explains the incredibly high risk and direct threat involved for wildlife and people of the Great Lakes region if pipeline expansions continue.
- The report warns of a pipeline hazard located at the Straits of Mackinac, where, submerged in the waters where the Lakes Michigan and Huron meet, more than 20 million gallons of crude oil and natural gas fluids are pumped every day through aging pipelines operated by Enbridge Energy--the Canadian company responsible for the worst inland oil disaster in U.S. history.
- Enbridge's track record is covered in oil spills. They are the world's biggest transporter of Canadian tar sands oil, and responsible for the biggest inland spill in American history. Learn more about Enbridge's track record, their reckless expansion plans, and unseemly marketing tactics used to defuse criticism.

Enbridge's Illegal Scheme to Double Tar Sands Imports

- ❖ Enbridge, the largest Canadian pipeline company, has come up with an illegal scheme to nearly double the capacity of its Alberta Clipper tar sands pipeline (aka Line 67). The scheme would ignite a new wave of tar sands imports through Minnesota, to Superior, WI. Enbridge wants to bypass the Presidential Permit process by transferring the dirty tar sands crude from Alberta Clipper to another pipeline, called Line 3, just north of the border, then re-transferring it back to Line 67 once it's crossed into the U.S.
- ❖ The scheme makes a mockery of the President's statements that another tar sands import pipeline – Keystone XL – is in the national interest only if it does not exacerbate the problem of climate change. Yet a State Department official has indicated that they will allow Enbridge to move forward with this plan regardless of the fact the State Department previously said an expansion would require a full environmental review.
- ❖ This illegal expansion would put Alberta Clipper on par with the controversial Keystone XL pipeline and significantly increase the amount of toxic, highly polluting tar sands crude being moved into the U.S. Tar sands is much more carbon polluting than regular crude, nearly impossible to clean up when it spills as was seen with the tragic 2010 Kalamazoo River spill, and is causing the destruction of pristine Canadian forests and violating the rights of indigenous peoples in Alberta.
- ❖ This illegal scheme was done with no public notice, and completely undermines the permitting process. This backroom deal between Enbridge and the State Department is especially troubling given allegations that the State Department has an inappropriately cozy relationship with the oil industry.
- ❖ Hopefully, Secretary Kerry will recognize that this scheme is not only illegal, but is at odds with his commitment to make meaningful progress combatting climate change.
- ❖ President Obama and Secretary Kerry have committed to bold action to protect our climate. Allowing a project that expands production of the dirtiest fuel source on the planet to sneak out of environmental review is completely inconsistent with these goals, would tarnish the Administration's credibility as a world leader on climate, and put countless resources in the Great Lakes region and beyond at risk.

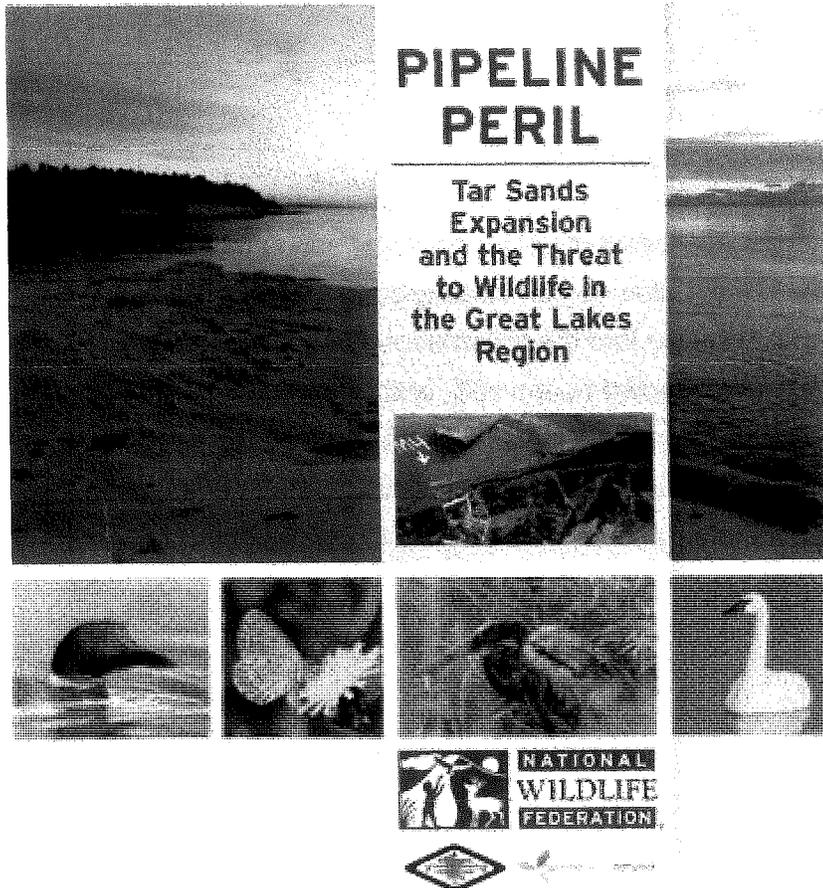


Pipeline Peril: Tar Sands Expansion and the Threat to Wildlife in the Great Lakes Region - National Wildlife Federation

"The Great Lakes Region provides valuable habitat for iconic species like moose, lynx, wolves and loons."

12-15-2014 // Jim Murphy

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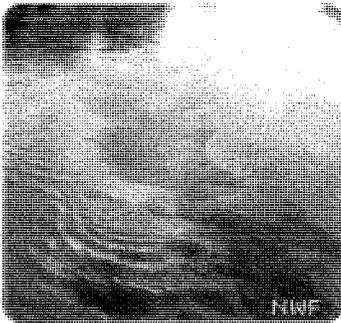


From the skyscrapers of bustling Chicago to the remote, rocky shores of Lake Superior, the Great Lakes region is one of America's most precious resources for people and wildlife. The lakes directly provide one in ten Americans with water for drinking and agriculture, and offer countless opportunities to connect with the outdoors. Few places on earth grant as many opportunities to enjoy wildlife from fishing to bird watching to hiking. The Great Lakes region also provides a multitude of sporting opportunities including sailing, kayaking, running, biking or skiing along the gorgeous shores of these immense fresh water

seas. The Great Lakes are the largest unfrozen freshwater source in the world and the region provides valuable habitat for iconic species like moose, lynx, wolves and loons, as well as endangered species like the beautiful Karner Blue Butterfly, Cerulean Warbler and the prehistoric Lake Sturgeon. **Yet, a growing threat looms, putting the health and future of the Great Lakes region at grave risk.** The region is encircled by a vast array of pipelines, sending toxic, spill-prone, and impossible-to-clean-up tar sands oil through the Great Lakes region. Tar sands oil is a carbon-intensive, sticky substance that is mined and drilled from deposits in the evergreen forests and rich wetlands of Northern Alberta, which is eventually refined into gasoline, jet fuel, and other transportation fuels.

The Direct Threats to the Region

Toxic Tar Sands Oil Spills and Explosions



With pipelines throughout the Great Lakes region, the threat of catastrophic tar sands oil spills imperils extensive habitat and water supply areas. The Great Lakes region already suffered a horrific spill in 2010 when nearly a million gallons of tar sands oil spilled into the Kalamazoo River. Thousands of birds, turtles, and small mammals, such as beavers, were affected by the spill, and many died. Tar sands oil pipelines currently threaten areas where wildlife thrive such as the Chippewa National Forest, Saint Louis River Estuary, and Necedah National Wildlife Refuge. Plans are currently being drawn up to allow tar sands oil to enter the Great Lakes region via tanker and some is starting to come in by rail. Such threats pose further spill risks to the Great Lakes region.

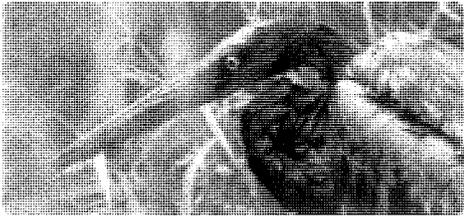
Climate Impacts



Tar sands oil is far more carbon polluting than conventional fossil fuels, with up to a 37% higher life-cycle basis than regular oil. The tar sands oil industry currently plans a massive expansion of the mining and export of tar sands oil provided they are able to transport their product to market. These tar sands oil transportation projects and the development they will trigger will serve to lock in run-away climate

change. The Great Lakes region has already begun seeing the harsh impacts of climate change, such as reduced water levels, increased frequency of intense storm events, and warmer water temperatures, all of which feed massive algae blooms. Algal blooms make recreation in the Great Lakes dangerous, smelly and unpleasant, and can also cause fish and wildlife dead zones in the usually productive Great Lakes.

Dirty Refineries



More tar sands will mean more pollution from the oil refineries processing tar sands oil throughout the region. Unrefined tar sands oil is heavier and contains substantially more toxins than conventional oil, resulting in a more intensive and polluting refining process. These pollutants may also be released into the communities surrounding the refineries, harming wildlife and jeopardizing the health of people living nearby. Refining tar sands oil also creates a harmful, coal-like solid byproduct called petroleum coke, or petcoke. This byproduct is often stored in massive, uncovered piles outside of refineries, frequently along rivers, allowing dust from the piles to contaminate neighboring rivers and communities. Petcoke can also be burned to create electricity, releasing more carbon pollution to the atmosphere and further exacerbating all the negative impacts of climate change.

Protecting the Great Lakes Region

Tar sands oil poses unacceptable risks to the Great Lakes region's treasures of wildlife, humanity and outdoor enjoyment. We do not have to accept those risks. Rather than building dangerous infrastructure that places our largest freshwater resources at risk, we need to invest in clean, wildlife-friendly energy sources and expand clean transportation solutions.

To protect wildlife, resources and communities, we recommend:

- The State Department should conduct a thorough public environmental review of the proposed Alberta Clipper expansion that accounts for all of the risks posed to the Great Lakes region and beyond from increased tar sands oil transport across the border.
- President Obama should consistently apply his "climate test"¹¹⁴ to all tar sands oil pipelines and reject them if they are found to significantly exacerbate the problem of carbon pollution, as he has committed to doing with Keystone XL.
- States in the Great Lakes region should put in place policies, like Clean Fuels Standards, that will reduce reliance on dirty fossil fuels and speed the transition to clean, renewable sources of energy that protect wildlife and people.

IMPORTING DISASTER

The Anatomy of Enbridge's Once and Future Oil Spills

NATIONAL WILDLIFE FEDERATION

2012



We all know the companies we buy our gas from: Exxon, BP, Shell, just to name a few. But do you know much about the companies that build, maintain, and operate the pipelines that transport oil throughout North America? Recently, corporations like Enbridge, Inc., TransCanada Corp., and Kinder Morgan, Inc. have entered into the public consciousness as part of the national energy debate. These companies are in the business of moving oil across our landscape—heavy crude oil from Canada's tar sands fields, for example—and have an obligation to operate their pipelines safely, clean up their spills, and not unduly influence lawmakers who are tasked with overseeing their operations. Our focus in this short report is on Enbridge, Inc., because of their shoddy safety record and their bold plans to expand their pipeline network in the U.S. to move dirty Canadian tar sands oil to market.

HERE ARE 3 THINGS YOU SHOULD KNOW ABOUT ENBRIDGE, INC.:

1. They are the world's biggest transporter of Canadian tar sands oil, the planet's dirtiest oil;
2. They are responsible for the biggest inland pipeline spill in American history—Over 1 million gallons near Kalamazoo, Michigan in July 2010; and
3. They have just announced a multi-billion dollar plan to expand their tar sands pipeline network in the U.S., which has serious ramifications for American energy policy.

As the biggest transporter of Canadian tar sands oil into the U.S., Enbridge has a responsibility to the American public to manage their operations in a manner that protects our communities and natural resources. But tar sands oil is a very different beast than conventional crude oil, and it is difficult to transport the former safely through pipelines that were designed for the latter. That's because tar sands oil is more corrosive (due to its chemical mixture) and abrasive (due to high-grit minerals), weakening the



CONFRONTING GLOBAL WARMING



Great Blue Heron on the Kalamazoo River, covered in tar sands oil from the Enbridge spill.

pipes to the point that they are more susceptible to leaks and ruptures. Remarkably, there are no standards in place to ensure that new pipelines are built, maintained and operated with this fact in mind. As if these problems are not enough, when it spills, tar sands oil is much harder to clean up than conventional crude oil, most notably because it sinks in water, rather than floats, putting our streams and rivers at risk.

Unfortunately, dirty energy companies have such a stranglehold on our politicians that even modest initiatives, like basic safety regulations for tar sands oil, rarely see the light of day in Washington. Until we break Big Oil's grip on our policymakers, meaningful and needed reforms to protect our water, protect our communities, and improve our energy future stand little chance of being enacted. A company with Enbridge's safety record cannot be allowed to expand without strict oversight and scrutiny. Otherwise, the risk of another serious spill is too great.

Are we going to let Enbridge expand their pipeline network in the U.S. and maximize profits, without implementing strong safety standards and practices? We know tar sands pipelines are going to spill. The only remaining questions are—When? How much? Where? Will it get cleaned up? And who will pay for it?



A Shoddy Safety History

On the evening of July 25, 2010, an Enbridge pipeline ruptured near Marshall, Michigan. Hundreds of miles across the border in the company's Edmonton, Alberta control center, alarms sounded, but operators ignored them and attempted several times to restart the pipeline—a mistake that compounded the disaster. Meanwhile, Marshall residents flooded the 911 line with alerts about a noxious petroleum smell permeating the air. Finally, a local natural gas worker alerted Enbridge to the spill that was pouring into Talmadge Creek and the Kalamazoo River.

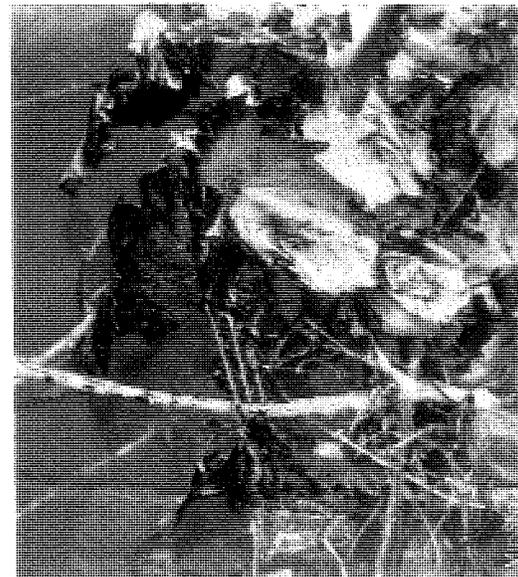
Just ten days prior, in testimony to Congress, Enbridge Vice President Richard Adams, had vouched for his company's ability to respond quickly to emergencies. "Our response time from our control center," said Adams, "can be almost instantaneous, and our large leaks are typically detected by our control center personnel." But in Marshall, when it mattered, 17 hours passed between the initial warnings and the time the first Enbridge employee arrived on site. By the time they had managed to shut down the pipeline, more than 1.1 million gallons of crude oil had been spilled.¹ It stands as the largest inland pipeline accident in U.S. history.

The Environmental Protection Agency ordered Enbridge to clean up the mess, but after two years, workers are still struggling to remove residual crude oil that has sunk into the riverbed and wetlands. As of July 2012, approximately \$800 million has been spent on a cleanup that is still not finished. So far, the cost of the tar sands clean-up has been 18 times more expensive than conventional oil spills.² The federal government levied a record \$3.7 million fine and 24 enforcement actions against Enbridge,³ a mere drop in the bucket

for a company that files over \$2 billion in profits annually.⁴

In July 2012, the National Transportation Safety Board (NTSB) released findings from their two year investigation into the spill, and revealed that Enbridge knew that its pipeline had been damaged five years prior to the spill. The NTSB was scathing in its assessment of the company's response, comparing Enbridge to the "Keystone Kops," the pinnacle of incompetence.⁵

The Kalamazoo spill may have been a poster child for corporate negligence but it is far from the company's only black mark. According to Enbridge's own reports, between 1999 and 2010 they have been responsible for at least 800 spills that have released close to



seven million gallons of heavy crude oil into the environment—or approximately half the amount of oil that spilled from the *Exxon Valdez* in 1989.⁷ Canada has seen its own share of Enbridge heartache, including a 61,000 gallon spill earlier this summer near Elk Point, Alberta.⁸

**TOTAL SPILLS ON ENBRIDGE PIPELINES
(CANADA AND U.S.). 1999 - 2010⁶**

Year	Number of Spills	Quantity of Gallons Spilled
1999	54	1,207,920
2000	48	315,546
2001	34	1,091,160
2002	48	616,686
2003	62	269,220
2004	69	136,584
2005	70	412,650
2006	68	240,828
2007	65	578,634
2008	92	119,364
2009	103	354,522
2010	91	1,438,836
TOTAL	804	6,781,950

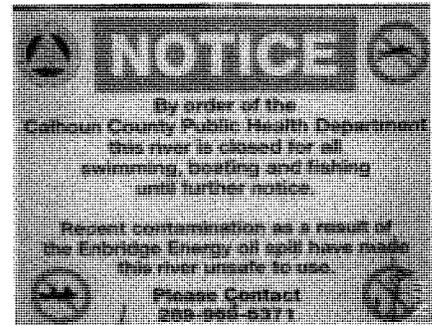
Exploiting Disaster

Before the Kalamazoo disaster had even been untangled, Enbridge began a series of moves to expand their Lakehead system, the pipeline network within the U.S. shown in purple in the map below that includes the ruptured line 6B, which runs from Chicago to Sarnia, Ontario. While Enbridge moved ahead to replace the ruined pipeline, they took the opportunity to replace and enlarge a particular section of the pipe that crosses the U.S./Canada border. With this new, bigger line in place, Enbridge dodged a key step in the federal regulatory process: the need for a "Presidential permit" issued by the U.S. State Department, which would have entailed a thorough environmental review of the project as a whole.

In fact, Enbridge has continued to put forth, piece by piece, projects labeled as "maintenance and rehabilitation," when in fact, each piece is replacing a majority of the existing Line 6B line with larger pipe.

Once completed, this new line will almost triple the capacity of the old one to create a system capable of shipping 33.6 million gallons per day, nearly as much as the contentious Keystone XL pipeline.⁹ Instead of a comprehensive federal review, Enbridge has only been required to obtain approval by the Michigan Public Service Commission, an agency that does not have the resources or the mandate to examine the project's broader impacts. This leaves major concerns and gaps in the review process, including the wide range of environmental impacts locally, nationally, and globally.

What's more, Enbridge intends to send this dirty fuel *through* Canada and the U.S. to ports on the east coast: In May 2012, Enbridge publicly announced a \$3.2 billion project to move oil from western Canada to refineries near Montreal.¹⁰ The plan involves the Line 6B expansion, plus the flow reversal of an existing



pipeline (Line 9)—which, coupled with semi-secret plans to reverse the flow of the "Portland/Montreal Pipeline," adds up to an unbroken pathway from Alberta's tar sands region to Portland, Maine.¹¹

Enbridge, having learned a lesson from TransCanada, Inc.'s bruising fight over Keystone XL, won't admit that the pieces add up to a greater whole, but their plans make no sense out of this context. Their carefully-worded denials simply don't hold water.

A tar sands pipeline route through eastern Canada to New England will put at risk cherished places like Lake Ontario, the Saint Lawrence River, the Connecticut River, the Androscoggin River, Sebago Lake and Casco Bay.¹² Citizens in Vermont, New Hampshire, and Maine may be next in line for a rude awakening, Kalamazoo style.

THE PLAN TO PUMP TAR SANDS THROUGH EASTERN CANADA AND NEW ENGLAND



Marketing Tar Sands Pipelines

Normally, a company attempting a major expansion while still under the cloud of disaster has very few options to convince the public that they should be allowed to proceed. A slick marketing campaign is a logical first step, and for a company like Enbridge, it can be easier to “greenwash” their image than it is to implement strong safety protections.

While they are trying to keep their expansion plans quiet in the U.S., Canada is a different story. In April 2012, Enbridge launched a \$5 million ad campaign to promote its massive Northern Gateway pipeline, which would extend from Alberta across British Columbia to the Pacific coast.¹³ (Remember, their fine for the Kalamazoo spill was only \$3.7 million.)



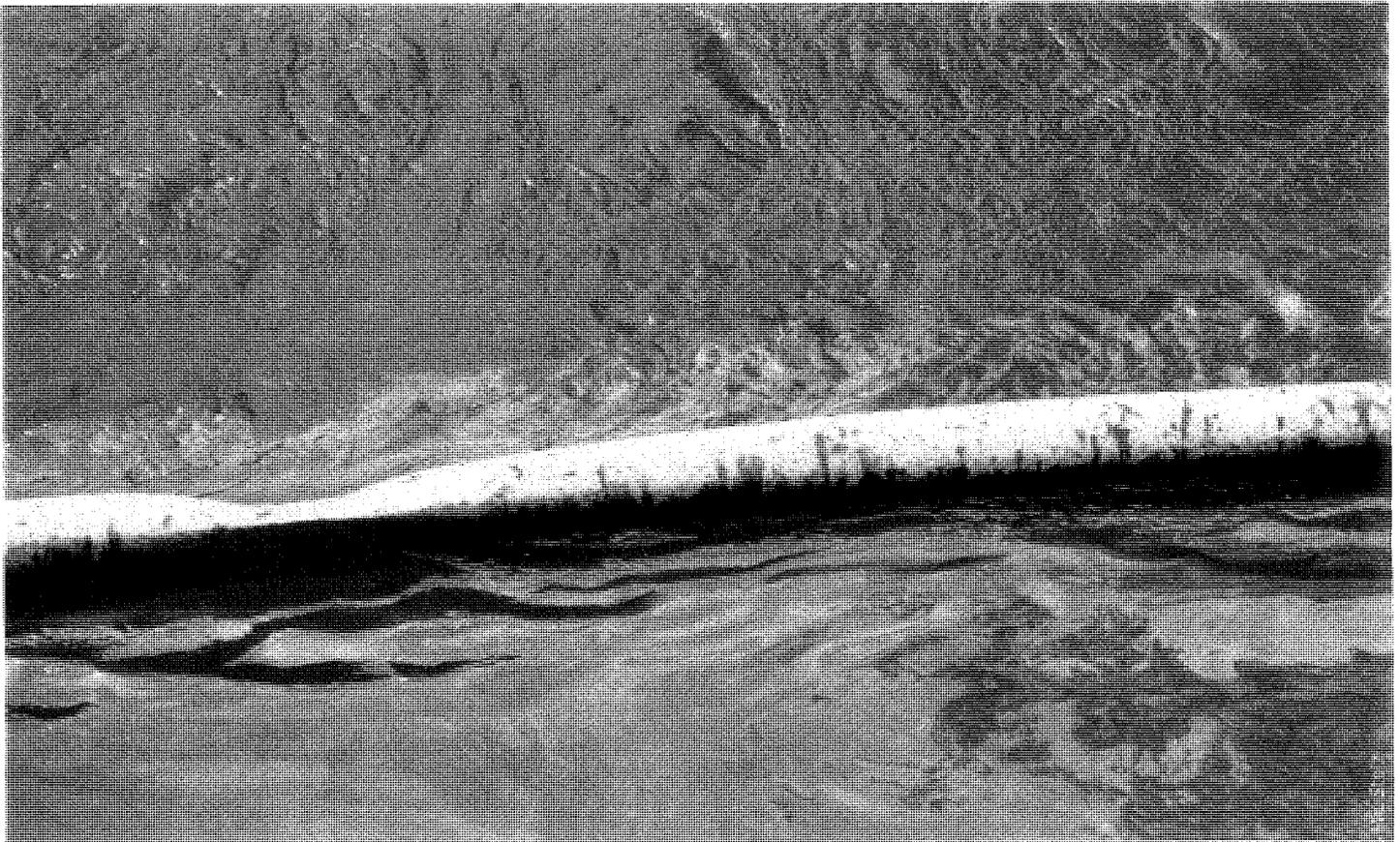
After reviewing the NTSB report on the Kalamazoo spill, British Columbia Premier Christy Clark publicly warned Enbridge, Inc. saying, “I think the company should be deeply embarrassed about what unfolded.... If they think they’re going to operate like that in British Columbia – forget it.”¹⁴

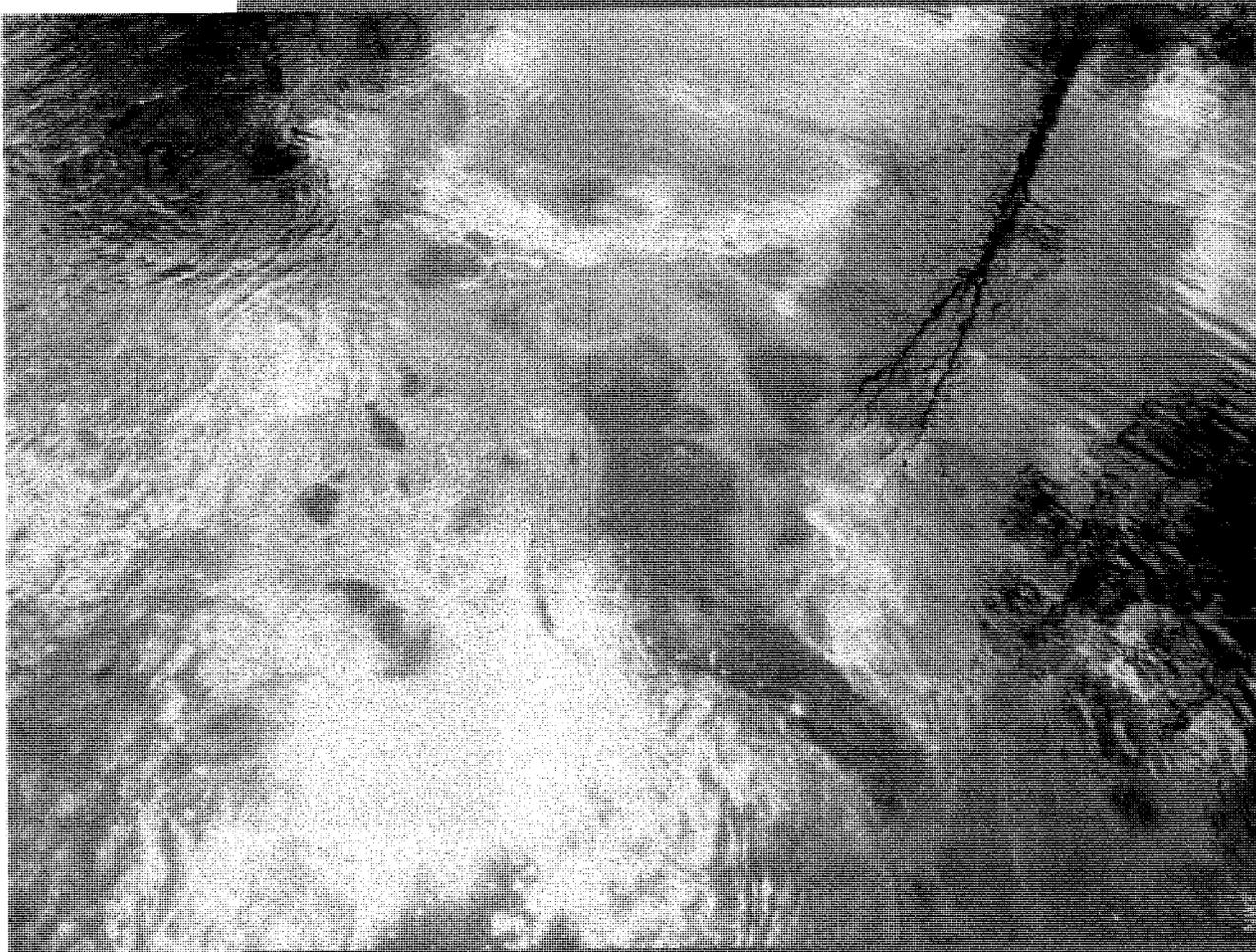
The advertisement and accompanying press release claim that the pipeline would be built to “world-class safety standards” that will “respect the terrain and wildlife.” The feel-good ad ends with the anodyne slogan—“It’s more than a pipeline. It’s a path to our future.”

Slick ads are one thing; material change is another. We need to know that Enbridge has learned from its mistakes and will not make them again. In the case of Enbridge, they have a big hurdle to overcome, restoring credibility as a company to be trusted.

Enbridge notes

- ¹ <http://www.dot.gov/affairs/2012/phmsa1512.html> (1 barrel = 42 gallons)
- ² <http://blog.nwf.org/2012/05/big-oils-big-plans-for-tar-sands-in-new-england/>
- ³ <http://www.dot.gov/affairs/2012/phmsa1512.html>
- ⁴ http://www.enbridge.com/InvestorRelations/FinancialInformation/~/_media/www/Site%20Documents/Investor%20Relations/2011/2011_ENB_AnnualGAAPFS.ashx (Page 4: Revenue - Expenses)
- ⁵ <http://www.latimes.com/news/nation/nationnow/la-na-nn-enbridge-oil-spill-michigan-20120710,0,5755454.story>
- ⁶ <http://www.tarsandswatch.org/files/Updated%20Enbridge%20Profile.pdf> (Page 50)
- ⁷ *ibid*
- ⁸ <http://www.vancouversun.com/news/Alberta+Point+pipeline+spill+releases+litres+heavy+crude+Enbridge/6809014/story.html>
- ⁹ <http://community.nasdaq.com/News/2012-05/enbridge-plans-1b-plus-investment-analyst-blog.aspx?storyid=141059>
- ¹⁰ <http://www.reuters.com/article/2012/05/17/us-enbridge-idUSBRE84G0HE20120517>
- ¹¹ <http://blog.nwf.org/2012/05/big-oils-big-plans-for-tar-sands-in-new-england/>
- ¹² <http://thinkprogress.org/climate/2012/07/07/512140/tar-sands-giants-sneaky-new-playbook-revealed/>
- ¹³ <http://www.northerngateway.ca/news-and-media/northern-gateway-blogs/jobs-and-benefits/it-s-a-path-to/>
- ¹⁴ <http://www.theglobeandmail.com/news/british-columbia/bc-premier-puts-enbridge-on-notice-over-pipeline-safety/article4409199/>





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Two Years Later and the Tar Sands Mess in Michigan Still Looks Ugly

07/25/2012 04:39 pm ET | Updated Sep 24, 2012

- Natural Resources Defense Council Midwest Program Director



This week marks the two-year anniversary of the massive Kalamazoo River pipeline spill. The event looks very different now than it did in 2010, when authorities openly worried that the Michigan mess would ooze tar sands oil into the Great Lakes. While there is still work underway to sop up the spill, it already stands as the longest and costliest pipeline cleanup in American history. And the ongoing investigations have given us a clearer and more frustrating view of the disaster, making it clear to anyone looking that our growing affinity for Canada's bottom-of-the-barrel unconventional tar sands oil is unsafe on a variety of levels.

In Michigan, the EPA has spent the last two years "writing the book" on what a tar sands cleanup looks like in an American river. While the disaster was unfolding, the CEO of Enbridge was on-hand, but did not bother to tell authorities that they should consider some alternative cleanup techniques to deal with the heavier-than-water bitumen slurping out of his busted pipe. As a result, the cleanup was largely focused on skimming oil off the surface initially. Later, officials realized that a wide swath of the river bottom was mucked with tar sands oil globules, as were sensitive wetlands along the waterway. The cleanup has focused on those areas since and recent press reports imply that even though most of the oil is gone, some of those submerged globules are continuing to spread.

The fact that Enbridge's CEO did not offer up help in this area is not surprising. The National Transportation Safety Board reports detailing the disaster are riveting to read; offering a shocking and damning account of incompetence and a bullying work atmosphere in the Alberta control room that was supposed to prevent this sort of spill. But his unwillingness to even admit that tar sands were involved in the unfortunate incident, even when asked directly by multiple reporters, continues to shock me.

And that lack of transparency is an important point at this moment in time. There are beavies of new tar sands pipeline projects being pushed through at the moment. Sure, there's the overly-politicized ugliness around Keystone XL. But there is also the pipeline reversal scheme in central Canada and New England that had gone by the name Trailbreaker at one time, but is now broken into smaller pieces so as to more easily sneak the plan to export tar sands oil from the east coast through. In Canada, there is the much-hyped and much-delayed Northern Gateway project which would move tar sands through the Rockies to an unwelcoming British Columbia coast. Here in Illinois, there is a pipeline that would move the oil from Flanagan south to the Gulf Coast, an effort to move tar sands oil out of the Midwest and

increase the price refineries in this region pay for the commodity (but guess who likely eventually pays that cost at the pump...).

And, of course, there's Enbridge's galling plan in Michigan.

Enbridge was warned of hundreds of anomalies in their Line 6B. For years, they did nothing about them until one of those anomalies burst, spilling that million gallons of tar sands into the Kalamazoo River. Now, the company plans to replace the entire pipeline. No, not to eliminate the anomalies, but to double its capacity. This comes even as their Michigan disaster is informing a debate about whether raw tar sands oil, which is more acidic and chock full of corrosion-inducing sulfur than typical petroleum, can even be moved safely in pipelines. The National Academy of Sciences is holding hearings on the issue this week and a report is due next year. But of course, Enbridge isn't waiting for that. Which leaves me wondering if they just do not understand the dangers of the stuff they are forcing at high pressure and elevated temperatures through their pipelines, or if they just don't care. Take this astounding op-ed from an Enbridge VP that ran in a Michigan paper. It is so full of mistruths and mischaracterizations that I am left scratching my head unable to decide whether the errors are intentional or not. But whatever the case, folks along the pathways of Keystone XL and all the rest of those tar sands projects should pay heed. The Kalamazoo River spill undercuts all the safety claims about speedy response (it took them more than 17 hours to shut the pipeline down) and leak detection (the spill was identified by a staffer from a natural gas utility in Michigan). And it makes clear that this stuff isn't your daddy's oil. It is heavy, stubborn and tough to clean. We already know it is the worst carbon polluting petroleum on the planet. In this steamy summer, we should already be concerned about its expanding usage and the impact on our climate. But we still don't even know if it can be safely moved in the US. With so many of these projects moving past and through sensitive water resources, it only takes one glance at the Kalamazoo to know that we shouldn't be moving more of this stuff until we can figure that out.

This post originally appeared on [NRDC's Switchboard blog](#).

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'Keystone Kops' Bungling Led to Costliest U.S. Pipeline Spill

July 25, 2012 — 5:19 PM EDT

By Elizabeth McGowan and Lisa Song

The following is an excerpt from "[The Dilbit Disaster: Inside the Biggest Oil Spill You've Never Heard of](#)," a seven-month investigation by [InsideClimate News](#), a non-profit news organization focused on climate change and energy issues. To see a slideshow about the 2010 Enbridge oil spill, [click here](#).

An acrid stench had already enveloped John LaForge's five-bedroom house when he opened the door just after 6 a.m. on July 26, 2010. By the time the building contractor hurried the few feet to the refuge of his Dodge Ram pickup, his throat was stinging and his head was throbbing.

LaForge was excavating a basement when his wife called a couple of hours later. The odor had become even more sickening, Lorraine told him. And a fire truck was parked in front of their house, where Talmadge Creek rippled toward the Kalamazoo River.

LaForge headed home. By the time he arrived, the stink was so intense that he could barely keep his breakfast down.

Something else was wrong, too.

Water from the usually tame creek had inundated his yard, the way it often did after heavy rains. But this time a black goo coated swaths of his golf course-green grass. It stopped just 10 feet from the metal cap that marked his drinking water well. Walking on the tarry mess was like stepping on chewing gum.

LaForge said he was stooped over the creek, looking for the source of the gunk, when two men in a white truck marked Enbridge pulled up just before 10 a.m. One rushed to LaForge's open front door and disappeared inside with an air-monitoring instrument.

The man emerged less than a minute later, and uttered the words that still haunt LaForge today: *It's not safe to be here. You're going to have to leave your house. Now.*

John and Lorraine LaForge, their grown daughter and one of the three grandchildren living with them at the time piled into the pickup and their minivan as fast as they could, given Lorraine's health problems. They didn't pause to grab toys for the baby or extra clothes for the two children at preschool. They didn't even lock up the house.

Within a half hour, they had checked into two rooms at a Holiday Inn Express, which the family of six

would call home for the next 61 days.

The LaForges' lives had been turned upside down by the first major spill of Canadian diluted bitumen in a U.S. river. Diluted bitumen is the same type of oil that could someday be carried by the much-debated Keystone XL pipeline. If that project is approved, it would cross the Ogallala aquifer, which supplies drinking water for eight states as well as 30 percent of the nation's irrigation water. President Barack Obama rejected TransCanada Corp.'s initial pipeline permit application in January, inviting them to reapply with an alternative route, which it has.

"People don't realize how your life can change overnight," LaForge told an InsideClimate News reporter as they drove slowly past his empty house in November 2011. "It has been devastating."

* * * *

July 25 marks the second anniversary of the nation's most costly oil pipeline accident—a rupture that dumped more than 1.1 million gallons of heavy crude into Michigan's Kalamazoo River, according to the U.S. Environmental Protection Agency. The spill drove 150 families permanently from their homes. The U.S. Pipeline and Hazardous Materials Safety Administration proposed \$3.7 million in civil fines for Enbridge on July 2. The National Transportation Safety Board (NTSB) recently cited the company for failing to properly maintain the pipeline and chastised the pipeline safety agency for weak federal regulations.

The spill happened in Marshall, a community of 7,400 in southwestern Michigan. More than 1.1 million gallons of oil blackened two miles of Talmadge Creek and almost 36 miles of the Kalamazoo River, according to the EPA's most recent Situation Report (pdf). The EPA's estimate of the amount of oil that has been collected exceeds Enbridge's estimate of 843,444 gallons by 15 percent. Enbridge spokeswoman Terri Larson told InsideClimate News that the company stands by that number as accurate.

Oil is still showing up two years later, as the cleanup continues. About 150 families have been permanently relocated and most of the tainted stretch of river between Marshall and Kalamazoo remained closed to the public until June 21.

The accident was triggered by a six-and-a-half foot tear in Line 6B, a 30-inch carbon steel pipeline operated by Enbridge Energy Partners LP, a U.S. affiliate of Enbridge Inc., Canada's largest transporter of crude oil. With Enbridge's costs already totaling more than \$765 million, it is the most expensive oil pipeline spill since the U.S. government began keeping records in 1968.

"This investigation identified a complete breakdown of safety at Enbridge. Their employees performed like Keystone Kops and failed to recognize their pipeline had ruptured and continued to pump crude into the environment," said NTSB Chairman Deborah A.P. Hersman in a July 10 press release. "Despite multiple alarms and a loss of pressure in the pipeline, for more than 17 hours and through three shifts

they failed to follow their own shutdown procedures." Enbridge restarted the pipeline twice in that 17-hour period, pumping through oil that would account for 81 percent of the total spill, the NTSB said.

Despite the scope of the damage, the Enbridge spill didn't attract much national attention, perhaps because it occurred just 10 days after oil stopped spewing from BP Plc's Macondo well in the Gulf of Mexico, which ruptured three months earlier. Early reports about the Enbridge spill also downplayed its seriousness. Just about everybody, including the EPA officials who rushed to Marshall in July 2010, expected the mess to be cleaned up in a couple of months.

What the EPA didn't know then, however, was that Line 6B was carrying bitumen, the dirtiest, stickiest oil on the market.

Bitumen is so thick—about the consistency of peanut butter—that it doesn't flow from a well like the crude oil found in most of the nation's pipelines. Instead the tarry resin is either steamed or strip-mined from sandy soil. Then it is thinned with large quantities of liquid chemicals so it can be pumped through pipelines. These diluents usually include benzene, a carcinogen. At this point it becomes diluted bitumen, or dilbit.

The National Resources Defense Council and some other environmental organizations say dilbit is so acidic and abrasive that it's more likely to corrode and weaken pipes than conventional oil. The oil industry disputes that hypothesis. Enbridge and other companies say dilbit is no different from conventional crude.

No independent scientific research has been done to determine who is right. But there is one fact neither side disputes: The cleanup of the Kalamazoo River dilbit spill was unlike any cleanup the EPA had ever tackled before. The National Academy of Sciences is conducting a research project into the "pipeline transport of diluted bitumen" that meets for the first time this week.

Instead of remaining on top of the water, as most conventional crude oil does, the bitumen gradually sank to the river's bottom, where normal cleanup techniques and equipment were of little use. Meanwhile, the benzene and other chemicals that had been added to liquefy the bitumen evaporated.

InsideClimate News learned that federal and local officials didn't discover until more than a week after the spill that Line 6B was carrying dilbit, not conventional oil. Federal regulations do not require pipeline operators to disclose that information, and Enbridge officials did not volunteer it.

Mark Durno, an EPA deputy incident commander who is still involved in the cleanup in Marshall, is among those who were surprised by what they found.

"Submerged oil is what makes this thing more unique than even the Gulf of Mexico situation," Durno said. "Yes, that was huge—but they knew the beast they were dealing with. This experience was brand new for us. It would have been brand new for anyone in the United States."

Jim Rutherford, the public health officer for Michigan's Calhoun County, said he had "no idea what I was driving into," when he rushed to Marshall the day 6B ruptured.

"We just weren't ready for anything of this magnitude," Rutherford said. "We didn't even know the nature of the type of crude."

Visit www.bloomberg.com/sustainability for the latest from Bloomberg News about energy, natural resources and global business.

-0- Jul/25/2012 21:19 GMT

Six primary agencies have responded to the emergency:

- U.S. Environmental Protection Agency (EPA)
- Michigan Department of Natural Resources and Environment (MDNRE)
- Michigan State Police Emergency Management Division
- Calhoun County Public Health Department
- Calhoun County Sheriff
- Kalamazoo County Sheriff

Supporting and assisting agencies:

- Agency for Toxic Substances and Disease Registry (division of U.S. Dept. of Health and Human Services)
- Allegan County Emergency Management
- American Red Cross
- Augusta Police Department
- B&B Fire Safety Emergency Response
- Calhoun Conservation District
- Calhoun County Commissioners
- Calhoun County Drain Commission
- Calhoun County Sheriff's Office
- Calhoun County Treasurers Office
- Calhoun Conservation District
- Calhoun Greenation District
- City of Battle Creek, Michigan
- City of Marshall, Michigan
- Federal Energy Regulatory Commission
- Fredonia Township Fire Department
- Huron Potawatomi
- Kalamazoo County Office of Emergency Management
- Kalamazoo Public Safety
- Kalamazoo County Health Department
- Kalamazoo Watershed Council
- Marshall Township Government and Fire Department
- Marshall Police Department
- Michigan Department of Community Health
- Michigan Occupational Safety & Health Administration
- Natural Resource Group
- Pipeline Hazardous Materials Safety Administration
- National Oceanic and Atmospheric Administration

- U.S. Coast Guard – U.S. Department of Transportation
- U.S. Fish & Wildlife Service
- Occupational Safety & Health Administration

How is the spill being contained?

So far, containment measures have limited the impact of the spill on the Kalamazoo River. To control the spill as much as possible, EPA and Enbridge have been placing containment and absorbent booms at strategic points on the river. Containment booms keep the oil from spreading. Absorbent booms, in addition to stopping movement, soak up the oil.

The response also includes the use of vacuum trucks and skimmer equipment to remove oil from the surface of the water.

What measures are being taken for the health and safety of those responding to the spill?

EPA, Michigan Occupational Safety and Health Administration (MIOSHA) and state and local responders have specific guidelines for working in an oil-related chemical environment. Cleanup crews must have specific safety training, skill sets, qualifications and certifications to ensure the safety of the spill site. Additionally, those working within the oil-affected areas are required to wear specific personal protective equipment. Safety and health officials are also on-scene monitoring oil spill response activities.

Will the spill affect the Kalamazoo River Superfund site?

The initial spill occurred near Marshall, and the Kalamazoo River Superfund site is not expected to be affected by the spill. However, officials continue to monitor developments on the river.

As a precaution, CCPHD and HCS are providing bottled water for drinking and cooking to those who live in homes with wells in those areas. If you have concerns about your private well, contact the Calhoun County Public Health Department, 269-969-6341, or the Kalamazoo County Health Department at 269-373-5210.

Wells outside the 200-foot area on either side of these waters are not likely to be affected by the spill since underground water supplies (“ground water” in environmental terms) typically flow toward rivers. Irrigation activities are not expected to affect either the direction of the ground water flow or well quality outside the 200-foot areas.

My water tastes or smells different. What should I do?

If you have concerns about your water, contact the Calhoun County Public Health Department, 269-969-6341, or the Kalamazoo County Health Department at 269-373-5210.

Can I swim or boat in the Kalamazoo River?

Kalamazoo County Health and Community Services has issued a ban on surface water activities on the Kalamazoo River as part of the county’s state of emergency, including swimming, wading, fishing, boating, canoeing and kayaking. Local health officials warn citizens to avoid all contact with water from the Kalamazoo River until further notice.

Calhoun County Public Health Department has issued a ban on the use of water from Talmadge Creek and the Kalamazoo River in Calhoun County for irrigation or livestock watering purposes. The Calhoun health department has also posted signs along the river saying it is closed for all swimming, boating and fishing.

Additionally, Michigan Department of Community Health advises that no one should swim, boat or touch the water of the Kalamazoo River from the west side of Morrow Lake upstream to the spill site.

Can we eat fish caught from the Kalamazoo River and Morrow Lake?

The Michigan Department of Community Health has issued an advisory for the waters downstream

(west) of I-69 on the Kalamazoo River to the west end of Morrow Lake. No one should eat fish of any kind from this stretch of the river. All post-oil spill fish advisories continue for other parts of the Kalamazoo River. See the Michigan Department of Community Health website for more information.

What should I do if I happen to get oil on my skin or clothing?

Wash affected skin with soap and water. Avoid using harsh detergents, solvents or other chemicals to wash oil from skin as they may promote absorption of the oil through the skin.

If you get oil on your clothing, wash in the usual way but separate from other clothing.

Wildlife and livestock FAQs

How does this affect livestock?

The Michigan Department of Agriculture has issued a ban on using the Kalamazoo River for drinking water for any animal or for irrigation (including watering lawns and golf courses). The ban was revised Aug. 7 to include only the Kalamazoo River above Morrow Dam and upstream to the point of the spill or any connected waters. More information is available from the Michigan Department of Agriculture.

What should I do if I see wildlife that has been exposed to the oil?

A wildlife rehabilitation center is open and receiving wildlife. If you see affected wildlife, call 800-306-6837. More information about spills and helping wildlife is available on the U.S. Fish and Wildlife website.

Response FAQs

What government agencies have responded to the emergency?

As Federal On-Scene Coordinator, EPA is leading the unified federal, state and local response to the incident. Emergency responders are working around-the-clock throughout the affected area. The unified response team includes federal, state and local agencies and EPA-approved contract workers.

What if I have health concerns about the spill?

If you live in an area affected by the oil spill and have questions about the potential impact on your health, call your doctor or contact the Calhoun County Public Health Department, 269-969-6341, or the Kalamazoo County Health Department at 269-373-5210. If you are experiencing serious health problems, seek immediate medical care or call 911.

Why are families being asked to voluntarily evacuate or relocate? Will I need to leave my home?

EPA is monitoring the air around-the-clock. The tools they are using can provide immediate information about the levels of chemicals in the air. The air sampling results have shown one chemical – benzene - at a level of potential concern for long-term health. Based on these concerns, the Calhoun County Public Health Department issued a voluntary evacuation notice on July 29 for people living in the most highly impacted areas. As the response progresses, it is possible there will be additional need for relocations.

- **Who will take care of my pets if I am evacuated voluntarily?**

Enbridge has committed assistance to anyone who lives within the voluntary relocation areas along the Kalamazoo River. Those affected should call the Enbridge public information line, 800-306-6837, where specific questions regarding individual situations can be answered.

What is being done to protect us from chemicals from the oil spill?

Public health officials are continuing to have air and water tested for harmful chemicals in affected areas around-the-clock. Based on these test results, officials are making decisions about the need to take actions such as evacuation recommendations and water advisories. Monitoring of air and water will continue as necessary to protect human health and the environment.

How might benzene affect my health?

In some areas affected by the spill, Calhoun County Public Health Department issued voluntary evacuation notices based on the level of benzene

measured in the air. Exposure to these levels of benzene can affect people differently. Some people may feel sleepy or dizzy. Others may get headaches. Benzene can also cause nausea, vomiting or a rapid heart rate. Long-term exposures to benzene may increase your risk of cancer. This is one of the key reasons the Calhoun County Public Health Department issued a voluntary evacuation, recommending residents temporarily relocate from the most highly impacted areas until the oil-related chemicals no longer pose a human health threat.

Who will pay for my doctor visits and medical bills?

People directly affected by the oil spill should call the Enbridge public information line, 800-306-6837, with specific questions regarding individual situations.

Have municipal water systems been affected by the spill?

Marshall and Battle Creek municipal water systems have NOT been affected by the oil spill. To date, there have been no indications the spill has contaminated any municipal water supply. Under the Safe Drinking Water Act, EPA sets legal limits on the levels of certain contaminants in drinking water to protect human health. Water systems have routine water testing schedules and methods that they must follow to detect contaminated water. These rules also list acceptable techniques for treating contaminated water.

Will my private well be impacted by the oil spill?

Calhoun County Public Health Department and Kalamazoo County Health & Community Services officials have been evaluating the potential impact the spill has had on private water wells. The health departments have been conducting a systematic evaluation of private drinking wells located within 200 feet of either side of the Kalamazoo River and Talmadge Creek. At this point, no well contamination has been detected. Calhoun County Public Health Department (CCPHD) and Kalamazoo County Health & Community Services (HCS) will continue to evaluate residents' well water in the affected area.



Oil Spill: Answers to Frequently Asked Questions

Enbridge Oil Spill

Marshall, Michigan

August 2010

For more information

If you have questions, comments or need more information about the Enbridge oil spill you can contact:

Don de Blasio

EPA Community Involvement
Coordinator

Cell Phone: 312-343-6666

Office Voice Mail: 312-886-4360
deblasio.don@epa.gov

On the Web

EPA has established a website at www.epa.gov/enbridgespill to provide daily information about the response.

More contacts

Public:

A toll-free number for the public has been established for this emergency:
800-306-6837

Media members:

888-363-8632
spillpress@epa.gov

On Monday, July 26, 2010, Enbridge Energy Partners LLP reported the burst of a 30-inch pipeline near Marshall, Michigan. The company estimates that more than 800,000 gallons of crude oil spilled into Talmadge Creek, a waterway that feeds the Kalamazoo River. U.S. Environmental Protection Agency has not independently confirmed this number. The spill has affected up to 25 miles of the Kalamazoo River. The spill site, between Marshall and Battle Creek, includes marshlands, residential areas, farmland and businesses.

Here are some answers to frequently asked questions (FAQs) regarding the spill situation:

General FAQ

What areas are affected by the oil spill?

The Enbridge Oil Spill and Response affects communities along Talmadge Creek and the Kalamazoo River in Calhoun County and Kalamazoo County, Michigan. EPA and unified federal, state and local agencies want people to be aware of possible threats to human health and the environment associated with crude oil contamination.

Health FAQs

What is causing the odor? Will cleanup activities increase odor problems?

Volatile Organic Compounds (VOCs) found in the crude oil are causing the odors. **You can smell most pollutants related to the oil spill well below levels that would cause health problems.** During the cleanup process, more odors may be released into the air as the oil is stirred up. The odors will be strongest near locations where crude oil is present.

Is the odor bad for my health?

It is important to understand that people are able to smell some VOCs at levels lower than would cause long-term health problems. Some of the chemicals that cause the odors may cause headaches, dizziness, nausea or vomiting. If you are sensitive to VOCs, stay indoors. If you continue to experience odor problems, contact the Enbridge public information line, 800-306-6837. If possible, close windows and doors, turn your air conditioner on and set to a recirculation mode. If you have severe nausea or other medical issues, please see your health care provider as soon as possible.

Government Investigation Provides Damning Picture of the Kalamazoo Tar Sands Spill

07/11/2012 05:31 pm ET | Updated Sep 10, 2012

- Canada Project Director, NRDC



The National Transportation Safety Board (NTSB) heard the major findings of its two-year investigation of the Enbridge tar sands pipeline spill, which released more than a million gallons of corrosive tar sands into the Kalamazoo River watershed in July 2010. The Kalamazoo spill has clearly demonstrated how dirty and dangerous tar sands pipelines are, even more dangerous than conventional oil pipelines. Nearly two years after what has become the most expensive pipeline disaster in U.S. history, emergency responders are still struggling to clean up the Kalamazoo River. The government's investigation raises serious questions about whether corrosive tar sands can be safely moved on the U.S. pipeline system, especially when they cross farms and waters in the U.S. heartland as the proposed Keystone XL tar sands pipeline would do. In particular, the NTSB provides a damning picture of Enbridge's pipeline safety measures. As one NTSB board member put it, this investigation did not only show corrosion of Enbridge's tar sands pipeline, but also demonstrates systemic corrosion of Enbridge's pipeline safety program.

"Delegating too much authority to the regulated is tantamount to letting the fox guard the hen house." Deborah Hersman, Chair of NTSB

NTSB's report shows in glaring detail that the \$807 million tar sands spill was the result of Enbridge taking advantage of weak pipeline safety regulations and poor oversight by federal pipeline safety regulators at the Pipeline and Hazardous Safety Materials Administration (PHMSA). Enbridge failed to identify multiple risks to pipeline safety, failed to properly identify the spill, and lacked the resources or planning to mitigate the spill. NTSB staff found that the Kalamazoo spill could and should have been addressed proactively.

NTSB made several major findings:

- The cause of the rupture of Enbridge's Line 6B pipeline was caused by the interaction of stress corrosion cracking and corrosion.
- Enbridge had been aware of both the corrosion and cracking on line 6B for five years, but the Canadian tar sands company failed to consider how the combination of corrosion and cracking would interact to lead to a pipeline rupture.
- Enbridge continued to operate the pipeline for 17 hours after the spill despite warnings from the leak detection system. The operator took no steps to investigate the potential leak, did not respond to 911 calls reporting the smell of oil, and only shutdown the pipeline after third parties located the spill.
- Enbridge's spill response plan was grossly inadequate for addressing a spill of this magnitude. The company's closest responder was 10 hours away. Only a small trailer of equipment had been prepositioned to respond to a spill.
- Federal pipeline regulators at PHMSA permitted the series of mistakes by a combination of ambiguous regulations and poor pipeline safety oversight.

Perhaps of most concern is that the causes of the Kalamazoo tar sands spill point to a systemic lack of a culture of safety in the pipeline industry and a failure of safety oversight by regulators at PHMSA. NTSB's findings highlight the urgency to proactively address the general failures in the nation's pipeline safety system and to proactively address the risks of tar sands pipelines.

While NTSB did not specifically address ways in which the unique risks of tar sands contributed to the spill and the severity of its impact, the panel presented several conclusions which implicated tar sands:

- The pipeline's failure was in part due to external corrosion which, combined with stress corrosion cracking, led to a pipeline failure. We've discussed for some time how the higher temperatures of tar sands can speed corrosion while pressure variations that can occur in viscous, or thick, tar sands can contribute to cycle pipeline stress.
- Enbridge's failure to identify the spill was in a large part due to a leak detection system prone to false alarms. We have discussed in some detail that more viscous, or thicker, tar sands leads to far more "noise" for pipeline leak detection systems which may trigger false alarms – meaning that a real spill is not identified.
- Enbridge was not prepared for a spill involving oil that did not float on the top of a river body. As we've seen, a large percentage of tar sands diluted bitumen sinks in waterbodies soon after a spill. The

company not only did not have sufficient spill response equipment, but they had the wrong type of spill response equipment which only contained oil floating on the water's surface. PHMSA's oversight in this area was found to be extremely lacking. The NTSB found that federal regulators are not taking their obligation to approve spill response plans seriously. This may explain why PHMSA has excluded the question of how to respond to tar sands spills from the scope of their study on the safety of tar sands pipelines. Without specific knowledge of how tar sands behaves when spilled, it will be impossible to correct the deficiencies in spill response planning which increased the cost and damage of the Kalamazoo tar sands spill.

NTSB made 19 recommendations for DOT, PHMSA, Enbridge and spill responders. As the agency concluded, pipeline safety should be more than a slogan. The Kalamazoo tar sands spill was the result of multiple mistakes made by Enbridge but federal regulators are also culpable. Both federal regulators and the pipeline industry have too often treated this issue as a public relations issue prior to spills and disaster management afterward. There is a better way -- one that requires strong, clearly outlined regulations and a pipeline safety agency focused on preventing spills rather than responding to them.

Photo courtesy of NTSB

Ingrid Kimball

From: John Munter <mumooatthefarm@yahoo.com>
Sent: Thursday, May 26, 2016 11:45 AM
To: *COMM_Pipeline Comments
Subject: Comments for Draft EIS of Sandpiper and Line 3

The Draft EIS for Sandpiper/Line 3 needs to assess all connecting projects as determined by MEPA criteria which outline three types of relationship between projects, any one of which qualifies the projects as connected actions (part 4410.0200, subpart 9b):

- One induces the other;
- One is a prerequisite for the other and is not justified by itself (the first occurring previously or simultaneously);
- Neither is justified by itself; that is, the two projects are interdependent parts of a larger whole.

Since prices and contracts change, all connecting projects need to be assessed for environmental climate impact and localized impact. Clearly there are connecting projects. Pipelines would have nothing to ship were it not for destruction of First Nation habitability in Alberta: the ability of indigenous peoples—the Cree and the Dene to hunt, fish, and gather wild foods and medicine.

Below is a new study of fracking in North Dakota describing the despoliation of ground water as one aspect that needs to be considered.

Clearly there are connecting pipelines as well like Line 61 in Wisconsin that is not quite permitted yet and the planning for Line 66 in the same corridor. Then there are the pipelines that move under the Mackinac Straits, or go east, and the recently permitted Flanagan South which goes to Cushing and its connecting pipeline (recently purchased by Enbridge) going to Houston and Gulf refineries for processing and export. A future connecting project appears to be a leg planned from Houston to Port Arthur Texas.

End use applications are connecting projects such as refineries which can pollute a wide area such as Southern Canada and cities in Texas. Port Arthur, Texas is already a national sacrifice zone with very high rates of asthma in children and respiratory diseases in minority populations and refinery emissions should be reduced not increased.

The cumulative effects of this project should be considered in light of the “Cumulative Impacts” defined in 4410.0200: Subp. 11. These include addition of greenhouse gases in contrast to burning Saudi crude, the cumulative impacts on minority and indigenous populations in Alberta, along the pipeline length and breadth such as the proverbial gun pointed at the head of wild rice harvesters in Minnesota, in Detroit and Southern Canada, in Houston and Port Arthur also in comparison to utilizing Saudi crude.

Regarding Project Segmentation the EQB’s Guidance for Environmental Review states: “Network projects such as highways, utility systems and pipelines may be divided for review if “logical in relation to the design of the total system or network and must not be made merely to divide up a large system into exempted segments” (parts 4410.1000 and 4410.2000, subparts 4)..” The word “logical” must be defined for the public logic not for the Enbridge corporate logic which may be entirely different.

We know what the Enbridge logic is. It is to not have the same approval issues that KXL did. The Enbridge logic says that if you can divide the Flanagan South into literally two thousand separate projects to avoid environmental review then you should do it. It says that if you can divert pipeline flow across the Canadian border to avoid environmental review then you should do it.

Obviously, these pipelines would have no product to sell without the environmental destruction of Alberta and North Dakota. Obviously, these pipelines will be utilized until they fail going through sensitive wild rice areas and high value tourist areas since Enbridge has plenty of sixty year old pipelines they have no intention or schedule to replace—even if they are going under the Mackinac Straits. Obviously these pipelines are delivering product to already environmentally degraded urban areas and “cumulative impacts” is particularly relevant in contrast to just utilizing Saudi crude which is less polluting than North American oil which is fast becoming ‘stranded assets’ which may never be utilized.

It is conceivable now with the difficulties of siting pipelines going east and west in Canada and through the US and with the low price of oil that the Alberta tar sands and North Dakota fracking will become ‘stranded assets’ and the value of keeping them in the ground should be assessed in comparison to utilizing Saudi and foreign crude until the economy can be converted to wind and solar.

Once again, see the new Duke study below which may supercede other North Dakota assessments for impacts of fracking.

John Munter

14860 Bruce Creek Rd, Warba, MN 55793...218-492-4179...mumooatthefarm@yahoo.com

<http://sites.nicholas.duke.edu/avnervengosh/>

Home



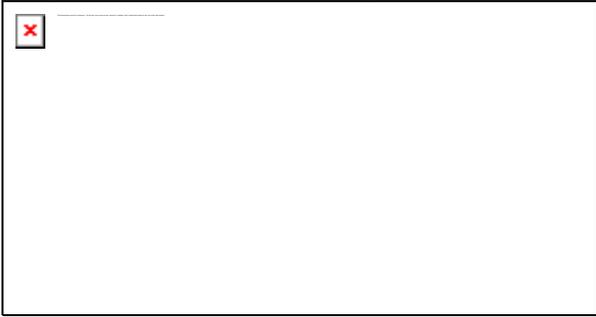
Welcome to Avner Vengosh Research Group web site!

The major theme of this research group is the elucidation of magnitude and mechanisms of water quality degradation and impacts on ecosystems and human health. The geochemical and isotopic variations are used as natural “fingerprints” for tracing the origin, migration, and fate of contaminants in the environment.

Major components of research at Vengosh's lab

April 27, 2016: A new study on oil and gas wastewater spills in North Dakota was published in [Environmental Science and Technology](#). This paper is the first to systematically examine the chemistry and quality of brine spills in areas of unconventional oil extraction in the Bakken region. The major take away points of this paper are (1) in addition to the high salts content, the Bakken produced waters have high levels of inorganic contaminants such as selenium, ammonium, and vanadium; (2) these inorganic contaminants are resilient in the environment and can be detected in spill water even a few years after the spill events; (3) the strontium isotope ratios of the Bakken brines are different from the composition of local surface water and groundwater and thus strontium isotopes can be used as a powerful tool to monitor and delineate brine spills in North Dakota; and (4) radium radionuclides are retained from the spill water to the soil and sediments in spill sites, causing accumulation of radium and decay products in the soil. The migration and dilution of the spill brines in the environment further intensify the radium mobilization to the soil, and high radium was observed in soil located downstream from the original spill sites. [Duke press release is described here](#). Numerous media outlets reported the

study, including [Great Forks Herald](#), [Bismarck Tribune](#), [KFYR-TV](#), [CBS News](#), [ZME Science](#), [Inside Climate](#), [Science Daily](#), [U.S. News and World Reports](#).



Timeline for the Retrofit of Affected Tank Cars for Use in North American HHFTs			
Tank Car Type / Service	US Retrofit Deadline*	Tank Car Type / Service	TC Retrofit Deadline
Non Jacketed DOT-111 tank cars in PG I service	(January 1, 2017) - January 1, 2018	Non Jacketed DOT-111 tank cars in Crude Oil service	May 1, 2017
Jacketed DOT-111 tank cars in PG I	March 1, 2018	Jacketed DOT-111 tank cars in Crude Oil service	March 1, 2018
Non Jacketed CPC-1232 tank cars in PG I service	April 1, 2020	Non Jacketed CPC-1232 tank cars in Crude Oil service	April 1, 2020
Non Jacketed DOT-111 tank cars in PG II service	May 1, 2023	Non Jacketed DOT-111 tank cars in Ethanol service	May 1, 2023
Jacketed DOT-111 tank cars in PG II service	May 1, 2023	Jacketed DOT-111 tank cars in Ethanol service	May 1, 2023
Non Jacketed CPC-1232 tank cars in PG II service	July 1, 2023	Non Jacketed CPC-1232 tank cars in Ethanol service	July 1, 2023
Jacketed CPC-1232 tank cars in PG I and PG II service and all remaining tank cars carrying PG III materials in an HHFT (pressure relief valve and valve handles)	May 1, 2025	Jacketed CPC-1232 tank cars in Crude and Ethanol service and all remaining tank cars carrying PG III materials in an HHFT (pressure relief valve and valve handles)	May 1, 2025

[1]The January 1, 2017 date would trigger a reporting requirement, and shippers would have to report to DOT the number of tank cars that they own or lease that have been retrofitted, and the number that have not yet been retrofitted.

The phaseout/retrofit schedule will see unjacketed DOT-111s removed from the most-volatile Packing Group I crude oil service by January 2018, jacketed DOT-111s by March 2018, unjacketed CPC-1232s by April 2020. For Packing Group II, jacketed and non-jacketed DOT-111s may remain in service until May 2023, non-jacketed CPC-1232s until July 2023, and jacketed CPC-1232s until May 2025.

To enforce the timeline, the regulations require stricter testing and classification of crude oil offered for transport.

The regulation removes the burden of reporting every oil train movement to state emergency response agencies. Instead, railroads must promptly respond to requests for information initiated by local emergency responders. This should address railroad complaints that business and security concerns were being compromised by state freedom of information laws.

The regulatory package is to be enforced by the department's sibling regulators, the Federal Railroad Administration (FRA) and the Pipeline and Hazardous Materials Safety Administration (PHMSA).

Cost of the fleet renewal is estimated by the regulators to be about \$1.7 billion. Total costs for the entire regulatory package, including train routing and speed restrictions, is projected to be \$2.5 billion.

The regulations remove the burden of reporting every oil train movement to state emergency response agencies. Instead, railroads must promptly respond to requests for information initiated by local emergency responders. This should address railroad complaints that business and security concerns were being compromised by state freedom of information laws.

The rule requires HHFTs (high-hazard flammable trains), defined as consisting of a continuous block of 20 or more tank cars or 35 or more cars dispersed through a train loaded with a flammable liquid, to have in place a two-way end-of-train (EOT) device or a distributed power (DP) braking system. HHFTs are limited to 50 mph, with a conditional 40 mph maximum in densely populated urban areas.

Trains meeting the definition of a “HHFUT” (high-hazard flammable unit train), defined as “a single train with 70 or more tank cars loaded with Class 3 flammable liquids,” with at least one tank car with Packing Group I materials, must be operated with an electronically controlled pneumatic (ECP) braking system by Jan. 1, 2021, or reduce maximum speed to 30 mph. All other HHFUTs must have ECP braking systems installed after 2023.

The urban speed limit will be lifted for trains consisting entirely of new or retrofitted cars meeting the DOT-117 requirements.

Even as he announced May 1 (jointly with Transport Canada Minister Lisa Raitt) that all unit oil trains must be equipped with electronically controlled pneumatic braking (ECP) by 2023, Transportation Secretary Anthony Foxx vocally anticipated legal challenges from railroads and fleet operators who say the technology is unreliable and unnecessary.

Indeed, railroaders and shippers were quick to declare their objections to ECP requirement.

“This is an imprudent decision made without supporting data or analysis,” said Ed Hamberger, president of the Association of American Railroads. “The ECP brake requirement ordered today by the Department of Transportation is an ‘operational requirement’ and is not part of the PHMSA tank car standard rule making. DOT is requiring that by Jan. 1, 2021 if a train is going to move 70 or more tank cars of crude oil those *tank cars* must be equipped with ECP brakes. If those tank cars are not equipped with ECP brakes, the train’s speed cannot exceed 30 mph. The requirement for ECP brakes is aimed at tank cars, not locomotives. Railroads don’t own tank cars, they own locomotives. While the requirement for ECP brakes is aimed at tank cars, not locomotives, by default, locomotives will have to be ECP-equipped to be able to move cars with ECP brakes. The decision whether or not to equip tank cars moving crude oil belongs to freight rail customers or tank car owners, not the freight railroads. If tank car owners decide not to equip tank cars intended for crude oil service, railroads must decide whether or not to move trains carrying 69 or fewer crude oil tank cars or travel no faster than 30 mph. Either scenario will decrease rail capacity and have negative consequences on both freight and passenger traffic.”

Speaking for shippers and fleet owners, the American Petroleum Institute said the ECP requirement will further stress an already impossible timeline for total fleet renewal. It warned that oil shortages will result as existing tank cars are withdrawn before builders can replace them: “We support upgrades to the tank car fleet and want them completed as quickly as realistically possible. The railcar manufacturing industry’s own calculations show it does not have the shop capacity to meet the retrofit timeline announced today, which will lead to shortages that impact consumers and the broader economy.”

Tank car manufacturers, however, greeted the timeline as “aggressive but appropriate.” Railway Supply Institute President Tom Simpson did join the chorus against ECP, saying “technical and logistical challenges” may not make ECP better than conventional distributed braking.

The requirement to equip tank cars and locomotives with ECP brakes is intended to slow a train with braking force applied simultaneously along its length. Conventional train line braking relies on air pressure releases that occur serially along the length of the train, rather than instantly at each car. Railroads objected to compulsory ECP after it was proposed in the DOT’s notice of rulemaking last August, saying braking distributed via mid-train locomotives and end-of-train devices would be just as effective.

Foxx challenged rail industry claims that ECP is a new and unproven technology by pointing to BNSF and Norfolk Southern, which already operate ECP-equipped unit trains in revenue service (but not yet for oil trains). “We believe ECP is a reliable technology,” Foxx said, adding in the same breath that courts are unlikely to throw out the complete regulatory package in the event that one aspect is successfully contested.

The requirement for ECP braking was the closest thing to a surprise in the suite of final oil train regulations promulgated by the department after review by the White House Office of Management and Budget.

This may be the first time regulators have distinguished between packing groups with respect to tank car choice. Currently, all three packing groups may be carried in identical cars, the only difference being in the hazmat placarding and documentation. The timeline for tank car retirement or retrofitting is also tied to packing group of the lading.

One intended effect is to allow older tank cars to transition from higher-risk crude to lower-risk ethanol service during fleet renewal. Gone from the final rules is the strategy to shift riskier cars to Alberta tar sands service, now that diluted or synthetic bitumen proved itself to be unexpectedly explosive in a pair of midwinter mishaps in northern Ontario.

Without much explanation, the final rules excluded incentives to encourage voluntary degasification or stabilization of crude oil before loading. But Foxx hinted at more to come in subsequent rulemaking initiatives, saying the quest for safer transportation of crude oil will now become a multi-departmental effort, with a focus on the volatility of the cargo.

“The final rule reflects a more refined cost-benefit analysis, but some stakeholders will think the rule does not go far enough to improve that safety of crude-by-rail, and others will think aspects of the rule produce little safety benefit at a very high cost,” noted Kevin Sheys, an attorney with Washington, D.C. based Nossaman LLP, which specializes in transportation law. “The narrower definition of ‘high-hazard flammable trains,’ which now considers packing group and tank car type, is a significant change and will come as a relief to some railroads and to shippers of flammable liquids in manifest trains. I anticipate that many railroad and shipper stakeholders will continue to question whether this retrofit schedule is achievable and express concern about tank car capacity

challenges. The limited and graduated rollout of ECP brakes is unlikely to satisfy the regulated industry, which has asserted with one voice that ECP braking systems are untested and produce very little safety benefit. ”

Not surprisingly, The Greenbrier Companies was quick to point out that its “Tank Car of the Future” is, in effect, a DOT/TC-117, strongly suggesting that regulators simply adopted its design as the new spec. “Greenbrier announced its Tank Car of the Future in February 2014, a safer design for crude oil and ethanol service and the transport of other hazardous materials that the USDOT and TC introduced today as the new DOT-117/TC-117,” said Chairman and CEO Bill Furman. “I’m proud to say we’re currently delivering cars to our customers that meet these new standards. Nearly 1,000 of these Greenbrier-designed and built tank cars are already in Class 3 flammable liquids service across North America. With orders in place for more than 2,500 cars of the DOT 117/TC-117 design, safer tanks cars are steadily joining the North American rail fleet. Greenbrier believes that by mandating the new DOT 117/TC-117 tank cars be built with features such as increased shell thickness, full-height half-inch-thick head shields, minimum 11-gauge jackets, a re-closeable pressure relief valve and thermal protection, the U.S. and Canada have taken steps to mitigate the consequences of train accidents and ultimately enhance public safety. These tank car design improvements produce tangible and immediate safety benefits that far exceed any marginal benefit from US DOT-mandated ECP brakes, which Greenbrier has consistently questioned.”

Furman also touted his company’s retrofit capabilities, and commented on the timeline: “Greenbrier is prepared to meet the need for tank car retrofits through GBW Railcar Services (GBW), its 50/50 joint venture with Watco Companies LLC for railcar repair and retrofitting. GBW is making significant new investments in its repair shop capacity to help ensure the industry’s ability to conduct the required tank car retrofits. GBW has obtained commitments from leading tank car owners to perform thousands of tank car retrofits, in the manner described in today’s rule. Through GBW we’ve laid the groundwork to meet the need for tank car retrofits required by the new rule. We look forward to continuing our work with our customers to address the achievable timeline announced today. Greenbrier asserts that a rapid replacement and retrofit phase-out timeline is completely feasible. A report prepared for Greenbrier by Cambridge Systematics indicates retrofit capacity will range from at least 8,400 to 19,600 cars per year in steady state, and that the unjacketed DOT-111s and unjacketed CPC-1232s in crude oil service could be retrofitted in 3.7 years, while similar cars in ethanol service could be retrofitted in an additional 2.3 years. In addition to examining tank car retrofit capacity, the Cambridge report goes on to note that in 2015 manufacturing capacity for new tank cars is at an all-time high of more than 40,000 units. With manufacturing capacity at these levels, the Cambridge report observes that the entire tank car fleet that is currently operating without advanced safety features could be replaced in less than five years with new cars that meet current standards for safety.”

A summary of the rule can be accessed [HERE](#).

The complete rule can be accessed [HERE](#).

60% by now - necessary volume over 10 years

- 1) Enbridge and Koch Refinery - Oil ^{pipelines} won't reduce train use
- 2) BNSF millions in track improvements + 500 million in Bakken
- 3) Rail use less diluent - expensive - than 30% required on pipes
- 4) Rail - no "take or pay" contracts like Sandpiper
- 5) East coast has 13 built rail unloading terminals
- 6) Price dictates pipeline or rail or barge
- 7) ~~Most oil goes east coast~~
Rail goes E & W when there are few pipelines

Jim Hansen - 6th 2000

2012

Dirtiest oil - methane CO2 intensive
ethane

Saudi's are diversify investment

MN wild rice - pine trees
Hunt, fish, + gather
degrades

intro ~~present~~ pipeline

EL to Gulf

UN seen
slow lead 60 year
crayfish pipes
900 anomalies
all pipeline leak

Strand assets cost

spill cost

more jobs in water even than oil



Park Rapids Hearing 2016

There is no economic justification for more pipeline infrastructure with the Saudi infusion of oil. I am afraid that when the new Department of Commerce economic analysis comes out it will read like an economics class: 'Economic cycles go up and down. The Saudis can't keep pumping cheap oil forever because of domestic instability and peer pressure. The Mackenzie Cty in the Bakken's break-even point is 29\$ a barrel with big efficiency gains. The huge drop in oil drilling will force the price up next year, and companies can easily retool, come out of bankruptcy, and will need the pipeline capacity in five years'.

That's all industry 'happy talk'...cancerous optimism—looking at things from OUR perspective. DOC should employ an international economist since we live in a world economy which is not just class room economics but involving real people with real agendas—like the Saudis.

The problem is is that we live in a weak global economy led by China and Japan and we are completely dependent on whatever the Saudi's want to pump so we should understand them.

They have several proxy wars going in Yemen and Syria against the Iranians and Russians and low oil prices hurt their enemies. These conflicts could go on for years.

More importantly, perhaps, they have a huge climate change problem brought to the fore late last year by one study saying areas of SW Asia could become unlivable due to the heat. Most recently the Max Planck Institute confirms that. Even now in Riyadh daily summer time high temperatures at night stay above 86 degrees F and daily highs can exceed 104 degrees F for the entire summer. Even if we curb emissions heat waves will go from 15 days now to 83 days in 2050. If we don't curb emissions summer heat waves will go to 118 days and 204 days a year by centuries end....14 degrees...122 degrees.

This is why the Saudis are totally retooling their economy led by the brilliant 30 year old Prince Muhammad Bin Salman—the 'power behind the throne' of his father, King Salman. Prince Muhammad is not only in Defense Minister, and second in line to the throne behind a cousin who is 25 years older, but also the economics minister.

Saudi's are planning to go public with 5% of Saudi Aramco—their oil company—and using the proceeds to invest in mining, petrochemical, and oil refining, and renewable energy. Chairman Khalid al-Falih says: "Many policy makers in Saudi Arabia think that because of climate change, rising fuel efficiency, and other factors, oil demand will probably peak before the supply starts to run out." (May 3, 2016—The Economist) They are investing in the whole production change of oil used for "feedstock for advanced materials, petro-chemicals, and plastics". So, the Saudis see the oil pie shrinking with renewables so that is why they want the biggest seat at the table of a smaller pie. US producers cannot hope to compete with Saudis who can pump oil for 3\$ a barrel and make a profit. (Economist interview, Jan 6, 2016)

Will they become unstable? Prince Muhammad says they have the 3rd largest budget reserve in the world, increased their non-oil revenues 29% percent last year, are going to institute a VAT value added

tax, plan on 100 billion dollar non-oil revenue, as well as privatizing health care, education, some military functions, and some state-owned companies. They expect revenue from mining, subsidy reform, expanding religious tourism, and increased employment. If they are really stretched thin they could boot out their 10 million foreign workers.

So, low oil prices for the Saudis hurt their enemies, bankrupt their competitors, provide the world with fewer greenhouse gas emissions than relying on Bakken and Alberta, and position themselves with a bigger seat at an ever smaller oil profit table. It is win-win for them all the way around as it forces them to diversify their economy which they have the money, the brains, the plan, the options, and the control to accomplish.

Competing with the Saudi's to build more pipeline infrastructure is a foolish gamble and serves no public purpose.

John Munter

St Paul Hearing May 09, 2016

The public need for the Sandpiper and a new Line 3 pipeline should be based on risk assessment with the profit motive excluded since catastrophic failures involving permanent damage to lives and eco-systems far out-weigh temporary monetary gain.

The Superior refinery can easily be supplied with two railroad tank cars a day so that the old Line 3 with 900 anomalies and the proposed new Line 3 running 760,000 barrels per day are unwarranted risks to the environment. All train cars are being upgraded to new DOT 117 standards with jackets, thermal insulation, full height guards, and better release valves to make them puncture resistant.

On the other hand, we know all pipelines will leak for two basic reasons. One is the wear and tear of the seasons, high pressure and caustic nature of the product, and human error. The other is the fact that Enbridge will never dig up and take out a pipe as proved by many sixty year old pipes going through Red Lake, under the Mackinac Straits, and refusal to remove the old Line 3 with 900 anomalies. This is also proved by the laxity of regulators. All Enbridge pipes will remain active until they break or leak.

who have not reprimanded their actions *choice of materials 100%*

Even though there is no history on the DOT 117 a risk assessment could be based on the rail transport of 45,000 barrels of oil a day versus the constantly aging pipeline infrastructure of much higher volume in place for a long era of inevitable fragility. The likelihood of a pipeline break would have to be, then, considered 100% compared to ~~two~~ replaceable and upgraded tank cars ~~a day~~ which may have less than 100% failure rate.

A risk assessment ^{should} ~~could~~ also be made on where pipeline failures happen. What percentage risk is there of a break into a waterway or aquifer versus not on the likely or possible proposed routings? A risk assessment of spills should be done on the Alberta to Superior to the Flanagan South to Cushing to the Gulf versus going from Alberta through Southern Minnesota to the Flanagan South and the Chicago area refineries versus going from Alberta south through the Dakota's to Cushing and to the Gulf. The content would have to be included with the sinking-to-the-bottom tar sands of Alberta in comparison to the float-on-water Saudi crude.

E is suggested under

Risk assessment could easily be done on Bakken and Alberta oil versus Saudi crude in terms of greenhouse gas emissions. The 10% methane leakage discovered from a satellite in 2013 could be used for the Bakken crude and updated White House figures on methane emissions are applicable as well compared to Saudi crude.

the fact that we do not know where the oil is going yet is completely ridiculous - connected pipelines to the land by eminent domain
This means we don't know what the purpose - the public purpose
if we don't know the public purpose - we can't establish the best routings
Therefore we need to do Chances are Enbridge will diversify and use all
therefore all potential routings between Alberta & Gulf need
risk Analysis in the EIS

Methane and the greenhouse-gas footprint of natural gas from shale formations A letter Robert W. Howarth · Renee Santoro · Anthony Ingraffea Received: 12 November 2010 / Accepted: 13 March 2011 © The Author(s) 2011. This article is published with open access at Springerlink.com Abstract We evaluate the greenhouse gas footprint of natural gas obtained by highvolume hydraulic fracturing from shale formations, focusing on methane emissions. Natural gas is composed largely of methane, and 3.6% to 7.9% of the methane from shale-gas production escapes to the atmosphere in venting and leaks over the lifetime of a well. These methane emissions are at least 30% more than and perhaps more than twice as great as those from conventional gas. The higher emissions from shale gas occur at the time wells are hydraulically fractured—as methane escapes from flow-back return fluids—and during drill out following the fracturing. Methane is a powerful greenhouse gas, with a global warming potential that is far greater than that of carbon dioxide, particularly over the time horizon of the first few decades following emission. Methane contributes substantially to the greenhouse gas footprint of shale gas on shorter time scales, dominating it on a 20-year time horizon. The footprint for shale gas is greater than that for conventional gas or oil when viewed on any time horizon, but particularly so over 20 years. Compared to coal, the footprint of shale gas is at least 20% greater and perhaps more than twice as great on the 20-year horizon and is comparable when compared over 100 years. Keywords Methane · Greenhouse gases · Global warming · Natural gas · Shale gas · Unconventional gas · Fugitive emissions · Lifecycle analysis · LCA · Bridge fuel · Transitional fuel · Global warming potential · GWP Electronic supplementary material The online version of this article (doi:10.1007/s10584-011-0061-5) contains supplementary material, which is available to authorized users. R. W. Howarth (B) · R. Santoro Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY 14853, USA e-mail: rwh2@cornell.edu A. Ingraffea School of Civil and Environmental Engineering, Cornell University, Ithaca, NY 14853, USA Climatic Change Many view natural gas as a transitional fuel, allowing continued dependence on fossil fuels yet reducing greenhouse gas (GHG) emissions compared to oil or coal over coming decades (Pacala and Socolow 2004). Development of “unconventional” gas dispersed in shale is part of this vision, as the potential resource may be large, and in many regions conventional reserves are becoming depleted (Wood et al. 2011). Domestic production in the U.S. was predominantly from conventional reservoirs through the 1990s, but by 2009 U.S. unconventional production exceeded that of conventional gas. The Department of Energy predicts that by 2035 total domestic production will grow by 20%, with unconventional gas providing 75% of the total (EIA 2010a). The greatest growth is predicted for shale gas, increasing from 16% of total production in 2009 to an expected 45% in 2035. Although natural gas is promoted as a bridge fuel over the coming few decades, in part because of its presumed benefit for global warming compared to other fossil fuels, very little is known about the GHG footprint of unconventional gas. Here, we define the GHG footprint as the total GHG emissions from developing and using the gas, expressed as equivalents of carbon dioxide, per unit of energy obtained during combustion. The GHG footprint of shale gas has received little study or scrutiny, although many have voiced concern. The National Research Council (2009) noted emissions from shale-gas extraction may be greater than from conventional gas. The Council of Scientific Society Presidents (2010) wrote to President Obama, warning that some potential energy bridges such as shale gas have received insufficient analysis and may aggravate rather than mitigate global warming. And in late 2010, the U.S. Environmental Protection Agency issued a report concluding that fugitive emissions of methane from unconventional gas may be far greater than for conventional gas (EPA 2010). Fugitive emissions of

methane are of particular concern. Methane is the major component of natural gas and a powerful greenhouse gas. As such, small leakages are important. Recent modeling indicates methane has an even greater global warming potential than previously believed, when the indirect effects of methane on atmospheric aerosols are considered (Shindell et al. 2009). The global methane budget is poorly constrained, with multiple sources and sinks all having large uncertainties. The radiocarbon content of atmospheric methane suggests fossil fuels may be a far larger source of atmospheric methane than generally thought (Lassey et al. 2007). The GHG footprint of shale gas consists of the direct emissions of CO₂ from end use consumption, indirect emissions of CO₂ from fossil fuels used to extract, develop, and transport the gas, and methane fugitive emissions and venting. Despite the high level of industrial activity involved in developing shale gas, the indirect emissions of CO₂ are relatively small compared to those from the direct combustion of the fuel: 1 to 1.5 g C MJ⁻¹ (Santoro et al. 2011) vs 15 g C MJ⁻¹ for direct emissions (Hayhoe et al. 2002). Indirect emissions from shale gas are estimated to be only 0.04 to 0.45 g C MJ⁻¹ greater than those for conventional gas (Wood et al. 2011). Thus, for both conventional and shale gas, the GHG footprint is dominated by the direct CO₂ emissions and fugitive methane emissions. Here we present estimates for methane emissions as contributors to the GHG footprint of shale gas compared to conventional gas. Our analysis uses the most recently available data, relying particularly on a technical background document on GHG emissions from the oil and gas industry (EPA 2010) and materials discussed in that report, and a report on natural gas losses on federal lands from the General Accountability Office (GAO 2010). The Climatic Change EPA (2010) report is the first update on emission factors by the agency since 1996 (Harrison et al. 1996). The earlier report served as the basis for the national GHG inventory for the past decade. However, that study was not based on random sampling or a comprehensive assessment of actual industry practices, but rather only analyzed facilities of companies that voluntarily participated (Kirchgessner et al. 1997). The new EPA (2010) report notes that the 1996 “study was conducted at a time when methane emissions were not a significant concern in the discussion about GHG emissions” and that emission factors from the 1996 report “are outdated and potentially understated for some emissions sources.” Indeed, emission factors presented in EPA (2010) are much higher, by orders of magnitude for some sources. 1 Fugitive methane emissions during well completion Shale gas is extracted by high-volume hydraulic fracturing. Large volumes of water are forced under pressure into the shale to fracture and re-fracture the rock to boost gas flow. A significant amount of this water returns to the surface as flowback within the first few days to weeks after injection and is accompanied by large quantities of methane (EPA 2010). The amount of methane is far more than could be dissolved in the flow-back fluids, reflecting a mixture of fracture-return fluids and methane gas. We have compiled data from 2 shale gas formations and 3 tightsand gas formations in the U.S. Between 0.6% and 3.2% of the life-time production of gas from wells is emitted as methane during the flow-back period (Table 1). We include tight-sand formations since flow-back emissions and the patterns of gas production over time are similar to those for shale (EPA 2010). Note that the rate of methane emitted during flow-back (column B in Table 1) correlates well to the initial production rate for the well following completion (column C in Table 1). Although the data are limited, the variation across the basins seems reasonable: the highest methane emissions during flow-back were in the Haynesville, where initial pressures and initial production were very high, and the lowest emissions were in the Uinta, where the flow-back period was the shortest and initial production following well completion was low. However, we note that the data used in Table 1 are not well documented, with many values based on PowerPoint

slides from EPA-sponsored workshops. For this paper, we therefore choose to represent gas losses from flowback fluids as the mean value from Table 1: 1.6%. More methane is emitted during "drill-out," the stage in developing unconventional gas in which the plugs set to separate fracturing stages are drilled out to release gas for production. EPA (2007) estimates drill-out emissions at 142×10^3 to 425×10^3 m³ per well. Using the mean drill-out emissions estimate of 280×10^3 m³ (EPA 2007) and the mean life-time gas production for the 5 formations in Table 1 (85×10^6 m³), we estimate that 0.33% of the total life-time production of wells is emitted as methane during the drill-out stage. If we instead use the average life-time production for a larger set of data on 12 formations (Wood et al. 2011), 45×10^6 m³, we estimate a percentage emission of 0.62%. More effort is needed to determine drill-out emissions on individual formation. Meanwhile, in this paper we use the conservative estimate of 0.33% for drill-out emissions. Combining losses associated with flow-back fluids (1.6%) and drill out (0.33%), we estimate that 1.9% of the total production of gas from an unconventional shale-gas Climatic Change Table 1

Methane emissions during the flow-back period following hydraulic fracturing, initial gas production rates following well completion, life-time gas production of wells, and the methane emitted during flow-back expressed as a percentage of the life-time production for five unconventional wells in the United States (A) Methane emitted (B) Methane emitted per (C) Initial gas production (D) Life-time (E) Methane emitted during flow-back day during flow-back at well completion production of during flow-back as % (10³ m³)a (10³ m³ day⁻¹)b (10³ m³ day⁻¹)c well (10⁶ m³)d of life-time productione Haynesville (Louisiana, shale) 6,800 680 640 210 3.2 Barnett (Texas, shale) 370 41 37 35 1.1 Piceance (Colorado, tight sand) 710 79 57 55 1.3 Uinta (Utah, tight sand) 255 51 42 40 0.6 Denver-Julesburg (Colorado, tight sand) 140 12 11 ? ?

Flow-back is the return of hydraulic fracturing fluids to the surface immediately after fracturing and before well completion. For these wells, the flow-back period ranged from 5 to 12 days

aHaynesville: average from Eckhardt et al. (2009); Piceance: EPA (2007); Barnett: EPA (2004); Uinta: Samuels (2010); Denver-Julesburg: Bracken (2008) bCalculated by dividing the total methane emitted during flow-back (column A) by the duration of flow-back. Flow-back durations were 9 days for Barnett (EPA 2004), 8 days for Piceance (EPA 2007), 5 days for Uinta (Samuels 2010), and 12 days for Denver-Julesburg (Bracken 2008); median value of 10 days for flow-back was assumed for Haynesville

cHaynesville: <http://shale.typepad.com/haynesvilleshale/2009/07/chesapeake-energy-haynesville-shale-decline-curve.html>1/7/2011 and <http://oilshalegas.com/haynesvilleshalestocks.html>; Barnett: <http://oilshalegas.com/barnettshale.html>; Piceance: Kruuskraa (2004) and Henke (2010); Uinta: <http://www.epmag.com/archives/newsComments/6242.htm>; Denver-Julesburg: <http://www.businesswire.com/news/home/20100924005169/en/Synergy-Resources-Corporation-ReportsInitial-Production-Rates> dBased on averages for these basins. Haynesville: <http://shale.typepad.com/haynesvilleshale/decline-curve/>; Barnett: http://www.aapg.org/explorer/2002/07jul/barnett_shale.cfm and Wood et al. (2011); Piceance: Kruuskraa (2004); Uinta: <http://www.epmag.com/archives/newsComments/6242.htm> eCalculated by dividing column (A) by column (D)

Climatic Change Table 2 Fugitive methane emissions associated with development of natural gas from conventional wells and from shale formations (expressed as the percentage of methane produced over the lifecycle of a well) Conventional gas Shale gas Emissions during well completion 0.01% 1.9% Routine venting and equipment leaks at well site 0.3 to 1.9% 0.3 to 1.9% Emissions during liquid unloading 0 to 0.26% 0 to 0.26% Emissions during gas processing 0 to 0.19% 0 to 0.19% Emissions during transport, storage, and distribution 1.4 to 3.6% 1.4 to 3.6% Total

emissions 1.7 to 6.0% 3.6 to 7.9% See text for derivation of estimates and supporting information well is emitted as methane during well completion (Table 2). Again, this estimate is uncertain but conservative. Emissions are far lower for conventional natural gas wells during completion, since conventional wells have no flow-back and no drill out. An average of 1.04×10^3 m³ of methane is released per well completed for conventional gas (EPA 2010), corresponding to 1.32×10^3 m³ natural gas (assuming 78.8% methane content of the gas). In 2007, 19,819 conventional wells were completed in the US (EPA 2010), so we estimate a total national emission of 26×10^6 m³ natural gas. The total national production of onshore conventional gas in 2007 was 384×10^9 m³ (EIA 2010b). Therefore, we estimate the average fugitive emissions at well completion for conventional gas as 0.01% of the life-time production of a well (Table 2), three orders of magnitude less than for shale gas.

2 Routine venting and equipment leaks After completion, some fugitive emissions continue at the well site over its lifetime. A typical well has 55 to 150 connections to equipment such as heaters, meters, dehydrators, compressors, and vapor-recovery apparatus. Many of these potentially leak, and many pressure relief valves are designed to purposefully vent gas. Emissions from pneumatic pumps and dehydrators are a major part of the leakage (GAO 2010). Once a well is completed and connected to a pipeline, the same technologies are used for both conventional and shale gas; we assume that these post-completion fugitive emissions are the same for shale and conventional gas. GAO (2010) concluded that 0.3% to 1.9% of the life-time production of a well is lost due to routine venting and equipment leaks (Table 2). Previous studies have estimated routine well-site fugitive emissions as approximately 0.5% or less (Hayhoe et al. 2002; Armendariz 2009) and 0.95% (Shires et al. 2009). Note that none of these estimates include accidents or emergency vents. Data on emissions during emergencies are not available and have never, as far as we can determine, been used in any estimate of emissions from natural gas production. Thus, our estimate of 0.3% to 1.9% leakage is conservative. As we discuss below, the 0.3% reflects use of best available technology. Additional venting occurs during “liquid unloading.” Conventional wells frequently require multiple liquid-unloading events as they mature to mitigate water intrusion as reservoir pressure drops. Though not as common, some unconventional wells may also require unloading. Empirical data from 4 gas basins indicate that 0.02 Climatic Change to 0.26% of total life-time production of a well is vented as methane during liquid unloading (GAO 2010). Since not all wells require unloading, we set the range at 0 to 0.26% (Table 2).

3 Processing losses Some natural gas, whether conventional or from shale, is of sufficient quality to be “pipeline ready” without further processing. Other gas contains sufficient amounts of heavy hydrocarbons and impurities such as sulfur gases to require removal through processing before the gas is piped. Note that the quality of gas can vary even within a formation. For example, gas from the Marcellus shale in northeastern Pennsylvania needs little or no processing, while gas from southwestern Pennsylvania must be processed (NYDEC 2009). Some methane is emitted during this processing. The default EPA facility-level fugitive emission factor for gas processing indicates a loss of 0.19% of production (Shires et al. 2009). We therefore give a range of 0% (i.e. no processing, for wells that produce “pipeline ready” gas) to 0.19% of gas produced as our estimate of processing losses (Table 2). Actual measurements of processing plant emissions in Canada showed fourfold greater leakage than standard emission factors of the sort used by Shires et al. (2009) would indicate (Chambers 2004), so again, our estimates are very conservative.

4 Transport, storage, and distribution losses Further fugitive emissions occur during transport, storage, and distribution of natural gas. Direct measurements of leakage from transmission are limited, but two studies give similar leakage rates in both the U.S. (as part

of the 1996 EPA emission factor study; mean value of 0.53%; Harrison et al. 1996; Kirchgessner et al. 1997) and in Russia (0.7% mean estimate, with a range of 0.4% to 1.6%; Lelieveld et al. 2005). Direct estimates of distribution losses are even more limited, but the 1996 EPA study estimates losses at 0.35% of production (Harrison et al. 1996; Kirchgessner et al. 1997). Lelieveld et al. (2005) used the 1996 emission factors for natural gas storage and distribution together with their transmission estimates to suggest an overall average loss rate of 1.4% (range of 1.0% to 2.5%). We use this 1.4% leakage as the likely lower limit (Table 2). As noted above, the EPA 1996 emission estimates are based on limited data, and Revkin and Krauss (2009) reported “government scientists and industry officials caution that the real figure is almost certainly higher.” Furthermore, the IPCC (2007) cautions that these “bottom-up” approaches for methane inventories often underestimate fluxes. Another way to estimate pipeline leakage is to examine “lost and unaccounted for gas,” e.g. the difference between the measured volume of gas at the wellhead and that actually purchased and used by consumers. At the global scale, this method has estimated pipeline leakage at 2.5% to 10% (Crutzen 1987; Cicerone and Oremland 1988; Hayhoe et al. 2002), although the higher value reflects poorly maintained pipelines in Russia during the Soviet collapse, and leakages in Russia are now far less (Lelieveld et al. 2005; Reshetnikov et al. 2000). Kirchgessner et al. (1997) argue against this approach, stating it is “subject to numerous errors including gas theft, variations in Climatic Change temperature and pressure, billing cycle differences, and meter inaccuracies.” With the exception of theft, however, errors should be randomly distributed and should not bias the leakage estimate high or low. Few recent data on lost and unaccounted gas are publicly available, but statewide data for Texas averaged 2.3% in 2000 and 4.9% in 2007 (Percival 2010). In 2007, the State of Texas passed new legislation to regulate lost and unaccounted for gas; the legislation originally proposed a 5% hard cap which was dropped in the face of industry opposition (Liu 2008; Percival 2010). We take the mean of the 2000 and 2007 Texas data for missing and unaccounted gas (3.6%) as the upper limit of downstream losses (Table 2), assuming that the higher value for 2007 and lower value for 2000 may potentially reflect random variation in billing cycle differences. We believe this is a conservative upper limit, particularly given the industry resistance to a 5% hard cap. Our conservative estimate of 1.4% to 3.6% leakage of gas during transmission, storage, and distribution is remarkably similar to the 2.5% “best estimate” used by Hayhoe et al. (2002). They considered the possible range as 0.2% and 10%. 5 Contribution of methane emissions to the GHG footprints of shale gas and conventional gas

Summing all estimated losses, we calculate that during the life cycle of an average shale-gas well, 3.6 to 7.9% of the total production of the well is emitted to the atmosphere as methane (Table 2). This is at least 30% more and perhaps more than twice as great as the life-cycle methane emissions we estimate for conventional gas, 1.7% to 6%. Methane is a far more potent GHG than is CO₂, but methane also has a tenfold shorter residence time in the atmosphere, so its effect on global warming attenuates more rapidly (IPCC 2007). Consequently, to compare the global warming potential of methane and CO₂ requires a specific time horizon. We follow Lelieveld et al. (2005) and present analyses for both 20-year and 100-year time horizons. Though the 100-year horizon is commonly used, we agree with Nisbet et al. (2000) that the 20-year horizon is critical, given the need to reduce global warming in coming decades (IPCC 2007). We use recently modeled values for the global warming potential of methane compared to CO₂: 105 and 33 on a mass-to-mass basis for 20 and 100 years, respectively, with an uncertainty of plus or minus 23% (Shindell et al. 2009). These are somewhat higher than those presented in the 4th assessment report of the IPCC (2007), but better account for the

interaction of methane with aerosols. Note that carbon-trading markets use a lower global-warming potential yet of only 21 on the 100-year horizon, but this is based on the 2nd IPCC (1995) assessment, which is clearly out of date on this topic. See Electronic Supplemental Materials for the methodology for calculating the effect of methane on GHG in terms of CO₂ equivalents. Methane dominates the GHG footprint for shale gas on the 20-year time horizon, contributing 1.4- to 3-times more than does direct CO₂ emission (Fig. 1a). At this time scale, the GHG footprint for shale gas is 22% to 43% greater than that for conventional gas. When viewed at a time 100 years after the emissions, methane emissions still contribute significantly to the GHG footprints, but the effect is diminished by the relatively short residence time of methane in the atmosphere. On this time frame, the GHG footprint for shale gas is 14% to 19% greater than that for conventional gas (Fig. 1b). Climatic Change Fig. 1 Comparison of greenhouse gas emissions from shale gas with low and high estimates of fugitive methane emissions, conventional natural gas with low and high estimates of fugitive methane emissions, surface-mined coal, deep-mined coal, and diesel oil. a is for a 20-year time horizon, and b is for a 100-year time horizon. Estimates include direct emissions of CO₂ during combustion (blue bars), indirect emissions of CO₂ necessary to develop and use the energy source (red bars), and fugitive emissions of methane, converted to equivalent value of CO₂ as described in the text (pink bars). Emissions are normalized to the quantity of energy released at the time of combustion. The conversion of methane to CO₂ equivalents is based on global warming potentials from Shindell et al. (2009) that include both direct and indirect influences of methane on aerosols. Mean values from Shindell et al. (2009) are used here. Shindell et al. (2009) present an uncertainty in these mean values of plus or minus 23%, which is not included in this figure Climatic Change 6 Shale gas versus other fossil fuels Considering the 20-year horizon, the GHG footprint for shale gas is at least 20% greater than and perhaps more than twice as great as that for coal when expressed per quantity of energy available during combustion (Fig. 1a; see Electronic Supplemental Materials for derivation of the estimates for diesel oil and coal). Over the 100-year frame, the GHG footprint is comparable to that for coal: the low-end shale-gas emissions are 18% lower than deep-mined coal, and the high-end shale-gas emissions are 15% greater than surface-mined coal emissions (Fig. 1b). For the 20 year horizon, the GHG footprint of shale gas is at least 50% greater than for oil, and perhaps 2.5- times greater. At the 100-year time scale, the footprint for shale gas is similar to or 35% greater than for oil. We know of no other estimates for the GHG footprint of shale gas in the peerreviewed literature. However, we can compare our estimates for conventional gas with three previous peer-reviewed studies on the GHG emissions of conventional natural gas and coal: Hayhoe et al. (2002), Lelieveld et al. (2005), and Jamarillo et al. (2007). All concluded that GHG emissions for conventional gas are less than for coal, when considering the contribution of methane over 100 years. In contrast, our analysis indicates that conventional gas has little or no advantage over coal even over the 100-year time period (Fig. 1b). Our estimates for conventional-gas methane emissions are in the range of those in Hayhoe et al. (2002) but are higher than those in Lelieveld et al. (2005) and Jamarillo et al. (2007) who used 1996 EPA emission factors now known to be too low (EPA 2010). To evaluate the effect of methane, all three of these studies also used global warming potentials now believed to be too low (Shindell et al. 2009). Still, Hayhoe et al. (2002) concluded that under many of the scenarios evaluated, a switch from coal to conventional natural gas could aggravate global warming on time scales of up to several decades. Even with the lower global warming potential value, Lelieveld et al. (2005) concluded that natural gas has a greater GHG footprint than oil if methane emissions exceeded 3.1% and worse

than coal if the emissions exceeded 5.6% on the 20-year time scale. They used a methane global warming potential value for methane from IPCC (1995) that is only 57% of the new value from Shindell et al. (2009), suggesting that in fact methane emissions of only 2% to 3% make the GHG footprint of conventional gas worse than oil and coal. Our estimates for fugitive shale-gas emissions are 3.6 to 7.9%. Our analysis does not consider the efficiency of final use. If fuels are used to generate electricity, natural gas gains some advantage over coal because of greater efficiencies of generation (see Electronic Supplemental Materials). However, this does not greatly affect our overall conclusion: the GHG footprint of shale gas approaches or exceeds coal even when used to generate electricity (Table in Electronic Supplemental Materials). Further, shale-gas is promoted for other uses, including as a heating and transportation fuel, where there is little evidence that efficiencies are superior to diesel oil.

7 Can methane emissions be reduced? The EPA estimates that 'green' technologies can reduce gas-industry methane emissions by 40% (GAO 2010). For instance, liquid-unloading emissions can be greatly reduced with plunger lifts (EPA 2006; GAO 2010); industry reports a 99% venting reduction in the San Juan basin with the use of smart-automated plunger lifts (GAO 2010). Use of flash-tank separators or vapor recovery units can reduce dehydrator emissions by 90% (Fernandez et al. 2005). Note, however, that our lower range of estimates for 3 out of the 5 sources as shown in Table 2 already reflect the use of best technology: 0.3% lower-end estimate for routine venting and leaks at well sites (GAO 2010), 0% lower-end estimate for emissions during liquid unloading, and 0% during processing. Methane emissions during the flow-back period in theory can be reduced by up to 90% through Reduced Emission Completions technologies, or REC (EPA 2010). However, REC technologies require that pipelines to the well are in place prior to completion, which is not always possible in emerging development areas. In any event, these technologies are currently not in wide use (EPA 2010). If emissions during transmission, storage, and distribution are at the high end of our estimate (3.6%; Table 2), these could probably be reduced through use of better storage tanks and compressors and through improved monitoring for leaks. Industry has shown little interest in making the investments needed to reduce these emission sources, however (Percival 2010). Better regulation can help push industry towards reduced emissions. In reconciling a wide range of emissions, the GAO (2010) noted that lower emissions in the Piceance basin in Colorado relative to the Uinta basin in Utah are largely due to a higher use of low-bleed pneumatics in the former due to stricter state regulations.

8 Conclusions and implications The GHG footprint of shale gas is significantly larger than that from conventional gas, due to methane emissions with flow-back fluids and from drill out of wells during well completion. Routine production and downstream methane emissions are also large, but are the same for conventional and shale gas. Our estimates for these routine and downstream methane emission sources are within the range of those reported by most other peer-reviewed publications inventories (Hayhoe et al. 2002; Lelieveld et al. 2005). Despite this broad agreement, the uncertainty in the magnitude of fugitive emissions is large. Given the importance of methane in global warming, these emissions deserve far greater study than has occurred in the past. We urge both more direct measurements and refined accounting to better quantify lost and unaccounted for gas. The large GHG footprint of shale gas undercuts the logic of its use as a bridging fuel over coming decades, if the goal is to reduce global warming. We do not intend that our study be used to justify the continued use of either oil or coal, but rather to demonstrate that substituting shale gas for these other fossil fuels may not have the desired effect of mitigating climate warming. Finally, we note that carbon-trading markets at present under-

value the greenhouse warming consequences of methane, by focusing on a 100-year time horizon and by using out-of-date global warming potentials for methane. This should be corrected, and the full GHG footprint of unconventional gas should be used in planning for alternative energy futures that adequately consider global climate change. Climatic Change Acknowledgements Preparation of this paper was supported by a grant from the Park Foundation and by an endowment funds of the David R. Atkinson Professorship in Ecology & Environmental Biology at Cornell University. We thank R. Alvarez, C. Arnold, P. Artaxo, A. Chambers, D. Farnham, P. Jamarillo, N. Mahowald, R. Marino, R. McCoy, J. Northrup, S. Porder, M. Robertson, B. Sell, D. Shrag, L. Spaeth, and D. Strahan for information, encouragement, advice, and feedback on our analysis and manuscript. We thank M. Hayn for assistance with the figures. Two anonymous reviewers and Michael Oppenheimer provided very useful comments on an earlier version of this paper. Open Access This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.

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²
The Pipelining Mordor by John Munter
First nations-poem

Ground Zero would be Fort Chipewyan
Where many of the one thousand souls are seized
With cancers of the gut and dying
With Leukemia, lymphoma, lupus, and Graves Disease.

It's "bloody oil" says George Poitras, the former Chief
Of the Mikisew Cree who was forced to resign by dirty oil
Since they were firing his tribe for his stubborn belief
That their cancers were not worth their toil.

Since it takes two to five barrels of fresh water to make one of oil
The Dene and Cree lose access at times to eighty percent of their land
Where they hunt, gather, and trap on its soil.
Where the fish are diseased, the water is bad, and tradition becomes like sand in the hand.

Up the Athabasca where cold, clean water cups were dipped
The beaver splashed and otters romped and played
Above the shallow river three hundred feet is tipped
Tar Island Dyke that leaks five swimming pools a day
Of carcinogenic PHA's, acids, cyanide, and heavy metals.
Some little reclamation moves the water, recycles, and plants some pine
But the toxic lakes of Mordor may take a thousand years to settle
Sprouting on the Athabasca like cancers on the spine.

Up the Athabasca an oil boom town makes the wild west
Feeding off the sulphurous slurry
Making many a hundred thousand ^{of dollars} driving truck as Alberta's guests
Or bulldozing moonscapes for the town called Fort McMurray.

Up the Athabasca beyond Fort McMurray's slurries
'Fort McMurray's' toxic belly bloats greater than Three Gorges
Where near 500 Chinese towns surrendered to inundating fury
But slighter than the son of Mordor's earthworks forges.

Syncrude Tailings Dam lounges a dozen miles long
Rising several hundred feet under all four major flyways
Over the Peace-Athabasca Delta's deformed fish and vanishing song.
It is stench that never freezes leaking toxins every day.

John Meuter

The ponds of Mordor mining is only a minor section.
The other four-fifths must be melted deep beneath the surface
Spending three times more carbon—no global climate protection—
Than for Mideast crude—making tar sands virtual coal on purpose.

The Peace-Athabasca's Delta's crowning jewel
Cloaked in the largest boreal delta forest,
Will you, Athabasca, be spent for fuel;
Your second largest carbon storehouse be made the poorest?

Your government's do not at all control
Nor play or plan the role of traffic cop
Of water takings by the Mordor trolls
Or of Warming's fifty percent water drop.

O' Athabasca, your aquifer also ^{is} threatened ^{id} deeply.
New tailings dams built on sand will leak below.
Year after year the threat arises steeply
But even more threats to you rise to know.

Ground water feeding you could be destroyed
By deeper manufactured mining steam explosions.
And by natural gas wells fracking now employed,
Or by well casings, mappings, piping place confusions.

Like an iceberg peak, Athabasca, your length is fed
By a laughing bedrock channel twenty-five kilometres wide and pure
Rushing from Saskatchewan, but by dirty needles bled
By well casings not long enough to not contaminate the aquifer.

Canada and Alberta for First Nations have no pity
For those who eat and drink and fish they seem to hate.
They trespass upon those with whom they have a treaty.
Their legal duty is to "consult and accommodate".

through

From: [Greg Murphy](#)
To: [*COMM Pipeline Comments](#)
Subject: Sandpiper pipeline
Date: Wednesday, May 25, 2016 8:54:25 AM

Please consider the potential consequences **WHEN** this proposed pipeline leaks. We must re-route the Sandpiper to preserve the integrity of our states greatest asset. We won't get a second chance!

From: [Greg Murphy](#)
To: [*COMM Pipeline Comments](#)
Subject: Sandpiper and Enbridge
Date: Wednesday, May 25, 2016 9:05:55 AM

How could anyone who calls Minnesota home not see the senseless risk of putting a pipeline through the heart of our lake country.

From: [Judy Murphy](#)
To: [*COMM Pipeline Comments](#)
Subject: Enbridge
Date: Wednesday, May 25, 2016 9:31:05 AM

The impact on our State's lakes and rivers when this pipeline bursts will be catastrophic. How can this even be an issue and why doesn't our government want to protect us. Where will the Governor fish?

Sent from my iPad