

**Physicians for Social Responsibility-Wisconsin and the Wisconsin
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HEALTH RISKS OF TAR SANDS OIL SPILL

The proposed Enbridge Energy pipeline *Line 61* expansion carries significant risks to the environment and health of the people of Wisconsin. This hidden pipeline crosses the state of Wisconsin diagonally carrying Canadian tar sands from Superior, WI to Flanagan, IL. Enbridge, a Canadian pipeline company, proposes to expand the pipeline to triple the capacity from 400,000 to 1.2 million barrels per day. New pumping stations will be built to increase the flow rate, which is 45% more oil than the proposed Keystone XL pipeline.

Health and environmental risks will increase as a result of the increased pressure in the pipeline and potential for a major oil spill. The pipeline carries diluted bitumen or "dilbit". It starts out as thick tar sands oil called bitumen that has been compared to the consistency of peanut butter before it is steamed or strip mined from the sandy soil. To make it flow through a pipeline, it is diluted with large quantities of liquid chemicals like benzene, a known human carcinogen, and toluene, to form dilbit.

Dilbit is considered to be so acidic and abrasive that is more likely to corrode and weaken pipelines than conventional oil, according to several environmental organizations, though this is debated by the industry. Additionally, the dilbit is heated to make it thinner and increase its speed through the pipeline. With the proposed increased flow rate, heat, and pressure in the pipeline, the risk of a pipeline rupture greatly increases. [See www.nrdc.org/energy/files/tarsandssafetyrisks.pdf for more information]

IMPACT OF A SPILL

Enbridge has a record of environmental violations. A disastrous Michigan pipeline rupture in 2010 caused significant contamination of the Kalamazoo River. 834,000 barrels of oil escaped down the river, where clean up is still occurring. Local residents were displaced from their homes for days to weeks during the initial clean up. Many experienced health effects from inhalation of the volatile chemicals including headaches, nausea and vomiting. Initial monitoring of the levels of these chemicals was inadequate since there was no local source for monitoring equipment at the time of the spill, nor was it immediately recognized that this was not ordinary crude oil. According to some reports, it was not until a day later that state and federal agencies were there to monitor benzene levels.

From the Natural Resources Defense Council website:

*Large quantities of diluted bitumen were spilled following pipeline ruptures in Marshall, Michigan, in 2010 and Mayflower, Arkansas in 2013. These spills, of at least 1.15 million gallons and 210,000 gallons, respectively, have proved extremely difficult to clean up. The tar sands oil that spilled in Michigan entered the Kalamazoo River, leading to the most expensive oil pipeline cleanup in U.S. history (now totaling more than \$1 billion). **After the spill in Michigan, the state Department of Public Health set up a broad surveillance effort that determined 320 people suffered adverse health effects, including cardiovascular, dermal, gastrointestinal, neurological, ocular, renal, and respiratory impacts.** Similarly, following the Arkansas spill, air monitoring data showed significantly increased levels of benzene in the ambient air, and residents living close to the spill reported increased headaches, nausea, and respiratory problems. Despite these health concerns, the federal government has failed to promulgate guidelines for dealing with chemical exposure at oil spills and has not commissioned any studies regarding the long-term human health impacts of these spills. [See www.nrdc.org/energy/tar-sands-health-effects.asp]*

TAR SANDS OIL AND CLIMATE CHANGE

The burning of fossil fuels is widely known to be the cause of climate change. Carbon rich tar sands oil has more of an impact than conventional oil. The extraction and refining of tar sands produces 30-70% more greenhouse gas emissions than conventional oil production, according to estimates by Alex Farrell and Adam Brandt published in the October 2007 issue of *Climatic Change*.

Health effects of climate change are many and include worsening air quality, in part due to increased fine particles, increased ozone levels, and increased pollen counts which causes asthma and emphysema to flare. Fine particles also increase heart disease risk. Climate change increases the average number of days with extreme heat, causing more heat related injuries and deaths. The frail elderly, young children, and those with chronic health and economic issues are at the greatest risk.

If climate change continues, there is a serious danger of worldwide famine. [See *Climate Change and Famine*, a report from Physicians for Social Responsibility www.psr.org/resources/climate-change-and-famine.html]

James Hansen, one of the US foremost climate scientists and former Director of the NASA Goddard Institute for Space Studies, said in an OpEd in the May 9, 2012 *New York Times*:

“If Canada proceeds [to develop all their tar sands], and we do nothing, it will be game over for the climate.”

Canada’s tar sands, deposits of sand saturated with bitumen, contain twice the amount of carbon dioxide emitted by global oil use in our entire history. If we were to fully exploit this new oil source, and continue to burn our conventional oil, gas and coal supplies, concentrations of carbon dioxide in the atmosphere eventually would reach levels higher than in the Pliocene era, more than 2.5 million years ago, when sea level was at least 50 feet higher than it is now. That level of heat-trapping gases would assure that the disintegration of the ice sheets would accelerate out of control. Sea levels would rise and destroy coastal cities. Global temperatures would become intolerable. Twenty to 50 percent of the planet’s species would be driven to extinction. Civilization would be at risk.

HEALTH EFFECTS OF CHEMICAL DILUTANTS, BENZENE AND TOLUENE

Benzene and toluene pose short and long term health hazards to those working with these chemicals and the potential for health effects when a spill occurs. Benzene and toluene are highly volatile so most exposures occur through inhalation causing headache, dizziness, drowsiness, confusion, tremors, and loss of consciousness. They can also cause eye and skin irritation.

Chronic exposure to benzene has been linked to a number of leukemias in adults and children (acute myeloid leukemia, acute and chronic lymphocytic leukemia), non-Hodkin’s lymphoma, and multiple myeloma. Chronic exposure can cause aplastic anemia. It also has been linked to immune system effects reducing resistance to infection. Over time, benzene exposure can also cause reproductive problems including abnormal sperm in men, and irregular periods and smaller ovaries in women. It has also been linked to low birth weight.

Toxicologists recognize that exposures to a mixture of volatile organic compounds can result in synergistic effects that exacerbate the adverse health effects of the individual chemicals.

Long-term exposure to toluene may harm the nervous system, heart, liver and kidneys. Nervous system effects include reductions in thinking, memory, and muscular abilities. It can also cause hearing loss and color

vision loss. At very high levels, toluene can cause permanent toxicity to the brain. It has also been associated with low birth weight. Though there has been some suspicion, currently, there is inadequate data to show that toluene is cancer causing.

