

What We Know (And Don't Know) About Line 3 Drilling Fluids

Prepared by Science for the People-Twin Cities

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Summary: The reported risk assessment testing of drilling fluid components is very limited, and appears to be restricted to very short term exposure of only a few organisms in laboratory settings. This kind of testing is well understood by risk assessment scientists to miss long term effects or harm to other organisms. And because different organisms often react very differently to exposure, the very few organisms reported in toxicity tests do not provide confidence that they can predict harm to the environment. The proprietary nature of the additives in drilling fluids also leaves the public in the dark, especially considering the very limited risk assessment testing that appears to have been done.

When spilled, drilling fluid typically appears as a pale gray silt on the land or a light brown plume in the water.

What's in the drilling fluid? There are 17 different drilling fluid additives that Enbridge may be using at different locations along the Line 3 route.

- MPCA confirmed that the additive in the drilling fluid spilled in the 'frac-outs' at the Mississippi River crossing was Polyselect Power PAC™-L. This additive is noted as a "wall cake enhancer" and "bore wall stabilizer".
- Neither MPCA nor Enbridge has disclosed the chemical composition of Polyselect Power PAC™-L drilling fluid. The chemical composition is listed as "proprietary" (i.e., a trade secret). It is noted to contain 60-100% 'polysaccharide'.
- In addition to whatever chemicals are contained in the additive, the drilling fluid is also known to contain bentonite.
- The most common form of bentonite used in drilling muds is sodium bentonite. Drilling muds are known to leach sodium into freshwater. Sodium can be toxic to aquatic life, depending on the concentration.

What are the risks from drilling fluid spills?

- The Data Safety information for Polyselect Power PAC™-L notes the following about this additive:
 - "May form combustible dust concentrations in air."
 - "May cause mild eye, skin, and respiratory irritation."
 - "Decomposition in fire may produce harmful gases. Organic dust in the presence of an ignition source can be explosive in high concentrations. Good housekeeping practices are required to minimize this potential."
 - "Environmental precautions: Prevent from entering sewers, waterways, or low areas."
 - "Methods for containment and cleaning up: Scoop up and remove."

- o “Handling Precautions: Avoid creating or inhaling dust. Avoid dust accumulations. Ensure adequate ventilation. Slippery when wet. Avoid contact with eyes, skin, or clothing. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.”
- o “Chronic Effects/Carcinogenicity: No data available to indicate product or components present at greater than 0.1% are chronic health hazards” [i.e., [this indicates no data is available one way or the other to assess chronic health effects](#)]
- o “Ecotoxicity effects: Product is not classified as hazardous to the environment”.
- o Ecotoxicity data shows that acute (short term) toxicity to fish was tested using one species (rainbow trout), and acute (short term) toxicity to invertebrates was tested using one species (an ocean shrimp). The toxicity data shows that the fluid is toxic to these organisms at high concentrations. These toxicity tests were conducted in the lab and likely do not represent real life settings.
- o There is no data available on the acute (short term) toxicity of the fluid to algae or micro-organisms. There is no data available on the chronic (long term) toxicity of the fluid to any type of plant, animal or microbe.
- Bentonite is a very fine sediment that will be a stressor to aquatic life if spilled into rivers and wetlands. Fine sediments can clog the gills and suffocate aquatic life like mussels, insects, and fish. Fine sediments can also ruin habitat for these life forms.
- There have been relatively few scientific studies of drilling fluid toxicity to the environment. Most of the available scientific studies were conducted for coastal environments. In coastal settings, drilling fluids have demonstrated toxicity for fish, crustaceans, mollusks and other organisms.
- At least one study indicates toxicity of ‘polysaccharide’-based drilling fluids to aquatic and plant life.
- The drilling fluid is likely to have components that are soluble (dissolve in water) and components that are insoluble (don’t dissolve in water, this includes the bentonite particulates). Soluble components are able to travel through groundwater into surface water. Insoluble components like bentonite can travel overland into water after a rainstorm, or can be spilled directly into waterways (including rivers and wetlands).

What has the Minnesota Pollution Control Agency said about these drilling fluids?

- MPCA environmental manager Melissa Kuskie stated that the MPCA “reviewed all components of the approved drilling fluid additives, including proprietary components not included in the safety data sheets (reviewed as non-public data)”. She also stated that the review was conducted “to ensure protection of drinking water and consisted of comparing the components of the additive to compounds with drinking water standards. The levels were expected to be below any levels of concern or there were not drinking water standards.”
- MPCA has not disclosed what scenarios they considered in conducting their review of drilling fluid impacts (i.e., what spill volumes & locations were considered), or if they conducted this review in the context of likely real life spill scenarios.