

Federal regulations should be strengthened to prepare for potential spills of diluted bitumen

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The U.S. Department of Transportation (DOT) needs to modify its regulations and planning in order to strengthen preparedness for accidental spills of diluted bitumen from pipelines, says a new report from the National Academies of Sciences, Engineering, and Medicine. Diluted bitumen, a type of crude oil made from bitumen extracted from tar sands, has properties that warrant special preparations to limit environmental damage in the event of a spill, said the committee that conducted the study and wrote the report.

"The recommendations set forth in our report represent a practical and pragmatic approach to mitigating the unique concerns associated with [spills](#) of diluted bitumen," said committee chair Diane McKnight, professor of civil, environmental, and architectural engineering and a fellow of the Institute of Arctic and Alpine Research at the University of Colorado.

Bitumen is a heavy and dense crude oil that is extracted from [tar sands](#) in Canada. It is mixed with lighter oils and transported through pipelines in this diluted form. Diluted bitumen has been transported by pipeline in the U.S. for more than 40 years, but the amount has increased recently as a result of improved extraction technologies and production and exportation by Canada. Both new and existing pipelines are being proposed and developed to accommodate this increased production.

An Academies study released in 2013 found that diluted bitumen is no more likely than other crude oils to be accidentally released from a pipeline. As a follow-up to that study, Congress and DOT further directed the Academies to investigate whether, if a spill occurs, the properties of diluted bitumen differ enough from other types of oil to warrant changes to preparedness or cleanup regulations or to spill response plans.

Such changes in regulations and planning are warranted, the new report says. While immediately following a spill, diluted bitumen behaves similarly to other crude oils immediately following a spill, exposure to the environment induces rapid physical and chemical changes known as "weathering" that are unique to diluted bitumen. Within days, diluted bitumen starts to turn into a heavy, viscous, sediment-laden residue that cannot easily be recovered using traditional response techniques. The residue has a strong tendency to adhere to surfaces, and it poses particular challenges if it is spilled into a body of water, because the residues can submerge or sink to the bottom.

The way diluted bitumen changes after weathering calls for greater concern compared with commonly transported crude oils and special response strategies and tactics, the report says. Currently, the regulations and practices of DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) do not take the unique properties of diluted bitumen into account, nor do they encourage effective planning for spills of diluted bitumen. A more comprehensive and focused approach is needed to improve preparedness for spills of diluted bitumen and to spur more effective cleanup and mitigation measures when spills do occur.

The report recommends that PHMSA modify its Part 194 regulations so that spill response plans can effectively anticipate and ensure an adequate response to spills of diluted bitumen. For example, PHMSA should:

- require response plans to describe activities and resources to mitigate impacts of spills of diluted bitumen, including capabilities to detect, contain, and recover submerged and sunken oil;
- consult with the U.S. Environmental Protection Agency (EPA) and/or the U.S. Coast Guard (USCG) to obtain their input on whether response plans are adequate for spills of diluted bitumen; and
- require response plans to describe procedures by which, if a spill occurs, pipeline operators will inform a designated federal or state official of the source and industry-standard name of any spilled diluted bitumen within six hours. If requested, they will provide a sample of the oil and information on the specific composition of the diluent within 24 hours.

PHMSA, together with the U.S. Environmental Protection Agency), the U.S. Coast Guard, and state and local governments should take advantage of the Area Response Planning process to increase coordination and share lessons learned in order to strengthen preparedness for spills of diluted bitumen.

In addition, EPA, USCG, and the oil and pipeline industry should support the development of effective, environmentally friendly techniques to detect, contain, and recover submerged and sunken oils in aquatic environments. USCG should revise its oil-grouping classification system to more accurately reflect the properties of diluted bitumen and to recognize it as a potentially nonfloating oil. And NOAA should lead an effort to acquire all relevant data that could aid advanced predictive modeling for spills of diluted bitumen being transported by pipeline.

Although many differences between diluted bitumen and other crude oils are well-established, some remaining areas of uncertainty hamper effective responses to spills, the report says. Further research is needed

in a range of areas, including the ecological and human health risks posed by weathered diluted bitumen, techniques to intercept and recover submerged oil in moving water, and alternatives to dredging to recover sunken oil.

More information: Report: [www.nap.edu/catalog/21834/spil ... comparative-study-of](http://www.nap.edu/catalog/21834/spil...comparative-study-of)

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