

# Research Advances on Unconventional Petroleum Hazards and Impacts

**A discussion on Lac Mégantic, pipelines and oil spills**



**Presented by Senator Prof. R. Galvez, Ph.D., P.Eng. P.Eng.**

*Unconventional oil* is petroleum extracted using much higher energy-intensive techniques than through the traditional oil-well. It is the case in Canada with bituminous sands or in USA with light oil from the Bakken formation where these crudes are extracted from tight rock or soils. These oils are then transported by pipelines and railways to be sold around the world. Factors including aging of pipeline and rail networks, plus increases in volumes shipped and inadequate tank cars have increased risk for high impact oil spills and catastrophic emergencies. Between 1990 and 2012, 17 605 incidents (leaks, spills) of contaminated soil and water were reported in Alberta. More notably, in Kalamazoo (Michigan), diluted bitumen (*Dilbit*) from Athabasca flowed into Talmadge Creek (tributary of Kalamazoo River) resulting in the largest and costliest inland oil spill (over \$1.2 Billion USD) in USA history. At Lac-Mégantic (Quebec), 72 car tanks derailed and spilled light Bakken oil, causing a series of explosions, flying fireballs and flowing oil on fire. The event resulted in the death of 47 citizens, the destruction of the entire downtown and the contamination of the waters of Lac Mégantic and the Chaudière river. The clean-up costs reached \$300M. The aftermath of these major accidents and the numerous pipeline proposals for the transport of *Dilbit* and *Bakken* oil, highlight the lack of preparedness of cities and governments to deal with unconventional oil emergencies. This seminar will summarize four years of research work including the analysis of case studies, the advanced characterization of unconventional oil, which is also a factor leading to oil spills, its divergent environmental fate and long-term impacts. These findings will assist municipalities, engineers, health and environmental professionals to better assess hazards and be prepared for emergencies.



Presenter:

Senator Professor Rosa Galvez is an expert in environmental impact and risk evaluation, contaminated site restoration and groundwater contaminant transport. She was appointed to the Canadian Senate in December 2016. She is a Professor in the Department of Civil and Water Engineering at Laval University, Quebec. At the end of her presentation, Senator Galvez will also talk about her activities in the Senate

## SCHEDULE

Please contact your local Section for venue and registration details.

DATE 2018	LOCATION	TIME	SECTION CONTACT	EMAIL	PHONE
Feb. 21	SHERBROOKE	5:00 pm	Zohra Alaoui	<a href="mailto:scgc@usherbrooke.ca">scgc@usherbrooke.ca</a>	873-200-2025
Feb. 28	MONTREAL	6:00 pm	Sara Rankohi	<a href="mailto:sara.rankohi@groupecanam.com">sara.rankohi@groupecanam.com</a>	514-208-3777
March 1	QUEBEC	6:30 pm	Kim Lajoie	<a href="mailto:scgc-sectionquebec@outlook.com">scgc-sectionquebec@outlook.com</a>	418-931-4850

This lecture tour in Quebec is part of the CSCE national lecture tour entitled “Lac-Mégantic’s Human and Environmental Disaster: The event, the impacts and the lessons to be learned”. The content has been amended to supplement the previous Quebec regional lecture tour presented in 2014. The Sherbrooke and Quebec City presentations will be delivered in French and the Montreal presentation will be delivered in English. Questions and discussion can be made in French or English at all presentations.