



Quebec Excavated Contaminated Soil Management Practices

HOT PROPERTIES

CANADIAN BROWNFIELDS 2008

TORONTO

October 23rd

Direction des politiques en milieu terrestre

**Développement durable,
Environnement
et Parcs**

Québec 

Quebec Excavated Contaminated Soil Management Practices

- In 1984, the Quebec Ministry of the Environment completed its first inventory of what was then known as the hazardous waste landfill sites, which became, over the years, the contaminated sites
- Since then, thousands of sites have been assessed and rehabilitated.
- Through that process, ways to steer and manage the excavated contaminated soils flow has been put in place
- The main elements of the practices developed in Quebec will be presented.

Quebec Excavated Contaminated Soil Management Practices

1. In Quebec a soil, even contaminated, is never a waste, can never become a waste.

The Ville LaSalle municipal landfill case (1985–1987)

- Used as a municipal landfill from 1940 till 1959: industries also eliminated some industrial waste there.
- A residential area has been build on the site.
- In 1985, samplings confirmed the presence of contaminants (PAH's, PCB's, Dioxins) in the soil and groundwater under the houses.

The Ville LaSalle municipal landfill case (1985–1987)

- Ministry proceeded to a full assessment and cleanup of the site.
- Some residents were relocated.
- 8 houses were demolished.
- 120 000 m³ of soil have been excavated and buried in a special double lined cell build nearby.
- Costs: 10 millions \$

The Hazardous Waste Regulation (1985)

- Hazardous waste are :
 - generically defined;
 - defined through leachate testing.

Ville LaSalle Case Teachings (1985)

- HWR applied to the Ville LaSalle contaminated soils does not work:
 - PCB's highly contaminated soils do not leach
 - Heavy metals slightly contaminated soils may leach : heavily contaminated sometimes do not
 - Other pathways, not taken into account by the leaching test, must be considered (inhalation, dermal contact)
 - Ecotox. (ex: plants grow an intake in contaminated soils) must be considered

Ville LaSalle Case Teachings (1985)

- Waste treatment often means destroying the waste;
- Contaminated soil treatment means taking the contaminants (waste) out of the soils, providing then a reusable soil;
- Biodegradation, hardly a solution for waste, works well with contaminated soils.

Ville LaSalle Case Teachings (1985)

- The Ville LaSalle case clearly heralded an era of interventions on contaminated sites : if one site generates 120 000 m³ of contaminated soils...
- Municipal landfills capacity must be preserved
 - Must go through a long and uncertain process to open new ones

Soil /Waste in the Regulations

Hazardous Materials Regulation

- **Article 2.** The following do not constitute hazardous materials:
 - (1) contaminated soil except, for the purposes of prohibiting deposit prescribed in section 94 of this Regulation, soil having more than 50 mg of PCB per kilogram of soil;

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Soil /Waste in the Regulations

Regulation respecting the landfilling and incineration of residual materials

- **article 4.** The following may not be disposed of in a landfill to which this Chapter applies :
 - (9) soils that, because of human activity, contain one or more contaminants in concentrations exceeding the limit values set out in Schedule I to the Land Protection and Rehabilitation Regulation (O.C. 216-2003, 03-02-26), and any product resulting from the treatment of such soils by a stabilization, fixation or solidification process

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3. Contaminated soils cannot be put on soils less contaminated than the incoming soils

The Soil Quality Protection

Regulation on the storage of contaminated soils

- **Article 4.** The disposal of soils containing contaminants in a concentration lower than the limit values in schedule 1 is prohibited on or in soils having a contaminant concentration lower than the contaminant concentration in the soils disposed of.

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2. Contaminated soils cannot be eliminated where waste would be.
3. Contaminated soils cannot be put on soil less contaminated than the incoming soils
4. Contaminated soils and waste have each their own segregated file

Contaminated Soils File

Contaminated soils have their own:

- Criteria (total content based) to assess contamination gravity, select cleanup level and decide what can be done with the excavated soils;

Contaminated Soils Criteria

- Criteria (total content) first used at the Ville LaSalle case
- Criteria (ABC) and generic use approach appeared first publicly in 1988 Policy
- Grid for the management of excavated contaminated soils (Policy 1998);
- Criteria became regulated in the Soil Protection and Land Rehabilitation Regulation (2003)
- Grid should become part of the regulation in 2009

Contaminated Soils File

Contaminated soils have their own:

- Criteria (total concentration based) to assess contamination gravity, select cleanup level and decide what can be done with the excavated soils;
- Landfills:
 - Guidelines on building secure contaminated soil (only) landfills (1988)

Special Landfills for Contaminated Soils

- First one build in 1987
- Five disposal sites actually existing
- Around 100 000 metric tons are yearly disposed off in those sites

Contaminated Soils File

Contaminated soils have their own:

- Criteria (total concentration based) to assess contamination gravity, select cleanup level and decide what can be done with the excavated soils;
- Landfills:
 - Guidelines on building secure contaminated soil (only) landfills (1988);
- Treatment sites :
 - Not being a waste, the soils treatment plants did not have to go through the lengthy and uncertain impact assessment process at which hazardous waste treatment plants were submitted.

Treatment Centres for Contaminated Soils

- First one build in 1991
- Now, a network of 30 sites (thermal, bio, physico-chemical)
- Since 2001, it is compulsory to treat excavated soils (D+) if there is a treatment plant in Quebec
- Around 400 000 metric tons are yearly treated in those sites

Treatment Centres for Contaminated Soils

Currently working on :

➤ Closing the gaps;

➤ Fostering in situ.

Currently working on :

- Providing more valorisation options (regulation 2009)
 - Use to revitalise degraded sites (mining sites, rock quarries)
 - Use in infrastructure works:
 - roads foundations
 - sound and visual barriers
 - Incorporate into industrial process
- Fostering material segregation on site to reduce soils volume to be transported/ treated/ eliminated