

THE USE OF SITE SPECIFIC ASSESSMENT AND THE IN SITU MANAGEMENT OF CONTAMINATED SOIL IN THE REDEVELOPMENT OF CONTAMINATED SITES

6TH MEETING OF THE INTERNATIONAL COMMITTEE
ON CONTAMINATED LAND

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Risk Assessment and Management on a Contaminated Site

- Through:
 - Use based generic criteria (generic risk) and cleanup to the criteria
 - Specific risk assessment and cleanup to 1) a specific criteria or 2) the in situ mitigation of the contamination through engineered measures

Use Based Generic Criteria (Generic Risk)

- Positive aspects
 - Conservative
 - Easy to use
 - Easy to «sell»
 - Limit follow up
 - Egalitarian
- Negative aspects
 - May be over protective for specific cases;
 - May lead to expensive (and in some cases unsustainable) intervention (\$\$\$)

Site Specific Risk Assessment

- Positive aspects
 - Cleanup tailored to site and project specific condition
 - «Scientifically» based
 - Reduce costs
 - Allows the realisation of projects which, otherwise, may have been jeopardised
- Negative aspects
 - Many assumptions having impacts on final results
 - More «fuzzy» for public, prospective buyers, bankers
 - More expansive assessments
 - «Eternal» follow up necessary

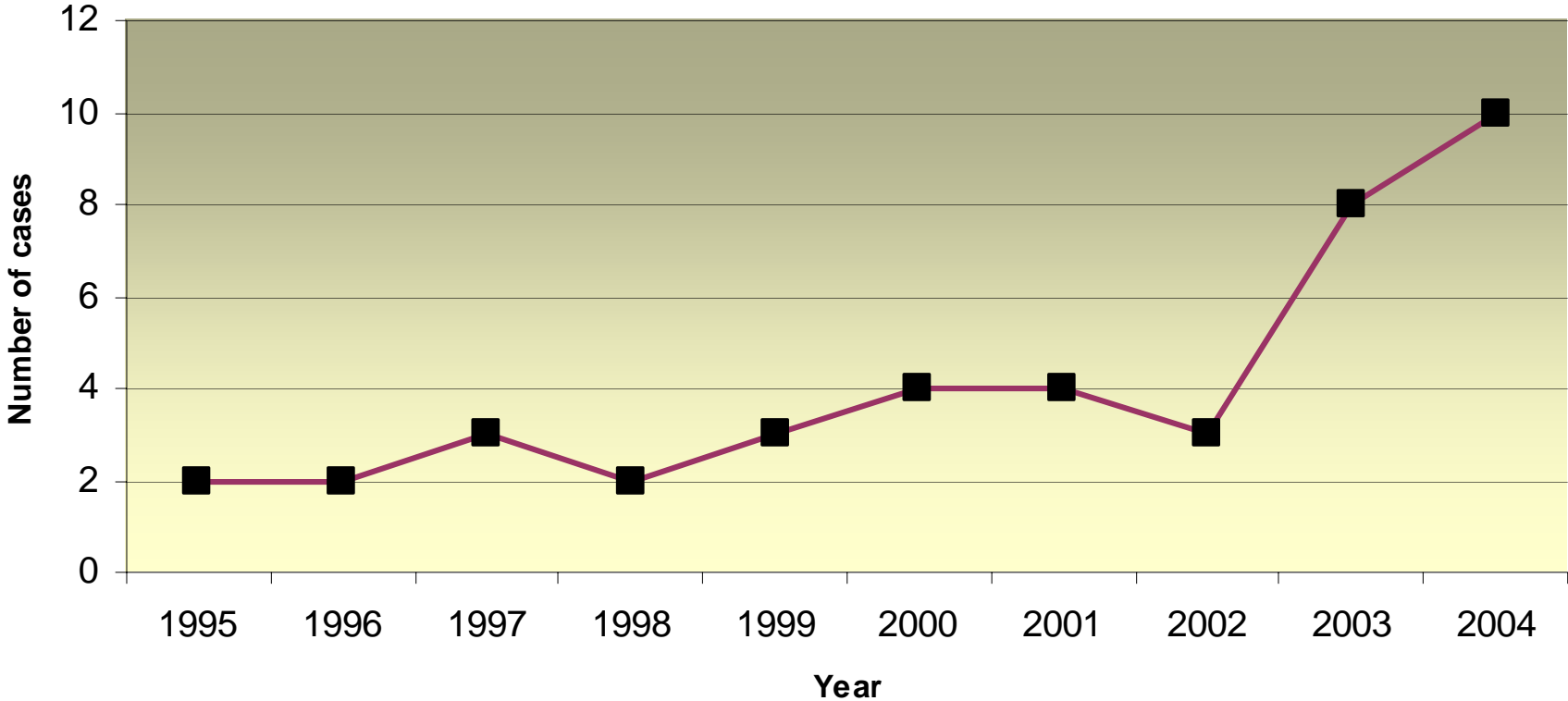
Risk Assessment on a Contaminated Site

- Most administration, while preferring the generic criteria (and their «definitive» consequences), will accept a two tiered approach where a proponent may, at will, choose the specific risk assessment if unsatisfied with the generic approach

Specific Risk Assessment in Québec

- Limited opening was first made in 1995.
- In 2003, the possibility to use specific risk assessment was included in the Environmental Quality Law

Specific risk assessement cases yearly reviewed by the GTE in Quebec



Risk Assessment in Quebec

- All together, over the last 11 years, 57 projects have been received and analysed by the ministry (28 since 2003)
- Projects encompass residential, greenspace, institutional, industrial as well as commercial projects
- It is possible to reflect on those projects and foresee where the actual followed course is leading

Initial Government Concerns

- It should not become a new way for polluters to leave contamination in place, transfer liability to someone else and escape their obligations (the old ways under disguised)
- Risk assessment should not become a black box from which questionable risks evaluations produced at will by indulgent site owners and consultants could emerge
- It should not become an ongoing battle of experts

Risk Assessment in Quebec

For answering those concerns, the Government has put in place a set of rules to guarantee :

- Scientifically sound and transparent risk assessment
- Publicity and long term memory
- Some governmental overview

Scientifically Sound Risk Assessment

All assessment must take into account:

- Toxicological risk
- Ecotoxicological risk
- Impact on groundwater

Toxicological Risk Assessment

- Toxicological risk assessment must be done following the extensive Health Ministry «Guidelines for conducting human health toxicological risk assessment»
- Any deviation must be highlighted and justified

Ecotoxicological Risk Assessment

- Ecotoxicological risk assessment must be done following the extensive Environment Ministry «Contaminated sites Ecotoxicological risk assessment»
- Any deviation must be highlighted and justified

Impact on Groundwater

- Has to be assessed using the groundwater use based criteria provided in the Soil Protection and Contaminated Sites Rehabilitation Policy
- But most of the sites are located in urban settings where groundwater is not used and drinking water is coming from surface water or far away groundwater and provided through a water pipe network

Publicity

- In all case of reutilisation the proponent must prior to any work on the site:
 - Publicised its project, the site assessment as well as the envisioned risk management measures in newspaper;
 - Make all studies available to the public;
 - Convene of at least one public meeting where the project will be presented and potential concerns can be expressed by residents;
 - Produce a summary of all public concerns as well as the follow up which will be given by the proponent

Long Term Memory

- Any contamination above the use based generic criteria must be registered on the land title
- Any associated land use restrictions, including the resulting charges or obligations, must be registered on the land title

Governmental Overview

- The risk assessment studies, public consultation report as well as rehabilitation plan (including the proposed risk management measures) must be submitted and approved by the governmental Technical Assessment Group (GTE)
- Local and central Environment and Health Ministries representatives sit on the GTE

Exclusion

- Specific risk assessment is no option for:
 - Petroleum hydrocarbons (generic criteria must be applied)
 - Residential redevelopment where owners have access to a private lot of land (generic criteria must be applied on the two first meters)

What is Working

- Protocols developed by Health and Environment ministries have been adopted by consultants: the tools are accepted (limited experts confrontation)
- Risk Assessments show that, in all cases submitted to the GTE, risk management measures are necessary (the process does not lead to risks underestimation)

What is Working

- Publicity measures were enforced in all cases (no «panic» or unjustified opposition among the future residents or population)
- Contamination and land use restrictions are dutifully registered on the land title

Problems

- For some contaminants, health risk assessment indicates that the level of exposition resulting from the «background» contamination alone (not related to the contamination on the site) is already beyond the acceptable daily intake
- Solution: ponder the relative contribution of the contaminated sites with the background contribution

Problems

- What is the meaning of the ecotoxicological impact on small or linear lots, where potentially impacted flora and fauna may move a few meters beside and escape the contamination or, if the surrounding lots are contaminated, be exposed anyway?

Problems

- None of the risk management plans submitted to date proposed specific criteria based cleanup.
- In all cases, in situ management of the contamination through some kind of confinement has been the implemented option (except for the contaminants and situation for which the ministry does not accept such solution)

Problems

Sophisticated risk assessment tends to be invariably followed by a simple risk management solution: add a meter of clean soil (some will propose less) on top of the contaminated soils. Proponents argue that:

- The new soil layer acts as an effective barrier isolating low mobility contaminants (heavy metals, PAH's, PCB's) from the humans (even for very high contamination level);
- The new clean soil layer provide a safe substratum for plants and animals.

Problems

- If the solution, cutting the exposure, is already known from the beginning, what is the relevance of doing a sophisticated risk assessment in the first place?
- Is this the end of elaborated risk assessment?
- Are we slowly reverting back to the situation we faced in the past, when contamination was simply left in place and passed over to the next generation?

Consultant and Site Owners Concerns

- Process is too complex (assessment) and long (governmental review) : should be simplified
- Restrictions (petroleum hydrocarbons and private residential lot) should be lifted)
- It should be possible to reuse excavated soils on their original site, with no regards to the contamination level
- As GTE requirement are getting stricter, there is less and less risk assessment done

A New Regulation

- The Ministry envisions a new regulation on risk assessment and risk management to influence the way specific risk assessment and on site contamination management are done
- The following obligations could be introduced:

A New Regulation?

- Anyone wishing to propose an in situ management of the contaminated soil (without treatment) would also have to submit a detailed evaluation of alternative options:
 - Treatment in situ or on site after excavation (if the technology exist)
 - Treatment off site (if the technology exist)
 - Excavation and off site landfilling
- The following elements will have to be looked at:
 - Human health and environmental protection;
 - Technical performance and efficiency of the proposed technologies
 - Feasibility, cost and schedule;
 - Potential impact on surrounding neighbourhoods
 - Permanency of the selected option

A New Regulation?

- The existing restrictions for petroleum hydrocarbons and residential area with access to private lots are maintained
- All >D excavated soil must be treated or eliminated in a contaminated soil secure landfill

A New Regulation?

- Excavated A-D soil may be reused on the land of origin if it is part of a risk management plan and following a risk assessment showing that there is no risk (or an acceptable risk)
- The soil may be placed in an above ground structure (bank, anti-sound wall, etc) if there is:
 - an encapsulation of the contaminated soil and a follow up plan of the site;
 - the soil contamination and management measures are registered on the land title;
 - the structure stays the property of an accountable entity

Conclusion

- The simplicity of the risk management measures proposed following a complex specific risk assessment questions the necessity of still doing, in the first place, the risk assessment;
- An hyper simplification of the process may bring us back to where we were 20 years ago : the simple transfer of the contamination from polluters to a third party (except for publicity and registration on land title);
- The interdiction of specific risk assessment and on site contamination management interdiction may jeopardize the redevelopment of major sites an impact cities renewal ;
- Balance has to be found