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Division

Remediation of the Hazardous Waste Landfill in Kölliken, Switzerland

Dr. Bernhard Hammer

NATO/CCMS Pilot Study Meeting

Athens, 5 -7 June 2006

Agenda

Bernhard Hammer:

- Introduction
- Principles of sustainable remediation
- The Kölliken landfill site – general informations

Jean-Louis Tardent:

- Remediation - Technical aspects
- Introduction to the film

Film

What is Switzerland?

like that?

What is Switzerland?

it's also like that!

Chromium VI-Emissions!

hundred thousands of tons of chemical waste!
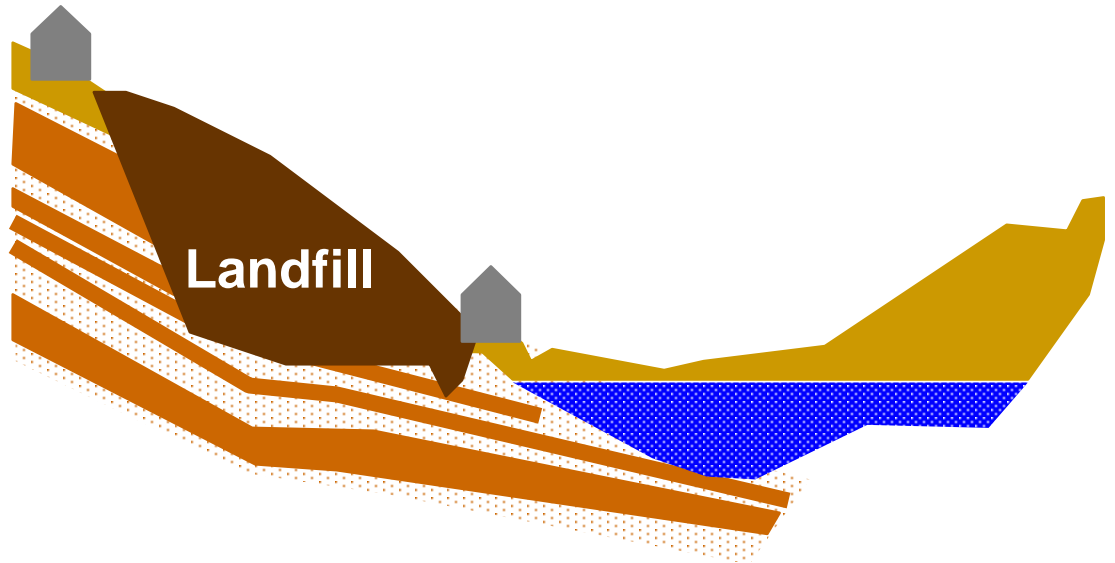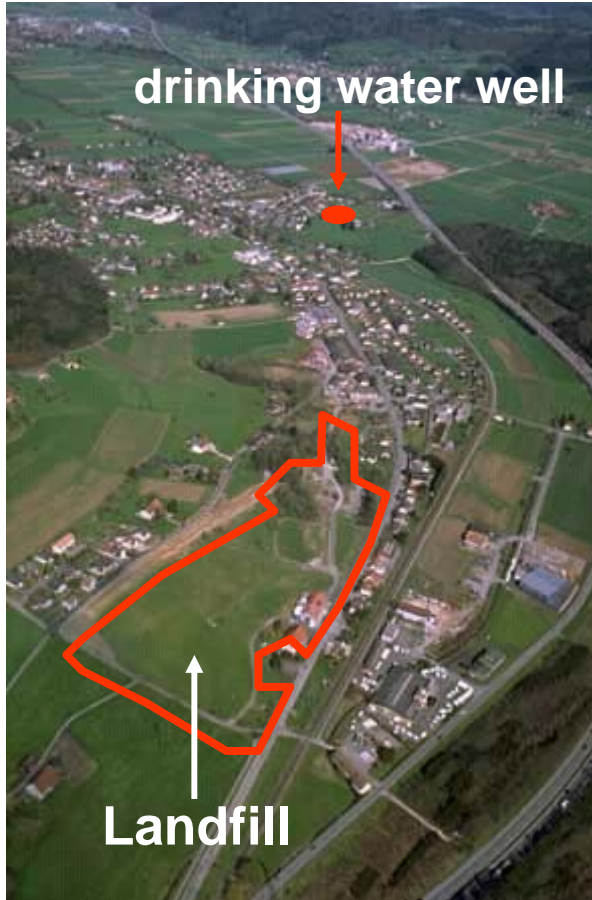
Brownfields!

Contaminated land in Switzerland

- no significant mining activities
- hardly any heavy industries
- few extended industrial areas
- no war-related contamination
- long tradition of waste incineration

but...

- high population densities
- little construction land available, expensive land
- intensively farmed soil, high quality requirements
- intensively used groundwater (80% of drinking water)
- most contaminated sites lie on groundwater deposits
- few large sites - many small sites

Kölliken landfill - General Situation

drinking water well

Landfill

Landfill

1978 – 1985:
250'000 m^3 of hazardous wastes

area: 40'000m^2

Persistant polluted site / PEPSI

Kölliken Landfill site = PEPSI site

High percentage of persistant pollutants

- Persistant pollutants well dispersed, not extractable
  (in-situ measures not applicable)

- Degradation & lixiviation of pollutants >>> 50 years

- Substantial danger exists over long periods
  (up to x00 years)

Remediation strategy

- For the Kölliken site decontamination is indicated

- Decontamination is the only solution for a long-term successfully and economically remediation

- In 2003 the authorities decreed the complete excavation of the landfill by 2012.

- Decontamination costs: 350 Mio. $ (excavation and off-site treatment)

- Containment methods would have very high consumer costs for the long-term operation over hundreds of years:
  - Containment costs to date: 100 Mio. $
  - Annual treatment/monitoring costs: 4 Mio. $