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Towards a new contaminated sites Ordinance establishing comprehensive assessment criteria in Austria

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In the 1980ies Austria was plagued with several dramatic incidents of soil and groundwater contamination

The press was loaded with dramatic stories referring to "subsoil bombs"


All incidents were inherited from the past when waste was not safely disposed of and waste water not treated adequately

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Political Response

- 1989: A remediation fund was established by law to finance soil and groundwater remediation, investigation and risk assessment of contaminated sites



waste treatment fee was established



remediation fund
approx. 70 mio. € / year
(8 € per citizen and year)

> 220 clean-up measures
> 460 risk assessments
maintenance of national management system
research projects
etc.

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Lessons Learned in Austria (after 20 years)

- A few contaminated 'high risk' sites, but a widespread structural problem
- Some sites are severely contaminated (harmful), but risks involved at many contaminated sites are low
- Total clean-ups ("natural status") are often neither technically nor economically feasible
- International discussions on risk based land management (CARACAS, CLARINET)
- Uncertainties about contamination and risks constrain investments in redevelopment of sites



→ **Consequence: major revision of ALSAG 1989 planned**

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Envisaged legislative changes

Draft Proposal for consultations – "ALSAG 2013"

- Systematic identification of contaminated and seriously contaminated sites
- Effect and land-use related risk assessments at seriously contaminated sites
- Risk based remediation measures (including monitoring and use-restrictions) at seriously contaminated sites; risks for humans and the environment have to be managed adequately
- Accompanying **ALSAG-Ordinance** specifying criteria to perform risk assessments and to determine (seriously) contaminated sites
- ALSAG 2013 (like ALSAG 1989) will not be applicable for:
 - Pollution originating from agriculture, forestry or mining
 - Radioactive or explosive substances
 - Emissions into atmosphere or surface water

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Assessing and controlling risks

Knowledge about intensity and extent of contamination

- Migration of gaseous and liquid pollutants (migration of landfill gas or substances in the groundwater)
- Impacts of pollutants on soil or surface water
- Issues regarding land-use; e.g. risks originating from flammable or suffocating gases, potential impact of contaminants for human health, increased mobilisation of contaminants
- Risks for human uptake of contaminants (to inhale, drink or eat but also to get in dermal contact with)

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General criteria to determine contaminated sites - 1

Site classification (after investigation)

- **Not or only minor contaminated**
- **Contaminated** ("more than minor contaminated" subsurface or amount of landfilled waste)
- **Seriously contaminated** (remedial actions – or at least monitoring – needed)

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General criteria to determine contaminated sites - 2

Assessment criteria

- Contaminant (contaminant behaviour)
- Intensity (contaminant concentration)
- Extent (volume or area)
- Effect related issues (e.g. mass flows)

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General criteria to determine contaminated sites - 3

The ordinance addresses 5 major groups of contaminants

- Chlorinated hydrocarbons
- Mineral oil – see page 11 and 12
- Tar oil
- Metals
- Landfills with the potential of landfill gas production – see page 13 and 14

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Specific criteria regarding mineral oil

Criteria for contaminated sites

contaminated sites	Intensity		Extent	
	Concentration Soil [mg/kg]	Concentration Soil Gas [mg/m ³]	Soil Volume [m ³]	NAPL
Hydrocarbon Oil Index (GC)	100-500 ^a	-	200	existing
Hydrocarbons (C ₅ to C ₁₀) ^d	-	50 ^c	200	existing
BTEX	6 ^b	10 ^c	200	existing
Benzene	1 ^b	5 ^c	200	existing

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Specific criteria regarding mineral oil

Criteria for seriously contaminated sites

seriously contaminated sites	Intensity		Extent		Site specific
	Concentration Soil [mg/kg]	Conc. Soil Gas [mg/m ³]	Volume [m ³]	NAPL [m ²]	Mass flow in groundwater [g/d]
Hydrocarbon Oil Index (GC)	500-2.000 ^a	-	5.000	500	50
Hydrocarbons (C ₅ to C ₁₀) ^d	-	100 ^c	5.000	500	-
BTEX	25 ^b	50 ^c	5.000	500	25
Benzene	5 ^b	10 ^c	5.000	500	0,5

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Specific criteria regarding sanitary landfills

Criteria for **contaminated sites**

contaminated sites	Intensity [vol.-%] ^a	Extent
		Volume [m ³]
Intermediate zone	methane > 2,5 % or carbon dioxide > 10 %	10.000
Reactive core zone	Total of methane + carbon dioxide > 40 %	1.000

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Specific criteria regarding sanitary landfills

Criteria for **seriously contaminated sites**

seriously contaminated sites	Intensity [vol.-%] ^a	Extent	Site specific	
		Volume [m ³]	Mass flow in groundwater [g/d]	Danger of landfill gas ^b
Intermediate zone	methane > 5 % and carbon dioxide > 15 %	100.000	-	yes
reactive core	Total of methane + carbon dioxide > 40 %	25.000	-	yes
Ammonia	-	-	5.000	yes
Boron	-	-	500	yes

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Results of stakeholder discussions and the way onwards


- Act on Contaminated Sites: minor revisions regarding competences necessary
- Accompanying Ordinance
 - General criteria fully accepted
 - Minor revisions of specific criteria necessary (especially regarding metals)
- Further stakeholder consultations on revised version (2013)
- Legislative process in Parliament (2014)
- Planned coming into force: 2015

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THANK YOU FOR YOUR ATTENTION!
QUESTIONS AND REMARKS ARE WELCOME!

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CONTAMINATED SITES
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