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Considerations when applying environmental liability legislation to prevention and remediation of damage to land

Dietmar MÜLLER-GRABHERR; EU4Environment (online seminar, 14.09.2022)

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COMMON FORUM - WHAT ABOUT?

CONSTITUENCY:

- initiated in 1994 (Bonn; Germany)
- policy makers, regulators & technical advisors
- European (EU + Free Trade Association)
- regular Secretariat (established in 2007)
  - **Environment Agency Austria (EAA; since 2017)**

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MISSION:

- **exchange of knowledge and experience**
- **Science-policy interfacing**
- **Cooperation to stakeholders**
- **discussion platform on policy & legislation (e.g. ELD, IED, WFD)**

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"Land damage" – a peculiar issue (1)

The purpose of the ELD:

- to **prevent** (art. 5 & 8) and **remedy** (art. 6, 7, 8 and Annex II) **environmental damage**
- **returning natural resources** (& services) to ***baseline conditions***

DAMAGE TO LAND

- If land contamination creates a "**<u>significant risk to human health</u>** being adversely affected"
  - neither reference to natural resources (!) nor to soil
  - "interim losses" but no compensatory remediation required (?)

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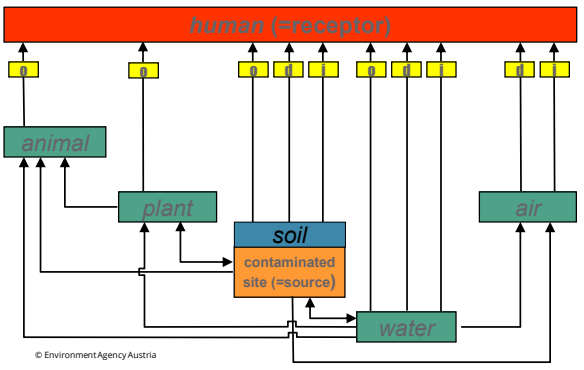
CONTAMINATED LAND
Potential pathways of exposure…



…but which pathways are relevant for my site ?

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"Land damage" – a peculiar issue (2)

Asssement and its pillars differ

- **BASELINE:**
  - Regionally references on environmental quality (soil & groundwater)
  - *(not environmental services)*

- **SIGNIFICANCE:**
  - Health risks exceeding generally **acceptable risk levels**
  - Depending on national legislative backgrounds *("regulatory significance")*
  - **General practices**: tiered assessment approaches (at least 2 stages)
    - (1) **Threshold Values (TV) based on the "FIT-FOR-USE"-CONCEPT**
    - (2) **In-depth Human Health Risk Characterisation**

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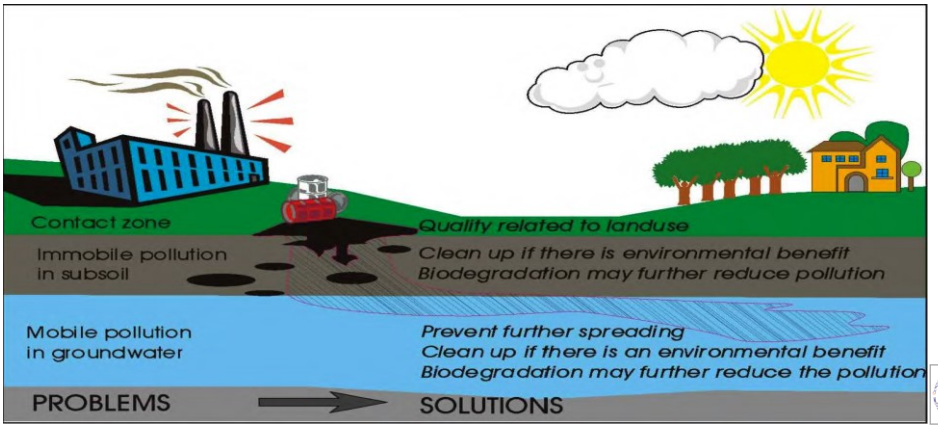
RISK BASED LAND MANAGEMENT (2002)
Common European Concept



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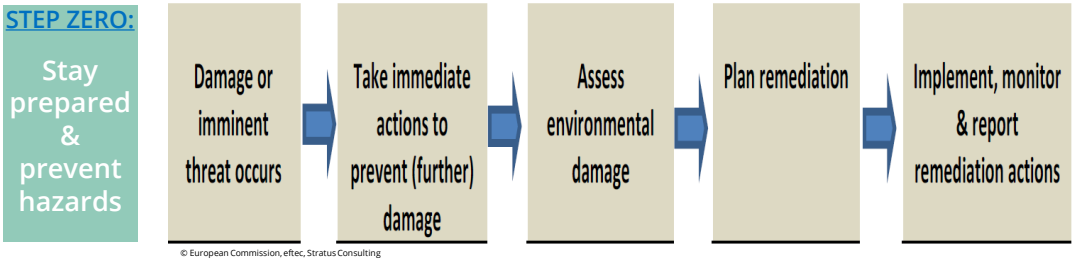
"Land damage" – a peculiar issue (3)

Land: (usually) a **private property** (!)
Soil: its **long-term memory** due to inherent "soil functions"

➢ **CREATES A PARTICULAR NEED FOR PREVENTION**



PREVENTION – STEP ZERO: getting prepared !

Competent authority:

➢ encourage the operator to establish a protocol, including
  a) a contingency plan (Who? What? When? How?)
  b) a communication plan (addressing authorities, citizens and media)

Experts:

➢ Recommend technical inputs regarding
  i. Best available technologies (BAT) & best environmental practices (BEP)
  ii. emergency actions to stop pollution
  iii. practical & effective measures to reduce risks (e.g. at "hot spots")

Operator:

➢ **should** deploy BAT/BEP and/or a protocol ready in case of an incidence

PREVENT DAMAGE: minimise and control

Competent authority & technical experts

- advise the operator to implement the contingency plan or
- advise to stop pollution at the source
- advise to plan for investigation and sampling

Operator:

- takes any steps to stop pollution at the source
- urgency actions to reduce land contamination or clean-up “hot-spots”
- takes responsibility to inform possibly affected communities (!!)

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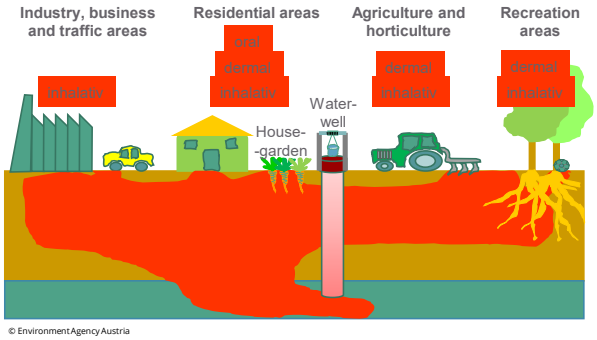
HUMAN HEALTH RISK ANALYSIS

Step 1: Site characterisation

- ✓ Contaminants and their distribution (e.g. physico-chemical characteristics, potential contact with humans)
- ✓ Land use and “activities”



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Categories of use	activities	uptake media				uptake paths		
		soil	air	water	food	oral	dermal	inhalativ
Residential areas	outdoor activities	•						x
			•					x
	gardening	•					x	x
	consumption of self produced food				•	x		
	drinking of groundwater			•		x		
	watering with groundwater			•			x	x
	taking showers with groundwater			•		x	x	x
Agriculture and horticulture	fiel work	•					x	x
Recreation areas	sports and recreation activities	•					x	x
Industry, business and traffic areas	indoor work	•						x
			•					x
	outdoor work	•						x
	use of traffic areas	•						x

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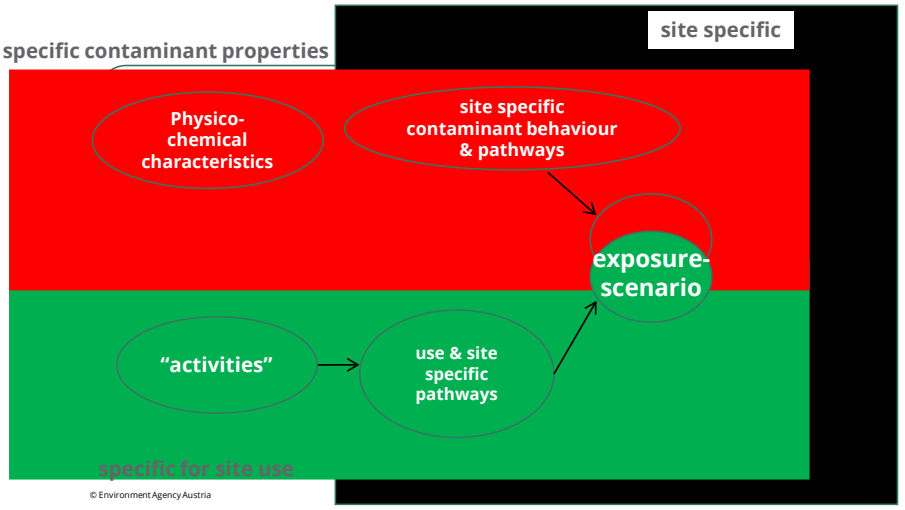
HUMAN HEALTH RISK ANALYSIS

Step 2: Identifying site-specifically relevant exposure scenarios



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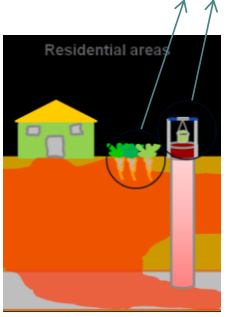
HUMAN HEALTH RISK ANALYSIS

Step 3: Planning and performing investigation

Exposure (mg/kg BW) =

= function of (biometric data, exposure time, contaminant concentration in exposure media)



Scale of investigation:

- entire site ("activities")
- impacted area
- Reference area (not impacted to establish reference conditions)

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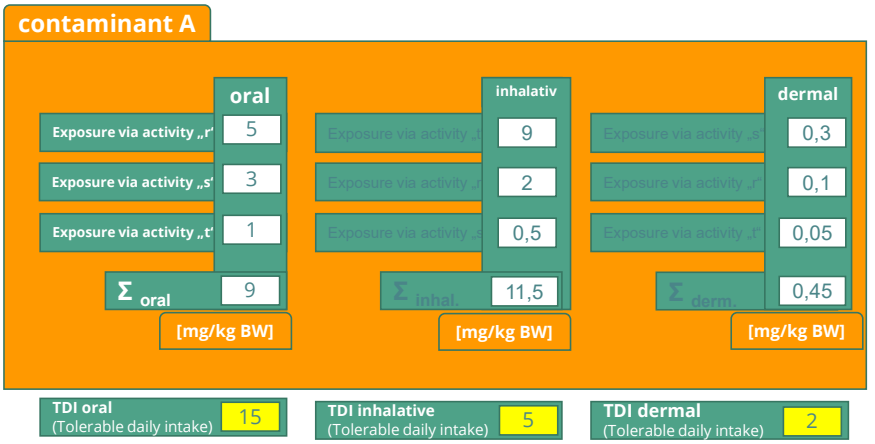
HUMAN HEALTH RISK ANALYSIS

Step 4: Exposure assessment



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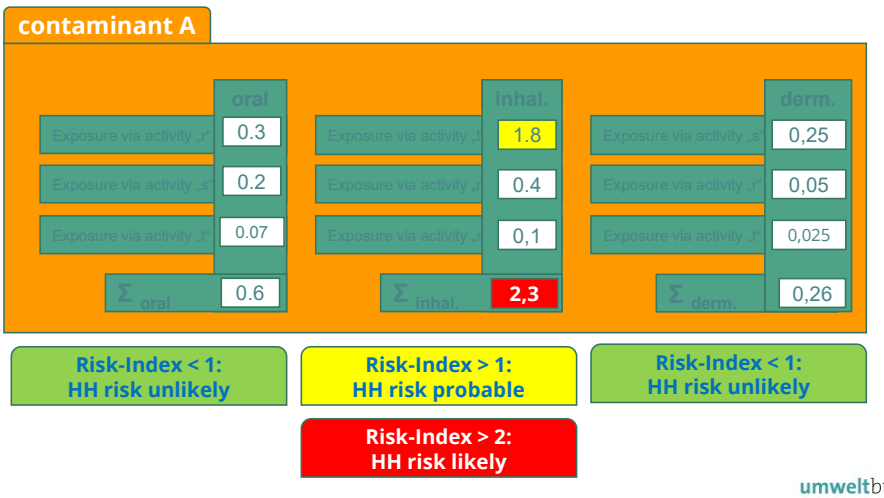
HUMAN HEALTH RISK ANALYSIS

Step 5: Risk characterisation



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REMEDIATING CONTAMINATED LAND
Risk Management (see also ELD, Annex II, clause 2)

COMPLEMENTARY ELEMENTS

- ✓ Supplementary Investigation
- ✓ Options Appraisal
- ✓ Risk Communication (transparent information)

DEFINING ALTERNATIVES & OPTIMISE COMBINED SOLUTIONS

TECHNOLOGIES e.g.
- decontamination
- immobilisation

LAND USE & ACTIVITIES e.g
- change surface: e.g. capping
- changing agricultural products

BEHAVIOURS & ACCESS e.g
- nutrition counselling
- use and/or access restrictions

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LAND DAMAGE – CONCLUDING REMARKS

40 years CLM experiences have been enabling new concepts, technology innovation & sound practices

It's not contaminant concentrations, but minimizing negative consequences (risks)

UNDERSTANDING FRAMES (scientific, technical, social, institutional) **is KEY for selecting remedial approaches**

- extensive (longer-term management) vs. intensive & fast remediation
- reduce energy intensity and use
- degradable contaminants: apply intensive bioremediation
- use natural processes and stimulate if feasible ("nature based solutions")

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