





Decision tree developed within the Sullied Sediments project A tool for deriving standards for sediment reuse

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Introduction



Develop decision system for CEC contaminated sediment









- 1. Identify possibilities & bottlenecks
- 2. Gain insight into international standardization frameworks

- 1. Gain overview of existing international target values
- 2. Identify key exposure & spreading pathways

Help decision-makers deal with CEC contaminated sediments

























CAS number	EU Number	Name of priority substance (EU 2013/39/EU	hazardous substance	(Ecofide, 20018)	receptor (Ecofide 2018)	contaminant (in most EU countries) (1)	Organic matter Grazing animals (mg/kg)	matter human health (without plant uptake) (mgkg)
15972-60-8	240-110-8	Alachlor		2,9				
	204-371-1						133	37000 human health without plant
120-12-7		Anthracene	х	4,7	ecology	standard parameter	grazing animals - risk model	uptake
1912-24-9	217-617-8	Atrazine		2,6				
71-43-2	200-753-7	Benzene		2,1		standard parameter		
not applicable	not applicable	Brominated diphenylethers	х	5,9-9,4	human (biota)			
7440-43-9	231-152-8	Cadmium and its compounds	×	na	ecology	standard parameter		
85535-84-8	287-476-5	Chloroalkanes, C 10-13	×	6	predator			
470-90-6	207-432-0	Chlorfenvinphos		3,9	ecology			
2921-88-2	220-864-4	Chlorpyrifos (Chlorpyrifos-ethyl)		5	ecology			
107-06-2	203-458-1	1,2-dichloroethane		1,5		standard parameter		
75-09-2	200-838-9	Dichloromethane		1,3		standard parameter		
117-81-7	204-211-0	Di(2-ethylhexyl)phthalate (DEHP)	×	7,5	predator			
330-54-1	206-354-4	Diuron		2,8				
115-29-7	204-079-4	Endosulfan	х	3,8	ecology			
	205-912-4						26,7	1600 human health without plant
206-44-0		Fluoranthene		5,2	human (biota)	standard parameter	graning annual - risk model	uptake
118-74-1	204-273-9	Hexachlorobenzene	х	5,7	human (biota)			
87-68-3	201-765-5	Hexachlorobutadiene	×	4,9				
608-73-1	210-168-9	Hexachlorocyclohexane (HCH)	×	3,5	ecology			
34123-59-6	251-835-4	Isoproturon		2,5				
7439-92-1	231-100-4	Lead and its compounds		na	ecology	standard parameter	250 grazing animals - risk model	310 human health without plant uptake
7439-97-6	231-106-7	Mercury and its compounds	×	na	predator	standard parameter	20 grazing animals - risk model	56 human health without plant uptake 13

































Tiered approach	
Screening step : basic screening on the parameter of concern- orders of magnitude Fast decision with limited data "very contaminated" versus "detection limit"	
• determine the category of a compound (based on availability of data and uncertainty) - collection of data to calculate levels for reuse as soil and/or construction material - determination of uncertainty level	
• category 1: all data available to calculate levels for reuse as soil and/or use as construction material • Reuse possibilities high	Possibi re
• category 2: all data available to calculate Human exposure (intervention levels) and leaching (reuse as construction material) but no or limited ecotoxicological data available to calculate levels for free reuse	lities for use
Tier 4 • category 3: all data available to calculate Human exposure but uncertainty on data is high	
Tier 5 • category 4: too little data available to calculate Human exposure or high uncertainty on data	

Screening step

Fast decision: very clean ⇔ very contaminated







Tiered approach		·
 Screening step : basic screening on the parameter of concern- orders of magnitude Fast decision with limited data "very contaminated" versus "detection limit" 		Screening step Fast decision: very clean ⇔ very contaminated
• determine the category of a compound (based on availability of data and uncertainty) - collection of data to calculate levels for reuse as soil and/or construction material - determination of uncertainty level		Categorization step
Tier 2 • category 1: all data available to calculate levels for reuse as soil and/or use as construction material • Reuse possibilities high	Possib re	Evolving decision system: substances can change category
• category 2: all data available to calculate Human exposure (intervention levels) and leaching (reuse as construction material) but no or limited ecotoxicological data available to calculate levels for free reuse	ilities for suse	
• category 3: all data available to calculate Human exposure but uncertainty on data is high		
• category 4: too little data available to calculate Human exposure or high uncertainty on data		



















Example

Characteristic		уре	Category 1 Category 2		Category 3	Category 4	Heptachlor	
				Human exposure				
				Physicochemical data				
Solubility (S)	Pł	HYS	х	Х	X or (X)	X or (X)	х	
Vapor pressure (D)	Pł	HYS	X or not relevant (*)	X or not relevant (*)	X or (X) or not relevant (*)	X or (X) or not relevant (*)	Not relevant	
Octanol/water partition coefficient (Kow)	Pł	HYS	x	x	X or (X)	X or (X)	х	
Henry-coefficient (H)	Pł	HYS	X or not relevant (*)	X or not relevant (*)	X or (X) or not relevant (*)	X or (X) or not relevant (*)	Not relevant	
				Human toxicity data				
Carcinogeneity	HUN	MAN	х	х	(X)	0	х	
Tolerable Daily Intake or reference Dose (for carci or non-carcinogenic compounds)	inogenic HUN	MAN	Х	X	(X)	0	x	
Tolerable Level in air		MAN	X or not relevant (*)	X or not relevant (*)	(X) or not relevant (*)	0	Not relevant	
Drinking water level		MAN	х	(X) or 0	(X) or 0	0	(X)	
Level in vegetables	HUN	MAN	х	(X) or 0	(X) or 0	0	(X)	
Level in meat/milk		MAN	х	(X) or 0	(X) or 0	0	(X)	
				Ecotoxicological levels				
				Toxicity data	1			
Levels for cattle and plants	ECO)	х	(X) or 0	(X) or 0	0	0	
Bioconcentration factor	ECO)	х	(X) or 0	(X) or 0	0	(X)	
				Leaching				
				Physicochemical data				
Solubility (S)		PHYS	Х	X	X or (X)	X or (X)	Х	
Octanol/water partitioncoefficient (Kow)		PHYS	х	Х	X or (X)	X or (X)	х	
Henry-coefficient (H)		PHYS	х	Х	X or (X)	X or (X)	Not relevant	
				Leaching				
	Toxicity data							
Tolerable Daily Intake	HUMA	۹N	х	Х	(X)	0	х	
							20	

Characteristic	Туре	Category 1	Category 2	Category 3	Category 4	Heptachlor	
			Human exposure				
			Physicochemical data				
Solubility (S)	PHYS	Х	х	X or (X)	X or (X)	x	
Vapor pressure (D)	PHYS	X or not relevant (*)	X or not relevant (*)	X or (X) or not relevant (*)	X or (X) or not relevant (*)	Not relevant	
Octanol/water partition	DHVS	Y	Y	X or (X)	X or (X)	v	
coefficient (Kow)	FIIIS	Λ	^	.,	. ,	^	
Henry-coefficient (H)	PHYS	X or not relevant (*)	X or not relevant (*)	X or (X) or not relevant (*)	X or (X) or not relevant (*)	Not relevant	
			Human toxicity data				
Carcinogeneity	HUMAN	v x	x	(X)	0	х	
Tolerable Daily Intake or reference Dose (for carcino or non-carcinogenic compounds)	genic HUMA	Reuse possib • Agricultur	Reuse possibilities according to category: • Agricultural use				
Tolerable Level in air	HUMA	Residentia	al use			Not relevant	
Drinking water level	нима	Recreational use					
Level in vegetables	нима	• Industrial use					
Level in meat/milk	нима	Construct				(X)	
• Construct			ion material				
		 Treatment 	t/dumping				
Levels for cattle and plants	ECO					0	
Bioconcentration factor	ECO	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	(א) טיט	(א) מי ע		(X)	
			Leaching				
			Physicochemical data				
Solubility (S)	PHYS	x	x	X or (X)	X or (X)	x	
Octanol/water partitioncoefficient (Kow)	PHYS	x	х	X or (X)	X or (X)	х	
Henry-coefficient (H)	PHYS	х	x	X or (X)	X or (X)	Not relevant	
			Leaching				
			Toxicity data				
Tolerable Daily Intake	HUMAN	х	х	(X)	0	×	







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