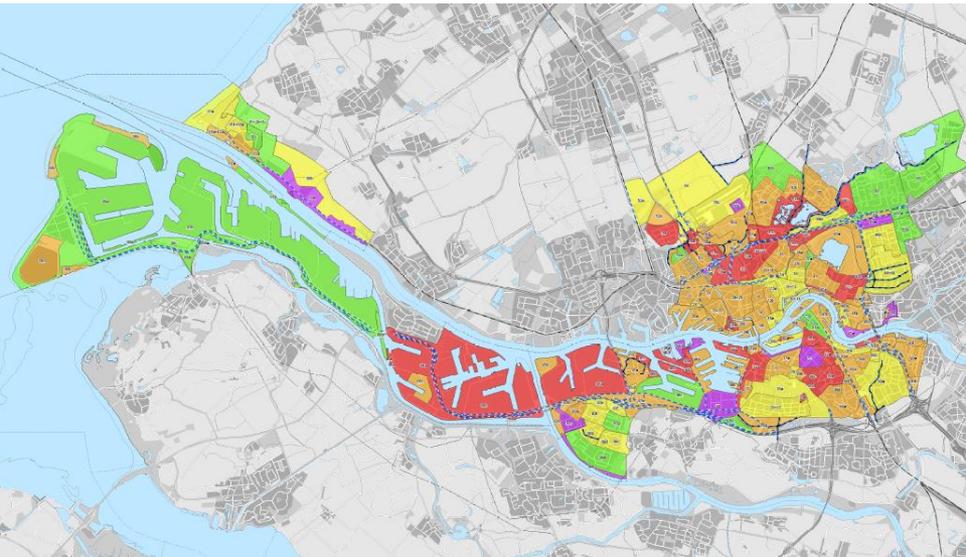




Rijkswaterstaat
Ministry of Infrastructure
and Water Management



Sustainable soil management in the Netherlands

excess of excavated soils

Co Molenaar
Margot de Cleen

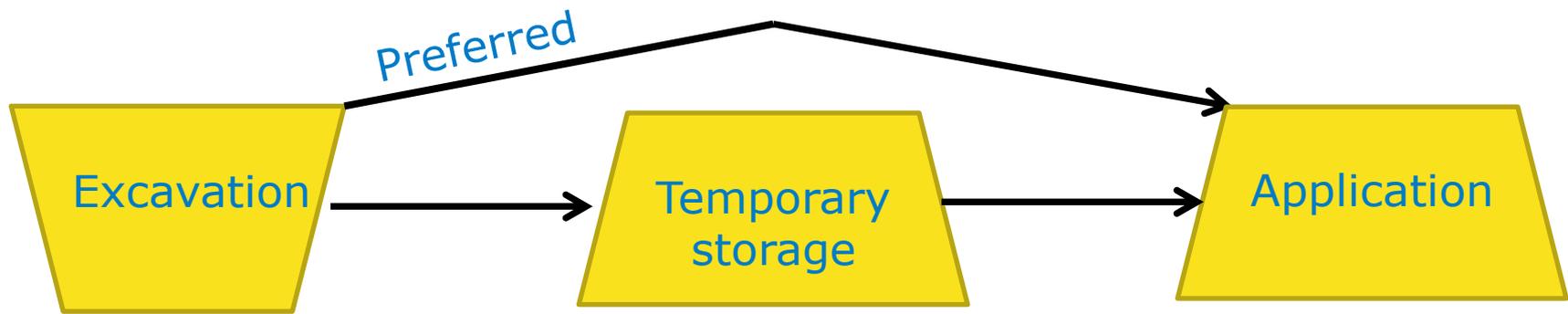


Common Forum, Barcelona 4-10-2018

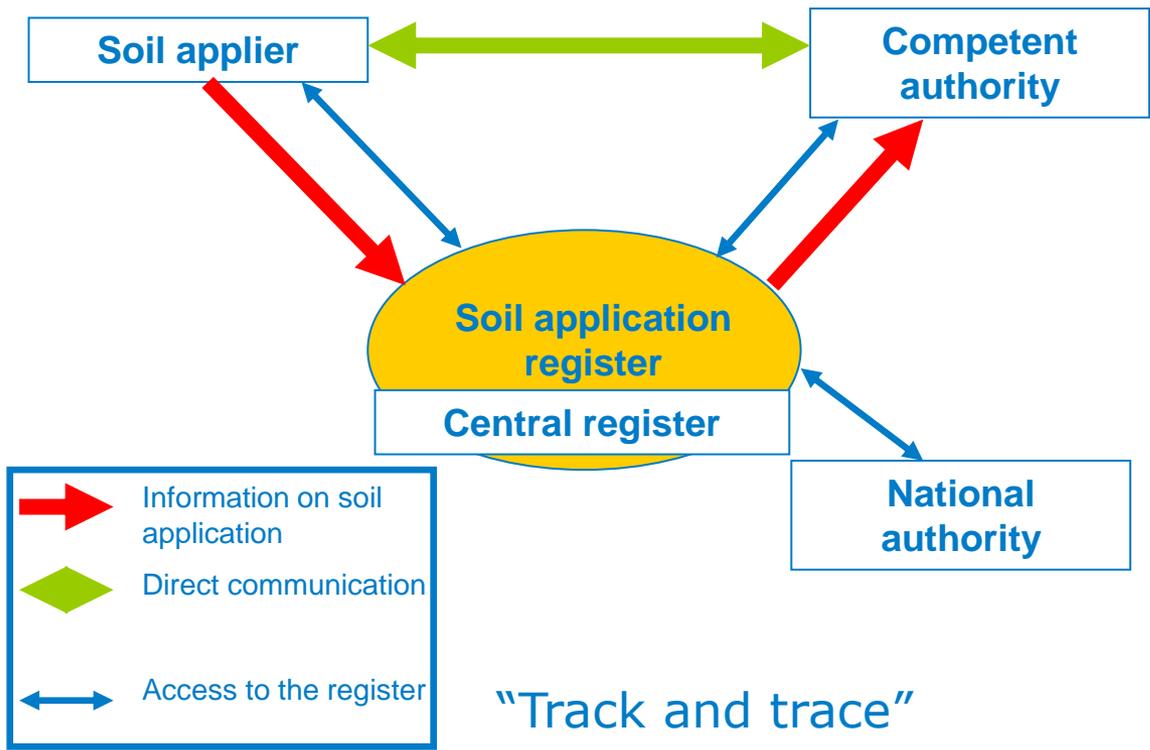


Starting points policy excavated soils

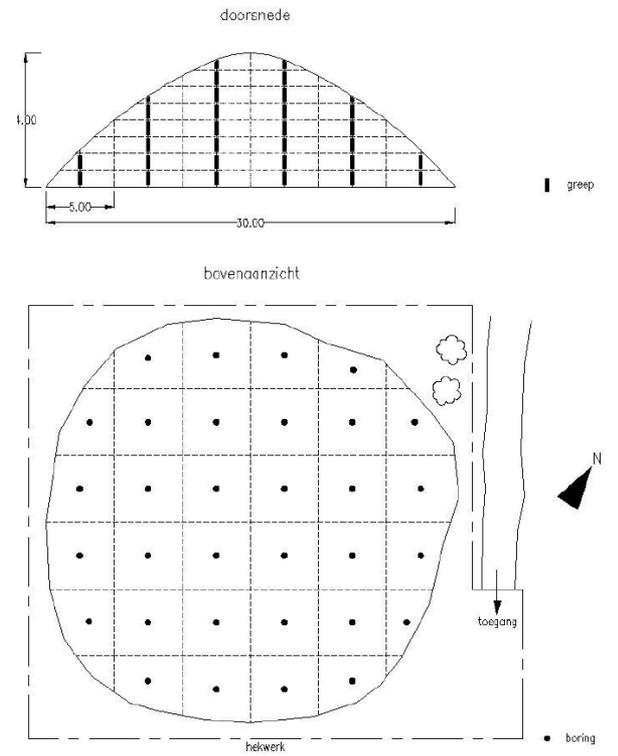
- Clean areas must be kept clean
- Transparency and traceability of the system are essential to built trust between parties and prevent fraud (quality control and quality security)
- Facilitating a market for reuse (value creation)
- To stimulate reuse a prohibition to bring it to a landfill must be made (except if not treatable)
- Decentralized competent authorities for tailor-made solutions (local risk based standards)
- Transport distances should be minimized (emission of greenhouse gasses), role for “soil banking”



- **Optimisation:** minimize distance, minimize storage, match supply and demand
- **General aspects:** Spatial planning, Safety and Health, Congestion, Noise and Dust
- **Specific aspects:** Investigation of quality (Stock-pile protocol), Track and Trace, Quality assurance, Transfer of Liability



Sampling protocol (2*50)



Basic Principles

1. Useful application

- A. Constructive works (dikes, roads, sound barriers, railroads)
- B. Elevation of land on agricultural, residential or industrial areas in order to improve soil (hydrological) quality
- C. Application on contaminated sites in order to manage risks on the site
- D. Shallow former sand mining sites in order to improve water quality and nature development
- E. restore sediments in the aquatic system
- F. application of sediments on landside

2. Stand still

- A. Parcel
- B. Neighbourhood
- C. Municipality

3. Fit for use

- A. <http://rwsenvironment.eu/subjects/soil/publications/know-the-quality/>

5 simple questions

1. Is this an useful application?
2. Which soil standards are effective at the reuse site?
3. What is the quality of the soil which is to be applied?
4. Is the quality of the soil properly tested?
5. Is the application reported to the competent authority?

Operationalisation – stand still on scale neighbourhood

figure a = CITY PLAN



figure b = LAND USE



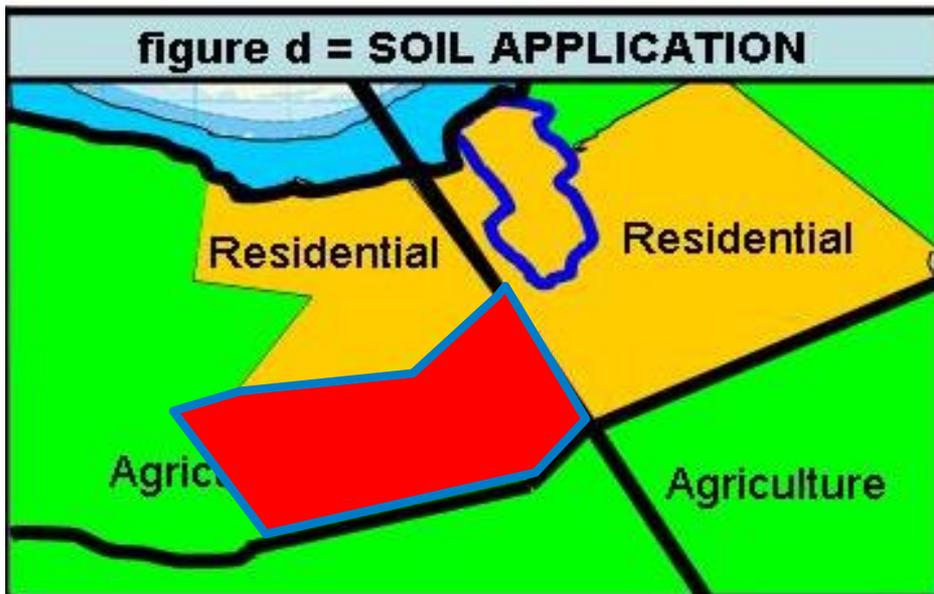
figure c = ACTUAL SOIL QUALITY



figure d = SOIL APPLICATION



Stand-still on scale municipality



TASKS

Public

- Environmental guarding
- Soil Policy (including protocols, standards, maps)
- Register of information

Private

- Useful application
- Proper investigation
- Register every application

Soil Quality Standards

- General
- Area specific: democratic process decision made in city council

Transfer of liability

- Excavated soil is considered waste (excavator/owner is liable)
- End of waste when properly applied in useful application (transfer of liability after acceptance)
- Random sampling to check quality

Dutch Soil Quality Standards for sustainable land management

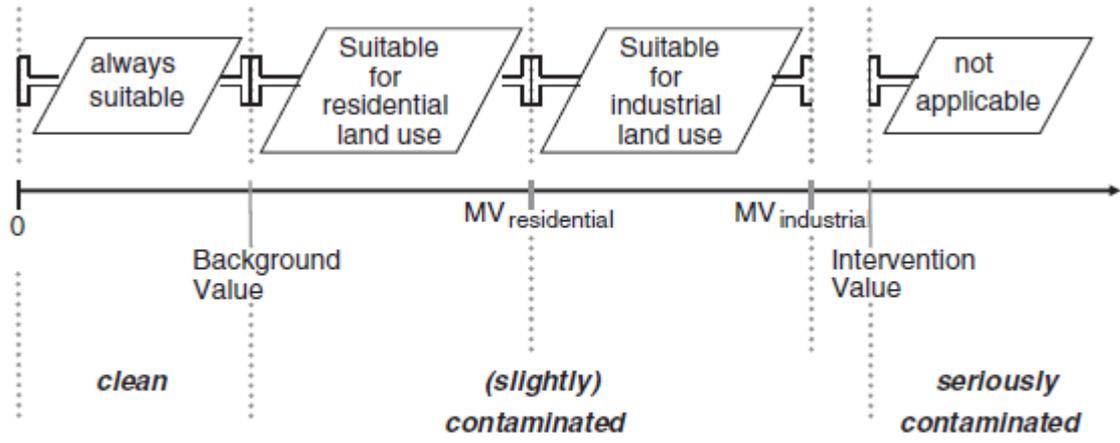
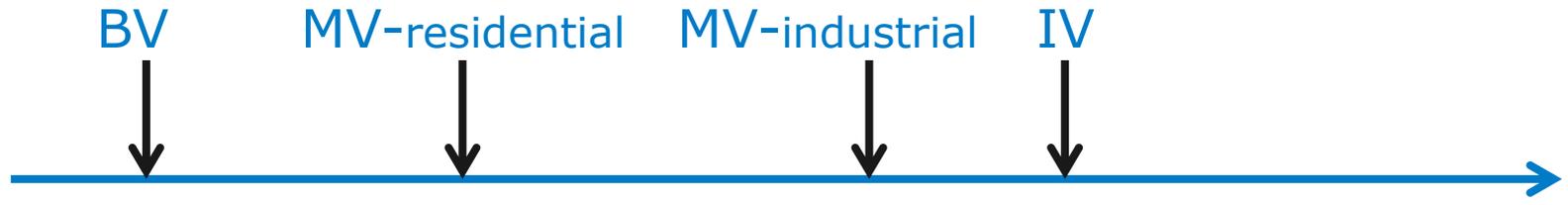


Fig. 2. General framework for sustainable land management. $MV_{residential}$ = Maximal Value for residential land use; $MV_{industrial}$ = Maximal Value for industrial land use.



Threshold values for 'common' contaminants

Contaminant	Background value	Residence	Industry	<i>Intervention value</i>
Arsenic	20	27	76	76
Cadmium	0.6	1.2	4.3	13
Cobalt	15	35	190	190
Copper	40	54	190	190
Mercury	0.15	0.83	4.8	36
Lead	50	210	530	530
Nickel	35	39	100	100
Zinc	140	200	720	720
PAH	1,5	6,8	40	40
PCB	0.02	0.02	0.5	1
Mineral Oil	190	190	500	5000

Conclusion/lessons learned

Policy

- The problem of contaminated soil and sediment is 'under control' in the Netherlands
- In 25 years we found the proper balance between soil protection and the need for recycling
- Stand still and fit for use are firmly implemented principles
- Guided implementation on a local level is necessary because soil management is a local/regional market

Market

- Creating a market for reusable soils takes time
- Public acceptance is critical, society demands trust in the quality of reusable soils
- A good functioning system of self-regulation, sufficient and focussed environmental guarding and professional public contracting are essential requirements for a healthy market