

Annex B1: Guidelines

Part 1: Background and guideline to the test data collection for contaminated sites

Background

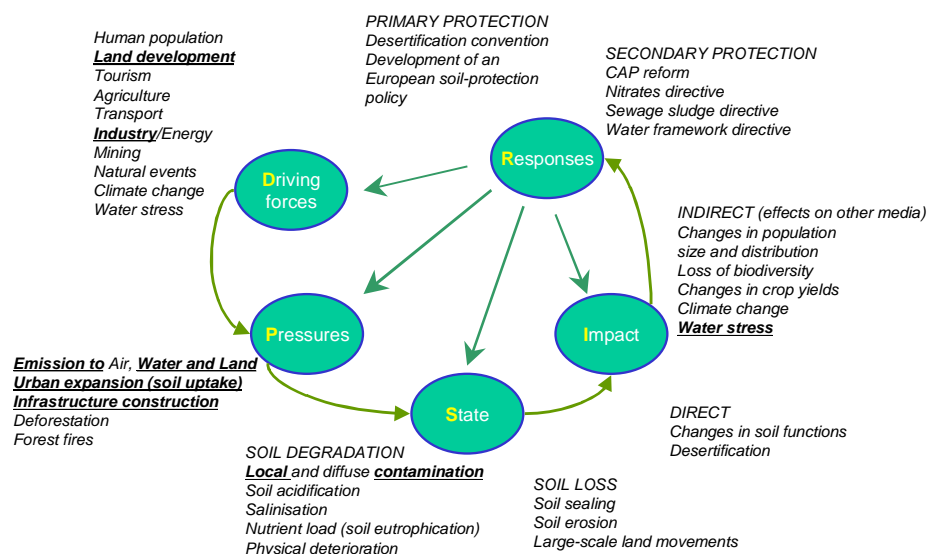
This section describes the European context of this exercise and explains why it is carried out.

The mission of the European Environment Agency (EEA) is ‘to support sustainable development and to help achieve significant and measurable improvement in Europe’s environment through the provision of timely, targeted, relevant and reliable information to policy-making agents and the public’.

The EEA works along a work programme and aims to provide information on 12 environmental relevant issues ⁽¹⁾ which are mostly developed with the support of topic centres. The European Topic Centre on Soil (ETC/S) contributes to the ‘soil degradation’ issue.

It is a key element of the EEA mission to report on the on the state and trends of the environment on a periodical basis. To carry out this mission, the EEA has chosen an indicator approach. From this year on, key reporting activities of the EEA are to produce a yearly indicator report, and a five-year report on the state and trends in the environment. As a consequence, appropriate indicators need to be developed for relevant issues. The EEA has developed an environmental assessment framework, which includes the elements ‘Driving forces’, ‘Pressures’, ‘State’, ‘Impacts’ and ‘Responses’ (DPSIR framework). Indicators on environmental relevant issues provide information on the DPSIR elements.

Figure 1: DPSIR framework applied to soil



⁽¹⁾ (1) Climate change, (2) Stratospheric ozone depletion, (3) Acidification, (4) Tropospheric ozone, (5) Chemicals, (6) Waste, (7) Biodiversity, (8) Inland waters, (9) Marine and coastal environment, (10) Soil degradation, (11) Urban environment, (12) Technological hazards.

State of soil/soil assessment, monitoring and reporting framework

An assessment, monitoring and reporting framework for soil is currently being developed by the ETC/S, in order to support the assessment of the conditions of soils in Europe.

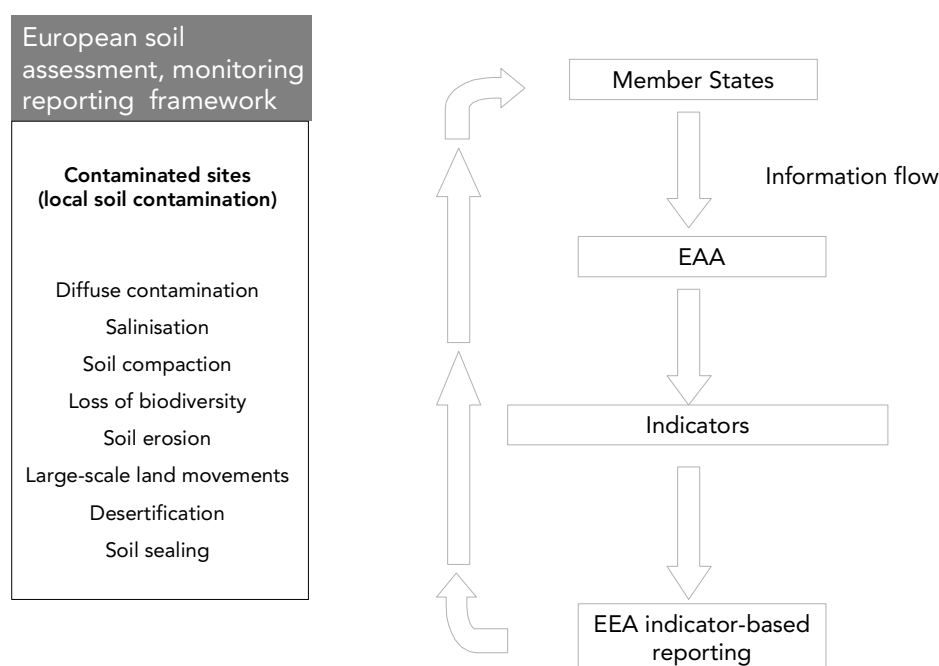
Table 1: Key degradation patterns related to soil

SOIL DETERIORATION	SOIL LOSS	
Local contamination/ contaminated sites Diffuse contamination — inorganic trace elements (e.g. heavy metals) — organic compounds — acidification — eutrofication Salinisation (ch) Compaction deterioration (ph) Loss of biodiversity (bio)	Soil displacement Soil erosion (ph) — wind — water Large-scale land movements (ph) Desertification	Soil defuncting Soil sealing

Abbreviations: (ch) = chemical, (ph) = physical, (bio) = biological.

Major elements of the soil assessment, monitoring and reporting framework are the development of tools to make national data comparable, to establish a European data flow, and to store and organise the obtained data.

The current data request addresses the soil-related degradation pattern ‘local soil contamination/contaminated sites’ and represents one part of a comprehensive soil assessment, monitoring and reporting framework.



Goals to be met for the local soil contamination/contaminated sites issue

Key goals to be achieved are to:

- define policy-relevant indicators for contaminated sites;
- make available data from national databases more comparable;
- model (estimate) data gaps;
- establish a European data flow on contaminated sites.

The objective is to provide policy-makers with reliable information concerning current developments, changes to the better or to the worse, and major impacts deriving from contaminated sites.

Implementation of the EEA information strategy for contaminated sites

It is the EEA's intention to develop a reliable data flow for contaminated sites in order to allow the assessment of the current and future states and impacts related to contaminated sites from a European perspective (how bad the situation is, are we improving, how much is spent on this issue).

A step-by-step approach will be implemented to achieve this goal. As a first step, a test data collection in a few (10) European regions will be carried out. This activity has been agreed and welcomed at the last technical workshop of the ETC/S in Athens (September 1998).

The requested data shall support the derivation of indicators. With the current data request, the DPSIR elements 'Driving forces', 'State' and 'Responses' are addressed, and hence major contributors to local soil contamination, the state of local soil contamination and the responses to the issue.

Time schedule for implementation

Summer 1999	Test data collection in selected European regions
10 November 1999	Dublin workshop: Presentation and discussion of: — results of the test data collection — estimation models for data gaps Proposal for the future implementation
End 1999	Definition of: — a preliminary data format for a future European data collection and assessment system — contaminated sites indicators to be used for future reporting

Guideline

This section gives guidance on how to complete the data request.

The current paper is a data request for contaminated sites and has the status of a first test implementation at a small scale, i.e. test region. The long-term objective of this exercise is to establish a common framework for the collection and the assessment of contaminated sites data at European scale. The framework as such does not aim to change existing national programmes, but to make national data more comparable.

During the test implementation, more data are requested than in a final European data request. At the current stage, we need to learn which data are available, relevant, and useful. For a future European data collection framework, it is the EEA's intention to reduce the data request to a small amount of relevant parameters.

The aim is to assess the seriousness of the impacts deriving from contaminated sites in Europe. To do this, a common methodology is required. Therefore, a classification is proposed with the intention to allow all EEA Member States to participate in such a common framework without the need to change their national data-management systems. The aim of the classification is to apply quality criteria for contaminated sites, which are flexible enough to co-exist with national terms and definitions. This idea has been clearly expressed at the last ETC/S workshop in Athens. As a result, it was proposed to define sites at different impact levels instead of using the generic term 'contaminated sites'.

A key step of this exercise will be the assignment of national contaminated sites data to the proposed impact levels. The proposal is, of course, in the developing phase and the results of this exercise are expected to improve the proposed impact level system.

Proposed classification for the test data collection

The following guideline is based on the results of the last workshop of the ETC/S (Athens 1998) ⁽²⁾. The key objective of the test data collection is to apply the proposed 'impact-level' approach and to test its feasibility for a future European data collection.

Sites at different impact levels

The term 'contaminated site' can include different levels of environmental and human health impacts, ranging from minor to relevant negative effects. The remediation of contaminated sites can result in a full elimination or in a reduction of these impacts. Table 2 summarises possible impact levels in this context.

⁽²⁾ EEA-ETC/S (1998), *Contaminated sites workshop of the European Topic Centre on Soil — Athens 29 September*, workshop proceedings prepared by the Austrian Federal Environment Agency, Vienna, Austria.

Table 2: Impact levels applied to contaminated sites and not contaminated sites

Level	Long definition	Brief definition
Level 0	Sites that do not pose any negative effects to human health or the environment; related environmental media can be used multi-functionally	No impacts; no use restrictions
Level 1	Sites where related environmental media have tolerable contamination levels (¹) and which do not pose a significant negative effects to human health or the environment; related environmental media can be used multi-functionally	Minor impacts (tolerable contamination); no use restrictions
Level 2	Sites that pose significant negative effects to human health or the environment if the use of the related environmental media changes to a more sensitive one; limited use of related environmental media	No significant impacts under current use of environmental media, restricted use only
Level 3	Sites that pose significant negative effects to human health or the environment under current use of related environmental media; action is needed.	Significant impacts, action needed

(¹) In this context: contamination exceeds background values (background values < contamination < target values) does not apply in areas with natural contamination.

Potentially contaminated site

Any site where an impact level of 1 to 3 is suspected but not verified. Investigations need to be carried out to verify the involved impacts. Investigations might as well reveal that the site does not pose any negative effects to human health and the environment (impact level 0).

Steps of contaminated sites management

For the assessment of contaminated sites data, it is important to know which methodologies are implemented at the national level for the identification and investigation of contaminated sites and how the implemented methodologies can be put into a general frame.

The table beneath gives an overview of key steps, identified in most countries. Through the experiment with the test regions, the ETC/S would like to find out:

- ❑ to what extent national methodologies correspond to the key steps of contaminated sites management mentioned below;
- ❑ to what extent these steps have been completed within the test region.

Table 3: The key steps of contaminated sites management

Step	Activity	Result
Preliminary survey	Negative effects to human health and the environment suspected	Existence of potential contamination detected
Preliminary investigation	Verification of negative effects to human health or the environment	Existence of contamination verified (definition of impact level eventually possible)
Main site investigation	Quantification of negative effects to human health or the environment	Extent of contamination determined (definition of impact level)
Feasibility study and remediation investigation	Detailed planning of measures to reduce the degree of negative effects to human health or the environment	Detailed remediation plan

Preliminary survey

On the basis of available information, the preliminary survey has the goal of assessing whether potentially polluting activities have taken place and whether contamination can be suspected. The results of the preliminary survey will in most cases classify a site as potentially contaminated. Preliminary surveys are carried out on a case-by-case basis but also on a regional basis as a systematic screening process for defined regions.

Preliminary investigation

Preliminary investigations are carried out to confirm the existence of contamination. The results of the preliminary investigation can in some cases be sufficient to define the impact level of a site.

Main site investigation

Major goals of the main site investigation are to define the extent of the contaminated area and the degree of contamination. The main site investigation is carried out to determine the need for remediation or other measures to eliminate or reduce the exposure to the contamination. The results of the main site investigation are supposed to be sufficient to define the impact level of a site.

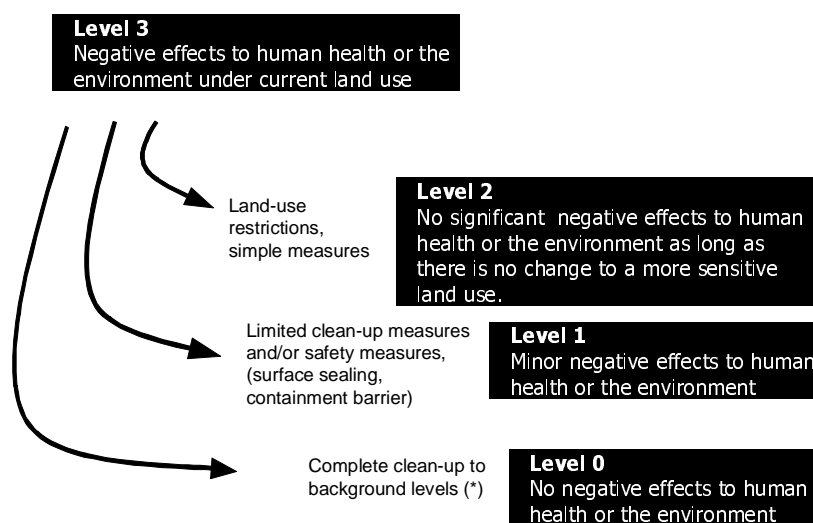
Feasibility study and remediation investigation

This step includes a feasibility study in view of the remediation measures to be implemented. The results of this activity determine the need for implementing specific remediation measures.

Remediation measures

Remediation measures are the response to reduce impacts deriving from contaminated sites. Their implementation can result in different quality targets (depending on available resources, valid quality standards, etc.). In order to compare remediation activities, it is necessary to distinguish between the remaining environmental impacts. Therefore, the implementation of the impact level approach is again recommended. Figure 2 explains the link between remediation measures and impacts levels.

Figure 2: Possible impact levels in the case of remediation of a site at impact level 3



(*) Does not apply in areas with natural contamination

Geographical reference

In the following section, some basic requirements for the selection of the test region are explained.

- ❑ The test region should consist of **at least one city with more than 100 000 inhabitants**. It is more recommendable to use a mixed pattern of urban and rural areas.
- ❑ As a maximum value, the test region should **not exceed an area of 10 000 km² and three million inhabitants**.

Because of the possible heterogeneity within the test region, we recommend to subdivide the test region into sub-regions.

- ❑ A high resolution is achieved if sub-regions correspond to municipalities. For the test data collection, we would therefore recommend to refer to the municipality level in order to gain as much experience as possible. For practical reasons, future data collections will be less geographically detailed.
- ❑ In case there are restraints to refer to the municipality level, we would recommend to make at least a distinction between urban areas (cities with more than 100 000 inhabitants) and rural areas.

The following example illustrates the best option and the minimal requirement for the definition of sub-regions.

Figure 3: Selection of a suitable geographical reference for the test data collection

Recommended:

Test region: North-west Salzburg
Sub-regions: Municipalities

Minimal requirement:

Test region: North-west Salzburg
Sub-regions: North-west Salzburg rural
Salzburg City

