INTERNATIONAL COMMITTEE ON CONTAMINATED LAND

QUESTIONNAIRE ABOUT LEGAL FRAMEWORK FOR SOIL/SITE CONTAMINATION MANAGEMENT

COUNTRY: FINLAND
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OVERALL CONTEXT

1. Does your national policy have a specific definition of “contaminated site”, “contaminated soil”? If yes, please provide the definition.

   There is no direct definition for ‘contaminated site’ in the legislation. Soil and groundwater contamination (=pollution), however, are defined by specific soil and groundwater prohibitions in the Environmental Protection Act (EPA 86/2000). In these regulations contamination/pollution of soil and groundwater is defined by the environmental and health effects and risks that emissions on soil or groundwater cause or may cause (i.e. definition is not based on concentrations of the harmful substances). The EPA also includes a generic effects-based definition of environmental contamination/pollution.

   Environmental Administration Guidelines on the Risk Assessment of Contaminated Sites and Sustainable Risk Management are under preparation and will be finalized in a few months. Contaminated site will most likely be defined in these guidelines as follows: contaminated site is a site, where due to human actions there are harmful substances in such amounts that they cause harm or a significant risk to the environment or to human health.

2. Is Groundwater included in this definition?

   Yes. See the previous answer.

3. Does your policy on contaminated sites/land/soil include other definitions (i.e. brownfield, sediment)?

   Yes, but not including brownfield or sediment.

4. Which sources are you considering? Industrial operations? Transport? Urban contamination? Etc.

Finnish legislation and policy considers sources widely – any source that has caused or can cause contamination. However, elevated concentrations in the top soil that are wide-spread and originate from mainly atmospheric deposition by multiple sources can be considered as being part of the regional background concentration, and are therefore not included in the definition of contamination.

LEGAL FRAMEWOK

5. Does your country have legislation with respect to contaminated land management?

    a. Whatever the situation is, please be precise if it's a specific or a common legislation, if integrated in a more general one (including prevention of emissions, soil protection, land planning, environment & health, etc.)

Soil contamination matters fall mainly under the **Environmental Protection Act (EPA 86/2000).** There is a special chapter (Chapter 12) in the Act, which is called 'Treatment of contaminated soil and groundwater'. The central sections in the EPA are:

- Soil pollution prohibition (§ 7)
- Groundwater pollution prohibition (§ 8)
- Duty to treat soil and groundwater (§ 75)
- Duty to notify (§ 76)
- Duty to investigate (§ 77)
- Remediation of soil (§ 78)
- Ordering restoration (§ 79)
- Reporting duty concerning a polluted area (§ 104)

The EPA is under revision at the moment and some changes in the articles regarding CLM are expected.

Excavated contaminated soil is mainly regarded as waste and an environmental permit is required for its recovery and disposal (EPA § 28). Large-scale treatment facilities require environmental impact assessment according to the Environmental impact assessment Law (468/1994).

Link to the EPA *:* *http://www.finlex.fi/en/laki/kaannokset/2000/20000086*

Based on the EPA a Government Decree (214/2007) on the Assessment on Soil Contamination and Remediation Needs has been given. It presents generic requirements for site-specific risk assessment of contaminated sites. It also includes threshold and guideline values for 52 substances or substance groups. The generic principles of the Decree 214/2007 are specified in the Environmental Administration Guidelines (2/2007). These

guidelines are now being updated. Changes in the guidelines will affect both risk assessment and risk management.

Link to the Decree*:* *http://www.finlex.fi/fi/laki/kaannokset/2007/20070214*

Soil contamination must be taken into account when land use is planned and building permits are granted. The health and environmental damages caused by polluted soil may hinder the granting of building permits. The control of building permits is carried out by local authorities. Closer details on these issues are regulated in the **Land Use and Building Act (132/1999).**

b. If there is no legislation, please be precise how you tackle the problem.

c. What are the main policy objectives?

We are now rewriting our policy objectives with intention to highlight the objectives of the concept 'sustainable remediation'.

d. What are the foundational principles on which the national policy is based? (e.g., polluter pays, risk-based, fit-for-use, stand-still, transparency, …).

Foundational principles are principle of pollution prevention and minimizing harmful impacts, principle of caution and care, principle of best available technique, principle of best environmental practise, polluter pays principle and risk-based land management.

6. What is the Chain of Liability for the management of contaminated land?
   a. Polluter? Land owner? Last operator? Occupier?

Under the law, any party whose activities have caused pollution of soil or groundwater is required to restore the soil or groundwater to a condition that will cause no harm to health and the environment or represent a hazard to the environment. The prohibition on soil pollution also means that an environmental permit may not be granted for an activity which does not conform to this regulation.

Depending on when the contamination occurred, the liability to remediate falls under different regulations. The EPA is applied only when soil contamination has taken place after 1January 1994. According to this act, either the polluter or the holder of the property is responsible for remediation. If the property holder of the polluted area or real estate is not able to treat the polluted soil, the local authority (municipality) has to establish the need for soil treatment and carry out the work itself.

Responsibility for old damages is regulated in the old laws and the decisions have to be partly based on case law. Waste disposal sites that were closed down before 1 January 1994 or contamination that took place before that date are regulated by the old Waste Management Act (WMA). According to this act, the party with primary responsibility for cleaning up the site is the polluter and, secondarily, the owner or holder of the property. In cases where the polluter or owner has neglected his or her obligations, municipalities have sometimes been in charge of the remediation, together with the state.

b. Is there any difference between new and historic contamination?

There are minor differences concerning the liabilities (see previous answer). The implementation of Industrial Emissions Directive will probably have some impact in setting the remediation targets for new installations.

c. Can a responsible party pass on the liability to a purchaser? (under statutory law? Contractually?)

Contractually yes, but if the contract fails the statutory law will be applied.

d. Do you separate the obligation to remediate soil pollution and the liability regarding the damage caused by soil pollution and the related remediation measures?

No

e. Are you facing specific situations (e.g. privatization of the industrial activities, war impacted areas, …) needing special programme?

Not really.

However due to the national Oil Pollution Compensation Fund approx. 2 – 3 million euros per year can be used for investigating and cleaning up abandoned sites, which have been contaminated by oil. A special programme has been set to organize this.

7. Are there any specifications at regional / local level?

No

8. Are there specifications for site closure?

In the EPA there are some general provisions about site closure at the moment. Based on them there can be special regulations in the environmental permit, for instance a duty to investigate soil and

groundwater and remediate (if needed) after site closure. The Industrial Emissions Directive is being implemented by revision of the EPA and because of that there will soon be more detailed provisions on a site closure.

National guidelines for determine baseline on the status of soil and groundwater (based on Industrial Emissions Directive) and to site closure are being prepared.

9. Is there any legal requirement to conduct investigation for potential contamination in the sale of the property?

   Yes, section § 104 in the EPA; Persons relinquishing or renting land shall provide the new owner or tenant with any information available on the activity carried out on the land and any wastes or substances that may cause pollution of the ground or ground-water.

10. Does your national policy have any kind of inventories/registers? If yes, please be precise regarding which sites are registered, how the data are collected and if the databases are public.

    There are about 24 000 sites in the Finnish soil database. Of these, around 17 500 are potentially contaminated – based on the knowledge of historical or on-going activities on these sites. The rest are either known to be uncontaminated or contaminated or have already been cleaned up or are still operative.

    The inventory was conducted for the first time in the early 1990's and it was updated during 1998 and 1999. A national database system on the state of soils was created based on the old inventories of potential activities. Land owners whose property was been preliminary logged into the data system had been contacted by writing during spring 2007 before the database was taken into full-scale operation.

    Most of the information in the soil database is available to the public, but the data system as a whole is only directly accessible to authorities and state institutions. Reports on specific properties are available on request from the regional Centres for Economic Development, Transport and the Environment. There is a public map service in the internet, which shows the locations of listed sites.

11. What are the strong, weak points and the major bottlenecks with respect to the current regulations in your country?

The regulation of contaminated sites exists and it is rather functioning. The major bottleneck concerns the reuse of excavated soils (uncontaminated, contaminated or treated). A Governmental Decree on the reuse of excavated soils will be developed in the near future.

TECHNICAL ISSUES RELATED TO THE LEGAL FRAMEWORK

12. Are there site investigation requirements?

These are dealt case by case but some general guidance exists for instance in the Decree 217/2007 and the guidelines for assessment of soil contamination and the remediation need.

13. Are Risk Assessment & Management the main tools?

Yes – risk assessment is required based to the Finnish regulation

14. Are there specific technical approaches used?

a. For Human Health (HH), Ecosystems, Groundwater (GW), Surface waters (SW), other targets (i.e. buildings, infrastructures, …please be precise).

b. On a site by site specific approach, or by derivation of guideline values? If possible, please detail your answer.

c. Do you take into consideration others sources of pollution in the risk assessment?

For a, b and c:

According to the Decree 214/2007 the assessment of soil contamination and remediation need shall always be based on site-specific risk assessment. All the relevant targets and sources (identified in the early stage of the assessment) should be included in the process, but they are not specifically defined in the regulation. The selection of the targets and their relevance is further explained in the guidelines on risk assessment and management (referred to in previous questions). In the guidelines technical approaches and related background information is given for the assessment of health and ecological risks and risks to the quality of the environment (mainly groundwater, surface water and indoor air) by contaminant migration.

Generic guideline values (see question 15) can be modified based on local environmental setting, e.g. by taking the regional background

concentration into account. However, in most of the cases they're used directly as such.

Background concentrations (referring both the natural background and wide-spread concentrations in the top soil due to anthropogenic sources) on the other hand are taken into account especially when the threshold values are applied.

15. If the national policy uses guideline values, please be precise in describing the following points:
    a. Reasons for derivation of generic values

Generic values are practical tools when they are used in a proper and justified manner. They harmonize assessments and the setting of objectives.

    b. Objectives / levels of implementation (investigation, risk assessment, remediation)

The Decree 204/2007 presents three separate values. The threshold value indicates negligible environmental risk and is used as a trigger value. When the threshold value is exceeded, a site-specific assessment of soil contamination and remediation need has to be carried out according to the Decree and the associated guidelines. However, regional background concentration can be used as the assessment trigger when it exceeds the threshold value.

The lower and upper guideline values are to be used as a tool in the assessment, but they are not legally binding. This means the priority is on the site-specific assessment. However, if no other reliable conclusion is made by the site-specific assessment, the soil is regarded as contaminated and risk reduction measures are required when the guidelines values are exceeded. The upper guideline value is applied in the case of industrial or similar insensitive sites and the lower guideline values in other sites such as residential.

The guideline values are based on potentially significant risks to human health or to soil ecosystem. They don't include the risks due to contaminant migration outside the site or to groundwater, which thus always requires site-specific assessment.

    c. Priority substances

There are no priority substances as all the relevant hazardous substances must be included in the assessments. In the Decree guidance and threshold values were established to 52 substances or groups of substances. The basis for the selection was: the substance was/is used widely, it has been found frequently in soil investigations and there is enough knowledge of the toxicity and the behaviour of the substance.

d. Protocols of derivation (including acceptable risk levels used).

The threshold and guideline values are based on a risk assessment carried out on a general level, in which various reference values for soil concentrations were derived, describing both negligible and maximum acceptable risks to the environment and human health. For ecological risks the risk levels included e.g. HC5 (threshold value) and HC50 (guideline values) and added risk approach (background concentrations added to the risk level), and for human health risks the TDI values and CR values (for carcinogens the acceptable risk level being 10^{-5} in the derivation of the guideline values). Background exposure (for HH assessment) and combined toxicity was not taken into account.

The methods, data and results of the risk assessment and an estimate of the uncertainty related to them are presented in a report, which is publicly available (only in Finnish).

16. What are the drivers for remediation?
    a. To what level is clean-up required? (i.e. acceptable risk, land use values, …)

Clean up targets should be set based on site-specific assessment. However, the guideline values are commonly used as target values.

Main drivers for a site investigation and remediation project in Finland include building and land use change, real estate transaction, closing down of activities, the specific remediation programme for decommissioned gasoline stations, and the suspicion of environmental or health risks e.g. based on visual findings, inventories or environmental monitoring.

    b. Does your national policy use cost-benefits analysis for the choice of the remedial solution?

The remedial solutions are decided case-by-case by an evaluation of the liable party within the remediation planning. There are no legal requirements on the selection remedial methods except the generic requirements on BAT/BEP. Although cost-benefit analysis and eco-efficiency analysis (including cost-benefit analysis) are recommended and calculation tools have been developed, they are used quite seldom.

Recommendation for the evaluation of the sustainability of remediation will be a new policy guideline.

17. What are the main remediation strategies or treatment techniques used in your countries (including Natural Attenuation)?
    a. Distribution of techniques?
    b. Evolution in time?

For a and b:

The most common remediation method for contaminated sites is soil excavation, often coupled with the contaminated soil being replaced by clean soil. Polluted soil is predominantly treated off site, but on site and *in situ* remediations are also used. The share of *in situ* remediation of all the sites is only about 10 % at the moment. The most commonly used *in situ* or on site technologies have been soil vapour extraction, pump & treat, MNA (monitored natural attenuation), isolation and stabilization. Additionally, reactive barriers, phytoremediation and some other techniques have been used, but not yet on a very large scale.

The markets for treating contaminated soils are rather limited in the sparsely inhabited country like Finland and the competition between contractors has recently been rather strict. However a wide range of methods exist for treating excavated contaminated soils in Finland. There are treatment facilities that can take on different types of contaminated soil.

During the recent years slightly contaminated soil has usually been reused in landfills e.g. for the building of roads and handling areas, the coating of wastes in daily practices, or in the closing phase. Today, also more heavily contaminated soils have been disposed of in landfills – as such (after sieving) or as, for instance, stabilized material. Special landfills have been built just for contaminated soil (mono-filled landfills). The utilization of contaminated soil outside waste handling areas is not common.

    c. Acceptance of innovative treatment techniques?

During the recent years some parties have complained that the authorities don’t easily accept innovative technologies, but the situation has been changing. These days innovative techniques are in general accepted by the authorities if the risks are treatable. The remediation techniques can´t be just copied from elsewhere but they have to be modified when necessary to fit the conditions (cold climate and soil geology) in Finland.

18. Are you considering sustainability in the national approach?

a. If yes, how? In particular, how the three pillars of sustainability are considered and balanced.
b. If no, explain the reasons and the future challenges.

For a and b:

New Environmental Administration Guidelines on the risk assessment of contaminated sites and sustainable risk management are under preparation and will be finalized in a few months.

In these guidelines background information on sustainable remediation and its evaluation will be given explaining the required balancing and the necessary value judgement associated within the process. No tools for evaluating sustainability will be presented, and the process itself, instead of the tools, is emphasized. In addition some general recommendations for sustainable risk management and remediation will be presented. They involve for instance topics like the role of land planning, the applicability of risk assessment, timing of the remediation, clean-enough top soil, contaminants of concern, treatment methods and reuse of contaminated soil and participation/communication. Partly different recommendations are given for the development/construction sites and the already built sites.

19. How does your country bridge the CLM approach with:
    a. Land planning programmes?
    b. Public health programmes (aggregation of impacts on surrounding populations)

For a and b:

Contaminated sites are not regarded as that big of a problem in Finland, e.g. there are only few areas that can be considered as brownfields. Regulations and practices to handle contaminated sites exist and they are mostly functioning. CLM approach does therefore not have a special role in the above mentioned programmes, though the problems of contamination have been identified. Cooperation between different administrative sectors and stakeholders exist, but could be further increased.

FINANCIAL ISSUES

20. What are the specific practices with respect to “Orphan sites”?

We have two funding mechanisms to handle orphan sites. The focus is on the sites that pose major risk to human health or to the environment.

21. Do you have an idea of the annual budget allocated to Soil Contamination Management?

a. How is it divided between public, private and others?
b. What are the main financial / funding systems in place in your country? (e.g. Financial guarantees, insurance, public – private partnerships, special foundation, industrial consortium, enforcement, …).
c. Between the different steps of management (investigation, remediation, monitoring…)?

for a, b and c:

The annual costs for remediation of contaminated soils in Finland will amount to 50–70 million euros, at least during the following two decades. For the period 2005–2025, it is estimated that the total cost of remediation of contaminated soils in Finland will be 1.2 billion euros. The annual cost per citizen amounts to some 10 euros, which is close to the European average. About one-third of the remediation work is funded by public money (municipalities, the state).

The party causing the contamination is economically responsible for cleaning up the site, if he is still operating at the site or if he is still in existence. If the polluter cannot be identified or if he no longer exists, then the owner of the property has the responsibility to clean up the site. This can be a heavy burden.

Finland has a waste management system under which the state can take action concerning remediation, if the property owner is not able to pay and if the costs are high compared to the costs of waste management in a municipality. Under the waste management system the state can, in co-operation with municipalities or property owners, participate in the remediation work or finance, on average, 45% of the remedial actions taken. So far the system has been applied to about 370 contaminated sites. However, the system suffers from both a shortage of appropriate funds, whether from local authorities or the government, and it is very strict in terms of application. The system will be reviewed and probably somewhat changed in the near future. In recent years this state budget money has been about 2-3 million euros per year. Regional Centres for Economic Development, Transport and the Environment select the sites and in most cases they also are responsible for management of the remediation.

The Oil Pollution Compensation Fund OPCF (approx. 2-3 million euros per year) can be used for cleaning up abandoned sites which have been contaminated by oil. The SOILI programme (since 1996), which is based on an agreement between petroleum industry businesses and public bodies, includes responsibility for the remediation of polluted decommissioned service station sites. The application period for the public part funded by the OPCF ended in 2005. To date, remedial action has been taken at 400 sites and applications for 1400 sites have been submitted to the SOILI programme. After SOILI a new programme called

JASKA has been established. The goal of this project is to investigate and remediate the orphan sites which have been contaminated by oil and which are situated in sensitive areas.

ORGANISATIONAL ISSUES

22. How are stakeholders and in particular communities involved in the approach?

- Ministry of the Environment: policy, legislation, funding
- Regional Centres for Economic Development, Transport and the Environment and Helsinki and Turku cities: promotion of inventories, investigation and remediation, permitting and supervision soil remediation projects
- Environmental Permit Authorities: permitting few large remediation project per year
- Municipalities: supervision
- Polluter or land owner: duty to notify, investigate and remediate the soil/area

23. Is there a specific approach for:
    a. Brownfields?

No. There are not many large brownfield areas in Finland. Most of the areas will be remediated due to land use change.

    b. Megasites?

No. There are not many megasites in Finland.

    c. Widespread pollutions?

No. There is no remarkable widespread pollution.

    d. Reuse of excavated soils? (e.g., in relation to their quality)

Some generic requirements exist, but will be specified in a forthcoming Decree on the reuse of excavated and treated soils (will be prepared in the near future).

24. Does your national policy include any accreditation system for consultants or service providers? If yes, please provide some details.

There is accreditation system for the laboratories and a certification system for people taking environmental samples (many of them

consultants). There are no other accreditation systems e.g. for consultants or other service providers.

25. Do you have any training / capacity building programme, any management accountability and performance measurement?

    There are no specific national programmes, but e.g. training is a natural part of the practice (training within a single firm or agency and more general training given by the national administration). Comparison studies for laboratories are being carried out by a national laboratory named for the purpose. Other comparison studies and performance measurements are organized on a project basis.

26. How is the necessary inter-governmental coordination for CLM organized? (e.g. with Health Protection Department, with the public site owners, with state or local public sector environmental organizations, with special interest advocacy groups,)

    These are mostly dealt case by case, but there is also some general guidance on cooperation, official or unofficial interest groups and mailing list etc.

CRUCIAL DEVELOPMENTS IN THE FUTURE

Are there any additional issues to be further developed in the following months/years whatever they are (Research and Development needs, organisational issues, …)?

Unofficially or officially, do you see any opportunities for collaboration in the coming months or years that may improve overall coordination among international organizations? (e.g., conferences, workshops, international (technical or policy) initiatives, growing alliances (e.g., in support of redevelopment /reuse of contaminated lands, etc.).

For instance AquaConSoil and Nordrocks (the Nordic countries) are significant conferences for dissemination of information and knowledge.

Collaboration could focus on sustainable remediation, reuse of excavated and treated soil and sediments.

REFERENCES

Please give most important references (documents, website, projects, and case studies) that could be relevant for explaining your national approach

Unfortunately almost all of the material is only in Finnish and some also in Swedish.

Link to the website where translated Finnish Acts and Degrees can be found:
http://www.finlex.fi/en/

Link to the website of the Ministry of the Environment
http://www.ym.fi/en-US

Link to the website of Finland´s environmental administration
www.environment.fi