INTERNATIONAL UNION
OF RAILWAYS

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Contaminated Soil Assessment Scheme

October 2010

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PREFACE

The UIC Polluted Soil Group decided to launch this project in 2008 due to discussions on the European Soil Directive and its potential consequences for UIC railway companies in Europe. A survey was launched on “polluted soil assessment schemes” in the railway sector.

The feedback provided by UIC member companies brought unexpected benefits to the Polluted Soil Group, in bringing to light the fact that an increasing number of environmental issues and developments aside from assessments were influential in present and future railway business and operations. This put the importance of “assessment schemes” into perspective.

In addition, project results were presented at the 11th UIC Sustainability Conference in Madrid on 16-18 June 2010, confirming the fact that the railway community is currently facing a great and ever-increasing number of environmental regulations related to polluted soil and sustainable property use. The future consequences in terms of finance and operations are unknown, but call for closer and more in-depth cooperation, and justify continued work by the polluted soil network.

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1. INTRODUCTION

1.1 BACKGROUND

Since the end of the 20th century there has been a growing awareness of the fact that soil is a crucial, largely non-renewable and very complex natural resource, yet it is increasingly damaged by certain human activities.
On 22 September 2006 the European Commission adopted a Soil Thematic Strategy (COM(2006) 231) and a draft Soil Framework Directive (COM(2006) 232) aiming to protect soils across the EU. In addition to inventory obligations due to the European Community accession process, the Directive – if it enters into force – calls for "an inventory of contaminated sites, a soil status report, and the establishment of a national strategy for identification, assessment and remediation of contaminated sites. This would be complemented by the obligation for seller or prospective buyer to provide a soil status report for any transaction of land where a potentially contaminating activity has taken or is taking place[1]."

Sites are contaminated as a result of improper use of pollutants and represent a highly unpredictable risk for human health and the environment. Contamination may limit the use of such sites and constitute a heavy financial burden on a company's budget. The risk of contamination may have a considerable negative impact on the value of property and opportunities for development or sale. Unknown risks and insufficient data for risk assessment have an especially harmful impact on a company's balance sheet, and thus its rating on international financial markets.
Railways and other business sectors are affected by these factors. Systematic risk assessment constitutes a potential approach for competitive and cost-effective management and handling of contaminated soil (properties).

This is the context in which the International Union of Railways (UIC) launched the "contaminated soil assessment scheme" project. Due to the increasing influence of environmental issues and regulations on railway operations, financial planning and risk management it is imperative to analyse all existing contamination assessment and recording schemes. European legislation makes it essential, especially for railway companies in the new member states which will be asked to create and install contamination registers for their

[1] Draft DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC, 2006

properties, to benefit from UIC's expertise and support in terms of existing and approved systems in the railway community.

Project content[2]

The main goal of the "contaminated soil assessment scheme" project was to develop an up-to-date inventory of systematic approaches and systems used by UIC member railways to manage contaminated soil-related risks and information on their properties. All features have been taken into account, from assessment and data collection to management and use of data. The inventory begins with an overall questionnaire aiming to identify existing systems, and is supplemented by more detailed interviews and discussions at selected railway companies. An overview and analysis of existing systems is of particular interest to all railway companies confronted with European membership obligations, standards and requirements, as well as railway companies which need to restructure, improve or extend existing systems due to internal requirements or domestic environmental regulations. The project focuses on existing systems in general. It does not seek to record or deal with stored system data in detail. The intention was not to create a database accessible to UIC or the general public, nor to share data among railway companies.

1.2 AIM OF THE PROJECT

The aims of the project are:

- Definition of the term "contaminated sites"
- Presentation of three important European guidelines and the draft Soil Framework Directive
- Some examples of domestic legislation (showing basic national registering and clean-up obligations)
- Assessment of *Questionnaire 1*
- Distribution and assessment of *Questionnaire 2*, drafted on the basis of *Questionnaire 1*
- Assessment of on-site and telephone interviews
- Presentation of the results and creation of a structured and suitable contamination assessment scheme on the basis of existing assessment schemes

[2] Official UIC project content

1.3 STRUCTURE OF THE PROJECT

The study is organised as follows:
The initial stage consists in establishing a common definition of contaminated sites on the basis of existing documents and examples of railway-specific contaminated sites. This stage is presented in **chapter 2**, which also highlights the importance of contaminated sites, and the ecological and economic incentives.

Chapter 3 gives an overview of existing European and national legislation and environmental directives. It outlines the tenor of the Council Directive on the conservation of natural habitats and of wild fauna and flora, the directive on water policy, the directive on public access to environmental information and the draft EU Soil Framework Directive. It then presents the national environmental policies of six member states, selected by the polluted soil network on the basis of their location in the EU.

Chapter 4 presents an in-depth examination of *Questionnaire 1* and *Questionnaire 2,* followed by the interpretation and assessment of on-site and telephone interviews. A quantitative approach was adopted for *Questionnaire 1* because basic information was required on assessment, data collection and data storage. The approach for *Questionnaire 2* was both quantitative and qualitative in order to obtain more detailed information, building on the feedback for *Questionnaire 1*. Additional questions were included to deal with potential inconsistencies caused by misunderstood questions or insufficient language skills. Moreover, on-site and telephone interviews were conducted with selected companies to clarify any further discrepancies and increase the information content of the answers. Finally, **chapter 5** presents some of the conclusions drawn.

2. CONTAMINATED SITES OF RAILWAY COMPANIES

Every railway company owns contaminated sites, which are termed “brownfield sites” by the United States Environmental Protection Agency (EPA). Uncertainties about liability, cost and potential health risks associated with brownfield sites may cause businesses to migrate to "greenfield sites" outside the city. The areas burdened with environmental contamination and declining property values[3] are left behind, even though their location, usually in urban areas with the best infrastructure, could make them very profitable.

2.1 COMMON DEFINITION

The EPA defines brownfield sites as abandoned, idled or underused industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination. Contaminated sites are former industrial sites on which environmentally harmful substances have been handled and former waste disposal sites on which waste has been treated, stored or buried – any contamination which may cause harmful changes in the soil or represent a hazard for individuals and the general public.

The general public is affected if (LfU, 1992: 15):

- Human health is endangered
- Livestock, birds, deer and fish are endangered
- Water, soil and crops are harmed
- Air pollution or noise have an environmental impact
- The interests of nature conservation, landscape conservation and urban development are not upheld
- Public policy and public security are endangered or disrupted

Sites suspected of being contaminated are real properties on which there is a suspected presence of physical, chemical, biological, or radiological substances in, on, or under the land that may cause harm to human health or the environment by contaminating water, air and soil. These substances may be trace elements, organic compounds, gases such as carbon dioxide or methane, or even plant nutrients such as nitrogen or phosphorous.
Contamination constitutes damage which decreases the value of real property. Countries may have specific legal definitions of contaminated sites[4].

[3] Technical Approaches to Characterizing and Cleaning up Brownfield Sites: Railroad Yards: 2002: 1, http://www.epa.gov/nrmrl/pubs/625r02007/625R02007.pdf
[4] EUGRIS, http://www.eugris.info/GlossaryDetails.asp?TermID=112&Term=Contaminated land&List=C

Railway-specific contaminated sites

Areas where rolling stock is maintained, stored, and coupled to form trains are called rail yards. “Rail yards are in effect the “garage” of rail lines, a central location in a region where railway companies can work on their rolling stock and dispatch trains to locations around the country[5].” In the past almost every town or city had a rail yard, especially in industrial regions, and the yards could vary significantly in size, from small ones consisting of a few sidings to large ones covering hundreds of acres. Thanks to technical progress and improved logistics, less storage space is required nowadays. In addition, railway companies face competition from the road sector in freight traffic. Consequently, an increasing number of rail yards are disused or lying idle. This can lead to environmental problems.

Examples of railway sites which may be suspected of contamination:

- Scrap yards
- Locomotive stabling areas
- Tank containers
- Hazardous substance storage facilities
- Oil depots
- Disposal areas
- Gasworks
- Sleeper impregnation yards
- Galvanisation facilities
- Maintenance workshops

Years of operations in such facilities and other industrial activities lead to contaminants seeping into the soil and ground water. Solvents and heavy metal-based paints are deposited in areas where rail vehicles are refurbished and maintained, and can also be found where locomotives and engines have been subject to such operations. Further environmental problems may be caused by creosote and pentachlorophenol (PCP), especially as a result of sleeper impregnation. Finally, contamination from transport operations may be caused by diesel fuel as a result of refuelling as well as possible contamination from spillage or leakage of hazardous cargo during transport[6]. Weather-related causes such as wind and rain, and human errors such as tank overflow during filling or locomotive cleaning have been and continue to be sources of soil contamination. However, like in any other industry, such contamination sources are also a result of unsatisfactory knowledge, training and awareness among staff of how to deal with contaminants.

[5] ibid. 1, 4
[6] ibid. 1, 5

Contaminants often found at the aforementioned sites are:

- Petroleum-derived hydrocarbons
- Polycyclic aromatic hydrocarbons (PAH)
- Highly volatile halogenated hydrocarbons
- Benzene, toluene, ethyl benzene and xylene (BTEX)
- Heavy metals (Ar, Pb, Cd, Cu, Ni, Hg, Zn)
- Solvents and paint thinners
- Fuel
- Oil and grease

For efficient contaminated site management, a detailed knowledge of the chemical characteristics and the type and extent of any contamination present at the site is essential. For example petroleum-derived hydrocarbons are biodegradable, can be smelt and float on water. Therefore their removal is a relatively uncomplicated and inexpensive procedure compared to other contaminants. Petroleum-derived hydrocarbons, however, make water non-potable, albeit at a level of toxicity significantly lower than that of highly volatile halogenated hydrocarbons, for example. This chemical compound is mostly used as a solvent and rarely exists in nature. It is generally not or only very slowly biodegradable. Highly volatile halogenated hydrocarbons are heavier than water, odourless, carcinogenic, mutagenic, neurotoxic and accumulate in the human body. These characteristics make clean-up measures for areas contaminated with highly volatile halogenated hydrocarbons complicated and expensive.
However, each site is unique and the specific clean-up measures are determined by the site assessment, future use of the site, budget and time frame[7].

2.2 IMPORTANCE OF CONTAMINATED SITES

In the past soil was considered indestructible and of stable value. It was seen as a capital and represented stability. However, over time companies came to realise that soil and ground water contamination led to considerable depreciation of land value.
The redevelopment of brownfield sites and contaminated sites represents a significant opportunity. An accurately planned and performed assessment of a contaminated site forms the basis of any successful redevelopment process. Although contaminated sites and sites suspected of being contaminated may represent potential dangers, investigations and

[7] ibid. 1, 30

remediation can make developed areas with good infrastructure available again. (HOLZAPFEL, 1992: 17).

The main reasons for redeveloping contaminated sites are explained hereafter.

2.2.1 ECOLOGICAL MOTIVATION

The redevelopment of contaminated sites represents an important alternative to building on greenfield land. Restoring inner-city brownfield sites supports economical land use and protects natural resources from sealing. Further environmentally-conscious action leads to reduced risks caused by contaminated sites, sustainable usage and conservation of natural resources and preservation of the natural foundations of life. The image of a company can also be enhanced when the quality of living is improved by turning former industrial sites into green areas and protecting such areas from sealing (LfU, 2008: 8). Moreover, the CO_2 balance of the company can be improved by replanting the cleaned-up site. These measures also contribute to climate protection.

2.2.2 ECONOMIC MOTIVATION

Railway company property is often located in urban areas. These areas are very attractive for investors because of the lack of space in densely populated areas. ”Used areas” already have features such as fully-developed and existing infrastructure that can increase the value. However, if unused the area is a source of costs, not profit. Moreover, suspected contamination leads to the depreciation of an area. “[...] a significant number of areas are not available to the market any more, because the [financial] risk based on ecological load that involve these areas is not quantifiable. For this reason the faith in the value of the affected area from a monetary perspective to defuse the subjective impression of depreciation”[8]. Due to their liability for contaminated areas belonging to them and their responsibilities in terms of human health and the environment, landowners should attach importance to removing the above mentioned limitations and raise the property value by remediation or comparable measures (e.g. physical protection).

Examples of profitable remediation and redevelopment:

- Transformation of an industrial area into a commercial area
- Transformation of an industrial area into a housing estate
- Transformation of an industrial area into a public space (park, event site, etc.)

[8] ITVA – INGENIEURTECHNISCHER VERBAND ALTLASTEN E.V. (2008): Monetäre Bewertung von ökologischen Lasten auf Grundstücken und deren Einbeziehung in die Verkehrswertermittlung. Arbeitshilfe – C 5-3. Juli 2008. - Berlin

Green redevelopment of a railway area in Antwerp

Situation in 1980

Situation in 2004

Situation in 2009

Opening of the converted site

Redeveloping contaminated land has commercial effects such as job creation, internal investment stimulation and land value increase. The reuse of abandoned, contaminated sites thus contributes to the creation of more vibrant communities, boosts demand for goods and services, builds community pride and protects public health. The regeneration of contaminated land contributes towards stimulating regional economies, including regional property markets, and the redevelopment of brownfield sites and contaminated sites in a structured and sustainable manner contributes to minimising the specific financial risks represented by such projects.

3. BIBLIOGRAPHICAL RESEARCH AND OVERVIEW OF EXISTING EUROPEAN AND NATIONAL LEGISLATION AND ENVIRONMENTAL DIRECTIVES

For almost 30 years the European Union has played an essential role in environmental policy and law. The first Environment Action Programme was adopted as early as in the 1970s, followed by another five programmes. Environmental awareness has remained a prime concern throughout the history of European Union.

The European Union takes action in many different areas with the aim of creating an effective and efficient environmental protection system. Its action focuses on areas such as climate change, waste disposal, air pollution, water protection as well as preservation of the environment and biodiversity.
The EU does not only focus on protecting the environment; it also takes into account the economic needs of various sectors to ensure international competitiveness in the future.

3.1 IMPORTANT EUROPEAN ENVIRONMENTAL GUIDELINES

There is a multitude of environmental guidelines. This section highlights three important guidelines and the draft Soil Framework Directive:

1. Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
2. Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy
3. Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC
4. EU Soil Framework Directive (draft as of 20 February 2009)

This chapter is concluded by a brief description of the influence of the directives on management and remediation of contaminated sites.

3.1.1 Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (FFH Directive) is one of the most famous directives. Together with the Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds), the FFH Directive forms the legal basis for nature conservation within the European Union.

"The aim of this Directive shall be to contribute towards ensuring bio-diversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the member states to which the Treaty applies"[9] without neglecting economical, social, cultural and regional requirements. The overarching objective is sustainable development.
An instrument to achieve this aim is the designation of special areas of conservation where special habitat types or species occur. "A coherent European ecological network of special areas of conservation shall be set up under the title Natura 2000."[10]

3.1.2 Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Framework Directive) was adopted after a four-year discussion, thus setting uniform environmental objectives for the protection of ground water and surface water. Furthermore, this was the first high-level legal framework for water protection. The directive adopts a comprehensive, integrated and transnational approach to river basin management, with a specific focus on sustainable conservation of natural resources and the preservation of the ecological integrity of water[11]. "This Directive aims at maintaining and improving the aquatic environment in the Community. This purpose is primarily concerned with the quality of the waters concerned. Control of quantity is an ancillary element in securing good water quality and therefore measures on quantity, serving the objective of ensuring good quality, should also be established[12]."
The improvements and the prohibition against regression are of particular importance.

[9] EUR-Lex, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0043:EN:HTML
[10] ibid. 7
[11] Bavarian Environment Agency, http://www.wasserrahmenrichtlinie.bayern.de/, (own translation)
[12] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy , 2000: 2, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2000:327:0001:0001:EN:PDF

3.1.3 DIRECTIVE 2003/4/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 28 JANUARY 2003 ON PUBLIC ACCESS TO ENVIRONMENTAL INFORMATION AND REPEALING COUNCIL DIRECTIVE 90/313/EEC

"The objectives of this Directive are:

a. to guarantee the **right of access to environmental information** held by or for public authorities and to **set out the basic terms and conditions** of, and practical arrangements for, its exercise; and

b. to ensure that, as a matter of course, **environmental information is progressively made available and disseminated** to the public in order to achieve the widest possible systematic availability and dissemination to the public of environmental information. To this end the use, in particular, of computer telecommunication and/or electronic technology, where available, shall be promoted[13]."

Now every citizen has the right to obtain environmental information without needing to demonstrate that they are acting on legal or professional grounds. The act also grants access to environmental information from every public authority. Furthermore, the periods within which public authorities must answer requests for environmental information are restricted to one month. "This legislation ensures improved access to environmental information[14]."

3.1.4 EU SOIL FRAMEWORK DIRECTIVE (DRAFT)

There is no coherent policy for soil protection in the European Union.

The Commission submitted a strategy on soil protection and a draft EU Soil Framework Directive in February 2009. The aim of this directive was to take in consideration all possible and existing soil functions, including the different processes which cause soil to deteriorate. It called upon every member state to create a register of contaminated sites, develop remediation plans and strategies to prevent further contamination, and either limit soil sealing or undertake compensatory measures. Furthermore, the sale of contaminated land was to be

[13] Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC, 2003: 27-28, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:041:0026:0032:EN:PDF

[14] http://bundesumweltministerium.de/umweltinformation/kurzinfo/doc/4031.php, (own translation)

regulated on an obligatory basis (the seller was obliged to inform the purchaser as well as the competent authority of any existing contamination).[15]

"The *Bundesrat* [Federal Council] of the Federal Republic of Germany rejected the draft EU Soil Framework Directive for the following reasons:

- The Commission's draft directive constitutes too much regulation […]
- National and regional soil protection measures which already exist and have been proven effective are not taken into consideration […]
- Additional administrative expenditure and disproportionate duties in terms of reporting and mapping should be avoided […]
- The Commission's proposal is incompatible with the principle of subsidiarity […]"[16].

At the EU Council of Ministers meeting on 20.12.2007 Germany and four other member states informed the minister of their rejection of the directive. The other 21 member states expressed approval and were willing to compromise in order to reach a political agreement on the EU Soil Framework Directive. However, this proved impossible and the item was removed from the agenda under the Portuguese Presidency of the EU Council. Under the Spanish and Belgian presidencies – countries which were both in favour of the directive – it was announced that this topic would be addressed; there is thus a significant chance of the directive entering into force within the foreseeable future.

3.1.5 IMPORTANCE OF CONTAMINATED SOIL – USING THE EXAMPLE OF A BIOTOPE

Contaminated areas can be found on former industrial sites or sites on which waste has been treated, stored or buried and on which environmentally harmful substances have been handled (see chapter 2)[17]. If such areas are abandoned and not used for several years they can provide ideal conditions for animals and plants to thrive.

Over the years a biotope can develop on contaminated soil. Soil which has known the effects of industrial activity, for example in the vicinity of gas works, is low in nutrients; this can encourage the growth of plants which benefit from such conditions. As the conditions are

[15] Draft DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC, 2006, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0232:FIN:EN:PDF

[16]. Vorschlag für eine Richtlinie des Europäischen Parlaments und des Rates zur Schaffung eines Ordnungs-rahmens für den Bodenschutz und zur Änderung der Richtlinie 2004/35/EG, 2006: 1-2, http://www.bundesrat.de/cln_152/nn_8336/SharedDocs/Drucksachen/2006/0601-700/696-06_28B_29,templateId=raw,property=publicationFile.pdf/696-06%28B%29.pdf (own translation)

[17] Federal Environment Agency, http://www.umweltbundesamt.de/boden-und-altlasten/aktuelles/brrl.htm, (own translation)

unusual, plants and animals which thrive in these locations are rare and therefore particularly worthy of protection. Remediation of the contaminated area would interfere with the biotope, destroying protected plants and animals listed in the FFH Directive. The FFH Directive states that the state of preservation of any protected species must not deteriorate, yet "the objectives of the Soil Framework Directive are to restore soil quality to a level of functionality consistent at least with current and intended use"[18].

The Water Framework Directive grants special protection to ground water. Generally, contaminant flow into the ground water must be avoided or limited. Ground water bodies in a good chemical condition must be protected from increasing pollution; any significant and permanent increase in pollution must be reversed[19]. Therefore, if a ground water body is classified as endangered because of harmful soil changes or a contaminated site and a tendency has been observed for the contamination to expand – thus deteriorating the chemical conditions in the vicinity – measures must be taken to prevent expansion or damage (GROßMANN, 2009). The state and quality of the biotope therefore stand in contradiction to concerns for human safety and soil and ground water protection.

It is obvious that the management and remediation of contaminated sites will be significantly affected by the directives of the European Parliament. Although EU regulations allow considerable leeway in terms of technical solutions, there will be considerable demand in terms of engineering processes (GROßMANN, 2009).

3.2 NATIONAL ENVIRONMENTAL POLICY AND ENFORCEMENT – EXAMPLES FROM SIX MEMBER STATES

The member states of the European Union are obliged to transpose directives on the environment into national legislation within one to three years.

"The Commission adopts Directives as opposed to regulations to allow for flexibility in national implementation; the member states are able to select the most appropriate measures at the most appropriate administrative and geographical level. This is indispensable to ensure that the regional and local features like variability of soil, land use, local climatically conditions and socio-economic conditions".

[18] Federal Environment Agency, http://www.umweltbundesamt.de/boden-und-altlasten/aktuelles/brrl.htm, (own translation)

[19] Die Wasserrahmenrichtlinie – Neues Fundament für den Gewässerschutz in Europa, 2004, http://www.umweltdaten.de/publikationen/fpdf-l/3044.pdf, (own translation)

By way of example, six member states have been selected by the Polluted Soil Group to characterise the administrative structure in various regions of Europe:

- Northern Europe: Denmark
- Western Europe: France
- Central Europe: Germany
- Eastern Europe: Poland
- South-eastern Europe: Romania
- Southern Europe: Spain

The issue of contaminated land is also addressed at national level as an EU Soil Framework Directive has not been adopted yet and the European Union has no coordinated course of action for soil protection. The range of different legal obligations is therefore considerable (see Appendix K).

In general most of the aforementioned countries follow the polluter pays principle, which is also part of European policy. The problem for railway companies stems from the high number of “third party” users – customers – on their property. If property use does not follow environmental legislation or suitable business regulations it can be very difficult to identify the amount, source and time of property pollution. Railway companies owning property may not be able to identify the polluter and the specific damage it has caused; consequently remediation costs are borne by railway companies and not the third party polluter. It is therefore very important to create a property pollution register for railway companies to identify and distinguish between third party pollution and ”home made“ pollution. In both cases, assessment and remediation costs will arise and it is important to have all necessary data and expertise available to minimise railway companies’ clean-up expenditure and charge third party polluters.
The polluter pays principle is followed by in most national legislations but without proper registering it has no chance of applying in reality.

Table 1: Overview of national environmental policy and enforcement

	Denmark	France	Germany	Poland	Romania	Spain
Superior enforcement body	Danish Ministry of Environment	The MEEDDAT[1]	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety	The Ministry for the Environment	The Ministry for the Environment	The Ministry for the Environment and Rural and Marine Affairs
Policy administration and enforcement	Decentralised	The Préfet[2] and the DRIRE[3], and in some regions the DREAL[4]	The 16 federal states	Administration and enforcement of environmental law is carried out by agencies and bodies with a more general range of activities	National Agency for Environmental Protection, coordinating the regional authorities	National, regional and local bodies
Liability for contaminated land	Liability is based on the polluter pays principle	No specific act for to allocate liability in the field of soil protection. At present the current or last user of the site is liable	Several persons listed in chapter 3.2.3 according to the "polluter pays principle"	Different categories of liable persons according to the "polluter pays principle"	Current owner according to the "polluter pays principle"	"Cascade liability" system (as per the Law on Waste) according to the "polluter pays principle"
Obligation to examine land for contamination	No	Yes, before and after being granted an environmental permit and prior to the sale of a plot of land	Yes, if there is suspicion of contaminated land	Private individual: No; a legal entity operating a road, railway line, airport or port must carry out periodic measurements	No. Exception: after remediation measures	No. Exception: after activities listed in the RD on Soil, reports and analyses about the status of the land must be drawn up

1)MEEDDAT: Ministry of Environment, Energy, Sustainable Development and National Planning

2) Préfet: the state representative at sub-regional level

3) DRIRE: Directions Régionales de l'Industrie, de la Recherche et de l'Environnement

4) DREAL: Directions Régionales de l'Environnement, de l'Aménagement et du Logement

4. QUESTIONNAIRES AND INTERVIEWS

4.1 QUESTIONNAIRE 1

Questionnaire 1 was developed by the UIC Polluted soil network to collect basic information before setting more detailed and specific questions. The questionnaire is divided into four parts:

a. Legal aspects
b. Responsibilities
c. Railway company strategy
d. Contamination management

The questionnaire was sent by UIC to the people in charge of environmental issues at 45 European railway companies (see Appendix A). *Questionnaire 1* only included closed questions (questions with a limited number of logical answers, in this case yes and no) as it was assumed that the respondent had the knowledge required for this purpose, and the questions targeted specific facts (KIRCHHOFF et al. 2003: 20).

The questionnaire was answered by 25 respondents (see Appendix B); as in some countries more than one company is responsible for the various categories, the statistics thus compiled should be considered an initial rough appraisal of the situation in Europe.

4.1.1 PURPOSE OF THE QUESTIONS

The following section describes the responses expected for each question. The aim was to keep the number of questions to a minimum in order to obtain as many responses as possible, while gaining as much information as possible.

a. Legal aspects

Question 1: Are contaminated areas systematically registered nationwide?

➔ The aim of this question was to investigate whether there was a legal obligation to record contaminated sites.

Question 2: Is there a legal obligation for registering?

➔ Answers would show whether companies registered contaminated sites of their own accord or to comply with legal obligations.

Question 3: Is assessment and sampling carried out on the basis of national lists concerning environmentally-sensitive property use?

➔ This question examined whether a national list existed containing criteria for critical, environmentally-sensitive property use. Answers would also give an idea of the level of knowledge among national administrations concerning environmentally-sensitive property use.

Question 4: Are these contaminations registered in the context of (several answers can be given):

- *Construction work?*
- *Environmental damage?*
- *An assessment programme?*

➔ Answers to this question would show whether contaminated sites were documented on a case-by-case basis or systematically.

b. Responsibilities

Question 1: Who is responsible for risk assessment in your country (several answers can be given)?

- *The government (public)*
- *Property owners*
- *Polluters*

➔ This question determined whether a national obligation for risk assessment existed. Furthermore it defined the person responsible, more precisely the status of the person responsible.

c. Railway company strategy

Question 1: Are there any environmental/sustainability targets regarding contaminated soil in your company?

➔ This question sought to determine whether the contaminated soil was considered a long-term problem in the company and a cost factor.

Question 2: Is there a systematic programme for registering properties with polluted soil in your company?

➔ This question aimed to determine whether compatible data was available and what were the costs involved.

Question 3: Is this done for financial and privatisation-related purposes?

➔ This question would provide information on whether data was used as part of a financial strategy.

Question 4: Is risk assessment and valuation of polluted property part of your company's financial strategy?

➔ This question determined whether companies were aware of the potential adverse effects of polluted property on their financial balance.

d. Contamination management

Question 1: Does your company follow a systematic assessment process?

➔ The answers obtained would show whether a company was prepared for future privatisation.

Question 2: Does your company have a contamination register?

➔ The question aimed at backing up question 1. A systematic assessment process should include a contamination register.

Question 3: Is the data available in digital format?

➔ This question sought information on how data was stored by companies.

Question 4: Is the data confidential and available on request?

➔ This question determined how long a data system had existed and how sensitive data was processed.

Question 5: Is the data available online (public access)?

➔ This question determined whether it was obligatory to publish data and make it available to the public.

Question 6: Is the data structured in accordance with EU directives?

➔ This question determined the level of preparedness regarding the transposition of upcoming directives into national law (for example the draft Soil Framework Directive).

Question 7: Does your company have additional databases (buildings, operations)?

➔ This question determined whether environmental data was stored alongside other types of data within the company.

Question 8: Are your data sets compatible with public databases and other company databases?

➔ The aim of the question was to find out whether further data processing may prove difficult due to different external guidelines for data administration.

Question 9: Have you identified a need for a company-wide contamination register?

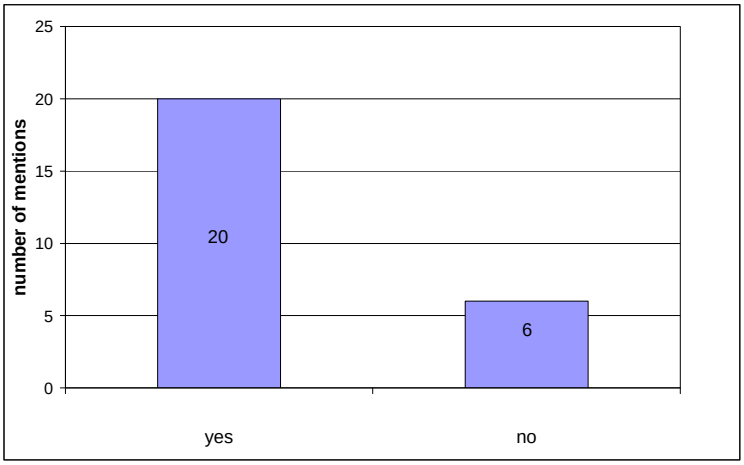
➔ This question determined whether the respondent was aware of the economic and ecological impact of contaminated sites.

4.1.2 ASSESSMENT

a. Legal aspects

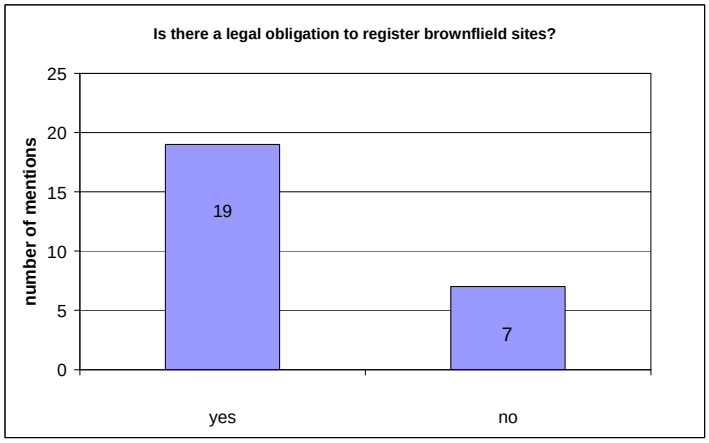
This part of the questionnaire sought information on the legal framework for registering contaminated sites.

Question 1: Are contaminated areas systematically registered nationwide?



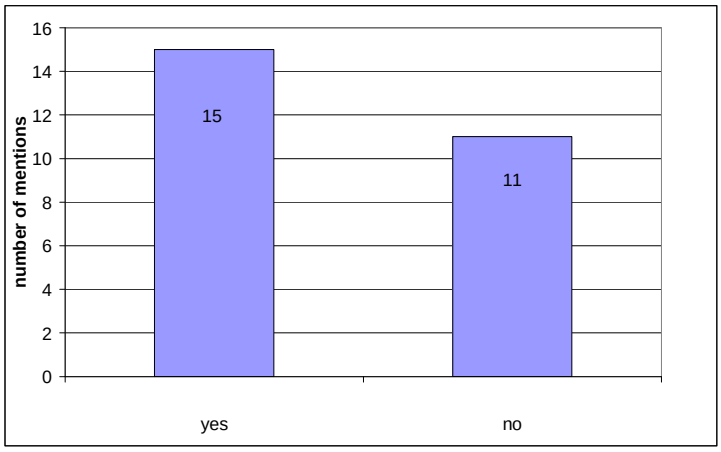
Most member states have a systematic register of contaminated sites in their country. Therefore, within the EU most contaminated sites are systematically recorded when they are acquired. However, no information could be obtained about quality.

Question 2: Is there a legal obligation for registering?



In more than two thirds of the member states there is a legal duty to list contaminated sites. Approximately 90% of the companies register the sites systematically; this means that some companies which register sites are under no legal obligation to do so.

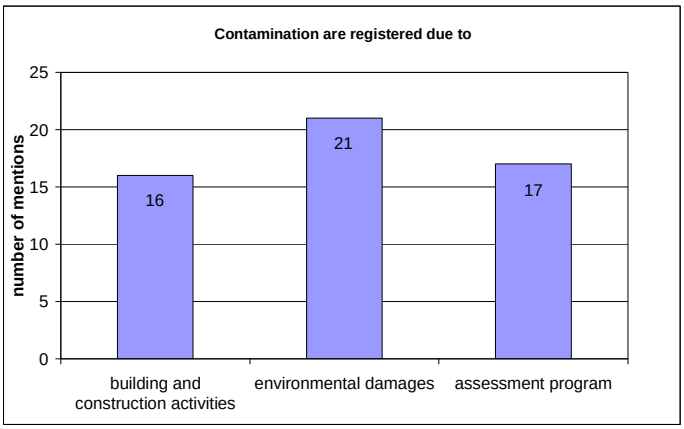
Question 3: Is assessment and sampling carried out on the basis of national lists concerning environmentally-sensitive property use?



Approximately 60% of the countries have national lists of environmentally-sensitive property use. This indicates that in 40% of the countries, the authorities have less experience in processing sensitive property, and are therefore unlikely to have set administrative regulations.

Question 4: Are these contaminations registered in the context of (several answers can be given):

- *Construction work?*
- *Environmental damage?*
- *An assessment programme?*



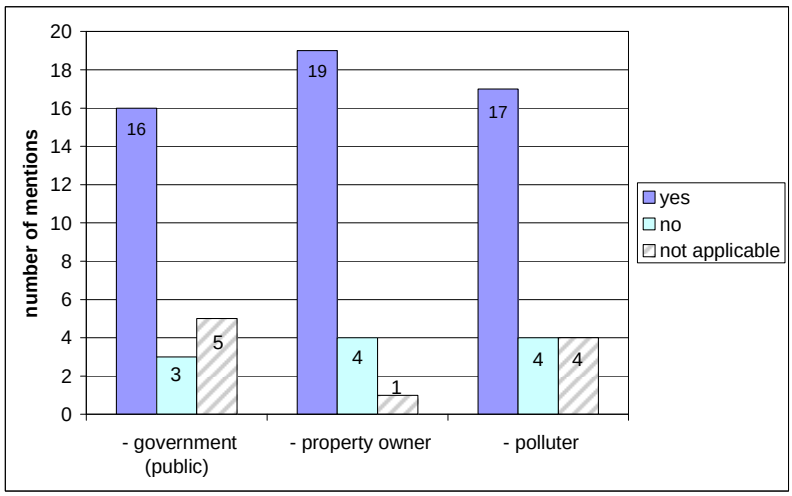
Cases of contamination are recorded mainly when environmental damage occurs, but also as part of construction work. However, it remains to be determined whether environmental damage includes accidents. Moreover, 70% of the companies run assessment programmes.

b. Responsibilities

The second part dealt with responsibility for risk assessment.

Question 1: Who is responsible for risk assessment in your country (several answers can be given)?

- The government (public)
- Property owners
- Polluters

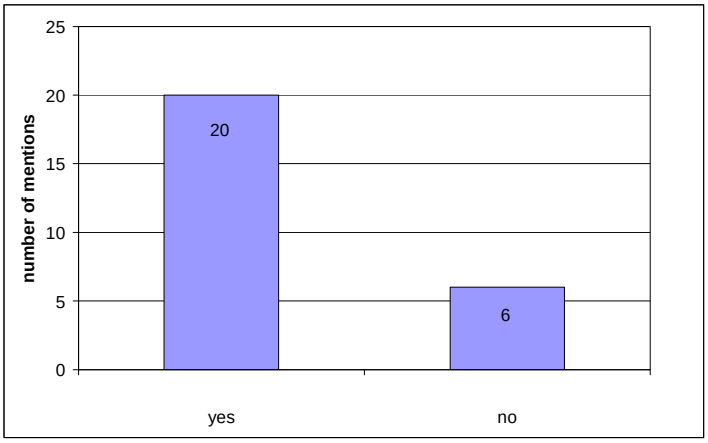


In most of the countries the property owner is responsible for risk assessment. It remains unclear whether the government has to pay for risk assessment of public contaminated sites. In many cases railway companies are government-owned; therefore the railway property owner is often the government.

c. Railway company strategy

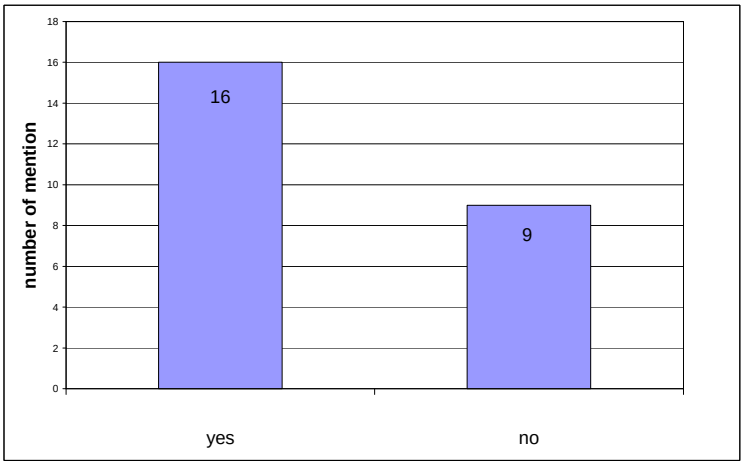
Questions in this part investigated company strategies in greater detail.

Question 1: Are there any environmental/sustainability targets regarding contaminated soil in your company?



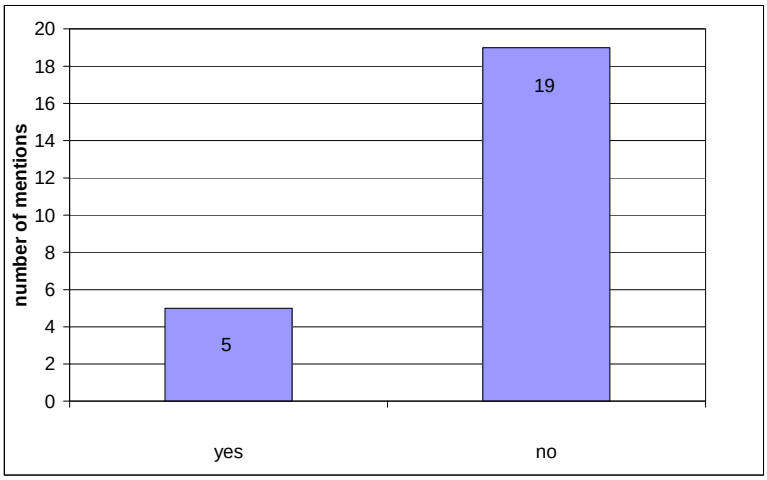
80% of the companies pursue a policy of sustainability. These companies recognise that contaminated soil must be seen as a long-term problem.

Question 2: Is there a systematic programme for registering properties with polluted soil in your company?



Approximately 65% of the companies register property with polluted soil according to a systematic programme. It remains to be clarified whether the other 35% of member states either do not have a programme for registering property with polluted soil or have a non-systematic one. This issue is addressed in questionnaire 2.

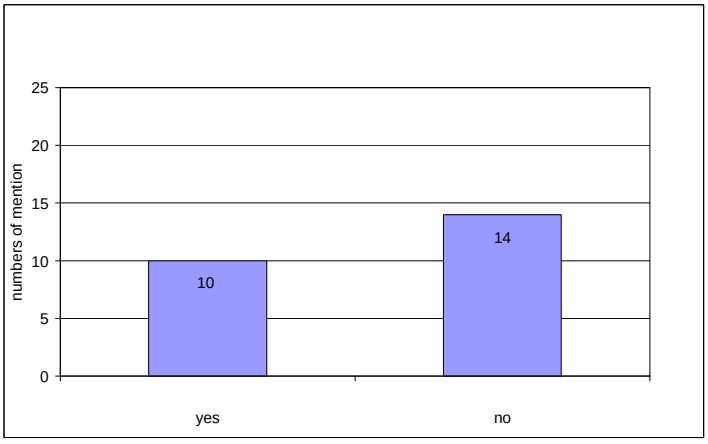
Question 3: Is this done for financial and privatisation-related purposes?



Among companies that run programmes for registering properties with polluted soil, only a third of them do so for financial and privatisation-related reasons. This implies that the company's market rating is not a motivation behind most of the programmes.

Two thirds of the companies do not consider privatisation or "going public" a driving force at the moment.

Question 4: Is risk assessment and valuation of polluted property part of your company's financial strategy?

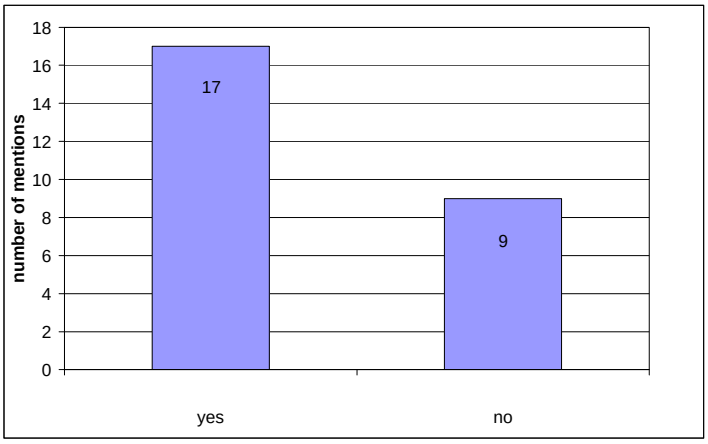


The responses to this question do not corroborate the answers to question 2. Contaminated sites have an adverse effect on the financial balance of railway companies. Nevertheless, only half of the companies recognise this fact.

d. Contamination management

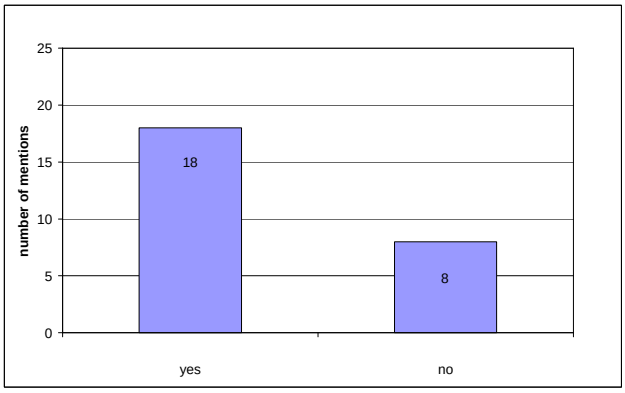
The final part of the first questionnaire addressed the issue of contamination management.

Question 1: Does your company follow a systematic assessment process?



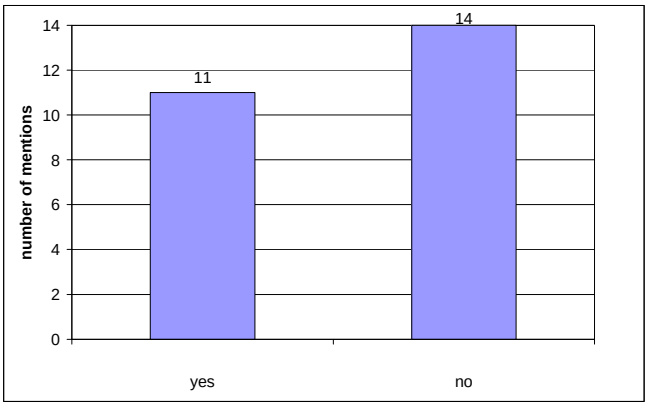
Approximately 65% of the interviewed companies follow a systematic assessment process, which suggests that they have structured data. However, no information is available on the quality and purpose of the data.

Question 2: Does your company have a contamination register?



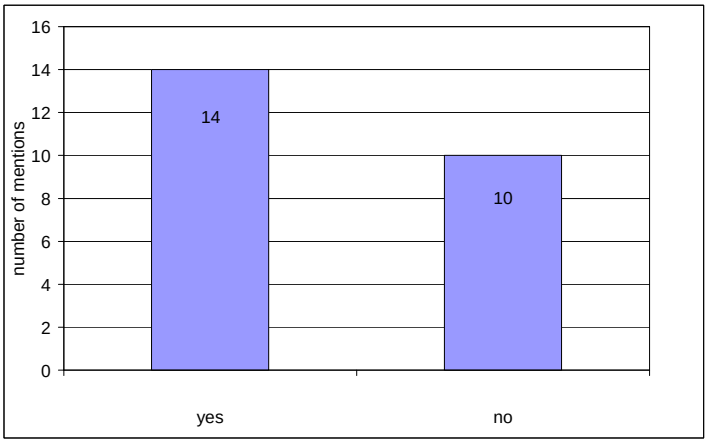
More than two thirds of the companies document contaminations. Many companies thus record contaminated sites when they acquire them.

Question 3: Is the data available in digital format?



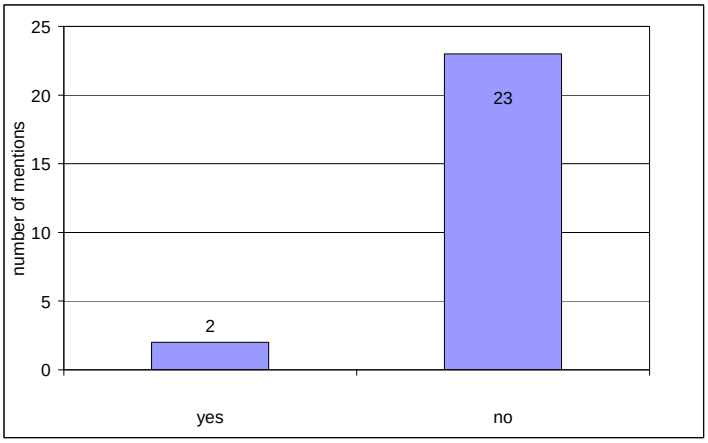
Half the companies do not have data on contamination available in digital format. Due to the rising number of GIS systems used by railway companies and public authorities it would be a tough challenge (and represent a significant investment) to create digital contamination databases (where appropriate) and transfer existing non-digital data into them.

Question 4: Is the data confidential and available on request?



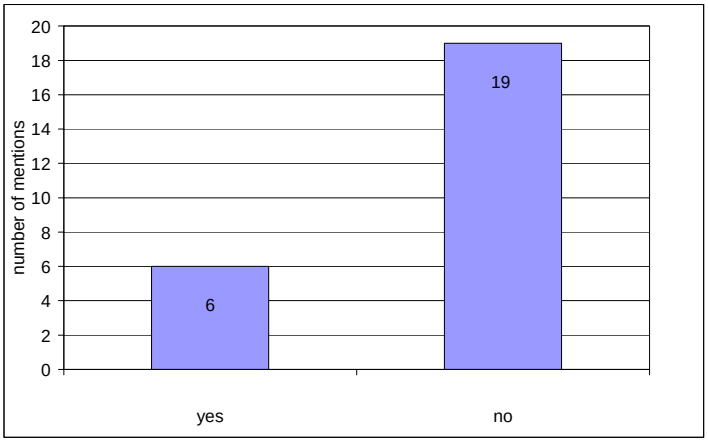
Although only half of the companies have data in digital format, approximately 60% of them provide information on request – data is thus available in paper format. But most of the companies handle this data confidentially.

Question 5: Is the data available online (public access)?



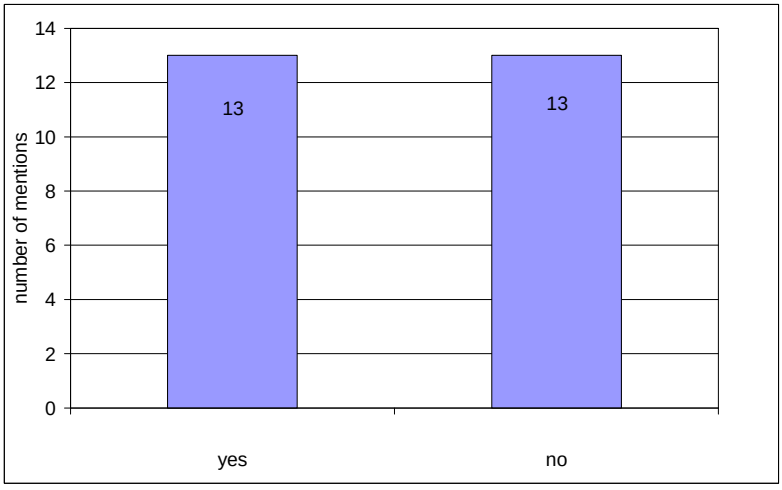
Only two companies (Pro Rail NL, SBB CH) provide data on contamination sites online. There is a difference in quality between online data available for public use and online data available for internal company use.

Question 6: Is the data structured in accordance with EU directives?



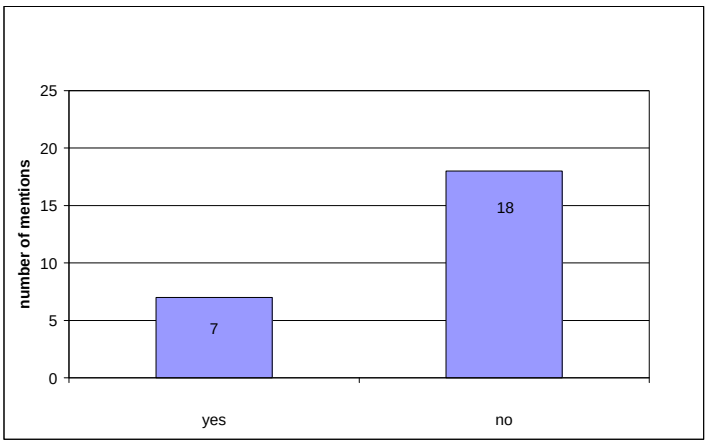
Approximately 80% of the companies do not structure their data according to EU directives. This suggests that the transposition of upcoming directives is not greatly taken into account, even though a non-harmonised structure leads to additional costs (see comment for question 3).

Question 7: Does your company have additional databases (buildings, operations)?



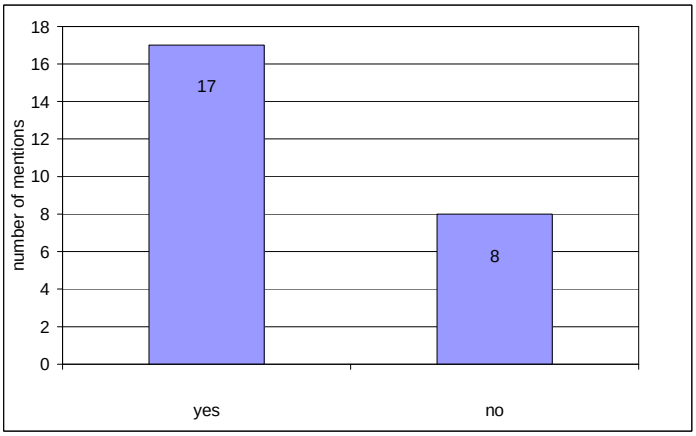
Half the companies have databases (hard copy or digital). A great deal of harmonisation and amendments would be required in order to obtain compatible environmental data. Incompatibility between existing databases constitutes an additional challenge for new environmental data.

Question 8: Are your data sets compatible with public databases and other company databases?



Only 25% of the companies have data that is compatible with public databases and other company databases. Further data processing within one company and/or national authorities could lead to exchange and processing problems. Seamless cooperation between authorities, consultants and railway companies will be difficult to achieve and probably take a long time.

Question 9: Have you identified a need for a company-wide contamination register?



Approximately two thirds of the companies consider a company-wide contamination register necessary. A contamination register already exists in two thirds of the companies (see question 1). This implies that no additional registers are deemed necessary.

4.1.3 SUMMARY

a. Legal aspects

Contaminated soil is taken into account in the legislation of most of countries considered. Contaminated areas are systematically registered, even by companies operating in member states in which this is not a legal obligation, emphasising the awareness among companies of the (economic) importance of contaminated sites. Contamination is mostly registered following cases of environmental damage (85%). But there are also assessment programmes which record cases of contamination (70%). These existing assessment programmes reflect a certain degree of awareness in terms of sustainable and economic use of soil.

b. Responsibilities

The owner of a contaminated area is responsible for risk assessment in 80% of the member states. The interesting fact brought to light by this question is that the government ranks second, ahead of the polluter, and that some respondents gave no answer (neither “yes” nor “no”).

It is unclear whether the polluter pays principle is always followed by legislation and in reality.

c. Railway company strategy

80% of the respondents stated that there were environmental/sustainability goals related to contaminated soil in their company. We can conclude that contaminated soil is considered a long-term problem. Approximately 65% register their polluted soil systematically and only 20% do so out of financial and privatisation-related concerns. In addition, only 45% of the companies include risk assessment and valuation of polluted property as part of their financial strategy, indicating differences in interpretation of the concept of sustainability, as well as bringing to light the fact that fewer than half of the companies recognise that contaminated sites may have an adverse effect on their financial balance.

d. Contamination management

Approximately two thirds of the companies have systematic assessment processes and a contamination register. Structured data thus exists, but in most of the companies (80%) it is not structured according to EU directives. In 60% of the companies data is confidential and available on request but only half of the respondents stated that the data was available in digital format. Approximately 65% of the companies consider a company-wide contamination register necessary. Although more than half of the companies (approx. 60%) have additional databases (buildings, operations), it is surprising that 75% of the respondents mentioned that their data was incompatible with other databases (including databases within the company and public databases). Only two companies make this data publicly available online. All these facts can lead to problems in terms of data availability, data processing within a company and data exchange with national authorities.

4.1.4 CONSEQUENCES

Questionnaire 1 provided an initial appraisal of the current situation among UIC member companies and their awareness of the contaminated site issue. However, the aim was to obtain more detailed and representative data on the investigation, remediation and management of contaminated sites. Therefore it was necessary to gather more information on existing data and assessment schemes within the UIC railway community. This was the reason a second questionnaire was sent out with more detailed questions on the quality of

registers and surveys, assessment processes, clean-up operations, and investment and property development strategies.

This more detailed investigation focused on facts such as:

- Performance in terms of the assessment strategy
- Data compatibility with existing databases
- Environmental strategy of the company
- Risk management based on existing data
- Data availability
- System costs and benefits

Information from the second questionnaire was completed by additional interviews with selected companies.

4.2 QUESTIONNAIRE 2

Questionnaire 2 was developed by VEGAS, University of Stuttgart (Nadine Bussmann) and the UIC polluted soil network. The structure of *Questionnaire 2* was almost identical to *Questionnaire 1*.
Questions were added to parts a, c and d.

Part c (Railway company strategy) was extended to cover three additional items:

- Assessment
- Planning
- Clean-up

To ensure *Questionnaire 2* was complete and to cross-check earlier answers to *Questionnaire 1*, the questions and answers from *Questionnaire 1* were incorporated into *Questionnaire 2*. The companies which had not responded to the first questionnaire thus had a second chance to give a response.

Questionnaire 2 was sent by UIC to the people in charge of environmental issues at 45 railway companies, following the same procedure as with *Questionnaire 1* (see Appendix A). Feedback was received from 23 companies representing 21 EU member states (see Appendix B).

The questionnaire included requests for examples of documents, reports, manuals etc. (see Appendix E). In answering *Questionnaire 2* companies gave their consent for UIC to publish this data in a project report and presentation.

4.2.1 PURPOSE OF THE QUESTIONS

This section describes the purpose behind each question. To ensure better understanding, some questions refer to the systematic US EPA approach (phases I – II, mentioned below) in the field of contaminated site management.

EPA Phases:

PHASE I: SITE ASSESSMENT AND DUE DILIGENCE

Site assessment and due diligence provide initial information regarding the feasibility of a brownfield redevelopment project. A site assessment examines the health-related and environmental risks of a site and the due diligence process examines the legal and financial risks. These two assessments help the planner develop a conceptual framework of the site, which will form the basis of the next steps in the redevelopment process.

PHASE II: SITE INVESTIGATION

The purpose of Phase II, site investigation, is to give planners and decision-makers objective and credible data on the nature of contamination in a brownfield site to help them develop an appropriate contaminant management strategy. A site investigation is typically conducted by an environmental professional. This process assesses the following types of data:

- Types of contamination present
- Clean-up and land reuse objectives
- Length of time required to meet clean-up objectives
- Post-treatment care required
- Costs

CONTAMINANT MANAGEMENT:

1. The first thing a company must do is assess remedial alternatives – if the site investigation shows that there is an unacceptable level of contamination, the problem must be resolved.

2. A second step is to develop a Remedy Implementation Plan. The plan is developed by a professional environmental engineer and describes the approach to adopt in order to contain and clean up contamination.
3. The final step is remedy implementation.

QUESTIONS:

A. LEGAL ASPECTS

Question 1: Is there a legal requirement as to which party provides financing for each EPA phase?
If so, is it: your company / authorities / other

➔ This question sought information on legal obligations for third parties (private or public) on financing activities of an EPA phase.

C. RAILWAY COMPANY STRATEGY

Question 1: Does your company pursue a strategy to prevent the pollution of sites?

➔ This question determined whether there was awareness and regular checks of potentially polluted sites. These may constitute a (long-term) problem if not given enough consideration.

Question 2: Is there a systematic contamination management programme which follows EPA phases?

➔ This question determined whether a systematic approach to handle contaminations existed, and whether any efforts were being made as a result of the European accession process.

Question 3: Does your company have a standardised investigation strategy for all properties? - If so, who initiated this strategy? your company / a third party
What standards is your strategy based on? EPA / World Bank / national / other

➔ This was a supplement to question 2 aiming to identify whether there was a structured and coherent strategy for investigations within the company, whether the company had developed its own strategy and whether it based the strategy on international standards.

Question 4: What criteria were applied to classify the areas for assessment (stations, rail yards, number of tracks etc.)?

➔ The aim of the question was to ascertain whether and how the investigated areas were classified, taking into account their use, the contamination risks and how they were recognised.

Question 5: Is there a special department in your company which deals with contaminations? Are there specialists within the company that solely deal with contamination risks?

➔ This question aimed to assess the importance companies attached to the issue of contaminated sites.

Question 6: Does your company maintain an internal archive (documentation) on the history of its property use?

➔ This question was related to the issue of providing long-term and historically-valid information on the use of environmentally-sensitive property for assessments.

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Question 7: Does your company have a fund or budget to cover additional contamination-related costs in future projects?

➔ This question aimed to show the level of awareness and suitable planning vis-à-vis the financial risks linked with site contamination.

Question 8: Does the risk assessment process include regular cost estimations for the future?

➔ This question sought information on how a systematic site investigation programme and risk planning procedure fitted in with companies' financial and assessment strategies. Was there any awareness of future contamination costs and were they part of companies' financial planning processes?

Question 9: Are these cost estimates updated periodically?

➔ Following on from the previous question, the aim was to obtain information on the sustainability of the aforementioned process.

Question 10: Is this financial data used in your company's financial planning?

➔ Answers would show whether contaminated sites were considered a significant factor in company finances.

Question 11: Does your company have a risk management system to assess the economic impact of contaminated sites?

➔ This question aimed to gauge awareness of the financial risks of contaminated sites, and whether this awareness translated into a regular risk management process.

I. Assessment

1. Please provide a brief description of your approach to EPA Phase I assessment (please attach an example). Is an EPA Phase I or similar process implemented for the purpose of assessment? If so, please provide an example (see Appendix E).

2. Is the historical land use of sites investigated and included in a documentary survey?

➔ This question served to cross-check question 6 and determine whether a historical survey was possible and sustainable data was available.

3. What sources of information are used for (Phase I) assessment and due diligence? maps (historical, thematic, topographic) / aerial photographs / trade index / public administrative data / archives / other

➔ Answers would give an overview of whether sources of historical data were available, what they were and whether they were used to obtain data.

4. Who collects the data? your company / a third party / the environmental department / authorities / other

➔ Answers would indicate whether it was the railway company or third parties that initiated data collection and whether the data was collected by consultants or within the railway company by its own specialists.

5. Do your assessment activities make use of sampling documents (forms, manuals etc.)?

➔ Answers would show whether assessments were carried in a coherent and homogeneous manner and what types of documents were used for collecting data.

6. Are there regular on-site property inspections focusing on contamination?
If so, who performs them? your company / the environmental department / the ministry / an independent authority / other

➔ Answers would provide information on awareness and priorities in terms of third party polluters or internal business activities resulting in property pollution.

7. On-site sampling and analysis is carried out as part of: assessment / construction work / property sale / other
According to what standards: EPA / World Bank / other

➔ This question served to cross-check question 4 of *Questionnaire 1* (legal aspects), providing information on where the majority of sampling data was collected and what standards were used.

8. Who carries out the on-site sampling? your company / consultants / authorities / other

➔ Answers would show whether sampling was mostly done by railway companies or consultants.

9. What data is sought? subsoil / ground water / surface water / geotechnical / chemical / other

➔ Answers would provide information on the variety of data and its use in further stages.

10. Is the data used to set remediation targets?

➔ The question aimed to determine whether the data collected was used to set future remediation targets and whether the railway company was carrying out active project management with a view towards the future.

II. Planning

1. Are feasibility studies performed for different clean-up scenarios?

➔ Answers would give an idea of how the property owner dealt with the feasibility of technical and financial remediation.

2. Is remediation planning divided into different steps such as approval planning, implementation planning etc.?

➔ Answers would show whether a systematic step-by-step process was being implemented.

3. Are there standard documents for remediation planning?

➔ The question aimed to determine whether a structured and coherent remediation planning process and example documents were available.

III. Clean-up

1. Does the clean-up level in projects prepare the property for multipurpose or only specific use in the future?

➔ Answers would show whether the scope of the clean-up operation depended on future property use and other economic and environmental issues.

2. Who sets clean-up targets? your company / environmental agency / environmental authorities / other authorities / other

➔ Answers would provide information on the process and decision-makers involved in meeting the targets. Was this a process driven by all parties or mainly influenced by authorities or others?

3. Are there any clean-up targets set by legislation?

➔ Answers would give an idea of the importance of remediation targets set at national level, which do not grant any flexibility in consideration of future property use

4. Who defines the remediation method? your company / consultants / authorities / other

➔ Supplement to question 2 – who drives the process (effectiveness)?

D. CONTAMINATION MANAGEMENT

Question 1: Is the data used for: mid or long-term planning / financial risk planning / area development projects / property tax deduction / property management / fund raising (for urban development, EU, government, region etc.) / nature conservation and land use planning / other

➔ Is the data collected as part of a company-wide strategy?

Question 2: Is the data you store in line with EU and national legislation (FFH, Ground Water Directive)?

➔ Are national and EU regulations known and taken into account in data collection and storage?

Question 3: Does your company make all this data available online? (- on request)

➔ Answers would indicate the importance companies attached to data use and data transfer.

Question 4: Is there long-term environmental data management (an archive)?

➔ Answers would indicate to what extent companies made provisions for future property use and management in environmental data storage and collection.

Question 5: Is there a standardised structure for electronic / hard copy data?

➔ This question aimed to identify structured and coherent data storage and management.

Question 6: How is a typical property data sheet structured in your company?

➔ The aim was to obtain some examples of existing data sheets and their structure.

Question 7: What data is stored in your system / archive?

➔ The aim of the question was to obtain information on the level of data specification and detail in the systems / archives.

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Question 8: Is there a regular procedure for selling or buying contaminated property in your company?

➔ Does property purchase or sale automatically include an assessment of financial risks due to contamination? Is that part of regular real estate business?

Question 9: Is there a quality management system in your company to support your contamination risk assessment?

➔ Answers would show whether a company used such a system, and recognised its importance and the benefits it could bring.

Question 10: Are there third party polluters on your properties? If so, do you usually charge them for environmental damage?

➔ Is there system which routinely checks and charges third party polluters (property tenants)?

Question 11: Does your company regularly carry out development work on contaminated properties?

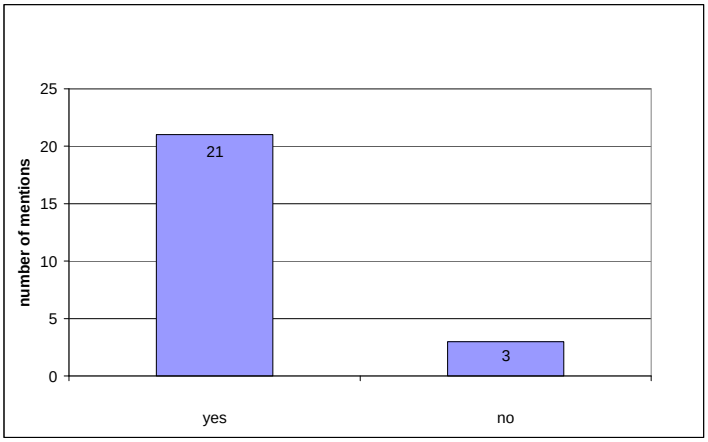
➔ Answers would show whether contamination risks were part of companies' daily property business.

4.2.2 ASSESSMENT

a. LEGAL ASPECTS

In this part information was sought on the legal framework of financial activities involving contaminated sites.

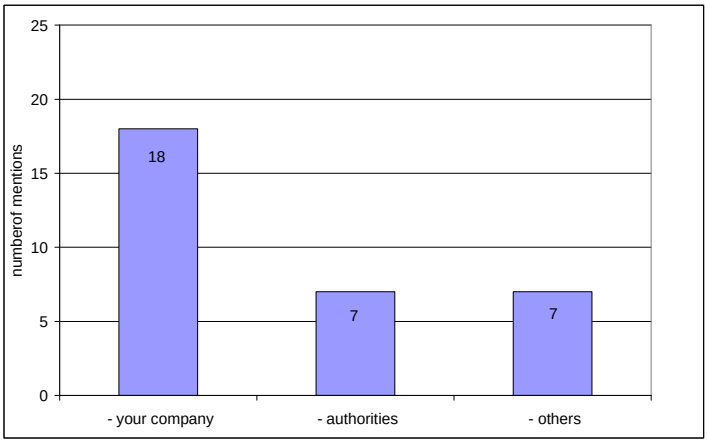
Question 1: Is there a legal requirement as to which party provides financing for each EPA phase?



In more than 85% of the countries there is a legal requirement as to which party must finance the cost of an EPA phase.

This is an interesting point for risk management strategies within companies. Spending money on assessments is obligatory.

If so, is it: your company / authorities / other



Generally the companies have to provide financing. This leads to expenses that affect the financial planning and balance.

An interesting fact is that seven out of eight companies in countries which joined the EU in 2004 stated that they had to provide financing.

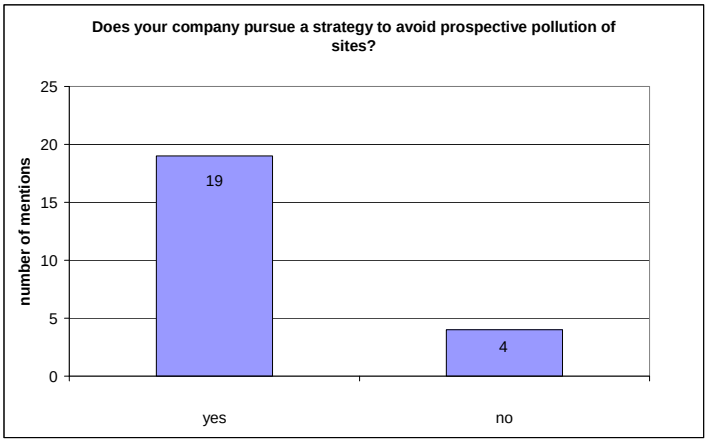
b. RESPONSIBILITIES

Nothing was added to this part of the questionnaire.

C. RAILWAY COMPANY STRATEGY

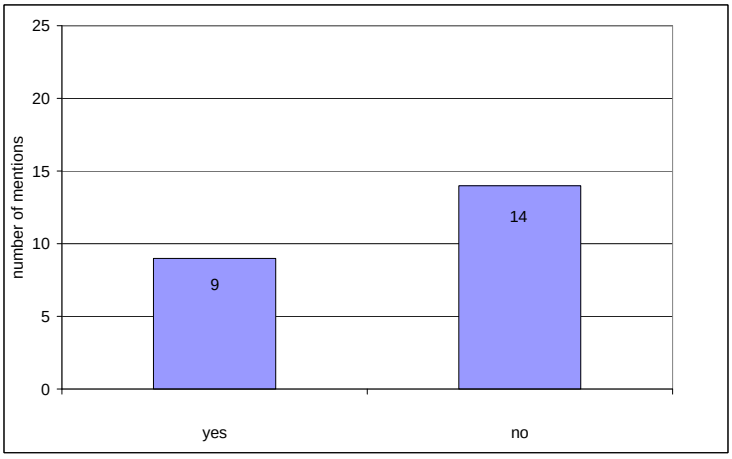
This part addressed the issue of railway companies' strategies. The main themes were assessment, planning and clean-up.

Question 1: Does your company pursue a strategy to prevent the pollution of sites?



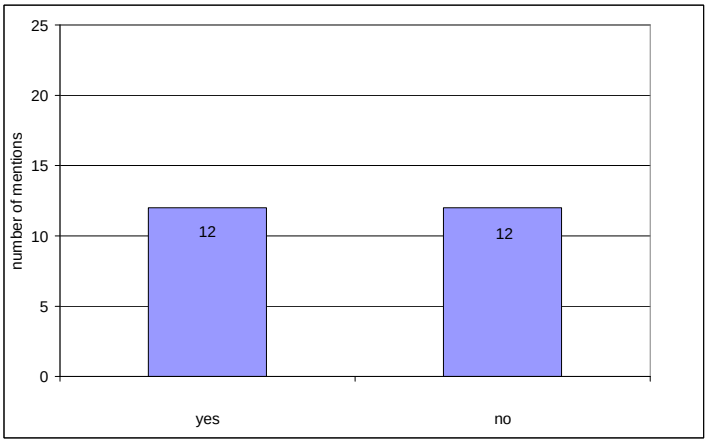
Approximately 80% of the companies pursue a strategy to prevent sites from becoming polluted. The companies have thus recognised that contaminated sites are a long-term and expensive problem. This strategy can also be part of an operating plan to avoid contamination.

Question 2: Is there a systematic contamination management programme which follows EPA phases?



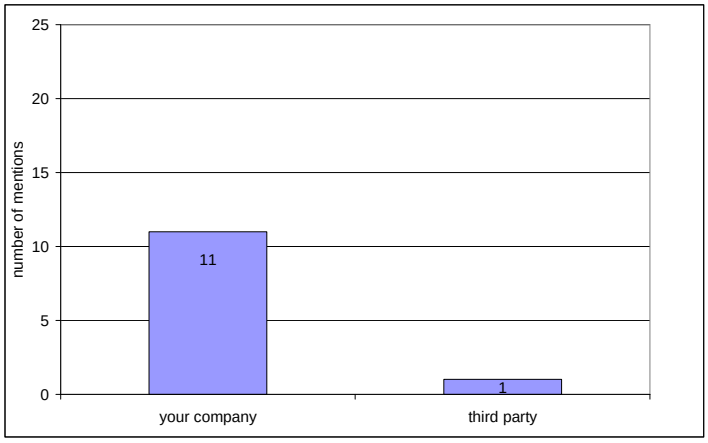
Around 60% of respondents stated that they had no systematic contamination management programme which followed EPA phases. It is unclear whether this means there is no systematic strategy or whether the systematic strategy simply does not follow EPA phases. It indicates that many cases of contamination are detected in the course of construction work or due to third party action.

Question 3: Does your company have a standardised investigation strategy for all properties?



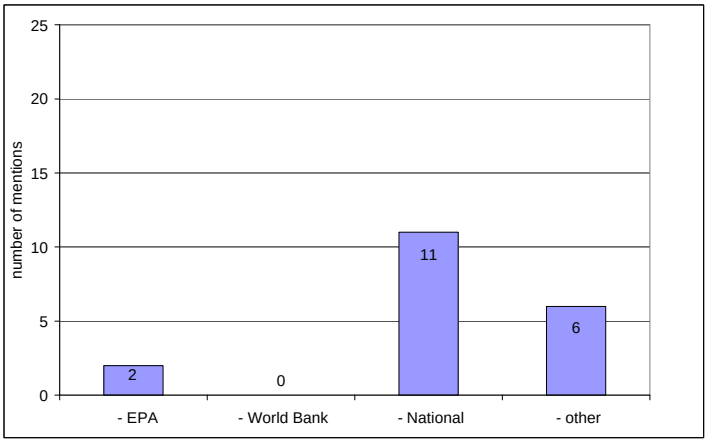
50% of the companies do not have a standardised investigation strategy. Investigations are carried out on a case-by-case basis and do not follow identical procedures. It is mainly among new EU member states that companies have not yet set up standardised investigation strategies.

If so, who initiated this strategy?



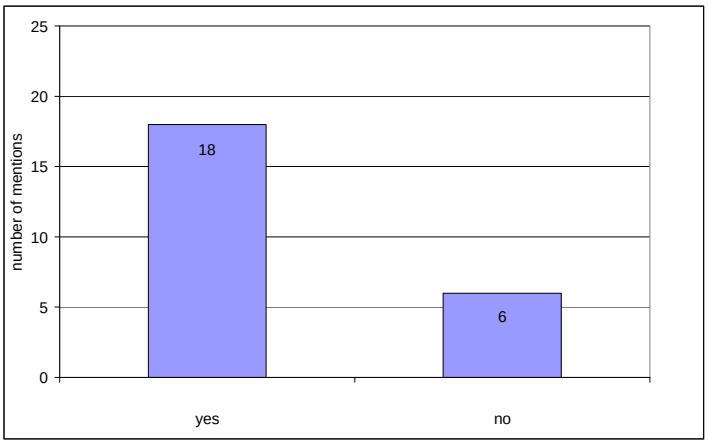
The companies that have a standardised investigation strategy have developed it themselves, implying that companies deal with investigations and use their experience to develop strategies.

What standards is your strategy based on?



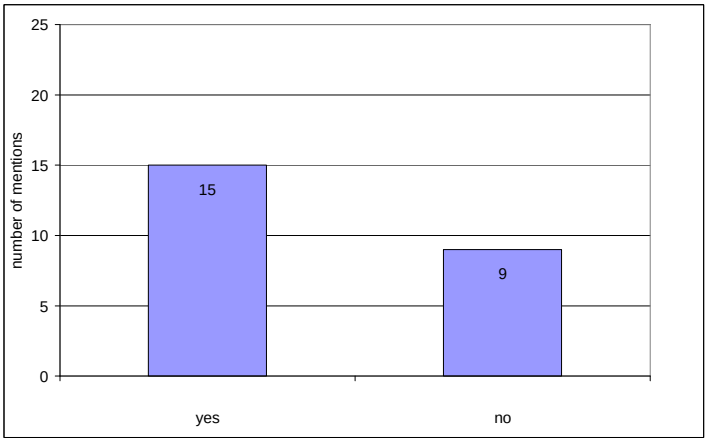
Most strategies follow national standards, while other parties (maybe consultants) often support the development of strategies. Only one company stated that their strategy complied with EPA standards. National standards dominate the assessment strategies.

Question 5: Is there a special department in your company which deals with contaminations?



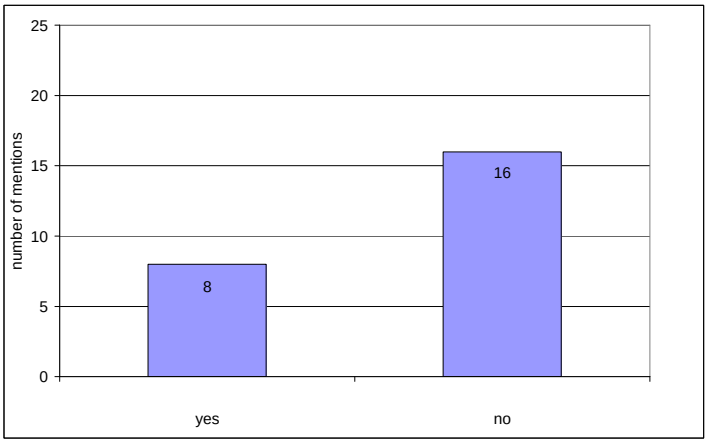
Approximately three quarters of the companies have set up a specific department for that purpose or have an environmental department which deals with contamination.

Question 6: Does your company maintain an internal archive (documentation) on the history of its property use?



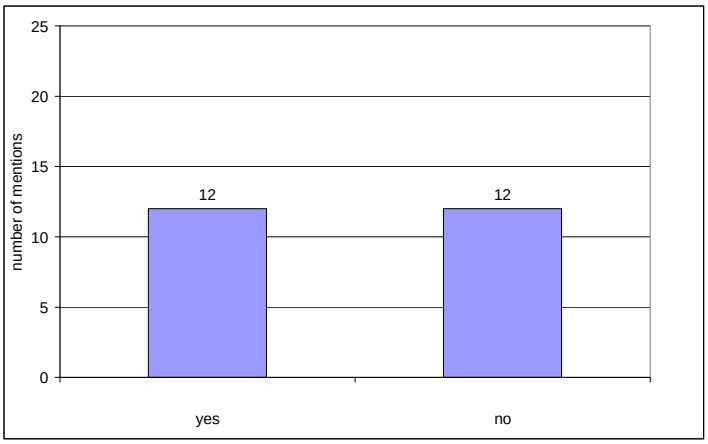
Only 60% of the companies claim to have a long-term internal archive containing historical data on property use. Without an archive, detecting property contamination through historical reviews is very time-consuming and difficult.

Question 7: Does your company have a fund or budget to cover additional contamination-related costs in future projects?



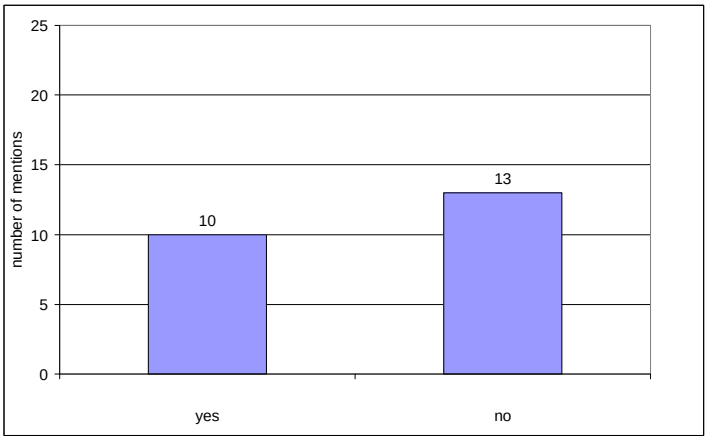
Although the previous questions reflected awareness of risks, only one third of the companies stated that they had a fund or budget to cover additional contamination-related costs arising in future projects. This is an indication that contamination risks are managed in the course of construction projects (project by project). Pollution-related costs are probably not indicated in companies' financial records.

Question 8: Does the risk assessment process include regular cost estimations for the future?



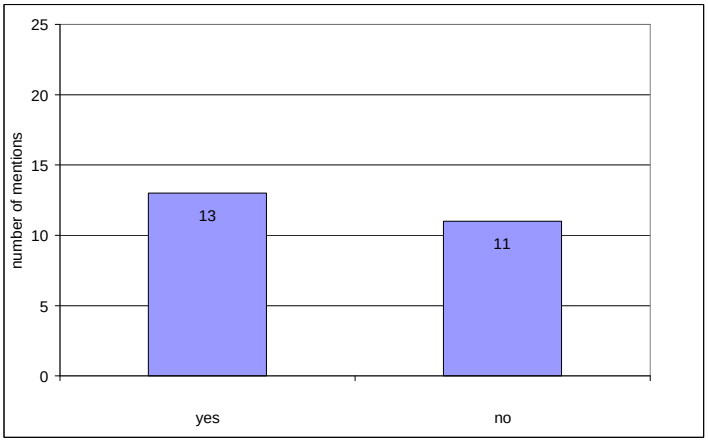
Only 50 % of the companies estimate costs regularly or include future assessment costs in their financial planning. This indicates that only rough estimates are used.

Question 9: Are these cost estimates updated periodically?



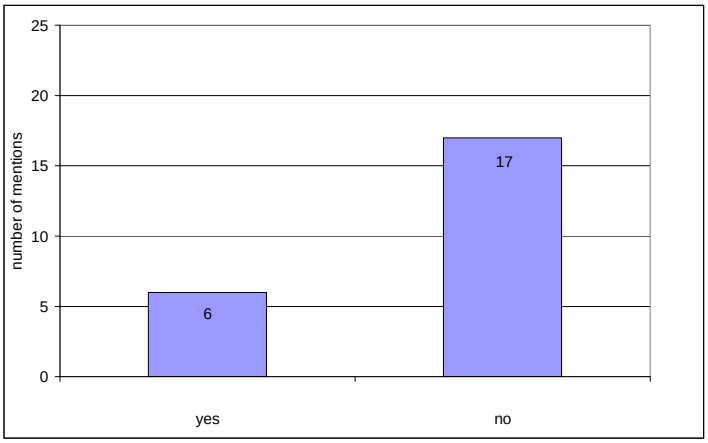
Most of the companies do not carry out a regular cost update.
Nevertheless, nine of the twelve companies that do estimate costs for future assessment measures update costs periodically.

Question 9: Is this financial data used in your company's financial planning?



The majority of companies use this data for financial planning.
However, questions 7 and 8 show that such data is not always available or precise.

Question 10: Does your company have a risk management system to assess the economic impact of contaminated sites?

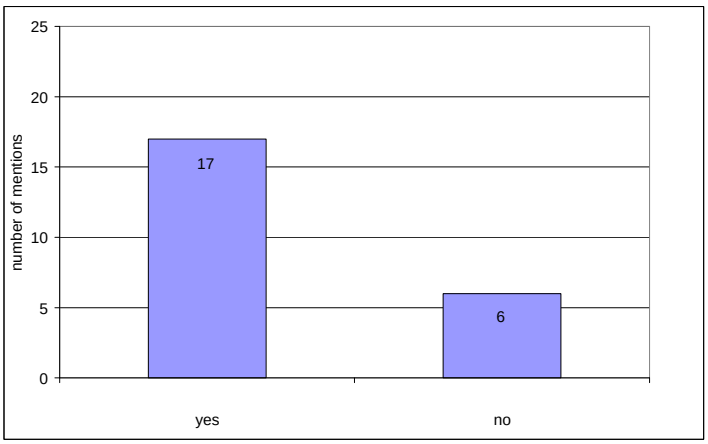


Approximately one quarter of the companies have a risk assessment system to ascertain the economic impact of contaminated sites. This shows that the financial risk represented by contaminated sites is underestimated, and risk management is in its early stages.

I. Assessment:

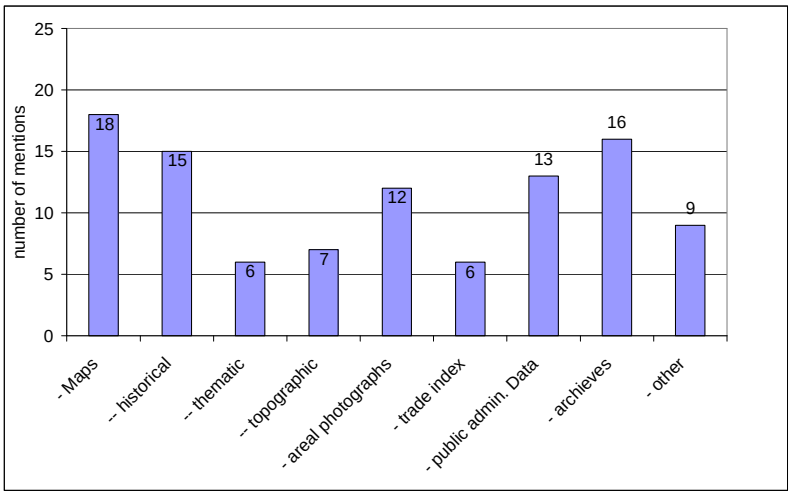
Question 1: Please provide a brief description of your approach to EPA Phase I assessment (please attach an example). For examples, see Appendix E.

Question 2: Is the historical land use of sites investigated and included in a documentary survey?



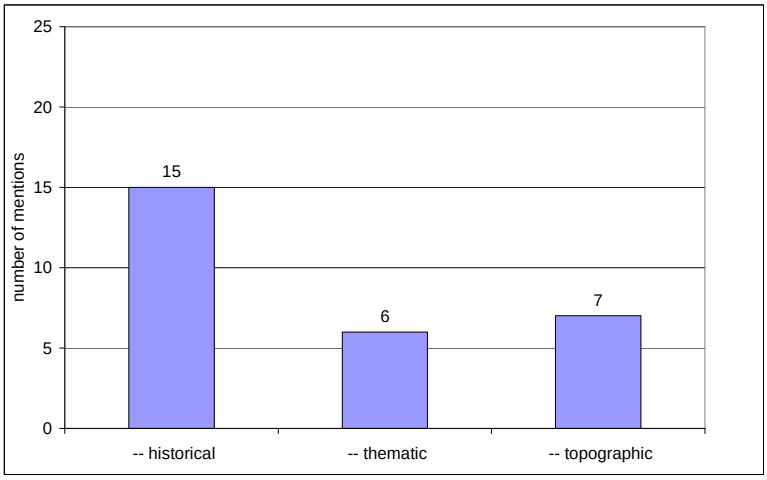
A quarter of the companies do not carry out data analysis and documentation but probably have data. Most of the companies stated that they provided financing for each EPA phase and documentation for further assessment measures.

Question 3: What sources of information are used for (Phase I) assessment and due diligence?



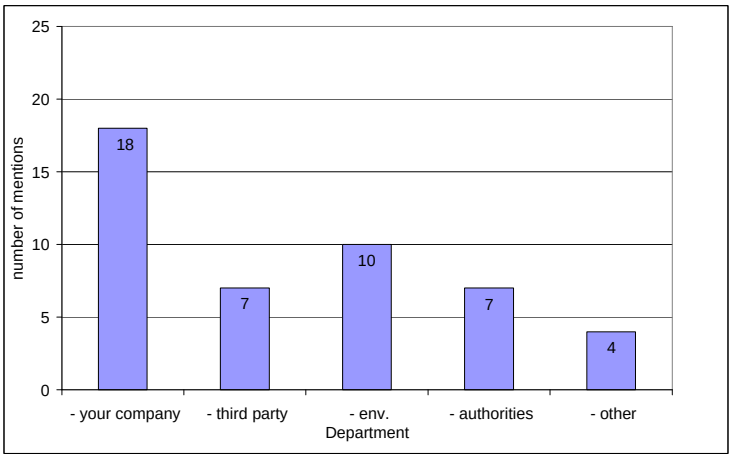
The main sources are maps (80%), followed by archives (65%) and public administration data (50%).

What kinds of maps are used?



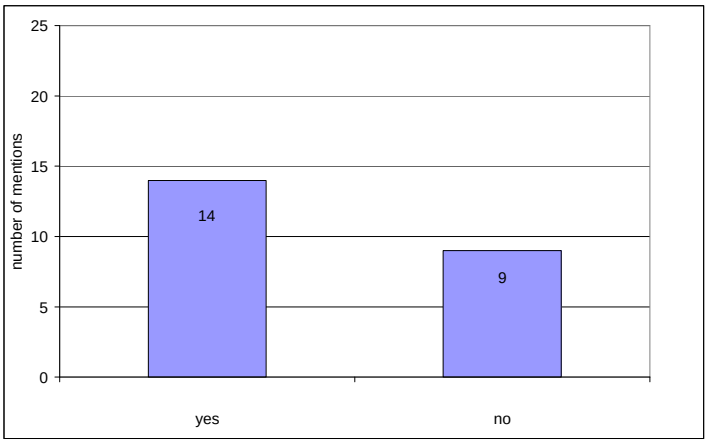
Companies generally use historical maps (80%), usually in combination with topographic and/or thematic maps.

Question 4: Who collects the data?



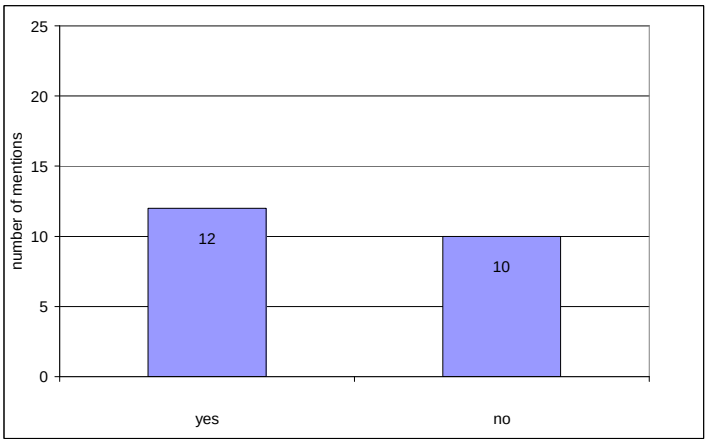
Data is mostly collected by the company itself, with the support of environmental departments, authorities and third parties.
This implies (extensive) internal knowledge of property conditions.

Question 5: Do your assessment activities make use of sampling documents (forms, manuals etc.)?



Approximately 60% of the companies have recommendations or documents on how assessment activities should be performed. Most of the companies seem to manage assessment and sampling more or less regularly.

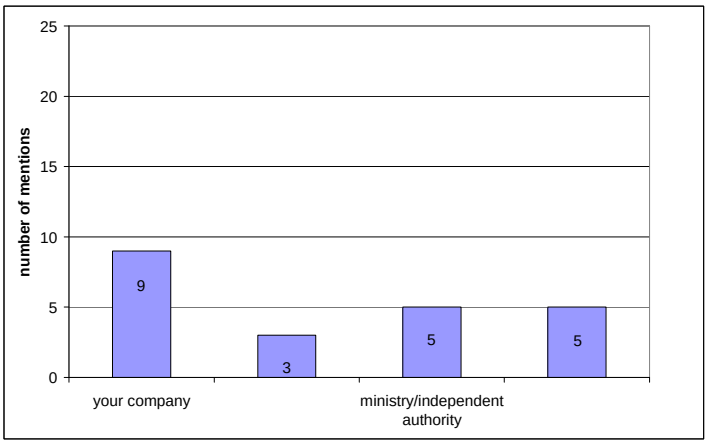
Question 6: Are there regular on-site property inspections focusing on contamination?



Half of the companies stated that they carried out regular on-site inspections of contamination.

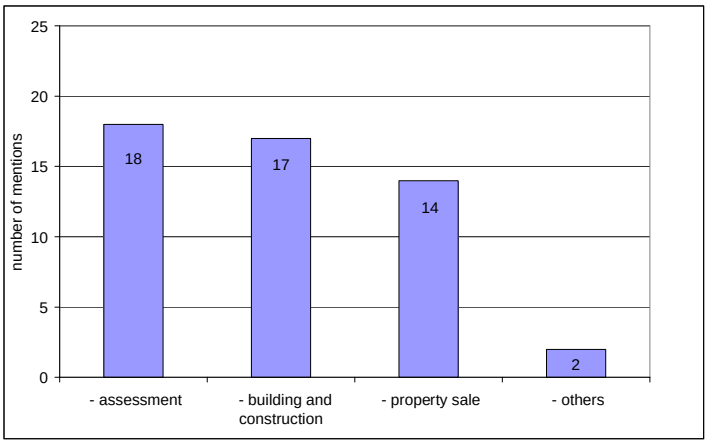
There is no information as to whether these inspections result in assessment measures, a clean-up, a change in business operations etc. The main objective is to avoid future contamination.

If so, who performs it?



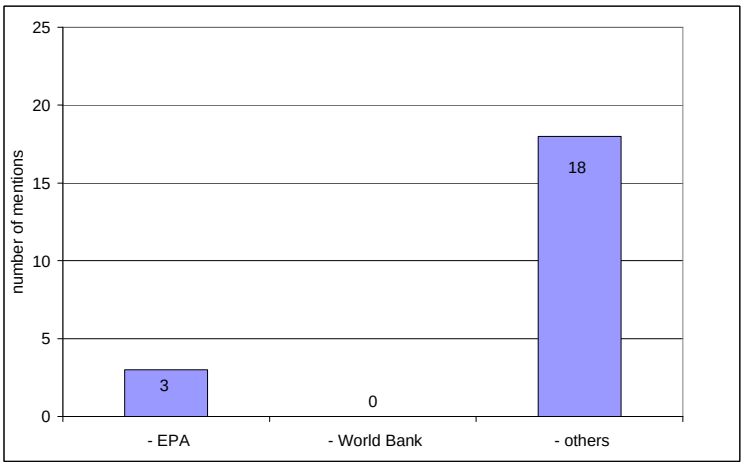
On-site property inspections are mostly performed by the companies themselves, followed by other parties and authorities, and the general conclusion is that checks are carried out but the departments or institutions performing them vary greatly.

Question 7: On-site sampling and analysis is carried out as part of:



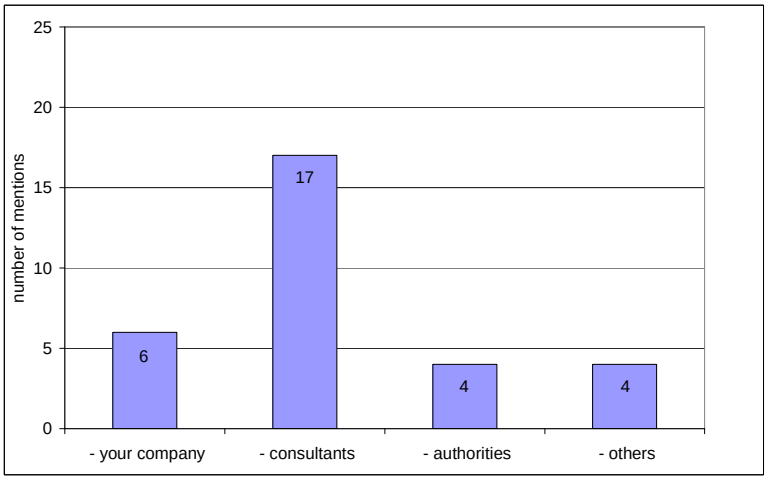
Sampling is carried out as part of assessment programmes as well as construction projects.

According to what standards?



Most standards used are national, local or even developed by consultants.

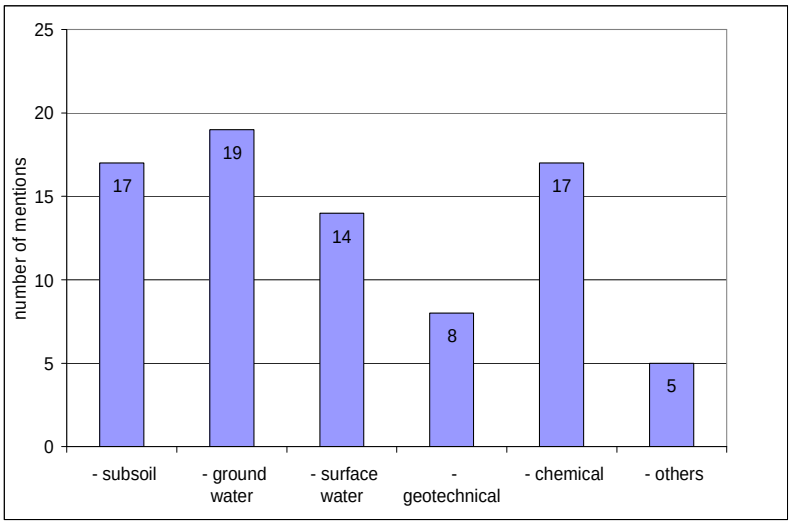
Question 8: Who carries out the on-site sampling?



None of the companies run internal sampling activities.

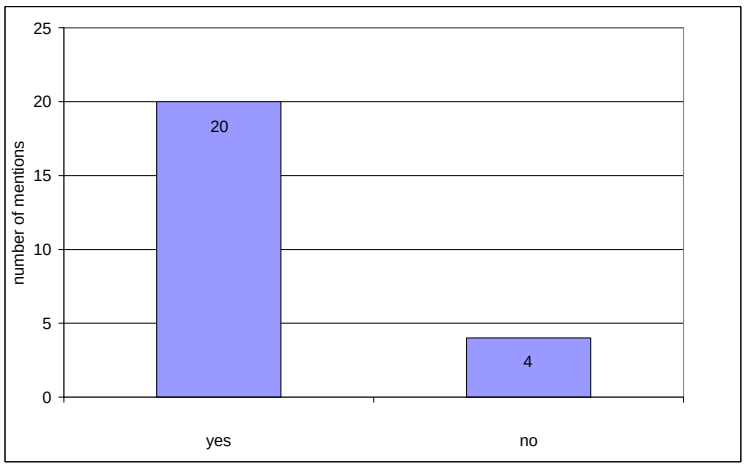
Approximately 75% of the companies commission consultants with on-site sampling.

Question 9: What data is sought?



All standard data is taken into account. However, it is striking that geotechnical data is only gathered when consultants carry out on-site sampling.

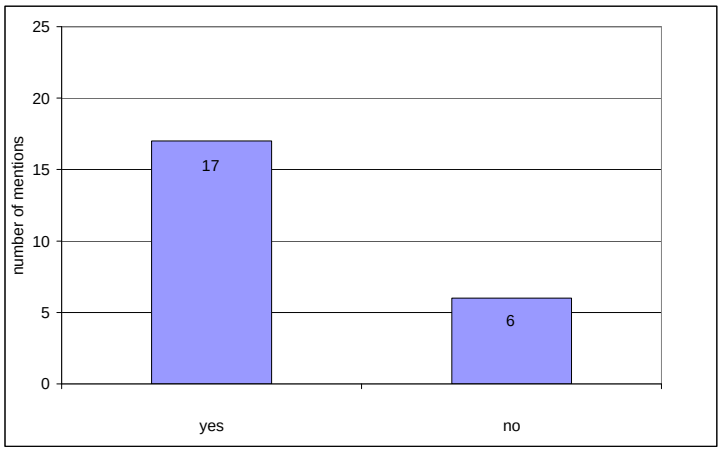
Question 10: Is the data used to set remediation targets?



Over 80% of the companies use the knowledge gained from the data to set remediation targets.

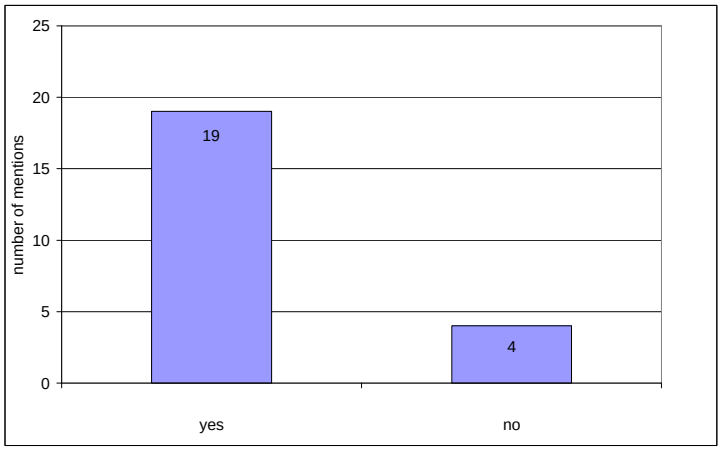
II. Planning

Question 1: Are feasibility studies performed for different clean-up scenarios?



Approximately 25% of the companies do not perform feasibility studies for different clean-up scenarios, indicating a potential to improve the efficiency and cost-effectiveness of the projects.

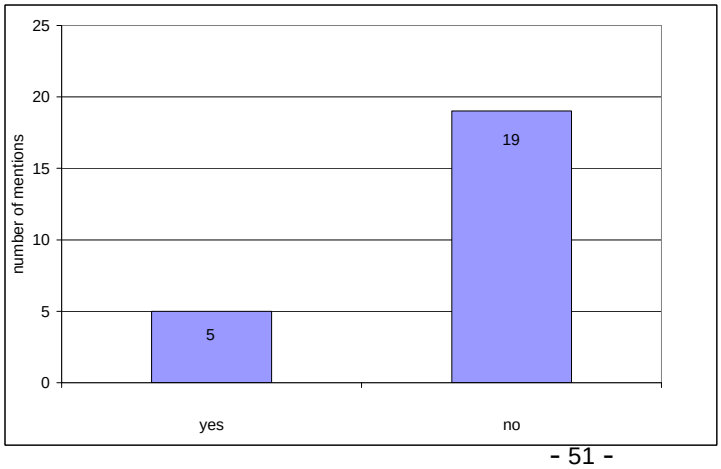
Question 2: Is remediation planning divided into different steps such as approval planning, implementation planning etc.?



More than 85% of the companies use a step-by-step model for remediation.

This implies that investments in remediation projects are dealt with very methodically.

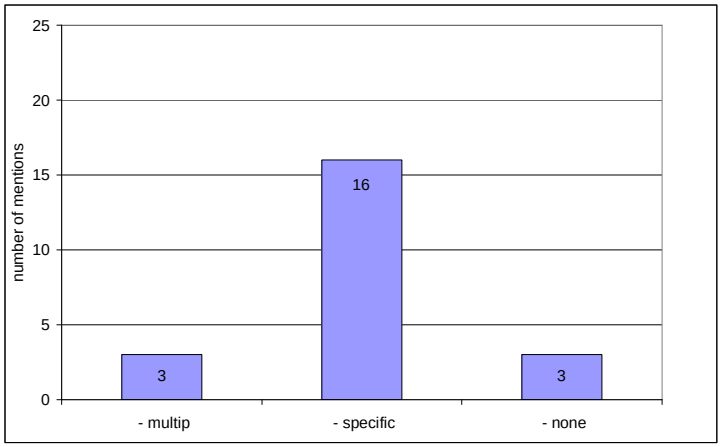
Question 3: Are there standard documents for remediation planning?



Approximately 80% of the companies do **not** have standard documents for remediation planning, implying that planning is done on a case-by-case basis, making systematic data management more difficult.

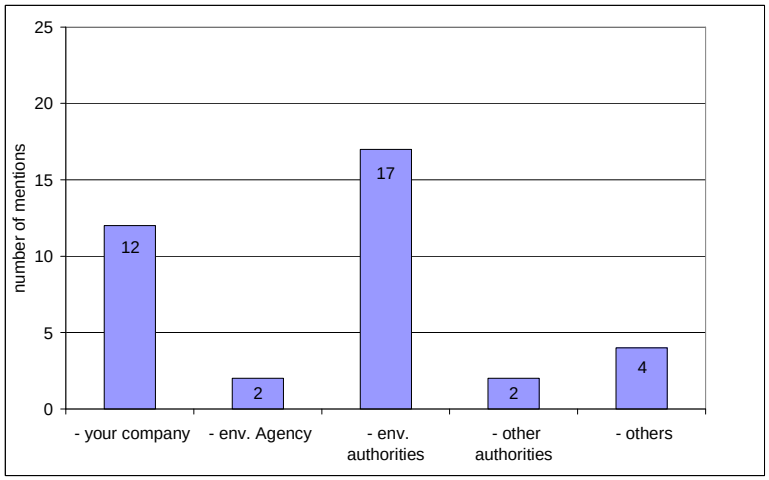
III. Clean-up

Question 1: Does the clean-up level in projects prepare the property for multipurpose or only specific use in the future?



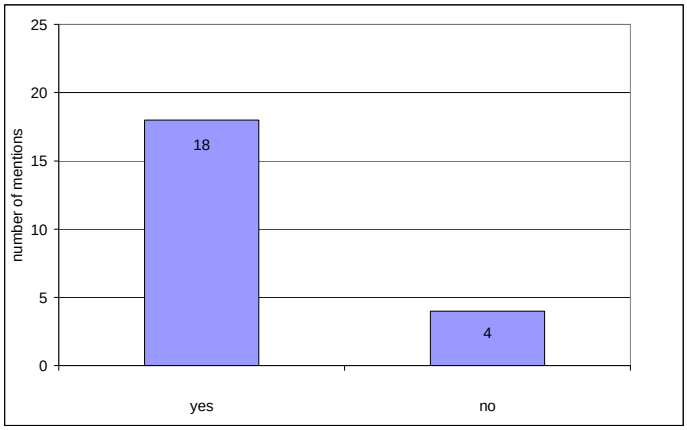
Two thirds of the companies clean up areas only to ensure suitability for a specific use, implying that future use and perspectives for the property are the main basis for remediation.

Question 2: Who sets clean-up targets?



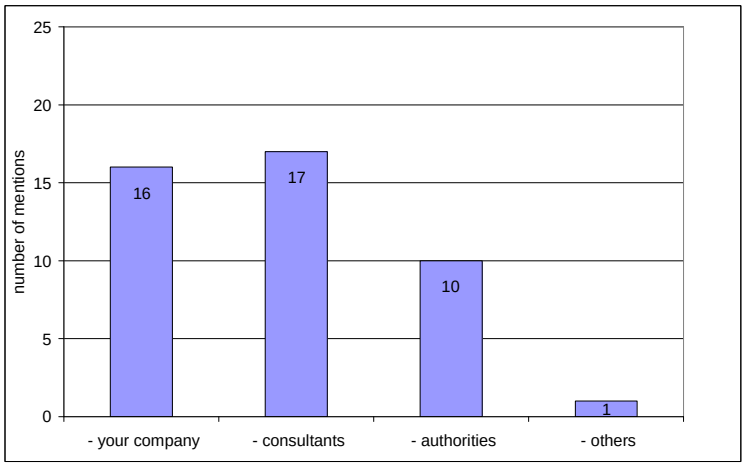
Environmental authorities are responsible for setting most of the clean-up targets, due to their public and legislative role. More than 50% of the railway companies assume corporate responsibility to set clean-up targets for their own property.

Question 3: Are there any clean-up targets set by legislation?



In approximately three quarters of the countries clean-up targets are stipulated in national law. This is somehow a limitation and leads to property owners setting their own remediation goals, putting into question the level of detail in national law.

Question 4: Who defines the remediation method?

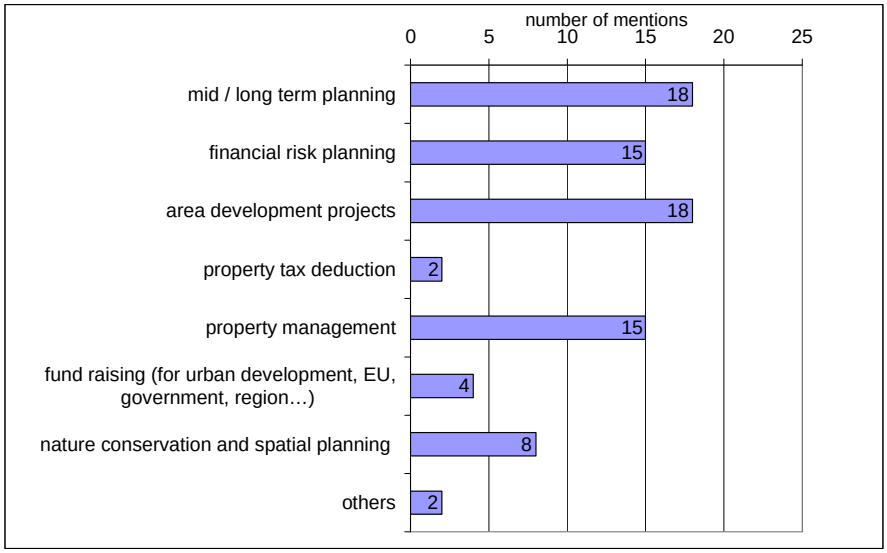


The actual method of remediation is mostly defined by companies in cooperation with consultants. No indication points to authorities carrying out such work.

d. Contamination management

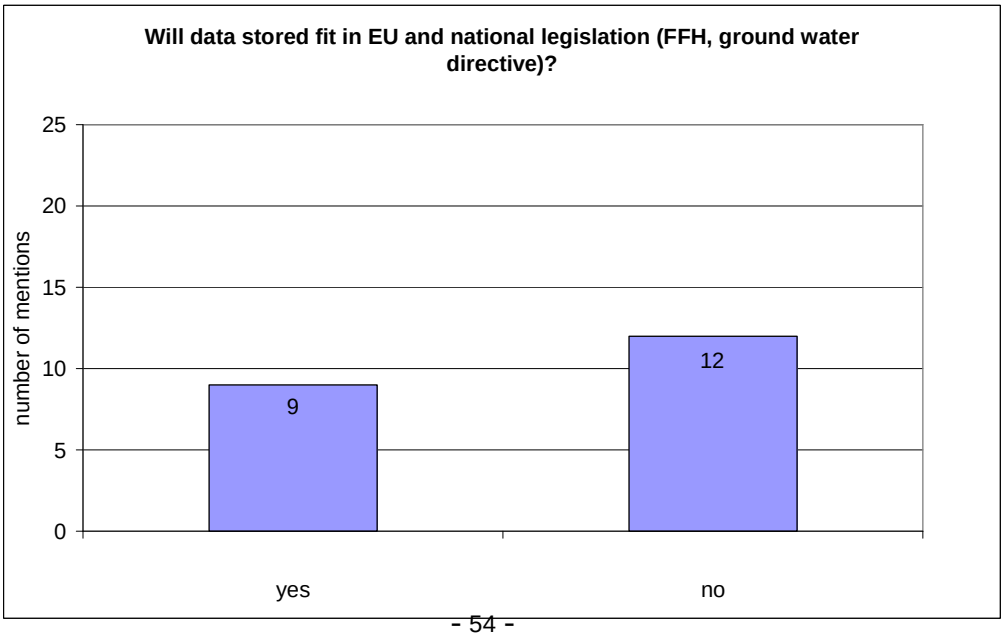
The final part dealt with general contamination management issues for railway companies.

Question 1: Is the data used for:



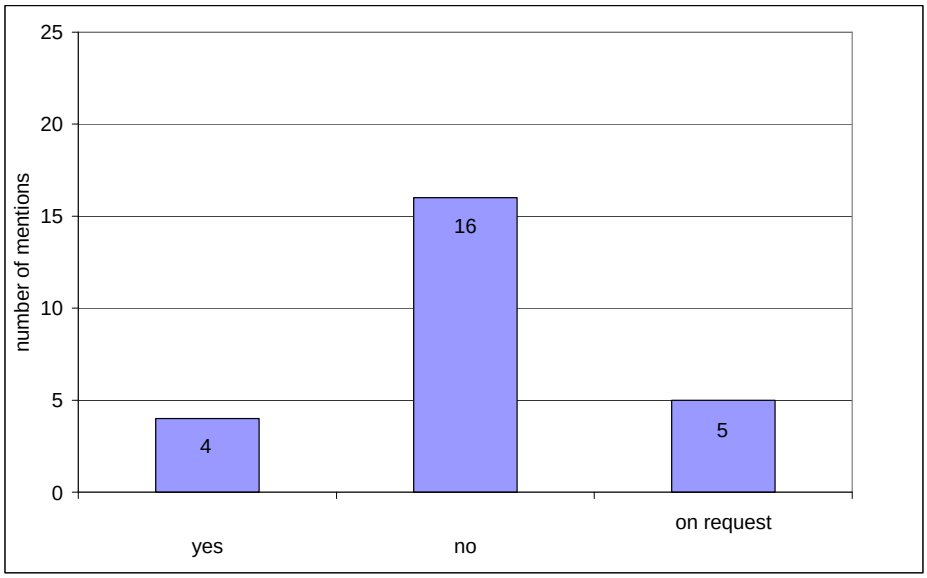
The data obtained is mostly used for mid or long-term planning, area development projects (80%) and property development. Financial risk planning (65%) is also mentioned. Some answers on the subject of cost estimation and risk management point towards a potential lack of quality in financial planning.

Question 2: Is the data you store in line with EU and national legislation (FFH, Ground Water Directive)?



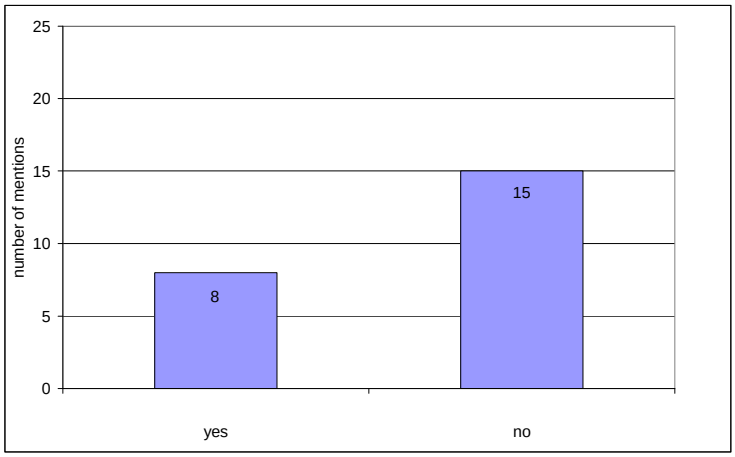
Only 40% of the companies store data that falls in line with EU and national legislation and regulations. The majority of companies would be facing a big challenge to meet all the requirements in the EU accession process and develop environmental authority structures and the necessary data exchange.

Question 3: Does your company make all this data available online?



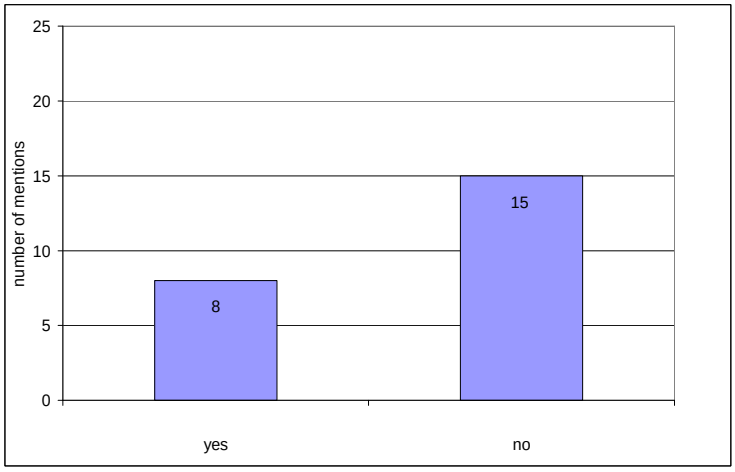
Over two thirds of companies answered that they did not provide data online. This could be a source of problems in future projects by making it more difficult to share data, experience and knowledge. The problem of confidentiality still exists for sensitive data.

Question 4: Is there long-term environmental data management (an archive)?



Sustainable long-term archives of environmental data can prove useful and cost-saving in developing assessment and sale methods. A lack of availability of long-term and historical data appears to lead to unsatisfactory data management in most of the companies, which in turn causes additional financial risks.

Question 5: Is there a standardised structure for electronic / hard copy data?



Data availability and compatibility relies directly on standardised structures in databases or archives. Most of the companies (65%) lack such standardisation and face additional challenges in structuring and reorganising data.

Question 6: How is a typical property data sheet structured in your company? See Appendix E: sample documents.

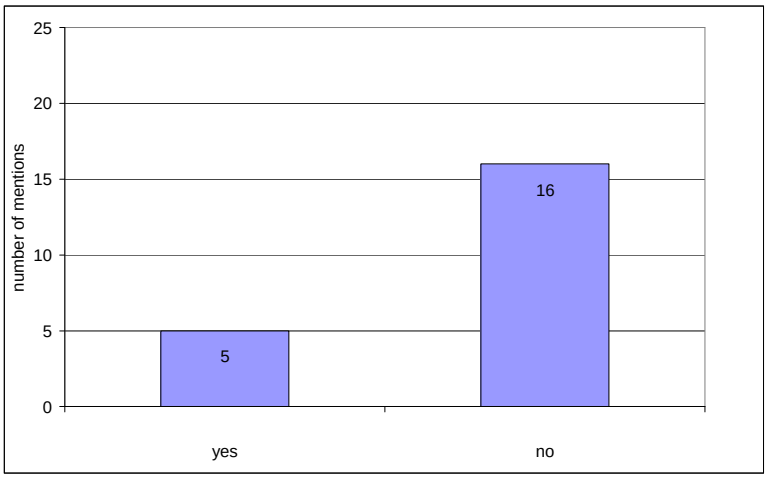
Question 7: What data is stored in your system / archive?

Table 2: Stored data

- name of area suspected of being hazardous	15	- detailed sampling location	8
- area size	14	- type of sampling	7
- possible hazardous use in the past	9	- substances analysed	9
- type of sampling (drilling, exhaust air etc.)	9	- measured concentrations of analysed subst.	11
- sampling diameter	8	- background concentrations of surrounding area	4
- sampling depth	8	- ground water level	10
- name of sampling location?	8	- depth to water table	6
- satisfactory completion of gauging / observation	6	- estimated remediation cost	11
- geology, geological profile	8	- accumulated expenses	7
- type of soil	9	- owner	10
- sampling date	10	- is any additional data stored	5

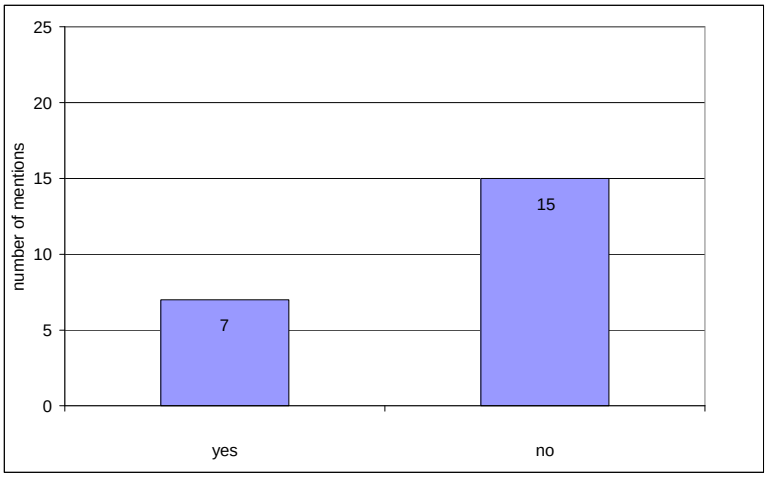
The type of data stored varies greatly, although the companies recognise the value of storing data. Stored data forms a basis of expertise for further assessment, remediation or development measures. Systematic data storage requires a clear definition of data sets. This task must be carried out in the future in accordance with national directives and legislation.

Question 8: Is there a regular procedure for selling or buying contaminated property in your company?



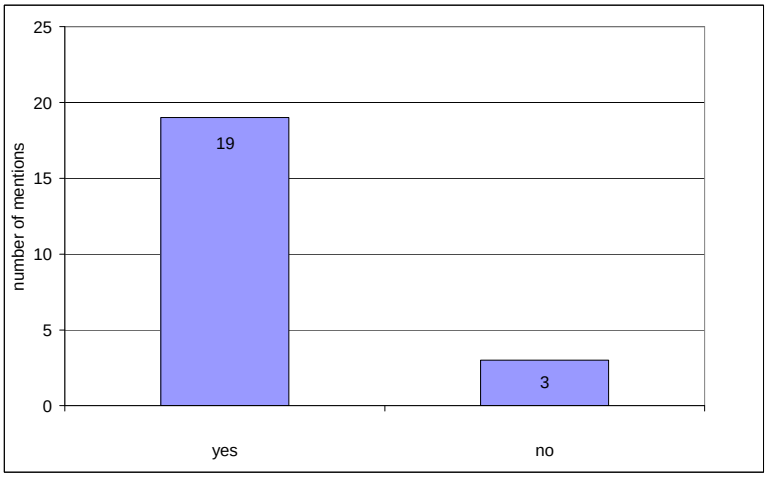
Approximately two thirds of the companies have **no** regular procedure for selling or buying contaminated property, pointing to a lack of awareness of financial risks and damage liability.

Question 9: Is there a quality management system in your company to support your contamination risk assessment?



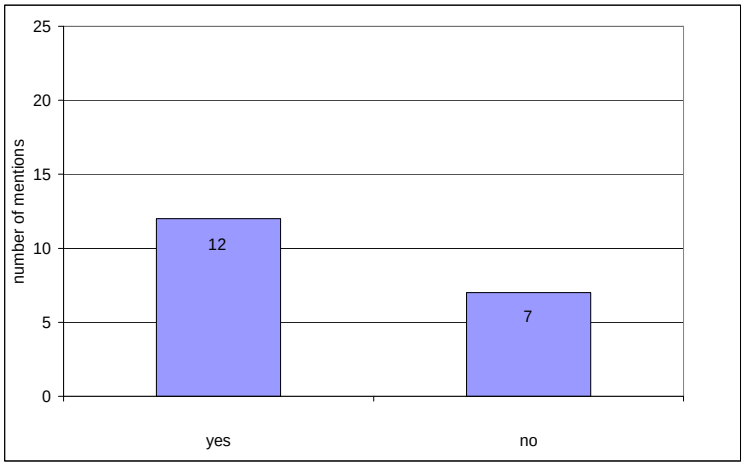
Only 30% of the companies have a quality management system to support contamination risk assessment. The importance and benefits of such a tool are not recognised by most companies.

Question 10: Are there third party polluters on your properties?



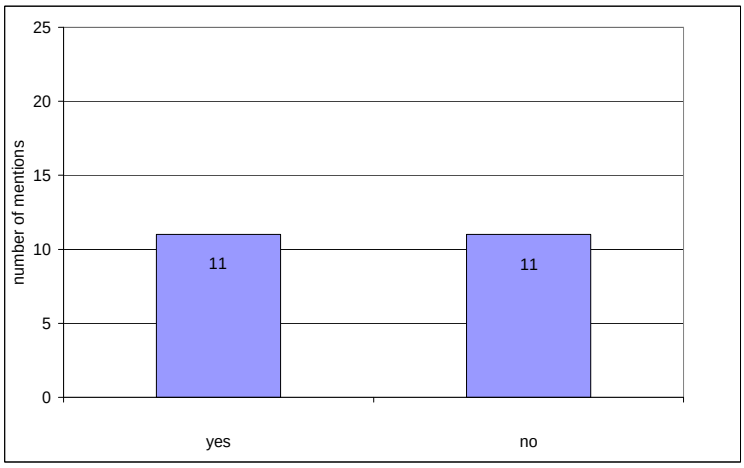
Approximately 80% of the companies stated that pollution on their property was caused by third parties. In consideration of the number of polluters, the lack of quality management represents a sizeable financial risk.

If so, do you usually charge them for environmental damage?



One third of the companies involved with third party polluters on their property routinely charge them for environmental damage. However, some of the earlier questions suggest a lack of clarity as to how they are charged and how pollution and financial consequences are determined.

Question 11: Does your company regularly carry out development work on contaminated properties?



Less than half of the companies carry out development work on contaminated property. This suggests that the benefits and value of prime locations is not recognised, and the opportunity to generate additional company income is not seized.

4.2.3 SUMMARY

This section presents the basic conclusions drawn from *Questionnaire 2*. (For further details see the assessment and Appendix H).

- Registering contaminated sites is a legal obligation in most countries
- Public registering is carried out in most countries (and includes or is set to include railway property)

- Railway companies are responsible for registering their own property in most countries
- Risk assessment is not always part of railway companies' financial strategies
- Financial resources available for assessment are insufficient (or inexistent)
- Most companies do not have a risk management system for contaminated sites
- Most companies are not prepared for the upcoming European Soil Directive

- Only a few contamination management programmes exist
- In most cases, future contamination costs are not budgeted or planned for

- There is a lack of awareness of increasing demand for and value of railway properties
- Potential sources of funding (community cooperation) are insufficiently known and used
- Three quarters of the companies do not have a quality management system for contamination data
- Existing data is often incompatible with public or other databases
- Many companies do not have a regular procedure for selling or buying contaminated property
- All companies have third party polluters on their property

4.2.4 CONSEQUENCES

The feedback from the two questionnaires reveals some shortcomings and reflects the differences in terms of assessment strategies and programmes within the railway community. It is impossible to compare or benchmark different systems due to differences between countries in terms of legislation, administration, social and economic structure, railway company size and organisation, and the market.

Nevertheless, in a growing and increasingly integrated European market the railway community must intensify its efforts to resolve or at least reduce the aforementioned shortcomings by organising programmes and sharing expertise and technical assistance where appropriate.
The next step will be the UIC “pollu-guider” project, due to be launched in 2011.

”Pollu-guider” can be considered a series of documents to be used in the future, including due diligence processes, waste handling, any sustainable activities on properties related to contamination etc. It will provide examples of best practices to resolve most of the above mentioned shortcomings, with a step-by-step approach and a focus on current developments in the European environment market and railway sector demands.

4.3 ON-SITE AND TELEPHONE INTERVIEWS

After analysing the answers to *Questionnaire 2*, on-site and telephone interviews were conducted with selected railway companies. Some questionnaires showed discrepancies in the answers and/or unanswered questions. Because of project deadlines and unexpected interference by the volcano Eyjafjallajökull, only four additional on-site and phone interviews could be conducted for this project.

4.3.1 PURPOSE OF THE INTERVIEWS

The idea behind the interviews was to gain a better understanding of the processes companies were applying to deal with contaminated property. Interviews enabled correlations to be better explained, as well as clarifying misunderstandings due to linguistic problems and unclear queries in *Questionnaire 2*. Particularly sensitive areas could be identified in companies and more in-depth answers could be obtained. Interviewees had the opportunity

to ask further questions and get to the bottom of other queries. The proposals submitted by interviewees were therefore a satisfactory and balanced basis for discussion. To ensure consistency an interview guide was developed (see Appendix F)

4.3.2 ASSESSMENT

Interviews were conducted with:

- Willy Bontinck, NMBS/SNCB Holding, Belgium
- Vincent Auriat, SNCF, France
- Aurora Smarandescu, CN CF "CFR" SA, Romania
- Jan Fokkens, Dutch Rail, the Netherlands

Railway companies usually address the issue of contaminated soil / property within a division of their technical department. In the Netherlands a foundation (SBNS, founded by the Ministry for the Environment, infrastructure manger ProRail and NS (Dutch rail)) deals with contaminated railway properties.

In the questionnaire the western European railway companies stated that the environment was a very important issue to them (sustainable development, competition, reputation); in the eastern part of Europe railway companies face lower awareness of environmental issues (negative public attitude). All the companies mentioned the importance of environmental departments in real estate operations and management.

All the interviewees stated that these business sectors needed the support of the environmental departments in the field of due diligence, sales and site investigation negotiations with public environmental authorities. In all countries there is an (increasing) need to use or reuse property, especially in densely populated areas and large cities.

Most of the countries have a special regional or federal environmental authority which deals with contaminations; there is no specific department for railway contaminations. Authority structures in old European member states are clear in the field of environmental activities. However, the quality of the work depends on political and administrative conditions as well as the motivation and skills of the staff.

In the new European member states the EU accession programme is leading a capacity-building process for the public environmental authorities. Railway companies must deal with new regulations and organisations as well as changing legislation and administration. Due to

this development process, existing manuals, procedures and guidelines for property assessment are being revised to suit the new market situation. This represents an opportunity to improve expertise sharing and knowledge transfer within the UIC community. UIC can organise workshops, produce manuals, send out information papers and e-mails, and organise a polluted soil network and environmental platform.

In the questionnaire most of the companies claimed to be at least acceptably informed about technical and legislative changes and challenges in the field of the environment due to EU membership and new directives and regulations. SNCF maintains an internal weekly information database service containing legislative news (also EU).

5. CONCLUSIONS AND OUTLOOK

- **FINANCIAL BALANCE**

As mentioned before, contaminated sites may have adverse financial effects. Risk assessment is an important instrument to determine the quantitative and/or qualitative value of risks related to polluted property. Risk assessment and valuation of polluted property are part of the financial strategy of less than half of the companies. Although 65% have registered their polluted soil property this data is not used for financial purposes.

➔ **There is still no regular risk assessment process, thus no reliable calculation of project costs.**

Few companies establish funds or draw up budgets to cover additional contamination-related costs in future projects. Although 50% of the companies estimate these costs in planning future assessment measures, few have a risk management system to assess the economic impact of contaminated sites.

➔ **Most of the companies in the new member states need to make a significant amount of progress to raise awareness of the financial effects of contaminated sites.**

- **QUALITY AND COMPATIBILITY OF INVESTIGATION PROGRAMMES**

Most of the companies run a systematic programme to register properties with polluted soil. Most also follow a systematic assessment process. However, few companies sent sample documents presenting their approach for EPA Phase I assessment. Moreover, most of the companies stated that contaminations were registered following cases of environmental damage.

➔ **Risk assessment is largely carried out as a result of accidents or on a case-by-case basis. Systematic investigation processes are rare.**

Companies generally use maps and archives to collect information. This work is carried out by the company itself. On-site sampling and analysis is performed in accordance with standards developed by other parties. An interesting fact is that only two companies use EPA standards.

As mentioned above, some companies estimate their future assessment costs, but without reliable cost planning, systematic investigation or property management is impossible.

➔ **Programmes vary greatly and are difficult to compare among one another because every company uses different standards developed by third parties.**

♦ **REMEDIATION PLANNING**

Most of the companies carry out feasibility studies for different clean-up scenarios. But two thirds of the companies do not have standard documents for remediation planning, raising the question about standardised procedures.

➔ **Remediation is planned on a case-by-case basis, is unlikely to be part of a general strategy and is therefore detrimental to the financial balance.**

♦ **REAL ESTATE MANAGEMENT**

Every railway company has been trading in property for years. It is therefore surprising that only 60% have long-term internal archives on property use. The use of a property over time determines its price, and any unknown previous use may have serious financial consequences and cause the property's price to drop (see 2.2.2). Current use may also lead to a price drop, yet only half of the companies carry out regular on-site inspections focusing on contamination. Moreover, only a quarter of the companies have a regular procedure for selling and buying contaminated property.

➔ **Many companies are unaware of the financial risks caused by poor contaminated property management – property may have to be sold at a loss and the opportunity to charge third party polluters may be missed.**

- **FUND RAISING**

  ➔ **Fund raising (for urban development, EU, government, region etc.) is not used.**

- **DATA PROCESSING AND STORAGE**

  Contamination registers exist but each company has its own views on what data should be obtained. Not a single data feature is shared among all the systems / databases operated by UIC railway companies.

  ➔ **The absence of harmonisation and structure in databases creates additional costs for companies in data processing and provision, and meeting European standards a difficult task.**

  In addition, many companies find it difficult to make data available, especially online, and few have functional databases.

  ➔ **There is a risk of data not being suitable for future use.**

- **COMPARISON BETWEEN UIC RAILWAY COMPANIES: NEW EU MEMBER STATES / OLD EU MEMBER STATES**

  One of the differences in how railway companies in old and new EU member states manage data is that in the latter the data is in hard copy. As part of the European accession process and new requirements for reporting and documentation, it will be necessary to digitalise and harmonise data. This will represent a huge challenge for the future (example of GIS database, SNCB, see Appendix J).

- **FUTURE EU DIRECTIVES**

  40% stated that their data was stored in line with EU and national legislation. However, only 20% of the companies structure their data in accordance with EU directives.

  ➔ **Most of the companies are not ready to meet EU data management requirements.**

Financial resources

Railway companies reported insufficient (or inexistent) financial resources for systematic assessment. Development on contaminated property requires preliminary investment (even for assessment), an aspect which is very often overlooked.

➔ **Insufficient financial resources are made available for assessment**

Increasing demand and value of railway properties

The demand for property development in densely populated areas in Europe will increase. Moreover, the European Union will limit land use in general in all member states. This in turn will lead to increased development on brownfield sites.
The railway community will have the chance to market its property at higher prices or develop it for its own purposes and generate higher income, but only if proper and systematic risk assessment is carried out in due time. Investments required for development work will rise due to an increasing number of environmental directives and restrictions with an impact on financial aspects and the time available.

➔ **The railway community has a great deal of experience; it needs to create a platform to share this experience and develop a UIC European railway strategy for contamination management.**

General information on environmental activities

Within the project, railway companies were asked to provide sample documents, manuals and handbooks. The feedback was impressive in quantity and variety:

- *Manuals, handbooks*

Many companies use handbooks, which often have a similar structure based on systematic assessment starting with historical reviews and followed by sampling, feasibility studies and remediation.

- *Reports, expertises*

There are many examples of reports and studies on environmental issues such as due diligence or risk assessments in various fields. These document numerous environmental activities in the railway community. Some of the activities fit in very well with polluted soil assessment schemes. For examples (not translated) see Appendix H.
For more detailed information please contact the specific railway companies (see e-mail addresses, Appendix D.)

For full details of this report, including all background information, responses and analysis, please contact: Lisette.Mortensen@uic.org.

As mentioned, many new environmental European and national regulations will influence railway business in the future. Today we have the opportunity to turn these regulations and directives into positive factors for our sector. To make the most of this opportunity and avoid being overwhelmed by such changes and their potentially negative effects in terms of time and expenditure required for projects, the railway community needs to play an active role in legislative, technical and political processes. The UIC network and cooperation between all railway companies will be necessary.

The “polluted soil assessment scheme” project brought to light certain shortcomings in the community which can be resolved quite swiftly, accelerating the European unification process and reducing its cost for railway companies.

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APPENDICES

LIST OF APPENDICES

APPENDIX A

CONTAMINATED SOIL ASSESSMENT SCHEME PROPOSAL

Contaminated sites are the result of incorrect handling of hazardous substances that may represent a risk to human health and the environment. Consequently they may restrict the potential use of property and constitute a significant financial burden. The information obtained shows that there are differences of opinion on contamination management among UIC members.

With the entry into force of the EU Soil Framework Directive, every member of the European Union will have to keep a register of contaminated sites. Furthermore, remediation plans and strategies will have to be developed to prevent further contamination, and the party selling contaminated property will have to inform authorities and the buyer of the degree of pollution. This project brought to light a lack of knowledge and awareness among UIC railway companies of handling, developing, buying and selling contaminated property and the associated data management, which must be performed in a structured way. The consequences for the company are an increase in the financial burden and greater expenditure in time and on administrative matters, particularly with regard to the upcoming EU Soil Framework Directive.

On the basis of examples of existing assessment schemes of EPA Phase I assessment received from Deutsche Bahn AG (Germany), the Finnish Transport Agency (Finland) and BANVERKET (Sweden) (see Appendix E), a proposal for a structured and suitable contamination assessment scheme was developed.

An accurate contaminated site management system has the following objectives:

- Record the source of pollutants that could endanger humans and the environment
- Describe the circumstances
- Ascertain whether the danger is real and must be mitigated
- If necessary, determine and implement suitable measures to prevent danger or limit risks

According to the EU Soil Framework Directive, all EU members must identify contaminated and threatened areas. This recommendation should be seen as a framework for contaminated soil assessment. However, each individual case is characterised by its own specific conditions.

1. BASIC INFORMATION ON THE TARGET AREA
Name
Location and size
Possible hazardous use in the past
Potential use in the future

2. LEGISLATION REGARDING CONTAMINATION
Obligation to investigate
Limits set by law
Clean-up targets

3. DESCRIPTION OF THE TARGET AREA
Location of the area under construction
Geographical profile
Geological profile
Hydrology

4. INVESTIGATION
Presentation and purpose of chosen methods
Sampling
- Date
- Location
- Depth
- Diameter

Documentation of analysed substances:
- Concentration
- Potential dangers

5. RISK ASSESSMENT
Results and conclusion of:
- Migration
- Health hazards
- Ecological risks

Estimated remediation costs for specific use

6. CONCLUSIONS
Classification of the area
Opportunities to develop the area (cost-benefit analyses)

Figure 1: Proposal for a structured and suitable contamination assessment scheme
Source: Developed by the authors, 2010

APPENDIX B

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APPENDIX C

INTERNET SOURCES

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APPENDIX E

RESPONSE TO QUESTIONNAIRE 1 AND QUESTIONNAIRE 2

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* *Questionnaire 1* was filled in together with *Questionnaire 2*

APPENDIX F

QUESTIONNAIRE 1

Questionnaire

Polluted soil assessment scheme

		yes	no
a)	**Legal aspects**:		
	Are contaminated areas systematically registered nationwide?	☐	☐
	Is there a legal obligation for registering?	☐	☐
	Is assessment and sampling carried out on the basis of national lists concerning the use of environmentally-sensitive property?	☐	☐
	Is contamination registered in the context of:		
	- Construction work	☐	☐
	- Environmental damage	☐	☐
	- An assessment programme	☐	☐
b)	**Responsibilities**		
	Who is responsible for risk assessment in your country?	☐	☐
	- The government (public)	☐	☐
	- Property owners	☐	☐
	- Polluters	☐	☐
c)	**Railroad company strategy**		
	- Are there any environmental / sustainability targets concerning contaminated soil in your company?	☐	☐
	- Is there a systematic programme for registering properties with polluted soil in your company?	☐	☐
	- Is this done for financial and privatisation-related purposes?	☐	☐
	- Is risk assessment and valuation of polluted property part of your company's financial strategy?	☐	☐

d)	**Contamination management**	yes	no
	- Does your company follow a systematic assessment process?	☐	☐
	- Does your company have a contamination register?	☐	☐
	- Is the data available in digital format?	☐	☐
	- Is the data confidential and available on request?	☐	☐
	- Is the data available online (public access)?	☐	☐
	- Is the data structured in accordance with EU directives?	☐	☐
	- Does your company have additional databases (buildings, operations)?	☐	☐
	- Are your data sets compatible with public databases and other company databases?	☐	☐
	- Have you identified a need for a company-wide contamination register?	☐	☐

If so, why? (Please explain)

Company: …… Department: ……

Date: …… Name: ……

Phone no: …… E-mail: ……

Signature:……..

APPENDIX G

QUESTIONNAIRE 2

Second questionnaire UIC project "Polluted Soil Assessment Scheme"

Dear Mr / Ms …….

The first questionnaire was sent to you in summer 2009. You will find your answers already marked (grey background). We would like you to answer the new questionnaire in the same manner, in order to obtain better and more detailed information on existing data and assessment schemes within the UIC railway community. If your company did not send us feedback for the first questionnaire, no questions have been marked and we would like you to answer **all** the questions.

Some questions refer to the systematic US EPA approach (Phase I – II, see below).

EPA Phases:

Phase I: Site assessment and due diligence

Site assessment and due diligence provide initial information regarding the feasibility of a brownfield redevelopment project. A site assessment examines the health-related and environmental risks of a site and the due diligence process examines the legal and financial risks. These two assessments help the planner develop a conceptual framework of the site, which will form the basis of the next steps in the redevelopment process.

Phase II: Site investigation

The purpose of a Phase II, site investigation, is to give planners and decision-makers objective and credible data on the nature of contamination in a brownfield site to help them develop an appropriate contaminant management strategy. A site investigation is typically conducted by an environmental professional. This process assesses the following types of data:

Types of contamination present; clean-up and land reuse objectives; length of time required to meet clean-up objectives; post-treatment care required; costs.

Contaminant Management:

Assess remedial alternatives – if the site investigation shows that there is an unacceptable level of contamination, the problem must be resolved.

Develop a Remedy Implementation Plan. The plan is developed by a professional environmental engineer and describes the approach to adopt in order to contain and clean up contamination.

Remedy implementation

If possible and where appropriate, we would be grateful if you could attach some example papers or documents as requested in some of the questions (in your own language if it is not possible in English).

Thank you very much for your time and diligence in answering these questions.

Second Questionnaire

Polluted soil assessment scheme

		yes	no
a)	**Legal aspects**:		
	Are contaminated areas systematically registered nationwide?	☐	☐
	Is there a legal obligation for registering?	☐	☐
	Is assessment and sampling carried out on the basis of national lists concerning the use of environmentally-sensitive property?	☐	☐
	Is contamination registered in the context of:		
	- Construction work	☐	☐
	- Environmental damage	☐	☐
	- An assessment programme	☐	☐
	Is there a legal requirement as to which party provides financing for each EPA phase?	☐	☐
	If so, is it:		
	☐ Your company		
	☐ Authorities		
	☐ Other:		
b)	**Responsibilities**		
	Who is responsible for risk assessment in your country?	☐	☐
	- The government (public)	☐	☐
	- Property owners	☐	☐
	- Polluters	☐	☐
c)	**Railway company strategy**		
	Are there any environmental / sustainability targets regarding contaminated soil in your company?	☐	☐

	yes	no
Is there a systematic programme for registering properties with polluted soil in your company?	☐	☐
Is this done for financial and privatisation-related purposes?	☐	☐
Is risk assessment and valuation of polluted property part of your company's financial strategy?	☐	☐

Is there a systematic contamination management programme which follows EPA phases? ☐ ☐

Does your company have a standardised investigation strategy for all properties? ☐ ☐

If so, who initiated this strategy:

☐ Your company

☐ Third party

What standards is your strategy based on?

☐ EPA ☐ World Bank

☐ National ☐ Other

- What criteria were applied to classify the areas for assessment (stations, rail yards, number of tracks etc.)?

Please explain:

Is there a special department in your company which deals with contaminations? ☐ ☐

	yes	no
Does your company maintain an internal archive (documentation) on the history of its property use?	☐	☐
Does your company have a fund or budget to cover additional contamination-related costs in future projects?	☐	☐
Does the risk assessment process include regular cost estimations for the future?	☐	☐
Are these cost estimates updated periodically?	☐	☐
Is this financial data used in your company's financial planning?	☐	☐

I. Assessment

Please provide a brief description of your approach to EPA Phase I assessment (please attach an example):

Is the historical land use of sites investigated and included in a documentary survey?	☐	☐

What sources of information are used for (Phase I) assessment and due diligence?

- ☐ Maps - ☐ Historical ☐ Thematic ☐ Topographic
- ☐ Aerial photographs
- ☐ Trade index
- ☐ Public admin. data
- ☐ Archives
- ☐ Other, please explain:

Who collects the data?

- ☐ Your company ☐ Third party
- ☐ Environmental dept. ☐ Authorities

☐ Other, please explain:

	yes	no
Do your assessment activities make use of sampling documents (forms, manuals etc.)?	☐	☐
If so, please attach example copies (in your own language if they are not available in English)		
Are there regular on-site property inspections focusing on contamination?	☐	☐

If so, who performs them?

☐ Your company

☐ Environmental dept.

☐ Ministry / independent authority

☐ Other, please explain:

On-site sampling and analysis are carried out as part of:

☐ Assessment

☐ Construction work

☐ Property sale

☐ Other

According to what standards?

☐ EPA ☐ World Bank ☐ other, please explain:

Who carries out the on-site sampling?

☐ Your company

☐ Consultants

☐ Authorities

☐ Other, please explain:

What data is sought?

☐ Subsoil

☐ Ground water

☐ Surface water

☐ Geotechnical

☐ Chemical

☐ Other, please explain:

	yes	no
Is the data used to set remediation targets?	☐	☐

II. Planning

Are feasibility studies performed for different clean-up scenarios?	☐	☐
Is remediation planning divided into different steps such as approval planning, implementation planning etc.?	☐	☐

If not, please explain:

Are there standard documents for remediation planning?	☐	☐

If so, please attach example copies (in your own language if they are not available in English)

III. Clean-up

Does the clean-up level in projects prepare the property for multipurpose or only specific use in the future?

☐ Multipurpose ☐ Specific ☐ None

Who sets clean-up targets?

☐ Your company ☐ Env. agency

☐ Env. authorities ☐ Other authorities

☐ Other, please explain:

	yes	no
Are there any clean-up targets set by legislation?	☐	☐

Who defines the remediation method?

☐ Your company ☐ Consultants

☐ Authorities ☐ Other, please explain:

d) **Contamination management**

Does your company follow a systematic assessment process?	☐	☐
Does your company have a contamination register?	☐	☐
Is the data available in digital format?	☐	☐
Is the data confidential and available on request?	☐	☐
Is the data available online (public access)?	☐	☐
Is the data structured in accordance with EU directives?	☐	☐
Does your company have additional databases (buildings, operations)?	☐	☐
Are your data sets compatible with public databases and other company databases?	☐	☐
Have you identified a need for a company-wide contamination register?	☐	☐

If so, why? Please explain:

Is the data used for

- ☐ Mid / long-term planning
- ☐ Financial risk planning
- ☐ Area development projects
- ☐ Property tax deduction
- ☐ Property management
- ☐ Fund raising (for urban development, EU, government, region etc.)
- ☐ Nature conservation and land use planning (multiple answers possible)
- ☐ Others, please explain:

	yes	no
Is the data you store in line with EU and national legislation (FFH, Ground Water Directive)?	☐	☐
Does your company make all this data available online?	☐	☐

☐ On request

If so, or if no request is made, to whom? Please explain:

Is there long-term environmental data management (an archive)?	☐	☐

	yes	no
Is there a standardised structure for electronic / hard copy data?	☐	☐

How is a typical property data sheet structured in your company?

Example of a hard copy data sheet (if applicable)

What data is stored in your system / archive?

- ☐ Name of area suspected of being hazardous
- ☐ Area size

☐ Possible hazardous use in the past

☐ Type of sampling (drilling, exhaust air, water well etc.)

☐ Sampling diameter

☐ Sampling depth

☐ Name of sampling location

☐ Satisfactory completion of gauging / observation

☐ Geology, geological profile

☐ Sampling date

☐ Detailed sampling location

☐ Type of sampling

☐ Substances analysed

☐ Measured concentrations of analysed subst.

☐ Ground water level

☐ Depth to water table

☐ Estimated remediation cost

☐ Accumulated expenses

☐ Owner

If any other data is stored, please attach an example:

Company: ..... Department: .....

Date: …….. Name: .....

Phone no: ..... E-mail: .....

Signature: ……..

APPENDIX H

EXAMPLES OF MANUALS, HANDBOOKS

Deutsche Bahn AG, Germany

Mustergliederung für eine Orientierende Untersuchung auf Flächen der Deutschen Bahn AG

Organisation of site investigation at Deutsche Bahn AG

Cover sheet

0. Table of contents
1. Motivation / description of the target
2. Basic information on the target area
    - Location and size of the area
    - Former use
    - Nature and extent of contamination
    - Migration
    - Restriction of possible uses
3. Description of the target area
    - Location of the area under investigation
    - Geography
    - Geology
    - Hydrology
    - Climate
    - Usage
    - Results of historical research
    - Results of other research
4. Work carried out (presentation of investigations and their purpose)
5. Presentation and assessment of the results
6. Assessments of the location
    - Risk assessment
    - Classification

BANVERKET, Sweden

Manual (Handbok)

BVH 585.81

Valid from	Version number	Number of pages
2004-06-01	1	122
Journal number		Number of appendices
B03-1986/SA60		3
Decision-maker	Unit concerned, officer	
CB	BBG, Niklas Löwegren	

Replaces

Inventory of potentially contaminated areas

Contents

APPENDIX I

EXAMPLES OF REPORTS AND STUDIES

Finnish Transport Agency, Finland

Traffic bureau/Turku town
TURKU, JÄKÄRLÄ (suburb of Turku)
Report Project number 09 50212180 352 (04-3747)

ASSESSMENT OF SOIL CONTAMINATION AND NEED FOR REMEDIATION

CONTENTS

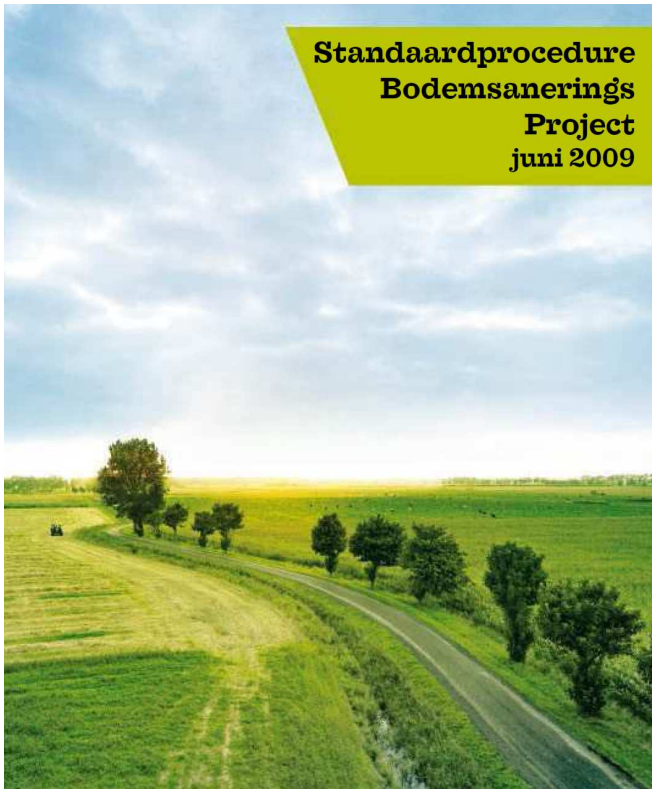
INHOUD C1 ALGEMENE ASPECTEN GRONDVERZET

Manual: SNCB indicator survey

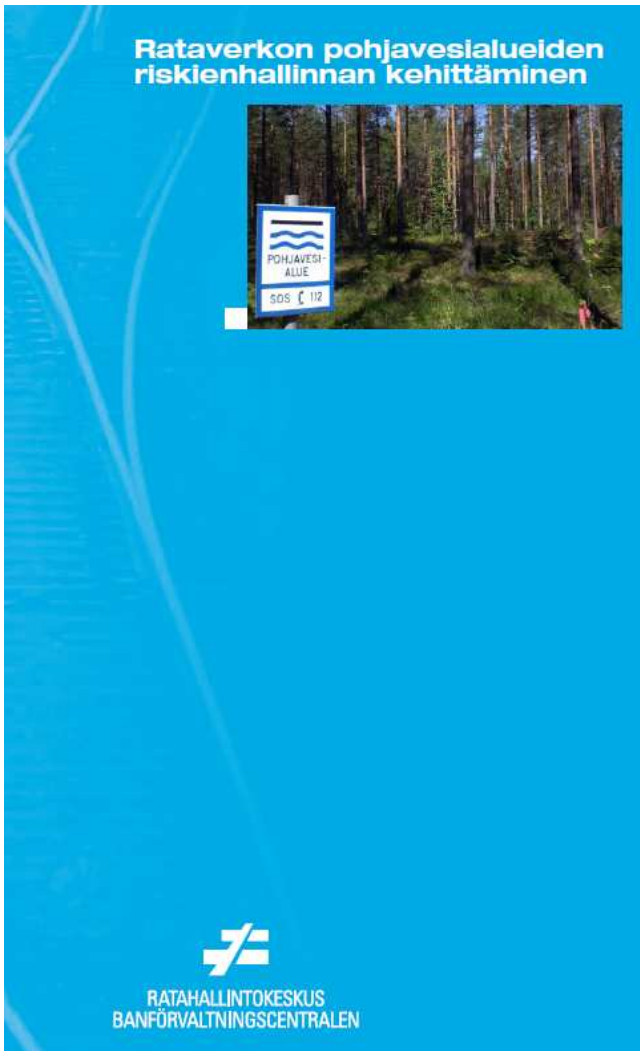
STANDAARDPROCEDURE ORIËNTEREND BODEMONDERZOEK

OPENBARE VLAAMSE AFVALSTOFFENMAATSCHAPPIJ

Samen maken we morgen mooier.



Manual: SNCB descriptive survey



Improving risk management in groundwater areas of the railway network. Finnish Rail Administration, Rail Network Department. Helsinki 2008. Publications of the Finnish Rail Administration A 9/2008. 38 pages and 11 appendices. ISBN 978-952-445-235-9, ISBN 978-952-445-236-6 (pdf), ISSN 1455-2604, ISSN 1797-6995(pdf)

SUMMARY

About one tenth of the total railway network length is situated in groundwater areas. Around 550 kilometres of the railway network intersects with the Class I and II groundwater areas, which are important for the water supply. In autumn 2007 Finnish Rail Administration began work on improving risk management in the groundwater areas of the railway network. The pilot area was South-eastern Finland, which has a high number of railway transports carrying dangerous goods.

The main focus of the work was to improve the risk assessment method from the perspective of track maintenance and create a risk assessment method, which would help to effectively assess the large number of groundwater areas, and be suitable for assessing the groundwater areas of the entire railway network. The result was a two-stage risk assessment method. In stage I of the risk assessment it is possible to effectively process the numerous groundwater areas and highlight those that need further investigation most. In stage II an expert team prepares more specified risk assessments of the groundwater areas chosen based on the results of stage I.

Another essential goal was to create a model for a groundwater area location card that would be suitable for the entire railway network area. The groundwater area location card contains information on groundwater areas, track maintenance, as well as traffic and risk management. The aim is for it to be a summarised source of information in relation to questions regarding the railway network groundwater areas.

Management of groundwater material with the help of geographic information and acquiring groundwater area information and assessing its suitability for Finnish Rail Administration's use were also dealt with. Finally, whether the groundwater areas of railway network should be marked on the terrain was also examined.

Example of a report for ground water risk management in track maintenance, Finland RHK

MiljøBistand

Holmestrand Stasjonsområde
Holmestrand kommune

Innledende miljøteknisk grunnundersøkelse – fase 1

ROM eiendomsutvikling AS

Environmental station report, NSB Norway

APPENDIX J

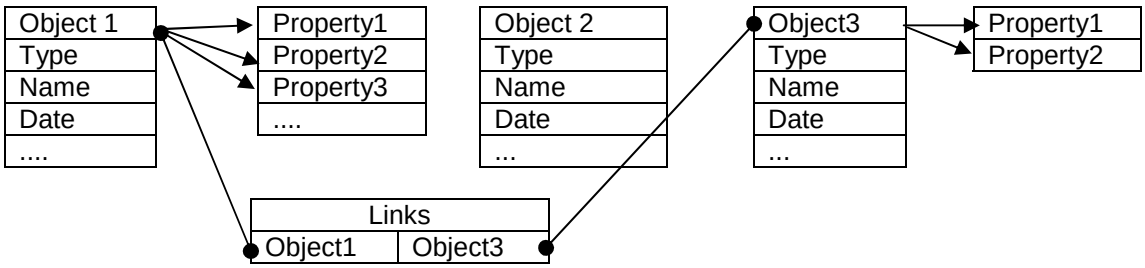
EXAMPLE OF A GIS DATABASE: SNCB

SNCB Polluted Soil Database

In order to manage information on polluted soils, the Environmental Department of SNCB-Holding has developed its own database in MS Access.

The data model is based on ideas of "objects", "object properties" and "links" between these objects.

Each object is defined by some generic data (name, type, date, city) and completed with "property" items giving more precise and specific information for that object.
Each object type has got its own set of possible properties and can be linked to a limited set of other object types.



This data model is very flexible. New types of information can be defined whenever needed by the user; no ICT intervention is required.

Initial choices

At development stage, the data model was established to satisfy financial and administrative requirements for soil management.

- It is not a GIS based system.
- It does not register individual drillings or detailed soil / ground water analyses.

However

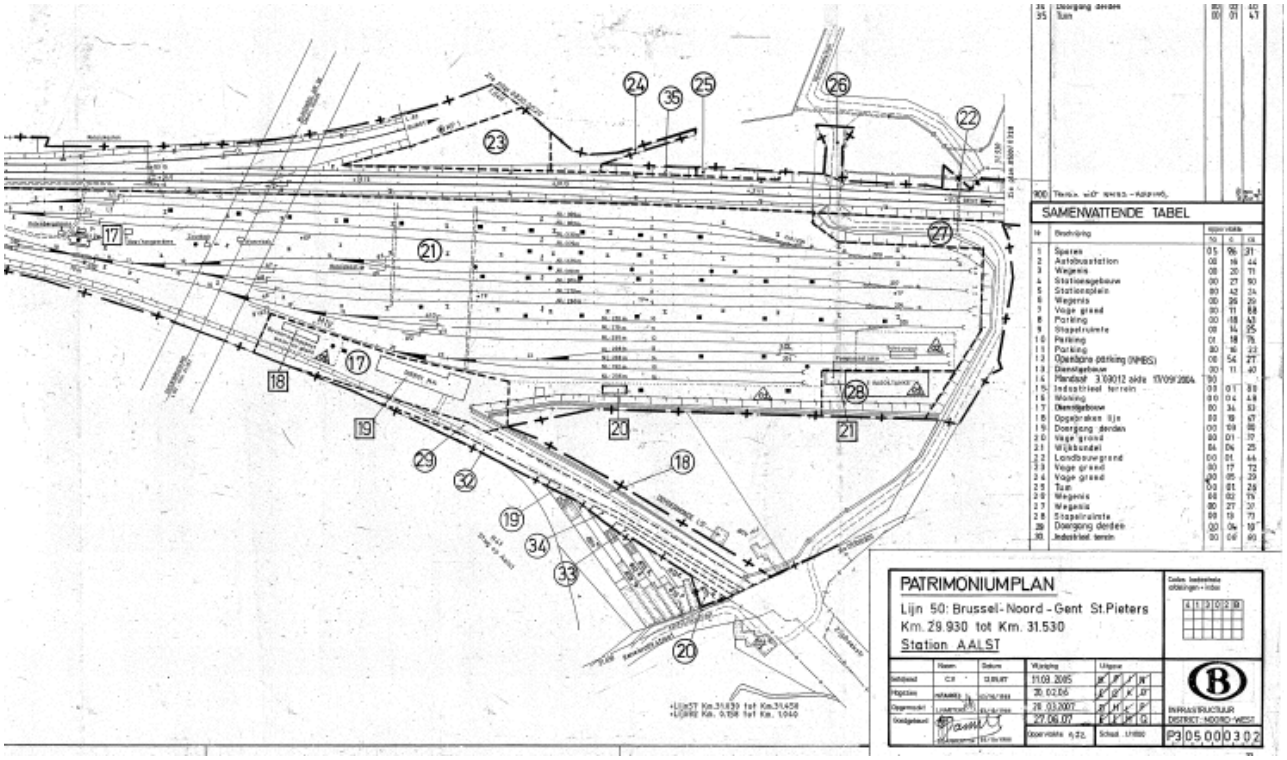
- The geographical identification is done by referring to existing cadastres on which each plot of land has a unique number.
- Technical details on soil assessment are available by referencing reports that are stored digitally on a file server.

Plot of land

A set of "property maps" document the entire railway landed property. Each map covers about 1 km. Each plot has a number; in combination with the number of the map, this gives each plot a specific number.

Double clicking on a plot number in the database automatically opens the corresponding map (scanned onto server).

Example: Part of a property map (plot numbers encircled):



These plots are defined as "objects" in the database model, having properties such as size and ownership.

Site object

Plots can be grouped together to form a "site". Sites are a top-level object and are defined by linking one or more plot objects to the site object. Sites can also be located by means of their lon / lat coordinates. Double-clicking on this attribute can activate a GIS application.

Accountancy for soil pollution is managed at site level and communicated to the financial department.

Report objects

Various types of reports focus on a specific type of object and can be detailed by property items and linked to plots. Selecting a plot in the system will show the list of reports available for that plot.

Pollution spot objects

A case of pollution is registered as a “spot” object, distinguished by properties such as type (soil / ground water), pollutant (oil, heavy metals etc.), surface, depth, volume, age, coordinates and knowledge level. Spots are linked to plots by a segmentation percentage (X % of the spot is located on the plot).

Prognosis objects

This is an object measured in currency, representing an estimate of the future cost of pollution remediation.
A prognosis object is linked to a spot object. A calculation algorithm helps provide a cost estimate if no detailed calculation has been made by an environmental expert.
Changes in the estimated future cost (remediation performed, new studies etc.) are registered by adding new (potentially negative) prognosis objects.
The actual prognosis for a spot is calculated by adding all prognosis objects.

Provision objects

Financial provisions for soil pollution are established in accordance with IFRS rules. The soil database keeps track of the financial provisions using provision objects that are of course measured in currency.
The amount of the provision set for a site is derived from the overall prognosis for the site.

Example calculation:

Site S1 consists of two plots, P1 and P2.
There is a spot, SP1, 50% of which is located on plot P2 and 50% on plot Px (part of another site).
The prognosis for spot SP1 is 100,000 EUR.
Spot SP2 is entirely located on plot P1. The prognosis for spot SP2 is 30,000 EUR.

The prognosis for the site S1 is:
100,00.00 x 50% + 30,000 x 100% = 80,000 EUR

The environmental department will suggest that the financial department make a provision of 80,000 EUR. If it has been confirmed that the provision has been made, a provision object is added to the soil database.

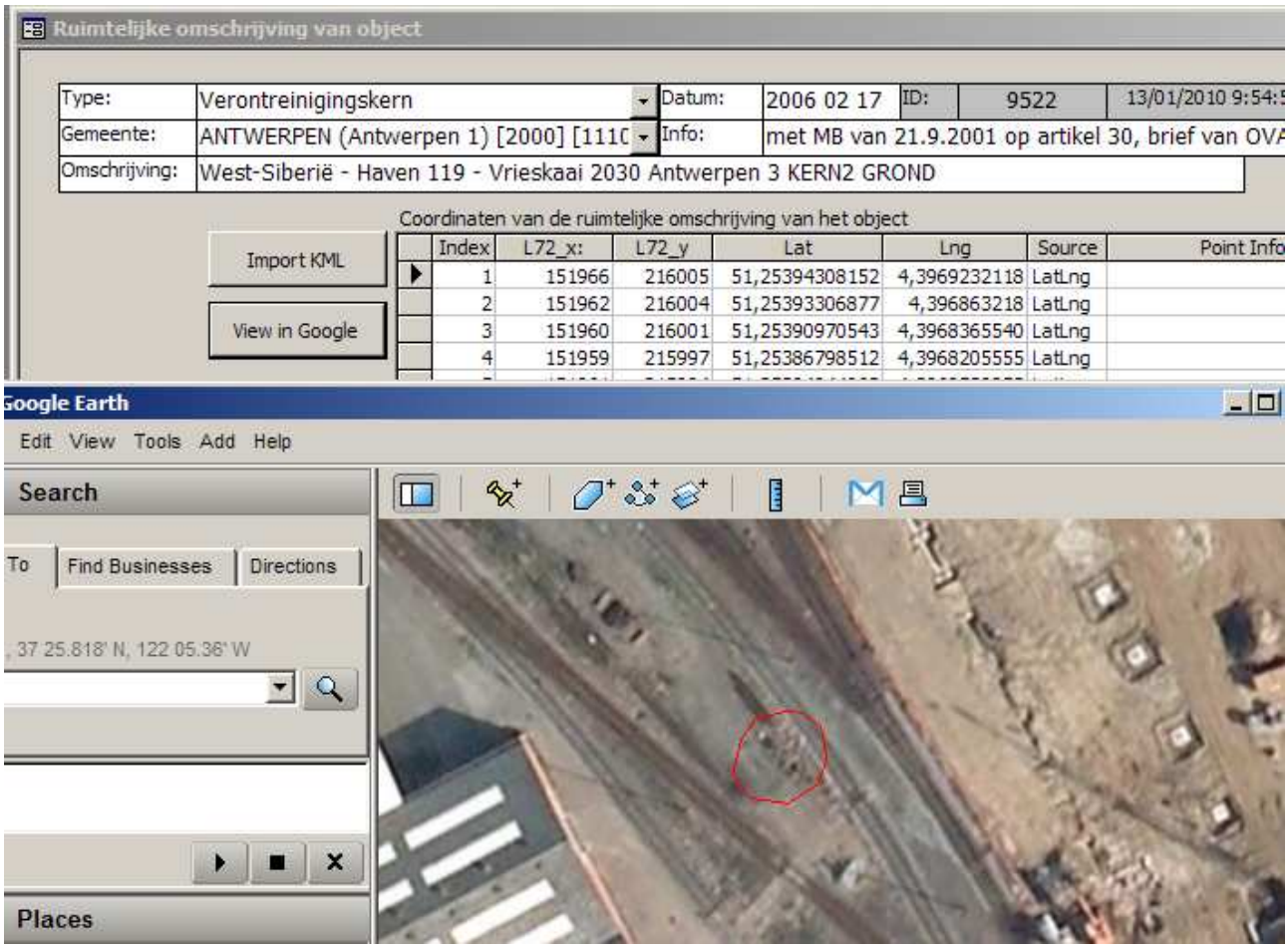
Periodically, overall prognosis and provisions set for each site are compared and corrections are proposed to the financial department if necessary.

Expense objects

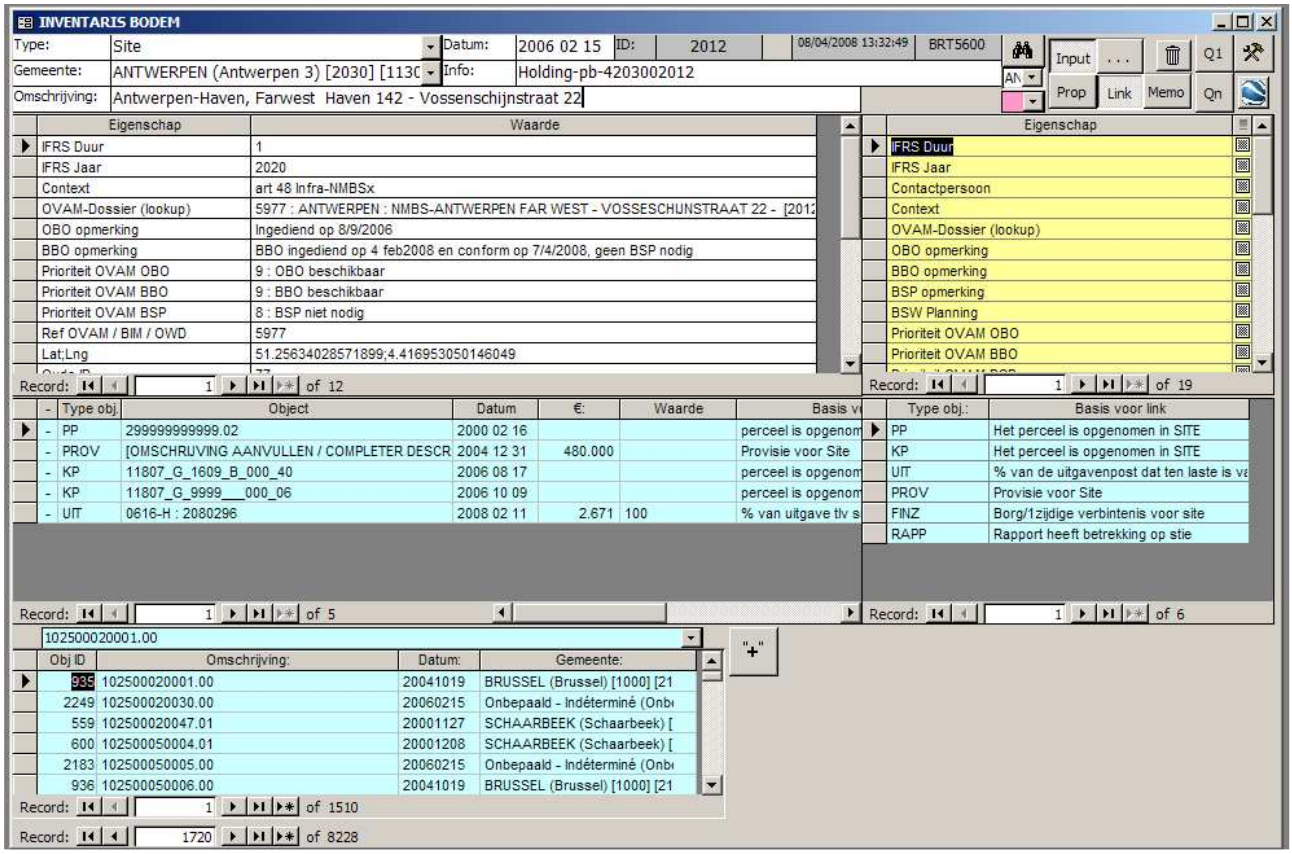
Each bill related to soil pollution assessment or remediation is registered in the soil database as an "expense" object, linked to a site object. This makes it possible to keep track of expenditure.
Expenses are compensated by a reduction in the prognosis if the work paid for by the expenses reduces the cost of the remaining remediation.

Google Earth

The database has been upgraded in a way that enables each object to be associated with a set of coordinates (lat, lon / Lambert projection) representing the physical boundaries of the object. The database can generate a Google Earth KML file so the object can be visualised.



Screenshot of main database window



List of object types and associated properties (LKP = lookup table with standard descriptions)		
Object Type	**Property**	**Data type**
Patrimoniumperceel	Eigenaar	LKP
Patrimoniumperceel	NIeuwe Eigenaar	LKP
Patrimoniumperceel	Vlarebo-karakter	LKP
Patrimoniumperceel	Gewest (niet meer nodig)	LKP
Patrimoniumperceel	Vlareborubriek	LKP
Patrimoniumperceel	Lambertcoördinaten centraal punt	TXT
Patrimoniumperceel	Oude eigenaar	LKP
Patrimoniumperceel	Oppervlakte m²	NUM
Kadastraal perceel	Lambert X;Y	TXT
Kadastraal perceel	Oude notatie als object (8.10.2006)	TXT
Kadastraal perceel	OVAM-notatie	TXT
Kadastraal perceel	Vlarebo-karakter	LKP
Kadastraal perceel	Aard	LKP
Kadastraal perceel	Adres	TXT
Kadastraal perceel	Oppervlakte m²	NUM
Kadastraal perceel	Eigenaar	LKP
Kadastraal perceel	Vlarebo-rubriek	LKP
Site	Ref OVAM / BIM / OWD	TXT
Site	Prioriteit OVAM BBO	LKP
Site	Contactpersoon	TXT
Site	IFRS Duur	TXT
Site	IFRS Jaar	TXT
Site	BSW Planning	TXT
Site	Lat;Lng	TXT
Site	Prioriteit OVAM BSP	LKP
Site	OVAM-Dossier (lookup)	LKP
Site	Prioriteit OVAM OBO	LKP
Site	OBO opmerking	TXT
Site	Provisierekening	TXT
Site	Oude ID	TXT
Site	OBO bestelling (niet verder aanvullen)	TXT
Site	BSP opmerking	TXT
Site	BBO opmerking	TXT
Site	Lambert X;Y centraal punt	TXT
Site	BBO bestelling (niet verder aanvullen)	TXT
Site	Context	LKP
Oriënterend bodemonderzoek	Ingediend door	TXT
Oriënterend bodemonderzoek	Datum conformverklaring	TXT
Oriënterend bodemonderzoek	Referentie conformverklaring	TXT
Oriënterend bodemonderzoek	Lambert X;Y centraal punt	TXT
Oriënterend bodemonderzoek	Document ID (Klassement)	TXT
Oriënterend bodemonderzoek	Lat;Lng	TXT
Oriënterend bodemonderzoek	Referentie	TXT
Oriënterend bodemonderzoek	Onderzochte oppervlakte (m²)	NUM
Oriënterend bodemonderzoek	Rapport in PDF beschikbaar	LKP

List of object types and associated properties (LKP = lookup table with standard descriptions)		
Object Type	**Property**	**Data type**
Oriënterend bodemonderzoek	Uitvoerder	LKP
Oriënterend bodemonderzoek	Datum naar OVAM	TXT
Oriënterend bodemonderzoek	Datum veldwerk	TXT
Oriënterend bodemonderzoek	Datum bestelling bij firma	TXT
Oriënterend bodemonderzoek	Datum interne bestelling	TXT
Oriënterend bodemonderzoek	Aanleiding	LKP
Oriënterend bodemonderzoek	Opdrachtgever	TXT
Oriënterend bodemonderzoek	Onderzochte kadastrale oppervlakte (m²)	NUM
Beschrijvend bodemonderzoek	Uitvoerder	LKP
Beschrijvend bodemonderzoek	Conformverklaring - Datum	TXT
Beschrijvend bodemonderzoek	Lambert X;Y	TXT
Beschrijvend bodemonderzoek	Conformverklaring - Referentie	TXT
Beschrijvend bodemonderzoek	Rapport in PDF beschikbaar	LKP
Beschrijvend bodemonderzoek	Opdrachtgever	TXT
Beschrijvend bodemonderzoek	Lat;Lng	TXT
Beschrijvend bodemonderzoek	Document ID (Klassement)	TXT
Beschrijvend bodemonderzoek	Ingediend door	TXT
Beschrijvend bodemonderzoek	Datum interne bestelling	TXT
Beschrijvend bodemonderzoek	Datum bestelling bij firma	TXT
Beschrijvend bodemonderzoek	Datum veldwerk	TXT
Beschrijvend bodemonderzoek	Datum naar OVAM	TXT
Beschrijvend bodemonderzoek	Onderzochte kadastrale oppervlakte	NUM
Beschrijvend bodemonderzoek	Onderzochte oppervlakte	NUM
Beschrijvend bodemonderzoek	Aanleiding	LKP
Beschrijvend bodemonderzoek	Referentie	TXT
Bodemsaneringsproject	Datum bestelling bij firma	TXT
Bodemsaneringsproject	Datum veldwerk	TXT
Bodemsaneringsproject	Datum naar OVAM	TXT
Bodemsaneringsproject	Betrokken kadastrale oppervlakte	NUM
Bodemsaneringsproject	Totale betrokken oppervlakte	NUM
Bodemsaneringsproject	Uitvoerder	LKP
Bodemsaneringsproject	Ingediend door	TXT
Bodemsaneringsproject	Opdrachtgever	TXT
Bodemsaneringsproject	Conformverklaring Datum	TXT
Bodemsaneringsproject	Conformverklaring Referentie	TXT
Bodemsaneringsproject	Document ID (Klassement)	TXT
Bodemsaneringsproject	Rapport in PDF beschikbaar	LKP
Bodemsaneringsproject	Referentie	TXT
Bodemattest	Perceel opgenomen in register	NUL
Bodemattest	OVAM standaardzin	LKP
Bodemattest	Inhoud attest	TXT
Bodemattest	Overdracht mogelijk met attest	NUL
Bodemattest	Opname art 30	NUL
Bodemattest	Adres perceel	TXT
Bodemattest	Behandeld door	LKP
Bodemattest	Document ID (Klassement)	TXT

List of object types and associated properties (LKP = lookup table with standard descriptions)		
Object Type	**Property**	**Data type**
Risico-activiteit	Vlarebo-rubriek	LKP
Risico-activiteit	Actuele activiteit ?	LKP
Risico-activiteit	Lat;Lng	TXT
Risico-activiteit	Calamiteit (Datum : Omschrijving)	TXT
Risico-activiteit	Lambert X;Y	TXT
Risico-activiteit	Vlarebo (oude tekstvorm)	TXT
Risico-activiteit	Oppervlaktebeslag van de activiteit (m^2)	NUM
Risico-activiteit	Extra info	TXT
Risico-activiteit	Verantwoordelijkheid	LKP
Risico-activiteit	Risico-installatie	TXT
Risico-activiteit	Exploitant	TXT
Risico-activiteit	Omschrijving Risico-activiteit	LKP
Risico-activiteit	Einddatum activiteit (JJJJMMDD)	TXT
Risico-activiteit	Startdatum activiteit (JJJJMMDD)	TXT
Verontreinigingskern	Getroffen maatregelen	TXT
Verontreinigingskern	Oude ID	TXT
Verontreinigingskern	Lat;Lng Contour	TXT
Verontreinigingskern	Lambert X;Y	TXT
Verontreinigingskern	Lat;Lng Centrum	TXT
Verontreinigingskern	Naam polluent	TXT
Verontreinigingskern	Omstandigheden calamiteit	TXT
Verontreinigingskern	Saneringsnoodzaak	LKP
Verontreinigingskern	Hoeveelheid verloren product (L)	TXT
Verontreinigingskern	Aard	LKP
Verontreinigingskern	Provisie	LKP
Verontreinigingskern	Verontreiniging Minerale olie	LKP
Verontreinigingskern	Volume (m^3)	NUM
Verontreinigingskern	Oppervlakte (m^2)	NUM
Verontreinigingskern	Diepte van (m)	NUM
Verontreinigingskern	Diepte tot (m)	NUM
Verontreinigingskern	Datum ontstaan (JJJMMDD)	TXT
Verontreinigingskern	Historisch	LKP
Verontreinigingskern	Aansprakelijkheid	LKP
Verontreinigingskern	Kennisniveau	LKP
Gemaakte kosten (~Facturen)	Motivering bedrag	TXT
Gemaakte kosten (~Facturen)	Leverancier	TXT
Gemaakte kosten (~Facturen)	Deelactiviteit /Plaats	TXT
Gemaakte kosten (~Facturen)	terugbetaalbaar door Holding	LKP
Gemaakte kosten (~Facturen)	Aanschrijfbaar op provisie?	LKP
Gemaakte kosten (~Facturen)	Boekjaar	TXT
Gemaakte kosten (~Facturen)	BTW is niet recupereerbaar	LKP
Gemaakte kosten (~Facturen)	Factuurnummer	TXT
Prognose toekomstige kosten	Provisie ?	LKP
Prognose toekomstige kosten	BTW?	LKP
Provisie	provisie voor bedrijf	LKP
Provisie	Provisierekening	TXT

List of object types and associated properties (LKP = lookup table with standard descriptions)		
Object Type	**Property**	**Data type**
Provisie	Terugvorderbaarheid provisie	LKP
Financiële zekerheid met eenzijdige verbintenis	Jaarlijkse commisie voor borg (%)	NUM
Financiële zekerheid met eenzijdige verbintenis	Klassement VM	TXT
Financiële zekerheid met eenzijdige verbintenis	Vorm van de zekerheid	LKP
Financiële zekerheid met eenzijdige verbintenis	Referentie bij bank	TXT
Financiële zekerheid met eenzijdige verbintenis	Bank	TXT
Financiële zekerheid met eenzijdige verbintenis	Raming gebaseerd op	TXT
Financiële zekerheid met eenzijdige verbintenis	Initieel bedrag (€)	NUM
Financiële zekerheid met eenzijdige verbintenis	Ref OVAM	TXT
Financiële zekerheid met eenzijdige verbintenis	Getekend door	TXT
Rapport (opvolging sanering, etc)	Document ID (Klassement)	TXT
Rapport (opvolging sanering, etc)	Uitvoerder	LKP
Rapport (opvolging sanering, etc)	Referentie	TXT
Rapport (opvolging sanering, etc)	Datum naar OVAM	TXT
Rapport (opvolging sanering, etc)	Ingediend door	TXT
Rapport (opvolging sanering, etc)	Datum conformverklaring	TXT
Rapport (opvolging sanering, etc)	Referentie conformverklaring	TXT
Rapport (opvolging sanering, etc)	Lambert X;Y centraal punt	TXT

APPENDIX K

EXAMPLES OF NATIONAL ENVIRONMENTAL POLICIES

Denmark[39]

Environmental policy and enforcement

Denmark's environmental policy is aimed at protecting people, nature and the environment against damage and contamination. Development is conducted on a sustainable basis. The Environmental Protection Act is the central law. It is based on a principle of decentralisation. Most of the legislation is administered and enforced by local authorities.

Enforcement bodies

In Denmark several authorities are competent for the enforcement and administration of environmental law. The Danish Ministry for the Environment is the highest authority in terms of environmental policy.

Two agencies are under its administration:

- The Danish Environmental Protection Agency – the Environmental Protection Act is a framework act, therefore it is be complemented with guidelines and regulations issued by the Ministry for the Environment and the Danish Environmental Protection Agency; this agency is also responsible for the Chemical Substances and Products Act and the Contaminated Soil Act.

- The Agency for Spatial and Environmental Planning – the agency is also responsible for the protection of the environment. It is also in charge of the Planning Act and new legislation on the environmental aspects of agricultural production.

Contaminated Land

Liability

Danish environmental legislation is based on the polluter pays principle.

The Soil Contamination Act applies strict liability for action causing contamination. Strict liability can be applied for pollution occurring after 1991. Concerning orders to carry out

[39] http://www.iclg.co.uk/khadmin/Publications/pdf/2746.pdf

remediation, strict liability can only be applied for contamination which has occurred after 1 January 2001.

If a party is obliged to carry out an investigation but no contamination is found or the investigation results show that the pollution was not caused by that party, the authorities have to pay back investigation expenses.

The Danish Environmental Protection Act applies if soil contamination is not regulated by the Soil Contamination Act. To be held liable under this act (as well as for contamination of ground water), claims of intention or negligence must be substantiated.

Obligation to investigate land for contamination

There is only an obligation for an owner to investigate land for contamination if environmental authorities request examinations due to suspicion of contamination.

Claim for compensation

In Denmark there is no obligation for the seller to reveal environmental problems to a prospective buyer. Caveat emptor, or “let the buyer beware”, is the basic principle in these cases. The seller must inform the buyer of any conditions which may have a decisive influence on the decision to purchase. If such information has not been given, the purchaser has the right to be fully compensated or withdraw from the contract.

France[40]

Environmental policy and enforcement

French environmental law is based on:

- European law, especially the treaty establishing the European Community and relevant EU directives.

- The French Environmental Charter (*Charte adossée à la Constitution*), added to the French Constitution on 28 February 2005. It guarantees that all citizens have the right to public health and to live in a balanced environment.

- Article L. 110-1 of the French Environmental Code: it sets out general principles such as the precautionary principle, the principle of preventive and corrective action, the 'polluter pays' principle and the principle of participation.

The political strategy is to promote environmental legislation through incentive systems encouraging companies to take the initiative. One motivation is the polluter pays principle (the person who caused environmental damage must pay for it), another is tax assistance for companies which aim to improve environmental management.

Enforcement bodies

At national level, competence for the implementation of environmental policy is mainly entrusted to the Ministry for the Environment, Energy, Sustainable Development and National Planning (the *MEEDDAT*). In addition, there are several national agencies (which are linked to the *MEEDDAT*) responsible for specific environmental fields, e.g. the *INERIS* (*Institut National de l'Environnement industriel et des risques*).

At local level:

- The *Préfet* (local representative of the state) grants environmental permits for classified installations and enforces administrative sanctions.

- The *DRIRE* (*Directions Régionales de l'Industrie, de la Recherche et de l'Environnement*) or, in some regions, the *DREAL* (*Directions Régionales de l'Environnement, de l'Aménagement et du Logement*) are responsible for the

[40] http://www.iclg.co.uk/khadmin/Publications/pdf/2752.pdf

technical approval of applications for environmental permits and the inspection of classified installations.

Contaminated Land

Liability

There is no specific act for soil protection allocating liability in case of damage and contamination. The classified installation regime holds the current or last operator of the site to account. The operator is defined as the person who is in charge of operations on a daily basis and/or has an operating permit or declaration receipt.

Another liability regime is the new environmental liability regime which also calls the operator to account. It is applicable to land contamination that may constitute a significant risk of harming human health and seriously damaging water.

However, it does not apply to past cases of contamination, when the event causing the damage occurred before 30 April 2007 or when this event resulted from an activity having ceased definitively before 30 April 2007.

If the liable person is unknown, insolvent or defaulting on its obligations to the Environment Agency, *ADEME* must carry out remediation.

Obligation to investigate land for contamination

A person may be obliged to investigate land for contamination before and after being granted an environmental permit: the application file for an environmental permit must include an environmental impact study with an analysis of the initial condition of the site, which usually involves an investigation for contamination.

If faced with evidence of risks to the environment, public authorities can also request that site operators perform an in-depth site review (with soil surveys).

Prior to the sale of a plot of land, sellers must investigate and check whether a classified installation was operated on their site in order to comply with the duty to provide information.

Claim for compensation

There is no specific obligation to provide information in case of merger and/or takeover transactions. However, the seller's silence on environmental problems may constitute deception, which is a ground for annulment of the contract. In this case, the purchaser may make a claim for compensation. Nevertheless, the purchaser must also inform itself.

In case of sale of a plot of land on which a classified installation subject to an environmental permit was operated in the past, the seller must inform the purchaser of past operation of such an installation and the consequent risks. Otherwise, the purchaser may request the

cancellation of the sale, a price reduction or remediation by the seller. This information obligation does not apply to plots of land on which a classified installation is currently being operated.

Germany[22]

Environmental policy and enforcement

German environmental policies and the implementation of environmental laws are based on three main principles:

- The "precautionary principle" (*Vorsorgeprinzip*) aims to protect the environment from potential pollution or danger at an early stage.

- The "polluter pays principle" (*Verursacherprinzip*) means that anyone responsible for damage caused to the natural environment must pay the cost of prevention, remediation and compensation.

- The "cooperation principle" (*Kooperationsprinzip*) states that environmental policy must be developed in close cooperation (by sharing information, through public hearings etc.) with all relevant public and private organisations to prevent future harm to the environment and clean up damage caused in the past.

Enforcement bodies

Key aspects of German environmental law are regulated by federal acts. However it is principally the duty of the 16 federal states (*Bundesländer*) to administer and enforce environmental law.

Important federal authorities are, for example, the Federal Ministry for the Environment (*Bundesministerium für Umweltschutz*) and the Federal Environmental Agency (*Umweltbundesamt*). The Environmental Agency is in charge of environmental research, planning and administrative tasks assigned to it by the Federal Ministry.

Contaminated Land

Liability

On 1 March 1999 the Federal Soil Protection Act entered in force. Since then, the 16 *Bundesländer* have had a uniform standard on how to manage soil and ground water contamination. The act aims to protect soil against future degradation, sets out liability and remediation measures for existing contamination. An ordinance sets threshold values, which are to be used to assess contamination risks.

[22] http://www.iclg.co.uk/khadmin/Publications/pdf/2753.pdf

The following persons can be held liable for environmental damage:

- The polluter
- The universal legal successor (*Gesamtrechtsnachfolger*) of the polluter
- The operator
- The owner
- The person exercising actual control over the land (*Inhaber der tatsächlichen Gewalt*), e.g. a lessee
- The person / entity responsible for the legal entity owning the site under general principles of commercial or corporate law
- Any former owner, provided they sold the property after 1/3/99

Any of these persons can be obliged by the competent authority to carry out an inspection at their own expense if there are sufficient grounds to believe a site is contaminated. The authority is also allowed to order remedial action.

Obligation to investigate land for contamination

If land is suspected of being contaminated, the authorities may order investigations to be performed at the expense of the persons liable (under the Federal Soil Protection Act) to estimate risks (*Gefährdungsabschätzung*). Moreover, especially in case of particularly hazardous or widespread contamination, the authorities may order that the investigation required to inform decisions on the type and extent of necessary measures be conducted (*Sanierungsuntersuchung*), and that a remediation plan (*Sanierungsplan*) be submitted.

Claim of compensation

According to German civil law the seller is liable for any defect in the property it sells, unless the buyer has been made aware of such a defect. “Defect”, in this sense, includes any dangerous contamination under the Federal Soil Protection Act. The seller must inform the purchaser of any existing or suspected contamination, otherwise the purchaser may be able to claim compensation.

Poland[42]

Environmental policy and enforcement

The Polish constitution of 1997 sets out that environmental protection falls under the principle of sustainable development, commits the public authorities to defend human health from effects of environmental degradation and demands that everyone protect the environment. Public authorities should offer support to citizens who carry out work aiming to protect and improve the environment.

The first act on the protection of nature was already established in 1949. In 2001 the Environmental Protection Law (EPL Act) entered into force, defining general rules and regulations (regulation of air pollution, regulations against noise and electromagnetic fields) and setting up institutions for environmental protection.

The basis of Polish environmental law is a "moderate holistic" approach. It is based on a several principles:

- The environment should be protected in a comprehensive manner
- The precautionary principle
- Preventive action
- The "polluter pays" principle
- Integration of environmental policy into other policies

But there are no explicit principles for high-level of protection or a principle according to which environmental damage should be rectified at the source.

Enforcement bodies

Administration and enforcement of environmental law is entrusted to agencies and bodies with wider-ranging roles, for example mayors of towns and cities, heads of districts (*starosta*), the national government's representatives to regions (*wojewoda*), to heads of regional governments (*marszalek*), and to regional assemblies (*sejmik województwa*). The National Environmental Protection Council, the commissions for environmental impact assessments, the environmental protection and water management funds, and the National Council for Eco-Management are establishments which provide advice and support. The Environmental Protection Inspection Body, however, is entrusted with monitoring compliance with environmental protection laws.

[42] http://www.iclg.co.uk/khadmin/Publications/pdf/2774.pdf

Contaminated Land

Liability

The act of 13 April 2007 on of the prevention and remediation of environmental damage (which implements Directive 2004/35/CE of the European Parliament) regulates liability for contamination of soil or ground water.

The act defines three different categories of liable persons:

- Strict liability for parties conducting an activity which represents a risk of damage to the environment (activities defined in the act and requiring, in most cases, a specific permit)
- Liability for parties whose activity has an influence on protected species or protected habitats
- Liability of land owners (or persons with a permanent usufruct to the land) when environmental damage occurred deliberately

The act does not cover soil contamination occurring before 30 April 2007. These “historical contaminations” are governed by the EPL Act.

Obligation to investigate land for contamination

Owners are not obliged by law to investigate land for contamination.

According to the EPL Act the state and the *starosta* (local government official) carry out environmental monitoring activities including topsoil assessment and land investigation. The legal person operating a road, railway line, light railway line, airport or port must carry out periodic measurements.

Claim for compensation

Neither the Polish environmental protection laws nor the commercial and civil laws govern disclosure of information. The seller can be held liable in case of non-compliance with environmental protection rules.

Romania[43]

Environmental policy and enforcement

Romania's environmental policy is based on several principles:

- Precaution in making decisions relating to the environment
- The principle of preventive measures
- The "polluter pays" principle
- Sustainable use of natural resources
- Public information and involvement in decision-making
- Development of international cooperation for environmental protection

Enforcement bodies

- The Ministry for the Environment (ME): central authority for environmental protection, subordinated to the Romanian Government
- The National Agency for Environmental Protection: public institution, competent for environmental protection and the implementation of legislation and policies related to environmental protection, coordinating the territorial authorities for environmental protection, subordinated to the ME
- The National Environmental Guard: a specialised inspection and monitoring body (determining and enforcing penalties for non-compliance with environmental protection laws), subordinated to the ME
- The National Administration "Romanian Waters": public institution, responsible for qualitative and quantitative water management
- The Ministry for Agriculture, Forests and Rural Development: responsible for the safety and protection of soil and forests, subordinated to the Romanian Government

Contaminated Land

Liability

Pollution of the soil, atmosphere or water endangering human, vegetal or animal life is classified as a criminal act under Government Emergency Ordinance no. 195/2005.

Liability for contamination occurring in the past, however, is not administered by this Government Emergency Ordinance. Consequently, the polluter pays principle is applied: the actual owner is the person liable for the environmental damage and shall bear the cost of remedial measures.

[43] http://www.iclg.co.uk/khadmin/Publications/pdf/2776.pdf

Obligation to investigate land for contamination

After remedial measures have been carried out the person responsible for contamination is obliged to monitor emissions. Such monitoring reports must be handed over for review to the environmental authorities, which establish lists of currently contaminated sites.

Claim for compensation

If contamination has occurred in the past, the actual owner may seek compensation from the previous owner (seller). Natural persons / legal entities, however, are not explicitly guaranteed this right under Government Emergency Ordinance no. 195/2005. Indeed this right is guaranteed under the general principles of civil law.

Spain[25]

Environmental policy and enforcement

Spanish environmental policy is set out in Article 45 of the Spanish constitution and is aimed at prevention, protection against and reparation of damage to the environment. The basis of Spanish environmental legislation is the principles of the European Community, for example the "polluter pays principle".

Enforcement bodies

Competence for enforcement and administration of environmental law lies with national, regional and local bodies. The implementation of basic environmental legislation, including transposing EU directives, is mainly entrusted to the Ministry for the Environment and Rural and Marine Affairs, the Ministry for Industry, Tourism and Trade and the Ministry for Health and Consumer Affairs.

Moreover, several independent agencies (e.g. the water basin authorities (*Confederaciones Hidrográficas*), the Autonomous Body of National Parks) are authorised to enforce legislation in their particular areas. The Environmental Protection Service (*Servicio de Protección de la Naturaleza, SEPRONA* – a special division of the Spanish Police) and the specialised departments of the public prosecution office for environmental matters are also authorities in the field of the environment.

Contaminated Land

Liability

A so called "cascade liability system" exists under the law on waste. If contamination is detected:

1. The entity which caused the contamination is held liable.
2. The user of the contaminated land is held liable.
3. The owner of the land is held liable, even if it is not the user.

Obligation to investigate land for contamination

If the Royal Decree 9/2005 of 14 January (the RD on Soil) is implemented, the autonomous regions will introduce reports on the state of the land before February 2007. The person responsible for these activities may be obliged to draw up additional reports and perform analyses in order to determine the status of the land.

[25] http://www.iclg.co.uk/khadmin/Publications/pdf/2782.pdf

In addition, those performing the activities listed in the RD on Soil are obliged to report at regular intervals on the situation of the land. The autonomous regions determine the content and the frequency of these reports.

Claim for compensation

The seller must inform the purchaser of any existing or suspected environmental problem. Otherwise the purchaser may cancel the contract. A lack of information on hidden defects may lead to additional liabilities.

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