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Contaminated sites

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Leibniz Association

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Dealing with contaminated sites is a complex and, as has become evident, long-term problem for our society. More than 300,000 sites suspected of being contaminated have been identified in Germany to date. Germany's Federal Soil Protection Act distinguishes between former waste disposal sites, former industrial sites, and contaminated sites.

1 Starting point

The German term *Altlasten* (contaminated sites) was originally coined by the German Advisory Council on the Environment *(Sachverständigenrat für Umweltfragen, SRU)* in its 1978 environmental assessment, in which it highlighted the unknown risks associated with old landfills and unregulated rubbish tips, which were estimated at the time to number 50,000 in West Germany (cf. *SRU* 1989).

These discussions were preceded by initial indications, beginning in 1972, of the environmental consequences of unregulated waste disposal. In the meantime, especially beginning in the early 1980s, the full extent of the problem came to light as it became apparent that soil contamination had resulted not only from deficiencies in waste disposal but also to a significant degree from improper handling of environmentally hazardous substances.

Awareness of the impact of soil pollution grew as:

- the full scope of the risk, which had previously been disregarded by all concerned, was gradually revealed as much more sensitive measuring technology for detecting traces of pollutants was developed;
- new insights about the properties and the potential hazards of pollutants were gained;
- there were changes in environmental awareness with regard to the protection of soil and subsurface layers, in part due to spectacular cases of pollution (▷ *Soil conservation*).

The emergence of suspected contaminated sites is closely linked to the development of our modern industrial and consumer society and its operational and production processes, and to past waste disposal practices. It is not only a problem in Germany, but also internationally.

The number of suspected contaminated sites identified in Germany currently exceeds 300,000, and the process of identifying and recording them continues in all of Germany's federal states today.

The identification and recording of contaminated sites and suspected contaminated sites is, according to section 11 of the Federal Soil Protection Act *(Bundes-Bodenschutzgesetz, BBodSchG)*, the responsibility of the federal states. Since this means requirements are mandated only indirectly by the German federal government, and since the identification and recording of such sites began long before the Federal Soil Protection Act came into force and was conducted according to the varying rules of the individual federal states, a comparison between states is only possible to a limited extent.

An area that is considered a contaminated site because of detrimental changes to its soil will no longer be able to fulfil all of its functions, which often hinders the purchase and use of such sites (▷ *Brownfield site, derelict/vacant site*). This is unfortunately also the case for sites which are merely suspected of being contaminated. For the owners of such sites, this status entails a devaluation because of uncertainty about the possible uses of the site and the need to budget for the costs of analyses and any necessary regeneration measures. Well-defined principles are therefore indispensable for the classification of suspected contaminated sites.

Table 1: Overview of contaminated sites in Germany (July 2014)

Federal states	Number of*	
	Former waste disposal sites	Former industrial sites
Baden-Württemberg	1.413	12.704
Bavaria	10.585	5.074
Berlin	1.174	5.551
Brandenburg	7.086	12.398
Bremen	21	3.505
Hamburg	274	1.411
Hesse	577	540
Mecklenburg-Western Pomerania	2.629	3.162
Lower Saxony	9.923	83.760
North Rhine-Westphalia	33.397	48.428
Rhineland-Palatinate	10.390	1.454
Saarland	1.648	3.657
Saxony	6.585	12.765
Saxony-Anhalt	4.742	10.391
Schleswig-Holstein	1.795	8.605
Thuringia	3.650	8.388
Total in Germany	**95.889**	**221.793**

Source: LABO 2014

Development opportunities for these sites are limited due to the contamination of their soil in the past. The effort involved in pursuing regeneration measures that completely return a site to its original range of functions is in most cases disproportionate, either due to the costs or to the secondary environmental damage resulting from the regeneration measures themselves. This means it will be important to develop tailored regeneration strategies on a case-by-case basis so that these sites can be returned to appropriate uses while helping to reduce land take (▷ *Landscape planning*; ▷ *Urban land-use planning*).

Legislators have acknowledged these problems and have established legal principles for dealing with contaminated sites.

2 Statutory basis and definitions

The Federal Soil Protection Act, which took effect on 1 March 1999, and the associated Federal Soil Protection and Contaminated Sites Ordinance *(Bundes-Bodenschutz- und Altlastenverordnung, BBodSchV)* (*BGBl*. [Federal Law Gazette] 1990 I, 1554; *BGBl*. 1998 I, 16), which took effect on 17 July 1999, established the first uniform legal basis in Germany for dealing with suspected contaminated sites.

The Federal Soil Protection Act distinguishes between the following:

1) former waste disposal sites: disused waste disposal facilities and other sites where waste was treated, stored or dumped;
2) former industrial sites: sites of disused facilities and other sites where environmentally hazardous substances were handled (with the exception of facilities whose closure requires a licence under nuclear energy legislation);
3) contaminated sites: former waste disposal sites and former industrial sites that cause harmful soil changes or other hazards to individuals or the general public.

These definitions allow for a systematic distinction between the disused sites described above and new kinds of environmentally hazardous contamination caused by ongoing activities. Accordingly, contaminated sites do not include:

- contamination of soil and subsurface layers caused by currently operating commercial or public facilities, including transfer sites and storage yards;
- seepage of environmentally hazardous substances from leaking pipes and sewers that are still in use.

2.1 Former waste disposal sites

It was common practice into the 1970s to dispose of waste without sufficient consideration for protecting the soil, subsurface layers and groundwater by dumping it on hillsides or in stockpiles or in natural or artificial depressions or by burying it on the company's own premises. Domestic and commercial waste accumulated at such sites without being identified, screened or sorted, mostly as uncompacted mixed waste, and it was inevitable that waste with environmentally

hazardous substances was also openly or surreptitiously deposited there. The increasing amount of chemicals in household waste also plays a role in potential soil pollution that should not be underestimated.

Alongside the approved and tolerated waste disposal sites, until 1972 there was a large number of unregulated rubbish tips that can be considered a classic example of improper waste disposal. Only when Germany's first waste disposal legislation took effect in 1972 (the Waste Act since 1986) did a comprehensive reorganisation of waste disposal begin. Some 40,000 unregulated dumping sites were closed. However, the regeneration and recultivation of former waste disposal sites, which was already called for in the German government's 1971 environmental programme, was generally limited to burying them or in some cases planting them for recultivation purposes with the aim of reintegrating them into the landscape. As a result, any of these former waste disposal sites have been forgotten (▷ *Waste management, waste avoidance*).

2.2 Former industrial sites

Another origin of suspected contaminated sites is the contamination of soil and subsurface layers caused by the use of environmentally hazardous substances on sites where facilities were once operated by commercial enterprises or public institutions.

Examples of such sites include former production facilities such as chemical and petrochemical plants, coking plants, gas works, surface finishing facilities, metal smelters and paint manufacturers, or former processing, commercial and service operations such as tanneries, abattoirs, dye works, railway operating sites (including rail networks), petrol stations and scrapyards.

At the industrial and commercial sites, production waste and other commercial waste that would now be designated environmentally hazardous was often deposited in the course of their internal operations.

The contamination of soil and subsurface layers on such sites and in their surroundings resulted not only from the underestimation of potential hazards but was also often due to careless and thoughtless handling of both waste and operating materials, and to leaking pipes and sewer systems and the demolition of facilities as well.

Contaminated or suspected contaminated sites resulting from the activities of the arms industry or acts of war are a special case under the umbrella term *former industrial sites*.

Problems involving legacy contaminated military sites involves issues whose origins go back to the First World War.

In the past, the German term for and concept of legacy contaminated military sites *(Rüstungsaltlasten)* was subsumed under the umbrella notion of 'consequences resulting from war' *(Kriegsfolgelasten)*, an undefined legal term described in more detail in a decision by Germany's Federal Constitutional Court (*BVerfG* [Federal Constitutional Court], order of 16 June 1959, case no. 2 BvF 5/56, *BVerfGE* [Federal Constitutional Court Decisions] 9, 305, 323 et seq.) and the commentaries on Article 120 of the Basic Law. More recently, a new understanding of the term *Rüstungsaltlasten*, still referring to contaminated military sites and based on the term for contaminated sites (*Altlasten*), has gained acceptance; however, there is no binding definition of the term at this time. As a result, there are significant differences in how the individual federal states deal with the issue of contaminated military sites.

In the German Federal Government's view, the problem of contaminated military sites is not limited to munition storage or chemical weapons production sites. Rather, the term is interpreted more broadly to include all soil, water and air pollution caused by chemicals from both conventional and chemical agents (German Federal Parliament 1990).

In line with the prevailing definition of the term *contaminated sites* in Germany, suspected contaminated sites are only to be designated as contaminated military sites if the results of a hazard assessment indicate a specific danger to human health and/or the environment.

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