

Risk management in civil engineering

advanced course

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SOIL CONTAMINATION, MINING ENVIRONMENTAL IMPACT AND WASTE LANDFILLS RISKS

Dominique Darmendrail
BRGM, Executive Direction
Orléans, France
e-mail: d.darmendrail@brgm.fr

Abstract

Nowadays, soil contamination by industries (including waste management and mining activities – also considered as IIPC sites) is usually treated under national legal framework. Therefore explaining how to deal with soil contamination needs a presentation of the basic principles of the legal framework.

The French Legal Framework

France has no specific legislation concerning contaminated sites. The only law for managing the remediation of soil polluted by industry is the one date 19 July 1976 on the classified Industrial Installations (replaced since September 200 by the Environment Act) and its decree of 21 September 1977. This legal document, which updated the 19th December of 1917 on dangerous, unhealthy and disruptive establishments, concerns all industrial activities and the prevention of their impact on Environment.

The National Policy on Contaminated land Management is defined more precisely in circulars of the Ministry for Environment to the Préfets (Government representatives at local levels) of the départements.

In 2007, a main revision of these documents has been done based on a 13 years return of experience. The basic principles (prevention of any future damage of the Environment, management of the collective industrial heritage using risk analysis and management according to the land uses, global environmental balance to ensure a sustainable and transparent management) will be presented.

In more detailed, the French approach is based on several principles:

- The precautionary principle (defined in Law No. 95-101 of 2 February 1995) specifies that the uncertainty inherent in current scientific and technical knowledge should not delay the adoption of measures intended to prevent the risk of serious and irreversible damage to the milieu, at an acceptable cost.
- The proportionality principle verifies the consistency between the detail of the study, the extent of the pollution, and the predictable effects of this pollution. This generally leads to implementing an iterative procedure; prior understanding of a site can be extremely useful for optimal design of required studies and work.
- The specificity principle states that remediation work should eliminate the appearance or persistence of risks or harm to humans or other identified targets (ecosystems, water resources, etc.). The aim of remediation is thus determined on a case-by-case basis by a specific approach to the sites, based on the assessment of the potential risks and on the intended use of the site by the owner/operator (so-called functional and specific approach).
- The transparency principle aims at imposing a rule so that choices (working hypotheses, tools used, degree of detail, understanding, residual uncertainties, etc.) inherent in the risk assessment procedure are presented, explained and discussed, in particular when the interested parties work together.

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In France, the chain of liability, initially based on the “polluter pays principle” can be simplified as following:

1. The operator of the industrial site is responsible for mastering risks; he has to prevent harm to surroundings populations and environment,
2. Per default, in particular on former industrial sites, the owner of the land is considered as the liable party.

The liable party must propose to the local administrations appropriate measures (can cover diagnosis, surveys, remediation work, residual monitoring) for preventing harms and must demonstrate the respect of objectives, in terms of reclamation objectives for environmental media (mainly soils and groundwater resources), efficiency of treatment process, deadlines ... The 2003 Law on Natural and Industrial risks has also précised who should intervene for defining the land use (and therefore the related reclamation objectives) when the site closed, and when land use will change in the future.

In particular, the two types of situation (land uses fixed by the industry or chosen by others, in particular municipalities, investors ...) will be detailed.

All the necessary information for managing contaminated land is available on our national dedicated portal (<http://www.sitespollues.ecologie.gouv.fr>). In particular, all stakeholders can find:

- legal framework documents,
- several databases:
 - Inventories of ancient industrial sites (BASIAS), know contaminated sites requiring an administrative action (BASOL)
 - Quality of Soils (BRGM, INRA, ADEME, at regional scales), and Groundwater resources (ADES-IC)
 - Hazardous substances (INERIS)
- technical guidance documents:
 - Visite of the site, diagnosis, management plans,
 - Monitoring of Groundwater resources
 - Management tools: restrictions of land use
 - Etc.
- other useful documents (such as foreign approaches in the world),
- invitation to the national information workshops (4 per year),
- training sessions,

The Examples

To illustrate how to proceed with Soil Contamination, Waste Landfills, Mining activities impacts and risks within a French and International contextes, several examples will be presented:

- Soil Contamination : Emailleries de Strasbourg,

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- Waste Landfill : Brest municipal waste landfill,
- Mining activities (either France, India, Republic Dominicana, Roumania)