Chapter 6

Management of Contaminated Sites

6. Management of Contaminated Sites

6.1 Current Conditions

6.1.1 Definition

The term “contaminated site” is not legally defined in Romania. What we call soil-contaminated sites or contaminated sites in this study is basically hazardous waste deposits and storage sites where hazardous substances present in the waste material have contaminated soil and groundwater. Contamination by toxic substances has been generally generated after a past activity of the waste deposit, but it can also be generated by a continuing activity in the present. The core problem of management of contaminated sites lies in how to control pollution generated by past activities of hazardous waste dumping and handling. The term “historical contaminated sites” is sometimes used in this JICA report in order to designate contaminated sites with past activity. The term "orphan contaminated sites" is also used in this JICA report for contaminated sites, generally historical sites, with no liable and accountable polluter to take the necessary measures of investigation, remediation, or cleanup. The term “orphan sites” is commonly used in EU reports, besides other terms like “abandonnes sites” for example.

There are however additional types of contaminated sites that should be included in the definition, although they do not strictly belong to the hazardous waste deposits category, in order to establish a policy of management of contaminated sites in Romania. Old industrial sites, waste dump sites, underground storage sites, and spill of toxic substances on ground are all potential sources of pollution of soil and groundwater by hazardous substances and should be considered in the definition of contaminated sites. Then, there are mainly 4 categories of sources of contamination that should be considered for definition of contaminated sites, with the possibility of contaminated land area around these sources due to the present or past mobility of contaminants in groundwater:

- Landfill site, including dumps or lagoons
- Storage of hazardous waste
- Accidental spill: Past leakage or recent / present spill.
- Factories out of operation after closure (abandoned factories)

The strategy and actions proposed in this Master Plan are the same for hazardous waste deposit sites and for other categories of sites involving the contamination of soil and groundwater by hazardous waste materials and substances. In each case, actions should be undertaken in order to prevent or eliminate the existing and potential damages to health and environment through unacceptable exposure to hazardous waste materials present in waste deposits and storage sites and in contaminated land and groundwater.

6.1.2 Legislation and Policy

A legal framework and policy for the management of contaminated sites needs to be established. There are however few regulations and actions in Romania that have been undertaken with direct positive effects on the management of contaminated sites. There is however no structured and explicit integrated approach to manage the problem. More particularly, the case contamination from past historical pollution sources is not addressed.

The Government Decision 162 of 20 February 2002 on the landfilling of waste is particularly significant because it implicitly gives a definition of what is a contaminated site in the specific case of hazardous waste landfill sites in operation: It is a landfill site that is in operation at the date of this Decision coming into force without having obtained the environmental permit. Such sites must be closed according to the legal procedure.

The Action program of Decision 118/2002 includes an inventory of contamination sources of surface and groundwater by hazardous substances, as presented in 6.4.4 of Volume 2. Relevance for contaminated sites issue is not sufficiently clear however. Order 756 issued in 1997 provides the soil quality values which are the present reference for decision making in case of soil and groundwater contamination in Romania. However, these values were not targeting at the management of contaminated sites at this time, and it would be necessary to establish new values and procedures in order to fit with the specific conditions of contaminated sites management.

6.1.3 Statement of Present Conditions

There are several data sources that are useful for the understanding of the contaminated sites issue: Inventory of landfills (ICIM), inventory of water hot spots (ICIM), inventory of accident hot spots (ICIM) and accident risk spots (Apele Romane), inventory of obsolete pesticides storage and dump sites (Ministry of agriculture and sylviculture), and inventories of groundwater vulnerability areas (ICIM, INMH). At the exception of the pesticides products inventory, none of them is concerned with historical waste deposit sites. Moreover, as far as they deal with pollution sources, these inventories are more concerned with the safeguarding of surface water quality rather than the protection of groundwater and soil resources.

In spite of these conditions of misunderstanding of the current conditions regarding the historical hazardous waste dump sites and the contaminated land and groundwater, there are several cases of soil pollution reported in Romania. The national State of Environment report shows that about 900,000 ha of soil are contaminated by heavy metals (Cu, Pb, Zn, Cd) and sulphur dioxide, with the typical examples of Baia Mare, Zlatna, and Copsa Mica. Of this area, the so-called excessive pollution area amounts to 200,000 ha. High levels of soil pollution are reported for Targu Mures, Turnu Magurele, Tulcea, and Zlatna. Pollution by oil and salt water from oil exploitation is considered to concern an area of about 50,000 ha. These data seem to be the results of the soil quality monitoring program based on the situation in 1992 and later to 1997, with the same figure in both cases. There is no statement or inventory of soil contaminated sites in Romania.

6.2. Issues

6.2.1 Data Management

1) Availability of Data

- Data in the field of soil and groundwater contamination are generally limited to those of compulsory monitoring at active waste landfill sites.
- There is no national database of contaminated sites with focus on potential impacts on groundwater and soil quality, and no inventory of past hazardous waste dump sites.
- There is no national statement of levels of contamination in soil and groundwater, geographical extent, environmental impacts, on-going or planned remediation actions.
- The establishment of a database will provide a better information on the hazardous waste substances which are not accounted in the waste data system managed by ICIM and give the possibility of estimating the impacts and risks for health and the environment.

2) National Inventory

- The establishment of a database system and compulsory inventory of soil contaminated sites is the most urgent and necessary action to be taken for starting the process of management of contaminated sites.
- The EPIs should be encouraged to elaborate inventories of past inactive hazardous waste dumpsites and other contaminated sites and to integrate data in the waste management plans and other official documents.
- A national inventory of contaminated sites should be initiated based on the experience obtained at county level and technical guidelines on inventory process.

3) Reporting System

- A reporting system of data relevant for inventory and follow-up of contaminated sites should be established. Reporting should be done involving local operators, local EPIs, and ICIM.
- List of data of key items for establishing the inventory database should be prepared within the scope of the inventory process.
- Information on contaminated sites should be widely diffused through local / national documents on environmental and waste management statements.

4) Registration System

- Historical hazardous waste dumpsites from past activity are not presently recorded in a specific document.
- There is no any official registration of sites referring to past activities. Registration would be a policy document with commitments like remediation and land use. It should be a specific document with possibility of integrating data of soil contaminated area in the spatial planning documents.

- The regulation for landfilling of waste has started to require the inclusion of landfills after closure in the cadastre document.

6.2.2 Scoring and Ranking System for Evaluation of Contaminate Sites

- The scoring and ranking process for evaluation of contaminated sites is based on data about contaminated site management conditions and environmental conditions. Its objective is to classify contaminated sites according to risk levels and urgency. Scoring and ranking of contaminated sites is the main aspect of inventory activity after collection of basic data.
- The MWEP has adopted a system of evaluation of priorities for planning closure of municipal landfill sites. It can be used as a methodological reference for scoring and ranking for inventory of contaminated sites.
- Ranking methods should be established at the county level before transposition at national level if necessary. The Pilot Project 4 of the JICA Study has proposed a ranking and scoring system based. The proposed system is shown in Section 7 of Volume 9 (Pilot Project 4 Documents).

Technical Notes on Scoring and Ranking of Contaminated Sites

a. In a scoring system, land and water uses related sensitivities can be linked with other factors like toxicity and quantity of contaminants, site management conditions, mobility of contaminants in groundwater and others.
b. Health protection should certainly be the point of focus in soil contaminated site management, and then risk exposure through land use and water consumption considered as the main factor for the good evaluation of scoring items and trigger concentration values in view of selection of remediation alternatives.
c. It is recommended that the scoring system as well as quality trigger concentration values should be based on both shallow groundwater and surface water which are sensitive exposure routes in case of soil contamination.
d. In the present context, the main objective of protection of groundwater quality seems to be more or less oriented toward the achievement of surface water quality objectives rather than the objective of protection of groundwater resources. Furthermore, land use sensitivity would be more significant for defining the objectives of soil cleanup than groundwater resources protection.
e. Relevant water use factors are not clearly established from the Romanian system for use in managing contaminated sites.
f. In the case of groundwater, scoring items should include vulnerability conditions, such as use for drinking water and other uses, and potential as a future resource. Groundwater vulnerability conditions are well studied by the water department of ICIM

6.2.3 Investigation

- There are very few examples of site investigation for soil and groundwater contamination
- Decision criteria for starting investigation are presently established according to Order 756, which was however not elaborated for the specific purpose of contaminated sites. A specific procedure should be set up.
- There are various legal requirements for surveys and sampling methods, but specific technical guidelines should be elaborated for investigation of contaminated sites.

6.2.4 Remediation

- There is no clear procedure of remediation in Romania
- There is no specific agency responsible to develop and control remediation works, and there is no clear legal statement of decision criteria for remediation and selection of the appropriate remediation alternatives
- There are temporary and permanent remediation measures that should be considered according to the situation and risk level. These measures should be established in technical guidelines.
- A temporary measure is to prevent exposure to/absorption of contaminated soil and groundwater, and to prevent the spreading of contamination. Taking such measure would not be necessary for sites where the risk is of acceptable level.
- Land use restriction should be considered as basic practical measure of remediation when appropriate. This approach is reasonable and adopted in several EU countries. The registration of landfills in cadastre documents is a good condition for use of land use restriction measures.

6.3 Objectives and Targets

6.3.1 Objectives

The basic objective of the strategy for management of soil-contaminated sites and more specifically historical hazardous waste dump sites is to prevent the possible health and environmental effects of past and present contamination sources of hazardous waste substances. This objective is stipulated in the environmental laws of Romania. Legal and international requirements regarding the protection of soil and groundwater quality have been overviewed in section 6.4 of Volume 2 of this JICA report. Other objectives can be summarised as follows:

- Protection of public health, through preventing unacceptable exposure levels to hazardous contaminants in soil and drinking water
- Avoidance of new soil-contaminated sites and protection of soil and groundwater

resources for future generations

- Contributing to achieve the environmental quality objectives of surface water, and to achieve international obligations of the Romanian government in the field of biodiversity preservation and prevention of ecological accidents in the Danube river (Danube river protection convention framework);
- Achievement of legislative requirements regarding the appropriate treatment and elimination of hazardous waste materials and substances for EU accession

6.3.2 Targets

- To develop a policy of management of contaminated sites (objectives, procedures, jurisdictions) through new ministerial orders and technical guidelines.
- To prevent spreading of soil and water contaminants and associated health and environmental risks from historical hazardous waste deposit sites (deposits, landfills, dumps, lagoons).
- To understand present conditions of environmental management practices and existing potential impacts on health and ecosystems of contaminated sites in Romania.
- To develop remediation measures and cleanup plans for contaminated sites that present potential high risk or damage to the population and the natural environment.

6.4. Strategy

The strategy proposed for the management of soil contaminated sites consists of the following main points:

- Start to establish a policy of management of historical waste deposit sites from identification to remediation and cleanup and strengthen institutional system for prevention of soil contamination by past inactive waste dump sites.
- Establish responsibilities of deposit sites operators and land owners as well as local and central government in case of historical and orphan sites for taking assessment and remediation measures.
- Establish county wide inventories and national inventory data base of contaminated sites.
- Establish the standards for procedures of identification, investigation, and remediation.
- Start to identify priorities for beginning a program of investigation and remediation measures and planning of cleanup in sites where urgent measures should be undertaken to reduce risk exposure (stopping the extension of contaminants).
- Enforce laws about pollution control and waste disposal and particularly the landfilling law in order to prevent any new uncontrolled hazardous waste deposits

and dumps and new potential sites of contaminated soil and groundwater.

- Raising awareness of environmental staff of MWEP and EPI as well as staff of other government agencies involved (health, industry, agriculture, local government officers) in order to promote and implement inventory activities and immediate measures of remediation for priority cases.

- Identify and implement cost effective and low cost measures for prevention of risk exposure like fencing and warning signboards and small scale land use restrictions.

The recommended actions that are listed in Table 6.4.1 aim at managing non active sites and contaminated areas in a way to eliminate or reduce environmental risk. These actions are classified according to five (5) categories and immediate, short or long term implementation. These actions are detailed in section 9.2 (actions H1 to H3).

Table 6.4.1 List of Strategic Recommendations

	Immediate term 2003	Short term 2003 - 2004	long term 2005 - 2008
1. Constitution of data base and management of data	• program of preliminary inventory of contaminated sites	• including statements in environmental statement white books and waste management plans • statement of results of implementation of the action program set up under Decision 118/2002	• national inventory of contaminated sites
2. Awareness raising and public communication	• awareness heightening program for EPI	• awareness heightening program for EPI	• making data available to the public through internet web site
3. Planning and undertaking measures	• including historical hazardous waste dumps or deposits of the company in their waste management plans	• taking appropriate monitoring measures of soil and groundwater for historical sites • proposing survey and control measures that should be undertaken as soon as possible • preliminary list of national high priority contaminated sites	• taking land use and water use restrictions measures • preparing remediation or cleanup plans and feasibility studies for the high risk priority sites
4. Upgrading technical		• preparing national technical guidelines	• study of funding system for

	Immediate term 2003	Short term 2003 - 2004	long term 2005 - 2008
capacity			financing remediation and cleanup of orphan sites
5. Legislative and institutional needs	• establishment of national working group on contaminated sites	• preparing and issuing a new ministerial order about historical contaminated sites • putting historical hazardous waste deposit sites in the task of inspection • system of approval of plans of investigation and rehabilitation • regulating the registration system of historical contaminated sites in cadastre documents • nomination of one person in charge of contaminated sites in MWEP • establishment of responsibilities of local government authorities	

Source: JICA Study Team