

## **Chapter 5**

# **Contaminated Site Survey**

## 5. Contaminated Site Survey

This Chapter consists of the following sections:

- 5.1 Outline of contaminated site surveys
- 5.2 Results of the field surveys
  - 5.2.1 Objectives of Survey
  - 5.2.2 Method of survey
  - 5.2.3 Field survey
  - 5.2.4 Outline of the survey results
  - 5.2.5 Data collected from contaminated sites visited
  - 5.2.6 Inventory of sites visited
- 5.3 JICA Questionnaire survey
  - 5.3.1 Results from the 1<sup>st</sup> Questionnaire on contaminated sites
  - 5.3.2 Results from the Questionnaire on contaminated sites
  - 5.3.3 Detailed data of the questionnaire

### 5.1 Outline of Contaminated Site Survey

JICA Study Team has conducted two types of survey for contaminated sites, i.e., field survey as explained in Section 5.1.1 and Questionnaire survey for EPIs (Environmental Protection Inspectorates under MWEP) as explained in 5.1.2.

#### 5.1.1 Field Survey

Field survey for contaminated site was carried out to know typical management conditions of hazardous waste deposit sites in Romania. The number of sites visited is 15 all together, located in 7 different counties. Naturally, contaminated sites vary in terms of type and size of contaminants, etc. We have selected some contaminated sites that are considered to be representative and/or typical in Romania.

Selection of sites was first based on information provided by the Romanian counterparts, namely MWEP, ICIM, and EPIs. 7 EPIs have provided their support for the identification and visit of sites.

The site surveys were carried out with the following procedure in general:

- To get information from counterparts on conditions of hazardous waste storage and/or contaminated sites,
- To request MWEP to make appointment to visit relevant EPIs,

- To visit EPIs and sites under EPI representatives' guidance.

### 5.1.2 Questionnaire Survey

The JICA study team has conducted the following questionnaire surveys with regard to contaminated sites:

- Questionnaire survey of general waste management conditions with a question concerning contaminated sites in the first questionnaire sent to EPIs, and
- EPIs Questionnaire survey focusing on soil-contaminated sites

The results of the first questionnaire sent to EPI have indicated that that there were 125 soil-contaminated sites belonging to 64 industrial operators and 7 geographical units after including all categories of sites at the discretion of EPIs staff.

JICA Study Team has analysed the EPIs data. As result, we estimated the number of contaminated sites in Romania was 97 all together located in 26 counties (out of 42 counties in whole Romania). Most of the soil-contaminated sites declared are dumps and landfills of industrial hazardous waste. Heavy metals and oils and petroleum products appear to be main contaminants.

The questionnaire focusing on soil-contaminated site was sent to each EPI on 26 July 2002, during the 3<sup>rd</sup> mission. The objective was to get a more complete and accurate information on the number and categories of soil-contaminated sites in the counties.

## 5.2 Results of the Field Survey

### 5.2.1 Objectives of Survey

The JICA field survey has been performed in May and June, and partly completed in July 2002. The objective of the survey was to collect data about 10 representative hazardous waste deposits and storage sites considered as contaminated sites in Romania. The list of hazardous waste deposits and storage site surveyed is shown in Table 5.2.1.

**Table 5.2.1 Contaminated Sites Visited by the JICA Study Team**

N°	Designation of sites	Counties	Source of information	Date of visits
1a	Landfill in Remetea	Sibiu	MWEP	30 May 2002
1b	Temporary storage in Sura Mica			
2a	Temporary storage in Pata Rat	Cluj	MWEP	31 May 2002
2b	Temporary storage in Turda			
2c	Temporary storage in Somes Dej			
3a	Temporary storage in Filiasi	Dolj	ICIM EPI	7 June 2002
3b	Thermal power plant in Craiova			
4a	Landfill in Ramnicu-Valcea	Valcea	MWEP	13 June 2002

4b	Landfill in Govora	Valcea	EPI	14 June 2002
4c	Temporary storage in Bujoreni			
5a	Dump lagoons in Campina	Prahova	MWEP	18 June 2002
5b	Dump lagoons in Ploiesti	Prahova	EPI	19 June 2002
5c	Landfills in Valea Calugareasca			
6a	Landfills in Zlatna	Alba	MWEP	24 June 2002
7a	Landfill in Tirveni	Mures	EPI	25 June 2002

The data collected from these sites have been used to evaluate such conditions like:

- Awareness and present knowledge of the problem
- Management conditions
- Potential impacts on environment and health

### 5.2.2 Method of Survey

The selection of the sites for observation by the JICA study team has been made on an empirical basis because of the absence of a pre-existing inventory in Romania. The selection of sites was done after discussion counterparts of the MWEP, ICIM, and EPIs. Several EPI agencies have provided their support for the identification and visit of sites. The number of sites visited was finally set at 15, located in 7 different counties.

The sites have been selected be as much as possible representative of contaminated sites in Romania in terms of hazardous waste materials of concern and categories of contaminated sites (Tables 5.2.2 and 5.2.3). Few of them are however not concerned with hazardous waste (3b, 4b, 5c and 6a), but they have been considered because of their potential hazardous consequences on water contamination. Among the categories of contaminated sites, historical waste deposits with no present activity are not represented. Most of the selected sites are known as major pollution sources in Romania.

**Table 5.2.2 JICA Team Survey on Contaminated Sites / Categories of Sites**

Categories of contaminated sites	1a	1b	2a	2b	2c	3a	3b	4a	4b	4c	5a	5b	5c	6a	7a
Temporary storage of hazardous waste (potential of contamination)		x	x	x	x	x				x					
Dumping / landfilling of industrial / hazardous waste (potential of contamination)	x						x	x	x		x	x	x		
Deposit of mining slag materials (potential of contamination)														x	
Old industrial site (potential of contamination)															
Soil contamination from accidental leakage											x	x			
Soil contamination from historical industrial activity / dumping activity								x			x	x	x		x

**Table 5.2.3 JICA Team Survey on Contaminated Sites / Hazardous Waste Substances**

Category of hazardous substances	1a	1b	2a	2b	2c	3a	3b	4a	4b	4c	5a	5b	5c	6a	7a
Metallic and equivalent inorganic compounds	x		x	x	x	x							x	x	x
Oils and petroleum products	x										x	x			
Aromatic compounds	x										x	x			
Chlorinated hydrocarbons						x		x							
Pesticides		x	x	x	x					x					
Ash residues and dust							x								
Other waste materials									x						

### 5.2.3 Field Visits

The principle of visits was:

- To discuss the survey objective with EPI and get recommendation about the most appropriate sites
- To get information about environmental conditions of the county under the EPI jurisdiction
- To visit the sites recommended, including discussion with the persons in charge and field observation

The main questions related to the visit of contaminated sites have been focusing on:

- Site description (site, surface area, operation, etc.)
- Waste description (types, quantities)
- Conditions of storage (containers, control of access, security, protection of facility)
- Organisation for environmental management
- Monitoring
- Assessment studies (of geographical extension of contamination and impacts)
- Measures taken for improvement of conditions (prevention of impacts, remediation of site)

The main questions related to the visit of EPIs have been focusing on:

- Major environmental issues in the field of industrial waste
- Inventory of contaminated sites and major contaminated sites in the county
- Studies for understanding of soil contamination conditions and issues

### 5.2.4 Outline of the Survey Results

The main issues raised by the survey have been summarised in Table 5.2.4. More

detailed information about sites is provided in the following section. The data collected from these sites have been used to evaluate such conditions like:

- Awareness and present knowledge of the problem
- Management conditions
- Potential impacts on environment and health

The EPI officers are aware of soil and groundwater contamination risk from sites which are managed under authorisation license and are known as major pollution sources, like those visited. Smaller pollution sources and particularly those generated by old activities are generally not known or considered as no existing in the county. Officers are however less aware of the specificity of the contaminated sites problem considered from the point of view of soil contamination, which affects subsurface soil and shallow groundwater. Historical waste dumps and particularly the non-active orphan dumps are even not given attention. Then, the issue of soil and groundwater pollution and the consequent potential risk are not known.

All holders of the sites visited are looking for expertise and technical assistance for finding out durable solutions against extension of contamination from the pollution source. The lack of financial resources and the need of receiving a fund for cleansing or containment have been stressed, especially in sites which are state owned, which is largely the case in those visited.

**Table 5.2.4 Characterisation of Sites According to Key Evaluation Items**

Evaluation items	1a	1b	2a	2b	2c	3a	3b	4a	4b	4c	5a	5b	5c	6a	7a
Measures to control the site (accesses)	x	x				x		x		x		x			
Land use restrictions around the site area															x
Monitoring network for soil quality			x	x	x										
Monitoring network for groundwater quality								x	x		x	x			x
Evaluation studies of contamination extension								x							x
Evaluation studies of impacts of contamination															
Prevention measures taken to minimise impacts	x	x				x	x	x	x	x		x		x	x
Plans to improve site environmental conditions															
Information to the public								x			x				

In case of measures undertaken: x

### (1) Measures To Control the Site

The measures taken to control accesses to the site are generally minimal, specially in the case of historical sites. Fencing is often lacking and not considered as a priority task. Permanent or regular control of sites by guardsmen is more common. Most hazardous waste like PCB and pesticides are stored in better conditions from the point of view of restriction of accesses.

### (2) Land Use Restrictions Around the Site Area

Only the site of Tirveni (7a) gives an example of measure taken for restriction of land use in the contaminated area. In this case, the site owner has purchased plots of

contaminated land to the farmers in order to avoid agricultural use and possible conflict. In the contaminated area around the Oltchim complex, it seems that there is informal restriction of use in the contaminated area by the restriction of housing development. According to EPI, the municipality did not take however clear measures to restrict land use. It seems that the potentially contaminated areas around the sites visited are already used for urban or agricultural purpose, and applying restriction rules is not possible.

### **(3) Monitoring Network for Groundwater Quality**

Monitoring groundwater quality around the contaminated sites is a general practice made according to the compliance document agreed between the site owner and the EPI office. The number of monitoring wells is in general limited in 1 or 2 points. Measured parameters are more or less complete according to the sites and possibilities of laboratory analyses.

### **(4) Monitoring Network for Soil Quality**

There is no monitoring system of soil quality around the contaminated sites. Soil quality measurements are generally done within the scope of studies like environmental audits.

### **(5) Evaluation Studies of Contamination Extension**

There are few studies made in order to evaluate the extension of soil contamination. This is generally done through the performance of environmental audits by the owners of the pollution source. However, there is no systematic or integrated study of contaminated area around the pollution sources. Then, in the best cases, the contaminated area is known according to individual case by case studies, like in Prahova and Mures for example.

### **(6) Evaluation Studies of Impacts of Contamination**

The evaluation of impacts and measures to prevent or minimise impacts is done through environmental audits. Several site owners have been required to perform a risk assessment study in addition to the basic studies. These studies are generally not specific to the contaminated sites, but concern the entire activity of the facility. In most cases, a monitoring activity is performed in compliance with EPI requirements after approval of environmental authorisation.

### **(7) Prevention Measures Taken to Minimise Impacts**

It seems that the shift from contaminated to safe water resources is the main and most common measure implemented in order to prevent sanitary impacts of contaminated sites. In the Oltchim area, former groundwater resources once contaminated have been replaced with upstream surface water resources through a centralised water supply systems. Accordingly, the contaminated sites visited seem not to be a source of sanitary impacts through water consumption. Other types of measures undertaken to mitigate the potential impacts of contaminated sites are those consisting into the prevention of extension of contamination. In the case of sites still in operation, they are mostly related to facilities for the good storage of hazardous substances or appropriate conditions of landfilling. In the case of historical sites, the lack of financial resources and the absence of plan to clean-up or confine the contaminated sites makes prevention measures almost inexistent.

## **(8) Plans to Improve Site Environmental Conditions**

Several site owners consider the possible measures to improve site conditions, like greening or improving the morphological stability of landfills. It seems that there is however no clear plan set up to implement such objectives in the sites visited.

## **(9) Information To the Public**

Information to the public is not considered as a priority. None of the sites owners met by the JICA study team has made an annual environmental report toward the general public. EPI offices are the main intermediates for delivering information through its public relations units. The direct involvement of sites owners to inform the public about their industrial activities and management of the environment is almost inexistent. One exception is the site 5a, where geographical location inside the urbanised area makes such action a priority.

All site owners and EPI officers have however underlined that there is no sensitive public opinion around the contaminated sites visited, at the exception of site 5a. Furthermore, they have underlined that the population of concern was generally strongly dependent on the industrial activities of the site owners from the economical point of view. Among the set of sites visited and according to EPIs explanations, there was no example of complaint about environmental nuisance addressed by the people to the local authorities.

The need to heighten the visibility of contaminated sites by the use of signboards is generally not perceived. Even in the site 5a which is close to the residents, there is neither systematic signboard system nor fencing of the dumping sites.

### **5.2.5 Data Collected from Contaminated Sites Visited**

This section provides a description of visited main contaminated sites during the JICA survey. The sites of concern are:

- Zlatmin S.A. Zlatna (Alba county)
- Pata Rat (Cluj county)
- Turda (Cluj county, 3 different sites)
- TMD-TMS (Craiova county)
- Thermal power plant (Craiova county)
- Tarnaveni (Mures county)
- Remetea (Sibiu)
- Sura Mica (Sibiu)
- Steaua Romana (Prahova)
- Astra Romana (Prahova)
- Romfosfochim (Prahova)
- Oltchim (Valcea)



Govora (Valcea)

Bujoreni (Valcea)

Each site is reviewed according to a list of key items for the understanding of the conditions of management of the hazardous waste deposits or storage and the environmental conditions. Information sources are mainly the discussion with EPI inspectors and staff and sites managers. The items of description are as follows:

### **BACKGROUND INFORMATION**

1. Site description
2. Designation of the site of concern
3. Category of site
4. Administrative location (County)
5. Geographical location (roads, morphology, landmarks, etc.)
6. Site land use conditions
7. Surveying conditions
8. Date / period of survey
9. Name / position of interlocutors (EPI and sites)
10. Information source about the site
11. Site activity
12. Type of present activity (factory, dump, others)
13. Starting year of activity, modifications of process
14. Period of activity of pollution source (storage, dump, etc.)
15. History of use of the site (old waste)
16. Environmental management unit
17. Pollution control level (facilities, certification, etc.)

### **POLLUTION SOURCE**

1. Background
2. Category of contaminated site
3. Waste ownership: Waste generator known or unknown
4. Land ownership: Owner of site known or unknown
5. Surface area
6. Person in charge of follow-up of site, maintenance, control
7. Number of people employed
8. Period of use (date of starting / stopping use)
9. Present conditions of use (storage activity)
10. Hazardous Waste and Substances
11. Types of waste and substances
12. Quantities
13. Equipment and Facilities
14. Containment of waste
15. Prevention of leakage and spills (equipment)
16. Quality statement of facilities
17. Prevention of fire and accidents
18. Control of accesses to the site (gatehouse, fencing)
19. Site identification signboards
20. Impacts Prevention
21. Emergency plan

22. Plan to improve environmental protection
23. Plan to clean-up the site

### **CONTAMINATED AREA**

1. Monitoring
2. Monitoring soil and groundwater
3. Sampling frequency
4. Parameters
5. Laboratory facility
6. Assessment
7. Establishment of a site evaluation fiche (EPI, municipality)
8. Inclusion of the site in inventory document (EPI, municipality)
9. Evaluation of contamination level and extension area
10. Evaluation of impacts on physical environment
11. Evaluation of impacts on health
12. Protection Measures
13. Urgency measures taken for security, environment, health
14. Prevention of leakage and spills from the site
15. Prevention of damage to the storage site
16. General conditions of storage
17. Restriction of use of the land area
18. Remediation Measures
19. Plan to improve conditions of environmental protection
20. Plan to clean-up the site

### **PUBLIC AWARENESS**

1. Communication with the public (EPI, companies)
2. Access to information (documents, internet)
3. Public opinion concerning the site (media)
4. Environmental protection NGOs
5. Complaints from neighbourhood residents

### **PHYSICAL ENVIRONMENT**

1. Land use and land use plan
2. Distance between site and housing zone
3. Distance between site and river
4. Distance between site and facilities
5. Distance between site and nature protection area
6. Slopes, morphology
7. Watershed area and hydrographic system
8. Surface water quality (class of river)
9. Other pollution sources near the site
10. Flood patterns
11. Depth of groundwater table
12. Groundwater quality

### **SOCIAL ENVIRONMENT**

1. Socio-economic data
2. Population
3. Population density

4. Sensitive population near the site
5. Sanitation
6. Main water uses (agriculture, industry, domestic),
7. System of supply (municipal, private wells),
8. Water sources (surface water, shallow wells, deep wells)
9. Water resources: Availability / scarcity / potential
10. Public Health and Welfare
11. Public health conditions
12. Welfare, quality of life
13. Landscape and amenities
14. Livelihood, local resources
15. Human settlements and housing

1. BACKGROUND INFORMATION	Zlatmin S.A. Zlatna (Alba county)	Pata Rat (Cluj county)
<b>Site description</b>		
Designation of the site of concern	<b>Landfill of ZLATNA</b>	Temporary storage of Pata - Rat - Cluj
Category of site	Deposit of mining materials; Settling lagoons; closed and in operation	Lagoon of hazardous wastes
Administrative location (County)	Zlatna city, Alba county	Cluj, Cluj District
Geographical location (roads, morphology, landmarks, etc.)	Valea Mica, along the Ampoi river	15 km from core city on an unimproved road (Someseni road)
Site land use conditions	A: Stock pile next to the plant B,C: Landfill 2.5 Km from the plant	Hill area, near Pata river (effluent of Somes river)
<b>Surveying conditions</b>		
Date / period of survey	June 24 <sup>th</sup> , 2002	May 31 <sup>st</sup> , 2002
Name / position of interlocutors (EPI and sites)	Mr. Dumitru Clepan, Chief Inspector Alba EPI Mr. Marius Barbat, Agex Eco private company Mrs. Poputa Gabriela, Abrud mines Mr. Pop – Chief engineer of Zlatmin S.A. Zlatna	Mr. Marian Proorocu – Chief Inspector Cluj EPI Mrs. Mihaela Beu – Chief commissar Cluj EPI Mr. Costa Stanisav – Inspector Cluj EPI
Information source about the site	Annual environmental statement report of Alba EPI 1 map of location of vulnerable mining areas in the county	Annual Environmental statement report – 2001
<b>Site activity</b>		
Type of present activity (factory, dump, others)	Mining extraction (Hanes mine) of heavy metals (Cu, Zn, Pb)	Disposal of municipal wastes – in the vicinity
Starting year of activity, modifications of process	1820	
Period of activity of pollution source (storage, dump, etc.)	1920	1971
History of use of the site (old waste)	Agricultural use	Municipal dump site
Environmental management unit	No environmental unit; responsible in charge with labor safety and environmental protection	
Pollution control level (facilities, certification, etc.)	2 sampling points, upstream and downstream; monthly sampling for heavy metals parameters, for inlet (water supply to plant) and outlet (after lagoon discharge)	Not certified

<b>2. POLLUTION SOURCE</b>		
<b>Background</b>		
Category of contaminated site	Disposal site of mining processing waste (suspended solids resulted from flotation process of metals based mineral ore) A: piling on land B,C: landfilling on valley floor	Temporary storage of hazardous wastes
Waste ownership: Waste generator known or unknown	Zlatmin S.A.	TERAPIA S.A. Cluj
Land ownership: Owner of site known or unknown	Public property (stateowned)	TERAPIA S.A. Cluj
Surface area	A:1 old disposal site – 7 ha (closed) B:1 disposal site in operation – 5.6 ha C:1 new disposal site – 1.7 ha	0.9 ha
Person in charge of follow-up of site, maintenance, control	Chief engineer	SALPREST S.A. representative
Number of people employed	300 employees	
Period of use (date of starting / stopping use)	20 years from now on	Factory in operation
Present conditions of use (storage activity)	Storage activity takes place at present on the old lagoons and after a certain level is met will continue into the new one as well	Chemical smell
<b>Hazardous Waste and Substances</b>		
Types of waste and substances	Waste waters from metal ores flotation process containing heavy metals as suspended solids (1:5)	Sludge from WWTP, spent carbon, exchange ion resins
Quantities	1 closed disposal site – 3.78 mil tones 1 disposal site in operation – 1.5 mil tones 1 new disposal site – 322.000 tones; final capacity = 3 mil tones	5500 t/year
<b>Equipment and Facilities</b>		
Containment of waste	Heavy metals in traces (Cu, Zn, Pb and small amounts of Au)	Sludge from effluent decontamination, spent carbon, ion exchange resins
Prevention of leakage and spills (equipment)	Dams built upstream the confluence along Ampoi river; surrounding walls at each lagoon	Clay layer
Quality statement of facilities	Risk of walls failure	Natural bottom lining
Prevention of fire and accidents	No special equipment	No equipment
Control of accesses to the site (gatehouse, fencing)	No fencing or gatehouse	No fencing
Site identification signboards	None	Yes

<b>Impacts Prevention</b>		
Emergency plan	None	No emergency plan
Plan to improve environmental protection	Waste water treatment plant for waste water discharged from the lagoons; forecasted for 2005	No
Plan to clean-up the site	None	No
<b>3. CONTAMINATED AREA</b>		
<b>Monitoring</b>		
Monitoring soil and groundwater	Not on a regular basis for soil monitoring; Ground water and Ampoi river water monitoring is performed up and downstream	Monitoring wells
Sampling frequency	Monthly basis	On a quarterly basis
Parameters	Heavy metals	Usual physico-chemical parameter
Laboratory facility	Alba EPI laboratory and Zlatmin laboratory	“Apele Romane” laboratory
<b>Assessment</b>		
Establishment of a site evaluation fiche (EPI, municipality)	Alba EPI includes the site evaluation within the annual state of environment report	EPI Cluj environmental reports
Inclusion of the site in inventory document (EPI,municipality)	Alba EPI includes the site into the annual inventory of wastes and disposal sites submitted to ICIM and MoWEP	Waste data base at EPI & ICIM
Evaluation of contamination level and extension area	Contamination level is rather qualitative than quantitative; no existing studies for soil contamination or groundwater quality	Soil and underground water contamination with organic compounds, ammonium and cyanide
Evaluation of impacts on physical environment	Environmental audit (level2) for the entire activity of Zlatmin, including the lagoons as well; risk assessment studies for disposal sites as well as soil stability study required by EPI compliance program	Impact on air, soil and shallow water
Evaluation of impacts on health	No evaluation	No study on health assessment
<b>Protection Measures</b>		
Urgency measures taken for security, environment, health	No urgency measures	No
Prevention of leakage and spills from the site	Survey of lagoon walls stability	no
Prevention of damage to the storage site	Permanent observation on site and periodical inspection of Alba EPI inspector	No
General conditions of storage	Stable conditions; in the lagoon site, there is illegal operating municipal dumping of waste	Not secure
Restriction of use of the land area	No restriction	No

<b>Remediation Measures</b>		
Plan to improve conditions of environmental protection	Compliance program established with Alba EPI for the entire activity	Ecological disposal site for industrial wastes – elaboration of the feasibility study
Plan to clean-up the site	None	Included into the compliance program
<b>4. PUBLIC AWARENESS</b>		
Communication with the public (EPI, companies)	Statements or press release on general issues or regarding the industrial sector	Not on an usual basis
Access to information (documents, internet)	At EPI premises	EPI Cluj public relation office
Public opinion concerning the site (media)	The entire Zlatna area is exposed to the public interest	-
Environmental protection NGOs		-
Complaints from neighbourhood residents	SO2 emission from Smelting Plant, Ampellum	No
<b>5. PHYSICAL ENVIRONMENT</b>		
Land use and land use plan	Residence with industry North side – Smelting plant East side – hillside across river Ampoi South side – farm field West side - hillside	Municipal disposal site
Distance between site and housing zone	1 Km	1 km from a gypsy community
Distance between site and river	200 m	500 m
Distance between site and facilities	500m; 2.5 Km	12 km
Distance between site and nature protection area	200 m	Not exist in neighbour
Slopes, morphology	Hill area, forestry	Clay
Watershed area and hydrographic system	Ampoiului river (goes to Mures river)	Somes (small river Pata)
Surface water quality (class of river)	Class I – 18 Km (upstream Zlatna) Class II – 39 Km (downstream Zlatna) ; permanent contamination with heavy metals and non-biodegradable suspended solids; for 10 km downstream Zlatna city is biologically dead	Class II
Other pollution sources near the site	Slag and ash disposal site from AMPELLUM S.A. Zlatna (metallurgical activity); air emissions with SOx and suspended solids	Municipal disposal site Pata Rat
Flood patterns	Frequent floods in Zlatna area	No
Depth of groundwater table	2 – 2.5 m	5 m
Groundwater quality	Nitrates and nitrites contamination	Contaminated with organic pollutants

<b>6. SOCIAL ENVIRONMENT</b>		
<b>Socio-economic data</b>		
Population	9 068	326.017 inhabitants
population density		108.46 loc/km <sup>2</sup>
sensitive population near the site	Zlatna city; area between Izvorul Ampoiului (at NW) and Alba Iulia (at SE)	Gypsy community (temporary houses)
<b>Sanitation</b>		
Main water uses (agriculture, industry, domestic), system of supply (municipal, private wells),	Industry Municipal network; 80% of private wells are contaminated with nitrates and nitrites	Industry, domestic Municipal
water sources (surface water, shallow wells, deep wells)	Surface water and underground water	Surface water (Gilau reservoir); underground water
Water resources: Availability / scarcity / potential	No studies carried out regarding possible water resources	Somes river
<b>Public Health and Welfare</b>		
Public health conditions	Poor	Good
Welfare, quality of life	Poor	Good
Landscape and amenities	Soil erosion and dead vegetation due to acid rains;	Hill area
Livelihood, local resources	Mineral ores (gold, metals)	industry
Human settlements and housing	Zlatna is located in the immediate neighbourhood of the metallurgical plant and mining area	Urban area



<b>1. BACKGROUND INFORMATION</b>	<b>Turda (Cluj county)</b>	<b>Turda (Cluj county)</b>	<b>Turda (Cluj county)</b>
<b>Site description</b>			
Designation of the site of concern	Temporary storage of Turda and neighbourhood	Temporary storage of Turda and neighbourhood	Temporary storage of Turda and neighbourhood
Category of site	Historical waste disposal sites	Historical waste disposal sites	Historical waste disposal sites
Administrative location (County)	Turda, Cluj district	Turda, Cluj district	Turda, Cluj district
Geographical location (roads, morphology, landmarks, etc.)	DN1, Km 440 to Alba Iulia, near Mihai Viteazu village	A. Posta – Rat – Forestry Department B. Municipal Stadium (backyard)	A. Batal Aries B. Cement Factory
Site land use conditions	Hill area, cultivated land	River terrace, floodplain of Aries (both sides of the river) Cow pasture with pine trees	Barren wasteland along Aries river
<b>Surveying conditions</b>			
Date / period of survey	May 31 <sup>st</sup> , 2002	May 31 <sup>st</sup> , 2002	May 31 <sup>st</sup> , 2002
Name / position of interlocutors (EPI and sites)	Mrs. Cecilia Onaca – Head of Environmental department of Turda Mayoralty Mrs. Mihaela Beu - Chief commissar Cluj EPI Mr. Isaia Magyar – Waste management department Cluj EPI	Mrs. Cecilia Onaca – Head of Environmental department of Turda Mayoralty Mrs. Mihaela Beu - Chief commissar Cluj EPI Mr. Isaia Magyar – Waste management department Cluj EPI	Mrs. Cecilia Onaca – Head of Environmental department of Turda Mayoralty Mrs. Mihaela Beu - Chief commissar Cluj EPI Mr. Isaia Magyar – Waste management department Cluj EPI
Information source about the site	Annual Environmental statement report – 2001	Annual Environmental statement report – 2001	Annual Environmental statement report – 2001
<b>Site activity</b>			
Type of present activity (factory, dump, others)	Cultivated with corn Smell of chemicals	Cow pasture	Disposal site of various wastes
Starting year of activity, modifications of process			
Period of activity of pollution source (storage, dump, etc.)	Until 1993	Until 1993	Until 1993
History of use of the site (old waste)	Agricultural land	pasture	Agricultural land
Environmental management unit			
Pollution control level (facilities, certification, etc.)	No certification	No certification	No certification

<b>2. POLLUTION SOURCE</b>			
<b>Background</b>			
Category of contaminated site	Temporary storage of hazardous wastes	Temporary storage of hazardous wastes	Former disposal site of Turda Chemical Factory (UCT); Industrial disposal site of Cement factory
Waste ownership: Waste generator known or unknown	Former Turda Chemical factory presently divided and privatized;	Former Turda Chemical factory presently divided and privatized;	Former Turda Chemical factory presently divided and privatized;
Land ownership: Owner of site known or unknown	Mayoralty of Mihai Viteazu	Turda city Local Council	A. Former Turda Chemical factory presently divided and privatized; B. Cement Factory
Surface area	Unclear boundary; 5,000 m <sup>2</sup>	Unclear boundary; mostly spot dumping –	Within construction waste landfill B. unclear boundary
Person in charge of follow-up of site, maintenance, control	Turda municipality – environmental department	Turda municipality – environmental department	Cement factory representatives
Number of people employed			
Period of use (date of starting / stopping use)	Factory has produced HCH between 1954 - 1983	Factory has produced HCH between 1954 - 1983	A. Factory has produced HCH between 1954 – 1983 B. Cement factory in work
Present conditions of use (storage activity)	Buried with soil, some excavated pit (HCH exposure)	Buried in spotted points, cow pasturage, several dead trees	Disposal site and sludge lagoon
<b>Hazardous Waste and Substances</b>			
Types of waste and substances	HCH from LINDAN manufacturing	HCH from LINDAN manufacturing	HCH, industrial wastes
Quantities	7500 m <sup>3</sup>	10,000 m <sup>3</sup>	A: 8,000 m <sup>3</sup> B: 24,000 m <sup>3</sup>
<b>Equipment and Facilities</b>			
Containment of waste	α- and β- isomers of HCH; max conc. 815734 mg/Kg-soil	α- and β- isomers of HCH; max conc. 345366 mg/Kg-soil	Slag, silica carbide; sludge demolition wastes
Prevention of leakage and spills (equipment)	Clay layer thickness Deposit: 1.5 m Covering: 0.3 – 0.5 m		Layer thickness deposit: A – 2 m B – 3 m Covering A: 0.3 – 0.5 m

Quality statement of facilities	Covered with gravel and earth; HCH illegal extraction and trade by the population; Covered with corn (partially)	Natural covered by soil and vegetation	Uncontrolled dump site
Prevention of fire and accidents	None	None	none
Control of accesses to the site (gatehouse, fencing)	No fencing	No fencing	No fencing
Site identification signboards	Yes	Yes (poisoning substances)	Yes
<b>Impacts Prevention</b>			
Emergency plan	Monitoring of the storage area by Turda municipality, Cluj EPI and Police department	Monitoring of the storage area by Turda municipality, Cluj EPI and Police department	Monitoring of the storage area by Turda municipality, Cluj EPI and Police department
Plan to improve environmental protection	Covering with soil and gravel;	No	No
Plan to clean-up the site	Various options: : Incineration, biological treatment, ecological reconstruction and transfer of the HCH wastes into a single secured disposal site	Various options: : Incineration, biological treatment, ecological reconstruction and transfer of the HCH wastes into a single secured disposal site	No
<b>3. CONTAMINATED AREA</b>			
<b>Monitoring</b>			
Monitoring soil and groundwater	No	No	No
Sampling frequency	Occasional	Occasional	
Parameters	HCH specific test	HCH specific test	
Laboratory facility	Specialised labs	Specialised labs	
<b>Assessment</b>			
Establishment of a site evaluation fiche (EPI, municipality)	EPI Cluj environmental reports Turda municipality – environmental department	EPI Cluj environmental reports Turda municipality – environmental department	EPI Cluj environmental reports Turda municipality – environmental department
Inclusion of the site in inventory document (EPI,municipality)	Waste data base at EPI & ICIM	Waste data base at EPI & ICIM	Waste data base at EPI & ICIM
Evaluation of contamination level and extension area	Pollution of soil, water and vegetation (according to the study carried out by the Institute of Hygiene in Cluj and the environmental audit)	Pollution of soil, water and vegetation (according to the study carried out by the Institute of Hygiene in Cluj and the environmental audit)	Pollution of soil, water and vegetation (according to the study carried out by the Institute of Hygiene in Cluj and the environmental audit)

Evaluation of impacts on physical environment	Impact on air, soil, vegetation	Impact on air, soil, vegetation, water and shallow water	Impact on air, soil, vegetation, water and shallow water
Evaluation of impacts on health	No specific studies carried out on this subject;	No specific studies carried out on this subject; NAPOLACT Cluj (diary factory) complains about the content of HCH active substance found in milk	No specific studies carried out on this subject;
<b>Protection Measures</b>			
Urgency measures taken for security, environment, health	Monitoring of the storage area by Turda municipality, Cluj EPI and Police department	Monitoring of the storage area by Turda municipality, Cluj EPI	Monitoring of the storage area by Turda municipality, Cluj EPI
Prevention of leakage and spills from the site	No	No	No
Prevention of damage to the storage site	Covering with soil and gravel	Natural covering with soil and pasture	Natural covering with soil
General conditions of storage	Not secure	Not secure	Not secure
Restriction of use of the land area	No	No	No
<b>Remediation Measures</b>			
Plan to improve conditions of environmental protection	Pre-feasibility study carried out by MINESA S.A. – Mining Research and Design Institute in order to find the optimum solution for ecological remediation;	Pre-feasibility study carried out by MINESA S.A. – Mining Research and Design Institute in order to find the optimum solution for ecological rehabilitation;	Organization of the sterile disposal site of SC HOLCIM – Cimentul S.A. Turda (looking for financing)
Plan to clean-up the site	Proposal for a Governmental decision for providing the necessary funds to secure the HCH disposal sites	Proposal for a Governmental decision for providing the necessary funds to secure the HCH disposal sites	Included into the compliance program
<b>4. PUBLIC AWARENESS</b>			
Communication with the public (EPI, companies)	No	No	No
Access to information (documents, internet)	EPI Cluj public relation office	EPI Cluj public relation office	EPI Cluj public relation office
Public opinion concerning the site (media)	-	Complains from NAPOLACT diary factory	-
Environmental protection NGOs	-	-	-
Complaints from neighbourhood residents	No	No	No

<b>5. PHYSICAL ENVIRONMENT</b>			
Land use and land use plan	Farm North – downhill toward city area East – farm field South – farm field West – farm field across road DN1	Cow pasture North – hilly terrain East – hilly terrain South side – Aries river, farm field West – farmers house	Industrial and commercial area North – alongside of Aries river, city core East – factories South – farm field with several shops West – farm field across DN1 road
Distance between site and housing zone	About 4 km	About 1 km	About 1 km
Distance between site and river	Aries river, 1 km north	Aries river runs along the south side	Next to Aries river
Distance between site and facilities	-	-	Next to the factory
Distance between site and nature protection area	Not exist in neighbour	Not exist in neighbour	Not exist in neighbour
Slopes, morphology	Cultivated soil, clay		
Watershed area and hydrographic system	Aries river	Aries river	Aries river
Surface water quality (class of river)	Class II	Class II	Class II
Other pollution sources near the site	No	No	No
Flood patterns	No	No	No
Depth of groundwater table	10 m	4-6 m	4-6 m
Groundwater quality	Possible contamination	Possible contamination	No evaluation
<b>6. SOCIAL ENVIRONMENT</b>			
<b>Socio-economic data</b>			
Population	61.931 inhabitants	61.931 inhabitants	61.931 inhabitants
population density			
sensitive population near the site	No	Yes	no
<b>Sanitation</b>			
Main water uses (agriculture, industry, domestic),	Industry, domestic, agriculture	Industry, domestic, agriculture	Industry, domestic, agriculture
system of supply (municipal, private wells),	Municipal	Municipal	Municipal
water sources (surface water, shallow wells, deep wells)	Underground water, surface water (Hasdate river)	Underground water, surface water (Hasdate river)	Underground water, surface water (Hasdate river)
Water resources: Availability / scarcity / potential	Underground water and surface water	Underground water and surface water	Underground water and surface water
<b>Public Health and Welfare</b>			
Public health conditions	Good	Good	Good
Welfare, quality of life	Good	Good	Good

Landscape and amenities	Hill area	Hill area	Hill area
Livelihood, local resources	Industry, farming	Industry, farming	Industry, farming
Human settlements and housing	Urban area	Urban area	Urban area

<b>1. BACKGROUND INFORMATION</b>	<b>TMD-TMS (Craiova county)</b>	<b>Thermal power plant (Craiova county)</b>
<b>Site description</b>		
Designation of the site of concern	Temporary storage TMD – TMS factory	Thermal power plant disposal site
Category of site	<b>PCB waste storage site</b>	Ash Disposal sites
Administrative location (County)	Filiasi, Dolj county	Craiova, Dolj county
Geographical location (roads, morphology, landmarks, etc.)	Between Filiasi and Tintareni, between the road and the railway, about 3 km from Filiasi	Near Isalnita commune, DN Craiova – Tr. Severin
Site land use conditions	Inside of the plant site; A: partly covered by vegetation bushes	Valley of Jiu river
<b>Surveying conditions</b>		
Date / period of survey	June 7 <sup>th</sup> , 2002	June 7 <sup>th</sup> , 2002
Name / position of interlocutors (EPI and sites)	Mr. Ilie Leu, chief inspector of EPI Mrs. Birtu Daniela, chief of waste department	Mr. Ilie Leu, chief inspector of EPI Mrs. Birtu Daniela, chief of waste department
Information source about the site	Annual environmental statement report of EPI List of hazardous waste sites	Annual environmental statement report of EPI List of hazardous waste sites
<b>Site activity</b>		
Type of present activity (factory, dump, others)	TMD – production of motors and transformers TMC – in charge of service providing: in-site transportation, power plant operation and maintenance; management of PCB storage site	Thermal power plant
Starting year of activity, modifications of process	production of transformers and condensers before 1988; recently privatised and divided into 2 companies: TMD and TMC	1964
Period of activity of pollution source (storage, dump, etc.)	1988 – 1992	1964 and 1967 – to date
History of use of the site (old waste)	Industrial site	Located in Jiu river bed; Originally marshes
Environmental management unit	TMC – general director	-
Pollution control level (facilities, certification, etc.)		Environmental permit
<b>2. POLLUTION SOURCE</b>		
<b>Background</b>		
Category of contaminated site	Temporary storage of hazardous wastes	Landfilling of industrial wastes
Waste ownership: Waste generator known or unknown	TMC	Craiova thermal power plant
Land ownership: Owner of site known or unknown	TMC	Craiova thermal power plant
Surface area	200 - 250 sq m	2 disposal sites of about 1.2 million sq m surface each

Person in charge of follow-up of site, maintenance, control	Mr. Constantin Firoiu, TMC General director	-
Number of people employed	TMD – 760 employed persons TMC – 127 employed persons	-
Period of use (date of starting / stopping use)	1988 - 1992	1964 – to date
Present conditions of use (storage activity)	2 storage sites, 100 m distance each other: A: PCBs liquid wastes; 2 steel cylindrical tanks (50 m <sup>3</sup> + 65 m <sup>3</sup> ) with concrete receiver and roof (corrugated iron sheet) B: condensers containing PCB; 6 steel containers and 5 empty vessels (autoclave) in steel/concrete enclosure, metal roof	Disposal at both sites is going to be closed soon
<b>Hazardous Waste and Substances</b>		
Types of waste and substances	PCBs	Ash generated by boiler
Quantities	A: 100 t B: 40 t	0.9 million tones/year
<b>Equipment and Facilities</b>		
Containment of waste	A: PCBs containing liquid (>50 ppm) B: condensers including PCBs containing liquid	Flying ash containing metals
Prevention of leakage and spills (equipment)	A: basins in concrete for waste containers; old roof, now partly damaged; area is closed by a 1m high earth levee (partly damaged) B: new roof structure; floor made in concrete; no water drainage system	Concrete bottom lining
Quality statement of facilities	good	Fine particles blown by the wind
Prevention of fire and accidents	No	No
Control of accesses to the site (gatehouse, fencing)	Access is closed by a high fence and locked with door	No fence
Site identification signboards	A: containers are identified with old paper sheets describing the contents; no warning signs B: warning sign on gate	no
<b>Impacts Prevention</b>		
Emergency plan	yes	yes
Plan to improve environmental protection	Not for the moment	Included into the compliance program
Plan to clean-up the site	Not applicable	Not applicable



<b>3. CONTAMINATED AREA</b>		
<b>Monitoring</b>		
Monitoring soil and groundwater	Several inspections by the government	Groundwater monitoring wells – 6 points around the site
Sampling frequency	occasional	monthly basis
Parameters	No	Few parameters; No heavy metals tests
Laboratory facility	no	Thermal plant lab EPI labs – only for air quality
<b>Assessment</b>		
Establishment of a site evaluation fiche (EPI, municipality)	Waste data base at EPI and ICIM	Waste data base at EPI and ICIM
Inclusion of the site in inventory document (EPI,municipality)	yes	yes
Evaluation of contamination level and extension area	no	Air pollution
Evaluation of impacts on physical environment	Risk of contamination	Air, water pollution
Evaluation of impacts on health	No assessment	No assessment
<b>Protection Measures</b>		
Urgency measures taken for security, environment, health	No specific measures	No specific measures
Prevention of leakage and spills from the site	Concrete container of 3 m depth and 2x2 m sides, closed on surface by a simple cover	Concrete liner
Prevention of damage to the storage site	High fence	No specific measures
General conditions of storage	good	40 m high above ground level
Restriction of use of the land area	No	no
<b>Remediation Measures</b>		
Plan to improve conditions of environmental protection	Looking for possibilities of waste destruction at country level	Improvement of technological process
Plan to clean-up the site	Not applicable	Embankment and covering to vegetation after closing
<b>4. PUBLIC AWARENESS</b>		
Communication with the public (EPI, companies)	No	No
Access to information (documents, internet)	EPI premises	EPI premises
Public opinion concerning the site (media)	-	-
Environmental protection NGOs	-	-
Complaints from neighbourhood residents	no	No
<b>5. PHYSICAL ENVIRONMENT</b>		
Land use and land use plan	Farm field	Farm field
Distance between site and housing zone	1 km	1 km

Distance between site and river	Outside the Jiu river bed; watercourse generally dried	Jiu river valley
Distance between site and facilities	A: Less than 10 m to oil containers for the in-site thermal power plant B: about 20 m distance from oil tanks; close to the warehouse	0.5 km from thermal power plant
Distance between site and nature protection area	Not in the neighbour	Not in the neighbour
Slopes, morphology		
Watershed area and hydrographic system	Jiu river valley	Jiu river valley
Surface water quality (class of river)	Class I and II	Class I and II
Other pollution sources near the site	Oil tanks	No
Flood patterns	No	Possible
Depth of groundwater table	8 m	5-6 m
Groundwater quality	Not contaminated	Not contaminated
<b>6. SOCIAL ENVIRONMENT</b>		
<b>Socio-economic data</b>		
Population	19.903	306.895
population density	98.7	100.4
sensitive population near the site	No	no
<b>Sanitation</b>		
Main water uses (agriculture, industry, domestic),	Industry, domestic	Industry, domestic
system of supply (municipal, private wells),	Municipal	Municipal
water sources (surface water, shallow wells, deep wells)	Water surface	Water surface
Water resources: Availability / scarcity / potential	Existing potential	Existing potential
<b>Public Health and Welfare</b>		
Public health conditions	Good	Good
Welfare, quality of life	Good	good
Landscape and amenities	Plain	Plain
Livelihood, local resources	Industry activity	Industry activity
Human settlements and housing	Urban area	Urban area

<b>1. BACKGROUND INFORMATION</b>	<b>TARNAVENI (Mures county)</b>	<b>Remetea (Sibiu)</b>	<b>Sura Mica (Sibiu)</b>
<b>Site description</b>			
Designation of the site of concern	<b>Landfill of Tarnaveni</b>	<b>Remetea landfill</b>	<b>Temporary storage of Sura Mica, CEDER SA Cristian farm</b>
Category of site	Landfilling of hazardous wastes	Lagoons	Warehouse
Administrative location (County)	Tarnaveni, Mures county	Sibiu, Sibiu county	Sura Mica village, Sibiu county
Geographical location (roads, morphology, landmarks, etc.)	Tarnaveni city	Remetea, 11 km from Sibiu centre	1.5 km far rom Sura Mica village
Site land use conditions	landfill	Municipal landfill site	Smell of chemicals No damage for vegetation
<b>Surveying conditions</b>			
Date / period of survey	June 25 <sup>th</sup> , 2002	May 30 <sup>th</sup> , 2002	May 30 <sup>th</sup> , 2002
Name / position of interlocutors (EPI and sites)	Danut Stefanescu – chief inspector Mures EPI 2 inspector from Mures EPI Mr. Suciu – director of BICAPA S.A.	Mr. Ungureanu – chief inspector of Sibiu EPI Mr. Mercurianu – head of waste management department	Mr. Mercurianu – head of waste management department
Information source about the site	Mures EPI and BICAPA S.A.	Sibiu EPI environmental statement report – 2001	Sibiu EPI environmental statement report – 2001
<b>Site activity</b>			
Type of present activity (factory, dump, others)	Chromium hexavalent containing waste	Landfilling of municipal and industrial wastes	Fruit tree farm
Starting year of activity, modifications of process	1917 – 1991; after 1991 split up into 2 units: BICAPA S.A. (plant service provider) and CARBIDFOX S.A. (carbide production)		
Period of activity of pollution source (storage, dump, etc.)	1968 – 2000	February, 1991	February 28 <sup>th</sup> , 2002
History of use of the site (old waste)	River bed	Municipal wastes	Mechanical workshop for farm equipment
Environmental management unit			
Pollution control level (facilities, certification, etc.)			

<b>2. POLLUTION SOURCE</b>			
<b>Background</b>			
Category of contaminated site	Landfilling of hazardous wastes	A: electroplating sludge, oils, tannery wastes B: spent oils from industrials and population	Historical waste storage site Storage of bins, boxes and bottles of liquid and solid pesticides
Waste ownership: Waste generator known or unknown	SC BICAPA S.A.	Several companies	Different companies
Land ownership: Owner of site known or unknown	SC BICAPA S.A (state owned company)	Remetea municipality	Sura Mica fruit tree farm
Surface area	25 ha (for the 3 compartments of the lagoon)	100 m <sup>2</sup> x 2	90 m <sup>2</sup>
Person in charge of follow-up of site, maintenance, control			Agricultural and Phyto-Sanitary Department in Sibiu
Number of people employed	300 (1400 in the past)		
Period of use (date of starting / stopping use)	1968 - 1999	February, 1991	February 28 <sup>th</sup> , 2002
Present conditions of use (storage activity)	2 compartments closed (solid waste) 1 compartment in use (sludge from WWTP)	Still in use	Recipients are deposited on floor and shelves and identified by labels bearing the name of the owner
<b>Hazardous Waste and Substances</b>			
Types of waste and substances	Heavy metal (Cr6+) containing solid waste (2 compartments); sludge from waste water treatment plant (1 compartment)	Oil residues from oil tank cleaning Sludge with heavy metals	Obsolete pesticides (fungicides, herbicides, insecticides, not-identified)
Quantities	1.7 mil tones for the 2 compartment with Cr6+ solid wastes; h = 10 m (but reaches more than 20 m for highest level)	Oil contained waste water – 400 m <sup>3</sup>	60 tones
<b>Equipment and Facilities</b>			
Containment of waste	Chromium hexavalent salts (sodium and potassium dichromate); Cr <sub>2</sub> O <sub>3</sub> 3 – 10%	Industrial oils, petroleum products; Heavy metals containing sludge; Tannery wastes	fungicides, herbicides, insecticides, not-identified (solid and liquid)
Prevention of leakage and spills (equipment)	Clay layer; concrete walls of 12 m of height (along river side) according to the technical design	A: pond with PVC sheet layer, 7 mm thickness B: pond without sheet (clay layer)	Building made in bricks with concrete platform, roof in asboement

		of 1 m depth)	
Quality statement of facilities	Good	Bad	Good
Prevention of fire and accidents			
Control of accesses to the site (gatehouse, fencing)	Guardian	Fence, guard cabin	Entrance gate on the farming territory and guardian
Site identification signboards	no	Warning sign at the entrance gate	no
<b>Impacts Prevention</b>			
Emergency plan	Prevention measures against groundwater pollution taken in 1978 (clay layer and concrete walls)		
Plan to improve environmental protection			
Plan to clean-up the site	Various research studies in order to find an efficient Cr recovery technology		Destruction by incineration of pesticides
<b>3. CONTAMINATED AREA</b>			
<b>Monitoring</b>			
Monitoring soil and groundwater	2 monitoring wells on the river side; soil sampling	No monitoring wells	No monitoring
Sampling frequency	Soil tests on the occasion of the environmental audit; Groundwater tests – regular basis		
Parameters	Heavy metals (Cr6+)		
Laboratory facility			
<b>Assessment</b>			
Establishment of a site evaluation fiche (EPI, municipality)	Mures EPI waste data base	Annual Environmental statement report	Annual Environmental statement report
Inclusion of the site in inventory document (EPI,municipality)	Included into the annual waste data base of Mures EPI submitted to ICIM and MoWEP	Waste data base of EPI and ICIM	Waste data base of EPI and ICIM
Evaluation of contamination level and extension area	Groundwater contamination at 200-300 m downstream; 12 ha affected surface upstream		No contamination

Evaluation of impacts on physical environment	Environmental audit; stability study and risk assessment study were carried out as well; Tarnava Mica river; ground water pollution since flooding in 1975		No contamination
Evaluation of impacts on health	No contamination of individual water wells		
<b>Protection Measures</b>			
Urgency measures taken for security, environment, health	Prevention measures against groundwater pollution taken in 1978		
Prevention of leakage and spills from the site	Concrete walls of 12 m in height		
Prevention of damage to the storage site			The site is secured
General conditions of storage	Risk of acute pollution of surface water through landslide that could be caused by floods; Collapse of slopes on highest level (20 m)		good
Restriction of use of the land area	12 ha affected were purchased by the company in order to avoid conflict with local farmers		no
<b>Remediation Measures</b>			
Plan to improve conditions of environmental protection	Extension of the concrete wall length downstream the landfill site		
Plan to clean-up the site		The pond containing waste oils will be decommissioned	incineration
<b>4. PUBLIC AWARENESS</b>			
Communication with the public (EPI, companies)			
Access to information (documents, internet)			
Public opinion concerning the site (media)			
Environmental protection NGOs			

Complaints from neighbourhood residents	In order to avoid possible complains the factory purchased the 12 ha affected by chromium contamination		no
<b>5. PHYSICAL ENVIRONMENT</b>			
Land use and land use plan	Residence with industry North side: plant East side: farm field South side: farm field across the river West side: plant	Heath area on hill	Fruit tree farm South – Sura Mica village
Distance between site and housing zone	1 Km		1.5 km
Distance between site and river	River bed	Cibin river – 2 km south-west	
Distance between site and facilities	500 m		1 km north west from 2 wells for fire control
Distance between site and nature protection area			
Slopes, morphology		clay	Cultivated soil, clay
Watershed area and hydrographic system	Tarnava Mica river (goes to Mures river);	Cibin river	Artificial pond for farm use, 1 km south
Surface water quality (class of river)	Tarnava Mica – upstream Tarnaveni: class I Tarnava Mica – downstream Tarnaveni: class II	Class III	
Other pollution sources near the site		Municipal wastes	
Flood patterns	Risk of floods		
Depth of groundwater table	groundwater depth – 1.5 m to 2 m		8 m
Groundwater quality	Contamination found at 200-300 m downstream the landfill site		good
<b>6. SOCIAL ENVIRONMENT</b>			
<b>Socio-economic data</b>			
Population	29 600 inhabitants	160.000 inhabitants	
population density			
sensitive population near the site	Across the river		no
<b>Sanitation</b>			
Main water uses (agriculture, industry, domestic),	industry and drinking water	Agriculture, domestic	Agriculture, domestic

system of supply (municipal, private wells),	Municipal system (about 60%), private wells	Private wells	Private wells
water sources (surface water, shallow wells, deep wells)	Surface water 97%; individual wells 3%	Surface water, deep wells	
Water resources: Availability / scarcity / potential	Good quality of surface water resources;		
<b>Public Health and Welfare</b>			
Public health conditions	Good		
Welfare, quality of life			
Landscape and amenities	Hill and mountain area	Hill area	Hill area
Livelihood, local resources	Natural gas, mineral ores		Farming, animal breeding
Human settlements and housing	Across the river		Rural area



<b>1. BACKGROUND INFORMATION</b>	<b>Steaua Romana (Prahova)</b>	<b>Astra Romana (Prahova)</b>	<b>Romfosfochim (Prahova)</b>
<b>Site description</b>			<b>ROMFOSFOCHIM ACTIVE S.A.</b>
Designation of the site of concern	Dump lagoons of Steaua Romana refinery	Dump lagoons of Astra Romana refinery	Romfosfochim landfill sites
Category of site	Lagoons	Lagoon	solid waste disposal site
Administrative location (County)	Campina, Prahova county	Ploiesti, Prahova county	Valea Călugărească, Prahova county
Geographical location (roads, morphology, landmarks, etc.)	Dumping site 1- 2 Km from refinery (Campina) Dumping site 2 – 1 km from refinery (Turnatorie) Dumping site 3 – Bucea - Lacul Pestelui (natural lake) – <b>3 km</b>	5 km west to the refinery	A - Stock pile next to the factory (West from chemical complex) B - 1 landfill site – 2.5 km from the factory (Darvari)
Site land use conditions	Dumping site 1- industrial area Dumping site 2 – industrial and residential area Dumping site 3 – industrial and residential area (individual houses); natural lake	industry, railway yard	residence with industry
<b>Surveying conditions</b>			
Date / period of survey	June 18 <sup>th</sup> , 2002	June 19 <sup>th</sup> , 2002	June 19 <sup>th</sup> , 2002
Name / position of interlocutors (EPI and sites)	Mr. Napoleon Pascu – General Manager Mrs. Rodica Georgescu – Head of Security, safety, environmental protection Department  Mrs. Carmen Miclea – EPI Inspector	Mrs. Gheorghita Joita – Head of Environmental Unit Mr. Gh. Duca – Head of Quality Unit Mrs. Carmen Miclea – EPI Inspector	Mr. Mircea Durbac – Director Mrs. Carmen Miclea – EPI Inspector
Information source about the site	Mr. Adrian Băceanu – EPI Chief Inspector EPI Prahova discussions Annual state of environment report of EPI (2001)	Mr. Adrian Băceanu – EPI Chief Inspector EPI Prahova discussions Annual state of environment report of EPI (2001)	Mr. Adrian Băceanu – EPI Chief Inspector EPI Prahova discussions Annual state of environment report of EPI (2001)

<b>Site activity</b>			
Type of present activity (factory, dump, others)	Oil refinery	Oil refinery	fertilizers production
Starting year of activity, modifications of process	1920	1888; 1976 – new refinery	1920 – 1997; dissolution process since 1997 ROMFOSFOCHIM S.A. split up into Romfosfochim Active S.A. and an American company owning the pyrite ash disposal sites
Period of activity of pollution source (storage, dump, etc.)	1 – 1976 (in use) 2 – 1920 – 1970 (closed) 3 – 1975 (in use)	1976	A – till 1997 B – till 1986
History of use of the site (old waste)			
Environmental management unit	Security, safety, environmental protection unit established in 1991	Environmental unit Quality department	
Pollution control level (facilities, certification, etc.)	environmental audit performed in order to obtain the environmental authorisation in 2002; licensed with compliance program	environmental audit performed in order to obtain the environmental authorisation; licensed with compliance program	environmental audit for privatisation in order to establish the environmental obligations
<b>2. POLLUTION SOURCE</b>			
<b>Background</b>			
Category of contaminated site	Landfilling of hazardous wastes: 1 – Acid tars lagoon 2 – Waste oil lagoon 3 – Waste water reservoir and sludge pond	Landfilling of hazardous wastes: Acid tars Bentonite Sludge from WWTP Used metallic catalyst (Mo, Ni) Organic compounds	Landfilling of hazardous wastes: A - Pyrite ash B - Phospho-gypsum
Waste ownership: Waste generator known or unknown	“Steaua Romana” refinery	Astra Romana refinery	A - MEGA company (USA) B - Romfosfochim Active S.A.
Land ownership: Owner of site known or unknown	“Steaua Romana” refinery	Astra Romana refinery	Romfosfochim Active S.A.
Surface area	1 – 10 ponds of 6 ha 2 – 5 lagoons of 3 ha 3 – 8 ha	3.5 ha; 5 m of depth	A: 5.5 ha; 20 m of height B: 29 ha + 65 ha
Person in charge of follow-up of site, maintenance, control	Head of Security, Safety and Environmental protection unit	Head of Environmental unit Head of Quality unit	

Number of people employed		Environmental unit: 3 persons + 30 for WWTP + lab and 4 persons at landfill site Quality unit: 4 persons	
Period of use (date of starting / stopping use)	1 – 1976 (in use 1 lagoon out of 10) 2 – 1920 – 1970 (closed) 3 – 1975 (in use)	since 1976	A – till 1997 B – till 1986
Present conditions of use (storage activity)	wastes are transported on site by trucks or pipe transfer; water covering to prevent polymerization	dumping of oil waste; water covering to prevent polymerization illegal dumping of municipal waste	storage activity stopped; phospho – gypsum landfill sites covered with vegetation
<b>Hazardous Waste and Substances</b>			
Types of waste and substances	1 – Acid tar from paraffin process 2 – Tars from paraffin process and oil processing (illegal dumping of demolition waste) 3 – sludge of refinery; semi-solid oil products resulted from WWTP (additional there is 1 dumping site for demolition waste)	acid tars, bentonite, waste water treatment sludge, metallic based catalyst, sulfur containing organics	pyrite ash (iron and sulphur) phospho – gypsum (phosphorus, calcium carbonate)
Quantities	1 – 18 (80) tones/month 2 – closed 3 – 160 – 800 tones/year	acid tars: 1240 tones/year bentonite – 500 t/year WWT sludge – 2000 t/y metallic catalyst – 2 t/y sulfur containing organics – 1000 t/y	A : 3 mil tones (stock) B: 5.5 mil tones (stock)
<b>Equipment and Facilities</b>			
Containment of waste	oil products (solvents, esters)	oil products, molybdenum, nickel, sulfur	Pyrite ashes (Fe <sub>2</sub> O <sub>3</sub> ): S-1,8%, Pb-0.39%, Zn-0,65%, As-0.07%, Cu-0.27% to 0.7%, Fe-52% and others like Ag-22g/tonne Phospho-gypsum: CaCO <sub>3</sub> , phosphorus

Prevention of leakage and spills (equipment)	none	concrete walls at the railway side clay layer plastic lining	B: excavated to clay layer, plastic lining
Quality statement of facilities	poor		
Prevention of fire and accidents	none; a fire took place at Lacul Pestelui in 1995		
Control of accesses to the site (gatehouse, fencing)	1 and 2 – no; a guardian makes a daily visit for control; 3 – fence, gate and guardian	concrete fence 3 shifted guardians	no fence, no guardian
Site identification signboards	3 - yes		
<b>Impacts Prevention</b>			
Emergency plan			
Plan to improve environmental protection	Compliance program negotiated with Prahova EPI	Compliance program negotiated with Prahova EPI	Compliance program negotiated with Prahova EPI
Plan to clean-up the site	petroleum component recovery in progress at Lacul Pestelui; possible future cooperation with a foreign company for petroleum products recovery by centrifugation	oil products recovery by extraction wells	pyrite ash exploitation
<b>3. CONTAMINATED AREA</b>			
<b>Monitoring</b>			
Monitoring soil and groundwater	1 – 4 monitoring wells in corners 2 – 2 monitoring wells inside and outside the site 3 – 4 monitoring wells in former site 1 - 6 sampling points for soil tests on 3 directions around Bucea lagoon (pH, cooper, iron and extractible substances)	2 monitoring wells, up and down stream (North to South) for groundwater;	2 monitoring wells for underground water; 20 sampling points for soil around the phospho-gypsum landfill
Sampling frequency	quarterly basis	monthly sampling	
Parameters	pH, petroleum extracts	petroleum extracts, suspended solids, phenols, naphthalene, sulphur compounds	

Laboratory facility	refinery lab	refinery lab	
<b>Assessment</b>			
Establishment of a site evaluation fiche (EPI, municipality)	State of Environment report of Prahova EPI	State of Environment report of Prahova EPI	State of Environment report of Prahova EPI
Inclusion of the site in inventory document (EPI,municipality)	Waste data base of Prahova EPI	Waste data base of Prahova EPI	Waste data base of Prahova EPI
Evaluation of contamination level and extension area	Environmental audit	Environmental audit	Environmental audit
Evaluation of impacts on physical environment	soil, subsoil and underground water contamination with petroleum products	soil, subsoil and underground water contamination with petroleum products	fine particles diffusion by wind (NE); southern areas of landfill site are more concentrated in pollutants such as phosphate, cooper, iron, lead
Evaluation of impacts on health			
<b>Protection Measures</b>			
Urgency measures taken for security, environment, health		concrete walls at railway side	fencing required by EPI
Prevention of leakage and spills from the site		bottom lining and concrete walls	
Prevention of damage to the storage site	fencing, guarding	high concrete fence	
General conditions of storage	no specific measures	good	
Restriction of use of the land area	none	none	
<b>Remediation Measures</b>			
Plan to improve conditions of environmental protection			
Plan to clean-up the site	petroleum component recovery in progress at Lacul Pestelui; possible future cooperation with a foreign company for petroleum products recovery by centrifugation	After 1998 – 3 extraction wells are used for monthly extraction of about 10 t of oil products Another 2 extraction well (ECOLINKS project) are operating since September 2000 for oil products recovery: light gasoline – 3%, heavy gasoline-11%, diesel fuel-25%	University of Karlsruhe carried out a rehabilitation study for phspho-gypsum landfill; funds are needed for a feasibility study
<b>4. PUBLIC AWARENESS</b>			
Communication with the public (EPI, companies)	Yearly information report drawn up by the company; public hearing when environmental audit is submitted	no environmental report prepared by the company; public hearing when environmental audit is submitted	

Access to information (documents, internet)	documents available at local EPI headquarters	documents available at local EPI headquarters	
Public opinion concerning the site (media)			
Environmental protection NGOs			
Complaints from neighbourhood residents			
<b>5. PHYSICAL ENVIRONMENT</b>			
Land use and land use plan	industry and residential	industry, farm field North – railway East – farm field South – farm field, refinery West - railway	industry, farm field North – farm field East – village Dirvari South – farm field West – Teleajen river, 100 m from the site
Distance between site and housing zone	between 300m and 1 km	about 1 km	about 1 Km ???
Distance between site and river	3 – 2 km	5 Km to Dambu river	100 m
Distance between site and facilities	between 1 and 2 km	5 km	next to the factory – 2.5 Km
Distance between site and nature protection area			
Slopes, morphology	clay	clay	B: clay
Watershed area and hydrographic system	3 - Doftana river, 2 km east – discharging point	Dambu river	Teleajen river
Surface water quality (class of river)	Doftana – 1 <sup>st</sup> class, 15 km up-stream	3 <sup>rd</sup> class	2 <sup>nd</sup> class
Other pollution sources near the site	3 – former disposal site of pyrite ash	no	no
Flood patterns	no	no	
Depth of groundwater table	3 to 4 m	6 m	
Groundwater quality	contaminated by oil products (layer of oil about 0.02 mm thick)	sometimes up-ward is worse groundwater quality	
<b>6. SOCIAL ENVIRONMENT</b>			
<b>Socio-economic data</b>			
Population	45.000 inhabitants	254.386 inhabitants	
population density			
sensitive population near the site	2 and 3 – residential area about 300 m and less near the site		
<b>Sanitation</b>			
Main water uses (agriculture, industry, domestic), system of supply (municipal, private wells),	industry, domestic municipal, private wells	industry, domestic municipal, private wells	industry, domestic municipal, private wells

water sources (surface water, shallow wells, deep wells)	deep wells, surface water	deep wells, surface water	deep wells, surface water
Water resources: Availability / scarcity / potential	existing resources; surface water, reservoirs	existing resources; surface water, reservoirs	existing resources; surface water, reservoirs
<b>Public Health and Welfare</b>			
Public health conditions	good	good	
Welfare, quality of life	good	good	
Landscape and amenities	hill area	plane area	
Livelihood, local resources	oil products extraction, transport and processing	oil products extraction, transport and processing	chemical complex which is in dissolution; agriculture
Human settlements and housing	Urban area; residential area in proximity	Urban area	Rural area

<b>1. BACKGROUND INFORMATION</b>	<b>Oltchim (Valcea)</b>	<b>Govora (Valcea)</b>	<b>Bujoreni (Valcea)</b>
<b>Site description</b>			
Designation of the site of concern	<b>Landfill of OLTCHIM manufacture</b>	Landfill of GOVORA (USG) manufacture	Pesticide storage site
Category of site	Hazardous waste disposal site; lagoons	Lagoons “white sea”	warehouse
Administrative location (County)	Ramnicu Valcea, Valcea county	Govora, Valcea city	Bujoreni fruit tree farm
Geographical location (roads, morphology, landmarks, etc.)	Along the national road to Dragasani; south of Rm Valcea city	Along the national road to Dragasani; south of Rm Valcea city	Bujoreni village, Valcea county
Site land use conditions	2 different landfills: 1 for CaCO <sub>3</sub> and 1 for organic compounds Organic wastes are stored into 4 cells, out of which 1 cell is closed and covered with vegetation (HCH – historical waste); 3 cells are in use; water covering to avoid organic vapour to be spread in air	8 cells of “white sea” and 2 effluent ponds	warehouse
<b>Surveying conditions</b>			
Date / period of survey	June 13 <sup>th</sup> , 2002	June 14 <sup>th</sup> , 2002	June 14 <sup>th</sup> , 2002
Name / position of interlocutors (EPI and sites)	Mr. Horia Popescu – Chief Inspector EPI Mrs. Doina Zaharia – Chief Guardian EPI Mrs. Victoria Negut – Oltchim Development Director Mr. Balint – Oltchim Production Director	Mr. Visalon – Inspector EPI Mr. Petru Nastase, Technical Director USG Mrs. Cruceru – Head of laboratory Mrs. Voichitu – Director USG	Mr. Visalon – Inspector EPI
Information source about the site	Valcea EPI State of Environment annual report – 2001 Report on aspects of environment in Valcea of April 2002 Outline sketch map of Oltchim landfill site	Valcea EPI State of Environment annual report – 2001 Report on aspects of environment in Valcea of April 2002	Valcea EPI State of Environment annual report – 2001 Report on aspects of environment in Valcea of April 2002



<b>Site activity</b>			
Type of present activity (factory, dump, others)	Chemical products Disposal site of organo-chlorinated compounds	Sodium hydrate production based on Solvey process Calcium carbonate residues	Historical pesticides
Starting year of activity, modifications of process	1976	1959; 66% of the total capacity is still in operation	
Period of activity of pollution source (storage, dump, etc.)	1978 – still in use	1959	
History of use of the site (old waste)	Natural marsh	Natural marsh	Warehouse for pesticides
Environmental management unit	OLTCHIM S.A. laboratory at the disposal site entrance	GOVORA laboratory	
Pollution control level (facilities, certification, etc.)	OLTCHIM S.A. is certified under ISO 14.001 Environmental authorisation issued for overall activities of the chemical complex	Environmental authorisation issued for overall activities of the chemical complex	
<b>2. POLLUTION SOURCE</b>			
<b>Background</b>			
Category of contaminated site	Controlled landfill site	Landfill site consisting in several cells working on a cyclic basis	warehouse
Waste ownership: Waste generator known or unknown	OLTCHIM S.A. Rm Valcea	Govora manufactory	A: OLTCHIM B: unkonown
Land ownership: Owner of site known or unknown	OLTCHIM S.A. Rm Valcea	Govora manufactory	Bujoreni fruit tree farm
Surface area	6 ha	168 ha	1 ha
Person in charge of follow-up of site, maintenance, control			
Number of people employed			
Period of use (date of starting / stopping use)	1978 – to date	1959 – to date	1994 – to date
Present conditions of use (storage activity)	Disposal of organo – chlorinated solvents resulted from the preparation of perchlor-ethylene	Settling lagoons for sludge resulted from soda hydrate preparation	Storage of used pesticides of not identified origin gathered from former agricultural cooperatives which are now abandoned
<b>Hazardous Waste and Substances</b>			
Types of waste and substances	Organic solvents monomers HCH residues (historical waste) Inorganic wastes	Solid component contains CaCO <sub>3</sub> and Ca SO <sub>4</sub> ; Liquid component contains CaCl <sub>2</sub>	Composition unknown

Quantities	1,500 tones/year – organic wastes 6,000 tones/year – inorganic wastes One cell capacity – 90,000 tons Active cell contains 4,500 tones of inactive isomers	100,000 – 120,000 tones/month of calcium carbonate residues out of which 30% represents solid component	2400 l (identified and not identified pesticides) 900 kg (not identified pesticides)
<b>Equipment and Facilities</b>			
Containment of waste	HCH inactive isomers, chlorinated residues, propene-oxide Calcium carbonate – lime	Calcium carbonate and calcium sulphate (solid matter), calcium chlorine (solution)	unknown
Prevention of leakage and spills (equipment)	Concrete wall, 30 cm x 14 – 17 m Bottom clay layer	Embankment; lagoons surrounded by high walls made in solid component of the residue	Concrete platform, roof, 2 concrete walls and 2 walls in iron bars
Quality statement of facilities	good	Separated water from sludge is migrating towards the surrounding dams	Packages are degraded; In the same warehouse other materials are stored as well (wooden chairs, etc.)
Prevention of fire and accidents	No	No	No
Control of accesses to the site (gatehouse, fencing)	Net fence with lock, guardian	No fence; a guardman	Provided with locked door and guardian
Site identification signboards	yes	yes	yes
<b>Impacts Prevention</b>			
Emergency plan	Yes; licensed ISO 14000	yes	no
Plan to improve environmental protection	Industrial incinerator for hazardous wastes Modernization of WWTP – biological step Compliance program negotiated with Valcea EPI	Compliance program negotiated with Valcea EPI	no
Plan to clean-up the site	Not in the near future	Not in the near future	Another amount of pesticides are to be brought in that location

<b>3. CONTAMINATED AREA</b>			
<b>Monitoring</b>			
Monitoring soil and groundwater	-16 monitoring wells, 6 inside and 10 outside of the deposit cells for underground water sampling -soil samples taken both outside and inside deposit area	4 monitoring wells, 50 – 60 m from the site for underground water sampling; 8 m to 25 m of depth	no
Sampling frequency	quarterly (by ECOIND Bucharest)	On a weekly basis	No tests
Parameters	About 20 parameters		Not applicable
Laboratory facility	Test laboratory for disposal site necessities	Manufactory test laboratory	Not applicable
<b>Assessment</b>			
Establishment of a site evaluation fiche (EPI, municipality)	Included into the EPI annual report of state of environment	Included into the EPI annual report of state of environment	Included into the EPI annual report of state of environment
Inclusion of the site in inventory document (EPI,municipality)	Waste data base (EPI, ICIM)	Waste data base (EPI, ICIM)	Waste data base (EPI, ICIM)
Evaluation of contamination level and extension area	Area around OLTCHIM is considered as a heavy soil contaminated area (historical pollution) Shallow water is contaminated	Both disposal and surrounding areas	Possible risks
Evaluation of impacts on physical environment	Shallow water contamination with chlorides and organo-chlorinated substances; surface and soil contamination by increasing of mineralization and salts level	Underground water and soil pH in the site area pH = 11 – 13, decreasing with the distance;	Not evaluated
Evaluation of impacts on health	Contamination of individual wells	Contamination of individual wells	No
<b>Protection Measures</b>			
Urgency measures taken for security, environment, health	Waste reception, registration and monitoring	Surrounding walls consolidation; survey of water level in the lagoons on a weekly basis; Topographic marks in order to identify possible slide movements of the walls	Permanent guarding and surveillance

Prevention of leakage and spills from the site	Permanent check-up of wall integrity	Liquid component is discharged into Olt river in the downstream of a dam; Permanent survey of Olt flow rate in order to provide the appropriate dilution of the waste waters discharged from lagoons	Concrete platform; packages are degraded; smell of chemicals
Prevention of damage to the storage site	Site guarding activity in order to prevent wastes theft	Site guarding	Site guarding
General conditions of storage	Smell of chemicals from landfill site	Large quantities of solid and liquid wastes	Relative clean site
Restriction of use of the land area	No restriction in land use	No restriction in land use	No restriction in land use
<b>Remediation Measures</b>			
Plan to improve conditions of environmental protection	Decreasing of waste amount in future (ISO 14001) Diminishing of the amount of historical wastes	Decreasing of the waste amount resulted from the technological process	-
Plan to clean-up the site	Not applicable	Not applicable	In case of a solution for waste destruction
<b>4. PUBLIC AWARENESS</b>			
Communication with the public (EPI, companies)	Occasional press release	Occasional press release	No
Access to information (documents, internet)	Specific document are available at EPI premises	Specific document are available at EPI premises	
Public opinion concerning the site (media)	No complains	No complains	No complains
Environmental protection NGOs	-	-	-
Complaints from neighbourhood residents	No	No	No
<b>5. PHYSICAL ENVIRONMENT</b>			
Land use and land use plan	Industry North – farm with residence East – Olt river, reservoir South – Olt river, reservoir West – Govora plant waste disposal site	Industry North – farm with residence East – OLTCHIM landfill site South – Olt river, reservoir West – agricultural use	Farming village North – up-hill with residence East – farm field South – village residence West – creek across road
Distance between site and housing zone	About 50 m	About 500 m	About 10 m
Distance between site and river	8 m, south – east	Olt river, 30 m	A creek to Olt river, 2 km south - east

Distance between site and facilities	About 1 km	About 1 km	
Distance between site and nature protection area	Not exist in neighbourhood	Not exist in neighbourhood	Not exist in neighbourhood
Slopes, morphology	Clay	clay	
Watershed area and hydrographic system	Olt river basin, mountainside springs	Olt river basin, mountainside springs	Olt river basin, mountainside springs
Surface water quality (class of river)	Class I in Oltchim area	Class I in Oltchim area	
Other pollution sources near the site	U.S. Govora waste disposal site Thermal power plant ash disposal site (across the river)	OLTCHIM landfill site Thermal power plant ash disposal site (across the river)	In the same location there is another warehouse storing pesticide residues
Flood patterns	Yes	Yes	No
Depth of groundwater table	1 -5 m shallow water 30 -40 m underground water	1 -5 m shallow water 30 - 40 m underground water	1 -5 m shallow water 30 - 40 m underground water
Groundwater quality	Contaminated since the years 60 - 70	Contaminated	
<b>6. SOCIAL ENVIRONMENT</b>			
<b>Socio-economic data</b>			
Population	119 741 inhabitants	3.170 inhabitants	-
population density	75.2 inhab/Km2 (county level)	75.2 inhab/Km2 (county level)	75.2 inhab/Km2 (county level)
sensitive population near the site	Village in the OLTCHIM neighbourhood	Village in the neighbourhood	Bujoreni village
<b>Sanitation</b>			
Main water uses (agriculture, industry, domestic),	Industry, domestic	Industry, domestic	Agriculture, domestic
system of supply (municipal, private wells),	Municipal	Municipal	Individual wells
water sources (surface water, shallow wells, deep wells)	Surface water – Olt river	Surface water – Olt river	Deep wells
Water resources: Availability / scarcity / potential	Surface water and lakes	Surface water and lakes	Underground water
<b>Public Health and Welfare</b>			
Public health conditions	Good	Good	good
Welfare, quality of life	High rate of unemployment - 11,9% (compared to 8% national average)	High rate of unemployment - 11,9% (compared to 8% national average)	farmers
Landscape and amenities	335 – mountains, 45% - hills, 20% - valleys	335 – mountains, 45% - hills, 20% - valleys	Hill area
Livelihood, local resources	Salts, crude oil and natural gas, coal, limestone, forests	Hot springs, mineral waters	Agriculture, fruit trees, forests
Human settlements and housing	urban area	Urban area	Rural area

## **5.2.6 Inventory of Sites Visited**

This section provides the results of the JICA survey in the form of maps, sketches and tables for each site. The purpose is to give an example of how an inventory of contaminated sites should look like at minimum. The sites of concern, which are those of the JICA survey, are first listed and presented in a synthetic table.

Table 5.2.5 shows the list of sites visited on the JICA survey, and the site locations are shown in Figure 5.2.1.

**Table 5.2.5 List of Contaminated Sites Visited**

ID No.	Location	Type of Waste	Condition	Generator	Owner	Area	Volume	Visit date	Note
S-1	Sura Mica, SIBIU	Pesticides, obsolete	Storehouse	various companies	Institute of Fruits Growing	70 m <sup>2</sup>	60 t	30/5/02	obsolete pesticides,
S-2	Remetia, SIBIU	Oil containing liquid	Pond	different companies	municipal	200 m <sup>2</sup>	400 t		temporary storage
T-1	Turda, CLUJ	Pesticides, isomer	Landfill	various companies	municipal	5000 m <sup>2</sup>	7500 m <sup>3</sup>	31/5/02	HCH isomer
T-2	Turda, CLUJ	Pesticides, isomer	Landfill	UST SA (former)	UST SA (former)	4000 m <sup>2</sup>	8000 m <sup>3</sup>		HCH isomer
T-3	Turda, CLUJ	Pesticides, isomer	Landfill	Forest Dept.	municipal	10000 m <sup>2</sup>	10000 m <sup>3</sup>		HCH isomer
D-1	Filiasi, DOLJ	PCBs containing liquid and solids	Tanks Containers	TMD (former)	TMC SA	100 m <sup>2</sup> 200 m <sup>2</sup>	115 m <sup>3</sup> 40 tons	7/6/02	temporary storage of recovering materials
D-2	Craiova, DOLJ	Coal Ash	Landfill	Power plant	Power plant	120 ha x 2			sprinkling water on landfill
V-1	Ramnicu-Valcea, VALCEA	Organic chemicals	Landfill	OLTCHIM	OLTCHIM	6 ha	250000 m <sup>3</sup>	13/6/02	Organic residue with HCH isomer
V-2	Rm-Valcea, VALCEA	Inorganic chemicals	Landfill	USG SA	USG SA	168 ha	30 Mm <sup>3</sup>	14/6/02	CaCO <sub>3</sub> , CaSO <sub>4</sub>
V-3	Bujoreni, VALCEA	Pesticides, obsolete	Storehouse	different companies	Agricultural department		2.4 m <sup>3</sup> 0.9 tons		obsolete pesticides
P-1	Campina, PRAHOVA	Oil wastes, acid tar	Lagoon	Steaua Romana	Steaua Romana	9 ha		18/6/02	refinery wastes
P-2	Ploiesti, PRAHOVA	Oil wastes	Lagoon	Astra Romana	Astra Romana	3.5 ha		19/6/02	refinery wastes
P-3	Valea-Calugareasca, PRAHOVA	Pyrite ash Phospho-gypsum	Landfill	Romfosfochim	Romfosfochim-Active	5.5 ha 29 + 65 ha	3 Mt 5.5 Mt		wastes from fertilizer process radioactivity in phosphogypsum
A-1	Zlatna, ALBA	Mining residue	Landfill	Zlatna Min	public	7 ha x 2	4.5 Mt	24/6/02	ore dressing residue, Pb/Zn
M-1	Tarnaveni, MURES	Metal contained waste	Landfill	SC BICAPA	SC BICAPA	8.5 ha	850000 m <sup>3</sup>	25/6/02	Cr <sub>2</sub> O <sub>3</sub> contained (3-10%) sludge

5-46

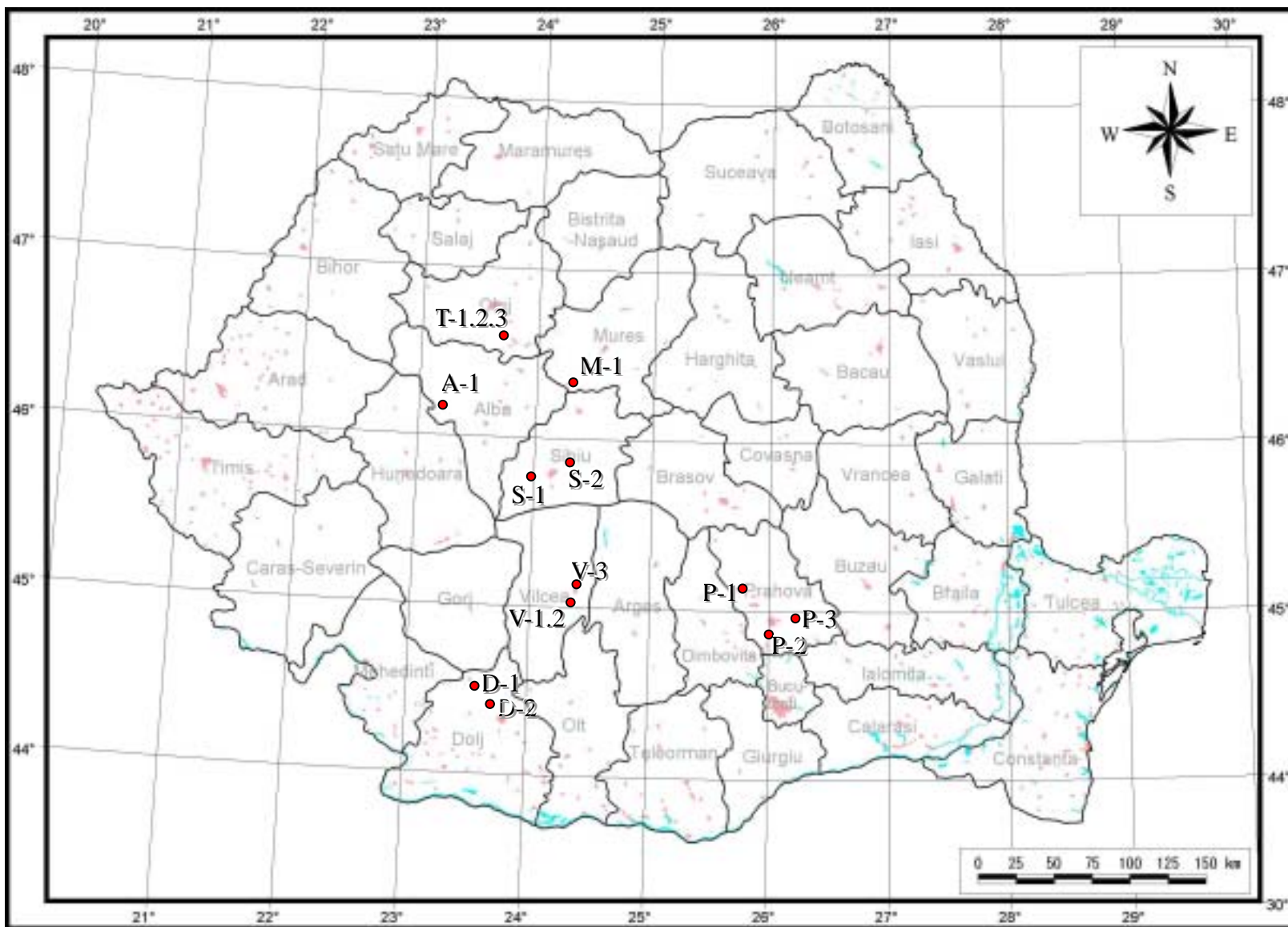


Figure 5.2.1 Locations of Contaminated Sites Visited