

Part 1

General Report on Pilot Project 4

“Strengthening EPI and Company Capacity in Hazardous Waste Management

GENERAL REPORT ON PILOT PROJECT no. 4

“Strengthening EPI and Company Capacity in Hazardous Waste Monitoring”

The JICA Study Project visit surveys and questionnaire surveys have indicated a wide ranging capability within enterprises to understand the recently adopted waste management legislation in Romania (including the identification and classification of hazardous waste), and that good waste management practice is generally lacking for a variety of reasons. The new IPPC legislation requires a better waste management by industry, especially of hazardous wastes. Consequently more knowledge will be required on the part of both the EPI-s and enterprises.

The pilot project no. 4 (PP4) was designed to assist both EPI-s and enterprises to better understand and implement good practices in hazardous waste management.

1. Outline of the Pilot Project - Objectives

The overall objective of PP4 is to strengthen an EPI capacity in hazardous waste management activities including waste monitoring, inspection, assessment of company annual waste report, and enforcement and development of information system on contaminated sites. The project activity was especially oriented to strengthen an EPI capacity in verifying the application of good practice in hazardous waste management (e.g. in accordance with IPPC directive) and support companies in the understanding of the new hazardous waste classification and development of their Waste Management Plans.

Specific objectives were established as follows:

- Improving capacity of an EPI staff for authorisation, permitting and approval of economic activities and enterprises)
- Improving capacity of an EPI in factory inspection, evaluation and enforcement of good hazardous waste management practice
- Improving capacity of an EPI in analytical monitoring of hazardous waste
- Increasing awareness of enterprises concerning good hazardous waste management practices
- Improving capacity of an EPI's staff for helping companies to develop their own waste management plans
- Elaboration of an information system for contaminated sites.

2. Methodology, Activities and Outputs

2.1 Hazardous Waste Management

This first component of the pilot project PP4 was based upon a number of visits to factories, observations at each factory, discussions with factory management, review of documents and discussions with representatives of EPI 's departments – permitting, monitoring, waste office, and Environmental Guard.

Planned outputs of this PP4 component were:

- Guidance note for hazardous waste identification and classification

- Guidance note for formulation of Company waste management plan
- Guidance note to improve inspection capacity on waste issues
- National Workshop for dissemination of outputs

2.2 Contaminated Sites Management

The achievement of the second component of PP4 – related to contaminated sites – was based on activities such as:

- Field observations / investigation on soil contaminated sites
- Laboratory analyses of samples collected during field investigation
- Identification of information sources and collection of data for the inventory and evaluation of contaminated sites
- Meetings and change of information between the JICA team, EPI and the owners of contaminated sites
- Mapping of identified contaminated sites
- Guidance for planning documents for contaminated sites management issues.

Planned outputs of this PP4 component are:

- Inventory of contaminated sites
- Priority ranking criteria and priority lists of contaminated sites / hazardous waste deposits
- Mapping the contaminated sites inventory
- Database containing on contaminated sites.

2.3 Provision of Laboratory Equipment

The criteria for selection of equipment were related to the available budget and an application that would support the needs to improve hazardous waste and/or contaminated sites monitoring. The list of equipment (see list attached as Annex A) was the outcome of discussions between JICA team members and EPI staff.

The equipment brought by the JICA team was installed within EPI Pitesti monitoring laboratory and put in function. The laboratory personnel were trained by the equipment provider to use it and evaluate the obtained results.

The installed new equipment will lead to a substantial diversification and enrichment of the EPI Pitesti plan for analytical monitoring of hazardous waste and contaminated sites in the year 2003.

3. Participants in the Project

In addition to the JICA Study team the participants in this pilot project have been as follows:

- EPI Pitesti
- ICIM consultants
- Enterprises in Arges county
 - a. Dacia (automobile producer)
 - b. Arpechim (oil refinery and chemical products)
 - c. Presate Dacia (automobile spare parts)
 - d. Ana Imeb (motor manufacturer)

e. Direct Auto Rom (automobile spare parts and other products)

EPI Pitesti was selected as a participant in PP4 on the following criteria:

- Arges is an industrialised county; it has many enterprises generating hazardous waste, which have accepted to participate in the project and co-operate with foreign consultants
- Pitesti is readily accessible from Bucharest, a fact that facilitates factory visits, meetings and discussions
- EPI Pitesti is one of the Inspectorates having a County level Waste Management Plan that contains a well-defined chapter on industrial waste management.

The enterprises participating in the project were selected on the basis of representing small, medium and large enterprises, their willingness to be involved and their acceptance to receive foreign consultants on their premises.

4. Evaluation of the Pilot Project Results

- ◆ The common works and activities achieved by the JICA team, EPI Pitesti personnel and ICIM specialists, as well as the documents produced within the PP4 frame have substantially improved the capacity of understanding the waste issues by both – EPI and companies involved in the project.
- ◆ The assessments performed within the project have underlined the needs for improvement of EPI departments' activities in permitting, inspection, and monitoring of waste. It is expected that the activity improvements will lead to:
 - Better quality of permitting documents elaboration
 - Deeper, more focussed, and consistent inspection on waste issues by using the inspection checklist on waste generation and management
 - More detailed and relevant inspection report by using the new format of the waste chapter within the general inspection report
 - Better companies' reporting on hazardous waste generation and management and identification of BAT and waste minimisation opportunities.
 - Better EPI control, evidence and reporting on hazardous waste generation and management at county level.
- ◆ The recommendations made for the EPI Pitesti ROF adjustment referring to waste office tasks and closer relationships between different EPI departments will also improve the management of waste issues at the local Inspectorate level.
- ◆ The Guidance Note on Identification and Classification of Hazardous Waste will help the implementation of the GD 856/2002 related to keeping records on waste management. The expected changes in classification/codification and the equivalence of waste reported under the former and recently enforced regulations will cause smaller disruption in the waste inventory if using the above – mentioned guidance note.
- ◆ As a result of PP4, companies in Pitesti county will receive a comprehensive Guidance Note for Elaboration of their Waste Management plan. By using it they will be capable to avoid omissions of data, mistakes or lack of relevant measures /provisions in their waste management plans.

- ◆ The 5 companies included in the project have already elaborated their new version of waste management plans; these new plans have shown that companies are now more aware of the requirements in the recently adopted waste legislation.
- ◆ Companies' good waste plans will contribute to the completion/ improvement of the second version of the county waste management plan that will be elaborated by the EPI.
- ◆ The pilot project has provided for the first time in Romania a detailed example of contaminated sites' information system. The example of Arges county contaminated site inventory could be further developed by application in other counties or regions. A national contaminated site inventory could be compiled if the Arges county experience will be disseminated and applied through whole Romania.
- ◆ The method of contaminated sites' evaluation and prioritisation is also a new management tool; the environmental authorities could use it in the negotiations with decision-makers from administration or companies' managers when planning/imposing remediation or clean-up plans.

5. Dissemination of the Pilot Project Results

- ◆ The dissemination of results obtained from PP4 is very important for the improvement of activities of local environmental authorities.
- ◆ The first step in PP4 results' dissemination will be to organize two seminars / workshops in which representatives of other central authorities (Ministry of Industry and Resources, Ministry of Health, etc.), local administrative authorities, other EPI-s and companies from different field of industrial activities will be invited.
- ◆ In order to achieve a large dissemination there is a proposal to promote as official documents the following PP4 outputs:
 - The guidance note on identification and classification of hazardous waste
 - The guidance note on elaboration of the company waste management plan
 - The new version of the inspection report containing a more detailed chapter on waste issues

The inspection checklist of questions on waste generation and management

- ◆ The inventory, evaluation and prioritisation of contaminated sites/ hazardous waste deposits at level of other counties or development regions – which is a need for Romania - could be made by promotion of the methods elaborated within PP4 by means of some follow-up studies.

6. Summary of Documents Produced

6.1 Guidance Note for Hazardous Waste Identification

The Guidance note for hazardous waste identification is intended to provide support for waste assessment, classification and codification to all actors involved in generation,

management and control of hazardous waste. It represents a tool helping the achievement of waste reporting obligations and waste control in accordance to the European Waste List (EWL), approved by the Governmental Decision 856/2002 on keeping records on waste management.

The Guidance note for hazardous waste identification contains explanations on the structure of EWL, the classification protocol for waste and the methodology for classification of hazardous waste according to the GD 856/2002. The methodology also considers the classification of the hazardous substances according to the provisions in GD 490/2002 on the approval of methodology for enforcing the Governmental Emergency Ordinance 200/2000 on classification, labelling and packing of hazardous chemical substances and materials.

In the new EWL, introduced by the GD 856/2002, hazardous wastes are included in 2 forms: “absolute entries”, marked with *, and about 180 entries of so called “mirror entries”.

- Absolute entries are hazardous waste types, which require no further testing for the presence of the hazardous properties (e.g. oil waste).
- Mirror entries are types of waste that have the potential to be either hazardous or not, depending on their specific composition and concentration of hazardous substances in the waste.
 - Mirror entries are covered by 2 entries: a hazardous waste entry (marked with *) and an alternative non-hazardous waste entry, not marked with *.
 - For the classification of waste in one of the mirror entries, tests are needed.
- All entries in EWL that are not absolute or mirror entries are not hazardous waste types.

The methodology described in the Guidance Note consists in 7 steps for assessment and classification of hazardous waste in mirror entries. The guidance note contains a chapter presenting examples for identification and classification of some specific waste types.

Annexes of the Guidance Note contain:

- The list of wastes (EWL)
 - Hazardous properties, according to Romanian and European legislation
 - Risk phrases and hazardous waste threshold limits
 - Testing methods for hazardous chemicals
 - Characteristics of wastes that render them hazardous (properties H3 – H8, H10, H11).
- The present guidance note is a draft, which needs improvement that will result of proposals coming from different users of the new waste list.

6.2 Guide for Elaboration of the Company Waste Management Plan

The elaboration of the Plan for Waste Management by the waste generators is an obligation resulted from the Law 426/2001 for the approval of the GEO 78/2000 on waste regime. This regulation is stipulating that all industrial waste producers have to elaborate their own waste management plans, considering provisions included into the Plans of Local Councils and the National Action Plan for Waste Management.

The Waste Management Plan has in the same time the purpose to implement the

application of the GEO 34/2002 on integrated pollution prevention and control; this action is needed in order to facilitate the obtaining of the integrated environmental authorization and, if the case, the elaboration of the conformation program in this respect.

The elaborated guidance note has the following content:

- General Description of Company
- Waste Management – Present Situation
- Prognosis on Waste Quantities and Management Needs
- Objectives for Waste Management
- Measures to Achieve the Objectives
- Activities for Quantity Reduction, Selective Collection Recovery and Environmentally Safe Treatment of Wastes
- Annexes (1 to 5) - Explanatory notes to help completion of Waste Management Plan

The present situation of the company waste management should be described by giving information on:

- Waste generation: types, codes of generated waste showing hazardous waste; waste quantities generated in the last three years, by type and total, specifying hazardous waste; indicators related to waste generation by product amount and number of employees
- Waste management operations: amount recovered and finally disposed by type of waste; service providers for recycling or disposal
- Company waste management own facilities: landfills, incinerators, other treatment facilities
- Costs of waste management
- Contaminated sites due to waste and measures for reducing the risks they pose for human health and environment

The prognosis of company waste generation and needs for management is required for the year 2005 and it has to support the objectives proposed in the plan. Clear actions including technical and administrative measures, as well as investment projects, have to be nominated for achieving each objective.

To help enterprises to elaborate their waste management plans, within the Annexes of the guide examples and explanatory notes are presented. There are given: an example of industrial and material process flow, the list of codes for recycling and disposal operations, description of measures for reducing risks generated by the contaminated sites, examples of waste management objectives, explanatory notes on waste minimization and waste handling best available techniques etc.

6.3 Analysis of the Annexes 4 and 5 Included in the Environmental Authorization

The environmental authorization is the most important act elaborated by EPI in relation with the activities having impact on the environment. It regulates for each company the quality and quantity of emissions that are legally accepted and describes the accepted appropriate abatement measures.

The delivery of environmental authorization is the task of the department Permits, Authorization and Approval within each local EPI. Within the environmental authorization,

the management of waste and hazardous substances is described within the Annexes 4 and 5.

The relevance of these annexes in the field of waste and hazardous substances is very important because, together with the Conformation Program, they represent reference documents for the activity of the inspection and monitoring departments.

In order to improve the EPI Pitesti capacity of regulating activities having impact on the environment, one task of PP4 refers to the analysis of Annexes 4 and 5 included in the authorizations of the chosen five companies. The analysis was made only in case of four companies because SC Direct Autorom SRL was not yet authorized at the moment of assessments.

EPI Pitesti has provided the existing Annexes 4 and 5 for analysis to the JICA team established for the PP4 and the discussions related to the Annexes elaboration and content took place.

Annex no. 4

The analysis of Annexes 4 included in the authorizations of the chosen companies' lead to general and specific (to each company) comments. The general comments are presented below.

- Not all analysed Annexes 4 respect the format, structure and content established by the current legislation at the moment of their elaboration; this fact generates the omission of some important information which are needed for checking the achievements of legal obligations of companies in waste management.
- Hazardous wastes were not separately mentioned
- In some cases the chapter referring to waste generation does not contain all hazardous waste types and quantities generated by the authorized activity.
- In other cases the chapter referring to the on-site recovery of waste does not contain all the existing and known data.
- There seems to be a confusion between:
 - - Temporary storage of waste for a short period before sending to recovery by known means
 - - Temporary storage of waste for a long period in order to find a solution for recovery or disposal, which is not yet established (e.g. asbestos and glass fibres waste at Arpechim company). The explanation of such situations could be the fact that no clear definition of temporary storage was provided by the national regulations till the appearance of the Governmental Decision 162/2002 on landfilling of waste.

Proposals to Improve the Elaboration of Annex no.4

- Respecting the recommended structure of the Annex 4 as required by the regulations in force at the moment of the authorization delivery
- Mentioning of all generated waste together with their codes, as specified by the G.O. 856/2002
- Highlighting the hazardous waste types within the section on “generated and managed waste”
- Presenting more details on the section concerning “monitoring of waste” from

generation to the final disposal.

Annex no. 5

Similar general comments have been made in relation to the analysed Annexes no 5, which present the management of hazardous substances and materials inside the authorized companies. Some of the specific comments are given below.

- The Annex 5 was correctly elaborated in case of ARPECHIM company
- In case of ANA IMEB and DACIA companies - the recommended structure of the Annex 5 was not integrally respected
- PRESATE DACIA authorization does not comprise any Annex no 5.

Proposals to Improve the Elaboration of Annex no.5

- Respecting the recommended structure of the Annex 5 as required by the legislation in force at the moment of elaborating the authorization;
- Presenting more details on the section concerning “monitoring of hazardous substances” than the standard phrase on the evidence register of used quantities.

EPI Pitesti has agreed that these proposals are supposed to be applied from now to any new elaborated authorization. During the process of renewing of existing authorizations in case of all companies, special attention will to be given to this annex in relation with any subsequent requirements of new legislation

6.4 Analysis of Inspection Department Activity Related to Companies Included in PP4

The evaluation of the inspection department activity was made by analysing documents and discussions with EPI Pitesti representatives.

The discussions have been focused on:

- Inspection planning
- Inspection manual
- Inspection report elaboration

Inspection Planning

Inspecting the activities of companies having impact on the environment is performed within the legal frame provided by the Ministerial Order 541/2000 establishing technical norms on organization and achievement of inspection and control for environmental protection.

The inspection annual plan is elaborated usually in the last part of the previous year and includes the companies to be inspected and the number of controls. The planning takes into consideration the human resources of EPI and the priority environmental problems on the county territory. During the year, the plan could be changed in relation to the new tasks and urgent needs generated by the implementation of new laws or emergency situations due to accidental pollution.

Separately, the Environmental Guard is making its own activity planning related to the control of installations having high impact on the environment, inspection of accidental

situations, control of the timely achievement of environmental investments and implementation of environmental laws.

Use of the Inspection Manual

To help the inspection activity, the MWEP has provided an Inspection Manual elaborated in the year 2000. The EPI Pitesti representatives have been asked to what extent they are using the Manual and which part is the most useful for them.

The discussion conclusion was that the general part (Chapters 1-6) is useful as guidance for new employees to learn how to ask questions in order to obtain relevant information; experienced inspectors do not use the Manual too much.

The most useful part is included in annexes 2.1...2.6 that are used as checklist in field activities. Inspectors do not usually consult other parts; some reasons explaining this situation are given below:

- Annexes 1-1 (Regulations in the field of environmental protection) and 1-2 (Standards for determination of the quality of environment) need to be updated because many new environmental regulations came into force after 1999 when the manual has been elaborated
- Annexes 3-1...3-4 (Sampling procedures and means to be used in field activities) are more useful for the monitoring department
- Annex 4 (the format and content of inspection report) is better presented within the Order 541/2000
- Annex 5 (Case studies: Inspection of Wastewater treatment Plants) is more useful for assessing the design (projects) of wastewater treatment plants and less for their inspection.

Because inspectors have different academic background they can not be experts in all fields of industrial activities; having to inspect companies with various activities and based on different industrial processes they need guidance related to:

- The types of industrial processes used in different activities;
- The flow of technological processes mentioning the raw materials and by-products resulted, the emissions in air, water and soil, the types of solid waste generated in each production phase;
- The appropriate procedures for pollution abatement, i.e. treatment of emissions in air, water or treatment of generated waste;
- Best options to avoid waste and polluting emissions.

As regard to what actions would be useful to complete the inspection manual the following proposals have been made:

- Updating annexes 1.1 and 1.2 containing environmental legislation and standards;
- Provision of guidance notes related to:
 - The description of technological flows and noxious emissions in the environment, in cases of different industrial activities,
 - The best management options to avoid waste and polluting emissions or to treat them.

Inspection Reports

In order to improve the inspection activities within EPI Pitesti a number of 7 inspection reports referring to 4 of the 5 companies included in PP4 have been analysed. General and specific comments have been produced. The general comments on inspection reports elaboration are presented below.

- The inspection reports have rather a formal character because usually they repeat the description of elements included in the environmental authorization; only seldom some new elements are added as a result of implementing the conformation actions, but even in such cases only few details are provided.
- Within the summary of the inspection findings, described in section D, there are not included comments on all aspects/ activities/ areas mentioned as objectives of control in section C of the report.
- Section E – analysis of the recommended measures achievement – usually contains only a general statement declaring the implementation of the measures established during the previous controls; there is no details mentioning the type of measures recommended or the manner of putting in practice and their effectiveness.
- Section H – evaluation of the company performances in environmental protection – is generally not completed. The given explanation was that the system is too subjective and could not have real relevance from environmental point of view.
- Section F – on applied punishment during the inspection - do not describe the real act that was punished and gives only the legal basis for it. (the article in specific law). The effect of punishment is only seldom shown in the following inspection report.

Recommendations/Proposals for Improving the Inspection Reports

- The aspects related to hazardous waste management and contaminated sites should be subject of more detailed inspection, verification and control. It is also a need to avoid as much as possible the risk of inspection reports becoming routine - “rubber stamp” reports.

In order to assure the achievement of this recommendation, the EPI representatives and the JICA team members have agreed to complete the format of the inspection report by adding some sub-chapters to the chapter summarizing the inspection findings. These sub-chapters, to be completed during the inspection, refer to:

- Management of household and similar waste generated by companies
- Management of hazardous and non-hazardous industrial waste
- Management of special regulated waste flows such as waste oils, waste batteries, PCBs, packaging and packaging waste
- Management of recyclable industrial waste
- Contaminated sites

A variant of the new inspection report format was agreed with EPI Pitesti and will be experimented during the next period.

- All inspection findings need to be based upon real evidence – direct observation, verified documents, and not only on statements of company management. If the company declares some actions (e.g. empty, rinse tanks weekly according to the written procedure included in the authorization), then, and if it is a significant activity, the inspector needs to observe this procedure really happening.
- The monthly record on waste generation and management should be verified and attached to the inspection report any time when waste issues are controlled, and at least twice annually.
- During the inspection a special attention will be given to the accuracy of hazardous waste codification and reporting to EPI. In order to facilitate the implementation of the new list of waste (G.O. 856/2002) a Guidance Note for Hazardous Waste Identification will be provided to help companies but also inspectors in verification of waste classification.

6.5 Checklist of Questions for Inspecting Hazardous Waste Management Inside Companies

The checklist is conceived as a guide for inspecting hazardous waste issues and helping the completion of the waste section (section D) within the Inspection Report of companies having impact on the environment.

Its main purpose is to ensure that the inspection reaches the following objectives:

- Eliminate unacceptable dumping of hazardous waste
- Avoid undeclared spills, losses or release in the environment
- Reduce potential for environmental accidents and risks
- Appropriate mitigation measures will be applied in case of accidents involving hazardous waste.

The checklist contains questions structured on three levels of complexity in order to point out general, specific and detailed aspects. It also contains remarks that could:

- Help the understanding of problems by the companies
- Orient on the type of answer that have to be obtained from the company
- Guide the inspector in giving appropriate advice.

Specific recommendations for the manner of doing inspection are also included. Some examples are presented below.

- Information on waste generated by technological processes should be verified by field observations and discussions based on material balance.
- Correct hazardous waste identification and reporting should be object of inspection/control achieved together with the personnel of waste bureau within EPI. The application of the new list of waste (HG 856/2002) has to be verified.
- Consideration must be given to issues related to quantities and handling manner. There are some wastes that could become dangerous when mixed with water or other substances or when exposed to heat.
- The fate of waste has to be tracked by field observation, which should be oriented on verifying the appliance of the “best available technology” for handling and

management.

- The greatest chance of accidental spills or release in the environment is during the hazardous materials or waste handling. Waste handling procedures are effective if based on standardized operations established according to the toxicity level, the persistence and the possible generated risks.
- Hazardous waste handlers have to receive appropriate training and be supplied with suitable equipment, including clothing. Any waste handler should be held liable for accidents caused by mismanagement.
- Good housekeeping measures on-site could reduce waste and minimize opportunities for environmental accidents. All equipment needs to be periodically checked, cleaned or maintained according to strict procedures. Recording of repairs is compulsory.
- In order to track hazardous waste from appearance to the final disposal a formalized chain of custody sheet must be used. This document accompanies the waste during all its movement and provides record of any transfer within the company or from one company to another. It constitutes the legal act supporting the records elaborated by waste generator, recycler or storage/disposal facility.
- To identify contaminated sites there is a need to inspect the areas of fuel tanks and fuel supply stations, the internal railway for raw materials supply and loading of final products in wagons, any place where waste are handled, as well as locations of previous activities.

6.6 Review of Tasks and Responsibilities of Waste Unit As Described in the Organizational and Functioning Regulation - ROF - of EPI Pitesti

The current ROF, elaborated as a draft by the EPI Pitesti, contains 2 chapters especially dedicated to the Waste Unit - named “Bureau for Waste Management and Hazardous Substances (WMHS bureau)”. The tasks of WMHS bureau are described in chapter IV, while its relations with the other EPI departments are detailed in the final chapter entitled “Diagram of Relationships”.

The review of tasks/responsibilities and relations of WMHS bureau was made by analysing the ROF above-mentioned chapters. It resulted some proposals that refer to a more concise/ clear description of tasks mentioned and a completion of attributions with new tasks.

By the close survey of the Waste Unit activity during the Pilot Project it resulted that there are some difficulties in organizing and correlating its common activity with other different compartments, especially the Environmental Guard. The effect is that no enough efficiency could be assured in the field of control of waste management activities. There was also identified a lack of opportunities for verifying the validity of data reported by the economic companies to the county waste database.

In order to eliminate the above-mentioned “weak points” it was proposed to entitle the waste unit personnel with the tasks of field inspection.

- This task is supposed to be fulfilled only in relation to waste/hazardous substances management items and in the purpose to verify their correct identification, management and reporting in normal and accidental conditions.
- The field inspections by the waste unit personnel have to be approved by the EPI chief inspector.
- The inspector in charge of surveying the company should participate to the waste unit inspection/verification.

The text proposed to be introduced in chapter IV of the ROF is as follows:

“To verify by field inspection the uprightness of company reports containing data on identification/ codification of generated waste and management operations.

The field inspections by the waste unit personnel have to be approved by the EPI chief inspector

The inspector in charge for the company current survey should participate to the waste unit inspection /verification”

6.7 Case Study for Elaboration of the Inventory of Contaminated Sites in Arges County

6.7.1 Inventory of Contaminated Sites Within Pitesti County

The environmental laws in Romania do not provide a legal definition of contaminated sites, except for the alert and intervention values of soil contaminants and actions needed when exceeding them (Ministerial Order 756/1997). This is why within the frame of PP4, the following sources that could cause site contamination have been considered:

- Out of use and function deposits of hazardous waste (dumps, lagoons, basins, controlled deposits)
- Former and recent accidental spills of hazardous substances from pipes, reservoirs / storage areas
- Out of use installations containing hazardous substances.

The inventory of contaminated sites and the collection of data about such sites, were based on analysing information provided by different local administrative organizations and field visits to places or enterprises which activities are known as possible source of contamination.

Most information have been obtained by:

- Discussing with EPI departments and analysing their working documents such as: database on waste, impact and auditing studies, companies conformation plans and results of the soil monitoring program;
- Discussions with other authorities: local administrative authorities, county Phyto-Sanitary Direction, Agricultural Direction, Forest Direction;
- Visits to the companies which activities could cause soil contamination (e.g. S.N. PETROM Pitesti - extraction and transport sector, ARPECHIM Pitesti S.A., Automobile Dacia S.A., ARO Campulung S.A., ELECTROARGES Curtea de Arges S.A. etc.).

The contaminated sites inventory was organized on 3 lists:

List 1: The inventory of former and actual (functioning) hazardous waste deposits (17 items out of which 5 are mixed municipal dumping sites that have received and are still receiving industrial waste (including hazardous).

List 2: The inventory of sites contaminated as result of hazardous material depositing (4 items out of which 2 sites contaminated by pesticides and 2 sites contaminated by oils and fuels and located inside Dacia Automobile main premise.

List 3: The inventory of sites contaminated by different accidental spills (13 items out of which 11 sites contaminated by oil and salty water from oil extraction activities, 1 site accidentally contaminated by crude oils spill from transport pipes (V.Preda property near ARPECHIM), 1 site contaminated by other complex spills (Pitesti railway depot).

- After inventorying contaminated site, information on their status and conditions that can generate different types of risks have been collected by using two types of checklists: one checklist was used for all sites, while the second – only for waste contaminated sites, respectively waste depositing areas.
- All information collected were centralized into the county database on contaminated sites

6.7.2 Pitesti County Database on Contaminated Sites

The design of the Database concerning contaminated sites and hazardous waste deposits in Arges county was made in ACCESS program.

The database contains 11 tables. The primary key in every table is the field “Name, location” and all tables are linked by a one-to-one relationship. The reason for using this kind of database design was the number of total fields, which are 73. A single table with 73 fields is too difficult to manipulate and this is why such a solution was adopted to make information available. After defining the above-defined relationship it is possible to create queries, forms and reports to display any information from several tables at once.

The tables representing the content of the database are the following:

- Identification data - with 7 fields;
- Contaminated sites characteristics - with 15 fields;
- Pollution source characteristics - with 5 fields;
- Contaminants characteristics - with 7 fields;
- Land use - with 3 fields;
- Distances - with 7 fields;
- Groundwater use & depth - with 6 fields;
- Management actions - with 8 fields;
- Monitoring - with 7 fields;
- Social aspects - with 8 fields;
- Public awareness - with 7 fields.

6.7.3 Priority Ranking Criteria and Priority Lists for Contaminated Sites and Hazardous Waste Deposits

Initially, the main characteristics of contaminated sites have been analysed considering their suitability as possible ranking criteria and usefulness for prioritisation in the practice.

It resulted that 4 characteristics are not appropriate as ranking criteria for the

following reasons:

- The type of contamination and the chemical nature of contaminants in case of Arges county (and perhaps in other zones, too) are clearly known, but the main contaminants have the same level of hazard and represent the same risks for humans, animals and plants life
- The concentration of the main contaminants, as well as the extend of the contamination, are only occasionally known because no systematic survey and monitoring actions have been achieved for contaminated sites till now.

Based on their availability and significance, the characteristics chosen for the prioritisation process were the following:

- Natural sensitivity of groundwater
- Groundwater use
- Land use
- Contaminated site surface.

The information on natural sensitivity of groundwater tables in Arges County according the hydro-geological conditions was extracted from ICIM studies (1992 – 2002) and verified by field visits. A map showing the natural sensitivity of groundwater tables in Arges county is included in PP4 documents (map no 1). Information on other characteristics was collected by field visits or extracted from different documents owned by EPI, industrial and agricultural enterprises and local authorities.

A scoring system using the collected information was established defining two types of indexes:

- Site Sensitivity Index (SSI), based on the natural sensitivity of groundwater, its use and the land use
- Combined Index of Sensitivity (CIS), which combines the SSI with the site surface dimension

Based on the elaborated method, two types of prioritisation lists have been drafted for contaminated sites and separately for hazardous waste deposits; the first type of lists are based on SSI values, while the second type of lists are based on the values of CIS.

In order to eliminate discrepancies (although usually no larger difference than 5 places between the position of one site on the two types of lists was observed), unified priority lists have been produced by combining the above-described priority lists of contaminated sites and hazardous waste deposits.

Each unified list shows high, medium and low priority items.

These lists have been discussed with EPI representatives and it was agreed that they could be used within the negotiations with the administrative local/central authorities and main economic enterprises when planning remediation and financing clean-up plans.

6.7.4 Mapping the Contaminated Site Inventory of Pitesti County

The inventoried and prioritised contaminated sites have been placed on the map of the

Arges county (maps no 2 and 3).

The maps show that most contaminated sites are concentrated in the Middle and Southern part of the Arges county, which are industrialized zones. Unfortunately, these zones are also the most sensitive to pollution when considering the vulnerability of the groundwater and the use of land.

ANNEXES

ANNEX I List of Laboratory Equipment Provided by JICA to EPI Pitesti within PP4

- Digester
- Petroleum products analyser – OCMA 310
- Portable VOC analyser

Annex II Table 1 EPI Pitesti's Plan of Using the Laboratory Equipment Provided by JICA

No.	Company /location	Investigated area	Env. Media	Analyser								
				Digester			OCMA 310			Portable VOC analyser		
				Metals	No sampling points/ measurements	Frequency	Oily sample	No sampling points/ measurements	Frequency	VOC	No of samples	Frequency
1.	Arpechim Pitesti	Old storage area for biological sludge	Water				x	6	2/year			
			Air							x	12	1/month
			Soil	x	10/20	1/year	x	20	1/year			
		Triazynic storage area	Water				x	12	2/year			
			Air							x	12	1/month
			Soil		4/8		x	8	1/year			
		New storage area for biological sludge	Water				x	6	2/year			
			Air							x	12	1/month
			Soil		8/16							
		Petroleum sludge storage area(lake 5 Dambovnic)	Water				x	4	2/year			
			Air							x	12	2/year
			Soil	x	8/16	1/year	x	16	1/year			
2.	Automobile Dacia /Mioveni	Unloading – storage area for heavy oil	Water				x	4	2/year			
			Air							x	12	2/year
			Soil	x	8/16	1/year	x	12	1/year			
		Central storage area – thermal treatment	Water				x	4	2/year			
			Air							x	6	2\year
			Soil	x	6/12	1/year	x	12	1/year			
		Lagoon area	Water				x	4	2/year			
			Air							x	6	2/year
			Soil	x	6/12	1/year						
3.	City Hall Mioveni	Piscani Area	Water				x	4	2/year			
			Air									
			Soil	x	8/12	1/year						
4.	Rail yard CFR	Heating plant + Oil storage	Water				x	4	2/year			
			Air							x	10	2/year
			Soil		4/8		x	8	1/year			
5.	Aro Campulung	Electroplating sludge reservoir	Water									
			Air									
			Soil	x	8/16	1/year						

18

No.	Company /location	Investigated area	Env. Media	Analyser								
				Digester			OCMA 310			Portable VOC analyser		
				Metals	No sampling points/ measurements	Frequency	Oily sample	No sampling points/ measurements	Frequency	VOC	No of samples	Frequency
6.	IPEE Curtea de Arges	Electroplating sludge storage tank	Water									
			Air									
			Soil	x	8/16	1/year						
7.	MTT Poiana Lacului	Surrounding land to new deposit of oily waste	Water				x	4	2\year			
			Air						x	12	4/year	
			Soil				x	6	2/year			
		Valea Lipia contaminated area	Water				x	2	2/year			
			Air							x	12	4/year
			Soil				x	6	1/year			
8.	Oil extraction fields: Pitesti, Gaiesti, Ciurasti	Polluted soil with petroleum products	Water				x	10	1/year			
			Air							x	34	1/trim
			Soil				x	12	1/year			
9.	Pitesti /Albota, Campulung C.de Arges, Costesti Topoloveni	Mixed waste depositing areas - urban dumping sites	Water									
			Air							x	10	1/year
			Soil	x	As necessary	1\year						
Sample Total					212			164			150	

Part 2

Guidance Note for Identification of Hazardous Waste

GUIDANCE NOTE FOR IDENTIFICATION OF HAZARDOUS WASTE

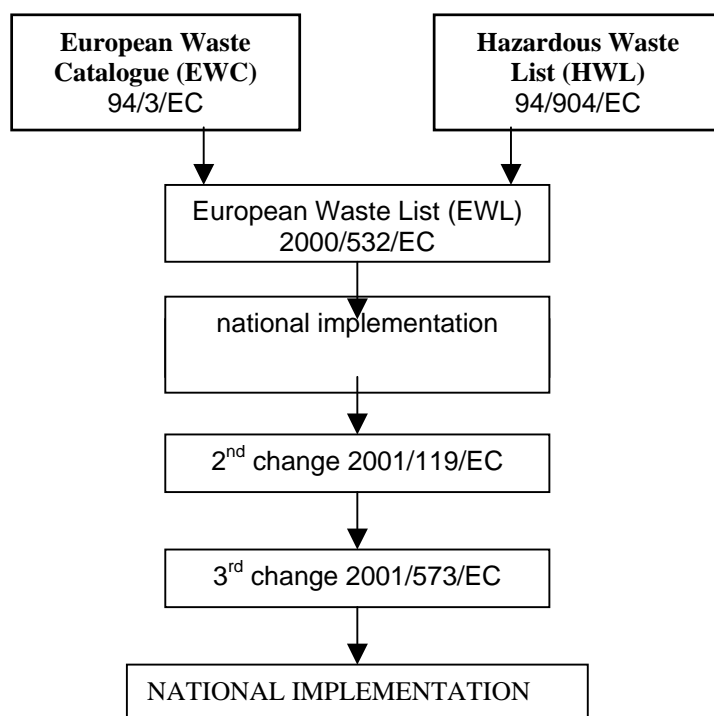
This document is a tool for the assessment and classification of hazardous waste. It is intended to provide guidance to all actors involved in the generation, management and control of hazardous waste. It is supporting the use of European Waste List (EWL) approved by the Governmental Decision (GD) 856/2002 on keeping records on waste management and introduction of the integrated waste list, including hazardous waste.

Document Structure

1. The European Waste List (EWL) and Regulatory Framework
 2. Waste classification protocol
 3. Identification of hazardous waste
 4. Methodology of hazardous waste assessment
 5. Specific waste issues
- Annex I – European Waste List
Annex II – Hazardous properties
Annex III – Risk phrases and hazardous waste threshold limits
Annex IV – Testing methods
Annex V – GD 856/2002, Article 8

1. EUROPEAN WASTE LIST (EWL) AND REGULATORY FRAMEWORK

GD 856/2002 on keeping records for waste management annuls GD 155/1999 which was introducing the use of European Waste Catalogue (EWC) and Hazardous Waste List (HWL); the new GD replaces the EWC and HWL with the new EWL regulated in EU countries by the consolidated version incorporating Council Decisions 2000/532/EC, 2001/118/EC, 2001/119/EC and 2001/573/EC.



The new list increases the number of waste streams compared to the EWC and identifies hazardous waste. It contains 839 waste types and serves as a nomenclature system for the description of waste, offering a basis for a common nation-wide identification of waste, including hazardous waste, for reporting purposes and also for control and monitoring.

GD 856/2002, through the new list of waste presented in its Annex 2, improves the classification structure of waste, introduces the classification protocol and offers criteria for assessment of hazardousness.

Hazardous wastes are classified in the list in two forms:

- Absolute entries (identified with *) are hazardous waste types which require no further testing for the presence of hazardous properties (e.g. oil waste)
- Mirror entries are types of waste that have the potential to contain hazardous materials or not, depending on individual processes; for the categorisation of waste in one of the mirror entries, tests are needed (i.e. effluent treatment sludge: 190205* and 190206).

Table 1 Comparison Between EWC/HWL and EWL

	EWC/HWL	EWL
Chapters (2-digit code)	20	20
Sections (4-digit code)	111	111
Wastes (6-digit code)	645	839
of which hazardous	237	405*

* including about 180 *mirror entries*

EWL implementation problems

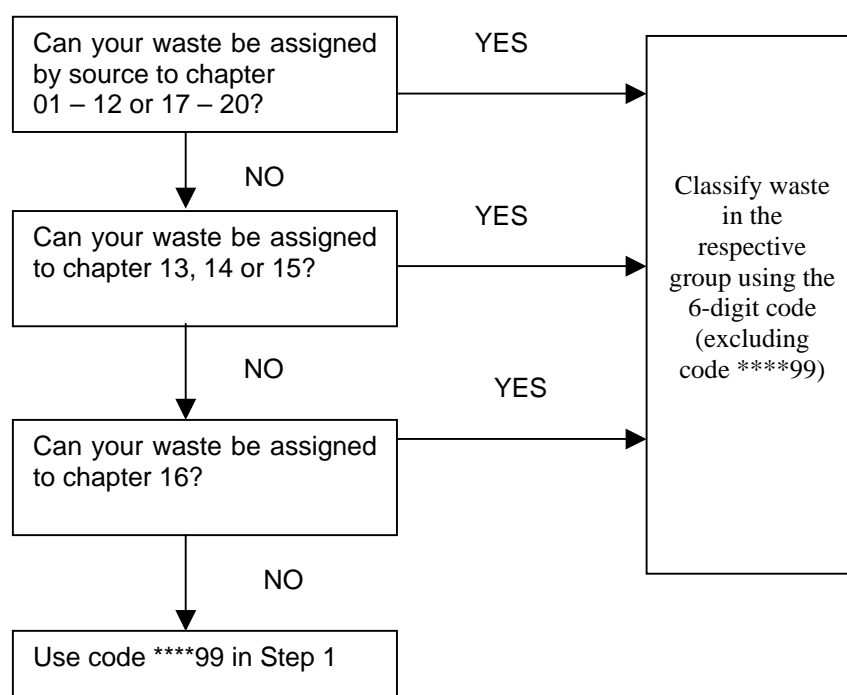
- Waste generators and administrators have to get used to new codes and descriptions
- Assessment of hazardous waste for mirror entries
- Comparison with data from previous years is difficult
- Waste information system have to be adapted
- Permits and licenses have to be adapted.

2. WASTE CLASSIFICATION PROTOCOL

GD 856/2002 presents in Article 6 the general methodology for framing a waste within one of the 6-digit codes in the EWL presented in Annex 2 of the GD (see Annex 1).

The steps to be followed are presented in the diagram below:

Figure 1 Waste Classification Scheme



3. IDENTIFICATION OF HAZARDOUS WASTE

Hazardous waste is defined in Annex 1A of Law 426/2001 on the approval of the Emergency Government Ordinance 78/2000 referring to waste regime as:

“Waste listed in Article 18¹ paragraph 1 based on categories or generic types of waste of hazardous waste presented in Annex 1C and the components of this waste presented in Annex 1D. Components that make this waste to be dangerous when they have one or more of the properties described in Annex 1E”.

These Annexes list types and constituents of waste that will render it hazardous and list specific hazardous properties (see Annex 2). They are a direct correlation with the Annexes supporting the EC Hazardous Waste Directive (91/689/EC).

Article 21 of Law 426/2001 modifies Art. 18 paragraph 1, of Emergency Government Ordinance 78/2000, hazardous waste management, states: “competent authorities shall prepare a list of hazardous waste within 90 days from the date of implementation of this emergency ordinance. The list will be based on categories or generic types of hazardous waste presented in Annex 1C, and on compounds of this waste, presented in Annex 1D, which make this waste be hazardous when they have the characteristics described in Annex 1E. Periodic updating will be approved by Government Decision.”

Wastes classified as hazardous in absolute entries in EWL of GD 856/2002 have one or more hazardous properties stated in Annex IE of the Law 426/2001 on the approval of the Urgency Ordinance 78/2000 referring to waste regime.

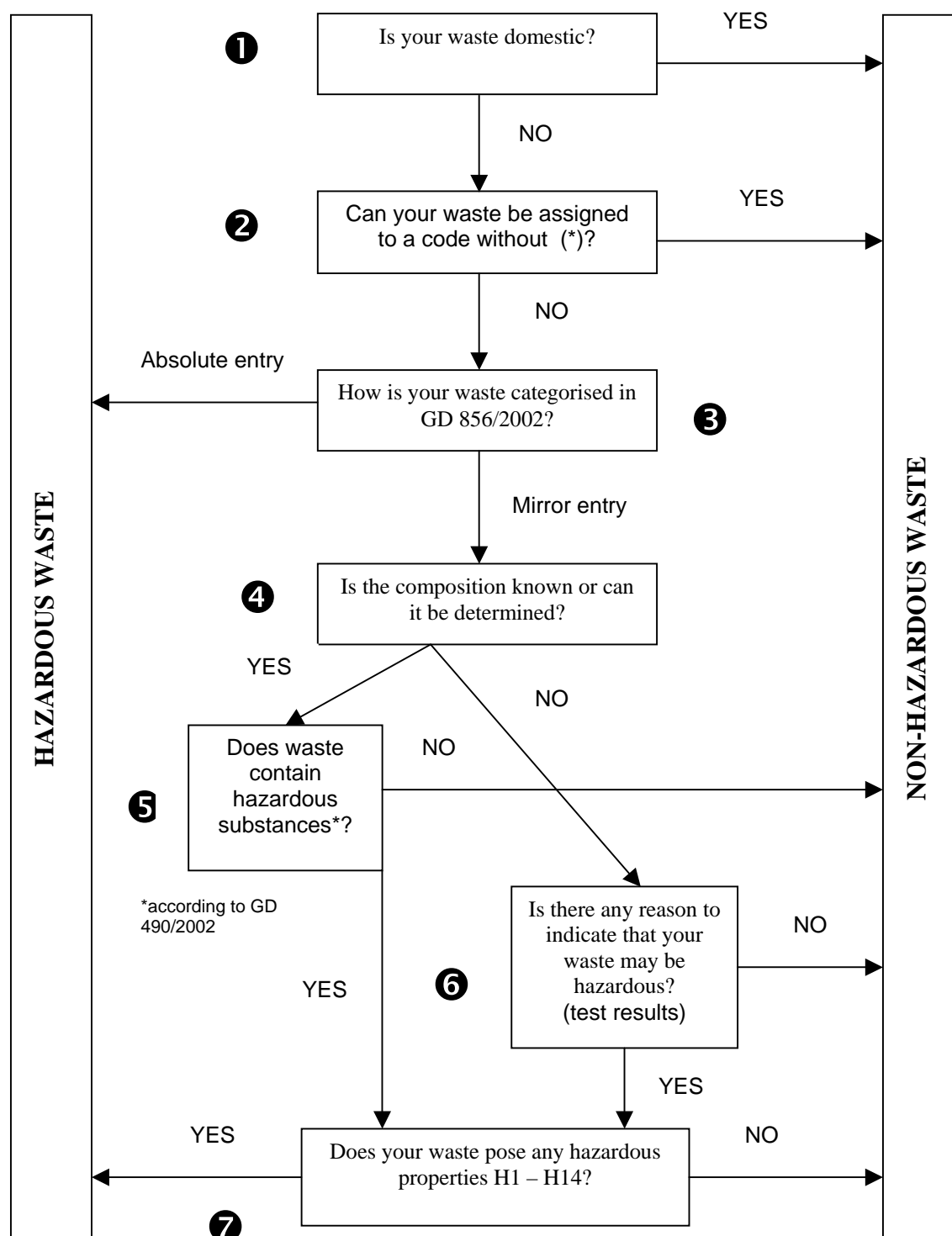
There are many reasons to test wastes to see whether or not they are hazardous waste:

- Operators of IPPC plants need to demonstrate the amount of hazardous waste that they produce and that they have considered options to reduce this waste
- All waste generators make annual declarations of hazardous waste to Ministry of Environment (EPIs)
- The Landfill Regulation (GD 162/2002) requires hazardous and non-hazardous waste to be sent to separate landfill sites and satisfy acceptance criteria
- Any new treatment plant for hazardous waste will need a testing system to ensure that incoming wastes are compatible with the treatment process and each other
- The plans to build new hazardous waste disposal and treatment facilities will be followed by requirements on waste generators to use these facilities, rather than store the materials on site, or dispose of them through the municipal waste system.
- For all of these reasons, both waste producers and the EPIs need some verification and testing procedures to determine whether or not a waste is a hazardous waste (mirror entries).

4. METHODOLOGY FOR HAZARDOUS WASTE ASSESSMENT

The following diagram presents the steps needed in order to classify waste as hazardous, using EWL in GD 856/2002.

Figure 2 Hazardous Waste Identification Methodology



Step 1 Is your waste domestic?

The definition of hazardous waste excludes domestic waste.

Step 2 Can your waste be assigned to a code without (*)?

If your waste is not domestic, try to follow the general methodology for waste classification and see if your waste can be assigned to a non-hazardous waste, according to source of generation.

Step 3 How is your waste categorised in GD 856/2002?

If your waste cannot be assigned to a non-hazardous 6-digit code, it may be either hazardous (identified by (*) as an absolute entry), or mirror entry (wastes that may have hazardous properties or not – pairs of 6-digit codes with the same description).

Absolute entry:

Some wastes covered by EWL are classified as hazardous regardless of their composition or the concentration of hazardous substances within the waste. These entries are termed as “absolute entries”, marked with (*) without a reference to hazardous substances. Threshold calculations are not required.

Mirror entry:

The EWL recognises that certain wastes have the potential to be either hazardous or non-hazardous, depending on their composition and concentration of hazardous substances in the waste. These wastes are covered by 2 entries called “mirror entries”:

- A hazardous waste entry, marked with (*)
- An alternative non-hazardous waste entry, not marked with (*)

They are easily identified because they make a general reference to hazardous substances, e.g.:

16 03 03*	inorganic wastes containing hazardous substances
16 03 04	inorganic wastes other than those mentioned in 16 03 03.

All entries in EWL that are not absolute or mirror entries are not hazardous.

Step 4 Is the composition known or can it be determined?

If your waste can be best assigned to a mirror entry code, you have to determine whether it is hazardous or not. This may be done if the composition is known or if it can be determined.

The easiest method is to identify the chemical composition of waste and then to determine if the concentration of chemicals in the waste are sufficient to render the waste hazardous.

If the composition is not known, the alternatives include testing the waste for hazardous properties or using the precautionary principle (step 6).

Step 5 Does your waste contain a hazardous substance?

If the composition is known you have to identify at least one substance that is hazardous.

The composition of waste can be identified by either:

- Knowing the process or activity generating the waste
- Chemical analysis of waste, or
- Information on safety data sheets (not yet approved)
- Information on labels of chemical containers.

Chemical analysis do not always identify the waste components (especially for inorganic), but only the individual species, such as anions and cations. In such cases, the waste holder should determine what substances are likely to be present according to the generating process and ions present. If the holders cannot decide which substances are present, they should assume the worst scenario for each component and assess the waste accordingly.

GD 490/2002 on the approval of Methodology for implementing the Emergency Government Ordinance 200/2000 on classification, labelling and packaging of hazardous substances and chemicals, regulates the followings:

- Classification and labelling of hazardous substances use the criteria in Annex 1 of the GD
- List of hazardous substances is presented in Annex 2 of the GD
- Testing methods for physico-chemical properties, toxicity and ecotoxicity are presented in Annex 3
- Categories of danger and symbols are presented in Annex 4
- Risk phrases list are presented in Annex 5
- Safety phrases list is presented in Annex 6.
- All annexes of the GD 490 are in accordance with the annexes of the EU Directive 67/548/EEC.

Annexes of the GD 490/2002 have been issued by the National Agency for Hazardous Substances and Chemicals and can be found on the web site of the Ministry of Industry and Resources: www.minind.ro/ANSPChP.

Step 6 Is there any reason to indicate that your waste may be hazardous?

If the composition of the waste is not known or cannot be determined, the waste holder have the duty to determine if the mirror entry is hazardous.

Thus, if:

- There is any reason to indicate that the waste may be hazardous, such as results of tests, knowing the production processes or raw materials use, and/or
- Composition of waste is not known, cannot be determined or is insufficient to allow classification of substances as hazardous,

the waste needs to be tested to determine if it possesses any hazardous properties. EU Directive 67/548/EEC identifies testing methods in Annex V (annex 3 in GD 490/2002) as the methods to be used for hazardous properties. There are some simple, inexpensive tests that can assess a waste as hazardous, such as flash point or pH determination, that can be used to indicate whether a waste is flammable or irritant/corrosive. The present guidance note illustrates in Annex 4 tables with testing methods approved for the determination of hazardous substances and the respective EU Directives.

The precautionary principle is a last option. It is expected that a waste holder will not assume an unknown waste is hazardous or not without a minimum testing of the components of waste.

GD 856/2002, Article 8 (2) gives the characteristics and thresholds that render a waste hazardous.

Step 7 Does your waste pose any hazardous properties H1 – H14?

In order to identify a mirror entry as hazardous, it must display a hazardous property (Annex 2).

There are 2 methods to determine if a mirror entry is hazardous or not:

- Calculating whether the hazardous property is appropriate to a threshold limit for a particular risk phrase (GD 856/2002, Article 8 (2)), or
- Testing the presence of a particular hazardous property.

If the calculation (identification of the chemical and its concentration) shows that the waste contains a hazardous substance above the threshold limit for any of the hazardous properties, the waste is categorised as hazardous mirror entry. If the concentration is below the threshold limit for all hazardous properties, the waste is categorized as non-hazardous mirror entry.

The most appropriate method is testing physical properties (e.g. flashpoint).

The National Agency for Hazardous Substances and Chemicals need to develop the assessment methodology for each hazardous property, including: definition of hazardous property, relevant risk phrases (R), thresholds, diagram setting out the assessment process, information on the testing methods.

Example of Hazardous Waste Assessment Methodology

Waste: Moulds and casting cores from casting ferrous pieces, containing 55% phenol in eluate

Step 1: Waste is not domestic

Step 2: It is not sure that the waste can be assigned to a hazardous waste (*) in the sub-category 10 09

Step 3: It is not an absolute entry in 10 09

Step 4: The composition is known: it contains more than 50% phenol in the eluate, so it may be assigned to the hazardous code 10 09 05*, and not to the 10 09 06

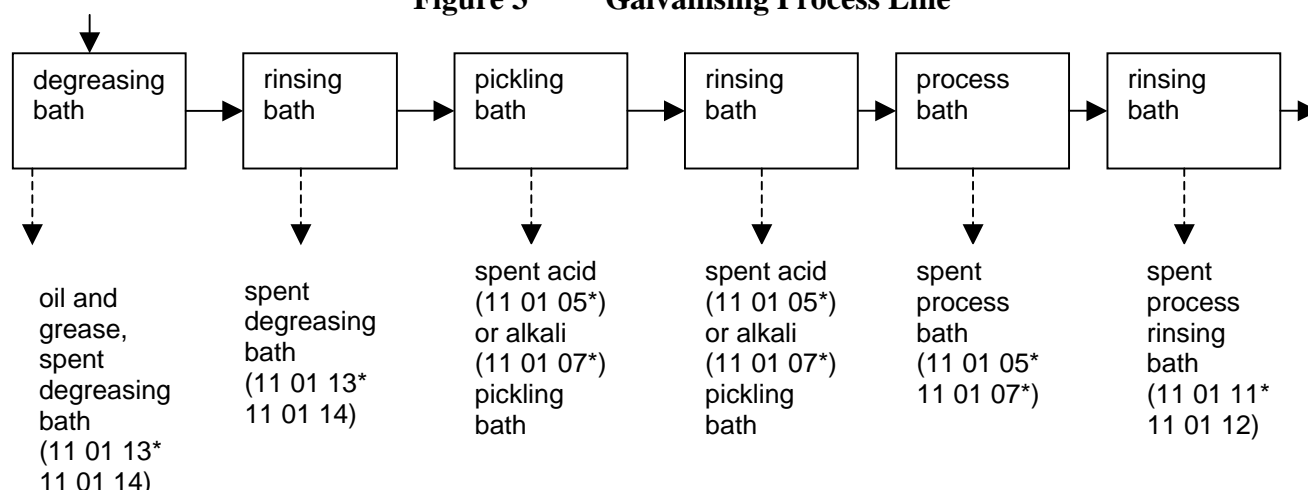
If the concentration of phenol in eluate is less than 50%, the waste may be assigned to the non-hazardous code (10 09 06).

5. SPECIFIC WASTE ISSUES

11 01 Wastes from chemical surface treatment and coating of metals and other materials (galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodising)

1 Processes The purpose of the surface treatment is to protect work pieces from corrosion or to produce a decorative coating. For this, the pieces are immersed in different process solutions in row.

Figure 3 Galvanising Process Line



1.1 Galvanising means electro-chemical production of thin layers on the surface of a piece. The layer of metal being applied lies as positive ions in an electrolyte. By applying an external source of electric power, the piece is charged and becomes a cathode, so that the metal ions on its surface are discharged and deposited. In pure chemical electrolytes, the required electrons come from an electrolyte-containing agent.

1.2 Chromating/Passivating

In order to increase resistance to corrosion and improve paint adhesion, work pieces containing zinc and aluminium are passivated using aquatic solutions of complex fluorides as well as organic polymers and copper salts, and chrome plated using solutions containing chrome VI.

1.3 Phosphatising

In order to increase resistance to corrosion and improve paint adhesion, pieces containing iron are iron or zinc phosphate coated. Iron phosphate coating uses phosphoric acid, zinc phosphate coating includes zinc and nickel or copper ions, as well as nitrate and chlorate as catalysts and hydrogen peroxide as oxidant.

1.4 Anodising is a process where an oxidised protective coating is applied to an aluminium surface to improve its resistance to corrosion. This process also takes place with the use of electricity, but the piece is charged and becomes the anode. After anodising there is a follow-up treatment: painting, sealing.

2 Waste

2.1 Waste from Process Lines

Spent degreasing baths:

Used acid degreasing baths contain dilute salt and phosphoric acid, emulsifiers, protective rust inhibitors, free and emulsified oils and grease.

Spent alkali degreasing baths contain sodium hydroxide, carbonate, phosphate, silicate, surfactant, free and emulsified oils and grease. Acid and alkali degreasing baths are normally classified as hazardous, therefore need special monitoring:

Classification according to EWL (mirror entries):

- 11 01 13* degreasing wastes containing hazardous substances (as a rule)
- 11 01 14 degreasing wastes other than those mentioned in 11 01 13 (exceptions)

Spent degreasing rinsing baths:

After degreasing, the rinsing baths are strongly diluted so they can be disposed of or treated together with spent degreasing baths.

Classification according to EWL (mirror entries):

- 11 01 13* degreasing wastes containing hazardous substances (as a rule)
- 11 01 14 degreasing wastes other than those mentioned in 11 01 13 (exceptions)

Spent acid pickling baths:

Spent acid pickling solutions contain free residual acids, iron chloride, zinc chloride, alloy components from pickled steel, pickling inhibitors.

Classification according to EWL:

- 11 01 05* pickling acids

Spent alkali pickling baths:

During pickling of aluminium, base solutions (sodium hydroxide) is used. Spent alkali pickling solutions contain sodium hydroxide, alloy components from pickled aluminium alloys.

Classification according to EWL:

- 11 01 07* pickling bases

Spent pickling rinsing baths:

After pickling, the rinsing baths are strongly diluted, so they can be disposed of or treated together with spent pickling baths.

Classification according to EWL:

- 11 01 05* pickling acids
- 11 01 07* pickling bases

Spent process baths:

The process solutions contain a mixture of inorganic components: acids, alkalis, metallic and non-metallic salts. To some extent, electrolytes may contain small quantities of organic additives. Some galvanic baths may contain cyanides.

Classification according to EWL:

11 01 05*	pickling acids
11 01 07*	pickling bases

Rinsing water:

Irrespective of the technical conditions and the rinsing technology used, the dragged out elements from the process bath are present in the rinsing water in different concentrations (0.01 – 10%).

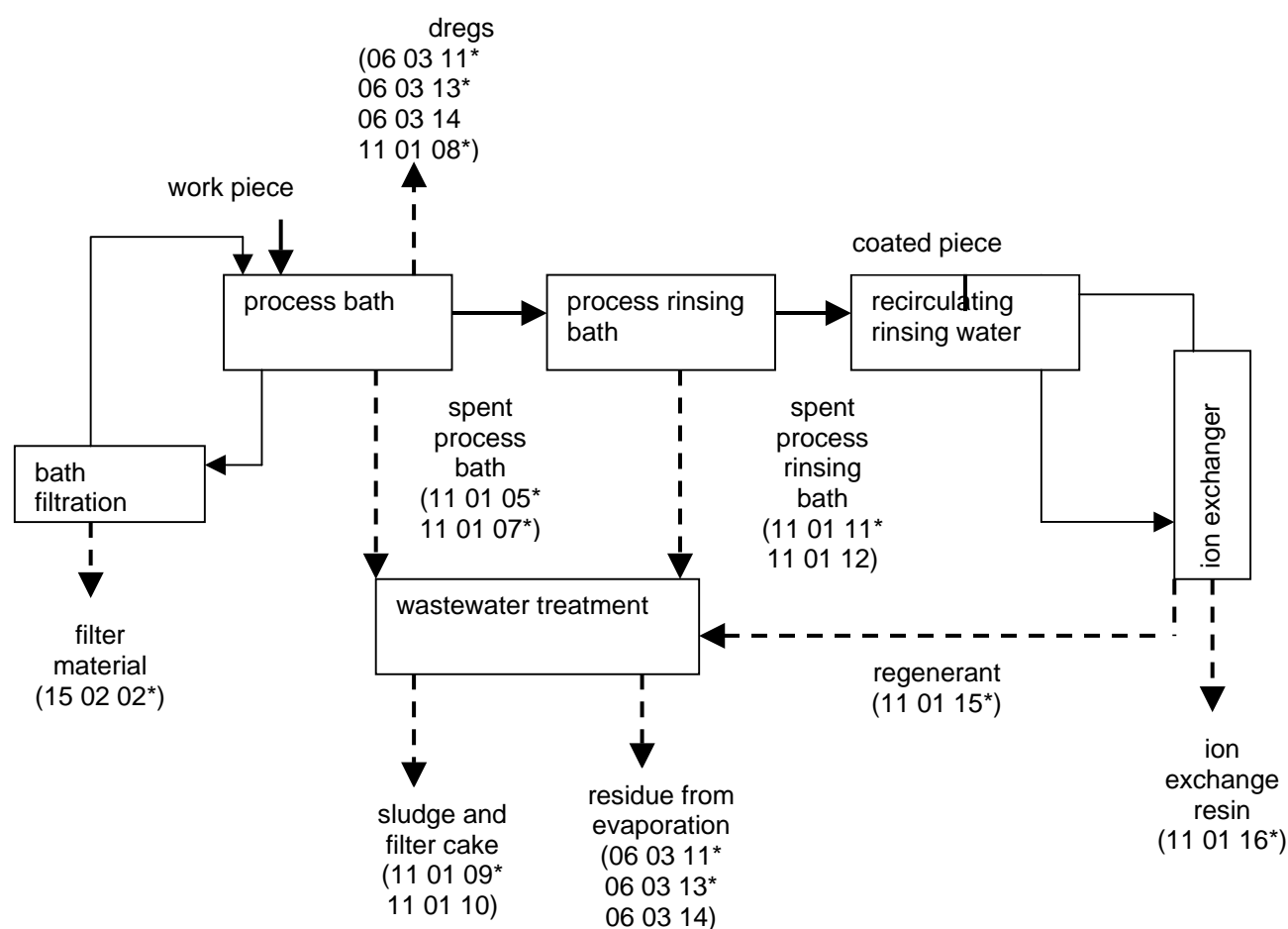
Classification according to EWL (mirror entries):

11 01 11*	aqueous rinsing liquids containing hazardous substances
11 01 12	aqueous rinsing liquids other than those mentioned in 11 01 11.

2.2 Waste from On-Site Wastewater Treatment

If the liquid waste is transferred to the internal wastewater treatment plant, the dissolved metal waste will be changed into a form that is not water soluble in a precipitation process. The resulting sludge or semisolid filter cake contain a large proportion of waste. If there is a small quantity of wastewater, vaporizer technology may be used.

Figure 4 Wastewater Treatment from Metal Treatment and Coating



Residue from bath filtration:

Most process baths are filtered in order to remove non-dissolved contaminants. Both filters and filtering materials are used. Contaminated filter materials appear as waste with electrolyte residue. Oil filters do not arise in galvanizing processes.

Classification according to EWL:

15 02 02* absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances

Dregs from process bath:

For a few electrolytes and during zinc phosphating it is difficult to dissolve dregs accumulated over the time in the process bath. They must be removed regularly.

Classification according to EWL:

06 03 11* solid salts and solutions containing cyanide
06 03 13* solid salts and solutions containing heavy metals
06 03 14 solid salts and solutions other than those mentioned in 06 03 11 and 06 03 13
11 01 08* phosphatising sludge

Sludge and filter cake from wastewater treatment plant:

During wastewater treatment, the precipitants used for heavy metals are usually sodium hydroxide and calcium hydroxide. The resulting sediment is difficult to be dissolved. It settles to a thin sludge layer with approx. 3-5% solid content.

The composition of the sludge depends on the composition of the treatment process or rinsing solution or added chemicals. It normally contains various metal hydroxides and calcium compounds difficult to dissolve (hydroxide, sulphate, phosphate, silicate, fluoride).

Usually, the on-site wastewater treatment plant includes the subsequent filtration of the sludge by means of filter press. The resulting filter cake is semisolid (30-40% solids). In some cases, a further thermal drying to a solid content of 70% follows. The composition of the filter cake is the same with that of the sludge.

Classification according to EWL: (*mirror entries*)

- 11 01 09* sludges and filter cakes containing dangerous substances
- 11 01 10 sludges and filter cakes other than those mentioned in 11 01 09*

Regenerant from ion exchanger:

Rinsing water from running rinses normally contains a high level of dilution (up to 0.01% of the process bath concentration). For saving reasons, the rinsing water is recycled through an ion exchanger. The elements in the rinsing water are then absorbed in the ion exchanger and the clean water is returned to the rinsing process.

During the regeneration of the ion exchange resins, there is an accumulation of regenerant which contains the separated elements from the rinsing water in concentrated form. The concentration of the regenerant elements is similar to the waste process solutions. The regenerant is then passed through the wastewater treatment plant.

Classification according to EWL:

- 11 01 15* eluate and sludges from membrane systems or ion exchange systems containing dangerous substances

Saturated and spent ion exchange resin:

Regeneration of saturated resins can be carried out in an external plant. Ion exchange resins used for the recovery of precious metals and which can not be regenerated are metallurgically used. After a time, ion exchange resins become unusable and have to be disposed of.

Classification according to EWL:

- 11 01 16* saturated or spent ion exchange resins

Residue from evaporation:

If the company produces a small amount of wastewater, it may be passed through an evaporation plant where salts contained in the solution crystallise out and they are disposed.

Classification according to EWL: (*mirror entries*)

- 06 03 11* solid salts and solutions containing cyanide
- 06 03 13* solid salts and solutions containing heavy metals

06 03 14 solid salts and solutions other than those mentioned in 06 03 11 and 06 03 13

Phosphate coating sludges:

During zinc phosphate coating, iron from the work material and metals from the phosphate coating solution go into the phosphate sludge, which is difficult to dissolve. The rinsing water and spent process solutions produced during the phosphate coating have to be specially treated or disposed of as hazardous waste.

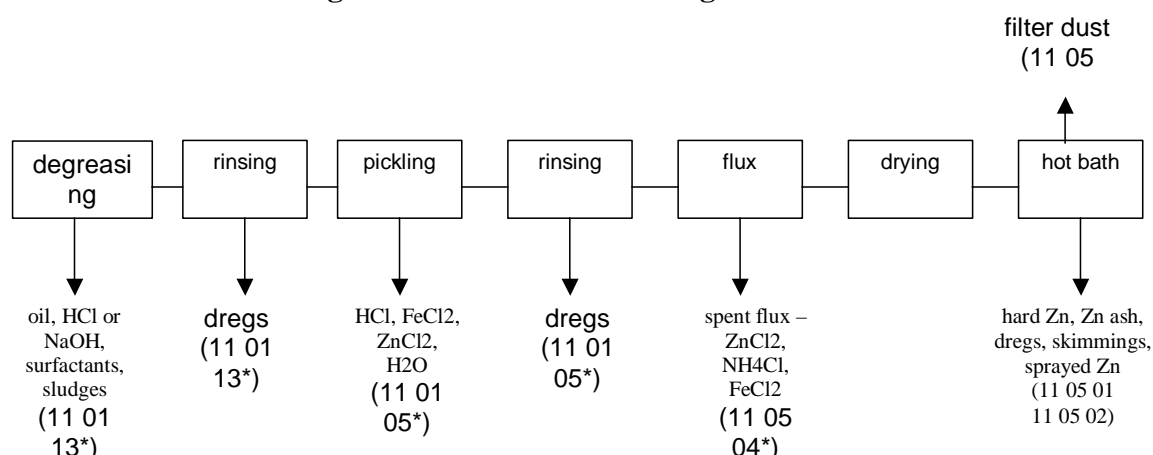
Classification according to EWL:

11 01 08* phosphatising sludge
11 05 Wastes from hot galvanizing processes

1 Processes Hot dip zinc galvanizing is a metallurgical process for applying zinc coatings to steel pieces by immersion in melted zinc. Between the melted zinc and steel surface, layers of iron-zinc alloy are formed, providing a good adhesion for the zinc coating.

The process has two steps: material preparation and immersion in a zinc bath.

Figure 5 Hot Galvanizing Process



2 Wastes

Wastes are generated during the material preparation (degreasing, pickling) and during the hot galvanizing process. Material preparation step also includes waste process baths and waste from cleaning the process baths, which can be classified in EWL in the chapter 11 01.

Spent degreasing baths:

Used acid degreasing baths contain diluted HCl and H₃PO₄, emulsifiers, corrosion inhibitors and free oil and grease. Spent alkali degreasing baths contain NaOH, sodium carbonate, sodium phosphate, silicate and surfactants, as well as free and emulsified oil and grease. Spent acid or alkali degreasing baths are normally classified as hazardous waste.

Classification according to EWL:

11 01 13* degreasing wastes containing dangerous substances

Spent degreasing rinsing baths:

After degreasing, the rinsing baths are diluted degreasing baths, so they are treated or disposed of together with spent degreasing baths.

Classification according to EWL:

11 01 13* degreasing wastes containing dangerous substances

Spent pickling baths:

Spent pickling baths contain free residual acids, iron chloride, zinc chloride, alloy compounds from the pickled steels, pickling inhibitors. Spent pickling baths are usually classified as hazardous waste.

Classification according to EWL:

11 01 05* pickling acids

Spent pickling rinsing baths:

The rinsing baths after the pickling are strongly diluted pickling baths, so they can be treated and disposed of together with the spent pickling baths.

Classification according to EWL:

11 01 05* pickling acids

Spent flux baths:

In time, flux baths accumulate acids and iron through contamination so the effectiveness of the flux is reduced and the bath has to be cleaned. Spent flux is classified as hazardous waste. It can be reprocessed at flux manufacturers or in hot galvanizing workshops.

Classification according to EWL:

11 05 04* spent flux

Hard zinc:

Hard zinc is an iron-zinc alloy which is deposited on the bottom of the hot galvanizing bath and must be removed regularly. It usually contain 95 – 98% zinc and it can be given to zinc refineries for reprocessing.

Classification according to EWL:

11 05 01 hard zinc

Zinc ash/zinc bath skimmings/zinc dregs:

Zinc ash results from zinc being in contact with oxygen in air and from reactions with flux. It mainly contains zinc oxide and zinc chloride. It floats on the surface of the melted zinc. The zinc ash is removed with a zinc bath skimmer. It is normally given to zinc refineries for reprocessing due to the high zinc content (80 – 90%).

Classification according to EWL:

11 05 02 zinc ash

Filter dust:

Dust that is deposited in the exhaust air filters contains mainly NH_4Cl and ZnCl_2 . The manufacturers may use it as raw material for flux production as long as it is not contaminated by oil and grease or dioxine. Filter dust is classified as hazardous waste.

Classification according to EWL:

11 05 03* solid waste from gas treatment.

ANNEX I

European Waste List (Annex 2 of GD 856/2002)

Notes:

codes marked red = hazardous absolute entries

codes marked blue = mirror entries

01 WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING, AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS

01 01 wastes from mineral excavation

01 01 01 wastes from mineral metalliferous excavation

01 01 02 wastes from mineral non-metalliferous excavation

01 03 wastes from physical and chemical processing of metalliferous minerals

01 03 04* acid-generating tailings from processing of sulphide ore

01 03 05* other tailings containing dangerous substances

01 03 06 tailings other than those mentioned in 01 03 04 and 01 03 05

01 03 07* other wastes containing dangerous substances from physical and chemical processing of metalliferous minerals

01 03 08 dusty and powdery wastes other than those mentioned in 01 03 07

01 03 09 red mud from alumina production other than the wastes mentioned in 01 03 07

01 03 99 wastes not otherwise specified

01 04 wastes from physical and chemical processing of non-metalliferous minerals

01 04 07* wastes containing dangerous substances from physical and chemical processing of non-metalliferous minerals

01 04 08 waste gravel and crushed rocks other than those mentioned in 01 04 07

01 04 09 waste sand and clays

01 04 10 dusty and powdery wastes other than those mentioned in 01 04 07

01 04 11 wastes from potash and rock-salt processing other than those mentioned in 01 04 07

01 04 12 tailings and other wastes from washing and cleaning of minerals other than those mentioned in 01 04 07 and 01 04 11

01 04 13 wastes from stone cutting and sawing other than those mentioned in 01 04 07

01 04 99 wastes not otherwise specified

01 05 drilling muds and other drilling wastes

01 05 04 fresh-water drilling muds and wastes

01 05 05* oil-containing drilling muds and wastes

01 05 06* drilling muds and other drilling wastes containing dangerous substances

01 05 07 barite-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06

01 05 08 chloride-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06

01 05 99 wastes not otherwise specified

02 WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING

02 01 wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing

02 01 01 sludges from washing and cleaning

02 01 02 animal-tissue waste

02 01 03 plant-tissue waste

02 01 04 waste plastics (except packaging)

02 01 06 animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site

02 01 0 wastes from forestry

02 01 08* agrochemical waste containing dangerous substances

02 01 09 agrochemical waste other than those mentioned in 02 01 08

02 01 10	waste metal
02 01 99	wastes not otherwise specified
02 02	wastes from the preparation and processing of meat, fish and other foods of animal origin
02 02 01	sludges from washing and cleaning
02 02 02	animal-tissue waste
02 02 03	materials unsuitable for consumption or processing
02 02 04	sludges from on-site effluent treatment
02 02 99	wastes not otherwise specified
02 03	wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation
02 03 01	sludges from washing, cleaning, peeling, centrifuging and separation
02 03 02	wastes from preserving agents
02 03 03	wastes from solvent extraction
02 03 04	materials unsuitable for consumption or processing
02 03 05	sludges from on-site effluent treatment
02 03 99	wastes not otherwise specified
02 04	wastes from sugar processing
02 04 01	soil from cleaning and washing beet
02 04 02	off-specification calcium carbonate
02 04 03	sludges from on-site effluent treatment
02 04 99	wastes not otherwise specified
02 05	wastes from the dairy products industry
02 05 01	materials unsuitable for consumption or processing
02 05 02	sludges from on-site effluent treatment
02 05 99	wastes not otherwise specified
02 06	wastes from the baking and confectionery industry
02 06 01	materials unsuitable for consumption or processing
02 06 02	wastes from preserving agents
02 06 03	sludges from on-site effluent treatment
02 06 99	wastes not otherwise specified
02 07	wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)
02 07 01	wastes from washing, cleaning and mechanical reduction of raw materials
02 07 02	wastes from spirits distillation
02 07 03	wastes from chemical treatment
02 07 04	materials unsuitable for consumption or processing
02 07 05	sludges from on-site effluent treatment
02 07 99	wastes not otherwise specified
03	WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD
03 01	wastes from wood processing and the production of panels and furniture
03 01 01	waste bark and cork
03 01 04*	sawdust, shavings, cuttings, wood, particle board and veneer containing dangerous substances
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
03 01 99	wastes not otherwise specified
03 02	wastes from wood preservation

03 02 01*	non-halogenated organic wood preservatives
03 02 02*	organochlorinated wood preservatives
03 02 03*	organometallic wood preservatives
03 02 04*	inorganic wood preservatives
03 02 05*	other wood preservatives containing dangerous substances
03 02 99	wood preservatives not otherwise specified
03 03	wastes from pulp, paper and cardboard production and processing
03 03 01	waste bark and wood
03 03 02	green liquor sludge (from recovery of cooking liquor)
03 03 05	de-inking sludges from paper recycling
03 03 07	mechanically separated rejects from pulping of waste paper and cardboard
03 03 08	wastes from sorting of paper and cardboard destined for recycling
03 03 09	lime mud waste
03 03 10	fibre rejects, fibre-, filler- and coating sludges from mechanical separation
03 03 11	sludges from on-site effluent treatment other than those mentioned in 03 03 10
03 03 99	wastes not otherwise specified
04	WASTES FROM THE LEATHER, FUR AND TEXTILE INDUSTRIES
04 01	wastes from the leather and fur industry
04 01 01	fleshings and lime split wastes
04 01 02	liming waste
04 01 03*	degreasing wastes containing solvents without a liquid phase
04 01 04	tanning liquor containing chromium
04 01 05	tanning liquor free of chromium
04 01 06	sludges, in particular from on-site effluent treatment containing chromium
04 01 07	sludges, in particular from on-site effluent treatment free of chromium
04 01 08	waste tanned leather (blue sheetings, shavings, cuttings, buffing dust) containing chromium
04 01 09	wastes from dressing and finishing
04 01 99	wastes not otherwise specified
04 02	wastes from the textile industry
04 02 09	wastes from composite materials (impregnated textile, elastomer, plastomer)
04 02 10	organic matter from natural products (e.g. grease, wax)
04 02 14*	wastes from finishing containing organic solvents
04 02 15	wastes from finishing other than those mentioned in 04 02 14
04 02 16*	dyestuffs and pigments containing dangerous substances
04 02 17	dyestuffs and pigments other than those mentioned in 04 02 16
04 02 19*	sludges from on-site effluent treatment containing dangerous substances
04 02 20	sludges from on-site effluent treatment other than those mentioned in 04 02 19
04 02 21	wastes from unprocessed textile fibres
04 02 22	wastes from processed textile fibres
04 02 99	wastes not otherwise specified
05	WASTES FROM PETROLEUM REFINING, NATURAL GAS PURIFICATION AND PYROLYTIC TREATMENT OF COAL
05 01	wastes from petroleum refining
05 01 02*	desalter sludges
05 01 03*	tank bottom sludges
05 01 04*	acid alkyl sludges
05 01 05*	oil spills
05 01 06*	oily sludges from maintenance operations of the plant or equipment
05 01 07*	acid tars
05 01 08*	other tars
05 01 09*	sludges from on-site effluent treatment containing dangerous substances
05 01 10	sludges from on-site effluent treatment other than those mentioned in 05 01 09
05 01 11*	wastes from cleaning of fuels with bases
05 01 12*	oil containing acids

05 01 13	boiler feedwater sludges
05 01 14	wastes from cooling columns
05 01 15*	spent filter clays
05 01 16	sulphur-containing wastes from petroleum desulphurisation
05 01 17	bitumen
05 01 99	wastes not otherwise specified
05 06	wastes from the pyrolytic treatment of coal
05 06 01*	acid tars
05 06 03*	other tars
05 06 04	waste from cooling columns
05 06 99	wastes not otherwise specified
05 07	wastes from natural gas purification and transportation
05 07 01*	wastes containing mercury
05 07 02	wastes containing sulphur
05 07 99	wastes not otherwise specified
06	WASTES FROM INORGANIC CHEMICAL PROCESSES
06 01	wastes from the manufacture, formulation, supply and use (MFSU) of acids
06 01 01*	sulphuric acid and sulphurous acid
06 01 02*	hydrochloric acid
06 01 03*	hydrofluoric acid
06 01 04*	phosphoric and phosphorous acid
06 01 05*	nitric acid and nitrous acid
06 01 06*	other acids
06 01 99	wastes not otherwise specified
06 02	wastes from the MFSU of bases
06 02 01*	calcium hydroxide
06 02 03*	ammonium hydroxide
06 02 04*	sodium and potassium hydroxide
06 02 05*	other bases
06 02 99	wastes not otherwise specified
06 03	wastes from the MFSU of salts and their solutions and metallic oxides
06 03 11*	solid salts and solutions containing cyanides
06 03 13*	solid salts and solutions containing heavy metals
06 03 14	solid salts and solutions other than those mentioned in 06 03 11 and 06 03 13
06 03 15*	metallic oxides containing heavy metals
06 03 16	metallic oxides other than those mentioned in 06 03 15
06 03 99	wastes not otherwise specified
06 04	metal-containing wastes other than those mentioned in 06 03
06 04 03*	wastes containing arsenic
06 04 04*	wastes containing mercury
06 04 05*	wastes containing other heavy metals
06 04 99	wastes not otherwise specified
06 05	sludges from on-site effluent treatment
06 05 02*	sludges from on-site effluent treatment containing dangerous substances
06 05 03	sludges from on-site effluent treatment other than those mentioned in 06 05 02
06 06	wastes from the MFSU of sulphur chemicals, sulphur chemical processes and desulphurisation processes
06 06 02*	wastes containing dangerous sulphides
06 06 03	wastes containing sulphides other than those mentioned in 06 06 02
06 06 99	wastes not otherwise specified

06 07	wastes from the MFSU of halogens and halogen chemical processes
06 07 01*	wastes containing asbestos from electrolysis
06 07 02*	activated carbon from chlorine production
06 07 03*	barium sulphate sludge containing mercury
06 07 04*	solutions and acids, e.g. contact acid
06 07 99	wastes not otherwise specified
06 08	wastes from the MFSU of silicon and silicon derivatives
06 08 02*	wastes containing chlorosilanes
06 08 99	wastes not otherwise specified
06 09	wastes from the MFSU of phosphorous chemicals and phosphorous chemical processes
06 09 02	phosphorous slag
06 09 03*	calcium-based reaction wastes containing or contaminated with dangerous substances
06 09 04	calcium-based reaction wastes other than those mentioned in 06 09 03
06 09 99	wastes not otherwise specified
06 10	wastes from the MFSU of nitrogen chemicals, nitrogen chemical processes and fertiliser manufacture
06 10 02*	wastes containing dangerous substances
06 10 99	wastes not otherwise specified
06 11	wastes from the manufacture of inorganic pigments and opacifiers
06 11 01	calcium-based reaction wastes from titanium dioxide production
06 11 99	wastes not otherwise specified
06 13	wastes from inorganic chemical processes not otherwise specified
06 13 01*	inorganic plant protection products, wood-preserving agents and other biocides.
06 13 02*	spent activated carbon (except 06 07 02)
06 13 03	carbon black
06 13 04*	wastes from asbestos processing
06 13 05*	soot
06 13 99	wastes not otherwise specified
07	WASTES FROM ORGANIC CHEMICAL PROCESSES
07 01	wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals
07 01 01*	aqueous washing liquids and mother liquors
07 01 03*	organic halogenated solvents, washing liquids and mother liquors
07 01 04*	other organic solvents, washing liquids and mother liquors
07 01 07*	halogenated still bottoms and reaction residues
07 01 08*	other still bottoms and reaction residues
07 01 09*	halogenated filter cakes and spent absorbents
07 01 10*	other filter cakes and spent absorbents
07 01 11*	sludges from on-site effluent treatment containing dangerous substances
07 01 12	sludges from on-site effluent treatment other than those mentioned in 07 01 11
07 01 99	wastes not otherwise specified
07 02	wastes from the MFSU of plastics, synthetic rubber and man-made fibres
07 02 01*	aqueous washing liquids and mother liquors
07 02 03*	organic halogenated solvents, washing liquids and mother liquors
07 02 04*	other organic solvents, washing liquids and mother liquors
07 02 07*	halogenated still bottoms and reaction residues
07 02 08*	other still bottoms and reaction residues
07 02 09*	halogenated filter cakes and spent absorbents
07 02 10*	other filter cakes and spent absorbents
07 02 11*	sludges from on-site effluent treatment containing dangerous substances
07 02 12	sludges from on-site effluent treatment other than those mentioned in 07 02 11

07 02 13	waste plastic
07 02 14*	wastes from additives containing dangerous substances
07 02 15	wastes from additives other than those mentioned in 07 02 14
07 02 16*	wastes containing silicones
07 02 17	wastes containing silicones other than those mentioned in 07 02 16
07 02 99	wastes not otherwise specified
07 03	wastes from the MFSU of organic dyes and pigments (except 06 11)
07 03 01*	aqueous washing liquids and mother liquors
07 03 03*	organic halogenated solvents, washing liquids and mother liquors
07 03 04*	other organic solvents, washing liquids and mother liquors
07 03 07*	halogenated still bottoms and reaction residues
07 03 08*	other still bottoms and reaction residues
07 03 09*	halogenated filter cakes and spent absorbents
07 03 10*	other filter cakes and spent absorbents
07 03 11*	sludges from on-site effluent treatment containing dangerous substances
07 03 12	sludges from on-site effluent treatment other than those mentioned in 07 03 11
07 03 99	wastes not otherwise specified
07 04	wastes from the MFSU of organic plant protection products (except 02 01 08 and 02 01 09), wood preserving agents (except 03 02) and other biocides
07 04 01*	aqueous washing liquids and mother liquors
07 04 03*	organic halogenated solvents, washing liquids and mother liquors
07 04 04*	other organic solvents, washing liquids and mother liquors
07 04 07*	halogenated still bottoms and reaction residues
07 04 08*	other still bottoms and reaction residues
07 04 09*	halogenated filter cakes and spent absorbents
07 04 10*	other filter cakes and spent absorbents
07 04 11*	sludges from on-site effluent treatment containing dangerous substances
07 04 12	sludges from on-site effluent treatment other than those mentioned in 07 04 11
07 04 13*	solid wastes containing dangerous substances
07 04 99	wastes not otherwise specified
07 05	wastes from the MFSU of pharmaceuticals
07 05 01*	aqueous washing liquids and mother liquors
07 05 03*	organic halogenated solvents, washing liquids and mother liquors
07 05 04*	other organic solvents, washing liquids and mother liquors
07 05 07*	halogenated still bottoms and reaction residues
07 05 08*	other still bottoms and reaction residues
07 05 09*	halogenated filter cakes and spent absorbents
07 05 10*	other filter cakes and spent absorbents
07 05 11*	sludges from on-site effluent treatment containing dangerous substances
07 05 12	sludges from on-site effluent treatment other than those mentioned in 07 05 11
07 05 13*	solid wastes containing dangerous substances
07 05 14	solid wastes other than those mentioned in 07 05 13
07 05 99	wastes not otherwise specified
07 06	wastes from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics
07 06 01*	aqueous washing liquids and mother liquors
07 06 03*	organic halogenated solvents, washing liquids and mother liquors
07 06 04*	other organic solvents, washing liquids and mother liquors
07 06 07*	halogenated still bottoms and reaction residues
07 06 08*	other still bottoms and reaction residues
07 06 09*	halogenated filter cakes and spent absorbents
07 06 10*	other filter cakes and spent absorbents
07 06 11*	sludges from on-site effluent treatment containing dangerous substances
07 06 12	sludges from on-site effluent treatment other than those mentioned in 07 06 11
07 06 99	wastes not otherwise specified
07 07	wastes from the MFSU of fine chemicals and chemical products not otherwise specified

07 07 01*	aqueous washing liquids and mother liquors
07 07 03*	organic halogenated solvents, washing liquids and mother liquors
07 07 04*	other organic solvents, washing liquids and mother liquors
07 07 07*	halogenated still bottoms and reaction residues
07 07 08*	other still bottoms and reaction residues
07 07 09*	halogenated filter cakes and spent absorbents
07 07 10*	other filter cakes and spent absorbents
07 07 11*	sludges from on-site effluent treatment containing dangerous substances
07 07 12	sludges from on-site effluent treatment other than those mentioned in 07 07 11
07 07 99	wastes not otherwise specified
08	WASTES FROM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS), ADHESIVES, SEALANTS AND PRINTING INKS
08 01	wastes from MFSU and removal of paint and varnish
08 01 11*	waste paint and varnish containing organic solvents or other dangerous substances
08 01 12	waste paint and varnish other than those mentioned in 08 01 11
08 01 13*	sludges from paint or varnish containing organic solvents or other dangerous substances
08 01 14	sludges from paint or varnish other than those mentioned in 08 01 13
08 01 15*	aqueous sludges containing paint or varnish containing organic solvents or other dangerous substances
08 01 16	aqueous sludges containing paint or varnish other than those mentioned in 08 01 15
08 01 17*	wastes from paint or varnish removal containing organic solvents or other dangerous substances
08 01 18	wastes from paint or varnish removal other than those mentioned in 08 01 17
08 01 19*	aqueous suspensions containing paint or varnish containing organic solvents or other dangerous substances
08 01 20	aqueous suspensions containing paint or varnish other than those mentioned in 08 01 19
08 01 21*	waste paint or varnish remover
08 01 99	wastes not otherwise specified
08 02	wastes from MFSU of other coatings (including ceramic materials)
08 02 01	waste coating powders
08 02 02	aqueous sludges containing ceramic materials
08 02 03	aqueous suspensions containing ceramic materials
08 02 99	wastes not otherwise specified
08 03	wastes from MFSU of printing inks
08 03 07	aqueous sludges containing ink
08 03 08	aqueous liquid waste containing ink
08 03 12*	waste ink containing dangerous substances
08 03 13	waste ink other than those mentioned in 08 03 12
08 03 14*	ink sludges containing dangerous substances
08 03 15	ink sludges other than those mentioned in 08 03 14
08 03 16*	waste etching solutions
08 03 17*	waste printing toner containing dangerous substances
08 03 18	waste printing toner other than those mentioned in 08 03 17
08 03 19*	disperse oil
08 03 99	wastes not otherwise specified
08 04	wastes from MFSU of adhesives and sealants (including waterproofing products)
08 04 09*	waste adhesives and sealants containing organic solvents or other dangerous substances
08 04 10	waste adhesives and sealants other than those mentioned in 08 04 09
08 04 11*	adhesive and sealant sludges containing organic solvents or other dangerous substances
08 04 12	adhesive and sealant sludges other than those mentioned in 08 04 11
08 04 13*	aqueous sludges containing adhesives or sealants containing organic solvents or other dangerous substances
08 04 14	aqueous sludges containing adhesives or sealants other than those mentioned in 08 04 13

08 04 15*	aqueous liquid waste containing adhesives or sealants containing organic solvents or other dangerous substances
08 04 16	aqueous liquid waste containing adhesives or sealants other than those mentioned in 08 04 15
08 04 17*	rosin oil
08 04 99	wastes not otherwise specified
08 05	wastes not otherwise specified in 08
08 05 01*	waste isocyanates
09	WASTES FROM THE PHOTOGRAPHIC INDUSTRY
09 01	wastes from the photographic industry
09 01 01*	water-based developer and activator solutions
09 01 02*	water-based offset plate developer solutions
09 01 03*	solvent-based developer solutions
09 01 04*	fixer solutions
09 01 05*	bleach solutions and bleach fixer solutions
09 01 06*	wastes containing silver from on-site treatment of photographic wastes
09 01 07	photographic film and paper containing silver or silver compounds
09 01 08	photographic film and paper free of silver or silver compounds
09 01 10	single-use cameras without batteries
09 01 11*	single-use cameras containing batteries included in 16 06 01, 16 06 02 or 16 06 03
09 01 12	single-use cameras containing batteries other than those mentioned in 09 01 11
09 01 13*	aqueous liquid waste from on-site reclamation of silver other than those mentioned in 09 01 06
09 01 99	wastes not otherwise specified
10	WASTES FROM THERMAL PROCESSES
10 01	wastes from power stations and other combustion plants (except 19)
10 01 01	bottom ash, slag and boiler dust (excluding boiler dust mentioned in 10 01 04)
10 01 02	coal fly ash
10 01 03	fly ash from peat and untreated wood
10 01 04*	oil fly ash and -boiler dust
10 01 05	calcium-based reaction wastes from flue-gas desulphurisation in solid form
10 01 07	calcium-based reaction wastes from flue-gas desulphurisation in sludge form
10 01 09*	sulphuric acid
10 01 13*	fly ash from emulsified hydrocarbons used as fuel
10 01 14*	bottom ash, slag and boiler dust from co-incineration containing dangerous substances
10 01 15	bottom ash, slag and boiler dust from co-incineration other than those mentioned in 10 01 14
10 01 16*	fly ash from co-incineration containing dangerous substances
10 01 17	fly ash from co-incineration other than those mentioned in 10 01 16
10 01 18*	wastes from gas cleaning containing dangerous substances
10 01 19	wastes from gas cleaning other than those mentioned in 10 01 05, 10 01 07 and 10 01 18
10 01 20*	sludges from on-site effluent treatment containing dangerous substances
10 01 21	sludges from on-site effluent treatment other than those mentioned in 10 01 20
10 01 22*	aqueous sludges from boiler cleansing containing dangerous substances
10 01 23	aqueous sludges from boiler cleansing other than those mentioned in 10 01 22
10 01 24	sands from fluidised beds
10 01 25	wastes from fuel storage and preparation of coal-fired power plants
10 01 26	wastes from cooling-water treatment
10 01 99	wastes not otherwise specified
10 02	wastes from the iron and steel industry
10 02 01	wastes from the processing of slag
10 02 02	unprocessed slag
10 02 07*	solid wastes from gas treatment containing dangerous substances
10 02 08	solid wastes from gas treatment other than those mentioned in 10 02 07
10 02 10	mill scales
10 02 11*	wastes from cooling-water treatment containing oil

10 02 12	wastes from cooling-water treatment other than those mentioned in 10 02 11
10 02 13*	sludges and filter cakes from gas treatment containing dangerous substances
10 02 14	sludges and filter cakes from gas treatment other than those mentioned in 10 02 13
10 02 15	other sludges and filter cakes
10 02 99	wastes not otherwise specified
10 03	wastes from aluminium thermal metallurgy
10 03 02	anode scraps
10 03 04*	primary production slags
10 03 05	waste alumina
10 03 08*	salt slags from secondary production
10 03 09*	black drosses from secondary production
10 03 15*	skimmings that are flammable or emit, upon contact with water, flammable gases in dangerous quantities
10 03 16	skimmings other than those mentioned in 10 03 15
10 03 17*	tar-containing wastes from anode manufacture
10 03 18	carbon-containing wastes from anode manufacture other than those mentioned in 10 03 17
10 03 19*	flue-gas dust containing dangerous substances
10 03 20	flue-gas dust other than those mentioned in 10 03 19
10 03 21*	other particulates and dust (including ball-mill dust) containing dangerous substances
10 03 22	other particulates and dust (including ball-mill dust) other than those mentioned in 10 03 21
10 03 23*	solid wastes from gas treatment containing dangerous substances
10 03 24	solid wastes from gas treatment other than those mentioned in 10 03 23
10 03 25*	sludges and filter cakes from gas treatment containing dangerous substances
10 03 26	sludges and filter cakes from gas treatment other than those mentioned in 10 03 25
10 03 27*	wastes from cooling-water treatment containing oil
10 03 28	wastes from cooling-water treatment other than those mentioned in 10 03 27
10 03 29*	wastes from treatment of salt slags and black drosses containing dangerous substances
10 03 30	wastes from treatment of salt slags and black drosses other than those mentioned in 10 03 29
10 03 99	wastes not otherwise specified
10 04	wastes from lead thermal metallurgy
10 04 01*	slags from primary and secondary production
10 04 02*	dross and skimmings from primary and secondary production
10 04 03*	calcium arsenate
10 04 04*	flue-gas dust
10 04 05*	other particulates and dust
10 04 06*	solid wastes from gas treatment
10 04 07*	sludges and filter cakes from gas treatment
10 04 09*	wastes from cooling-water treatment containing oil
10 04 10	wastes from cooling-water treatment other than those mentioned in 10 04 09
10 04 99	wastes not otherwise specified
10 05	wastes from zinc thermal metallurgy
10 05 01	slags from primary and secondary production
10 05 03*	flue-gas dust
10 05 04	other particulates and dust
10 05 05*	solid waste from gas treatment
10 05 06*	sludges and filter cakes from gas treatment
10 05 08*	wastes from cooling-water treatment containing oil
10 05 09	wastes from cooling-water treatment other than those mentioned in 10 05 08
10 05 10*	dross and skimmings that are flammable or emit, upon contact with water, flammable gases in dangerous quantities
10 05 11	dross and skimmings other than those mentioned in 10 05 10
10 05 99	wastes not otherwise specified
10 06	wastes from copper thermal metallurgy
10 06 01	slags from primary and secondary production
10 06 02	dross and skimmings from primary and secondary production
10 06 03*	flue-gas dust

10 06 04	other particulates and dust
10 06 06*	solid wastes from gas treatment
10 06 07*	sludges and filter cakes from gas treatment
10 06 09*	wastes from cooling-water treatment containing oil
10 06 10	wastes from cooling-water treatment other than those mentioned in 10 06 09
10 06 99	wastes not otherwise specified
10 07	wastes from silver, gold and platinum thermal metallurgy
10 07 01	slags from primary and secondary production
10 07 02	dross and skimmings from primary and secondary production
10 07 03	solid wastes from gas treatment
10 07 04	other particulates and dust
10 07 05	sludges and filter cakes from gas treatment
10 07 07*	wastes from cooling-water treatment containing oil
10 07 08	wastes from cooling-water treatment other than those mentioned in 10 07 07
10 07 99	wastes not otherwise specified
10 08	wastes from other non-ferrous thermal metallurgy
10 08 04	particulates and dust
10 08 08*	salt slag from primary and secondary production
10 08 09	other slags
10 08 10*	dross and skimmings that are flammable or emit, upon contact with water, flammable gases in dangerous quantities
10 08 11	dross and skimmings other than those mentioned in 10 08 10
10 08 12*	tar-containing wastes from anode manufacture
10 08 13	carbon-containing wastes from anode manufacture other than those mentioned in 10 08 12
10 08 14	anode scrap
10 08 15*	flue-gas dust containing dangerous substances
10 08 16	flue-gas dust other than those mentioned in 10 08 15
10 08 17*	sludges and filter cakes from flue-gas treatment containing dangerous substances
10 08 18	sludges and filter cakes from flue-gas treatment other than those mentioned in 10 08 17
10 08 19*	wastes from cooling-water treatment containing oil
10 08 20	wastes from cooling-water treatment other than those mentioned in 10 08 19
10 08 99	wastes not otherwise specified
10 09	wastes from casting of ferrous pieces
10 09 03	furnace slag
10 09 05*	casting cores and moulds which have not undergone pouring containing dangerous substances
10 09 06	casting cores and moulds which have not undergone pouring other than those mentioned in 10 09 05
10 09 07*	casting cores and moulds which have undergone pouring containing dangerous substances
10 09 08	casting cores and moulds which have undergone pouring other than those mentioned in 10 09 07
10 09 09*	flue-gas dust containing dangerous substances
10 09 10	flue-gas dust other than those mentioned in 10 09 09
10 09 11*	other particulates containing dangerous substances
10 09 12	other particulates other than those mentioned in 10 09 11
10 09 13*	waste binders containing dangerous substances
10 09 14	waste binders other than those mentioned in 10 09 13
10 09 15*	waste crack-indicating agent containing dangerous substances
10 09 16	waste crack-indicating agent other than those mentioned in 10 09 15
10 09 99	wastes not otherwise specified
10 10	wastes from casting of non-ferrous pieces
10 10 03	furnace slag
10 10 05*	casting cores and moulds which have not undergone pouring containing dangerous substances
10 10 06	casting cores and moulds which have not undergone pouring other than those mentioned in 10 10 05
10 10 07*	casting cores and moulds which have undergone pouring containing dangerous substances

10 10 08	casting cores and moulds which have undergone pouring other than those mentioned in 10 10 07
10 10 09*	flue-gas dust containing dangerous substances
10 10 10	flue-gas dust other than those mentioned in 10 10 09
10 10 11*	other particulates containing dangerous substances
10 10 12	other particulates other than those mentioned in 10 10 11
10 10 13*	waste binders containing dangerous substances
10 10 14	waste binders other than those mentioned in 10 10 13
10 10 15*	waste crack-indicating agent containing dangerous substances
10 10 16	waste crack-indicating agent other than those mentioned in 10 10 15
10 10 99	wastes not otherwise specified
10 11	wastes from manufacture of glass and glass products
10 11 03	waste glass-based fibrous materials
10 11 05	particulates and dust
10 11 09*	waste preparation mixture before thermal processing containing dangerous substances
10 11 10	waste preparation mixture before thermal processing other than those mentioned in 10 11 09
10 11 11*	waste glass in small particles and glass powder containing heavy metals (e.g. from cathode ray tubes)
10 11 12	waste glass other than those mentioned in 10 11 11
10 11 13*	glass-polishing and -grinding sludge containing dangerous substances
10 11 14	glass-polishing and -grinding sludge other than those mentioned in 10 11 13
10 11 15*	solid wastes from flue-gas treatment containing dangerous substances
10 11 16	solid wastes from flue-gas treatment other than those mentioned in 10 11 15
10 11 17*	sludges and filter cakes from flue-gas treatment containing dangerous substances
10 11 18	sludges and filter cakes from flue-gas treatment other than those mentioned in 10 11 17
10 11 19*	solid wastes from on-site effluent treatment containing dangerous substances
10 11 20	solid wastes from on-site effluent treatment other than those mentioned in 10 11 19
10 11 99	wastes not otherwise specified
10 12	wastes from manufacture of ceramic goods, bricks, tiles and construction products
10 12 01	waste preparation mixture before thermal processing
10 12 03	particulates and dust
10 12 05	sludges and filter cakes from gas treatment
10 12 06	discarded molds
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)
10 12 09*	solid wastes from gas treatment containing dangerous substances
10 12 10	solid wastes from gas treatment other than those mentioned in 10 12 09
10 12 11*	wastes from glazing containing heavy metals
10 12 12	wastes from glazing other than those mentioned in 10 12 11
10 12 13	sludge from on-site effluent treatment
10 12 99	wastes not otherwise specified
10 13	wastes from manufacture of cement, lime and plaster and articles and products made from them
10 13 01	waste preparation mixture before thermal processing
10 13 04	wastes from calcination and hydration of lime
10 13 06	particulates and dust (except 10 13 12 and 10 13 13)
10 13 07	sludges and filter cakes from gas treatment
10 13 09*	wastes from asbestos-cement manufacture containing asbestos
10 13 10	wastes from asbestos-cement manufacture other than those mentioned in 10 13 09
10 13 11	wastes from cement-based composite materials other than those mentioned in 10 13 09 and 10 13 10
10 13 12*	solid wastes from gas treatment containing dangerous substances
10 13 13	solid wastes from gas treatment other than those mentioned in 10 13 12
10 13 14	waste concrete and concrete sludge
10 13 99	wastes not otherwise specified
10 14	waste from crematoria
10 14 01*	waste from gas cleaning containing mercury

11	WASTES FROM CHEMICAL SURFACE TREATMENT AND COATING OF METALS AND OTHER MATERIALS; NON-FERROUS HYDRO-METALLURGY
11 01	wastes from chemical surface treatment and coating of metals and other materials (eg. galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodising)
11 01 05*	pickling acids
11 01 06*	acids not otherwise specified
11 01 07*	pickling bases
11 01 08*	phosphatising sludges
11 01 09*	sludges and filter cakes containing dangerous substances
11 01 10	sludges and filter cakes other than those mentioned in 11 01 09
11 01 11*	aqueous rinsing liquids containing dangerous substances
11 01 12	aqueous rinsing liquids other than those mentioned in 11 01 11
11 01 13*	degreasing wastes containing dangerous substances
11 01 14	degreasing wastes other than those mentioned in 11 01 13
11 01 15*	eluate and sludges from membrane systems or ion exchange systems containing dangerous substances
11 01 16*	saturated or spent ion exchange resins
11 01 98*	other wastes containing dangerous substances
11 01 99	wastes not otherwise specified
11 02	wastes from non-ferrous hydrometallurgical processes
11 02 02*	sludges from zinc hydrometallurgy (incl. jarosite, goethite)
11 02 03	wastes from the production of anodes for aqueous electrolytical processes
11 02 05*	wastes from copper hydrometallurgical processes containing dangerous substances
11 02 06	wastes from copper hydrometallurgical processes other than those mentioned in 11 02 05
11 02 07*	other wastes containing dangerous substances
11 02 99	wastes not otherwise specified
11 03	sludges and solids from tempering processes
11 03 01*	wastes containing cyanide
11 03 02*	other wastes
11 05	wastes from hot galvanising processes
11 05 01	hard zinc
11 05 02	zinc ash
11 05 03*	solid wastes from gas treatment
11 05 04*	spent flux
11 05 99	wastes not otherwise specified
12	WASTES FROM SHAPING AND PHYSICAL AND MECHANICAL SURFACE TREATMENT OF METALS AND PLASTICS
12 01	wastes from shaping and physical and mechanical surface treatment of metals and plastics
12 01 01	ferrous metal filings and turnings
12 01 02	ferrous metal dust and particles
12 01 03	non-ferrous metal filings and turnings
12 01 04	non-ferrous metal dust and particles
12 01 05	plastics shavings and turnings
12 01 06*	mineral-based machining oils containing halogens (except emulsions and solutions)
12 01 07*	mineral-based machining oils free of halogens (except emulsions and solutions)
12 01 08*	machining emulsions and solutions containing halogens
12 01 09*	machining emulsions and solutions free of halogens
12 01 10*	synthetic machining oils
12 01 12*	spent waxes and fats
12 01 13	welding wastes
12 01 14*	machining sludges containing dangerous substances

12 01 15	machining sludges other than those mentioned in 12 01 14
12 01 16*	waste blasting material containing dangerous substances
12 01 17	waste blasting material other than those mentioned in 12 01 16
12 01 18*	metal sludge (grinding, honing and lapping sludge) containing oil
12 01 19*	readily biodegradable machining oil
12 01 20*	spent grinding bodies and grinding materials containing dangerous substances
12 01 21	spent grinding bodies and grinding materials other than those mentioned in 12 01 20
12 01 99	wastes not otherwise specified
12 03	wastes from water and steam degreasing processes (except 11)
12 03 01*	aqueous washing liquids
12 03 02*	steam degreasing wastes
13	OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)
13 01	waste hydraulic oils
13 01 01*	hydraulic oils, containing PCBs ⁶
13 01 04*	chlorinated emulsions
13 01 05*	non-chlorinated emulsions
13 01 09*	mineral-based chlorinated hydraulic oils
13 01 10*	mineral based non-chlorinated hydraulic oils
13 01 11*	synthetic hydraulic oils
13 01 12*	readily biodegradable hydraulic oils
13 01 13*	other hydraulic oils
13 02	waste engine, gear and lubricating oils
13 02 04*	mineral-based chlorinated engine, gear and lubricating oils
13 02 05*	mineral-based non-chlorinated engine, gear and lubricating oils
13 02 06*	synthetic engine, gear and lubricating oils
13 02 07*	readily biodegradable engine, gear and lubricating oils
13 02 08*	other engine, gear and lubricating oils
13 03	waste insulating and heat transmission oils
13 03 01*	insulating or heat transmission oils containing PCBs
13 03 05*	mineral-based chlorinated insulating and heat transmission oils other than those mentioned in 13 03 01
13 03 07*	mineral-based non-chlorinated insulating and heat transmission oils
13 03 08*	synthetic insulating and heat transmission oils
13 03 09*	readily biodegradable insulating and heat transmission oils
13 03 10*	other insulating and heat transmission oils
13 04	bilge oils
13 04 01*	bilge oils from inland navigation
13 04 02*	bilge oils from jetty sewers
13 04 03*	bilge oils from other navigation
13 05	oil/water separator contents
13 05 01*	solids from grit chambers and oil/water separators
13 05 02*	sludges from oil/water separators
13 05 03*	interceptor sludges
13 05 06*	oil from oil/water separators
13 05 07*	oily water from oil/water separators
13 05 08*	mixtures of wastes from grit chambers and oil/water separators
13 07	wastes of liquid fuels
13 07 01*	fuel oil and diesel
13 07 02*	petrol

⁶ For the purpose of this list of wastes, PCBs will be defined as in GD 173/2000

13 07 03*	other fuels (including mixtures)
13 08	oil wastes not otherwise specified
13 08 01*	desalter sludges or emulsions
13 08 02*	other emulsions
13 08 99*	wastes not otherwise specified
14	WASTE ORGANIC SOLVENTS, REFRIGERANTS AND PROPELLANTS (except 07 and 08)
14 06	waste organic solvents, refrigerants and foam/aerosol propellants
14 06 01*	chlorofluorocarbons, HCFC, HFC
14 06 02*	other halogenated solvents and solvent mixtures
14 06 03*	other solvents and solvent mixtures
14 06 04*	sludges or solid wastes containing halogenated solvents
14 06 05*	sludges or solid wastes containing other solvents
15	WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED
15 01	packaging (including separately collected municipal packaging waste)
15 01 01	paper and cardboard packaging
15 01 02	plastic packaging
15 01 03	wooden packaging
15 01 04	metallic packaging
15 01 05	composite packaging
15 01 06	mixed packaging
15 01 07	glass packaging
15 01 09	textile packaging
15 01 10*	packaging containing residues of or contaminated by dangerous substances
15 01 11*	metallic packaging containing a dangerous solid porous matrix (e.g. asbestos), including empty pressure containers
15 02	absorbents, filter materials, wiping cloths and protective clothing
15 02 02*	absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances
15 02 03	absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02
16	WASTES NOT OTHERWISE SPECIFIED IN THE LIST
16 01	end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)
16 01 03	end-of-life tyres
16 01 04*	discarded vehicles
16 01 06	end-of-life vehicles, containing neither liquids nor other hazardous components
16 01 07*	oil filters
16 01 08*	components containing mercury
16 01 09*	components containing PCBs
16 01 10*	explosive components (e.g. air bags)
16 01 11*	brake pads containing asbestos
16 01 12	brake pads other than those mentioned in 16 01 11
16 01 13*	brake fluids
16 01 14*	antifreeze fluids containing dangerous substances
16 01 15	antifreeze fluids other than those mentioned in 16 01 14
16 01 16	tanks for liquefied gas
16 01 17	ferrous metal
16 01 18	non-ferrous metal

16 01 19	plastic
16 01 20	glass
16 01 21*	hazardous components other than those mentioned in 16 01 07 to 16 01 11 and 16 01 13 and 16 01 14
16 01 22	components not otherwise specified
16 01 99	wastes not otherwise specified
16 02	wastes from electrical and electronic equipment
16 02 09*	transformers and capacitors containing PCBs
16 02 10*	discarded equipment containing or contaminated by PCBs other than those mentioned in 16 02 09
16 02 11*	discarded equipment containing chlorofluorocarbons, HCFC, HFC
16 02 12*	discarded equipment containing free asbestos
16 02 13*	discarded equipment containing hazardous components ⁷ other than those mentioned in 16 02 09 to 16 02 12
16 02 14	discarded equipment other than those mentioned in 16 02 09 to 16 02 13
16 02 15*	hazardous components removed from discarded equipment
16 02 16	components removed from discarded equipment other than those mentioned in 16 02 15
16 03	off-specification batches and unused products
16 03 03*	inorganic wastes containing dangerous substances
16 03 04	inorganic wastes other than those mentioned in 16 03 03
16 03 05*	organic wastes containing dangerous substances
16 03 06	organic wastes other than those mentioned in 16 03 05
16 04	waste explosives
16 04 01*	waste ammunition
16 04 02*	fireworks wastes
16 04 03*	other waste explosives
16 05	gases in pressure containers and discarded chemicals
16 05 04*	gases in pressure containers (including halons) containing dangerous substances
16 05 05	gases in pressure containers other than those mentioned in 16 05 04
16 05 06*	laboratory chemicals consisting of or containing dangerous substances including mixtures of laboratory chemicals
16 05 07*	discarded inorganic chemicals consisting of or containing dangerous substances
16 05 08*	discarded organic chemicals consisting of or containing dangerous substances
16 05 09	discarded chemicals other than those mentioned in 16 05 06, 16 05 07 or 16 05 08
16 06	batteries and accumulators
16 06 01*	lead batteries
16 06 02*	Ni-Cd batteries
16 06 03*	mercury- containing batteries
16 06 04	alkaline batteries (except 16 06 03)
16 06 05	other batteries and accumulators
16 06 06*	separately collected electrolyte from batteries and accumulators
16 07	wastes from transport tank, storage tank and barrel cleaning (except 05 and 13)
16 07 08*	wastes containing oil
16 07 09*	wastes containing other dangerous substances
16 07 99	wastes not otherwise specified
16 08	spent catalysts
16 08 01	spent catalysts containing gold, silver, rhenium, rhodium, palladium, iridium or platinum (except 16 08 07)
16 08 02*	spent catalysts containing dangerous transition metals ⁸ or dangerous transition metal compounds

⁷ hazardous components from electrical and electronic equipment may include accumulators and batteries mentioned in 16 06 and marked as hazardous; mercury switches, glass from cathode ray tubes and other activated glass etc.

16 08 03	spent catalysts containing transition metals or transition metal compounds not otherwise specified
16 08 04	spent fluid catalytic cracking catalysts (except 16 08 07)
16 08 05*	spent catalysts containing phosphoric acid
16 08 06*	spent liquids used as catalysts
16 08 07*	spent catalysts contaminated with dangerous substances
16 09	oxidising substances
16 09 01*	permanganates, e.g. potassium permanganate
16 09 02*	chromates, e.g. potassium chromate, potassium or sodium dichromate
16 09 03*	peroxides, e.g. hydrogen peroxide
16 09 04*	oxidising substances, not otherwise specified
16 10	aqueous liquid wastes destined for off-site treatment
16 10 01*	aqueous liquid wastes containing dangerous substances
16 10 02	aqueous liquid wastes other than those mentioned in 16 10 01
16 10 03*	aqueous concentrates containing dangerous substances
16 10 04	aqueous concentrates other than those mentioned in 16 10 03
16 11	waste linings and refractories
16 11 01*	carbon-based linings and refractories from metallurgical processes containing dangerous substances
16 11 02	carbon-based linings and refractories from metallurgical processes others than those mentioned in 16 11 01
16 11 03*	other linings and refractories from metallurgical processes containing dangerous substances
16 11 04	other linings and refractories from metallurgical processes other than those mentioned in 16 11 03
16 11 05*	linings and refractories from non-metallurgical processes containing dangerous substances
16 11 06	linings and refractories from non-metallurgical processes others than those mentioned in 16 11 05
17	CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)
17 01	concrete, bricks, tiles and ceramics
17 01 01	concrete
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 06*	mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing dangerous substances
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 02	wood, glass and plastic
17 02 01	wood
17 02 02	glass
17 02 03	plastic
17 02 04*	glass, plastic and wood containing or contaminated with dangerous substances
17 03	bituminous mixtures, coal tar and tarred products
17 03 01*	bituminous mixtures containing coal tar
17 03 02	bituminous mixtures other than those mentioned in 17 03 01
17 03 03*	coal tar and tarred products
17 04	metals (including their alloys)
17 04 01	copper, bronze, brass

⁸ For the purpose of this entry, transition metals are: Scandium, Vanadium, Manganese, Cobalt, Copper, Yttrium, Niobium, Hafnium, Tungsten, Titanium, Chromium, Iron, Nickel, Zinc, Zirconium, Molybdenum and Tantalum. These metals or their compounds are dangerous if they are classified as dangerous substances. The classification of dangerous substances shall determine which among those transition metals and which transition metal compounds are hazardous.

17 04 02	aluminium
17 04 03	lead
17 04 04	zinc
17 04 05	iron and steel
17 04 06	tin
17 04 07	mixed metals
17 04 09*	metal waste contaminated with dangerous substances
17 04 10*	cables containing oil, coal tar and other dangerous substances
17 04 11	cables other than those mentioned in 17 04 10
17 05	soil (including excavated soil from contaminated sites), stones and dredging spoil
17 05 03*	soil and stones containing dangerous substances
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 05*	dredging spoil containing dangerous substances
17 05 06	dredging spoil other than those mentioned in 17 05 05
17 05 07*	track ballast containing dangerous substances
17 05 08	track ballast other than those mentioned in 17 05 07
17 06	insulation materials and asbestos-containing construction materials
17 06 01*	insulation materials containing asbestos
17 06 03*	other insulation materials consisting of or containing dangerous substances
17 06 04	insulation materials other than those mentioned in 17 06 01 and 17 06 03
17 06 05*	construction materials containing asbestos
17 08	gypsum-based construction material
17 08 01*	gypsum-based construction materials contaminated with dangerous substances
17 08 02	gypsum-based construction materials other than those mentioned in 17 08 01
17 09	other construction and demolition wastes
17 09 01*	construction and demolition wastes containing mercury
17 09 02*	construction and demolition wastes containing PCB (e.g. PCB-containing sealants, PCB-containing resin-based floorings, PCB-containing sealed glazing units, PCB-containing capacitors)
17 09 03*	other construction and demolition wastes (including mixed wastes) containing dangerous substances
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
18	WASTES FROM HUMAN OR ANIMAL HEALTH CARE AND/OR RELATED RESEARCH (except kitchen and restaurant wastes not arising from immediate health care)
18 01	wastes from natal care, diagnosis, treatment or prevention of disease in humans
18 01 01	sharps (except 18 01 03)
18 01 02	body parts and organs including blood bags and blood preserves (except 18 01 03)
18 01 03*	wastes whose collection and disposal is subject to special requirements in order to prevent infection
18 01 04	wastes whose collection and disposal is not subject to special requirements in order to prevent infection (e.g. dressings, plaster casts, linen, disposable clothing, diapers)
18 01 06*	chemicals consisting of or containing dangerous substances
18 01 07	chemicals other than those mentioned in 18 01 06
18 01 08*	cytotoxic and cytostatic medicines
18 01 09	medicines other than those mentioned in 18 01 08
18 01 10*	amalgam waste from dental care
18 02	wastes from research, diagnosis, treatment or prevention of disease involving animals
18 02 01	sharps (except 18 02 02)
18 02 02*	wastes whose collection and disposal is subject to special requirements in order to prevent infection

- 18 02 03 wastes whose collection and disposal is not subject to special requirements in order to prevent infection
- 18 02 05* chemicals consisting of or containing dangerous substances
- 18 02 06 chemicals other than those mentioned in 18 02 05
- 18 02 07* cytotoxic and cytostatic medicines
- 18 02 08 medicines other than those mentioned in 18 02 07

19 WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE

19 01 wastes from incineration or pyrolysis of waste

- 19 01 02 ferrous materials removed from bottom ash
- 19 01 05* filter cake from gas treatment
- 19 01 06* aqueous liquid wastes from gas treatment and other aqueous liquid wastes
- 19 01 07* solid wastes from gas treatment
- 19 01 10* spent activated carbon from flue-gas treatment
- 19 01 11* bottom ash and slag containing dangerous substances
- 19 01 12 bottom ash and slag other than those mentioned in 19 01 11
- 19 01 13* fly ash containing dangerous substances
- 19 01 14 fly ash other than those mentioned in 19 01 13
- 19 01 15* boiler dust containing dangerous substances
- 19 01 16 boiler dust other than those mentioned in 19 01 15
- 19 01 17* pyrolysis wastes containing dangerous substances
- 19 01 18 pyrolysis wastes other than those mentioned in 19 01 17
- 19 01 19 sands from fluidised beds
- 19 01 99 wastes not otherwise specified

19 02 wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)

- 19 02 03 premixed wastes composed only of non hazardous wastes
- 19 02 04* premixed wastes composed of at least one hazardous waste
- 19 02 05* sludges from physico/chemical treatment containing dangerous substances
- 19 02 06 sludges from physico/chemical treatment other than those mentioned in 19 02 05
- 19 02 07* oil and concentrates from separation
- 19 02 08* liquid combustible wastes containing dangerous substances
- 19 02 09* solid combustible wastes containing dangerous substances
- 19 02 10 combustible wastes other than those mentioned in 19 02 08 and 19 02 09
- 19 02 11* other wastes containing dangerous substances
- 19 02 99 wastes not otherwise specified

19 03 stabilised/solidified wastes⁹

- 19 03 04* wastes marked as hazardous, partly¹⁰ stabilised
- 19 03 05 stabilised wastes other than those mentioned in 19 03 04
- 19 03 06* wastes marked as hazardous, solidified
- 19 03 07 solidified wastes other than those mentioned in 19 03 06

19 04 vitrified waste and wastes from vitrification

- 19 04 01 vitrified waste
- 19 04 02* fly ash and other flue-gas treatment wastes
- 19 04 03* non-vitrified solid phase
- 19 04 04 aqueous liquid wastes from vitrified waste tempering

19 05 wastes from aerobic treatment of solid wastes

⁹ Stabilisation processes change the dangerousness of the constituents in the waste and thus transform hazardous waste into non hazardous waste. Solidification processes only change the physical state of the waste (e.g. liquid into solid) by using additives without changing the chemical properties of the waste.

¹⁰ A waste is considered as partly stabilised if after the stabilisation process dangerous constituents which have not been changed completely into non dangerous constituents could be released into the environment in short, middle or long term.

19 05 01	non-composted fraction of municipal and similar wastes
19 05 02	non-composted fraction of animal and vegetable waste
19 05 03	off-specification compost
19 05 99	wastes not otherwise specified
19 06	wastes from anaerobic treatment of waste
19 06 03	liquor from anaerobic treatment of municipal waste
19 06 04	digestate from anaerobic treatment of municipal waste
19 06 05	liquor from anaerobic treatment of animal and vegetable waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste
19 06 99	wastes not otherwise specified
19 07	landfill leachate
19 07 02*	landfill leachate containing dangerous substances
19 07 03	landfill leachate other than those mentioned in 19 07 02
19 08	wastes from waste water treatment plants not otherwise specified
19 08 01	screenings
19 08 02	waste from desanding
19 08 05	sludges from treatment of urban waste water
19 08 06*	saturated or spent ion exchange resins
19 08 07*	solutions and sludges from regeneration of ion exchangers
19 08 08*	membrane system waste containing heavy metals
19 08 09	grease and oil mixture from oil/water separation containing edible oil and fats
19 08 10*	grease and oil mixture from oil/water separation other than those mentioned in 19 08 09
19 08 11*	sludges containing dangerous substances from biological treatment of industrial waste water
19 08 12	sludges from biological treatment of industrial waste water other than those mentioned in 19 08 11
19 08 13*	sludges containing dangerous substances from other treatment of industrial waste water
19 08 14	sludges from other treatment of industrial waste water other than those mentioned in 19 08 13
19 08 99	wastes not otherwise specified
19 09	wastes from the preparation of water intended for human consumption or water for industrial use
19 09 01	solid waste from primary filtration and screenings
19 09 02	sludges from water clarification
19 09 03	sludges from decarbonation
19 09 04	spent activated carbon
19 09 05	saturated or spent ion exchange resins
19 09 06	solutions and sludges from regeneration of ion exchangers
19 09 99	wastes not otherwise specified
19 10	wastes from shredding of metal-containing wastes
19 10 01	iron and steel waste
19 10 02	non-ferrous waste
19 10 03*	fluff-light fraction and dust containing dangerous substances
19 10 04	fluff-light fraction and dust other than those mentioned in 19 10 03
19 10 05*	other fractions containing dangerous substances
19 10 06	other fractions other than those mentioned in 19 10 05
19 11	wastes from oil regeneration
19 11 01*	spent filter clays
19 11 02*	acid tars
19 11 03*	aqueous liquid wastes
19 11 04*	wastes from cleaning of fuel with bases
19 11 05*	sludges from on-site effluent treatment containing dangerous substances
19 11 06	sludges from on-site effluent treatment other than those mentioned in 19 11 05
19 11 07*	wastes from flue-gas cleaning
19 11 99	wastes not otherwise specified

19 12	wastes from the mechanical treatment of waste (e.g. sorting, crushing, compacting, pelletising) not otherwise specified
19 12 01	paper and cardboard
19 12 02	ferrous metal
19 12 03	non-ferrous metal
19 12 04	plastic and rubber
19 12 05	glass
19 12 06*	wood containing dangerous substances
19 12 07	wood other than that mentioned in 19 12 06
19 12 08	textiles
19 12 09	minerals (e.g. sand, stones)
19 12 10	combustible waste (refuse derived fuel)
19 12 11*	other wastes (including mixtures of materials) from mechanical treatment of waste containing dangerous substances
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
19 13	wastes from soil and groundwater remediation
19 13 01*	solid wastes from soil remediation containing dangerous substances
19 13 02	solid wastes from soil remediation other than those mentioned in 19 13 01
19 13 03*	sludges from soil remediation containing dangerous substances
19 13 04	sludges from soil remediation other than those mentioned in 19 13 03
19 13 05*	sludges from groundwater remediation containing dangerous substances
19 13 06	sludges from groundwater remediation other than those mentioned in 19 13 05
19 13 07*	aqueous liquid wastes and aqueous concentrates from groundwater remediation containing dangerous substances
19 13 08	aqueous liquid wastes and aqueous concentrates from groundwater remediation other than those mentioned in 19 13 07
20	MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS
20 01	separately collected fractions (except 15 01)
20 01 01	paper and cardboard
20 01 02	glass
20 01 08	biodegradable kitchen and canteen waste
20 01 10	clothes
20 01 11	textiles
20 01 13*	solvents
20 01 14*	acids
20 01 15*	alkalines
20 01 17*	photochemicals
20 01 19*	pesticides
20 01 21*	fluorescent tubes and other mercury-containing waste
20 01 23*	discarded equipment containing chlorofluorocarbons
20 01 25	edible oil and fat
20 01 26*	oil and fat other than those mentioned in 20 01 25
20 01 27*	paint, inks, adhesives and resins containing dangerous substances
20 01 28	paint, inks, adhesives and resins other than those mentioned in 20 01 27
20 01 29*	detergents containing dangerous substances
20 01 30	detergents other than those mentioned in 20 01 29
20 01 31*	cytotoxic and cytostatic medicines
20 01 32	medicines other than those mentioned in 20 01 31
20 01 33*	batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries
20 01 34	batteries and accumulators other than those mentioned in 20 01 33

20 01 35*	discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components ¹¹
20 01 36	discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35
20 01 37*	wood containing dangerous substances
20 01 38	wood other than that mentioned in 20 01 37
20 01 39	plastics
20 01 40	metals
20 01 41	wastes from chimney sweeping
20 01 99	other fractions not otherwise specified
20 02	garden and park wastes (including cemetery waste)
20 02 01	biodegradable waste
20 02 02	soil and stones
20 02 03	other non-biodegradable wastes
20 03	other municipal wastes
20 03 01	mixed municipal waste
20 03 02	waste from markets
20 03 03	street-cleaning residues
20 03 04	septic tank sludge
20 03 06	waste from sewage cleaning
20 03 07	bulky waste
20 03 99	municipal wastes not otherwise specified"

¹¹ hazardous components from electrical and electronic equipment may include accumulators and batteries mentioned in 16 06 and marked as hazardous; mercury switches, glass from cathode ray tubes and other activated glass etc.

ANNEX II

HAZARDOUS PROPERTIES

H1	“Explosive” : substances and preparations which may explode under the effect of flame or which are more sensitive to shocks or friction than dinitrobenzene.
H2	“Oxidizing” : substances and preparations which exhibit highly exothermic reactions when in contact with other substances, particularly flammable substances
H3A	“Highly flammable” <ul style="list-style-type: none"> - liquid substances and preparations having a flash point of 21°C (including extremely flammable liquids), or - substances and preparations which may become hot and finally catch fire in contact with air at ambient temperature without any application of energy, or - solid substances and preparations which may readily catch fire after brief contact with a source of ignition and which continue to burn or to be consumed after removal of the source of ignition, or - gaseous substances and preparations which are flammable in air at normal pressure, or - substances and preparations which, in contact with water or damp air, evolve highly flammable gases in dangerous quantities.
H3B	“Flammable” : liquid substances and preparations which have a flash point equal or greater than 21°C and less than or equal to 55°C
H4	“Irritant” : non-corrosive substances and preparations which, through immediate, prolonged or repeated contact with the skin or mucous membrane, can cause inflammation
H5	“Harmful” : substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may involve limited health risks
H6	“Toxic” : substances and preparations (including very toxic substances and preparations) which, if they are inhaled or ingested or if they penetrate the skin, may involve serious acute or chronic health risks or even death
H7	“Carcinogenic” : substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce cancer or increase its incidence
H8	“Corrosive” : substances and preparations which may destroy living tissue on contact
H9	“Infectious” : substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms
H10¹⁾	“Toxic for reproduction” : substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may produce or increase the incidence of non-heritable adverse effects in the progeny and/or male or female reproductive functions or capacity
H11	“Mutagenic” : substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce hereditary genetic defects or increase their incidence
H12	Substances and preparations which release toxic or very toxic gases in contact with water, air or an acid
H13	Substances and preparations capable by any means, after disposal, of yielding another substance, e.g. a leachate, which possesses any of the characteristics listed above
H14	“Ecotoxic” : substances and preparations which present or may present immediate or delayed risks for one or more sectors of the environment
1) Emergency Ordinance 200/2000 states that “Toxic for reproduction” is considered to be in line with the hazardous property H10 “Teratogenic” in the Hazardous Waste Directive	

ANNEX III

RISK PHRASES and HAZARDOUS WASTE THRESHOLD LIMITS

Risk Phrase*		Hazardous Properties	Hazardous Waste Threshold Limits	Comments
R 1	explosive when dry	H13 by H1	na	a waste containing substance with risk phrase R1 has hazardous property because it may become dry during disposal
R 2	risk of explosion by shock, friction, fire or other sources of ignition	H1	test for explosive by ignition or shock	test is given in Annex 3 of GD 490/2002
R 3	extreme risk of explosion by shock, friction, fire or other sources of explosion	H1	test for explosive by ignition or shock	test is given in Annex 3 of GD 490/2002
R 4	forms very sensitive explosive metallic compounds	H13 by H1	na	
R 5	heating may cause an explosion	H13 by H1	na	
R 6	explosive with or without contact with air	H13 by H1	na	
R 7	may cause fire	H2	test and/or calculation	tests are given in Annex 3 of GD 490/2002; not applicable to organic peroxides
R 8	contact with combustible materials may cause fire	H2	test and/or calculation	tests are given in Annex 3 of GD 490/2002; not applicable to organic peroxides
R 9	explosive when mixed with combustible materials	H2	test and/or calculation	tests are given in Annex 3 of GD 490/2002; not applicable to organic peroxides
R 10	flammable	H3B	flash point: >21 ⁰ C to 55 ⁰ C	tests are given in Annex 3 of GD 490/2002
R 11	highly flammable	H3A (a) (H3B) H3A (c)	H3A (a) fpt ≤21 ⁰ C H3A (c) test	H3A (a) applies to liquids H3A (c) applies to solids H3A (d) applies to gases tests are given in Annex 3 of GD 490/2002
R 12	extremely flammable	H3A (a) (H3B) H3A (d)	H3A (a) fpt ≤21 ⁰ C H3A (d) test	H3A (a) applies to liquids H3A (c) applies to solids H3A (d) applies to gases tests are given in Annex 3 of GD 490/2002

Risk Phrase*		Hazardous Properties	Hazardous Waste Threshold Limits	Comments
R 14	reacts violently with water	na	na	additional risk phrase (alone will not cause a waste to be hazardous)
R 15	contact with water liberates extremely flammable gases	H3A (e)	test and/or calculation	applies to solids and liquids in waste; tests are given in Annex 3 of GD 490/2002
R 16	explosive when mixed with oxidising substances	H13 by H1	na	
R 17	spontaneously flammable in air	H3A (b)	test	applies to solids, liquids and gases; tests are given in Annex 3 of GD 490/2002
R 18	in use may form flammable/explosive vapour-air mixture	H13 by H1, H2 or H3	na	a waste containing substance with this risk phrase is a candidate for hazard H13 (by H1, H2 or H3)
R 19	may form explosive peroxides	H13 by H1, H2 or H3	na	a waste containing substance with this risk phrase is a candidate for hazard H13 (by H1, H2 or H3)
R 20	harmful by inhalation	H5	$\geq 25\%$	threshold limit applies to the total concentration of substances classified as harmful; the concentrations of substances are additive along with the concentrations of substances with risk phrases R65 and those with combined risk phrase R48/R68
R 21	harmful in contact with skin	H5	$\geq 25\%$	threshold limit applies to the total concentration of substances classified as harmful; the concentrations of substances are additive along with the concentrations of substances with risk phrases R65 and those with combined risk phrase R48/R68
R 22	harmful when swallowed	H5	$\geq 25\%$	threshold limit applies to the total concentration of substances classified as harmful; the concentrations of substances are additive along with the concentrations of substances with risk phrases R65 and those with combined risk phrase R48/R68

Risk Phrase*		Hazardous Properties	Hazardous Waste Threshold Limits	Comments
R 23	toxic by inhalation	H6 (H5)	$\geq 3\%$	threshold limit applies to the total concentration of substances classified as toxic; the concentrations of substances are additive along with the concentrations of substances with combined risk phrase R39/R48
R 24	toxic in contact with skin	H6 (H5)	$\geq 3\%$	threshold limit applies to the total concentration of substances classified as toxic; the concentrations of substances are additive along with the concentrations of substances with combined risk phrase R39/R48
R 25	toxic when swallowed	H6 (H5)	$\geq 3\%$	threshold limit applies to the total concentration of substances classified as toxic; the concentrations of substances are additive along with the concentrations of substances with combined risk phrase R39/R48
R 26	very toxic by inhalation	H6 (H5)	$\geq 0.1\%$	threshold limit applies to the total concentration of substances classified as very toxic; the concentrations of substances are additive along with the concentrations of substances with combined risk phrase R39
R 27	very toxic in contact with skin	H6 (H5)	$\geq 0.1\%$	threshold limit applies to the total concentration of substances classified as very toxic; the concentrations of substances are additive along with the concentrations of substances with combined risk phrase R39
R 28	very toxic when swallowed	H6 (H5)	$\geq 0.1\%$	threshold limit applies to the total concentration of substances classified as very toxic; the concentrations of substances are additive along with the concentrations of substances with combined risk phrase R39

Risk Phrase*		Hazardous Properties	Hazardous Waste Threshold Limits	Comments
R 29	contact with water liberates toxic gas	H12	test and/or calculation	test is given in Annex 3 of the GD 490/2002
R 30	can become highly flammable in use	na	na	this is an additional risk phrase; alone will not cause a waste to be hazardous
R 31	contact with acids liberates toxic gas	H12	test and/or calculation	test is given in Annex 3 of the GD 490/2002
R 32	contact with acids liberates very toxic gas	H12	test and/or calculation	test is given in Annex 3 of the GD 490/2002
R 33	danger of cumulative effects	na	na	R33 is used when R48 is not warranted due to the degree of danger posed and will not constitute a hazardous waste in isolation
R 34	causes burns	H8 (H4)	$\geq 5\%$	the concentrations with R34 are additive; they are not additive with corrosive substances assigned R35
R 35	causes severe burns	H8 (H4)	$\geq 1\%$	the concentrations with R35 are additive; they are not additive with corrosive substances assigned R34
R 36	irritating to eyes	H4	$\geq 20\%$	the concentrations with R36 are additive; they are not additive with irritant substances assigned R41
R 37	irritating to respiratory system	H4	$\geq 20\%$	the concentrations with R37 are additive; they are not additive with irritant substances assigned R41
R 38	irritating to skin	H4	$\geq 20\%$	the concentrations with R38 are additive; they are not additive with irritant substances assigned R41
R 39	danger of very serious irreversible effects	H6 (H5)	$\geq 3\%$ (toxic) $\geq 0.1\%$ (very toxic)	R39 is used in conjunction with combinations of R23, R24, R25 or R26, R27, R28, which are used to identify the exposure route; threshold limit will depend whether R39 is used in conjunction with a toxic or very toxic substance; threshold limit applies to the total concentration of substances classified as toxic or very toxic and should be added to the concentrations of the substances with

Risk Phrase*		Hazardous Properties	Hazardous Waste Threshold Limits	Comments
				the same classification
R 40	limited evidence of carcinogenic effect	H7	$\geq 1\%$	the concentration of an individual substance assigned R40 must be above the threshold limit
R 41	risk of a serious damage to eyes	H4	$\geq 10\%$	the concentrations of substances with R41 are additive; their concentrations cannot be added with irritant substances assigned R36, R37 or R38
R 42	may cause sensitisation by inhalation	na	na	sensitisation has no associated hazard and will not constitute a hazardous waste in isolation
R 43	may cause sensitisation by contact with skin	na	na	sensitisation has no associated hazard and will not constitute a hazardous waste in isolation
R 44	risk of explosion if heated under confinement	H13 by H1	na	
R 45	may cause cancer	H7	$\geq 0.1\%$	the concentration of an individual substance assigned R45 must be above the threshold limit
R 46	may cause heritable genetic damage	H11	$\geq 0.1\%$	the concentration of an individual substance assigned R46 must be above the threshold limit
R 48	danger of serious damage to health by prolonged exposure	H5 H6 (H5)	$\geq 25\%$ (H5) $\geq 3\%$ (H6)	R48 is only used in conjunction with combinations of R20, R21, R22 or R23, R24, R25, which are used to identify the exposure route; threshold limit will depend whether R48 is used in conjunction with a toxic or harmful substance; threshold limit applies to the total concentration of substances classified as toxic or harmful and should be added to the concentrations of the substances with the same classification

Risk Phrase*		Hazardous Properties	Hazardous Waste Threshold Limits	Comments
R 49	may cause cancer by inhalation	H7	$\geq 0.1\%$	the concentration of an individual substance assigned R49 must be above the threshold limit
R 50	very toxic to aquatic organisms	H14	$\geq 25\%$	the interrelationship between these risk phrases is complex, with different combinations of the risk phrases being additive depending on the particular effect considered
R 51	toxic to aquatic organisms	H14	$\geq 25\%$	
R 52	harmful to aquatic organisms	H14	$\geq 25\%$	
R 53	may cause long term effects in the aquatic environment	H14	$\geq 25\%$	
R 54	toxic to flora	H14	na	until the detailed criteria have been developed, risk phrases R54 to R58 should not be considered when assessing hazardous waste
R 55	toxic to fauna	H14	na	
R 56	toxic to soil organisms	H14	na	
R 57	toxic to bees	H14	na	
R 58	may cause long term adverse effects in the environment	H14	na	
R 59	dangerous for ozone layer	H14	$\geq 0.1\%$	substances that are listed in Annex 1 to Council Regulation 2037/2000 on substances that deplete the ozone layer and its subsequent amendments
R 60	may impair fertility	H10	$\geq 0.5\%$	the concentration of an individual substance assigned R60 must be above the threshold limit
R 61	may cause harm to the unborn child	H10	$\geq 0.5\%$	the concentration of an individual substance assigned R61 must be above the threshold limit
R 62	possible risk of impaired fertility	H10	$\geq 5\%$	the concentration of an individual substance assigned R62 must be above the threshold limit
R 63	possible risk of harm to the unborn child	H10		the concentration of an individual substance assigned R63 must be above the threshold limit
R 64	may cause harm to breast fed babies	na	na	this is an additional risk; alone will not cause a waste to be hazardous

Risk Phrase*		Hazardous Properties	Hazardous Waste Threshold Limits	Comments
R 65	harmful: may cause lung damage if swallowed	H5	>= 25%	threshold limit applies to the total concentration of substances classified as harmful; the concentrations of substances are additive along with the concentrations of substances with risk phrases R20, R21, R22 and those with combined risk phrase with R48 and R68
R 66	repeated exposure may cause skin dryness or cracking	na	na	this is an additional risk; alone will not cause a waste to be hazardous
R 67	vapors may cause drowsiness and dizziness	na	na	this is an additional risk; alone will not cause a waste to be hazardous
R 68	possible risk of irreversible effects	H11	>= 1%	must be above the threshold limit
		H5	>= 25%	only used in conjunction with combinations of R20, R21, R22 which are used to identify the exposure route; threshold limit applies to the total concentration of substances classified as harmful; concentrations of substances are additive with risk phrases R20, R21, R22, R65 and those with combined risk phrase with R48

Notes:

* risk phrases are those mentioned in Annex 5 (Nature of Special Risks Assigned to Hazardous Substances and Preparations) of GD 490/2002

na = not applicable

H3A (a) = highly flammable: liquid substances and preparations with flash point $\leq 21^{\circ}\text{C}$ (including extremely flammable liquids)

H3A (b) = highly flammable: substances and preparations which may become hot and catch fire in contact with air at ambient temperature, without any application of energy

H3A (c) = highly flammable: solid substances and preparations which may readily catch fire after brief contact with a source of ignition and continue to burn or to be consumed after removal of source of ignition

H3A (d) = highly flammable: gaseous substances and preparations which are flammable in air at normal pressure

H3A (e) = highly flammable: substances and preparations which, in contact with water or damp air, evolve highly flammable gases in dangerous quantities

ANNEX IV

TESTING METHODS

Annex 3 in GD 490/2002 (not yet available, by the time present Notes are developed) is divided in three parts which contain Testing Methods for chemicals that address all areas of concern:

- **Part A** contains methods for the determination of PHYSICO-CHEMICAL PROPERTIES
- **Part B** contains testing methods for the determination of effects on HUMAN HEALTH
- **Part C** contains methods for determination of ENVIRONMENTAL EFFECTS, ecotoxicity and environmental fate

Part A – Determination of Physico-Chemical Properties

Method		EU Directive	Official Journal
A.1	melting/freezing temperature	92/69/EEC	L 383 A 1992
A.2	boiling temperature	92/69/EEC	L 383 A 1992
A.3	relative density	92/69/EEC	L 383 A 1992
A.4	vapour pressure	92/69/EEC	L 383 A 1992
A.5	surface tension	92/69/EEC	L 383 A 1992
A.6	water solubility	92/69/EEC	L 383 A 1992
A.8	partition coefficient	92/69/EEC	L 383 A 1992
A.9	flash point	92/69/EEC	L 383 A 1992
A.10	flammability (solids)	92/69/EEC	L 383 A 1992
A.11	flammability (gases)	92/69/EEC	L 383 A 1992
A.12	flammability (contact with water)	92/69/EEC	L 383 A 1992
A.13	pyrophoric properties of solids and liquids	92/69/EEC	L 383 A 1992
A.14	explosive properties	92/69/EEC	L 383 A 1992
A.15	auto-ignition temperature (liquids and gases)	92/69/EEC	L 383 A 1992
A.16	relative self-ignition temperature for solids	92/69/EEC	L 383 A 1992
A.17	oxidizing properties (solids)	92/69/EEC	L 383 A 1992
A.18	number – average molecular weight and molecular weight distribution of polymers	98/73/EC	L 305 1998
A.19	low molecular weight content of polymers	98/73/EC	L 305 1998
A.20	solution/extraction behaviour of polymers in water	98/73/EC	L 305 1998

Part B – Determination of Effects on Human Health

Method	EU Directive	Official Journal	Notes
B.1 bis	acute toxicity (oral) - fixed dose method	92/69/EEC	L 383 A 1992
B.1 tris	acute toxicity (oral) – acute toxic class method	96/54/EC	L 248 1996
B.2	acute toxicity (inhalation)	92/69/EEC 93/21/EEC	L 383 A 1992 L 110 1993
B.3	acute toxicity (dermal)	92/69/EEC	L 383 A 1992
B.4	acute toxicity (skin irritation)	92/69/EEC	L 383 A 1992
B.5	acute toxicity (eye irritation)	92/69/EEC	L 383 A 1992
B.6	skin sensitization	96/54/EC	L 248 1996
B.7	repeated dose (28 days) toxicity (oral)	96/54/EC	L 248 1996
B.8	repeated dose (28 days) toxicity (inhalation)	92/69/EEC	L 383 A 1992
B.9	repeated dose (28 days) toxicity (dermal)	92/69/EEC	L 383 A 1992
B.10	mutagenity – in vitro mammalian chromosome aberration test	2000/32/EC	L 136 2000
B.11	mutagenity – in vivo mammalian bone-marrow chromosome aberration test	2000/32/EC	L 136 2000
B.12	mutagenity – in vivo mammalian erythrocyte micronucleus test	2000/32/EC	L 136 2000
B.13/14	mutagenity – reverse mutation test using bacteria	2000/32/EC	L 136 2000 English version title corrected in 2001/59/EC
B.15	gene mutation – <i>Saccharomyces cerevisiae</i>	88/302/EEC	L 133 1988 Numbering in 96/54/EC
B.16	mitotic recombination - <i>Saccharomyces cerevisiae</i>	88/302/EEC	L 133 1988 Numbering in 96/54/EC
B.17	mutagenity – in vitro mammalian cell gene mutation test	2000/32/EC	L 136 2000 Numbering in 96/54/EC
B.18	DNA damage and repair – unscheduled DNA synthesis – mammalian cells in vitro	88/302/EEC	L 133 1988 Numbering in 96/54/EC
B.19	sister chromatid exchange assay in vitro	88/302/EEC	L 133 1988 Numbering in 96/54/EC
B.20	sex-linked recessive lethal test in <i>Drosophila melanogaster</i>	88/302/EEC	L 133 1988 Numbering in 96/54/EC
B.21	in vitro mammalian cell transformation test	88/302/EEC	L 133 1988 Numbering in 96/54/EC
B.22	rodent dominant lethal test	88/302/EEC	L 133 1988 Numbering in 96/54/EC
B.23	mammalian spermatogonial chromosome aberration test	2000/32/EC	L 136 2000 Numbering in 96/54/EC
B.24	mouse spot test	88/302/EEC	L 133 1988 Numbering in 96/54/EC
B.25	mouse heritable translocation	88/302/EEC	L 133 1988 Numbering in 96/54/EC
B.26	sub-chronic oral toxicity test – repeated dose 90 days oral toxicity study in rodents	2001/59/EC	L 225 2001 Numbering in 96/54/EC
B.27	sub-chronic oral toxicity test – repeated dose 90 days oral toxicity study in non-rodents	2001/59/EC	L 225 2001 Numbering in 96/54/EC
B.28	sub-chronic dermal toxicity test – repeated dose 90 days oral toxicity study in rodents	88/302/EEC	L 133 1988 Numbering in 96/54/EC

Method		EU Directive	Official Journal	Notes
B.29	sub-chronic inhalation toxicity test – repeated dose 90 days oral toxicity study in rodents	88/302/EEC	L 133 1988	Numbering in 96/54/EC
B.30	chronic toxicity test	88/302/EEC	L 133 1988	Numbering in 96/54/EC
B.31	teratogenicity test – rodent and non-rodent	88/302/EEC	L 133 1988	Numbering in 96/54/EC
B.32	carcinogenicity test	88/302/EEC	L 133 1988	Numbering in 96/54/EC
B.33	combined chronic toxicity / carcinogenicity test	88/302/EEC	L 133 1988	Numbering in 96/54/EC
B.34	one generation reproduction toxicity test	88/302/EEC	L 133 1988	Numbering in 96/54/EC
B.35	two generation reproduction toxicity test	88/302/EEC	L 133 1988	Numbering in 96/54/EC
B.36	toxicokinetics	88/302/EEC	L 133 1988	Numbering in 96/54/EC
B.37	delayed neurotoxicity of organophosphorus substances following acute exposure	96/54/EC	L 248 1996	
B.38	delayed neurotoxicity of organophosphorus substances 28 day repeated dose study	96/54/EC	L 248 1996	
B.39	unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo	2000/32/EC	L 136 2000	French version corrected in 2001/59/EC
B.40	skin corrosion	2000/33/EC	L 136 2000	
B.41	phototoxicity – in vitro 3T3 NRU phototoxicity test	2000/33/EC	L 136 2000	English version corrected in 2001/59/EC

Part C – Determination of Environmental Effects

Method		EU Directive	Official Journal	Notes
C.1	acute toxicity for fish	92/69/EEC	L 383 A 1992	
C.2	acute toxicity for Daphnia	92/69/EEC	L 383 A 1992	
C.3	algal inhibition test	92/69/EEC	L 383 A 1992	
C.4	biodegradation: determination of the “ready” biodegradability	92/69/EEC	L 383 A 1992	
C.4 A	dissolved organic carbon (DOC) – die-away test	92/69/EEC	L 383 A 1992	
C.4 B	modified OECD screening test	92/69/EEC	L 383 A 1992	
C.4 C	carbon dioxide evolution test	92/69/EEC	L 383 A 1992	
C.4 D	manometric respiratory test	92/69/EEC	L 383 A 1992	
C.4 E	closed bottle test	92/69/EEC	L 383 A 1992	
C.4 F	MITI test	92/69/EEC	L 383 A 1992	
C.5	degradation: biochemical oxygen demand (BOD)	92/69/EEC	L 383 A 1992	
C.6	degradation: chemical oxygen demand (COD)	92/69/EEC	L 383 A 1992	
C.7	degradation: abiotic degradation: hydrolysis as a function of pH	92/69/EEC	L 383 A 1992	
C.8	toxicity for earthworms: artificial soil test	88/302/EEC	L 133 1988	
C.9	biodegradation: Zahn-Wellen test	88/302/EEC	L 133 1988	
C.10	biodegradation: activated sludge simulation test	88/302/EEC	L 133 1988	
C.11	biodegradation: activated sludge respiration inhibition test	88/302/EEC	L 133 1988	
C.12	biodegradation: modified SCAS test	88/302/EEC	L 133 1988	
C.13	bioconcentration: flow-through fish test	98/73/EC	L 305 1998	
C.14	fish juvenile growth test	2001/59/EC	L 255 2001	
C.15	fish short-term toxicity test on Embryo and sac-fry stages	2001/59/EC	L 255 2001	
C.16	honeybees – acute oral toxicity test	2001/59/EC	L 255 2001	
C.17	honeybees – acute contact toxicity test	2001/59/EC	L 255 2001	
C.18	adsorption/desorption using a batch equilibrium method	2001/59/EC	L 255 2001	
C.19	estimation of the adsorption coefficient (K_{OC}) on soil and sewage sludge using a high performance liquid chromatography (HPLC)	2001/59/EC	L 255 2001	
C.20	<i>Daphnia magna</i> reproduction test	2001/59/EC	L 255 2001	

Summary Table on Methods

Method	EU Directive	Official Journal	Comments
A.1 to A.17 B.1 bis B.3 to B.5 B.8 to B.9 C.1 to C.7	92/69/EEC	L 383 A 1992	B.2 modified in 93/21/EEC B.6 and B.7 updated in 96/54/EC B.10 to B.13/14 updated in 2000/32/EC
B.2 B.15 to B.16 B.18 to B.22 B.24 to B.25 B.28 to B.36 C.8 to C.12	92/69/EEC 93/21/EEC 88/302/EEC	L 383 A 1992 L 110 1993 L 133 1988	Numbering established in 96/54/EC Algal test updated in 92/69/EEC B.17 and B.23 updated in 2000/32/EC B.26 and B.27 updated in 2001/59/EC
B.1 tris B.6 B.7 B.37 B.38 numbering from B.15 to B.38	96/54/EC	L 248 1996	
A.18, A.19, A.20 C.13	98/73/EC	L 305 1998	
B.10 to B.13/14 B.17 B.23 B.39	2000/32/EC	L 136 2000	B.13/14 English version corrected in 2001/59/EC B.39 French version corrected in 2001/59/EC
B.40 to B.41	2000/33/EC	L 136 2000	B.41 English version corrected in 2001/59/EC
B.26 and B.27	2001/59/EC	L 225 2001	

ANNEX V

Article 8 in GD 856/2002 (excerpt)

- (1) Wastes classified as hazardous – marked with (*) – present one or more hazardous properties in Annex IE in Emergency Ordinance 78/2000 approved by Law 426/2001
- (2) Wastes with properties H3 – H8, H10 and H11 in Annex IE are hazardous if they possess one or more of the following characteristics:
 - a) Flash point $\leq 55^{\circ}\text{C}$
 - b) One or more substances classified as very toxic, in total concentration $\geq 0.1\%$
 - c) One or more substances classified as toxic, in total concentration $\geq 3\%$
 - d) One or more substances classified as harmful, in total concentration $\geq 25\%$
 - e) One or more substances classified as corrosive (R35), in total concentration $\geq 1\%$
 - f) One or more substances classified as corrosive (R34), in total concentration $\geq 5\%$
 - g) One or more substances classified as irritant (R41), in total concentration $\geq 10\%$
 - h) One or more substances classified as irritant (R36, R37 and R38), in total concentration $\geq 20\%$
 - i) One substance known as carcinogenic, category 1 or 2, in concentration $\geq 0.1\%$
 - j) One substance known as carcinogenic, category 3, in concentration $\geq 1\%$
 - k) One substance toxic for reproduction, category 1 or 2 (R60, R61), in concentration $\geq 0.5\%$
 - l) One substance toxic for reproduction, category 3 (R62, R63), in concentration $\geq 5\%$
 - m) One substance mutagenic, category 1 or 2 (R46), in concentration $\geq 0.1\%$
 - n) One substance mutagenic, category 3 (R40), in concentration $\geq 1\%$.
- (3) For the hazardous properties named in (2), the following notes are made:
 - a) For the hazardous property H10 the name “toxic for reproduction” is used, in accordance to Emergency Ordinance 200/2000
 - b) Substances are classified as hazardous in accordance to GD 490/2002
 - c) Heavy metal means any compound or metallic form of arsenic, cadmium, chromium (VI), copper, lead, mercury, nickel, selenium, Sn, Sb, thallium or tellur.

Part 3

Guide

for Elaboration of

Company Waste Management Plan

GUIDE for Elaboration of COMPANY WASTE MANAGEMENT PLAN

The elaboration of the plan for waste management by the waste generators is an obligation resulted from the Law 426/2001 for the approval of the GEO 78/2000 on waste regime.

The paragraph (2) of article 8 1 stipulates that waste management plans at county level shall be elaborated based on plans of local councils and industrial waste producers. Plans of local councils and industrial waste producers should have the same content and format as the national plan of waste management.

The Waste Management Plan has also the purpose to promote the application of the GEO 34/2002 on integrated pollution prevention and control in order to facilitate the obtaining of the integrated environmental authorization and, if the case, the elaboration of the conformation program in this respect.

LIST OF CONTENTS of this Guidance Note

1. General Description of Company
 2. Waste Management – Present Situation
 3. Prognosis on Waste Quantities and Management Needs
 4. Objectives for Waste Management
 5. Measures to Achieve the Objectives
 6. Activities for Quantity Reduction, Selective Collection Recovery and Environmentally Safe Treatment of Wastes
- Annexes (1 to 5) Explanatory notes to help completion of Waste Management Plan

1 GENERAL DESCRIPTION OF COMPANY

1.1. Elements for Company Identification

Company name:.....
SIRUES Code
Locality:
Address: Street..... no.
Capital form:.....
Juridical status:.....
Main activity – CAEN Code:.....
Secondary activities - CAEN Codes:.....

Name of the person appointed under paragraph (n) of Art 19 GEO 78/2000) within the unit for surveying and ensuring the accomplishment of the obligations provided by law for the waste producers

1.2. Short Characterization

Details on the location (site environmental conditions).....

Starting operation (year).....
Total number of employeesNumber of productive employees.....

1.3. General Description of the Activity

No.	Technological processes	Raw material used in production	Main products	Waste generation	
				Waste name	Waste code

1.4. Products Amount At Present and Production Forecast for 2005

Product name	Measurement unit	1999	2000	2001	2005

1.5. Process Flow and Material Balance

See example in Annex 1

2 WASTE MANAGEMENT – PREZENT SITUATION

2.1. Waste

Previous and actual situation of waste generated quantities will be presented by waste codes, based on annual records transmitted to local EPI.

Trend in total waste generation

Waste name	Waste code	Generated quantities in the last 3 years(to/year)		
		1999	2000	2001
Total				

Trend in Hazardous Waste Generation

Waste name	Waste code	Hazardous constituents	Hazardous properties	Generated quantities in the last 3 years (to/year)		
				1999	2000	2001
Total						

Indicators Referring to Quantities of Waste(Referring to the Last Year)

Waste name	Waste code	Waste generated quantity / product unit (to /to or pieces)	Waste generated quantity / productive employee (to/ employee)
Medium value			

2.2. Present Waste Management (Referring to the Last Year)

Waste type	Waste code	Waste quantities (to/year)					
		Finally disposed			Recovered		
		Quantity (to/year)	Disposal cod	Place of disposal	Quantity (to/year)	Recovery cod	Contractor name
Total							

See codes for disposal and recycling – as mentioned in GEO 78/2000 - in the Annex no 1

2.3. Selective Collected Waste for Recovery Or On-Site Recovered Waste(Referring to the Last Year)

Recovered waste type	Recovered quantity (to/year)	Contractor name
Paper & cardboard		
Wood, sawdust		
Metall		
Plastics		
Textile		
Waste oil		
Used tyres		
Car scraps		
Manure		
Others waste (specify)		
Total		

2.4. Summary on the Management of Waste (Data Referring to the Last Year)

Management activity	Hazardous waste	Non-hazardous waste	Total industrial waste	Municipal waste	Total waste
	a	b	c = a + b	d	e = c + d
1. Initially generated					
2. Internally recycled					
3. Amount reported as generated quantity (1 – 2)					
4. Incinerated within company own incinerator					
5. Stored or landfilled on company own facility					
6. Waste sent to other companies [3 - (4 + 5)]					
7. Sent to recyclers					
8. Sent to external waste management facilities (6 – 7)					
9. Sent to external incinerator					
10. Sent to external landfill (8 – 9)					
11. Sent to municipal landfill					
12. Sent to other industrial landfill site (10 – 11)					

2.5. Waste Landfilling on Company Own Site

Landfill location	Year of start operation	Distance from dwelling areas [m]	Type of landfill*	Landfill arrangements**	Environment license yes/no	Landfill surface [ha]	Projected capacity [to]	Occupied capacity [to]	Yearly landfilled waste quantity [to/y]	Types of landfilled waste	Code of landfilled waste

*Codes for type of landfill:

- Mixed industrial waste landfill (DIA);
- Hazardous waste landfill (DIDP);
- Non-hazardous industrial waste landfill(DIDN);
- Inert waste landfill (DDI);
- Municipal landfill (DUM);
- Industrial & municipal waste landfill (DDIM) ;
- Sterile dump (HS);
- Ash and slag landfill (HZC);
- Settling tank (ID);
- Lagoon (B);
- Sludge drying bed (PU);
- Underground storage (DS).

**Codes for landfill arrangements:

- Fencing and gate(I) ;
- Lining (IM) ;
- Guarding (perimetral) ditch (CG) ;
- Drainage (D) ;
- Monitoring wells (FM) ;
- Weighing bridges (C) ;
- Without any arrangement (N)

2.6. Waste Incineration

No.	Type of incinerator (eg rotary, 2-stage combustion etc)	Incineration temperature. (°C)	With or without energy saving	Type of incinerated waste	Capacity (to/day or to/hour)	Operating hours per year	Resulted ash quantity (to/day)	Gas cleaning technology for scrubbing and particulate removal

2.7. Physico- Chemical Treatment on Own Company Site

2.8. Cost of Waste Management (lei/to)

Costs by type of waste	Internal costs*	External costs**		Total costs***
		costs	incomes	
Municipal waste				
Industrial waste				
a).....				
b).....				
c).....				
Total				

* Internal costs = waste transport cost + materials cost + labor cost + own facility operation costs

** External costs = costs resulted from sending waste to other organizations – costs of service provided and incomes obtained from waste recycling

*** Total costs = internal costs + external costs – external incomes

2.9. Contaminated Sites Due to Waste

2.9.1 List of Contaminated Sites Within the Company

No.	Contaminated site location	Surface (ha)	Type of contamination		Nature of risk	
			Type of waste	Polluting substances	For environment	For health

Explanatory notes for completion of section 2.9.1 in the Annex no 1

2.9.2 Management Actions/Measures for Reducing the Risks Related To Contaminated Sites

No.	Contaminated site location	Actions/Measures			Deadline for achievement	Who is responsible
		Applied	Under way	Proposed clean-up plan		

Explanatory notes for completion of section 2.9.2 in the Annex no 1

2.10. Assessment of the Present Situation in Company Waste Management

See general explanatory notes in Annex no 1

2.10.1 Waste Handling in Accordance With BAT

See explanatory notes for completion of point 2.10 1 in the Annex no 4

2.10.2. Waste Recycling, Recovery and Disposal in Accordance to BAT

See explanatory notes for completion of point 2.10.2 in the Annex no 5

3 PROGNOSIS ON WASTE QUANTITIES AND MANAGEMENT NEEDS

A forecast will be made on waste generation in the years 2005 depending on activities development and new technologies input.

Forecast of Waste Generation

Waste generating processes	Waste type	Waste code	Industrial waste quantities (to/year)	
			reference year - 2001	year 2005
Total				

4 OBJECTIVES FOR WASTE MANAGEMENT

The selection of objectives will depend on the provisions included in the National Strategy for Waste Management and the County Waste Management Plan. They should be in conformity with all environmental regulations

Objectives definition, phases and deadlines for implementing

See explanatory notes for completion of point 4 in the Annex no 1

5 MEASURES TO REACH THE OBJECTIVES

5.1. Measures for Generated Waste Quantity Minimization

See explanatory notes for completion of point 5.1 in the Annex no 1

5.2. Waste Treatment (Pretreatment)

See explanatory notes for completion of point 5.2 in the Annex no 1

5.3. Waste Recovery

See explanatory notes for completion of point 5.3 in the Annex no 1

5.4. Waste disposal

See explanatory notes for completion of point 5.4 in the Annex no 1

6 ACTIONS FOR QUANTITY REDUCTION, SELECTIVE COLECTION, RECOVERY AND ENVIRONMENTAL SAFE TREATMENT OF WASTE

6.1. Technical & Administrative Measures

Measure	Waste category	Data of implementation	Cost

See explanatory notes for completion of point 6.1 in the Annex no 1

6.2. Investment projects

No.	Type of activity generating waste	Project name	Project initiator	Project stage	Project Value (EURO)	Financing sources

See explanatory notes for completion of point 6.2 in the Annex no 1

Date

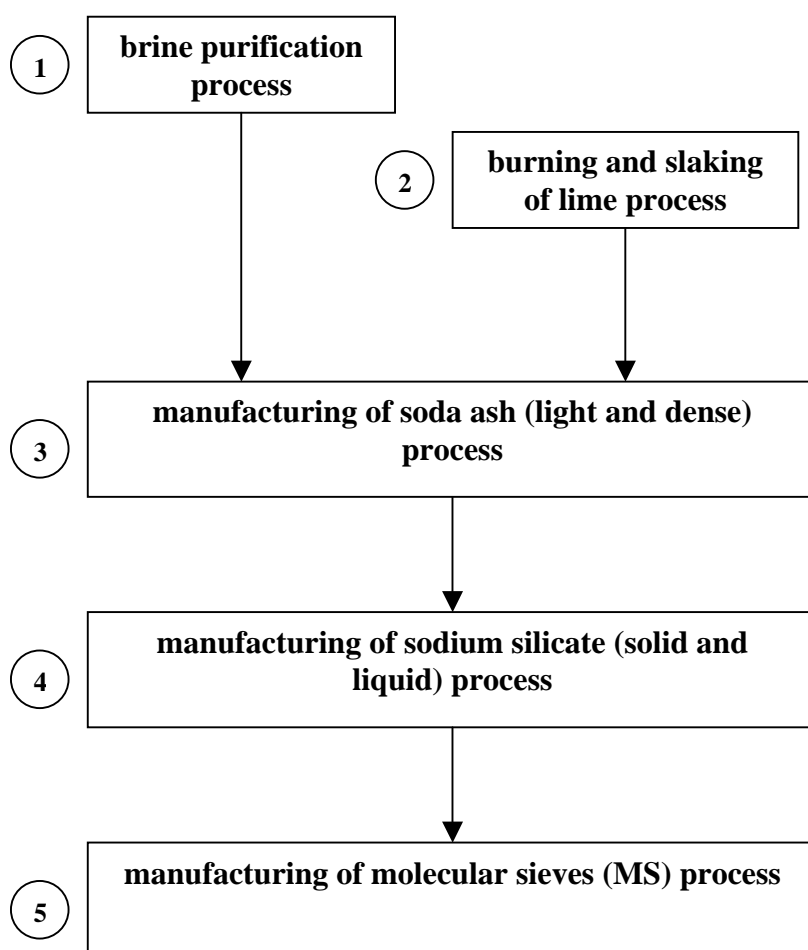
MANAGER
Name, signature, stamp

Environmental Protection Responsible
Name, signature,

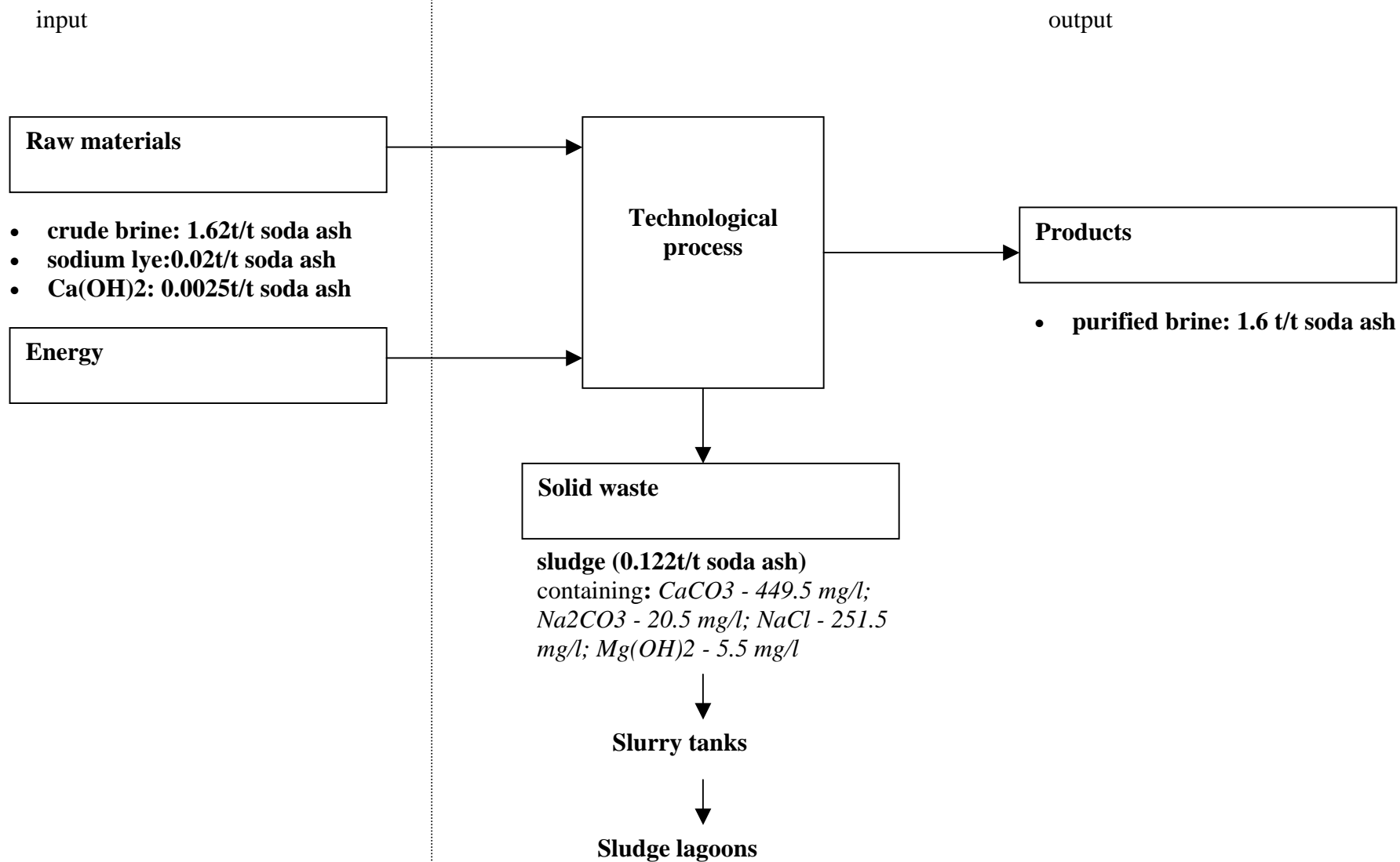
ANNEX I EXPLANATORY NOTES FOR COMPLETION THE GUIDE SECTIONS

Example for completion of the section 1.5 – Process flow and material balance

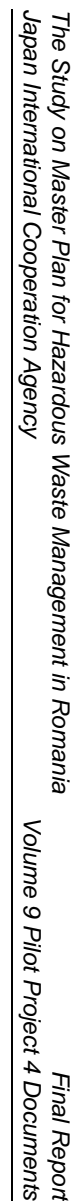
GENERAL PRESENTATION OF TECHNOLOGICAL PROCESSES



BRINE PURIFICATION PLANT SCHEME



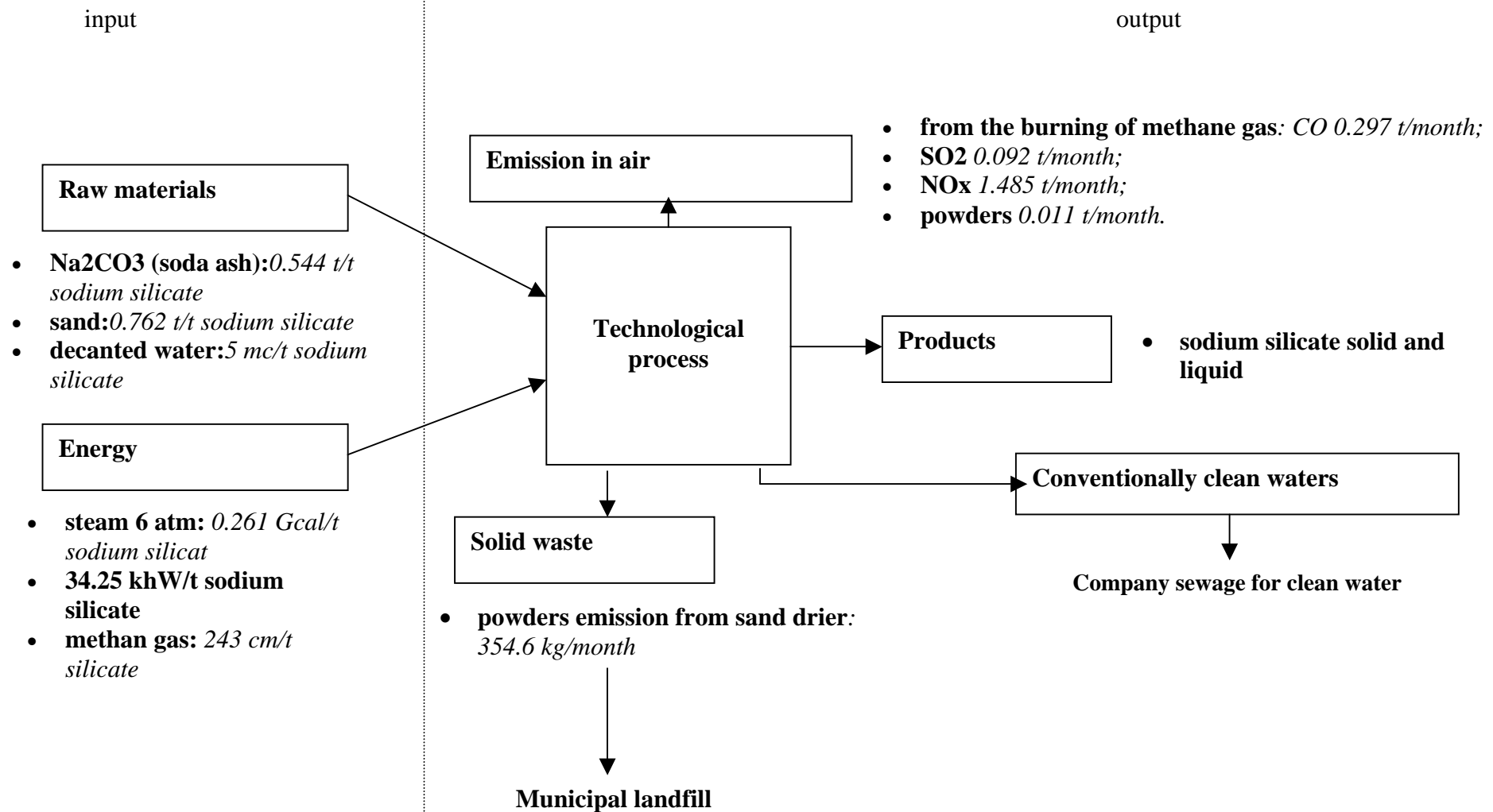
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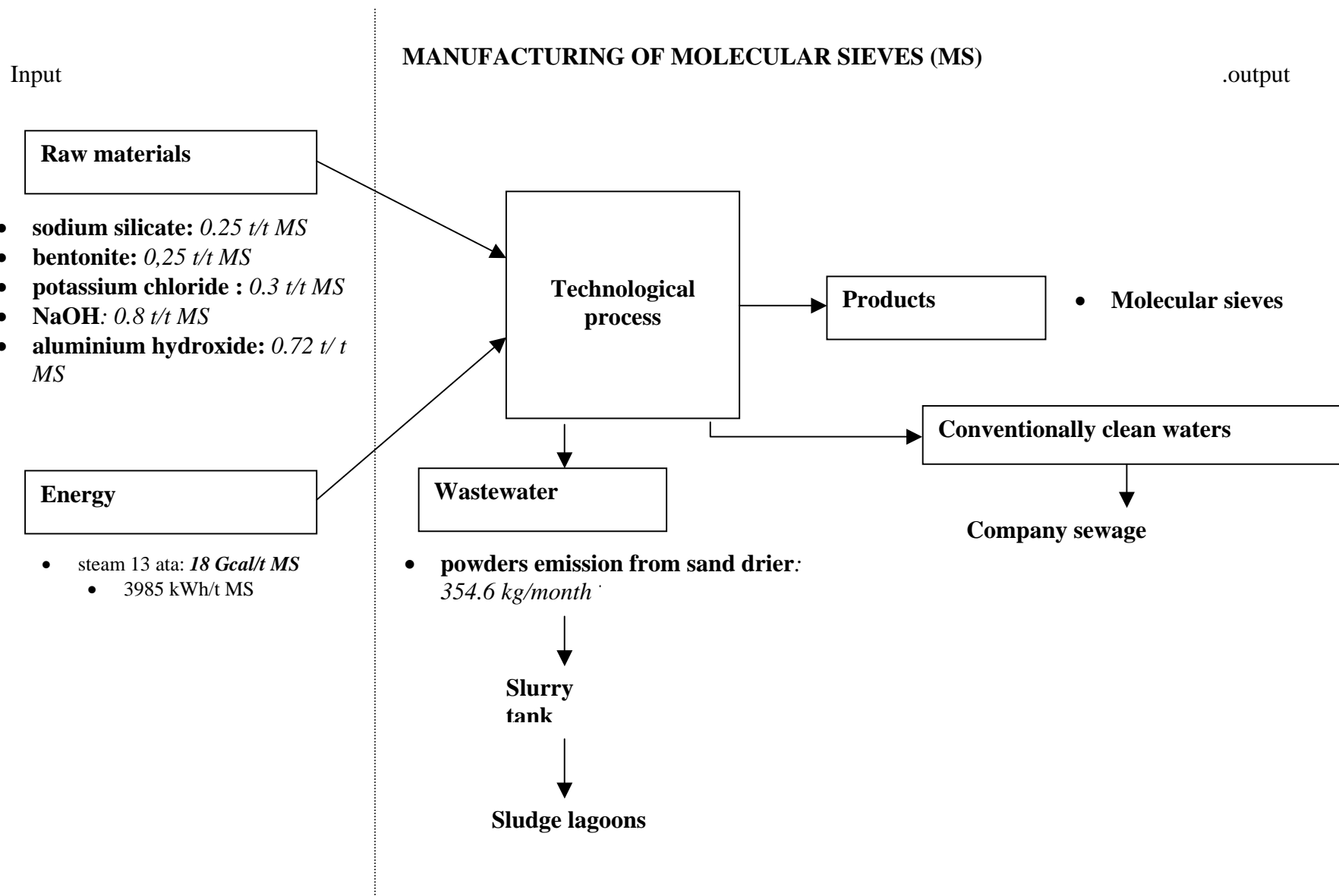


The Study on Master Plan for Hazardous Waste Management in Romania *Final Report*
Japan International Cooperation Agency *Volume 9 Pilot Project 4 Documents*



MANUFACTURING OF SODIUM SILICATE SCHEME





Explanatory Notes for Completion of Section 2.2

Codes for recycling operations, as mentioned in GEO 78/2000

- R1 = solvent reclamation / regeneration
- R2 = recycling /reclamation of organic substances which are not used as solvents
- R3 = recycling /reclamation of metals or metallic compounds
- R4 = recycling /reclamation of other inorganic compounds
- R5 = regeneration of acids or bases
- R6 = recovery of components use for pollution abatement
- R7 = recovery of components from catalysts
- R8 = oil re-refining or other re-reuses of oils
- R9 = use principally as fuel or other means to generate energy
- R10 = spreading on land resulting in benefit to agriculture or ecological improvement, including composting and other biological transformation processes
- R11 = use of waste obtained from any of the operations numbered R1 – R10
- R12 = exchange of waste for submission to any of the operations numbered R1 – R11
- R13 = storage of materials intended for submission to any operation numbered R1 - R12, excluding temporary storage before collection, on the site where it is produced

Codes for disposal operations, as mentioned in GEO 78/2000

- D1 = tipping above or underground (e.g. landfilling, etc.)
- D2 = land treatment (biodegradation of liquid or sludge discards in soil, etc.)
- D3 = deep injection (e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.)
- D4 = surface impoundment (e.g. placement of liquid or sludge discards into pits, ponds, or lagoons, etc.)
- D5 = specially engineered landfill (e.g. placement of liquid into lined discrete cells which are capped and isolated from other one another and the environment, etc.)
- D6 = release of solid waste into water bodies except seas/ oceans
- D7 = release of solid waste into water bodies including seabed insertion
- D8 = biological treatment not specified elsewhere in this list which results in final compounds or mixtures which are disposed of by means of any of the operations in this list
- D9 = physico-chemical treatment not specified elsewhere in this list which results in final compounds or mixtures which are disposed of by means of any of the operations in this list (evaporation, drying, calcination, etc.)
- D10 = incineration on land
- D11 = incineration on sea
- D12 = permanent storage (e.g. emplacement of containers in a mine, etc.)
- D13 = bending or mixture prior to submission to any of the operations numbered D1-D12 in this list
- D14 = repackaging prior to submission to any of the operations numbered D1-D13 in this list
- D15 = storage pending any of the operations numbered D1-D14 in this list, excluding temporary storage before collection, on the site it is produced.

Explanatory Notes for Completion of Section 2.4

Table 1.Example for the Completion of the Summary on the Management of Waste

Management activity	Hazardous waste	Non- hazardous waste	Total industrial waste	Municipal waste	Total waste
	a	b	c = a + b	d	e = c + d
1. Initially generated	1,500	5,000	6,500	3,000	9,500
2. Internally recycled	300	1,500	1,800	200	2,000
3. Amount reported as generated quantity (1 – 2)	1,200	3,500	4,700	2,800	7,500
4. Incinerated within company own incinerator	0	200	200	100	300
5. Stored or landfilled on company own facility	200	500	700	0	700
6. Waste sent to other companies [3 - (4 + 5)]	1,000	2,800	3,800	2,700	6,500
7. Sent to recyclers	100	500	600	0	600
8. Sent to external waste management facilities (6 – 7)	900	2,300	3,200	2,700	5,900
9. Sent to external incinerator	0	200	200	0	200
10. Sent to external landfill (8 –9)	900	2,100	3,000	2,700	5,700
11. Sent to municipal landfill	200	1,100	1,300	2,700	4,000
12. Sent to other industrial landfill site (10 – 11)	700	1,000	1,700	0	1,700

Explanatory Notes for Completion of Section 2.9.1

a) The category “contaminated sites due to waste management” will comprise the following sites:

- Non-engineered hazardous waste landfills in use
- Municipal landfills that have accepted hazardous waste in the past or still accept them now
- Former hazardous waste landfills, being or not subject of clean-up measures or actions
- Former industrial facilities known to have contained hazardous substances
- Sites accidentally affected by spillage of hazardous substances or waste.

b) When classifying a site as being contaminated, provisions of the Ministerial Order 756/1997 shall be observed.

Explanatory Notes for Completion of Section 2.9.2

Management actions/ measures will be classified as follows:

a) *Measures for reducing the risks for health and environment*

- Cessation of the contaminating activity
- Identification of the contaminated site and nature of risk
- Limiting the contaminated area and control of access on the site (for humans, animals);
- - Forbidding groundwater use.

- Implementing a pollution monitoring plan

b) clean-up measures

- Contaminated soil layer removal
- Agro-phytotechnical measures (sowing pollutants bio-accumulating plants and controlled disposal after harvesting)
- Applying specific technologies for decontamination depending on pollutant nature

General Explanatory Notes for Completion of Section 2.10

The assessment of existing situation will show the trend of generated and managed waste quantity and this trend will be linked with the development in production chain and in waste management practices.

Estimation could be made depending on indicators such as:

- Ratio of yearly generated waste quantity (to/year) / yearly output (tons, pieces)
- Ratio of yearly generated waste quantity / rate of turnover

The assessment will identify deficiencies in waste management and will analyze their causes.

Some elements to be considered when assessing the existing situation

Each waste flow will be assessed considering quantitative and qualitative aspects, as well as applied management practices:

- For each waste type it should be presented if it is recovered or finally disposed of, and if disposed - to justify why recovery is technically or economically not possible and what measures are taken to avoid or reduce any impact
- Conditions and restrictions related to the waste disposal resulting from the landfill regulation should be included
- Best applicable option for each waste type disposal or improvements that could be brought in future

Explanatory Notes for Sections 2.10.1 and 2.10.2 Are Provided in the ANNEXES no IV and V

Explanatory Notes for Completion of Section 4

Objectives as required by paragraph (2) of art. 8² in the Law 426/2001

- Reduction or limiting generated waste quantity and their hazard
- Recycling and recovery
- Safe disposal
- Remediation of sites contaminated by waste

The principle of sustainable development applied to waste management means saving natural resources and pollution prevention. That is why the waste management system will

assume products life cycle and will identify all possibilities leading to the achievement of the above mentioned objectives.

Explanatory Notes for Completion of Section 5

Examples of measures that could be promoted

5.1. Measures for Generated Waste Quantity Minimization

- Obtaining products with a long life cycle
- Use of new technologies, assuring better operating performance
- By-products on-site recovery
- Efficient use of raw materials
- Avoiding producing of overstock due to missing of market (exceeding term of validity transforms products into waste)
- Adequate packaging for avoiding products deterioration or their changing into waste through transport and manipulation

5.2. Waste Treatment (Pretreatment)

- Applying of adequate technics for elimination or neutralization of hazardous substances which are contained in recyclable or disposable waste;
- Thermal treatment with or without energy recovery (to assure volume reducing and obtain inert residues)
- Biological treatment of organic materials (aerobic fermentation produces compost which is merchandable and reduces the waste volume; anaerobic digestion produces methane which can be use for energy generation).

5.3. Waste Recovery

- Waste reuse in company own processes;
- Recycling of waste and by-products that could be recovered;
- Selling waste to other specialized companies, which are licenced for waste recovery.

5.4. Waste Disposal

- Depositing hazardous waste in special cells arranged inside the company own landfill
- Participate to the construction of regional facilities for waste disposal

Explanatory Notes for Completion of Section 6.1

Examples of technique- administrative measures

- -Actions for renewing the environmental permit as required by the GEO 34/2002 (IPPC)
- -Measures for reduction of raw materials and energy consumption
- -Actions to avoid spills and leakage from installations and facilities
- -Permanent and automatic survey of processes
- -Periodical control and verification of installations
- -Periodical assessment of technological performances
- -Implementation of a recording and reporting system on waste generation

Explanatory Notes on Section 6.2

6.2 Investment Projects

No.	Type of activity generating waste	Project name	Project initiator	Project stage	Project Value (EURO)	Financing sources
	-Mining/ ore processing -Crude oil extraction and oil processing -Natural gas extraction -Energy generation -Chemical fertilizer -Chemical industry -Plastic processing industry -Metallic constructions -Domestic appliance industry -Machine & electric fitting industry -Electronics & communications industry -Fine mechanics -Pulp, paper industry -Glass industry -Wood processing industry -Textile industry -Leather industry -Building material industry -Transport -Agriculture & food processing industry -Other			-Proposition -Pre-feasability study -Feasability study -Technical project -Implementation		- Own sources - Transfers from the state budget - Other local or foreign sources (specify)

ANNEX II

Table 1 Most Significant Waste Streams by Industrial Sector

INDUSTRY	IMPORTANT WASTE STREAMS
Car manufacture	Metals, plastics, oils, end of life vehicles, cutting oils, paints, tires
Construction	Soils, sub-soils, demolition wastes, asbestos, paints and solvents, plasterboard, wood
Electronic components	Solvents, plastics, packaging, heavy metals, PCBs, absorbents, finely divided copper and plastics, circuit boards, forming acids, swarf, wires, rubber/insulators, batteries, components, glass (some of which may be contaminated with phosphor), windings, capacitors, sodium sulfate, degreasers, etching sludge, electrolytes, solder, fluxes
Engineering	Cutting oils, swarf, packaging, solvents, pickling acids, metals
Food producer/ Food Retailer	Organic waste, transit packaging, cardboard, plastics, fluorescent tubes, animal tissue – some classified as Specified Risk Materials under BSE legislation, peeling and washing sludge, preservatives
Foundry	Foundry sand, metals, binders, cores and moulds, furnace slag and dusts, dross, skimming, flue gas dusts
Manufacturing	Metals, plastics, solvents, chemicals, obsolete plant, components, wood, dust, pallets, slag, canteen waste, paint, cutting oils, packaging
National Retail	Cardboard, packaging, plastics, out of date stock, canteen waste, human hygiene waste, post consumer take back waste
Oil/Petrochemical	Oils, solvents, chemicals, tars, sludge, catalysts, filter materials.
Printing	Solvents, paper, card, inks, ink sludge, toner, photographic wastes.
Resources Company	Digging and drilling spoils, obsolete plant, chemicals, oil.
Service sector/ finance	Paper, catering wastes, human hygiene wastes, office furniture, computers and electronic equipment, fluorescent tubes
Utility	Excavation spoil, sewage sludge, water treatment sludge, screenings, grease, oil and oil and water mixes, ion exchange resins, metals, cables, slags, fly ash, boiler dusts, de-sulphurisation wastes, acids, catalysts.

ANNEX III Hazardous Wastes Minimization

- A) The most difficult and dangerous wastes are those defined as hazardous in the Law 426/2002 on Waste Regime on the basis that they have at least one of fourteen hazardous properties. These include for example corrosive, explosive, ecotoxic and carcinogenic properties, which make some wastes an obvious priority for review and reduction.
- B) If you can reduce or eliminate hazardous wastes, you can reduce potential environmental impact and save future liability costs such as:
- Treatment/disposal costs (which are likely to be high)
 - Administrative costs of complying with the specific and general regulations

In fact, disposal costs are likely to increase as controls over the landfilling of hazardous waste are tightened in accord with the EC Landfill Directive.

- C) However in carrying out a review of hazardous wastes, you will need to bear in mind that:
- The **waste hierarchy** may not be applied in the normal way to substances which are banned for use. PCBs for example may not be considered for re-use or re-cycling but must be destroyed – usually by incineration.
 - It may be better to change processes to **increase** the amount of waste if that would allow hazardous waste to be replaced by non-hazardous or less hazardous waste.

ANNEX IV Waste Handling

This section relates to the management of waste produced at the installation.

Characterize and quantify each waste stream and describe the proposed measures for waste management, storage and handling by using the following steps:

- Identify and quantify the waste streams
- Identify the current and/or proposed handling arrangements
- Describe the current and/or proposed position with regard to the techniques listed below.

Indicative Best Available Techniques

1. A responsible person should have the designated responsibility for hazardous waste management.
2. A system should be maintained to record the quantity, nature, origin and, where relevant, the destination, frequency of collection, mode of transport and treatment method of any waste that is disposed of or recovered.
3. Wherever practicable, waste should be segregated and the disposal route identified. This should be as close to the point of production as possible.
4. Records must be maintained of any waste that is sent off-site.
5. Storage areas should be located away from watercourses and sensitive boundaries, e.g. adjacent to areas of public use, and should be protected against vandalism.

6. Storage areas should be clearly marked and signed, plus containers should be clearly labeled.
7. The maximum storage capacity of storage areas should be stated and not exceeded. The maximum storage period for containers should be specified.
8. Appropriate storage facilities should be provided for special requirements such as for substances that are flammable, sensitive to heat or light and the like, and incompatible waste types should be kept separate.
9. Containers should be stored with lids, caps and valves secured and in place. This also applies to emptied containers.
10. Storage containers, drums and the like should be regularly inspected.
11. Procedures should be in place to deal with damaged or leaking containers, and other emergencies.
12. All appropriate steps to prevent emissions (e.g. liquids, dust, VOC-s and odor) from storage or handling should be taken.

ANNEX V Waste Recycling, Recovery or Disposal

In accord with the Law on Waste, and where waste is unavoidably produced, it should be recovered or where this is technically or economically impossible it is disposed of, while avoiding or reducing the impact on the environment. ***Describe how you propose to recover or dispose of each waste stream. If you propose any disposal, explain why recovery is technically and economically impossible and describe the measures planned to avoid or reduce any impact on the environment.***

1. Describe, for each waste stream produced by the installation, whether the waste in question is to be recovered or disposed of, and if a disposal option is planned, - justify why recovery is “technically or economically impossible”; together with the measures planned to avoid or reduce any impact on the environment.
2. Include in the description whether the waste disposal is likely to be restricted by implementation of the Landfill Directive.
3. Describe the current and/or proposed position with regard to the techniques listed below.

Indicative Best Available Techniques

1. There are such a wide variety of possible waste streams that general guidance on recovery and disposal options, and the instances in which disposal may be justified, is not practicable. However, any reference information about these issues from other guidance may be included.
2. Identify and describe the best practicable environmental options for waste disposal. This may include an improvement condition if a better future alternative appears possible / desirable.

Part 4

Guidance Note to Improve Waste Inspection Capacity

GUIDANCE NOTE TO IMPROVE WASTE INSPECTION CAPACITY

Analysis of inspection department activity was related to the companies included in PP4

The analysis of the inspection department activity was made by analysing documents and discussions with EPI Pitesti representatives. The discussions have been focused on:

- -Inspection planning
- -Inspection manual
- -Inspection report elaboration

1. Inspection Planning

Inspecting the activities of companies having impact on the environment is performed within the legal frame provided by the Ministerial Order 541/2000 establishing technical norms on organization and achievement of inspection and control for environmental protection.

The inspection annual plan is elaborated usually in the last part of the previous year and includes the companies to be inspected and the number of controls. The planning takes into consideration the human resources of EPI and the priority environmental problems on the county territory.

Separately, the Environmental Guard is making its own activity planning related to the control of installations having high impact on the environment, inspection of accidental situations, control of the achievement of environmental investments in right time and implementation of environmental laws. [Note: For information, the UK Environment Agency prioritized site inspections in accord with an 'Operator and Pollution Risk Appraisal (OPRA) Score'.]

During the year the plan could be changed in relation to the new tasks and urgent needs generated by the implementation of new laws or emergency situations generated by accidental pollution. In this context it was established that, if needed, during the first part of December 2002, there is a possibility for planning new inspections in the five companies included in PP4.

2 Use of the Inspection Manual

To help the inspection activity the MWEP has provided an Inspection Manual elaborated in the year 2000 by an international team comprising specialists from the following companies:

- -Chemonics International
- -USAID
- -ECOIND Bucharest – Romania

The content of this manual could be summarized as follows:

Chapter 1 – *General principles of environmental constraints*

Chapter 2 – *Types of environmental inspections*
Chapter 3 – *Inspection procedures*
Chapter 4 – *The role of environmental inspection*
Chapter 5 – *Communication techniques in environmental inspections*
Chapter 6 – *Inspector's working instruments.*

Annex 1-1 - *Regulations in the field of environmental protection*
Annex 1-2 - *Standards for determination of the quality of environment*
Annex 2-1...2-6 - *List of questions for field control*
Annex 3-1...3-4 - *Sampling procedures and means to be used in field activities*
Annex 4 - *Format of Inspection Report*
Annex 5 – *Case studies: Inspection of Wastewater treatment Plants*

- *The EPI Pitesti representatives have been asked at what extend they are using the manual and which part is the most useful for them.*

Discussions conclusion: The general part (Chapters 1-6) is useful as guidance for new employees to learn how to ask questions in order to obtain relevant information; experienced inspectors do not use the manual too much.

The most useful part is included in annexes 2.1...2.6 that are used as checklist in field activities. Inspectors do not usually consult other parts; some reasons explaining this situation are given below:

- Annexes 1-1 and 1-2 need to be updated because many new environmental regulations came into force after 1999 when the manual has been elaborated;
- Annexes 3-1...3-4 are more useful for the monitoring department and they contain some already known elements;
- Annex 4 - the format and content of inspection report - is better presented within the Order 541/2000;
- Annex 5 is more useful for assessing the design (projects) of wastewater treatment plants and less for their inspection.

The EPI Pitesti representatives have been asked what would be useful to complete the inspection manual?

Discussions conclusion: Because inspectors have different academic background they are not experts in all fields of industrial activities; having to inspect companies with various activities and based on different industrial processes they need guidance related to:

- The types of industrial processes used in different activities;
- The flow of technological processes mentioning the raw materials and by-products resulted, the emissions in air, water and soil, the types of solid waste generated in each production phase;
- The procedures for pollution abatement, i.e. treatment of emissions in air, water or treatment of generated waste;
- Best options to avoid waste and polluting emissions.

Proposals

The EPI representatives and the JICA team members have agreed to make the following proposals:

- As an action for the future and not included within this pilot study tasks - the completion of the Inspector's Manual consisting in updating annexes 1.1 and 1.2 containing environmental legislation and standards;
- As a support to the Inspection Manual and not included in this pilot study tasks – provision of some guidance notes related to the description of technological flows and noxious emissions in the environment, in cases of different industrial activities, as well as the best options to avoid waste and polluting emissions or to treat them.

3. Inspection Reports

In order to improve the inspection activities within EPI Pitesti a number of 7 inspection reports referring to 4 of the 5 companies included in PP4 have been analysed.

General comments on inspection reports elaboration

- The inspection reports have rather a formal character because usually they repeat the description of elements included in the environmental authorization; only seldom some new elements are added as a result of implementing the conformation actions, but even in such cases only few details are provided.
- Within the summary of the inspection findings, described in section D, there are not included comments on all aspects/ activities/ areas mentioned as objectives of control in section C of the report.
- Section E – analysis of the recommended measures achievement – usually contains only a general statement declaring the implementation of the measures established during the previous controls; there is no details mentioning the type of measures recommended or the manner of putting in practice and its effectiveness.
- Section H – evaluation of the company performances in environmental protection – is generally not completed. The given explanation was that the system is too subjective and could not have real relevance from environmental point of view.
- Section F – on applied punishment during the inspection - do not describe the real act that was punished and gives only the legal basis for it. (the article in specific law). The effect of punishment is only seldom shown in the following inspection report.

Specific comments in relation with the inspection on waste management issues

- Although mentioned many times as controlled elements, the findings on the waste management are generally very superficial. The most controlled aspect is the temporary storage of waste inside the company. The life cycle of the waste, from its appearance to the final disposal, is not really controlled. The impacts of bad waste management practices are not mentioned.

- The monthly records on waste management seem to be only seldom subject of control (a single example found in inspection reports at Dacia enterprise).
- Verifying the waste classification and attribution of appropriate codes to hazardous waste within the company waste reporting to EPI is not subject of inspection.
- Contaminated sites are controlled only in case of large enterprises and in case of special situations (such as the conformation program of Dacia or the cleaning experiment performed on the compartment no5 of Dambovnic lake at Arpechim).

Recommendations/ Proposals to improve inspection reports

- The aspects related to hazardous waste management and contaminated sites should be subject of more detailed inspection, verification and control. It is also a need to avoid as much as possible the risk of inspection reports becoming routine - “rubber stamp” reports.
- In order to assure the achievement of this recommendation, the EPI representatives and the JICA team members have agreed to complete the format of the inspection report by adding some sub-chapters to the chapter summarizing the inspection findings. These sub-chapters, to be completed during the inspection, refer to:
 - Management of household and similar waste generated by companies
 - Management of hazardous and non-hazardous industrial waste
 - Management of special regulated waste flows such as waste oils, waste batteries, PCBs, packaging and packaging waste
 - Management of recyclable industrial waste
 - Contaminated sites.

A variant of the new inspection report format was agreed with EPI Pitesti at the end of November and will be experimented in the future.

- All inspection findings need to be based upon real evidence – direct observation, verified documents, and NOT on company manager statements only. If the company says they do something (e.g. empty rinse tanks weekly according to the written procedure included in the authorization), then and if it is a significant activity, the inspector needs to observe this procedure really happening.
- The monthly record on waste generation and management should be verified and attached to the inspection report any time when waste issues are controlled, and at least twice annually.
- During the inspection a special attention will be given to the accuracy of hazardous waste codification and reporting to EPI. In order to facilitate the implementation of the new list of waste (G.O. 856/2002) a Technical Guidance

Note for Hazardous Waste identification will be provided to help companies but also inspectors in verification of waste classification.

- Section E shall contain a detailed description of recommended measures implementation and their effects on the environment.
- Section F – on the effect of the applied punishments – shall also contain more details relevant for the punished actions and on the new practices implemented as result of inspection, thus demonstrating both - the company progress in environmental management and the efficiency of the inspector activity.
- Section H should be completed in all inspection reports. The main argument for doing it is that the same inspector is regularly (at least for a certain period) surveying the same companies and progress on environmental management could be easily highlighted by carefully completion of this section.
- As a result of EPI Pitesti request, the JICA team has provided documents on Duty of Care and Waste Manifest Systems in UK.

EPI Pitesti is interested to draft sheets for surveying waste movement and waste transporters activity. At the present, the provisions of the EO 91/2002 on the modification and completion of the Law for environmental protection (L.137/1995) refers to domestic and international transport of hazardous waste.

Transboundary hazardous waste transport is regulated by the international conventions on hazardous merchandise movement signed by Romania.

Domestic transport of hazardous waste is made under the provisions of hazardous merchandise transport rules on railway and roads. No records for surveying waste transport are required, yet.

The UK system will be analysed in order to prepare (not within this pilot project) a proposal of forms for surveying waste movement and transporter activity.

4. Checklist for Inspecting Hazardous Waste Management

The checklist is conceived as a guide for inspecting hazardous waste management and helps the completion of the waste section (section D) within the Inspection Report of companies having impact on the environment.

Its main purpose is to ensure the inspection to reach the following objectives:

- Eliminate unacceptable dumping of hazardous waste
- Avoid undeclared spills, losses or release in the environment
- Reduce potential for environmental accidents and risks
- Assure that in case of accidents involving hazardous waste appropriate containment and mitigation measures will be applied.

The above mentioned objectives can be achieved by:

- control of each generated hazardous waste from the moment of its appearance to the moment of its final disposal or destruction;
- use of a recording system to track each hazardous waste through all treatment, storage, containment, collection, transport, treatment, recovery, destruction or disposal processes to which it is submitted;
- use approved containers and distinctive labeling of hazardous waste containers and transport means;
- assure training of personnel to apply safety measures when handling hazardous materials or wastes and emergency procedures in case of accidents that involve or generate them.

The checklist contains questions structured on three levels of complexity in order to point out general, specific and detailed aspects. It also contains remarks that could:

- help the understanding of problems by the companies
- orient on the type of answer that have to be obtained
- guide the inspector in giving appropriate advice.

1. First level of Questions

1.1 Does the company have a person in charge with waste management problems and especially with hazardous waste?

Remarks:

- It is to expect that only large companies will have a person with dedicated responsibility with waste and especially hazardous waste management. It would be possible that in case of small companies the person in charge with environmental protection aspects including waste and covering hazardous waste problems, too.
- In both situations the person who best knows the waste problems should be asked to participate in the inspection.

1.2 Does the company have a Plan for Waste Management?

1.3 What are the main provisions included in the Waste Management Plan? (Ex. List of Contents)

1.4 Which are the main generated hazardous wastes as types and quantities?

1.5 What quantities are generated daily/monthly or yearly? What is the trend in hazardous waste generation? Is it related to the increasing of productive activity?

1.6 Which types of hazardous waste are recovered and which are disposed off?

1.7 What is the justification of not recycling/recovering wastes, which are disposed off?

1.8 What are the restrictions/conditions related to hazardous waste disposal?

1.9 What changes in hazardous waste management are planned or foreseen in the future?

Remark: Changes could be related to the generated quantity (minimization), reduction of toxicity, recovery, treatment for reduction of toxicity and facilitate recovery or disposal.

2. *Second Level of Questions*

2.1 What wastes are resulting from each technological process? Which ones are hazardous and why?

Remarks:

- Information on waste generated by technological processes should be verified by field observations and discussions based on material balance.
- Correct hazardous waste identification and reporting should be object of inspection/control achieved by the personnel of waste bureau within EPI. The application of the new list of waste (HG 856/2002) has to be verified. The guidance notes for hazardous waste identification could help companies in correct codification and inspectors in giving appropriate advice.
- Consideration must be given to issues related to quantities and handling manner. There are some wastes that could become dangerous when mixed with water or other substances or when exposed to heat.

2.2 What is the fate of each waste flow from its appearance until the moment of final disposal or destruction?

Remarks:

- The fate of waste has to be tracked by field observation, which should be oriented on verifying the appliance of the “best available technology” for handling and management.
- The greatest chance of accidental spills or release in the environment is during the hazardous materials or waste handling. Strict handling procedures have to be established, according to the toxicity level, the persistence and the generated risks. Waste handling procedures are effective if based on standardized operations.
- Hazardous waste handlers have to receive appropriate training and be supplied with suitable equipment, including clothing. Any waste handler should be held liable for accidents caused by mismanagement.
- Good housekeeping measures on-site could reduce waste and minimize opportunities for environmental accidents. All equipment needs to be periodically checked, cleaned or maintained according to strict procedures. Recording of repairs is compulsory.

3. *Third level questions*

General remarks: Hazardous waste collection, storage and disposal

- Usually generated hazardous wastes are to be collected and stored within the company prior of being recycled or disposed.
- The storage could be temporary (meaning less than 3 years – before recycling or treatment) or permanent. There are certain types of waste for which no safe disposal or destruction technology is available in Romania at present. Such waste must be maintained in permanent storage until further actions can be undertaken or they will pose no longer a hazard to the environment.
- Facilities built for permanent storage or disposal (lagoons, basins) must be constructed according to the most stringent requirements in accord with national standards and norms and periodic full inspection to verify the integrity of infrastructure should be carried out. When renewing their environmental authorization, hazard and risk analysis is needed.

3.1 Hazardous Waste Collection/Transport

3.1.1 Where and how is the generated hazardous waste collected in-site the company?

3.1.2 What types of containers are used for hazardous waste collection? Are they resistant to chemical or physical aggressive factors? Are they secured with leads/caps? Are they UN certified containers.

3.1.3 Are containers labeled? What information are included on the label (nature of hazard, whom to contact in case of emergency etc.)? Does the label design provide a clear warning to all that may come in contact with the hazardous waste?

3.1.4 Are containers sent to a central temporary storage area or stored at the generating source?

3.1.5 What is the purpose of temporary storage?

3.1.6 Is the waste treated prior to recycling or disposal? If yes, what treatment technologies are used?

3.1.7 If the purpose of temporary storage is recovery, who is recycling specific types of waste?

3.1.8 If the purpose of temporary storage is landfilling or destruction by incineration of waste, who is doing these actions, where and how?

3.1.9 If a service provider collects hazardous wastes, who is it and is it an authorized company?

3.1.10 Which is the frequency of hazardous waste delivery to the service provider?

3.1.11 Which are the documents showing the waste quantity that leaves the generating company?

3.1.12 If delivered, who is doing the waste transport? Is the waste transporter authorized by the environmental authorities, police, road administration etc?

3.1.13 In case of transport made by the waste generating company:

- What requirements for waste packaging during transport are fulfilled?
- What requirements for the vehicles transporting hazardous waste are fulfilled?
- Is the personnel involved in hazardous waste transport trained to use safety procedures and act in case of emergency situations?

Remarks: Chain of custody

- In order to track hazardous waste from appearance to the final disposal a formalized chain of custody sheet must be used. This is a one-page document filled in as many copies to be kept by each involved party. This document accompanies the waste during all its movement and provides record of any transfer within the company or from one company to another. It constitutes the legal act supporting the records elaborated by waste generator, recycler or storage/disposal facility.

3.2 The Waste Storage Areas

3.2.1 If there is a special area designated for storage of hazardous waste where is it located? (There is a need to verify if it is far enough from protected areas). Is there a plan showing waste storage areas?

3.2.2 Is the storage area clearly delimited (by fences, dikes etc) and provided with warning notice? Who has access in the area?

3.2.3 How is the storage area engineered?

3.2.4 What types of hazardous waste are accepted in the area?

3.2.5 Is there a recording system on waste quantities entering and leaving the storage area? When was the last entry made to this register / inventory?

3.2.6 In case of acceptance of many waste types:

- How are packed the different stored waste?
- Are the wastes segregated in terms of compatibility?

3.2.7 What measures are taken in case of storage of special waste – flammable, corrosive, toxic etc?

3.2.8 What are the measures provided in case of accidents? Is there an emergency plan?

3.2.9 How are prevented leakage/spills from the storage area?

3.2.10 Who is in charge to verify the good functioning of the storage area (including the physical state of containers) and the integrity of engineering? Is there a monitoring system in place? What are the components of the monitoring system? What is the frequency of the monitoring actions?

3.3 Hazardous Waste Disposal

3.3.1 How are the hazardous wastes disposed off?

3.3.2 If incinerated, what installation is used?

- What are the installation performances? Are they complying the requirements of the GD 128/2002?
- How is the incineration monitored? Is there a regular record of emissions quantities?
- Where is the resulted ash sent? Is the ash periodically analysed? Is the ash treated prior to evacuation?

3.3.3 If landfilled, what type of landfill is receiving the hazardous waste? Is it complying the requirements of GD 162/2002?

3.3.4 If the incinerator/landfill is owned by the inspected company was it subject of an auditing or risk assessment study? Does it have an environmental permit?

3.3.5 What measures to avoid environmental accidents or release from disposal facilities are in place?

3.3.6 Is there an Emergency Action Plan developed in relation to the disposal facilities?

3.3.7 What is the periodicity of verifying the landfill integrity or the incinerator's operation parameters?

3.3.8 What maintenance actions are usually applied?

3.3.9 Who is surveying/verifying the correct functioning and maintenance of the disposal facility?

3.3.10 Are records kept on hazardous waste disposal activities?

3.3.11 Is there an interest to avoid disposal of waste by minimization or recovery?

3.3.12 What actions are planned within the Waste Management Plan in order to reduce hazardous waste disposal?

3.4 Sites Contaminated by Waste

3.4.1 Is there an inventory of the company sites contaminated by hazardous waste or hazardous substances?

Remark: To identify contaminated sites there is a need to inspect the areas of fuel tanks and fuel supply stations, the internal railway for raw materials supply and loading of final products in wagons, any place where waste are handled, as well as locations of previous activities.

3.4.2 What monitoring of waste contaminated sites is performed?

3.4.3 What pollutant containment actions are applied on the contaminated sites?

3.4.4 Is there a clean-up plan for contaminated sites? What are its provisions for the near future? Is it financed or not?

Part 5

Case Study for Elaboration of an Inventory of Contaminated Sites in Arges County

CASE STUDY FOR THE ELABORATION OF AN INVENTORY OF CONTAMINATED SITES IN ARGES COUNTY

1. General Presentation of the Case Study

The inventory of contaminated sites in Arges county was one of the tasks included in PP₄ terms of reference. The inventory of contaminated sites has been elaborated with the following components:

- Definition of contaminated sites for the inventory
- Elaboration of data key items necessary for the preparation of the inventory
- Identification of information sources and collection of data
- Elaboration of information sheets for each site (county database)
- Elaboration of a method of scoring and priority ranking of contaminated sites
- Elaboration of priority lists of contaminated sites
- Geographical localisation of contaminated sites on maps at county level

In the frame of the case study for the elaboration of an inventory of contaminated sites in Arges county the following outputs have resulted:

- Method of elaboration of the inventory list
- Inventory lists (3) according to categories of sites
- Elaboration of the priority ranking criteria
- List of priority sites, based on categories of priorities (extreme, high, medium, low)
- Design of the database items used to establish the inventory
- Presentation of the data sheets for each site in Annexes I and II, corresponding to 2 levels of details of data
- Maps of localisation of the contaminated sites.

The case study has identified the present contaminated sites in the Arges county and has provided an evaluation of priorities from the point of view of potential risk for health through land use and water use.

The priority list of contaminated sites will constitute the reference document of EPI Arges for the selection of sites which need to be considered first for investigation and remediation.

The next step after inventory should be to plan investigation studies and appropriate remediation measures for priority sites.

It is expected that this case study documents will be useful as a model of inventory making for other counties of Romania.

2. Elaboration of the Inventory

The environmental laws in Romania do not provide a legal definition of contaminated

sites, except for the alert and intervention values of soil contaminants and actions needed when exceeding them (Ministerial Order 756/1997). This is why within the frame of PP4 that addresses to a nominated zone (Arges county) the following specific sources that could cause site contamination have been initially considered:

- a) Out of use and functioning deposits of hazardous waste (dumps, lagoons, basins, controlled deposits)
- b) Former and actual accidental spills of hazardous substances from pipes, reservoirs or storage areas
- c) Out of use installations containing hazardous substances.

The inventory of contaminated sites, as well as the collection of data about such sites, have been based on analysing information existing inside the county administrative organizations and field visits to enterprises which activities are known as possible source of contamination. Most information have been obtained by:

- Discussing with EPI departments and analysing their working documents such as: database on waste deposits, impact and auditing studies, companies conformation plans and results of the soil monitoring program;
- Discussions with other authorities: local administrative authorities, county Phyto-Sanitary Direction, Agricultural Direction, Forest Direction;
- Visits to the companies which activities could cause soil contamination (e.g. S.N. PETROM – Pitesti extraction and transport sector, ARPECHIM Pitesti S.A., Automobile Dacia S.A., ARO Campulung S.A., ELECTROARGES Curtea de Arges S.A. etc.).

Initially, the following inventory lists have been produced:

- List 1: The inventory of former and actual (functioning) hazardous waste deposits
- List 2: The inventory of sites contaminated as result of hazardous material depositing
- List 3: The inventory of sites contaminated by different accidental spills

The inventory of former and actual (functioning) hazardous waste deposits - presented as List 1 - contain 17 items out of which 5 are mixed municipal dumping sites that have received and are still receiving industrial waste (including hazardous).

The inventory presented as List 2 contains 4 items out of which:

- 2 sites contaminated by pesticides
- 2 sites contaminated by oils and fuels located inside Dacia Automobile premise
- The inventory presented as List 3 contains 13 items out of which:
 - 11 sites contaminated by oil and salty water from oil extraction activities
 - 1 site accidentally contaminated by crude oils spill from transport pipes (V.Preda property)
 - 1 site contaminated by other complex spills (Pitesti railway depot).

After inventorying contaminated site, information on their status and conditions that can generate different types of risks have been collected by using two types of checklists: one long checklist was used for all sites, while an other short checklist – only for waste

contaminated sites, respectively waste depositing areas. Both types of filled information sheets for the identified sites are included in Annexes. It is to mention that, although a comprehensive and double-crossed search for information was performed, some data are still missing or uncertain. It results that there is a future need to obtain, verify and include the missing data in the compiled information sheets.

Collected data have been used for establishing priority-ranking criteria and prioritizing the identified sites.

Finally, all information collected were centralized into the county database on contaminated sites.

3. Arges county Database on Contaminated Sites

The design of the Database concerning contaminated sites and hazardous waste deposits in Arges county was made in ACCESS program.

The database contains 11 tables. The primary key in every table is the field “Name, location” and all tables are linked by a one-to-one relationship. The reason for using this kind of database design was the number of total fields, which are 73. A single table with 73 fields is too difficult to manipulate and this is why such a solution was adopted to make information available. After defining the above-defined relationship it is possible to create queries, forms and reports to display any information from several tables at once.

The tables representing the content of the database are the following:

- Identification data - with 7 fields;
- Contaminated sites characteristics - with 15 fields;
- Pollution source characteristics - with 5 fields;
- Contaminants characteristics - with 7 fields;
- Land use - with 3 fields;
- Distances - with 7 fields;
- Groundwater use & depth - with 6 fields;
- Management actions - with 8 fields;
- Monitoring - with 7 fields;
- Social aspects - with 8 fields;
- Public awareness - with 7 fields.

List 1 Inventory of Former and Actual Hazardous Waste Deposits in Arges County

No	Name of site	Owner of site	Deposit position		Main contaminant	Site Surface (ha)	Level of management *	Contamination level **
			Inside the waste generator main premise	Outside the waste generator main premise				
1	Poiana Lacului – Oily sludge storage basins	PETROM S.A.	yes		Oily hydrocarbons	1.5	M	KP
2	DACIA Pitesti – former sludge laoons	S.C. Automobile Dacia S.A.	yes		Heavy metals, chlorinated compounds	0.908	G	KP
3	Mioveni-City Hall property-PISCANI Former industrial waste deposit of Dacia enterprise	Mioveni City Hall Property		yes	Heavy metals, mineral oils, hydrocarbons, chlorinated compounds	6.5	B	KNP
4	ARPECHIM – old deposit for oily sludge	ARPECHIM S.A. Pitesti	yes		Oily hydrocarbons	2.4	M	KNP
5	ARPECHIM – New deposit for oily sludge	ARPECHIM S.A. Pitesti	yes		Oily hydrocarbons	0.8	M	KNP
6	ARPECHIM – Deposit for triazinic waste	ARPECHIM S.A. Pitesti	yes		Organo chlorinated and triazinic pesticides	0.1	M	KNP
7	ARPECHIM – Dambovnic lake - compartment 5 – Deposit for oily sludge from reservoirs	ARPECHIM S.A. Pitesti		yes	Oily hydrocarbons	1.8	B	KNP
8	ARO Campulung Electroplating sludge tank	ARO Campulung S.A.	yes		Heavy metals	0.1	M	KNP
9	IPEE Curtea de Arges Electroplating sludge tank	IPEE Curtea de Arges S.A.	yes		Heavy metals	0.003	M	KNP
10	ELECTROARGES Curtea de Arges S.A. Electroplating sludge tank	ELECTROARGES Curtea de Arges S.A.	yes		Heavy metals	0.0012	M	KNP
11	AUTO GENERAL MOTOR Maracineni Cyanide Sludge tank	AUTO GENERAL MOTOR Maracineni	yes		Free and complex cyanides	0.002	M	KNP

No	Name of site	Owner of site	Deposit position		Main contaminant	Site Surface (ha)	Level of management*	Contamination level**
			Inside the waste generator main premise	Outside the waste generator main premise				
12	DACIA Pitesti Davidesti controlled industrial waste depozit	DACIA Pitesti		yes	Phosphating sludge; Heavy metal sludge Paints, lacquers, resins; Casting sand Asbestos waste	10 ha - out of which 1 ha is used for sludge and foundry sand that are not packed	G	Under control
13	PITESTI – Municipal mixed dumping site	Pitesti Local Council		yes	Inorganic compounds Hydrocarbons Organo-chlorinated compounds, Pesticides	10.6	B	KP
14	CURTEA de ARGES – Municipal mixed dumping site	Curtea de Arges Local Council		yes	Inorganic compounds Hydrocarbons Organo-chlorinated compounds, Pesticides	2.0	B	KP
15	COSTESTI – Municipal mixed dumping site	Costesti Local Council		yes	Inorganic compounds Hydrocarbons Organo-chlorinated compounds, Pesticides	1.5	B	KP
16	CAMPULUNG – Municipal mixed dumping site	Campulung Local Council		yes	Inorganic compounds Hydrocarbons Organo-chlorinated compounds, Pesticides	3.2	B	KP
17	TOPOLOVENI – Municipal mixed dumping site	Topoloveni Local Council		yes	Inorganic compounds Hydrocarbons Organo-chlorinated compounds, Pesticides	1.0	B	KP

LEGEND: * Level of management:

G = good (fencing, lining, control of emissions, monitoring wells or already remediated)

M = medium (concrete basin, wells monitoring, control of people access)

B = bad (no facilities, poor control)

**Contamination level:

KP = known and proved contamination

KNP = known but not analytically proved contamination

P = possible but no proofs of contamination

REMARK:

Detailed information sheets on contaminated site and hazardous waste deposits are presented in the Annexes

List 2 Inventory of Contaminated Sites As Result of Hazardous Material Depositing

No	Name of site	Owner of site	Material depositing		Main contaminant	Site Surface (ha)	Level of management*	Contamination level**
			Inside the owner main premise	Outside the owner main premise				
1	Micesti - pesticide contaminated area	Private person - Samoila Constantin		yes	Pesticides	0.025	B	KNP
2	Falfani -pesticide contaminated area	Falfani Agricultural Association	yes		Pesticides	As land - 0.005ha As groundwater - 20ha	B	KP
3	DACIA Pitesti – Oils central storage area	S.C. Automobile Dacia S.A.	yes		Mineral oils, Chlorinated compounds	0.1	G	KP
4	Dacia Pitesti – Fuel supply/depositing area	S.C. Automobile Dacia S.A.	yes		Oily hydrocarbons	0.16	G	KP

LEGEND: * Level of management: G = good (fencing, lining, control of emissions, monitoring wells or already remediated)
 M = medium (concrete basin, wells monitoring, control of people access)
 B = bad (no facilities)
 **Contamination level: KP = known and proved contamination
 KNP = known but not analytically proved contamination
 P = possible but no proofs of contamination

REMARK: Detailed information sheets on contaminated site and hazardous waste deposits are presented in the Annexes

List 3 Other contaminated Sites in Arges County

No	Name of site	Owner of site	Main contaminant	Site Surface (ha)	Level of management*	Contamination level**
1	Poiana Lacului - oil and salty water contaminated area	various owners (public and private)	Oily hydrocarbons	19	B	KP
2	Mosoia-Albota - oil and salty water contaminated area	various owners (public and private)	Oily hydrocarbons	19	B	KP
3	Cocu-Babana - oil and salty water contaminated area	various owners (public and private)	Oily hydrocarbons	2.55	B	KP
4	Draganu- Merisani - oil and salty water contaminated area	various owners (public and private)	Oily hydrocarbons	7.8	B	KP
5	Sapata - oil and salty water contaminated area	various owners (public and private)	Oily hydrocarbons	15	B	KP
6	Vedea - oil and salty water contaminated area	various owners(public and private ownership)	Oily hydrocarbons	14	B	KP
7	Topoloveni – oil and salty water contaminated area	Romanian state	Oily hydrocarbons	3.7	B	KP
8	Oarja – oil and salty water contaminated area	various private owners	Oily hydrocarbons	over 20	B	KP
9	Cateasca – oil and salty water contaminated area	various private owners	Oily hydrocarbons	14.29	B	KP
10	Barla – oil and salty water contaminated area	various private owners	Oily hydrocarbons	4.42	B	KP
11	Caldararu – oil and salty water contaminated area	12 private owners	Oily hydrocarbons	10.3	B	KP
12	Pitesti railway depot	National Company for Domestic Transport	Oily hydrocarbons	0.05	M - B	KNP
13	ARPECHIM vicinity - V. Preda private property	V. Preda - private owner	Oily compounds	1.2	M - G	KP

LEGEND: * Level of management:

G = good (fencing, control of emissions, monitoring wells or already remediated)

M = medium (wells monitoring, control of people access)

B = bad (no facilities, poor control)

**Contamination level:

KP = known and proved contamination

KNP = known but not analytically proved contamination

P = possible but no proofs of contamination

4. Priority Ranking Criteria

For the purpose of establishing priority-contaminated sites in the frame of the JICA pilot project no. 4, the following elements have been initially considered as possible ranking characteristics:

- Type of contamination (by waste depositing, accidental spills, abandoned industrial installations)
- Chemical nature of contaminants
- Concentration of contaminants
- Extend of contamination (as surface or depth)
- Natural sensitivity of the groundwater
- Land use.

By analysing the available information on the identified contaminated sites and hazardous waste deposits in Arges county (34 items), it resulted that part of the above-mentioned characteristics are not relevant as ranking criteria for different reasons as described below.

- The type of contamination and the chemical nature of contaminants in case of Arges county (and perhaps in other zones, too) are clearly known, but the main contaminants have the same level of hazard and, consequently, represent the same risks for humans, animals and plants life (e.g. organic compounds, petroleum hydrocarbonates, leachate from mixed municipal dumping sites).
- The concentration of the main contaminants, as well as the extend of the contamination, are only occasionally known because no systematic survey and monitoring actions have been achieved in case of contaminated sites till now.

The remaining two characteristics – the natural sensitivity of the groundwater and the land use – seem to be the most appropriate elements for the elaboration of ranking (prioritization) criteria because:

- Such information is available for almost any site
- There are clear differences from one site to an other.

4.1 Natural Sensitivity of Groundwater

The natural sensitivity of groundwater could be defined by two parameters:

- The groundwater vulnerability to pollution
- The groundwater (actual and future) use.

Groundwater vulnerability to pollution

In Romania, the groundwater vulnerability to pollution was defined at level of hydrographic basins. ICIM studies (1992 - 2002) have established groundwater vulnerability to pollution according to hydro-geological conditions, mainly by considering the presence/absence and thickness of a natural protection layer above the first groundwater table.

The groundwater vulnerability classes, established on the basis of the thickness of the protective layer, are presented below.

vulnerability classes	thickness of the protective layer
A - high vulnerability	0 – 3 m
B – medium vulnerability	3 – 5 m
C - low vulnerability	more than 5 m

- Protective layer thickness
- Type of water infiltration.

vulnerability classes	vulnerability sub-classes
Class A – High vulnerability	A ₁ - absence of any protective layer
	A ₂ – natural layer thickness less than 3m
Class B – Medium vulnerability	B ₁ - natural layer thickness between 3 - 5 m - water infiltration through the river bank
	B ₂ - natural layer thickness between 3 - 5 m - water infiltration through the soil
Class C – Low vulnerability	C ₁ – protective layer of 5 –10 m thickness
	C ₂ – protective layer of more than 10 m thickness

- For drinking, cooking, household needs
- Industrial or agricultural use
- No use.

U = groundwater use

Vulnerability sub - classes	Marks
A ₁	9
A ₂	6
B ₁	4
B ₂	3
C ₁	2
C ₂	1

Type of use	Marks
drinking, cooking, household needs	5
Industrial, commercial	3
No use	1

The second characteristic considered appropriate in order to prioritize contaminated sites is the type of land use.

- Dwellings
- Agriculture, pasture, forest
- Industrial and commercial facilities.

Marks attached as scoring to the land use have to observe the provision of the Ministerial Order 756/1997 on the evaluation of environmental pollution. Article 8 of this regulation defines sensitivity levels related to land use as follows:

- High sensitivity - in case of dwellings, agricultural lands, pastures and forests
- Low sensitivity - in case of industrial or commercial uses

Sensitivity category	Types of land use	Scoring
High	dwellings	5
	Agriculture, pasture, forest	3
Low	Commercial, industrial facilities	1

Equation (2): SSI = GSI x LU where: SSI = site sensitivity index
 GSI = groundwater sensitivity index
 LU = land use scoring

- Giving marks to information on groundwater vulnerability and use in order to calculate the groundwater sensitivity index
- Scoring the information on land use
- Applying calculation upon equation (2).

4.3 Surface of Contaminated Site

The Site Sensitivity Index (SSI), as defined above, expresses mainly the qualitative risk of pollution generated by the contaminated sites. It was considered that a more complex ranking could be obtained by introducing a quantitative factor related to the magnitude of contamination and the risk of exposure generated by the contaminated sites.

As already mentioned, the quantity of contaminant generating pollution or its concentration in soil or groundwater is only seldom known, which means that - at present - it can not be used. An element that is better known is the surface of the contaminated site.

To reflect the influence of the site surface into the prioritization process the SSI values have to be multiplied by the contaminated site surface. In this way the site surface could be integrated into a “Combined Index of Sensitivity” (CIS).

The application of the described system to the Arges county has implicated the following steps:

- Identification of the contaminated sites by using different information sources
- Collection for each site of the data included on the checklist for contaminated sites
- Attaching marks to the groundwater vulnerability on each site as defined on the map no 1 showing the groundwater vulnerability sub – classes
- Calculating the groundwater sensitivity index (GSI)
- Attaching marks to the land use in the neighborhood of the contaminated site
- Calculating the site sensitivity index (SSI)
- Multiplying the SSI by the surface of the contaminated sites (expressed as hectares)
- Calculating the combined index of sensitivity (CIS) of each contaminated site

The tables 6 and 7 show the results of these actions.

Based on the method described two series of prioritization lists have been drafted; first lists - in tables 8A and 8B - are based on SSI values, while the following lists – tables 9 A and 9 B - are based on the values of CIS.

By comparison, it results that only slight differences could be find between these two lists. Most sites have similar positions on both list types and other sites position does not differ more than 5 places, except the following situations:

- Micesti – pesticide contaminated area (position 7 on the list based on SSI and position 18 on the list based on CIS (because of its small surface)
- Municipal mixed dumping site Campulung (position 10 on the list based on SSI and position 4 on the list based on CIS because of its quite large surface)

In order to eliminate differences, the unified priority list shown in Tables 10A was established by integrating the lists in tables 8A with 9A and the unified priority list shown in table 10 B was established by integrating the lists in tables 8B with 9B.

The unified priority lists could be used by the environmental authorities within the

negotiations with the administrative local/central authorities and main economic enterprises when planning remediation and financing clean-up plans.

If necessary, remarks related to the already existent or promotion of remediation plans could be added and the position of some sites within the finally accepted priority list could be changed subsequently.

5. Mapping of Contaminated Sites

The inventoried and prioritised contaminated sites have been placed on the map of the Arges county.

Map no 2 shows the location of contaminated sites by type of contamination and map no. 3 shows the location of sites by their priority, as resulted from the unified lists in tables 10A and 10 B.

The maps demonstrate that most contaminated sites are concentrated in the Middle and Southern part of the Arges county, which are industrialized zones. Unfortunately, these zones are also the most sensitive to pollution when considering the vulnerability of the groundwater and the use of land.

Table 6 Calculation of the Site Sensitivity Index for Contaminated Sites in ARGES County

No	Name of the contaminated site	Groundwater sensitivity					Land use		Site Sensitivity Index (SSI)
		Vulnerability		Use		Groundwater Sensitivity Index (GSI)	Type of use	Mark	
		Vulnerability subclass	Mark	Groundwater use	Mark				
1	Micesti - pesticide contaminated area	A ₂	6	Agriculture	3	6x3=18	Agriculture	3	18 x 3 = 54
2	Falfani / Stolnici - pesticide contaminated area	A ₂	6	Water supply	5	6x5=30	Dwellings	5	30 x 5 = 150
3	Poiana Lacului / Samara - oil and salty water contaminated area	A ₂ - C ₂	6 - 1* medium value 3.5	Water supply	5	3.5x 5=17.5	Dwellings Forest	5 – 3 mv = 4	17.5 x 4 = 70
4	Mosoiaia / Albota - oil and salty water contaminated area	A ₂ - C ₂	6 - 1* medium value 3.5	Water supply	5	3.5x 5=17.5	Dwellings Forest	5 – 3 mv = 4	17.5 x 4 = 70
5	Cocu / Babana - oil and salty water contaminated area	C ₂	1	Agriculture Water supply	5-3 mv=4	1x4=4	Dwellings Forest	5 – 3 mv = 4	4 x 4 = 16
6	Draganu / Merisani - oil and salty water contaminated area	A ₂ - B ₂	6 - 3* medium value 4.5	No use	1	1x4.5=4.5	Agriculture	3	4.5 x 3 = 13.5
7	Sapata - oil and salty water contaminated area	A ₂ - B ₂	6 - 3* medium value 4.5	Agriculture Water supply	5-3 mv=4	4.5x4=18	Agriculture	3	18 x 3 = 54
8	Vedea - oil and salty water contaminated area	A ₂ - C ₂	6 - 1* medium value 3.5	No use	1	3.5x1=3.5	Agriculture Dwellings	3 – 5 mv = 4	3.5 x 4 = 14
9	Topoloveni - oil and salty water contaminated area	A ₂ - C ₁	6 - 2* medium value 4	Not use	1	4x1=4	Forest	3	4 x 3 = 12
10	Oarja - oil and salty water contaminated	C ₂	1	Water supply	5	1x5=5	Agriculture Dwellings	3 – 5 mv = 4	5 x 4 = 20
11	Cateasca - oil and salty water contaminated area	A ₂	6	Agriculture	3	6x3=18	Agriculture	3	18 x 3 = 54
12	Caldararu - oil and salty water contaminated area	B ₁ - B ₂	4 – 3 medium value 3.5	Agriculture	3	3.5x3=10.5	Agriculture	3	10.5 x 3 = 31.5
13	Barla - oil and salty water contaminated area	A ₂ - B ₂	6 – 3* medium value 4.5	Agriculture + water supply	5 – 3 mv=4	4.5x4=18	Agriculture	3	18 x 3 = 54
14	Poiana Lacului – oily sludge storage basins	C ₂	1	Not used	1	1x1=1	Forest	3	1 x 3 = 3
15	DACIA Pitesti - Former sludge lagoons	C ₁	2	Industrial	3	2x3=6	Industrial	1	6 x 1 = 6
16	DACIA Pitesti - Oils central storage area	C ₁	2	Industrial	3	2x3=6	Industrial	1	6 x 1 = 6

No	Name of the contaminated site	Groundwater sensitivity				Land use		Site Sensitivity Index (SSI)	
		Vulnerability		Use		Groundwater Sensitivity Index (GSI)	Type of use		Mark
		Vulnerability subclass	Mark	Groundwater use	Mark				
17	DACIA Pitesti Fuel supply / depositing area	C ₁	2	Industrial	3	6x3=18	Industrial	1	6 x 1 = 6
18	DACIA Pitesti -Davidesti controlled landfill	C ₁	2	Not used	1	2x1=2	forest	3	2 x 3 = 6
19	Mioveni - City hall property Former industrial waste deposit of Dacia enterprise	A ₂ -B ₁	6 – 4* medium value 5	Not used	1	5x1=5	Possible industrial use	1	5 x 1 = 5
20	Pitesti railway depot	A ₂	6	Not used	1	6x1=6	Industrial	1	6 x 1 = 6
21	ARPECHIM vicinity - V.Preda private property	C ₂	1	Not used	1	1x1=1	industrial future use	1	1 x 1 = 1
22	ARPECHIM - Old deposit for oily sludge	C ₂	1	Industrial	3	1x3=3	Industrial	1	3 x 1 = 3
23	ARPECHIM - New deposit for oily sludge	C ₂	1	Industrial	3	1x3=3	Industrial	1	3 x 1 = 3
24	ARPECHIM – Dambovnic lake - Compartment 5 -Depozit for oily sludge from rezervoirs	C ₂	1	Not used	1	1x1=1	Agriculture	3	1 x 3 = 3
25	ARPECHIM -Depozit for triazinic waste	C ₂	1	Industrial	3	1x3=3	Industrial	1	1 x 1 = 3
26	ARO Campulung – Electroplating sludge tank	C ₂	1	Industrial	3	1x3=3	Industrial	1	3 x 1 = 3
27	IPEE Curtea de Arges Electroplating sludge tank	C ₁	2	Industrial	3	2x3=6	Industrial	1	6 x 1 = 6
28	ELECTROARGES Curtea de Arges - Electroplating sludge tank	C ₁	2	Industrial	3	2x3=6	Industrial	1	6 x 1 = 6
29	AUTO GENERAL MOTOR Maracineni – Cyanide sludge tank	C ₁	2	Industrial	3	2x3=6	Industrial	1	6 x 1 = 6
30	PITESTI -Municipal mixed dumping site	A ₂	6	Not used	1	6x1=6	Agriculture -pasture	3	6 x 3 = 18
31	CURTEA DE ARGES - Municipal mixed dumping site	C ₁	2	Not used	1	2x1=2	Agriculture pasture	3	2 x 3 = 6
32	COSTESTI - Municipal mixed dumping site	B ₂	3	Not used	1	3x1=3	Agriculture pasture	3	3 x 3 = 9

No	Name of the contaminated site	Groundwater sensitivity				Land use		Site Sensitivity Index (SSI)	
		Vulnerability		Use		Groundwater Sensitivity Index (GSI)	Type of use		Mark
		Vulnerability subclass	Mark	Groundwater use	Mark				
33	CAMPULUNG Municipal mixed dumping site	C ₂	1	Not used	1	1x1=1	Agriculture pasture	3	1 x 3 = 3
34	TOPOLOVENI Municipal mixed dumping site	C ₁	2	Not used	1	2x1=2	Agriculture pasture	3	2 x 3 = 6

Legend:

- marks are expressing the variations of local conditions as identified in the field and declared in the site sheet

Table 7 Calculation of the Combined Index of Sensitivity for Contaminated Sites in ARGES County

No	Site name	Site Sensitivity Index (SSI)	Site surface (S) ha	Combined Index of Sensitivity (CIS = SSI x S as ha)
1	Falfani / Stolnici- pesticide contaminated area	150	20	3000
2	Poiana Lacului - oil and salty water contaminated area	70	19	1330
3	Mosoia / Albota - oil and salty water contaminated area	70	19	1330
4	Sapata - oil and salty water contaminated area	54	15	810
5	Cateasca - oil and salty water contaminated area	54	14	756
6	Barla - oil and salty water contaminated area	54	4.42	239
7	Micesti - pesticide contaminated area	54	0.01	0.54
8	Caldararu - oil and salty water contaminated area	31.5	10.3	330
9	Oarja - oil and salty water contaminated area	20	20	400
10	PITESTI - Municipal mixed dumping site	18	11	198
11	Cocu / Babana - oil and salty water contaminated area	16	3.2	51.2
12	Vedea- oil and salty water contaminated area	14	14	196
13	Draganu / Merisani - oil and salty water contaminated area	13.5	7.8	105.3
14	Topoloveni - oil and salty water contaminated area	12	3.7	44.4
15	COSTESTI - Municipal mixed dumping site	9	1.5	13.5
16	DACIA Pitesti – Davidesti controlled landfill – middle part	6	1,0	6
17	CURTEA DE ARGES - Municipal mixed dumping site	6	2	12
18	TOPOLOVENI - Municipal mixed dumping site	6	1	6
19	DACIA Pitesti - Former sludge lagoons	6	0.8	4.8
20	DACIA Pitesti - Fuel supply / depositing area	6	0.2	1.2
21	DACIA Pitesti - Oils central storage area	6	0.1	0.6
22	Pitesti railway depot	6	0.1	0.6

No	Site name	Site Sensitivity Index (SSI)	Site surface (S) ha	Combined Index of Sensitivity (CIS = SSI x S as ha)
23	IPEE Curtea de Arges Electroplating sludge tank	6	0.001	0.006
24	ELECTROARGES Curtea de Arges - Electroplating sludge tank	6	0.001	0.006
25	AUTO GENERAL MOTOR Maracineni – Cyanide sludge tank	6	0.001	0.006
26	Mioveni-City hall property - Former waste deposit PISCANI	5	6.5	32.5
27	CAMPULUNG - Municipal mixed dumping site	3	3.2	9.6
28	ARPECHIM - Old deposit for oily sludge	3	2.4	7.2
29	ARPECHIM-lake Dambovnic-Compartment 5 - Depozit for oily sludge	3	1.8	5.4
30	ARPECHIM - New deposit for oily sludge	3	0.8	2.4
31	Poiana Lacului – oily sludge storage basins	3	0.4	1.2
32	ARPECHIM - Depozit for triazinic waste	3	0.1	0.3
33	ARO Campulung – Electroplating sludge tank	3	0.1	0.3
34	ARPECHIM vicinity - V.Preda private property	1	1.2	1.2

Table 8 A. Priority List of Contaminated Sites Considering Site Sensitivity Index (SSI values)

No	Contaminated site name	SSI value
1	Falfani / Stolnici– pesticide contaminated site	150
2	Poiana Lacului – PETROM - oil and salty water contaminated area	70
3	Mosoia / Albota - PETROM - oil and salty water contaminated area	70
4	Sapata - PETROM - oil and salty water contaminated area	54
5	Cateasca – PETROM - oil and salty water contaminated area	54
6	Barla – PETROM - oil and salty water contaminated area	54
7	Micesti – pesticide contaminated site	54
8	Caldararu - PETROM - oil and salty water contaminated area	31.5
9	Oarja - PETROM - oil and salty water contaminated area	20
10	Cocu / Babana - PETROM -oil and salty water contaminated area	16
11	Vedea - PETROM oil and salty water contaminated area	14
12	Draganu / Merisani - PETROM - oil and salty water contaminated area	13.5
13	Topoloveni - PETROM oil and salty water contaminated area	12
14	DACIA - Fuel supply area	6
15	DACIA - Oils storage area	6
16	Pitesti railway depot	6
17	Mioveni – City Hall property	5
18	V.Preda property – near ARPECHIM	1

Table 8 B. Priority List of Hazardous Waste Deposits Considering Site Sensitivity Index (SSI values)

No	Hazardous waste deposit name	SSI value
1	Municipal mixed dumping site - PITESTI	18
2	Municipal mixed dumping site COSTESTI	9
3	Municipal mixed dumping site C. ARGES	6
4	Municipal mixed dumping site TOPOLOVENI	6
5	AUTO GENERAL MOTOR Maracineni –cyanide sludge tank	6
6	IPEE Curtea de Arges - electroplating sludge tank	6
7	ELECTROARGES Curtea de Arges - electroplating sludge tank	6
8	DACIA - Former sludge lagoons (Batal-prebatal)	6
9	DACIA – Davidesti controlled landfill site	6
10	Municipal mixed dumping site CAMPULUNG	3
11	ARPECHIM - Old depozit for oily sludge	3
12	ARPECHIM - Compartment 5 – Dambovnic lake	3
13	ARPECHIM - New depozit for oily sludge	3
14	Poiana Lacului – PETROM - oily sludge basins	3
15	ARPECHIM - Depozit for triazinic waste	3
16	ARO Campulung- electroplating sludge tank	3

Table 9 A Priority List of Contaminated Sites Considering Combined Index of Sensitivity (CIS) Calculated by SSI x Surface As Hectares.

No	Contaminated site name	CIS value
1	Falfani / Stolnici pesticide contaminated area	3000
2	Poiana Lacului - PETROM - oil and salty water contaminated area	1330
3	Mosoia / Albota - PETROM - oil and salty water contaminated area	1330
4	Sapata - PETROM - oil and salty water contaminated area	810
5	Cateasca - PETROM - oil and salty water contaminated area	756
6	Oarja – PETROM - oil and salty water contaminated area	400
7	Caldararu – PETROM - oil and salty water contaminated area	330
8	Barla – PETROM - oil and salty water contaminated area	239
9	Vedea – PETROM - oil and salty water contaminated area	196
10	Draganu / Merisani - PETROM - oil and salty water contaminated area	105.3
11	Cocu / Babana - PETROM -oil and salty water contaminated area	51.2
12	Topoloveni – PETROM - oil and salty water contaminated area	44.4
13	Mioveni – PISCANI- City Hall property	32.5
14	DACIA - Fuel supply area	1.2
15	V. Preda property – near ARPECHIM	1.2
16	DACIA - Oils storage area	0.6
17	Pitesti railway depot	0.6
18	Micesti pesticide contaminated area	0.05

Table 9 B Priority List of Hazardous Waste Deposits Considering Combined Index of Sensitivity (CIS) Calculated by SSI x Surface As Hectares.

No	Hazardous waste deposit name	CIS calculated by SSI x Surface as hectares.
1	Municipal mixed dumping site PITESTI	198
2	Municipal mixed dumping site COSTESTI	13.5
3	Municipal mixed dumping site CURTEA DE ARGES	12
4	Municipal mixed dumping site CAMPULUNG	9.6
5	ARPECHIM - Old depozit for oily sludge	7.2
6	Municipal mixed dumping site TOPOLOVENI	6
7	DACIA – Davidesti controlled landfill site- the middle part	6
8	ARPECHIM Compartment 5 – Dambovnic	5.4
9	DACIA - Former sludge lagoons (Batal-prebatal)	4.8
10	ARPECHIM - New depozit for oily sludge	2.4
11	Poiana Lacului - oily sludge basins	1.2
12	ARPECHIM - Depozit for triazinic waste	0.3
13	ARO Campulung - electroplating sludge tank	0.3
14	IPEE Curtea de Arges - electroplating sludge tank	0.006
15	ELECTROARGES Curtea de Arges - electroplating sludge tank	0.006
16	AUTO GENERAL MOTOR Maracineni –cyanide sludge tank	0.006

Table 10 A Unified Priority List of Contaminated Sites

Priority	Contaminated site name
Extreme priority	Falfani / Stolnici– pesticide contaminated site
High priority	Poiana Lacului – PETROM - oil and salty water contaminated area
	Mosoia / Albota - PETROM - oil and salty water contaminated area
	Sapata - PETROM - oil and salty water contaminated area
	Cateasca – PETROM - oil and salty water contaminated area
	Barla – PETROM - oil and salty water contaminated area
	Micesti – pesticide contaminated site
	Caldararu - PETROM - oil and salty water contaminated area
	Oarja - PETROM - oil and salty water contaminated area
	Cocu / Babana - PETROM -oil and salty water contaminated area
	Vedea - PETROM oil and salty water contaminated area
	Draganu / Merisani - PETROM - oil and salty water contaminated area
	Topoloveni - PETROM oil and salty water contaminated area
	Mioveni – PISCANI - City Hall property
Medium priority	DACIA - Fuel supply area
	DACIA - Oils storage area
	Pitesti railway depot
Low priority	V.Preda property – near ARPECHIM

Table 10 B Unified Priority List of Hazardous Waste Deposits

Priority	Name of hazardous waste deposits
High priority	Municipal mixed dumping site PITESTI
	Municipal mixed dumping site COSTESTI
	Municipal mixed dumping site CURTEA DE ARGES
	Municipal mixed dumping site CAMPULUNG
	Municipal mixed dumping site TOPOLOVENI
Medium priority	AUTO GENERAL MOTOR Maracineni –cyanide sludge tank
	IPEE Curtea de Arges - electroplating sludge tank
	ELECTROARGES Curtea de Arges - electroplating sludge tank
	DACIA - Former sludge lagoons (Batal-prebatal)
	DACIA – Davidesti controlled landfill site
	ARPECHIM - Old depozit for oily sludge
	ARPECHIM - Compartment 5 – Dambovnic lake
	ARPECHIM - New depozit for oily sludge
	ARPECHIM - Depozit for triazinic waste
	Poiana Lacului – PETROM - oily sludge basins
	ARO Campulung - electroplating sludge tank

ANNEX I

Information Sheets on Former and Actual Hazardous Waste Deposits (Short Checklist Format)

Sheet 1.1

Information on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)

- Name of the waste disposal site: **PETROM – Poiana Lacului -Oily sludge controlled storage area**
- Location (locality and county): Poiana Lacului commune, Arges county
- Site owner: S.C. PETROM-Schela Pitesti
- Year of the site establishment: 2000
- Year of the site closure: not known
- Generator(s) of waste stored: S.C. PETROM-Schela Pitesti
- Types and quantities of waste stored or disposed:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity (tons)
1	oily sludge and salty drilling / extraction mud	010506	5744

- Site surface (ha): 1.5 (0.39)
- Site capacity (cm) 10000
- Site engineering (please tick):

fence	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
X		X	X		X	

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
X (south-east)	X (west)	X (north)	X (east and south)

- Distance to the nearest surface water: 1000m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use

- Depth of ground water: 17m

- Use of ground water:

no use	Industrial/ agricultural use	drinking use
	X	X

- Distance to other sensitive areas:

dwelling	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
600				

Sheet 1.2

Information on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)

- Name of the waste disposal site: **Dacia Pitesti - Former sludge lagoons (pre-batal, batal)**
- Location (locality and county): Mioveni city, Arges county
- Site owner: S.C. Automobile DACIA S.A.
- Year of the site establishment: 1971
- Year of the site closure: 1999
- Generator of waste stored or disposed: S.C. Automobile DACIA S.A.
- Types and quantities of waste stored or disposed:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity
1	Sludge containing hazardous substances (heavy metals)	110109	prebatal: 3000 cm batal: 12000 cm
2	Phosfating sludge	110108	
3	Sludge containing paints, lacquers and solvents	080115	
4	Sludge from industrial wastewater treatment containing hazardous substances	160207	

- Site surface (ha): 0.908
- Site capacity (cm): 15000 cm
- Site engineering (please tick):

fence	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
		X	X	X	X	

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
		X	

- Distance to the nearest surface water: 4000 m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
X				

- Depth of ground water: 6 -10 m

- Use of ground water:

no use	industrial / agricultural use	drinking use
	X	

- Distance to other sensitive areas:

dwelling	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
1000 m				

Sheet 1.3

Information on Industrial Waste Disposal Sites (in Operation and Out of Use Sites)

- Name of the waste disposal site: **Dacia - Davidesti controlled disposal site**
- Location (locality and county): **Davidesti commune, Arges county**
- Site owner: **S.C. Automobile DACIA S.A.**
- Year of the site establishment: **1999**
- Year of the site closure: **2014**
- Generator of waste stored or disposed: **S.C. Automobile DACIA S.A.**
- Types and quantities of waste stored or disposed:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity (tons)
1	Sludge containing hazardous substances(heavy metals)	110109	4400
2	Phosfating sludge	110108	
3	Sludge containing paints, lacquers and solvents	080115	
4	Used cores and moulds containing hazardous waste	100907	
5	Asbestos waste	17 06 01	
6	Sludge from industrial wastewater treatment containing hazardous substances	160207	

- Site surface (ha): **10**
- Site capacity (cm): **100000**
- Site engineering (please tick):

fence	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
X	X	X	X	X	X	

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
	X		

- Distance to the nearest surface water: **3000 m**

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
X				

- Depth of ground water: **10 m**

- Use of ground water:

no use	Industrial/ agricultural use	drinking use
X		

- Distance to other sensitive areas:

natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
			X

Sheet 1.4

Information on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)

- Name of the waste disposal site: **ARPECHIM - old deposit for sludge /oily tank residues**
- Location (name of the locality): Pitesti, Arges
- Site owner: ARPECHIM Pitesti
- Year of the site establishment: 1974
- Year of the site closure: 1999
- Generator(s) of waste stored or disposed: ARPECHIM Pitesti
- Types and quantities of waste stored or disposed:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity (tons)
1	Residues from oil reservoirs	050103	130000
2	Oily sludge from wastewater treatment containing hazardous substances	050109	

- Site surface (ha): 2.4
- Site capacity (cm): 200 000.
- Site engineering (please tick):

Fence /dikes	weighing device	lining	surrounding channel	drainage	Monitoring wells	not any facility
X		X	X		X	

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
		X	

- Distance to the nearest surface water: 20 m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
X				

- Depth of ground water: 5-10 m

- Use of ground water:

no use	industrial / agricultural use	drinking use
	X	

- Distance to sensitive areas:

dwelling	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
5000 m				

Sheet 1.5

Information on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)

- Name of the waste disposal site: **ARPECHIM new deposit for oily sludge / oily tank residues**
- Location (name of the locality): Pitesti, Arges
- Site owner: ARPECHIM Pitesti
- Year of the site establishment: 1993
- Year of the site closure: not known
- Generator(s) of waste stored: ARPECHIM Pitesti
- Types and quantities of waste stored or disposed of:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity (tons)
1	Biological sludge containing hazardous substances from industrial wastewater treatment	050109	40000
2	Residues from oil tanks	050103	

- Site surface (ha): 0.8
- Site capacity (cm): 100000
- Site engineering (please tick):

Fence /dikes	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
X		X	X		X	

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
		X	

- Distance to the nearest surface water: 300m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
X				

- Depth of ground water: 5-10m

- Use of ground water:

no use	industrial / agricultural use	drinking use
	X	

- Distance to other sensitive areas:

dwelling	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
5000m				

Sheet 1.6

Information on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)

- Name of the waste disposal site: **ARPECHIM deposit for triazinic waste**
- Location (name of the locality): Pitesti, Arges
- Site owner: ARPECHIM Pitesti
- Year of the site establishment: 1981
- Year of the site closure: 1998
- Generator(s) of waste stored : ARPECHIM Pitesti
- Types and quantities of waste stored or disposed of:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity (tons)
1	Pesticide (triazinic) waste	070711	1400

- Site surface (ha): 0.1
- Site capacity (cm): 2000
- Site engineering (please tick):

Fence /dikes	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
X		X			X	

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
		X	

- Distance to the nearest surface water: 3000m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
X				

- depth of ground water: 5-10m

- use of ground water:

no use	industrial / agricultural use	drinking use
	X	

- Distance to other sensitive areas:

dwelling	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
3000m				

Sheet 1.7

**Information
on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)**

- Name of the waste disposal site: **ARPECHIM - Dambovnica lake-compartment no.5 - deposit for sludge/ oily tanks residues**
- Location (name of the locality): Pitesti, Arges
- Site owner: ARPECHIM Pitesti
- Year of the site establishment: 1981
- Year of the site closure: 1995
- Generator(s) of waste stored: ARPECHIM Pitesti
- Types and quantities of waste stored or disposed of:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity (tons)
1	Tank oily sludge Sludge from biological treatment containing hazardous substances	050103 050109	100000

- Site surface (ha): 1,8
- Site capacity (cm) 100000
- Site engineering (please tick):

Fence /dikes	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
X		X			X	

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
X		X	

- Distance to the nearest surface water: 10m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
X				

- Depth of ground water: 5-7 m

- Use of ground water:

no use	industrial / agricultural use	drinking use
X		

- Distance to other sensitive areas:

dwellings	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
2000 m				

Sheet 1.8

**Information
on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)**

- Name of the waste disposal site: **ARO Campulung electroplating sludge tank**
- Location (locality and county): Campulung, Arges
- Site owner: S.C. ARO Campulung S.A
- Year of the site establishment: 1992
- Year of the site closure: not established
- Generator(s) of waste stored or disposed: S.C. ARO Campulung S.A
- Types and quantities of waste stored or disposed:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity (tons)
1	Sludge containing hazardous substances	110109	230

- Site surface (ha): 0.1
- Site capacity (cm): 400
- Site engineering (please tick):

fence	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
X	X	X				

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
		X	

- Distance to the nearest surface water: 400m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
	X			X

- Depth of ground water: 12m

- Use of ground water:

no use	industrial / agricultural use	drinking use
	X	

- Distance to other sensitive areas:

dwellings	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
50 m				

Sheet 1.9

Information on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)

- Name of the waste disposal site: **IPEE Curtea de Arges electroplating sludge tank**
- Location (locality and county): Curtea de Arges
- Site owner: IPEE Curtea de Arges
- Year of the site establishment: 1992
- Year of the site closure: 2005
- Generator of waste stored: IPEE Curtea de Arges
- Types and quantities of waste stored or disposed:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity (tons)
1	Sludge containing hazardous substances	11 01 09	16

- Site surface (ha): 0.003
- Site capacity (cm) 144
- Site engineering (please tick):

fence	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
X		X				

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
		X	

- Distance to the nearest surface water: 1000 m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
X				

- Depth of ground water: 10 m

- Use of ground water:

no use	industrial / agricultural use	drinking use
	X	

- Distance to other sensitive areas:

dwelling	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
250				

Sheet 1.10

**Information
on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)**

- Name of the waste disposal site: **ELECTROARGES Curtea de Arges electroplating sludge tank**
- Location (locality and county): Curtea de Arges
- Site owner: ELECTROARGES Curtea de Arges
- Year of the site establishment: 1999
- Year of the site closure: 2004
- Generator of waste stored: ELECTROARGES Curtea de Arges
- Types and quantities of waste stored or disposed of:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity (tons)
1	Sludge containing hazardous substances	11 01 09	16.4

- Site surface (ha): 0.0012
- Site capacity (cm): 26.2
- Site engineering (please tick):

fence	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
		X				

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
X		X	

- Distance to the nearest surface water: 1000 m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
	X			

- Depth of ground water: 10 m

- Use of ground water:

no use	industrial / agricultural use	drinking use
	X	

- Distance to other sensitive areas:

dwelling	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
100 m				

Sheet 1.11

**Information
on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)**

- Name of the waste disposal site: **S.C. Auto General Motor SA Maracineni sludge disposal site**
- Location (locality and county): Maracineni
- Site owner: S.C Auto General Motor SA Maracineni
- Year of the site establishment: 1977
- Year of the site closure: 1996
- Generator of waste stored or disposed: S.C Auto General Motor SA Maracineni
- Types and quantities of waste stored or disposed of:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity (tons)
1	Sludge containing cyanide	110301	1 ton

- Site surface (ha): 0,002
- Site capacity (cm): 35
- Site engineering (please tick):

fence	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
X		X				

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
		X	

- Distance to the nearest surface water: 5000 m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use

- Depth of ground water: 7 m

- Use of ground water:

no use	industrial / agricultural use	drinking use
	X	

- Distance to other sensitive areas:

dwellings	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
2000				

Sheet 1.12

**Information
on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)**

- Name of the waste disposal site: **PITESTI – ALBOTA Municipal mixed waste disposal site**
- Location (locality and county): Pitesti municipality, Arges county
- Site owner: Pitesti local council
- Year of the site establishment: 1966
- Year of the site closure: 2005 probably
- Generators of waste stored or disposed: Pitesti city, Maracineni and Stefanesti communes
- Types and quantities of waste stored or disposed:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity
1	Packaging containing hazardous waste or contaminated with hazardous substances	150110	Not available
2	Car oil filters	160107	
3	Out of use equipment containing free asbestos	160212	
4	Organic waste containing hazardous substances	160305	
5	Hazardous chemical substances from laboratories	160506	
6	Chemicals containing hazardous substances from health care activities	180106	
7	Solid waste from gas emissions filtration	190107	
8 s	Sludge from physico-chemical treatment of hazardous materials	190205	
9	Solidified hazardous sludge	190306	
10	Pesticide waste	200119	
11	Out of use equipment containing CFC	200123	
12	Paints, adhesives and resins waste containing hazardous substances	200127	
13	Batteries and accumulators others than those specified at 1606	200133	
14	Electrical and electronic equipment containing hazardous components	200135	

- Site surface (ha): 10.6
- Site capacity (cm) not known, but exceeded
- Site engineering (please tick):

fence	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
						X

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
X			

- Distance to the nearest surface water: 4000 m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
X				

- Depth of ground water: 4 -10 m

- Use of ground water:

no use	industrial / agricultural use	drinking use
X		

- Distance to other sensitive areas:

dwelling	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
3000 m				

Sheet 1.13

**Information
on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)**

- Name of the waste disposal site: **CURTEA de ARGES Municipal mixed waste disposal site**
- Location (locality and county): Curtea de Arges municipality, Arges county
- Site owner: Curtea de Arges local council
- Year of the site establishment: 1952
- Year of the site closure: 2005
- Generators of waste disposed: Curtea de Arges municipality
- Types and quantities of waste stored or disposed:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity
1	Packaging containing hazardous waste or contaminated with hazardous substances	150110	Not available
2	Car oil filters	160107	
3	Out of use equipment containing free asbestos	160212	
4	Organic waste containing hazardous substances	160305	
5	Hazardous chemical substances from laboratories	160506	
6	Chemicals containing hazardous substances from health care activities	180106	
7	Solid waste from gas emissions filtration	190107	
8	Sludge from physico-chemical treatment of hazardous materials	190205	
9	Solidified hazardous sludge	190306	
10	Pesticide waste	200119	
11	Out of use equipment containing CFC	200123	
12	Paints, adhesives and resins waste containing hazardous substances	200127	
13	Batteries and accumulators others than those specified at 1606	200133	
14	Electrical and electronic equipment containing hazardous components	200135	

- Site surface (ha): 2.0
- Site capacity (cm): not known, but exceeded
- Site engineering (please tick):

fence	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
						X

- urrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
X			

- Distance to the nearest surface water: 100 m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
X				

- Depth of ground water: 8-10 m

- Use of ground water:

no use	industrial / agricultural use	drinking use
X		

- Distance to other sensitive areas:

dwelling	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
1000 m				

Sheet 1.14

**Information
on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)**

- Name of the waste disposal site: **COSTESTI Municipal mixed waste disposal site**
- Location (locality and county): Costesti municipality, Arges county
- Site owner: Costesti local council
- Year of the site establishment: 1992
- Year of the site closure: 2005
- Generators of waste disposed: Costesti municipality
- Types and quantities of waste stored or disposed:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity
1	Packaging containing hazardous waste or contaminated with hazardous substances	150110	Not available
2	Car oil filters	160107	
3	Out of use equipment containing free asbestos	160212	
4	Organic waste containing hazardous substances	160305	
5	Hazardous chemical substances from laboratories	160506	
6	Chemicals containing hazardous substances from health care activities	180106	
7	Solid waste from gas emissions filtration	190107	
8 s	Sludge from physico-chemical treatment of hazardous materials	190205	
9	Solidified hazardous sludge	190306	
10	Pesticide waste	200119	
11	Out of use equipment containing CFC	200123	
12	Paints, adhesives and resins waste containing hazardous substances	200127	
13	Batteries and accumulators others than those specified at 1606	200133	
14	Electrical and electronic equipment containing hazardous components	200135	

- Site surface (ha): 1,5
- Site capacity (cm): not known
- Site engineering (please tick):

fence	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
						X

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
X -pasture			

- Distance to the nearest surface water: 6000 m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
X				

- Depth of ground water: 8-10 m

- Use of ground water:

no use	industrial / agricultural use	drinking use
X		

- Distance to other sensitive areas:

dwelling	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
5000 m				

Sheet 1.15

**Information
on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)**

- Name of the waste disposal site: **CAMPULUNG Municipal mixed waste disposal site**
- Location (locality and county): Campulung municipality, Arges county
- Site owner: Campulung local council sau EDILUL
- Year of the site establishment: 1967
- Year of the site closure: not known, probably 2005
- Generators of waste disposed: Campulung municipality
- Types and quantities of waste stored or disposed:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity
1	Packaging containing hazardous waste or contaminated with hazardous substances	150110	Not available
2	Car oil filters	160107	
3	Out of use equipment containing free asbestos	160212	
4	Organic waste containing hazardous substances	160305	
5	Hazardous chemical substances from laboratories	160506	
6	Chemicals containing hazardous substances from health care activities	180106	
7	Solid waste from gas emissions filtration	190107	
8 s	Sludge from physico-chemical treatment of hazardous materials	190205	
9	Solidified hazardous sludge	190306	
10	Pesticide waste	200119	
11	Out of use equipment containing CFC	200123	
12	Paints, adhesives and resins waste containing hazardous substances	200127	
13	Batteries and accumulators others than those specified at 1606	200133	
14	Electrical and electronic equipment containing hazardous components	200135	

- Site surface (ha): 1,5
- Site capacity (cm) not known
- Site engineering (please tick):

fence	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
						X

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
X - pasture			

- Distance to the nearest surface water: 400 m

- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
X				

- Depth of ground water: 8-16 m

- Use of ground water:

no use	industrial / agricultural use	drinking use
X		

- Distance to other sensitive areas:

dwelling	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
3000 m				

Sheet 1.16

Information on Industrial Waste Disposal Sites (In Operation and Out of Use Sites)

- Name of the waste disposal site: **TOPOLOVENI Municipal mixed waste disposal site**
- Location (locality and county): Topoloveni municipality, Arges county
- Site owner: Topoloveni local council
- Year of the site establishment: 1975
- Year of the site closure: not known
- Generators of waste disposed: Topoloveni municipality
- Types and quantities of waste stored or disposed:

No	Waste types	Waste code (G.D. 856/2002)	Estimated stored quantity
1	Packaging containing hazardous waste or contaminated with hazardous substances	150110	Not available
2	Car oil filters	160107	
3	Out of use equipment containing free asbestos	160212	
4	Organic waste containing hazardous substances	160305	
5	Hazardous chemical substances from laboratories	160506	
6	Chemicals containing hazardous substances from health care activities	180106	
7	Solid waste from gas emissions filtration	190107	
8 s	Sludge from physico-chemical treatment of hazardous materials	190205	
9	Solidified hazardous sludge	190306	
10	Pesticide waste	200119	
11	Out of use equipment containing CFC	200123	
12	Paints, adhesives and resins waste containing hazardous substances	200127	
13	Batteries and accumulators others than those specified at 1606	200133	
14	Electrical and electronic equipment containing hazardous components	200135	

- Site surface (ha): 1,5
- Site capacity (cm) not known
- Site engineering (please tick):

fence	weighing device	lining	surrounding channel	drainage	monitoring wells	not any facility
						X

- Surrounding conditions:

- Use of the neighboring land:

agricultural use	forest	industrial	dwelling
X - pasture			

- Distance to the nearest surface water: 800 m
- Use of surface water:

no use	industrial use	agricultural use	leisure use	drinking use
X				

- Depth of ground water: 6-8 m
- Use of ground water:

no use	industrial / agricultural use	drinking use
X		

- Distance to other sensitive areas:

dwelling	natural preserved areas	historic or architectural places	leisure places	No sensitive areas in the neighborhood
3000 m				

ANNEX II
Information Sheets on Contaminated Sites and Hazardous Waste Deposits
(Detailed Checklist Format)

Sheet 2.1

**Information
on the Contaminated Site – MICESTI**

1. Contaminated Site Identification Data:

- Name, location (county, administrative unit): ...**Micesti area contaminated with pesticide**
- Owner:Samoila Constantin
- Nature of ownership (state, private):private
- Former use:open air pesticide storage area
- Actual conditions:contaminated area having pesticide removed
- Planned use in the future:no use; monitoring

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
0.025	yes			no	no	no	no	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
	pesticide			no	before 1989

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/ 2002		in soil	in groundwater
Organo-chlorinated and triazinic pesticides	020108	1t	Organo-chlorinated pesticides in different points: 65.316 – 603.920 (EPI-13.11.2002)	Organo-chlorinated pesticides in one monitoring well: 18.192 (EPI-13.11.2002)

5. Land Use

dwelling	leisure area	agriculture	pasture	forest	industrial/ commercial
		yes			

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
300 m				1000 m

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
15			yes	yes			yes	yes

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	yes	no	yes			no	

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
no	no		no		no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Communal water supply	known	not known but possible		
100		yes			yes	no	yes

11. Public Awareness

People are or not aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
no	no		no			yes

Sheet 2.2

**Information
on the Contaminated Site FALFANI- Pesticide**

1. Contaminated Site Identification Data:

- Name, location (county, administrative unit):.....**Falfani area contaminated with pesticide**-Falfani village, Stolnici commune, Arges county
- Owner:Falfani Agricultural Association
- Nature of ownership (state, private):private
- Former use:pesticide storage depot in the not concrete basement of a building
- Actual conditions:contaminated phreatic water-table
- Planned use in the future:no use of groundwater (wells); planned public water-supply system.

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
50 sqm as soil and the water-table on 20 ha	yes			no	no	no	no	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
	pesticide			no	before 1989

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Organo-chlorinated and triazinic pesticides	020108	unknown	Organo-chlorinated pesticides in different points: 42.75 - 987.77 (EPI-13.11.2002)	Organo-chlorinated pesticides in different domestic wells: 2.408 – 8.406 (EPI-13.11.2002)

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/commercial
yes					

6.Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
10 m to the nearest house				500 m to Cotmeana river

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
5			yes	yes			yes	yes

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
no	no	yes	yes	no	no	yes	no	

9. Pollution Monitoring

Monitoring System yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
occasionally	no		yes	Pesticides total amount	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Central water supply	known	not known but possible		
50		yes			yes	no	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	not known	no			yes

Sheet 2.3

Information on the Contaminated Site POIANA LACULUI – Petrom

1. Contaminated Site Identification Data:

- Name..... **Poiana Lacului area contaminated with crude oil and salty water**
- Location (county, administrative unit): Poiana Lacului commune, Arges county
- Owner:different owners
- Nature of ownership (state, private):private and public
- Former use:forest land
- Actual conditions:land having trees mostly removed
- Planned use in the future:area rehabilitated as forest

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trenches	drainage
18.6		yes		no	no	Some times	Some times	Some times	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
			yes	yes	before 1992

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	010506	impossible to estimate	Salty water:33 – 4830 Crude oil:13060 - 51400	Chlorides:124 - 6248

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
yes		yes		yes	

6. Distance (m) Between the Site and Protected Areas

dwellings	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
10-3000				30 to 3000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
2-10			yes	yes	yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	yes			yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
occasionally	yes	pH, humus, P, K, salts, oily compounds	yes	pH, conductivity, COD, chlorides, Ca, Mg, Na, K, Fe, NH ₄ , NO ₂ , NO ₃ , SO ₄ , HCO ₃ , water hardness	yes	Same parameters as for ground water in surface water (rivers)

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Communal water supply	known	not known but possible		
98,4			yes		yes	yes	yes

11. Public Awareness

People are or not aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	271	yes			yes

Sheet 2.4

**Information
on the Contaminated Site MOSOAIA - ALBOTA – Petrom**

1. Contaminated Site Identification Data:

- Name, **Mosoia- Albota area contaminated with crude oil and salty water**
- Location (county, administrative unit):.....Mosoia and Albota communes, Arges county
- Owner:different owners
- Nature of ownership (state, private):private and public
- Former use:dwelling, arable and forest land
- Actual conditions:non-usable land
- Planned use in the future:area rehabilitated as forest

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trenches	drainage
19.1		yes	yes	yes	no	no	some times	some times	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
			yes	yes	before 1975

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	010506	impossible to estimate	Not available	Not available

5. Land Use

dwelling	leisure area	agriculture	pasture	forest	industrial/ commercial
yes		yes		yes	

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
10-2000 to the nearest house				10 to 3000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
2-10			yes	yes	yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	sometimes	no	no	yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
occasionally	yes	pH, humus, P, K, salts, oily compounds	yes	pH, conductivity, COD, chlorides, Ca, Mg, Na, K, Fe, NH ₄ , NO ₂ , NO ₃ , SO ₄ , HCO ₃ , water hardness		

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Communal water supply	known	not known but possible		
92,4		yes			yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	not known	yes			yes

Sheet 2.5

**Information
on the Contaminated Site COCU- BABANA – Petrom**

1. Contaminated Site Identification Data:

- Name:..... **Cocu-Babana - site contaminated with crude oil and salty water**
- Location (administrative unit):.....Cocu and Babana communes, Arges county
- Owner:different owners
- Nature of ownership(private or public):public and private
- Former use:forest/arable land
- Actual conditions:.....non-usable land
- Planned use in the future:area rehabilitated as forest

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trenches	drainage
2.55		yes	yes	some times	no	no	some times	some times	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
			yes	yes	1975

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	010506	unknown	Not available	Chlorides: 6248

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
yes		yes		yes	

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
50-5000 to the houses				10-3000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
more than 15			yes	yes	yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	some times	no	no	yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
occasionally	yes	pH, humus, salts, oil residues	yes	pH, oil residues, water hardness, chlorides, conductivity,	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Communal water supply	known	not known but possible		
90.5	yes				yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	not known	yes			yes

Sheet 2.6

**Information
on the Contaminated Site DRAGANU-MERISANI – Petrom**

1. Contaminated Site Identification Data:

-Name:..... **Draganu-Merisani**
area contaminated with crude oil and
salty water

-Location (administrative unit):..... Merisani and Merisani
communes, Arges county

-Owner:different owners

-Nature of ownership(private or public):public and private

-Former use:forestry / pasture land

-Actual conditions:.....non-usable land

-Planned use in the future:area rehabilitated as forest

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trenches	drainage
7.89		yes	yes	some times	no	no	some times	some times	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
			yes	yes	1975

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	010506	unknown	Not available	Not available

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
yes			yes	yes	

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
10-4000 to the houses				300-5000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
2-15	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	sometimes	no	no	yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
yes	yes	pH, humus, salts, oil	yes	pH, oil residues, water hardness, chlorides, conductivity,	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Communal water supply	known	not known but possible		
90.5			yes		yes	yes	yes

11. Public Awareness

People are or not aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	not known	yes			yes

Sheet 2.7

**Information
on the Contaminated Site SAPATA– Petrom**

1. Contaminated Site Identification Data:

-Name, **Sapata area contaminated with crude oil and salty water**
 -Location (county, administrative unit):.....Lunca Corbului, Sapata commune, Arges county
 -Owner:different owners
 -Nature of ownership (state, private):private and public
 -Former use:dwelling, arable and forest land
 -Actual conditions:non-usable land
 -Planned use in the future:area rehabilitated as forest

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
15.22		yes	yes	yes	no	no	some times	some times	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
			yes	yes	after 1975

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	010506	impossible to estimate	not available	not available

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
yes		yes		yes	

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
10 - 6000				200 - 3000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
2-10	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	sometimes	no	no	yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
occasionally	yes	pH, humus, P, K, salts, oily compounds	yes	pH, conductivity, COD, chlorides, Ca, Mg, Na, K, Fe, NH ₄ , NO ₂ , NO ₃ , SO ₄ , HCO ₃ , water hardness	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Communal water supply	known	not known but possible		
94,4		yes	yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	not known	yes			yes

Sheet 2.8

**Information
on the Contaminated Site VEDEA – Petrom**

1. Contaminated Site Identification Data:

-Name, **Vedea area contaminated with crude oil and salty water,**
 -Location (county, administrative unit):..... Vedea commune, Arges county
 -Owner:different owners
 -Nature of ownership (state, private):private and public
 -Former use:dwelling, arable and forest land
 -Actual conditions:non-usable land
 -Planned use in the future:area rehabilitated as forest

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trenches	drainage
13.6		yes	yes	yes	no	no	some times	some times	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
			yes	yes	1975

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	010506	impossible to estimate	Not available	Not available

5. Land Use

dwelling	leisure area	agriculture	pasture	forest	industrial/commercial
yes		yes		yes	

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
10-5000 to the nearest house				100 - 3000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
2-10	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	some times	no	no	yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
occasionally	yes	pH, humus, P, K, salts, oily compounds	yes	pH, conductivity, COD, chlorides, Ca, Mg, Na, K, Fe, NH ₄ , NO ₂ , NO ₃ , SO ₄ , HCO ₃ , water hardness		

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Communal water supply	known	not known but possible		
94,4			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	Not known	yes			yes

Sheet 2.9

**Information
on the Contaminated Site TOPOLOVENI – Petrom**

1. Contaminated Site Identification Data:

-Name..... **Topoloveni area contaminated with crude oil and salty water-**
 -Location (county, administrative unit): Topoloveni locality and neighboring areas, Arges county
 -Owner:various owners
 -Nature of ownership:private and public property
 -Former use:forestry land
 -Actual conditions:land having trees mostly removed
 -Planned use in the future:area rehabilitated as forest

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trenches	drainage
3.7		yes		no	no	no	no	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
			yes	yes	before 1999

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	010506	Impossible to estimate	Not available	Not available

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/commercial
				yes	

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
500-6000				100-2000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
2-15	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	yes			yes	yes

9. Pollution Monitoring

Monitoring System Yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
occasionally	yes	pH, humus, salts, oily compounds	yes	pH, oil residues, water hardness, chlorides, conductivity	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Communal water supply	known	not known but possible		
104.4			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	not known	yes			yes

Sheet 2.10

**Information
on the Contaminated Site - OARJA – Petrom**

1. Contaminated Site Identification Data:

-Name..... **Oarja area contaminated with crude oil and salty water**
 -Location (county, administrative unit):..... Oarja commune, Arges county
 -Owner:various owners
 -Nature of ownership(private or public):.....private
 -Former use:.....agricultural land
 -Actual conditions:.....contaminated –not usable land
 -Planned use in the future:area rehabilitated as agricultural land

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
20	yes			no	no	no	no	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
			yes	yes	before 1960

4. Characteristics of Contaminants

Chemical nature (see)		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydrocarbons	010506	impossible to estimate	Not available	Not available

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
		yes			

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
100-2000 m to the houses				500-2000 m

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
2-10			yes	yes			yes	yes

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	yes	no	no	yes	yes

9. Pollution Monitoring

Monitoring System Yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
Yes (occasionally)	yes	pH, humus, salts, oily compounds	yes	pH, oil residues, water hardness, chlorides, conductivity	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Central water supply	known	not known but possible		
90.5		yes			yes	yes	yes

11. Public Awareness

People are aware of the health risks (yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	not known	yes			yes

Sheet 2.11

**Information
on the Contaminated Site CATEASCA –Petrom**

1. Contaminated Site Identification Data:

-Name:..... **Cateasca area contaminated with crude oil and salty water**
 -Location (county, administrative unit):.....Cateasca locality, Cateasca commune, Arges county
 -Owner:various owners
 -Nature of ownership(private or public):.....private properties
 -Former use:.....agricultural land
 -Actual conditions:.....not used, contaminated land
 -Planned use in the future:rehabilitation as agricultural land

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
14.29	yes			no	no	no	no	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
			yes	yes	before 2001

4. Characteristics of Contaminants

Chemical nature (see)		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydrocarbons	010506	impossible to estimate	Not available	Not available

5. Land initial Use

dwellings	leisure area	agriculture	pasture	forest	industrial/commercial
		yes			

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
500-2000 m to the houses				100 - 2000 m

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
2-10			yes				yes	

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	yes			yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
Yes (occasionally)	yes	pH, humus, salts, oily compounds	yes	pH, oil residues, water hardness, chlorides, conductivity	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Central water supply	known	not known but possible		
101.5			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	not known	yes			yes

Sheet 2.12

**Information
on the Contaminated Site CALDARARU – Petrom**

1. Contaminated Site Identification Data:

-Name:..... **Caldararu area contaminated with crude oil and salty water**
 -Location (county, administrative unit):.....Caldararu commune, Arges county
 -Owner:various owners (12)
 -Nature of ownership(private or public):.....private properties
 -Former use:.....agricultural land
 -Actual conditions:.....not used, no vegetation on land
 -Planned use in the future:rehabilitation as agricultural land;
 monitoring.

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
10.3	yes			Some times	no	Seldom	Some times	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from oil pipes or reservoirs		
			yes	yes	1975 - 2001

4. Characteristics of Contaminants

Chemical nature (see)		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	010506	impossible to estimate	Not available	Not available

5. Land Initial Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
		yes			

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
100 - 6000 to the houses				300 - 2000m

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
3-10			yes				yes	

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	sometimes	no	no	yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
Yes (occasionally)	yes	pH, humus, salts, oily compounds	yes	pH, oil residues, water hardness, chlorides, conductivity	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Central water supply	known	not known but possible		
95.5		Yes, partially	Yes, partially		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	40	yes	yes		yes

Sheet 2.13

Information on the Contaminated Site BARLA –Petrom

1. Contaminated Site Identification Data:

-Name:..... **Barla area contaminated with crude oil and salty water**
 -Location (county, administrative unit):.....Barla commune, Arges county
 -Owner:various owners (17)
 -Nature of ownership(private or public):.....private properties
 -Former use:.....agricultural land
 -Actual conditions:.....not usable, contaminated land
 -Planned use in the future:rehabilitation as agricultural land;
 monitoring.

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
4.42	yes			Some times	no	Some times	Some times	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
			yes	yes	1975 –1995

4. Characteristics of Contaminants

Chemical nature (see)		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	010506	Impossible to estimate	Not available	Not available

5. Land Initial Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
		yes			

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
50 - 6000 m to the houses				300 – 2000 m

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
2-10			yes				yes	

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	sometimes	no	no	yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
Yes (occasionally)	yes	pH, humus, salts, oily compounds	yes	pH, oil residues, water hardness, chlorides, conductivity	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Central water supply	known	not known but possible		
101.5			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	35	yes			yes

Sheet 2.14

**Information
on the POIANA LACULUI OILY SLUDGE STORAGE FACILITY**

1. Contaminated Site Identification Data:

-Name:.....**Poiana Lacului controlled sludge storage facility**
 -Location (county, administrative unit):.....Poiana Lacului commune, Arges county
 -Owner:S.N.P. Petrom – schela Pitesti
 -Nature of ownership(private or public):.....state properties
 -Former use:.....agricultural land
 -Actual conditions:..... sludge controlled storage facility
 -Planned use in the future:same use

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
1.5 (0.3)	yes			yes	yes	yes	yes	yes	yes

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from oil pipes or reservoirs		
yes (oily sludge)			yes	yes	1996 (rehabilitated in 2000)

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	010506	impossible to estimate	not available	not available

5. Land Initial Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
		yes			

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
600 m to the houses				1000 m

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
17			yes	yes			yes	

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
Used for waste storage		yes	yes	yes			yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
Yes (occasionally)	yes	pH, humus, salts, oily compounds	yes	pH, oil residues, water hardness, chlorides, conductivity	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Central water supply	known	not known but possible		
98.4		Yes, partially	Yes, partially		yes	yes	yes

11. Public Awareness

People are or not aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no		yes			yes

Sheet 2.15

**Information
on the Contaminated Site Pitesti – RAILWAY DEPOT**

1. Contaminated Site Identification Data:

-Name:.....**Pitesti railway depot contaminated area**
 -Location (county, administrative unit):.....Pitesti municipality, Arges county
 -Owner: National Company for Domestic Transport
 -Nature of ownership(private or public):.....state properties
 -Former use:.....industrial
 -Actual conditions:..... industrial - transportation
 -Planned use in the future: rehabilitation for the same use;

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
0.05	yes			yes	no	no	no	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from oil pipes or reservoirs		
Yes (waste oils)	Yes (fuel, lubricants)		yes	yes	1973 - 2001

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	050105 050106	impossible to estimate	Not available	Not available

5. Land Initial Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
					yes

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
300 m to the houses				2000m

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
3-10		yes				yes		

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	sometimes	no	no	no	no

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
Yes (occasionally)	yes	pH, humus, salts, oily compounds	yes	pH, oil residues, water hardness, chlorides, conductivity	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Central water supply	known	not known but possible		
4419			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
no	no		yes			yes

Sheet 2.16

**Information
on the DACIA – Oil Central Storage Facility**

1. Contaminated site identification data:

-Name:.....**Dacia – Oil central storage facility**
 -Location (county, administrative unit):.....Mioveni municipality, Arges county

 -Owner:S.C Automobile Dacia S.A.
 -Nature of ownership(private or public):.....private property
 -Former use:.....industrial – oil storage area
 -Actual conditions:..... contaminated site under remediation
 -Planned use in the future:same use

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
0.1		yes		yes		yes		yes	

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from oil pipes or reservoirs		
	yes		yes	partially	1974 - 1999

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Mineral oils, Chlorinated compounds	050105 120107 120106	impossible to estimate	Mineral oils 12246 mg/kg dry substance.	Mineral oils with chlorinated compounds 95-14986 mg/l

5. Land initial Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
					yes

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
1600 m to the houses				4000 m

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
6-12		yes				yes		

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	contain -ment	excavation of contaminated layers	other	yes/no	financing source
	yes	yes	yes	yes	yes	Tightness verification Reservoirs cleaning	yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
Yes	yes	pH, oily residues	yes	pH, oily residues,	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Central water supply	known	not known but possible		
98.4			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no		yes			yes

Remark: Declared data are extracted from the “Complementary report on soil and groundwater quality, assessment of risk and remediation solutions for Dacia contaminated lands” - ENVICO 2002

The excavated polluted soil will be treated within the enterprise own treatment plant for contaminated soil

Sheet 2.17

**Information
on the DACIA – Former Sludge Lagoons (Batal, Prebatal)**

1. Contaminated Site Identification Data:

-Name:.....**Dacia – Former sludge lagoons**
 -Location (county, administrative unit):.....Mioveni city, Arges county

 -Owner:S.C Automobile Dacia S.A.
 -Nature of ownership(private or public):.....private property
 -Former use:.....industrial – sludge storage area
 -Actual conditions:..... contaminated site under remediation
 -Planned use in the future:industrial use

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
0.908		yes		yes	yes		yes	yes	yes

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from oil pipes or reservoirs		
yes				no	1971 - 1999

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration	
Order 756/1997	Order 856/2002		in soil	in groundwater
Heavy metals, Chlorinated compounds	110109 110108 080115 160207	3000 cm (prebatal) + 12000 cm (batal)	Cr: 1431 mg/kg dry subst. Zn: 4712 mg/kg dry subst PAH: 5.18 mg/kg dry subst	Cr: 0.144 mg/l Cu: 0.245 mg/l

5. Land Initial Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
					yes

6. Distance (m) Between the Zite and Protected Areas

dwellings	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
1000 m to the houses				4000 m

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
6-10		yes				yes		

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	contain -ment	excavation of contaminated layers	other	yes/no	financing source
	yes	yes	yes	yes	yes	Sludge stabilisation Lining (clay+ geomembrane + geotextile)	yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
Yes	yes	Heavy metals, PAH, chlorinated compounds	yes	pH, heavy metals, PAH, chlorinated compounds	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Central water supply	known	not known but possible		
98.4			yes		yes	Not any more	yes

11. Public Awareness

People are aware of the health risks (yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no		yes			yes

Remark: Declared data are extracted from the “Complementary report on soil and groundwater quality, assessment of risk and remediation solutions for Dacia contaminated lands” - ENVICO 2002. The excavated polluted soil will be treated within the enterprise own plant for contaminated soil treatment

Information on the DACIA – Fuel Supply and Depositing Area – Thermal Treatment

-Name:.....**Dacia – Fuel supply and depositing area**
-Location (county, administrative unit):.....Mioveni municipality, Arges county

-Owner:S.C Automobile Dacia S.A.
-Nature of ownership(private or public):.....private property
-Former use:.....industrial – fuel wagons discharge,
fuel supply and depositing
-Actual conditions:..... contaminated site under remediation
-Planned use in the future:same industrial use, under controlled
conditions

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
0.16		yes		yes		yes		yes	yes

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from oil pipes or reservoirs		
	yes		yes	no	1968 - 1999

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oil hydrocarbons	050105	Not known	Total hydrocarbons (C ₁₀ – C ₄₀): 19.538 mg/kg dry subst. PAH: 5000 mg/kg dry subst	Total hydrocarbons (C ₁₀ – C ₄₀): 150 micrograms/l

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
					yes

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
1500 m to the houses				4000 m

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
6-10		yes				yes		

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	contain -ment	excavation of contaminated layers	other	yes/no	financing source
	yes	yes	yes	yes	yes	Reservoirs cleaning and tightness verification	yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
yes	yes	total hydrocarbons	yes	pH, total hydrocarbons	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Central water supply	known	not known but possible		
98.4			yes		yes	not any more	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no		yes			yes

Remark: The excavated polluted soil will be treated within the enterprise own contaminated soil treatment plant

Declared data are extracted from the “Complementary report on soil and groundwater quality, assessment of risk and remediation solutions for Dacia contaminated lands” ENVICO 2002

Sheet 2.19

Information on the MIOVENI City Hall Property – PISCANI Contaminated Site

1. Contaminated Site Identification Data:

-Name:.....**PISCANI contaminated site**
 -Location (county, administrative unit):.....Mioveni municipality, Arges county
 -Owner:Mioveni City Hall property
 -Nature of ownership(private or public):..... state property
 -Former use:.....industrial waste storage area
 -Actual conditions:..... contaminated site
 -Planned use in the future:not established

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
6.5			yes	no	no	no	no	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from oil pipes or reservoirs		
yes	yes			No	1982 – 1996

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Heavy metals Mineral oils, Hydro carbons, Chlorinated compounds	110109 050105 050103 110113 120106	Around 300000cm	Relevant data not available.	Available data (irrelevante): PH-6.6 Total Nitrogen-7.6ppm Nitrates - 7.9ppm Chlorine - 368.8ppm Sulfate – 279.1ppm Hydrogen sulfite - 8.5ppm Copper – 0.135ppm

5. Land Initial Use

dwelling	leisure area	agriculture	pasture	forest	industrial/ commercial
					yes

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
400 m to the houses				10 m

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
2.3–6.3	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	contain -ment	excavation of contaminated layers	other	yes/ no	financing source
	yes	no	no	no	no	no	no	no

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/ no	parameter(s) controlled	yes/ no	parameter(s) controlled	yes/ no	parameter(s) controlled
Yes (occasionally)	no		yes	pH, heavy metals, oil residues, NO ₃ , H ₂ S, SO ₄ , chlorides	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	Central water supply	known	not known but possible		
98.4			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
no	no		no	no	no	no

Sheet 2.20

**Information
on the Contaminated Site –Private Property V. Preda near ARPECHIM**

1. Contaminated Site Identification Data:

-Name.....**Private property V. Preda near
ARPECHIM**

-Location (county, administrative unit):Pitesti, Arges county

-Owner:V. Preda (as natural person)

-Nature of ownership (state, private):private

-Former use:agricultural land

-Actual conditions:contaminated area already remediated

-Planned use in the future:no use; monitoring

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
1.2	yes			no	no	no	no	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
			yes	no	before 1999

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/ 2002		in soil	in groundwater
Oily compounds	05 01 05	Not known	Total hydrocarbons: Initially:1.48 –0.81% or 14800-8100 ppm	unknown

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
		yes			

6.Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
300 m to the nearest house				1000 m to Doamnei river

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
7-10	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	contain -ment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	no	yes	first soil layer cleaned	yes	yes

9. Pollution Monitoring

Monitoring system yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
no	no		no		no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	central water supply	known	not known but possible		
97.5					yes	no	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
no	no		no			yes

Sheet 2.21

**Information on
ARPECHIM - Triazinic Waste Disposal Site**

1. Contaminated Site Identification Data:

-Name,.....**ARPECHIM Pitesti triazinic waste disposal site**
 -Location (county, administrative unit):.....Pitesti municipality, Arges county
 -Owner:ARPECHIM Pitesti
 -Nature of ownership(private or public):public
 -Former use:industrial area
 -Actual conditions:.....officially closed
 -Planned use in the future:industrial

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
0.1	yes				yes	yes		yes	

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
yes				no	1981

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Organo chlorinated and triazinic pesticides	070711	2000 cm	Not available	CN: 0 – 0.028 mg/l

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/commercial
					yes

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
3000				3000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
5-10		yes				yes		

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
yes		yes	yes	yes			no	

9. Pollution Monitoring

Monitoring System Yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
yes	no		yes	CN ⁻ concentration	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	central supply system	known	not known but possible		
97.5			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no		yes			yes

Sheet 2. 22

**Information on
ARPECHIM - Old Deposit for Sludge and Oily Tank Residues**

1. Contaminated Site Identification Data:

-Name..... **ARPECHIM Pitesti old deposit for
sludge and oily tank residues**
-Location (county, administrative unit):Pitesti municipality, Arges county
-Owner:ARPECHIM Pitesti
-Nature of ownership(private or public):public
-Former use:industrial landfill site
-Actual conditions:officially no more in use
-Planned use in the future:industrial

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
2.4					yes		yes	yes	yes

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
yes				yes	1974 - 1999

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	050103 050109	130.000 t	Relevant data not available	Phenol – 0 Oily hydrocarbons – 0 Sulphite – 0 COD – 58 mg/l Only 3 monitoring wells for whole area

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
					yes

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
5000				20

7. Depth and use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
5-10		yes				yes		

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
yes		yes	no	yes	no	no	no	

9. Pollution Monitoring

Monitoring System yes/no	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
yes	no		yes	pH, COD, phenols, sulfite, oily compounds	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	central supply system	known	not known but possible		
97.5			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
no	no	-	yes			yes

Sheet 2.23

**Information on
ARPECHIM – New Deposit for Sludge and Tank Oily Residues**

1. Contaminated Site Identification Data:

-Name..... **ARPECHIM – New deposit for sludge and tank oily residues**
 -Location (county, administrative unit):.....Pitesti municipality, Arges county
 -Owner:ARPECHIM S.A. Pitesti
 -Nature of ownership(private or public):.....public
 -Former use:industrial area
 -Actual conditions:.....functioning deposit
 -Planned use in the future:industrial

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
0.8	yes				yes		yes	yes	

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
yes				yes	1999

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 756/1997		in soil	in groundwater
Oily hydrocarbons	050103 050109	40.000 t	No relevant available data	Oily hydrocarbons – 0 Sulfite – 0 COD – 58 mg/l (Same 3 monitoring wells for whole area)

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/commercial
					yes

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
5000				300

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
5-10		yes				yes		

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	yes		yes	no	no	no	

9. Pollution Monitoring

Monitoring system	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
yes	no		yes	pH, COD, phenols, sulfite, oily compounds	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	central supply system	known	not known but possible		
97.5			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no		yes			yes

Sheet 2.24

**Information on
ARPECHIM - Dambovnic Lake Compartment 5 –
Deposit for Sludge and Oily Tank Residues**

1. Contaminated Site Identification Data:

-Name:.....**ARPECHIM – Dambovnic lake
Compartment 5 - Deposit for Sludge
and Oily Tank Residues**

-Location (county, administrative unit).....Pitesti municipality, Arges county

-Owner:ARPECHIM Pitesti

-Nature of ownership(private or public):public

-Former use:agricultural land

-Actual conditions:.....deposit for tank oil sludge

-Planned use in the future:remediation; no sensitive uses

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
1.8					yes		yes		

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
yes				yes	1981

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Oily hydro carbons	050103 050109	100.000 cm	Not available	Not available

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
		yes			yes

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
2000		25		10

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
5-7	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
	yes	no	no	yes	no	no	no	

9. Pollution Monitoring

Monitoring system	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
yes	no		yes	oily compounds COD, pH, etc	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	central supply system	known	not known but possible		
97.5			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no	-	yes			yes

Sheet 2.25

**Information on
ARO Campulung - Electroplating Sludge Tank**

1. Contaminated Site Identification Data:

-Name.....**ARO Campulung - Electroplating
sludge tank**
-Location (county, administrative unit):.....Campulung town, Arges county
-Owner:ARO Campulung
-Nature of ownership(private or public):private
-Former use:industrial area
-Actual conditions:.....electroplating sludge tank
-Planned use in the future:industrial

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
0.1		yes				yes			

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
yes				yes	1992

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Inorganic compounds – heavy metals	110108	230 t	Not available	Not available

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
					yes

6. Distance (m) Between the Site and Protected Areas

dwellings	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
50m to the nearest house				400 m

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
12		yes				yes		

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
yes		yes		yes			no	

9. Pollution Monitoring

Monitoring system	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
yes	no		yes	not available	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	central supply system	known	not known but possible		
1242			yes		yes	no	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no	-	yes			yes

Sheet 2.26

**Information on
IPEE Curtea de Arges- Electroplating Sludge Tank**

1. Contaminated Site Identification Data:

-Name.....**IPEE - Electroplating sludge tank**
 -Location (county, administrative unit):.....Curtea de Arges, Arges county
 -Owner:IPEE Curtea de Arges
 -Nature of ownership(private or public):private
 -Former use:industrial
 -Actual conditions:.....functioning sludge tank till 2005
 -Planned use in the future:industrial

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
0.003		yes			yes	yes			

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
yes				yes	1992

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Inorganic compounds - heavy metals	110109	16 t	Not available	Not available

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
					yes

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
250				1000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
10		yes				yes		

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
yes		yes		yes	no	no	no	

9. Pollution Monitoring

Monitoring system	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
yes	no		yes	COD, pH, heavy metals	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	public supply system	known	not known but possible		
506			yes		yes	no	yes

11. Public Awareness

People are aware of the health risks (yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no	-	yes			yes

Sheet 2.27

**Information on
ELECTROARGES – Curtea de Arges -Electroplating Sludge Tank**

1. Contaminated Site Identification Data:

-Name.....**ELECTROARGES – Curtea de Arges -
Electroplating Sludge Tank**

-Location (county, administrative unit):.....Curtea de Arges, Arges county

-Owner:.....ELECTROARGES – Curtea de Arges -

-Nature of ownership(private or public):private

-Former use:industrial

-Actual conditions:.....functioning sludge tank till 2004

-Planned use in the future:industrial

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
0.0012		yes			yes	yes			

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
yes				yes	1999

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Inorganic compounds - heavy metals	110109	16.4 t	Not available data	Not available data

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
		yes			yes

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
100				1000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
10		yes				yes		

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
yes		yes		yes	no	no	no	

9. Pollution Monitoring

Monitoring system	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
yes	no		yes	COD, pH, heavy metals	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	public supply system	known	not known but possible		
506			yes		yes	no	yes

11. Public Awareness

People are aware of the health risks (yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no	-	yes			yes

Sheet 2.28

**Information on
Auto General Motor MARACINENI -Cyanide Sludge Tank**

1. Contaminated Site Identification Data:

-Name.....**Auto General Motor MARACINENI
Cyanide Sludge Tank**
 -Location (county, administrative unit):.....Maracineni, Arges county
 -Owner:.....Auto General Motor MARACINENI
 -Nature of ownership(private or public):private
 -Former use:industrial
 -Actual conditions:.....out of use from 1996
 -Planned use in the future:industrial

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
0.002		yes			yes	yes			

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
yes				no	1977-1996

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
Inorganic compounds - free and complex cyanides	110301	1 t	Not available data	Not available data

5. Land Use

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
					yes

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
2000				5000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
7		yes				yes		

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
yes		yes		yes			no	

9. Pollution Monitoring

Monitoring system	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
yes	no		yes	COD, pH, cyanide	no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	public supply system	known	not known but possible		
95			yes		yes	no	yes

11. Public Awareness

People are aware of the health risks (yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no	-	yes			yes

Sheet 2.29

**Information on
the Municipal Mixed Waste Disposal Site PITESTI - ALBOTA**

1. Contaminated Site Identification Data:

-Name.....**Municipal mixed waste disposal site
Pitesti-Albota**

-Location (county, administrative unit):.....Pitesti municipality, Arges county

-Owner:Pitesti Local Council

-Nature of ownership(private or public):Local Council private property

-Former use:pasture area

-Actual conditions:.....mixed waste disposal site

-Planned use in the future:not established

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
10.6			yes	yes	no	no	no	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
mixed urban and industrial				yes	from 1966

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
-Inorganic compounds: metals and others	150110 160107 160212 160305	Not available	Chlorine: 213 - 351	Not available
-Hydrocarbons	160506		Nickel: 11.3-119.6	
BTEX	180106		Cadmium: 0.33 -1.53	
AH	190107		Copper: 6.7 - 46.7	
PAH	190205		Chromium: 11.3 -47.4	
-Organo chlorinated compounds	190306		Zinc: 29 - 77	
-Pesticides	200119		Lead: 12.2-92.75	
	200123			
	200127			
	200133			
	200135			

5. Land Use (In Neighborhood)

dwelling	leisure area	agriculture	pasture	forest	industrial/ commercial
		yes	yes		

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
3000				4000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
4 - 10	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	contain- ment	excavation of contaminated layers	other	yes/ no	financing source
	yes	no	yes	no	no	no	no	

9. Pollution Monitoring

Monitoring system	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/ no	parameter(s) controlled	yes/ no	parameter(s) controlled	yes/ no	parameter(s) controlled
Yes, occasionally	yes	pH, chlorine, Heavy metals	no		yes	pH, COD, BOD, chlorine, sulfate, metallic ions in leachate

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	public supply system	known	not known but possible		
4419			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks(yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	Yes	8 – 10/year	yes	yes	no	yes

Sheet 2.30

**Information on
the Municipal Mixed Waste Disposal Site CURTEA DE ARGES**

1. Contaminated Site Identification Data:

-Name.....**Municipal mixed waste disposal site –
Curtea de Arges**

-Location (county, administrative unit):.....Curtea de Arges municipality, Arges
county

-Owner:Curtea de Arges Local Council

-Nature of ownership (private or public):.....Local Council private property

-Former use:pasture area

-Actual conditions:.....mixed waste disposal site

-Planned use in the future:not established

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
2.0			yes	yes	no	no	yes	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
mixed urban and industrial waste				yes	from 1952

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
-Inorganic compounds: metals and others	150110 160107 160212 160305	Not available	PH 7.0 – 7.45	Not available
-Hydrocarbons	160506		Chlorine: 170 - 192	
BTEX	180106		Nickel: 13.7 - 23.7	
AH	190107		Cadmium: 0.07– 0.27	
PAH	190205		Copper: 8.0 – 15.0	
-Organo chlorinated compounds	190306		Chromium: 4.23–21.3	
-Pesticides	200119		Zinc: 21.2 – 30	
	200123		Lead: 2.5 - 7.8	
	200127			
	200133			
	200135			

5. Land Use (In Neighborhood)

dwelling	leisure area	agriculture	pasture	forest	industrial/ commercial
			yes		

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
1000				100

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
3 - 10	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	contain- ment	excavation of contaminated layers	other	yes/ no	financing source
	yes	no	yes	no	no	new dikes	no	no

9. Pollution Monitoring

Monitoring system	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/ no	parameter(s) controlled	yes/ no	parameter(s) controlled	yes/ no	parameter(s) controlled
Yes (occasionally)	yes	pH, chlorine, Heavy metals	no		yes	PH,COD, BOD, chlorine, sulfate, metallic ions in leachate

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	public supply system	known	not known but possible		
506			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks (yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no	2 - 4/year	yes	yes	no	yes

Sheet 2.31

**Information on
the Municipal Mixed Waste Disposal Site COSTESTI**

1. Contaminated Site Identification Data:

-Name.....**Municipal mixed waste disposal site – Costesti**
 -Location (county, administrative unit):.....Costesti municipality, Arges county
 -Owner:Local Council Costesti
 -Nature of ownership(private or public):state property
 -Former use:pasture area
 -Actual conditions:.....mixed waste disposal site
 -Planned use in the future:not established

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
1.5			yes	yes	no	no	yes	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
mixed urban and industrial waste				yes	from 1952

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
-Inorganic compounds: metals and others -Hydrocarbons BTEX AH PAH -Organo chlorinated compounds -Pesticides	150110 160107 160212 160305 160506 180106 190107 190205 190306 200119 200123 200127 200133 200135	Not available	PH: 6.7-7.9 Chlorine: 170 - 213 Nickel: 26 - 57.2 Cadmium: 1.17 -4.9 Copper: 10.0-15.0 Chromium: 8.1-22.2 Lead: 21 - 40	Not available

5. Land use (In Neighborhood)

dwelling	leisure area	agriculture	pasture	forest	industrial/ commercial
			yes		

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
5000				6000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
8-10	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	contain- ment	excavation of contaminated layers	other	yes/ no	financing source
	yes	no	no	no	no	new dikes	no	

9. Pollution Monitoring

Monitoring system	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/ no	parameter(s) controlled	yes/ no	parameter(s) controlled	yes/ no	parameter(s) controlled
Yes (occasionally)	yes	pH, chlorine, Heavy metals	no		no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	public supply system	known	not known but possible		
113			yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks (yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
no	no	no	yes	no	no	yes

Sheet 2.32

Information on the Municipal Mixed Waste Disposal Site CAMPULUNG

1. Contaminated Site Identification Data:

-Name.....**Municipal mixed waste disposal site – Campulung**
 -Location (county, administrative unit):.....Campulung municipality, Arges county
 -Owner:Local council Campulung
 -Nature of ownership(private or public):state property
 -Former use:pasture area
 -Actual conditions:.....mixed waste disposal site
 -Planned use in the future:not established

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
3.2		yes		yes	no	no	yes	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
mixed urban and industrial waste				yes	from 1967

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
-Inorganic compounds: metals and others	150110 160107 160212 160305	Not available	PH: 7.4 -7.5	No available
-Hydrocarbons	160506		Chlorine: 245 - 596	
BTEX	180106		Nickel: 11.2 – 20	
AH	190107		Cadmium: 0.0 – 0.6	
PAH	190205		Copper: 7.9 –17.7	
-Organo chlorinated compounds	190306		Chromium: 51 – 60	
-Pesticides	200119		Zinc: 10.4 – 29.3	
	200123		Lead: 21 – 37.3	
	200127			
	200133			
	200135			

5. Land use (In Neighborhood)

dwelling	leisure area	agriculture	pasture	forest	industrial/ commercial
			yes		

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
3000				400

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
8 -16	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	contain- ment	excavation of contaminated layers	other	yes/ no	financing source
	yes	no	no	no	no	new dikes	no	

9. Pollution Monitoring

Monitoring system	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/ no	parameter(s) controlled	yes/ no	parameter(s) controlled	yes/ no	parameter(s) controlled
Yes (occasionally)	yes	pH, chlorine, Heavy metals	no		no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	public supply system	known	not known but possible		
1242		yes	yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks (yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	around 2/year	yes	no	no	yes

Sheet 2.33

**Information on
the Municipal Mixed Waste Disposal Site TOPOLOVENI**

1. Contaminated Site Identification Data:

-Name.....**Municipal mixed waste disposal site – Topoloveni**
 -Location (county, administrative unit):.....Topoloveni municipality, Arges county
 -Owner:Topoloveni Local Council
 -Nature of ownership(private or public):state property
 -Former use:agricultural land
 -Actual conditions:.....mixed waste disposal site
 -Planned use in the future:not established

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
1.5		yes		no	no	no	yes	no	no

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
mixed urban and industrial waste				yes	from 1975

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/2002		in soil	in groundwater
-Inorganic compounds: metals and others -Hydrocarbons BTEX AH PAH -Organo chlorinated compounds -Pesticides	150110 160107 160212 160305 160506 180106 190107 190205 190306 200119 200123 200127 200133 200135	5100cm/year	PH: 7.1-7.9 Chlorine: 160 - 266 Nickel: 19.3 – 25.2 Cadmium: 0.8 – 1.1 Copper: 21.2–34.0 Chromium: 0.0–1.3 Zinc: 11.8 – 42.9 Lead: 7 - 15	Not available

5. Land Use (In Neighborhood)

dwelling	leisure area	agriculture	pasture	forest	industrial/ commercial
			yes		

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
3000				800

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
6 - 8	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	contain- ment	excavation of contaminated layers	other	yes/ no	financing source
	yes	no	no	no	no	new dikes	no	no

9. Pollution Monitoring

Monitoring system	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/ no	parameter(s) controlled	yes/ no	parameter(s) controlled	yes/ no	parameter(s) controlled
Yes (occasionally)	yes	pH, chlorine, Heavy metals	no		no	

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	public supply system	known	not known but possible		
310		yes	yes		yes	yes	yes

11. Public Awareness

People are aware of the health risks (yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	yes	2-3/year	yes	no	no	yes

Sheet 2.34

**Information on
the DACIA – Davidesti Controlled Landfill**

1. Contaminated Site Identification Data:

-Name.....**DACIA – Davidesti controlled landfill**
 -Location (county, administrative unit):.....Davidesti commune , Arges county
 -Owner:S.C. Automobile DACIA S.A.
 -Nature of ownership(private or public):private property
 -Former use:pasture land
 -Actual conditions:.....industrial waste disposal site
 -Planned use in the future:not established

2. Characteristics of the Contaminated Site

Surface (ha)	Topography			Barriers for pollution containment					
	plane	hill	valley	natural (clay strata)	artificial				
					lining	concrete walls	dikes	trench	drainage
10		yes		yes	yes	no	yes	yes	yes

3. Characteristics of Pollution Source

Nature of polluting source				Is the pollution source still active (yes/no)	Age of contamination (from the year...)
depositing hazardous waste	depositing hazardous materials	out of use installation containing hazardous substances	accidental spills from pipes or reservoirs		
yes				yes	from 1999

4. Characteristics of Contaminants

Chemical nature		Estimated quantity having generated the contamination	Pollutant concentration (ppm)	
Order 756/1997	Order 856/20 02		in soil	in groundwater
-Sludge containing heavy metals	110109	4400cm/year	PH: 7.1-7.9	Not available
-Phosphating sludge	110108		Chlorine: 160 - 266	
-Sludge containing paints, lacquers and solvents	080115		Nickel: 19.3 – 25.2	
-Used cores and moulds containing hazardous substances	100907		Cadmium: 0.8 – 1.1	
-Asbestos waste	170601		Copper: 21.2–34.0	
Sludges from industrial wastewater treatment	160207		Chromium: 0.0–1.3	
			Zinc: 11.8 – 42.9	
			Lead: 7 - 15	

5. Land Use (In Neighborhood)

dwellings	leisure area	agriculture	pasture	forest	industrial/ commercial
				yes	

6. Distance (m) Between the Site and Protected Areas

dwelling	leisure areas	agricultural	sanitary protected areas	surface water (rivers, lakes)
5000				3000

7. Depth and Use of Ground Water

Depth (m)	Actual use				Future possible use			
	no use	industrial	domestic agriculture	drinking	no use	industrial	domestic agriculture	drinking
10	yes				yes			

8. Management Actions in Place

Restricted use of land		Control of access on the site		Preventive measures to stop extension of contamination			Clean-up plan	
total restriction	only for sensitive uses	fences gates	alert sign	containment	excavation of contaminated layers	other	yes/no	financing source
yes		yes	yes	yes	no	Dikes, lining, drainage, monitoring wells, surrounding channel	no	no

9. Pollution Monitoring

Monitoring system	Soil monitoring		Groundwater monitoring		Other types of monitoring	
	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled	yes/no	parameter(s) controlled
Yes	yes	pH, chlorine, Heavy metals	yes	All usual parameters	yes	Technological parameters

10. Social Aspects

Population density (inh/km ²)	Water supply			Impact on health		Impact on landscape (yes/no)	Impact on economic value of land
	deep wells	shallow wells	public supply system	known	not known but possible		
10	yes				yes	yes	yes

11. Public Awareness

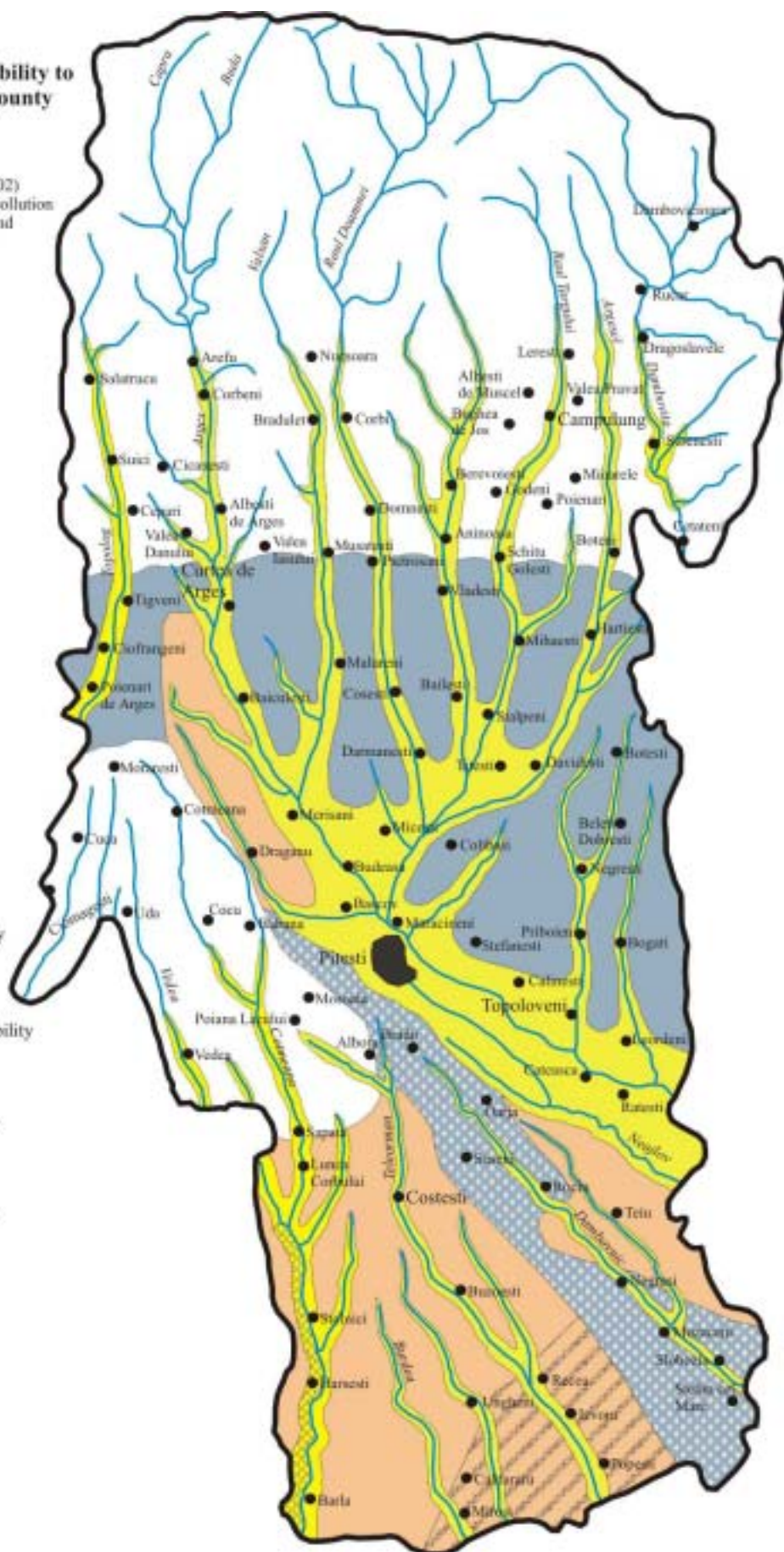
People are aware of the health risks (yes/no)	Complaints		Official information of people about the risks			
	yes/no	registered number	yes/no	public campaign organized by		
				media	NGO	EPI or other authorities
yes	no	no	yes	no	no	yes

MAP No. 1
Groundwater vulnerability to pollution in Arges county

Source: ICIM Studies (1992-2002)
"Groundwater vulnerability to pollution in Olt, Veden, Arges, Ialomita and Dambe hydrographic basins"

Legend

- Area with high vulnerability
 - A1 sub-class
 - A2 sub-class
- Area with medium vulnerability
 - B1 sub-class
 - B2 sub-class
- Area with low vulnerability
 - C1 sub-class
 - C2 sub-class
- Area without vulnerability
 - C2 sub-class



Source: ICFM Studies (1992-2002)
 "Groundwater vulnerability to pollution
 in Olt, Vedea, Arges, Ialomita and
 Danube hydrographic basins"



MAP No. 3