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International POPs Elimination Project

*Fostering Active and Efficient Civil Society Participation in
Preparation for Implementation of the Stockholm Convention*

Constanta Medical Waste Incinerator: A POPs Hotspot

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About the International POPs Elimination Project

On May 1, 2004, the International POPs Elimination Network (IPEN <http://www.ipen.org>) began a global NGO project called the International POPs Elimination Project (IPEP) in partnership with the United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Program (UNEP). The Global Environment Facility (GEF) provided core funding for the project.

IPEP has three principal objectives:

- Encourage and enable NGOs in 40 developing and transitional countries to engage in activities that provide concrete and immediate contributions to country efforts in preparing for the implementation of the Stockholm Convention;
- Enhance the skills and knowledge of NGOs to help build their capacity as effective stakeholders in the Convention implementation process;
- Help establish regional and national NGO coordination and capacity in all regions of the world in support of longer term efforts to achieve chemical safety.

IPEP will support preparation of reports on country situation, hotspots, policy briefs, and regional activities. Three principal types of activities will be supported by IPEP: participation in the National Implementation Plan, training and awareness workshops, and public information and awareness campaigns.

For more information, please see <http://www.ipen.org>

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IPEP Hotspot Report

Constanta Medical-Waste Incinerator

INTRODUCTION

In 2002, in the Tomis Nord residential district of the town of Constanta, a medical waste incinerator was built despite opposition from the local people. The concerned public was informed by the non-governmental organization Mare Nostrum about the dangers to health and the environment represented by the incinerator due to the emission of persistent organic pollutants, especially of dioxins and furans. The Environmental Protection Agency from Constanta issued the environmental agreement. NGO Mare Nostrum began the „anti-incinerator campaign” and developed multiple plans including calling the Environmental Protection Agency into court, where it requested cancellation of the permit and to stop building.

Regrettably, the incinerator has been in operation since then. Data about the concentrations of POPs in the atmosphere of the Tomis Nord district, and also the impact on human health and environment are not known by the citizens inhabiting this place, although they have informed the authorities from time to time that they can feel the negative impacts of incineration on their health.

I. Physical description of site

1. Geographical location

The town of Constanta, the economic and administrative centre of Constanta County, is settled in the south-eastern extremity of Romania, in the latitude of 44°11' North and the longitude 28°39' East. The eastern side of it is washed by the Black Sea waters and the Danube River flows about 50 km to the West. Constanta was founded on the ruins of the ancient town of Tomis, with an administrative surface of 12,489 km² the town is the largest in the south-eastern part of the country, and also the most important industrial and touristy centre of the country. It is on the same parallel in respective importance as the Sevastopol (Ukraine) harbor and New York City (USA), and located on the same meridian as Rhodos/Greece.

The residential area of the Constanta town has a few residential districts: Tomis I, II, III, IV, V and Tomis Nord, and other complexes such as Bratianu, Abator, Gara, Km. 4-5, Faleză Nord and Faleză Sud.

The incinerator itself, property of SC Full Management, is located in Tomis Nord residential district, on a surface of 780 mp, bordering four blocks of houses (five and nine floors) (West and South sides), Electric Power Plant Tomis Nord and Autonomous Administration for Communal Management (East side). A distance of only 50 -75 m separates the incinerator building from the nearest social buildings; a kindergarten and a human health center

2. Nature of land

Soils from the Constanta town have mean texture (clayish or clay-sandy), with a high permeability and good physical qualities, which are maintained as such all year long. The salinity of soils has remained relatively stationary.

3. Surrounding water supplies

The water supply of Constanta is achieved by the Municipal Water Administration. The natural sources for the supply are:

Sources	Settled flow capacity (mc/h)	Exploited flow capacity (thousands mc/2005)
Cismea I + II	10,1322	60,375
Caragea	3,594	19,199
Constanta Nord	2,218	4,169
Basarabi I si II	2,220	4,458
Valu Traian	680	980
Galesu	16,250	19,520

The Tomis Nord district is supplied from the Cismea source.

4. Flora and fauna

Vegetation specific for the supra-littoral is characterized by a severe anthropisation and ruralisation. Being influenced by the urban agglomeration, only a few arenicole and halofile species, characteristic of the initial phytocoenosis still exist in floristic composition in Constanta, such as *Elymus giganteus*, *Salsola kali*, *Argusia sibirica*, *Crambe maritima*, *Glaucium flavum*, *Cakile maritima*, *Salicornia europea*, etc.

The urban vegetation, represented by parks, protective forest belts and green spots are characterized by uniformity of the species being cultivated. The most represented tree and bush species are: sweet chestnut, poplar, birch, plane tree, white acacia, willow, black pine, spruce fir, box thorn, cowberry, ivy, etc.

Fauna. The parks and green spots shelter numerous animals, the most representatives being the bird populations. The most frequent brooding species all year long are: *Passer domesticus* (sparrow), *P. montanus* (sparrow), *Pica pica* (magpie), *Streptopelia decaocto* (ring dove), *Corvus monedula* (jackdow), *C. corone corone* (crow), *C. corone cornix* (crow), *C. frugilegus* (crow), *Garrulus glandarius* (jay), *Hirundo rustica* (swallow).

A large area of green spots is concentrated around the littoral lake (Tabacarie Park) and marine sea walls, thus numerous sea birds are found: *Podiceps cristatus* (big diver), *P.nigricollis* (black-headed diver), *Cygnus olor* (swan), *Ardea cinerea* (brown heron), *A. purpurea* (red heron), *Phalacrocorax carbo* (big cormorant), *P.pygmaeus* (small cormorant), *Egretta alba alba* (egret),

Oxyura leucocephala (white-headed duck), *Larus ridibundus* (seagull) *L. argentatus* (silver seagull) etc.

5. Surrounding communities

In conformity with the last census of population carried out in 2002, the population of Constanta is 310,474. The table below presents the ethnic structure of the population:

Total population	310,471
Romanians	286,332
Turkish	9,018
Tartars	8,724
Russians +Lippovans	879
Greeks	546
Romanos	2,962

The population living in the Tomis Nord residential district is approximately 2,500.

6. Type of site

6.1. Treatment of medical wastes in Constanta town

In Constanta, there are no deposits of domestic/municipal wastes. Domestic wastes are transported, in order to be deposited, in the ecological landfill in the town of Ovidiu. The inert wastes are deposited on a special arranged platform in the precinct of Constanta harbour.

Up to 2002, when the incinerator from Tomis Nord district was built, the hazardous wastes resulting from medical activities were burned in personal facilities located at three hospitals of the crematory type (Emergency Clinic Hospital, Lung Diseases Hospital, Hospital of Infectious Diseases), or in the incinerator found also in the precinct of Constanta harbour.

6.2. Incineration station – “ecologic” incinerator type IE 150

6.2.1. Description

In 2002, the Commercial Society Full Management proposed and obtained all the permits from the local authorities to build a clinical incinerator on a location found in the middle of Tomis Nord residential district. The method chosen for incineration was incineration on land. Due to the high costs, the owner decided to mount an incinerator made in Romania, namely incinerator IE 150, constructed by the CALORIS Group.

The incinerator is composed by:

- *body of incinerator* – a block construction, tight, thermic and refractory protected, with three chambers (incineration initiation and supporting chamber, after-burning and extension of after-burning chamber, where the filtration of gasses is done); over the body is the furnace for burnt gasses dispersion, 9 m height;

- *air ventilator* introduces the air in collector; it is distributed through three pipes and adjusted through three valves;

- *superior and inferior impulse burners*, which work horizontally or inclined, with flow capacity 10-50 Nmc CH₄/h;

- *three final distribution pipes*, which take the air from the superior distribution belt as tertiary air;

- *two final distribution pipes* which take the air from the intermediary distribution belt as primary air;

- *two distribution pipes* which take the air from the inferior distribution belt as secondary air.

The incinerator is equipped with:

- a charging hole for wastes and ash and slag;

- two sight openings with doors for access of the wick (in the manually lightening).

6.2.2. Types and quantities of processed wastes

At the entry into activity, the operator of the incinerator station - SC Eco Fire Sistem - informed us that it has to process 18 types of wastes resulting from clinical and veterinary activities or connected research, namely:

- wastes resulted from the prevention, diagnosis and medical care developed in sanitary units;

- sharp objects;

- human anatomic remains and organ parts, including blood recipients and conserved blood;

- clothes, gyps apparatus, underwear, swaddling clothes, etc.

The hazardous wastes, as they are described in the Governmental Decision No. 856/2002, are not incinerated.

The medical wastes are collected from the following sources: Constanta District Hospital, Constanta Town Hospital, TBC Hospital, clinics and policlinics, private consulting rooms.

The activity in the station will develop in two shifts, 8 hours/shift.

The residues are gathered in plastic bags and deposited in closed containers, after that an ash sample is collected for laboratory analyses. After incineration the ash is transported to the municipal stockpile, settled in Ovidiu.

II. History of site

1. Owners and activities

1.1. Owners

As the Environmental Impact Study specifies, the incinerator IE 150 from Tomis Nord Constanta has the following status:

- Owner –S.C. FULL MANAGEMENT SRL, Constanta
- Projector of works – Group CALORIS MULTISERV SRL
- Operator of installation – SC ECO FIRE SYSTEMS

1.2. Activities

The technologic flux of medical wastes incineration and other hazardous wastes comprises the following phases:

- collection and package of hospital wastes; carried out by the specialized personnel from the hospital field;
- package in plastic bags, plastic bottles which will be delivered in polyethylene bags;
- temporary depositing in refrigeration rooms from hospitals;
- transport to the incinerator;
- supplying of the incinerator and
- proper incineration
- evacuation of ashes and their transportation at the stockpile of town, found in Ovidiu.

2. Government regulatory actions

2.1. Legal instruments

Through the Governmental Decision No. 17/2001 modified through GD No. 325/2001 regarding the organization and functioning of Ministry of Environment and Waters Management the specialty body for central public administration in Romania, with juridical personality, subordinated to Government, is the Ministry of Environment and Waters Management (MEWM).

The MEWM achieves the policy in the field of protection of waters and environment, at national level, elaborates the strategy and specific regulations for development and harmonization of these activities within the general policy of Government, assures and coordinates the application of Government's strategy in the respective fields, carrying out the role of state authority, of synthesis, coordination and control in these fields.

We give below a few rules, laws and regulations elaborated by this ministry, some of them after March 21, 2002 when Romania started the harmonization of national legislation with EU aquis communautaire, and the negotiations with EU of chapter 22 (regarding the environment).

- **Law No. 98/1994** regarding the legal norms for hygiene and public health.
- **Law No. 137/1995** on the environmental protection revised with the **Governmental Ordinance of Urgency No. 195/2005** on environmental protection.
- **Order No. 125/1996** for approval the procedures for regulations of social and economic activities with impact on the environment.
- **Law on waters No. 107/1997.**
- **Order No. 536/1997** regarding the Norms of hygiene and of recommendations regarding the life environmental of population.
- **Order No. 277/1997** for approval the Norms for preparing the technical documentations requested for obtaining the permit for waters management.
- **Order No.689/1999** for approval of competency for issuing the agreements and permits for waters management.
- **Ordinance of Urgency No. 78/2000** on the wastes regime.
- **Law No. 426/2001** regarding the approval of Governmental Urgent Ordinance No. 78/200 regarding the wastes regime. The subject of this ordinance is constituted by the regulation of activities for management of wastes in conditions of protection of human health and environment. The provisions are applied to all types of wastes, including hazardous one.
- **Law No. 462/2001** for approval of Governmental Ordinance of Urgency regarding the regime of natural protected areas, conservation of natural habitats, wild flora and fauna.
- **Law No. 655/2001** for approval of Governmental Ordinance of Urgency No. 243/2000 regarding the protection of atmosphere.
- **Law No. 378/2001** for approval the Governmental Ordinance No. 43/2000 on the protection of archaeological heritage.
- **Decision No. 349/2002** on the management of packages and package wastes.
- **Order No. 860/2002** for approval the Procedure for assessment of impact on the environment and issuing the environmental agreement.
- **Decision No. 918/2002** regarding the Procedure-Framework for assessment the impact on the environment and for approval the list of public or private projects subjected to this procedure.
- **Decision No. 128/2002** regarding the incineration of wastes has to regulate the activities of incineration and co-incineration and to measures for controlling and pursuing the incineration and co-incineration installations. The regulation of activities of incineration and co-incineration are aiming to prevent or reduction the negative effects on the environment, especially the pollution of air, soil, surface and underground waters and any risks for human health. **Decision No. 268/2005** makes some modification and completion the Decision No. 128/2002.
- **Governmental Ordinance of Urgency No. 152/2005** regarding the prevention and integrated control of pollution.
- **Governmental Decision No. 1856/2005** regarding the national levels of emissions for pollutants.

2.2. Actions for Stockholm Convention implementation

The Parliament of Romania ratified the Stockholm Convention through Law No. 261 from June 16, 2004, which entered into force on January 29, 2005.

Having in view the importance of this document and necessity for its implementation in our country, the United Nations Industrial Development Organization (UNIDO) and Global Environment Facility (GEF) have awarded the project “*Enabling Activities to Facilitate Early Action in the Implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) in Romania*” to the National Research – Development Institute for Environment Protection (ICIM). The contract was signed in July 2002.

The objective of the project is to assist Romania to fulfill its obligation in the Stockholm Convention and prepare and endorse its National Implementation Plan (NIP) on Persistent Organic Pollutants (POPs).

In the Project Document a number of steps are prescribed at the country level that can assist with NIP development. These include:

1. determination of the coordinating mechanisms and organization of process of NIP development
2. establishment of a POPs inventory and assessment of national infrastructure and capacity
3. priority-setting and determination of objectives
4. formulation of a prioritized and monetary estimated NIP and specific Action Plan on POPs
5. endorsement of the NIP by stakeholders

The steps 1, 2 and 3 have been already achieved and the fourth step is on going at the present time (spring 2006).

2.3. Action of Environmental Protection Agency Constanta

The Ministry of Environment and Waters management works in territory through the agencies for environmental protection.

In 2005, the Environmental Protection Agency from Constanta elaborated and implemented the *Local Action Plan for Environment* which represents the strategy for short, medium and long term for solving the environmental issues in the Constanta District, through the approaching the principles of sustainable development. This Plan is in compliance with the *National Action Plan for Environmental Protection*, and utilized for establishing the content and standard templates the methodology indicated by the *Manual for Elaboration and Implementation of Local Action Plan for Environment* elaborated by MEWM.

3. Non-governmental activities for public awareness

3.1. Anti-incinerator campaign developed by NGO Mare Nostrum

NGO Mare Nostrum used all the types of activities which its apolitical and non-governmental organization status affords it in order to inform and raise awareness about the dangers represented by the hospital waste incinerator. As soon as Mare Nostrum found out that

SC Full Management solicited the authorizations for locating the incinerator in Tomis Nord district, Mare Nostrum developed the following activities:

- informed, through official statements, the radio and TV stations (PROFM, TELE 7 ABC, ANTENA 1, RADIO CONTACT) and local newspapers (CUGET LIBER) about its approaches in supporting the 2500 citizens of Constanta
- organized meetings with citizens;
- edited leaflets which were distributed by its activists and volunteers in each block and house of the Tomis Nord district
- edited petition against the location of the medical wastes incinerator, in which the citizens were informed about the danger of the persistent organic pollutants of dioxin and furans type on the human health and environment; the petition was signed by 300 persons
- created a webpage, in order to keep informed the local peoples and for signing the petition
- started a series of meetings with political leaders, members of Parliament

3.2. NGO Mare Nostrum versus APM Constanta & SC Full Management

NGO Mare Nostrum allied itself with those who were opposed to locating the hospital waste incinerator in the middle of a block of flats where 2500 people are living. NGO Mare Nostrum became part of a trial in the role of a claimant. Availing itself of its process capacity (in compliance with art. 41 Code of civil procedure), and its right, as a legal personality, to associate in organizations defending the environment and to address, direct or through associations, to administrative or judicial authorities, to prevent a direct or indirect prejudice (Law No. 137/1995 on environmental protection), Mare Nostrum cited the Environmental Protection Agency Constanta and SC Full Management SRL in the Court of Constanta, requesting the cancellation of the environmental agreement and stopping the building of the incinerator.

The reasons set forth for sustaining its cause were:

- The environmental agreement was null due to inappropriate authorization. In compliance with the Law on environmental protection, the competence of issuing the environmental agreement incumbents on the central environmental authority (i.e. Ministry of Environment), not on the local authority (i.e. Environmental protection Agency Constanta), as it happened.
- The environmental impact study was incomplete. Although, the institution which elaborated it did not measure POPs emissions in air, (because it did not have the necessary analyzers for dioxins and furans as it recognized), in the chapter “Effects on the air” it is mentioned: *“the contribution of incinerator to atmospheric pollution is insignificant”*.
- The environmental impact study did not accumulate material about the emissions, and the way in which they can affect the neighborhood, especially due to the direction and speed of winds.
- There were a few inadvertences between study and environmental agreement regarding the furnace height; the agreement specifies 15 m while the study specifies only 9 m (*our note*: lower than the height of surrounding apartments);

- At the moment of starting the construction, the SC Full Management SRL did not have all the permits necessary for building;
- Incinerator IE 150 is made by Romanian firm Caloris Group, a model which was never used until then, so its real impact on the environment could not be anticipated without real measurements;
- The impact study had in view only the Directives CE 94/67 (regarding the incineration of hazardous materials) and 89/369 (regarding the reduction of atmospheric pollution caused by wastes incineration). Or, in the circumstances of adoption by Romania of community acquis, Chapter 22, 3 (wastes management) provides: *„the transposition of the Directive 2000/76/EC provisions in national legislation will be done through „integral and complete taken over of text”.*

In September 2002, having legitimate presumption of “active implication” of an administrative authority, Mare Nostrum requested the Supreme Court, through a disputed claims office, to dismiss the case. Its request was agreed and the judgment of cause was continued in the Court of the town of Brasov.

In order to sustain its cause and to bring new proofs, Mare Nostrum requested also extra-judicial examination, for having the possibility to make measurements, affirming: *“in the conditions of winds blowing with 10 m/sec., in the area of incinerator settlement it is possible the formation of a diffuse pen of emissions, and higher concentrations of POPs at some distance and height will be possible”.*

Considering that the reasons set forth by Mare Nostrum are reasonable, both EPA and SC Full Management SRL submitted contestations, contesting even its procedural quality.

- Referring to the fact that Ministry of Environment assigned to hear the competence of issuing of environmental agreement, EPA appealed article 11 of OUG No. 91
- The possible dioxins and furans emissions, with grave effects on human health were considered „speculations” of Mare Nostrum
- The environmental agreement was issued based on a study of human health carried out by the Institute of Public Health from Bucharest (ISP), which concluded: *„the unit can be sanitary authorized in the provided location and distances (minimum 50 m up to the nearest block flat), if the recommendations of Chapter 12 of the impact study are respected” (our note: „the burnt gases will be filtered and purified in such a manner as the pollutants will have the concentrations provided by the Order of Ministry of Environment No. 462/1993, and at the limit of station, they will have the norms provided by STAS 12574/1987)) (our note: two obsolete normative acts)*
- EPA and SC Full Management SRL claimed that the dioxin and furan emissions were not possible because the hospital wastes contained plastics composed only of low-density polyethylene, which do not contain PVC
- The agency and company also claimed that compared to a crematory, the incinerator would not produce dioxins and furans, because the resulting gases in the combustion chamber are burnt at more than 1100°C.

After more than two years of debates, Mare Nostrum together with the people of the Tomis Nord district did not win the case. Consequently SC Full Management finished the constructions and EPA issued the environmental permit.

Mare Nostrum considers, even today, that the Ministry of Environment mandated the environmental agreement too easily, and in spite of the fact that in EU countries the general tendency is to close medical waste incinerators, not to build new ones. Also, the environmental authorities should be more vigilant in authorization such activities and it must *„to take into consideration the life of the peoples, the impact on human health and environment, solving the social problems, etc.”*, as stipulates the Order 125/1996, line 4.3.5.

3.3. Local and central mass media

As soon as the „anti-incinerator campaign” started and long after the finalizing of the debates in two courts (Constanta or Brasov), the local and central mass media (newspapers, radio and TV stations) informed about the building of a medical waste incinerator in the middle of a crowded ward in Constanta. The media covered the impact of dioxin and furans emissions and the debates in the two courts (Constanta and Brasov).

Titles, more or less incendiary, occurred in the pages of newspapers, such as:

- „A pollutant ecological incinerator the newspaper - Adevarul (The Truth)
- Under this title „A dangerous incinerator”, Adevarul published the letter of the inhabitants from the Tomis Nord district, after the public debate of Environmental impact study and EPA decision to issue the environmental agreement, although the representatives of the inhabitants explained that there were some procedural errors.
- „Poisonous furnace” - Ziua de Constanta (The Day of Constanta)
- „Mare Nostrum begins legal action against the Environmental Protection Agency” – Jurnalul de Constanta (The Journal of Constanta)
- „Country of hazardous wastes” - Jurnalul de Internet (The journal on Internet)
- „Pollution with dioxin hangs over the Tomis Nord district” - Replica (The Replay)
- „The ecological incinerators – source for dioxin pollution” - Cuget Liber (Free conscience)
- „The inhabitants from the Tomis Nord pull out the battle axe” - Observator de Constanta
- The most ample and caustic material entitled „EPA gives environmental agreement for an incinerator which produces a toxic substance in air”, appeared in the local newspaper Observator (The Observer). Having as sub-titles „ False-studied concerns of the environmental

inspectors”, the reporter describes the history of the conflict between Mare Nostrum and EPA, and also the grave effects of the dioxins on the human health and environment.

- „Incinerator from Constanta „is smoking” under Timpa” (Timpa is the mountain where Brasov town is settled) - Romania Libera (Romania Free).

- "Mare Nostrum tries to stop the works for incinerator building”, „EPA sued in court" - Independentul (The Independent).

- „The scandal „incinerator” comes back” - „Constanta people claim the emissions effects”, and comments „The chief of EPA says „they are imagining it” - Observator.

- „The Constanta peoples – are certainly condemned to death” – a declaration of a local politician in newspaper Cuget Liber.

III. Chemical characterization

1. Persistent organic pollutants (POPs)

1.1. Definition, classifications source

Persistent organic pollutants (POPs) are carbon containing chemical compounds that, to a varying degree, resist photochemical, biological and chemical degradation. POPs are characterized by low water solubility and high lipid solubility, leading, together with their persistence, to bio-accumulation in fatty tissues. They are also semi-volatile, a property which permits these compounds either to vaporise or to be adsorbed on atmospheric particles. They therefore undergo long range transport in air and water from warmer to colder regions of the world.

Table 1 – Types of POPs

Pesticides	Industrial Chemical Products	Un-wanted By-products
Aldrin Dieldrin	Polychlorinated biphenyls (PCBs)	Polychlorinated dibenzo-p-dioxins (PCDDs)
Endrin	Hexachlorobenzene (HCB)	Polychlorinated dibenzofurans (PCDFs)
Chlordane		Polychlorinated biphenyls (PCBs)
DDT		Hexachlorobenzene (HCB)
Heptachlor		
Mirex		
Toxaphene		
Hexachlorobenzene (HCB)		

Although many different chemicals may be defined as POPs, only 12 have been chosen as priority pollutants by the United Nations Environment Program (UNEP) for their impact on human health and environment for initial inclusion in the Stockholm Convention. An additional five substances have been nominated for addition to the Convention and are currently being evaluated (perfluorooctansulfonate, pentabromodiphenyl ether, chlordecone, hexabromobiphenyl, and Lindane.)

Polychlorinated dibenzo-para-dioxins (dioxins) and polychlorinated dibenzofurans (furans) are two structurally similar families of compounds that include 75 and 135 congeners, respectively collectively as dioxins. Dioxins are not commercially produced, but are by-products of combustion and industrial processes, including the manufacture of chlorinated chemicals, the incineration of hospital, hazardous and municipal waste, and the bleaching of paper products. Dioxins are stable, persistent compounds that are believed to have a half-life of seven to twenty years in the human body. At least seventeen are considered highly toxic.

According to the European Dioxin Inventory report the major industrial emission sources in Europe (accounting for about 62% of total dioxin air emissions) are probably:

- incinerators for municipal waste
- iron or sinter plants
- incinerators for clinical waste
- Facilities of the non-ferrous metal industry

2. Present status of the POPs emissions in Constanta

The majority of the data presented in this section about POPs emissions come from two documents elaborated by the Environmental Agency Protection, namely *Local Action Plan for Environmental Protection* and *Status of Environmental factors in 2004*.

2.1. Emissions in air

In Constanta County, the POPs emission sources are situated in four main economic sectors: agriculture, industry, transportation and energy. The fifth sector is nominated “Other sources” where “human settlements” with their waste landfills, incineration plants for hospital wastes, are included.

Agriculture. In the surrounding zones of Constanta town, there are large arable areas, where, during more than 45 years of socialist agriculture, organochlorine substances were used in huge quantities to produce crops, most of them only on paper. The effects of their irrational use are felt nowadays, both in the surface and also in the underground waters, in the form of diffuse pollution, although there is no special important research oriented in the direction of establishing such effects. Approximately 46 deposits of pesticide wastes were identified, their stocks being evaluated such as:

- liquid wastes - 39,000 liters,
- solid wastes – 38 tons.

At the level of whole country, the pesticides emitted from the agriculture sector have been decreased according to the production decrement between 1989 and 2001. For instance, the emissions of Lindane have been decreased with 91.3 percent, and pentachlorophenol applied as fungicide and herbicide with 88 percent in the same period of time.

Industry. Constanta and the surrounding areas has a strongly developed industry, the most representative sectors being construction and naval repairs (in Shipyard Constanta, S.C. Meconst), petrochemistry (in PetroMidia Navodari), construction and materials of construction (cement, prefabricated confections, synthetic resins), wood and cellulose industry (in SC Palas, Comp Paper Converting), and alimentary industry. On the marine oil drilling from the Black Sea territorial waters, SC Petrom SA Bucharest - branch Petromar Constanta develops activities of extraction of crude oil and natural gasses.

However, information about the POPs emissions from this sector is very poor for Constanta County. The two documents cited above mention that the sources are generally “point sources”, and there are also some diffused sources, generated by the solid and liquid deposits, originating in pesticide production. PCBs are coming mainly from transformers, capacitors, batteries and other electric equipment. There are 12 economic agents which are holding equipment using oils with a high content of PCBs, the quantity being 64,538 l.

In order to have an idea about the POPs emissions produced in this sector, we present below some figures provided by the *National Implementation Plan of the Stockholm Convention on Persistent Organic Pollutants (POPs) in Romania*, for whole territory of Romania, in the period 1989-2001:

Pollutant	1989	1990	1991	1995	2000	2001
PAHs (kg/year)	127,198	110,045	72,933	96,007	58,613	64,098
Dioxins (gl TEQ/year)	1,552.88	1,337.63	1,105.81	670.02	93,447	104,248
PCBs (g/year)	0	0	0	0	0	0
HCB (g/year)	56,830	49,560	41,160	24,380	11,530	3,420

Referring to the dioxins emission (representing 28-57 percent of the total dioxins emission) in industrial sector, they have been decreased since 1995 by 77 percent to the emission 2001.

Road transport in Constanta is a source of POPs, due to the fuels that are used: Diesel fuel (or fuel oil), gasoline (leaded or unleaded), kerosene (Table 2). Higher emissions from leaded gasoline are linked to the presence of halogenated scavengers as additives to the fuel. Poor maintenance and poor combustion efficiency are likely to result in increased PCDD/PCDF formation, especially during the summer season, when the number of auto vehicles is two-fold higher due to the influx of tourists.

Table 2 - Emissions of POPs from road transport in Constanta district

2001	2002	2003	2004
0.237	0.1088	0.281	5.37935E-9

Energy sector. Referring to the district of Constanta, there are a scarcity of data regarding the POPs concentration from the energy sector, especially dioxins and furans. In Constanta, this sector includes industrial firing places (furnaces) and installations for providing space heating, which are fired with fossil fuels. Although EPA Constanta monitored the emissions at the municipal thermal power plant (CET Palas), in a regime of sampling for 24 hours, only the values of gas pollutants CO, SO₂ and NO_x were reported and not values for dioxins and furans (Table 3).

Table 3 – Concentrations of some air pollutants generated by CET Palas Constanta

Indicator	Mean value (mg/m ³)	Maximum value (mg/m ³)	Minimum value (mg/m ³)
Ammonium (NH ₃)	0.01	0.0852	0.00012
Dioxide nitrogen (NO ₂)	0.003	0.029	0.000161
Sulfur dioxide	0	0	0

However, the *National Implementation Plan of the Stockholm Convention on Persistent Organic Pollutants (POPs) in Romania* considers the energy sector the main sector emitting dioxins in the air: 38.9% (1989) to 61.7% (2001) of the whole dioxins production in Romania. Although the commercial, institutional and residential combustion plants and energy production in the industry had decreased between 1989 and 2001, the dioxin emissions from the power plant and cogeneration plants has increased by 30.5% in the same period of time.

Table 4 – Emissions in air by energy sector in period 1989-2001
(cf. *National Implementation Plan of the Stockholm Convention on Persistent Organic Pollutants (POPs) in Romania*)

Pollutant	1989	1990	1991	1995	2000	2001
PAHs (kg/year)	6,175	6,763	5,022	5,844	3,650	3,980
Dioxins (gl-TEQ/year)	243,10	179,50	128,70	349,70	251,8	252,70
PCBs (g/year)	96,427	72,451	57,701	139,485	100,667	109,036
HCB (g/year)	0	0	0	0	0	0

Other sources include the hospital/clinical crematories and incinerators. Up until 2002, when the incinerator from Tomis Nord was built, the hazardous wastes resulting from medical activities was burned in their own facilities located in three hospitals of the crematory type (Emergency Clinic Hospital, Lung Diseases Hospital, Hospital of Infectious Diseases), or in the incinerator found in the precinct of Constanta harbour. Table 5 shows the data.

Table 5 - Emissions resulted from the incineration of healthcare wastes

2001	2002	2003	2004
2.726E-06	1.951E-08	8E-08	1.584E-10

For comparison, we present in the table below a more accurate situation of POPs emissions produced in hospital/clinical wastes incineration, a long-term evolution of main compounds at the whole Romanian territory level (cf. *National Implementation Plan of the Stockholm Convention on Persistent Organic Pollutants (POPs) in Romania*):

Pollutant	1989	1990	1991	1995	2000	2001
PAHs (kg/year)	67	77	77	127	125	183
Dioxins (gl-TEQ/year)	6.70	6.75	6.88	7.27	15.62	10.52
PCBs (g/year)	81.28	81.85	83.42	88.14	193.10	131.84

2.2. POPs concentrations in marine waters and sediments

Romania has a littoral length of 245 km at the Black Sea. Taking into consideration the fate of the POPs in marine environment (see section IV) and impact on marine biota, we consider it important to present some data regarding the long-term evolution of the organochlorine hydrocarbons concentration, both in seawater and sediments, as well as in the tissues of different organisms.

In 2004, the Romanian littoral area zone between Sulina (northern part) and Vama Veche (southern part) were characterized by the presence of a great variety of pesticides (HCB, Lindane, heptachlor, aldrin, dieldrin, DDE, DDD, DDT), in concentrations up to 500 ng/l in water, and 500 ng/g dry sediment. Occasionally, higher concentrations (789.23 ng/l and 1999 ng/l, 79 ng/l in water were determined. The most affected areas are found in front of the Danube Delta – Sf.Gheorghe, Portita, but also Eforie Sud and Mangalia (southern part of the Romanian littoral).

The Table below presents the concentrations of organochlorine hydrocarbons (ng/l) in the seawater and sediments from the southern area of the Romanian Black Sea (where Constanta is located), in 2000 – 2004 period (Piescu *et al.*, 2005):

Pollutant	Waters	Sediments
HCB	0-139.7	0 – 1935
Lindane	0-388	9,7 - 1950
Heptachlor	0-1110	
Dieldrin	0-919.3	0 - 1951
Aldrin	0-68.7	4.1 – 173.5
Endrin	0.46-78.6	0 – 39.7
DDE	82-296.3	0 - 596
DDD	0-1010	0 - 417
DDT	0-109.8	0 – 1940

2.3. POPs concentrations in benthic organisms

Contamination with organochlorine pesticides was present in some economically important marine organisms. For instance, individuals of sprat and mussels caught from the

whole Romanian littoral, from Chituc to Mangalia, presented contamination with different compounds (Piescu et al., 2004), such as:

Compound	Concentrations (ng/g.s.w.w.)	
	<i>Sprat</i>	Mussels
HCB	0-3.1	0-0.44
Lindan	9.89-24.2	0-21.7
p-p DDE	1.19-158.2	3.95-90.9
M-p DDD	4.14—53.9	0-18.6
o-p DDT	11.7-188.5	2.74-46.3
Dieldrin	0-2.08	0-1.36
Endrin	0-9.59	0-3.6

Certainly, the sources of these contaminating substances are different. In fact there is a synergistic influence since they come from activities both on land and at sea.

3. Exiting data about the emitting chemicals by the incinerator IE 150

3.1. POPs emission

There are very few data regarding the POPs emitted by the incinerator built in Tomis Nord County. The measurements requested by EPA for issuing the environmental permit in 2003 revealed that 17 compounds were emitted from the incineration of 468.7 kg medical wastes. Among them were 2,3,7,8 TCDD, 1,2,3,7,8 PeCDD, 1,2,3,4,7,8 HxCDD, 2,3,4,7,8 PeCDF, 1,2,3,7,8 PeCDF, 1,2,3,4,7,8 HxCDF, OCDD, 2,3,7,8 TCDF, 2,3,4,7,8 PeCDF, etc. The toxicity factors of these compounds ranged from 0.001 (OCDD and OCDF) and the maximum of 1 (2,3,7,8, TCDD). The concentrations of all of the compounds were under the detection limits, meaning under the maximum admissible concentration of 0.1 ng/Nm³.

3.2. Other chemicals

The measurements of emissions in different sources, carried out in 2003, with the occasion of the audit level II, revealed the following chemicals (Table 6 and 7).

Table 6 – Mean concentrations of pollutants identified in air emissions of the IE 150 pertaining of SC Full Management SRL Constanta

Sources	Pollutant	UM	Mean concentration	PA	PI
Dispersion furnace	CO	mg-Nmc with 3% O ₂	3.87	70	100
Fuel	SO ₂	mg-Nmc with 3% O ₂	0	24.5	35
Burning	NO _x	mg-Nmc with 3% O ₂	177.78	245	350
Fuel	SO ₂	mg-Nmc with 3% O ₂	0	24.5	35
	O ₂	%	11.00	-	-
Dispersion furnace	CO	mg-Nmc with 11% O ₂	0	-	150
Incineration	NO _x	mg-Nmc with 11% O ₂	84.18	-	400
Wastes	SO ₂	mg-Nmc with 11% O ₂	1.10	-	200
	O ₂	%	8.2	-	-

Table 7 – Results of measurements of the emissions from the IE 150, expressed in compliance with the environmental rules

Sources	Pollutant	UM	Mean concentration* μ_r el	PA	PI
Dispersion furnace	CO	mg-Nmc with 3% O ₂	4.06	70	100
Fuel	SO ₂	mg-Nmc with 3% O ₂	0	24.5	35
Burning	NO _x	mg-Nmc with 3% O ₂	186.67	245	350
Fuel	SO ₂	mg-Nmc with 3% O ₂	0	24.5	35
Dispersion furnace	CO	mg-Nmc with 11% O ₂	0	-	150
Incineration	NO _x	mg-Nmc with 11% O ₂	88.39	-	400
Wastes	SO ₂	mg-Nmc cu 11% O ₂	1.16	-	200

4. Recent data about the pollutants emitted by “ecologic” incinerator IE 150

Following the letter No. 15/16.02.2006 sent to EPA Constanta, NGO Mare Nostrum received new data about the monitoring of emissions in air produced by the “ecologic” incinerator settled in Tomis Nord district. We give below the updated information:

- S.C. Eco Fire Sitem SRL - operator of incinerator – concluded contracts with the medical units for transport and incineration; it makes monthly reports about the management of wastes, quantities of wastes incinerated, bulletins of analysis, which are sent to EPA Constanta

- The quantity of hazardous medical wastes incinerated in 2005 was 124,887 Kg; in January 2006, the quantity was 8,965 Kg; the nominal capacity of incineration is 0.05 t/h
- Generally, the hazardous incinerated wastes were collected from the following medical units:
 - 7 hospitals from Constanta
 - Center for transfusion of blood from Constanta
 - Direction for children protection Constanta
 - Service of ambulance Constanta
 - Balneary Sanatorium Mangalia; 135 private consulting rooms and laboratory for medical tests from Constanta Town and County
 - Tulcea County Hospital

4.1. Identified pollutants

SC Eco Fire Sistem SRL – operator of IE 150 incinerator – uses to carry out half-yearly measurements for determination of TOC, dioxins, furans, heavy metals, HCl, HF. It concluded contracts with OVM ICCPET SA for sampling and with SC ICECHIM SA for samples analyzing. Also, the unit had the personal apparatus for on-line measurements, based on the electrochemical sensors, which continually measures the following indicators: oxygen, CO, total hydrocarbons, NO_x, SO₂, temperature of burnt gases at furnace.

4.1.1. Dioxins and furans

On November 9, 2005, SC Eco Fire Sistem sampled 12.0 m³ gases from the evacuation furnace of incineration installation in order to identify the emissions of halogenated dioxins and furans. We make the following remarks: the height of furnace was 17 m, the diameter was 0.22 m, the time of sampling was 6 hours, volume of sampled gas was 12 m³, medical wastes incinerated - 210 Kg (Table 8).

Table 8 – Persistent Organic Pollutants identified in the gasses emitted in the air by the incinerator IE 150 from Tomis Nord, Constanta

Crt. No.	Chemical compounds	Toxicity factor	Max.admis. conc. (ng/Nm ³)	Results (ng/Nm ³)
1.	2,3,7,8 tetrachlorodibenzodioxin TCDD	1	0.1	under det.limit
2	1,2,3,7,8 pentachlorodibenzodioxin PeCDD	0.5	0.1	under det.limit
3	1,2,3,4,7,8 hexachlorodibenzodioxin HxCDD	0.1	0.1	under det.limit
4	1,2,3,6,7,8 hexachlorodibenzodioxin HxCDD	0.1	0.1	under det.limit
5	1,2,3,7,8,9 hexachlorodibenzodioxin HxCDD	0.1	0.1	under det.limit
6	1,2,3,4,6,7,8 heptachlorodibenzodioxin HpCDD	0.01	0.1	under det.limit
7	Octachlorodibenzodioxine OCDD	0.001	0.1	under det.limit
8	2,3,7,8 tetrachlorodibenzofuran TCDF	0.1	0.1	under det.limit
9	2,3,4,7,8 pentachlorodibenzofuran PeCDF	0.5	0.1	under det.limit
10	1,2,3,7,8 pentachlorodibenzofuran PeCDF	0.05	0.1	under det.limit
11	1,2,3,4,7,8 hexachlorodibenzofuran HxCDF	0.1	0.1	under det.limit
12	1,2,3,6,7,8 hexachlorodibenzofuran HxCDF	0.1	0.1	under det.limit
13	1,2,3,7,8,9 hexachlorodibenzofuran HxCDF	0.1	0.1	under det.limit
14	2,3,4,6,7,8 hexachlorodibenzofuran HxCDF	0.1	0.1	under det.limit
15.	1,2,3,4,6,7,8 heptachlorodibenzofuran HpCDF	0.01	0.1	under det.limit

4.1.2. Heavy metals

For determining the content of heavy metals a volume of 140 l/h gas was sampled; the time of sampling was 30 min.

Table 9 - Emissions of heavy metals from furnace powders resulted from incineration of medical wastes, at November 28, 2005

Pollutant	Values determined of heavy metal emissions			
	Quantity reported to total mass of powder		Concentration measured in normal conditions	Concentration reported at 11% O ₂ dry gas
	ppm	Mg.10 ³	Mg/m ³ N 10 ⁻³	
Cadmium (Cd)	87.1	11.92	1.40	1.51
Thalium (Tl)	36	4.93	0.58	0.62
Mercury (Hg)	12.242	0.606	0.4828 + 9.411*	0.52 +10.182*
Antimony (Sb)	13.5	1.848	0.21	0.23
Arsenic (As)	22	3.012	0.35	0.37
Lead (Pb)	675	92.40	10.85	11.73
Chromium (Cr)	4173	571.38	61.96	67.04
Cobalt (Co)	1121	153.46	18.01	19.48
Copper (Cu)	795	108.84	12.77	13.81
Manganese (Mn)	4130	565.397	66.36	71.80
Nickel (Ni)	5707	781.28	84.73	91.67
Vanadium (V)	133	18.21	2.13	2.30

* Total concentration of Hg was calculated taking into consideration also the Hg content from adsorbant solution of NHO₃22%

4.1.3. Other chemicals

Using the analyzer TESTO 350 XL, the following chemicals were identified in the burnt gases from furnace, during three days of measurements:

02.11.2005			03.11.2005			04.11.2005		
Indicator	Unit	Value	Indicator	Unit	Value	Indicator	Unit	Value
Oxygen	%	10.38	Oxygen	%	10.72	Oxygen	%	8.83
CO	mg/m ³	2	CO	mg/m ³	0	CO	mg/m ³	2
NO _x	mg/m ³	196	NO _x	mg/m ³	243	NO _x	mg/m ³	256
SO ₂	mg/m ³	0	SO ₂	mg/m ³	0	SO ₂	mg/m ³	0
CO ₂	%	6.02	CO ₂	%	5.82	CO ₂	%	6.90
NO	mg/m ³	196	NO	mg/m ³	240	NO	mg/m ³	254
NO ₂	mg/m ³	0.0	NO ₂	mg/m ³	3.7	NO ₂	mg/m ³	1.2

IV. Environmental and health consequences

1. POPs effects on human health

The greatest part of human exposure to the 12 POPs is attributed to the ingestion of food. Contamination of food may occur through environmental pollution in the air, water and soil, or through the previous use or un-authorized use of pesticides on food crops.

The health effects of POPs are generally subtle and can be triggered at extraordinary low concentrations. The latency period for POPs may be very long, between exposure and outcome in the exposed individual, in some cases effects occurring in future generations.

Exposure to POPs can be associated with the following health effects in humans:

- Immune system biochemical alterations
- Reproductive deficits
- A shortened period of lactation in nursing mothers
- Neurobehavioral impairment including learning disorders, reduced performance on standard tests, and attention deficits
- Diabetes
- Cancer

International Agency for Research on Cancer evaluated the carcinogenic risk to humans for the 12 POPs made:

Classification	Un-wanted POPs
Group 1: The agent (mixture) is carcinogenic to humans	2,3,7,8-Tetrachlorodibenzo- <i>para</i> -dioxin (TCDD)
Group 2A: The agent (mixture) is probably carcinogenic to humans	Mixtures of polychlorinated biphenyls
Group 3: The agent (mixture or exposure circumstance) is unclassifiable as to carcinogenicity in humans	Polychlorinated dibenzo- <i>para</i> -dioxins (other than TCDD) Polychlorinated dibenzofurans

- High-dose acute exposure: typically results from accidental fires or explosions involving electrical capacitors or other PCB-containing equipment, or high dose food contamination
- Mid-level chronic exposure is predominantly due to the occupational exposure.
- Chronic, low-dose exposure is characteristic for the general population world-wide as a consequence of the existing global background levels of POPs with variations due to diet, geography, and level of industrial pollution. Low level and population-wide effects are more difficult to study. People are exposed to multiple POPs during their lifetime and most people today carry detectable levels of a number of POPs in their body (WFPFA, 2000).

2. POPs fate in marine environment and impact on vegetal and animal communities

Having in view that Constanta district has 240 Km coasts along the Black Sea, it is very important to describe the fate and effects of POPs in the marine environment.

The primary mechanism by which dioxins enter ecological food chains of marine environment is via atmospheric deposition. Dioxin and related compounds would enter the atmosphere directly through air emissions and are widely spread in the marine environment as a result of a number of physical and biological processes.

a/ **The air water film interface.** The surface layer of the sea is a film with a maximum thickness of 1 mm, which is known to contain fatty acids. Because of their lipid solubility, the POPs may therefore accumulate in it becoming of considerable importance to surface living organisms or to birds that skim fat off the surface of the sea.

b/ **Open sea sediment deposition and cycling of POPs.** Planktonic organisms play a very important role in open sea sedimentation, being the main source of sediments and sediment contamination. When these organisms die, they sink through the water column to deep sea environments, where they form sediments. When the particles sink through the water column, a degradation of the organic matrix occurs and consequently, POPs are released into the surrounding water.

c/ **Sediment burial and anoxic environments.** Particles, with POPs adsorbed onto them, can be buried by sediments and thus create submerged pools of contaminants; under anoxic conditions, sediments could release contaminants into the surrounding water, making the pollutants available for the benthic fauna.

d/ **Food chain interactions.** Planktonic organisms are the first link for pollutant transfer in the pelagic system. Traditionally the phytoplankton has been considered as the initial step for transport of POPs into food chains. Recent studies, however, point out that the capacity of uptake of bacteria is an important route for POPs transportation via the microbial food chain. The microbial food chain is the link between microorganisms in the sea.

There is substantial evidence to indicate that populations of wildlife species high on the food chain are suffering health damage due to reproductive and developmental impairment due to background exposures to dioxins and related compounds. Exposure to dioxin-like compounds has been linked to large-scale hormonal, reproductive, and developmental impairment among numerous species of predator birds, fish and wildlife; these impacts are primarily trans-generational, affecting the offspring of the exposed organisms.

3. Status of comfort and health of Constanta community in connection with air emissions

In the two documents prepared by the Environmental Protection Agency - *Local Action Plan for Environmental Protection and Status of Environmental factors in 2004* – there is a scarcity of data referring to the direct impact of inadequate quality of the air upon the citizens.

The discussion is made especially about the discomfort felt by the pedestrians due to the road traffic emissions, due to the increased risk in chronic exposure to the lead generated by the road traffic.

Another kind of discomfort is felt in the areas where the private power plants installed in block houses, villa or houses, if the distance from furnace of evacuation of these plants is very close by the windows of the surrounding buildings. This discomfort is produced by the emissions of soot or insufficient burnt gases.

The statistic data about the morbidity and mortality for the diseases in relation to environmental factors are in course to be collected and processed by the Direction for Public Health Constanta.

As for the effects of the air pollution on the public health status, there are discussed the modifications which occur in the body of exposed persons, as a consequence of the contact with different air pollutants, generally the impact on human health are a synergistic effect of many pollutants present in the same time in atmosphere.

The most representative air pollutants are:

- Pollutants with irritant action: sulfur oxides and nitrogen oxides resulted in the burning of fossil fuels;
- Pollutants with poisonous action: carbon oxide resulted from incomplete burning;
- Pollutants with carcinogenic action: polycyclic aromatic hydrocarbons resulting in the incomplete burning of solid and liquid fuels.

Regarding the risk assessment on the health status of humans exposed to suspensions in the air, the categories of persistent organic pollutants is altogether ignored. There topic of inducing allergy is discussed, among them being cited the nitrogen, sulfur and carbon oxides or the volatile substances from insecticides, detergents, plastics, which produce acute rhinitis, tracheitis, asthma or ocular (conjunctivitis and blepharitis) and cutaneous (eczema, rash) manifestations.

V. Responsible authorities

In Constanta, the authorities responsible for the incinerator are:

- The Environmental Protection Agency from Constanta for control the emissions, which is monthly reported by SC Eco Fire Sitem SA
- The Direction of Public Health from Constanta for controlling the public health.

In order to comply the Romanian legislation with EU requests of legal provisions for environmental protection of the medical unit producing medical hazardous wastes, among the Ministry of Environment and Waters Management, Ministry of Health and National Authority for Control – National Environmental Guard, a Protocol was concluded in October 2004.

This protocol is aiming to introduce the infrastructure for separately collecting the wastes in all the medical care units, to establish the environmental circumstances in which the crematories from the medical units can work up to the moment when they will be closed, in conformity with the calendar of closing negotiated through the Plan of Implementation of Directive 2000/76/CE – incineration of wastes and promotion of procedure for thermic sterilization, concomitant with the utilization of authorized existent capacities of incineration.

Some of the attributions and responsibilities of the three parties are:

Ministry of Environment and Waters management

- To regulate in territory and keep evidences on the request for environmental agreements for incinerators, installations for sterilizations and types of sterilizations;
- To pursue the conformation of authorized existent incinerators with the requests of Directive 2000/76/CE;
- To regulate the functioning of medical units, including the crematories in the transition period;
- To control the conformation of method for final elimination of hazardous medical wastes with the Provisions of Plan for implementation of Directive 2000/76/CE.
- To give the act of regulation for stopping the activity for crematories.

Ministry of Health

- To elaborate the criteria establishing the conditions for acceptance the installations for sterilization for hazardous medical wastes;
- To analyze and reconsider the years for opening the crematories producing heavy pollution of the environment
- To elaborate the model of program-framework for management of hazardous medical wastes
- To issue the sanitary permit for means of conveyance for hazardous wastes
- To participate in the procedure for environmental impact assessment for objectives having as activity the elimination of hazardous wastes

National Environmental Guard

- To control the application of provisions of Plan of implementation;
- To check the medical units which close the proper crematories and verify if these units have concluded contracts with other medical units (which have crematories in function) or with authorized incinerators/sterilizers for final elimination of hospital hazardous wastes;

- To control the contracts of medical units (which have not crematories) with specialized and authorized means of conveyance for transporting hazardous wastes.

VI. Plans for cleanup

Following the discussions between Environmental Protection Agency and the incinerator operator – SC Eco Fire Systems SRL, a contract with the Administration of Fund for Environment was signed, regarding the financing of a project entitled “*System for ecological incineration equipped with cooling installation and treatment of gasses*”. This system will be settled on the PETROMIDIA refinery platform in the town of Navodari. This new project will be finalized by the end of 2006, or early 2007. The incinerator found in Tomis Nord district from Constanta will be closed, respecting the legal provisions in force, referring to the cessation of incineration activity.

On the other hand, the existent installations for cremation of the hazardous wastes produced in medical centers from Constanta town will be closed, respecting the calendar provided in Annex of Decision No. 268/2005 for modification and completion the Governmental Decision No. 128/2002 regarding the wastes incineration:

Medical unit	2004	2005	2006	2007	2008
District Clinic Hospital of Emergency			x		
Hospital for Infectious diseases				x	

In order to identify the proposal for projects for substantiation the elaboration of Action Plan for Stockholm Convention’s implementation, EPA Constanta organized a series of meetings with the economic stakeholders, being advanced to the National Research – Development Institute for Environment Protection (ICIM) Bucharest (which prepared the document “*Enabling activities to facilitate early action in the implementation of the Stockholm Convention of POPs in Romania*” the following projects:

- “Replacement of PCB containing capacitors (in exploitation) with performing non PCB capacitors-piles” (investments/and manpower costs – 500,000 €)
-
- “Elimination of capacitors containing PCB from installations and stock-piles” (investments/and manpower costs – 54,000 €)

VII. Recommendations of Mare Nostrum NGO

Ever since the incinerator IE 105 was built in the Tomis Nord neighborhood, besides the actions developed against this type of treatment of medical wastes, Mare Nostrum NGO proposed the solution of using the waste disinfection authorized devices. Potentially infectious health care waste is disinfected by means of HF thermal disinfection technology. The advantages of such devices:

- Destroys biological contaminants
- Reduces volume of waste to a little as 10% of original volume
- Environmentally safe – no radiation, no microwaves, no harmful emissions
- Costs 50-70% less than other systems
-

The devices are patented, environmentally-safe disinfecting and disposal unit than can process up to 75 liters of regulated medical wastes, including syringes, needles, blades, dialysis filters, pads, bandages, plastic tubing, and even glass – in a single 12-minute cycle. At the end of each cycle, a valve in the treatment chamber automatically opens, allowing the entire contents to be released into a centrifuge, which separates the solid from the liquid.

Fortunately, the MEWM together with the Ministry of Health elaborated a common project which will approve the technical norms regarding the criteria for assessment the equipment for thermal sterilization of hazardous wastes resulted from the hospital activities, which will be accepted in 2008.

REFERENCES

1. EPA, 2005 – *Local Action Plan for Environmental Protection*, Constanta district, 113 pp. (In Rom.)
2. ICIM, Bucharest, 2002 – *Enabling Activities to Facilitate Early Implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) in Romania. National Implementation Plan*, 98 pp. (In Engl.)
3. EPA Constanta, 2005 – *Local Plan for Sustainable Development of Constanta town*, 42 pp.
4. Piescu, V., A. Oros, V. Coatu, I. Pecheanu, 2005 - Levels of some dangerous substances in the marine environment in front of Danube mouths between 1996-2004.– in *Clean Black Sea Working Group*, Varna, Bulgaria.
5. Piescu, V., V. Coatu, A. Oros, V. Patrascu, I. Pecheanu, 2004 – Assessment of dangerous substances level off the Danube mouths. *Cercetari Marine – Recherches Marines*, **35/2004**: 35.
6. Ciurea, O., 2005 – Wastes resulted from the medical care activity – solutions for final elimination”, in *Salubritatea*, No. 2(14), p. 12.