International POPs Elimination Project

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

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Mexican Isthmus: generation of and contamination by Persistent Organic Pollutants (POPs)

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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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Introduction

In Mexico's Northern Isthmus, the government-owned Pajaritos Petrochemical Complex located in Coatzacoalcos, Veracruz is the most significant industrial source of POPs included in the Stockholm Convention.

During the last 30 years, the Mexican scientific community has consistently pointed to the ongoing contamination of the Coatzacoalcos River (in its sediments and in the tissues of organisms) with polycyclic aromatic hydrocarbons (PAHs); heavy metals (especially chrome, lead and mercury); organochlorine compounds; and PCBs. In addition, it is important to add that dioxins, furans, PCBs, hexachlorobenzene and polybrominated diphenyl ethers (PBDE) have been found in eggs from backyard chickens near the Pajaritos Petrochemical Complex as was reported by IPEN in the Global Egg Report.

The dioxin contamination of backyard chicken eggs near the Pajaritos Petrochemical Complex –six times greater than the European Union limit and nearly 19 times higher than baseline environmental levels– is a bio-indicator of the high level of contamination generated by the complex and of the possible impact on food chains in the region. It is important to highlight that the areas where livestock feed is grown and where egg farms are located are the food production areas that are at risk.

Sources of by-product POPs in Pajaritos

Pajaritos unintentionally generates dioxins and furans due to its production of chlorine and vinyl chloride monomer (VCM) used to make PVC plastic. The production of VCM involves an oxychlorination process for producing dichloroethane or DCE, a known human carcinogen. In addition, the facility generates POPs due to the incineration of chlorinated hazardous wastes generated in the Pajaritos Petrochemical Complex.

The production of vinyl chloride in the Pajaritos Petrochemical Complex is an intermediate link in the PVC production chain, in which the primary beneficiaries are the private companies in the *Grupo Cydsa* and *Mexichem* that dominate the national market for PVC and are the main exporters of PVC.

The handling of hexachlorinated wastes and diverse hazardous wastes generated at the Pajaritos Petrochemical Complex –through direct treatment at the complex or contracted services from private companies for their confinement or export for their incineration– has been characterized by a series of irregularities that has led to frequent fines and sanctions imposed by Mexico's Federal Environmental Protection Agency (*Procuraduría Federal de Protección al Ambiente*).

Plans to modernize Pajaritos

The modernization of the Pajaritos Petrochemical Complex and the plan to double productive capacity for vinyl chloride will likely result in an increased generation of dioxins and furans. It is necessary that Pemex recognizes this problem to comply with the commitments made in the Stockholm Convention. The Convention will require an explanation of how the Pajaritos Petrochemical Complex, will reduce the total release of dioxins and other unintentional POPs into the environment, not only their release into the atmosphere but also into water and wastes.

The modernization plans of Pajaritos also include the construction of a new incinerator for chlorinated wastes. It is important to note that although the company claims that the new incinerator II will generate dioxins and furans within the limits for release into the atmosphere established by Mexican authorities in NOM-098-SEMARNAT-2002 at 0.2 ng/m^3 TEQ, this standard is weaker than the one established as the maximum atmospheric limit in Europe at 0.1 ng/m^3 TEQ by the OSPAR Convention for plants producing DCE/VCM. In addition, a single measurement per year, as indicated in Mexican standards, is not a frequency of measurement representing a very effective "control." In addition, the focus on the incinerator overlooks the fact that other points of the production process for vinyl chloride monomer (e.g. in the oxychlorination process), can also generate these POPs.

Pajaritos and the Stockholm Convention

Priority should be given to evaluating alternative forms of preventing the formation and release of dioxins, and to respond to the demand for Best Available Techniques and Best Environmental Practices, as established in the Stockholm Convention. Pemex has to communicate the health risks of POPs to the exposed workers and the environmental risks to the potentially affected communities. It is evident that these and other issues should be considered within the National Implementation Plan for the Stockholm Convention, since to date the commitments acquired in this international agreement have not been taken fully into account by Pemex or by the national government.

In general, there is a lack of environmental standards in Mexico in relation to dioxins and furans generated by the production of vinyl chloride monomer at the Pajaritos Petrochemical Complex. Nor are there environmental restrictions or maximum limits placed on the releases of carcinogenic substances such as dichloroethane and vinyl chloride at the Pajaritos Petrochemical Complex, as required by the OSPAR Convention in installations for similar production.

POPs in the Southern Isthmus

In the Southern Isthmus we noted the presence of polyaromatic hydrocarbons (PAHs) and heavy metals in the Salina Cruz port and in the Tehuantepec Isthmus Lagoon Complex, the latter of which is the country's largest system of lagoons in the Southern Pacific area. The presence of PAHs and heavy metals is registered in marine shrimp and shrimp in the Tehuantepec Isthmus lagoon system. Also, POPs such as lindane are found in shrimp in the *tapos* used by the Huave indigenous people in shrimp farming. The fact that the presence of high molecular weight PAHs is registered in significant concentrations in shrimp tissue

indicates that there is a process of bioaccumulation of these compounds, which are characterized by a high level of affinity for fatty tissue, as well as carcinogenic properties.

Recommendations

In light of the problems described in this report, we recommend that the following actions be incorporated into the Mexico national implementation plan for the Stockholm Convention:

1) To include the lower basin of the Coatzacoalcos River as a hot spot contaminated with POPs and to establish a mechanism for implementing a plan for the ecological restoration of the affected area and a program for attending to the exposed population.

2) To establish a multi-sector committee for fulfilling the commitments acquired through the Stockholm Convention in the Coatzacoalcos River Basin; to achieve the reduction and elimination of generating sources of POPs, with participation by the corresponding federal, state and municipal entities, including *Pemex Petroquímica*, as well as the various exposed social sectors, workers, the academic sector and organizations working to protect health and the environment; and to contribute to paying the environmental debt created by petrochemical and petroleum activities in the region.

3) To put a end to the incineration of organochlorinated wastes at the Pajaritos Petrochemical Complex, as a preventative measure to avoid the formation and release of dioxins and furans, and to evaluate alternative forms of treatment that do not generate these POPs.

4) To conduct an occupational heath and epidemiological study with the population – including pregnant women and children, as the most vulnerable sector– exposed to the Pajaritos Petrochemical Complex, given the use of carcinogenic toxic substances and the long-standing generation of dioxins.

5) To conduct campaigns for training workers on preventing health risks related to the generation of dioxins and furans in the production of chlorine and vinyl chloride monomer.

6) To develop a program for monitoring dioxins and furans at the Pajaritos Petrochemical Complex, for their ongoing reduction and eventual elimination. The results from this program should be accessible to the public and should make up part of the Pollutant Release and Transfer Register (PRTR).

7) To further develop the measurement of contamination from dioxins and furans in the Teapa stream, in the sediments of the Coatzacoalcos River, in marine fauna and in estuarine-lagoon fauna, corresponding to commercial fishing in the region.

8) To evaluate contamination from dioxins in the livestock and poultry production area to the south of the Pajaritos Petrochemical Complex.

9) To establish deadlines for the substitution of mercury cells for membrane or diaphragm cells in chlorine production, to prevent releases of mercury into the environment and its bioaccumulation.

10) To open up a public debate process to evaluate the existing, potential alternatives that would make it possible to substitute the production of vinyl chloride monomer and PVC in its diverse uses, as part of a sustainable national materials policy in accordance with the Stockholm Convention.

11) To conduct a massive program, in both the Northern and Southern Isthmus regions, to disseminate information regarding the environmental and public health reasons that motivated the prohibition of the pesticides included in the Stockholm Convention, with the aim of preventing their illegal use.

12) To promote alternative agroecological forms of pest control as a measure to prevent the risks derived from exposure to organochlorinated pesticides such as lindane and endosulfan and other pesticides that create severe, chronic effects in workers and communities.