

**Assessment of Mechanisms in Mexico for
Tracking Imports and Exports of Mercury for
Use and Disposal**
- Final Report-

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Table of Contents

Symbols, Units and Acronyms	iv
1.0 Background	1
2.0 Objectives	1
3.0 Project Scope	2
4.0 Methodology	2
5.0 Laws, Regulations and Policies Governing Mercury Products and Waste	2
5.1 <i>Customs Law and Regulation</i>	3
5.1.1 Importer Registration	4
5.1.2 Declaration	4
5.1.3 Returns, Losses and Waste	5
5.1.4 Inspection	5
5.1.5 Statistics	5
5.2 <i>General Health Law</i>	6
5.3 <i>Cicoplafest</i>	7
5.4 <i>Federal Firearms and Explosives Law and its Regulation</i>	7
5.4.1 Permits	7
5.4.2 Record-keeping	8
5.4.3 Monthly Reports	8
5.5 <i>General Law on Ecological Balance and Environmental Protection</i>	8
5.5.1 LGEEPA Regulation on Environmental Impact	9
5.5.2 LGEEPA Regulation on Air Pollution Prevention and Control	11
5.5.3 National Water Law and Regulation	14
5.5.4 LGEEPA Regulation on Hazardous Waste	15
5.6 <i>Regulation on Ground Transportation of Hazardous Materials and Wastes</i>	22
6.0 Extent of Cross-Border Trade in Mercury Products and Wastes	22
6.1 <i>Mercury and its Compounds</i>	23
6.1.1 Publications	23
6.1.2 Limitations	23
6.2 <i>Mercury-containing Wastes</i>	24
7.0 Existing Control and Reporting Mechanisms for Import and Export of Mercury-Related Products and Waste	25
7.1 <i>Customs Law</i>	25
7.2 <i>Cicoplafest</i>	26
7.3 <i>Federal Firearms and Explosives Law</i>	26
7.4 <i>General Law on Ecological Balance and Environmental Protection</i>	26
8.0 Feasibility of Transboundary “Cradle-To-Grave” Tracking of the Transboundary Movement of Mercury-Related Products and Wastes	27

9.0 Summary and Analysis..... 30

 9.1 Customs Law 30

 9.2 Cicoplafest..... 31

 9.3 Federal Firearms and Explosives Law..... 32

 9.4 LGEEPA 33

 9.5 Regulation on Ground Transportation of Hazardous Materials and Waste..... 35

10.0 Conclusions and Recommendations..... 36

11.0 References..... 40

List of Tables	Page
Table 1 – Hazardous Waste Codes for Filing Form INE-04-004a	16
Table 2 – Hazardous Waste Codes for the Notice of Return	21

Symbols, Units and Acronyms

Bancomext	National Foreign Trade Bank (<i>Banco Nacional de Comercio Exterior</i>)
CEC	Commission for Environmental Cooperation
Cicoplafest	Intersecretarial Commission for the Control of Pesticides, Fertilizers and Toxic Substances (<i>Comisión Intersecretarial para el Control de Plaguicidas, Fertilizantes y Sustancias Tóxicas</i>)
CNA	National Water Commission (<i>Comisión Nacional del Agua</i>)
Cofemer	Regulatory Improvement Commission (<i>Comisión de Mejora Regulatoria</i>)
Cretib	Corrosive, Reactive, Explosive, Environmentally Toxic, Flammable and Biological-Infectious (<i>Corrosivo, Reactivo, Explosivo, Tóxico al ambiente, Inflamable y Biológico-infeccioso</i>)
DOF	Official Gazette of the Federation (<i>Diario Oficial de la Federación</i>)
EIS	Environmental impact statement
EPA	Environmental Protection Agency
HAZTRAKS	Hazardous waste tracking system
Hg	Mercury
INE	National Institute of Ecology (<i>Instituto Nacional de Ecología</i>)
Inegi	National Institute of Statistics, Geography and Information (<i>Instituto Nacional de Estadística, Geografía e Informática</i>)
LAU	Comprehensive Environmental License (<i>Licencia Ambiental Unica</i>)
Lfafe	Federal Firearms and Explosives Law (<i>Ley Federal de Armas de Fuego y Explosivos</i>)
LGEEPA	General Law on Ecological Balance and Environmental Protection (<i>Ley General del Equilibrio Ecológico y la Protección al Ambiente</i>)
NARAP	North American Regional Action Plan
NOM	Mexican Official Standard (<i>Norma Oficial Mexicana</i>)
Profepa	Office of the Federal Attorney General for Environmental Protection (<i>Procuraduría Federal de Protección al Ambiente</i>)
PRTR	Pollutant Release and Transfer Register
SAAI	Comprehensive Automated Customs System (<i>Sistema Automatizado Aduanero Integral</i>)
SAT	Revenue Administration Service (<i>Sistema de Administración Tributaria</i>)
SCT	Ministry of Communication and Transportation
Sedena	Ministry of National Defense (<i>Secretaría de la Defensa Nacional</i>)
Semarnat	Ministry of the Environment and Natural Resources (<i>Secretaría de Medio Ambiente y Recursos Naturales</i>)

SGPA	Office of the Deputy Minister for Management of Environmental Protection (<i>Subsecretaría de Gestión para la Protección Ambiental</i>)
SHCP	Ministry of the Treasury and Public Credit
SIRG	Integrated Direct Regulation and Environmental Management System (<i>Sistema Integrado de Regulación Directa y Gestión Ambiental</i>)
SIRREP	Hazardous Waste Tracking System (<i>Sistema de Rastreo de Residuos Peligrosos</i>)
SSA	Ministry of Health (<i>Secretaría de Salud</i>)
TCLP	Toxicity characteristic leachate procedure

1.0 Background

In 1997 the governments of Canada, Mexico and the United States agreed to a North American Regional Action Plan (NARAP) on mercury, intended to support the domestic and trilateral efforts to reduce the exposure of North American ecosystems, flora and fauna, and especially humans, to mercury. The ultimate goal of this NARAP is to prevent and reduce anthropogenic releases and transfers of mercury to the North American environment, through the development and execution of appropriate national and international initiatives.

Phase II of the mercury NARAP sets out a list of action items, two of which concern adequate tracking of import and export of mercury for manufacturing processes, or the tracking of mercury waste destined for recycling or final disposal:

“[to] review and assess the adequacy of existing methodologies and processes for tracking imports and exports of mercury designated for manufacture or use in processes and products, with the goal of stimulating life cycle management practices at the national level”; and

“to undertake a review of national programs to determine the adequacy of national reporting mechanisms used to track the ultimate fate of mercury-containing wastes within North America, particularly waste transported across national boundaries for storage, handling, processing, disposal or long-term containment, and to make recommendations to improve such mechanisms.”

This project analyzes these two aspects of Phase II of the mercury NARAP as related to Mexico: a review of national regulations/policies regarding: 1) import and export of mercury for processing, and 2) mercury waste for recycling or final disposal.

2.0 Objectives

The constant increase in the transboundary movement of chemical substances and hazardous products and waste represents a challenge for the countries in the region, in their efforts to control pollutant releases into the environment—more so due to the differences in policies and mechanisms in force in each country to control and track these movements. In congruence with the actions established in Phase II of the mercury NARAP, with regard to the transboundary movements of mercury and products containing mercury and mercury waste, this project has the following objectives:

- Identify and assess existing methodologies and processes in Mexico for tracking imports and exports of mercury designated for manufacture or use in processes and products.
- Identify and assess national reporting mechanisms in Mexico used to track the ultimate fate of mercury-containing wastes within North America, particularly waste transported across national boundaries for storage, handling, processing, disposal or long-term containment.

- Assess whether, and to what extent, it is possible to track from “cradle-to-grave” imports and exports of mercury, mercury-bearing products and mercury-containing waste, including an assessment of existing gaps and barriers for adequate tracking and control.

3.0 Project Scope

In accordance the above listed objectives of the project, the following topics will be covered:

- 3.1 The laws, regulations, standards and policies governing mercury products and wastes;
- 3.2 The extent of the trade of mercury products and wastes across borders or an identification of the obstacles and alternatives to access that information;
- 3.3 Existing control and reporting mechanisms (manual or computerized) for national control and for imports and exports for a) mercury used for processing and b) mercury destined for recycling or final disposal;
- 3.4 To what extent is tracking from cradle to grave possible across borders and existing gaps or barriers for adequate tracking/control.

4.0 Methodology

In this work, official procedures and mechanisms related to imports and export of mercury for use in processes and products, and records generated for such purposes, were identified. The same was done for the import, export and final disposal of mercury-containing hazardous wastes. Official statistics were reviewed and interviews were conducted with the personnel of appropriate official agencies, to assess the functionality of such procedures and the completeness and reliability of the information generated. All these activities were intended to assess how well these procedures and mechanism allow for efficient tracking of transboundary movements of mercury products and waste and to determine existing barriers or gaps for adequate tracking/control.

5.0 Laws, Regulations and Policies Governing Mercury Products and Waste

Laws, regulations and standards governing certain aspects of mercury and mercury-containing products and compounds, as well as the hazardous waste thereof, were identified. For the purposes of this project, only those concerned with imports, exports and waste disposal will be reviewed and analyzed for the purposes of this project, and the provisions related to health issues, agricultural practices and pest control, that do not deal with the trade or disposal of mercury compounds, products and wastes, will not be taken into consideration. The following mechanisms are identified and will be reviewed and assessed for the purpose of this project:

- a) Customs Law and import and export regulation (*Ley Aduanera y su reglamento en materia de importación y exportación*)

- b) Decree listing tariff codes that require authorization for import and export by the Intersecretarial Commission for the Control of Pesticides, Fertilizers and Toxic Substances (*Decreto por el que se especifican las fracciones arancelarias que requieren autorización de importación y exportación del Comité Intersecretarial para el Control de Plaguicidas, Fertilizantes y Sustancias Tóxicas—Cicoplafest*)
- c) General Health Law and its Regulation on Control of Establishments, Products and Services.
- d) Federal Firearms and Explosives Law (*Ley Federal de Armas de Fuego y Explosivos*) and Regulation
- e) General Law on Ecological Balance and Environmental Protection (*Ley General del Equilibrio Ecológico y la Protección al Ambiente—LGEEPA*), its Regulation and other related provisions:
- LGEEPA Regulation on Environmental Impact (*Reglamento de la Ley General del Equilibrio Ecológico y Protección al Ambiente en Materia de Impacto Ambiental*)
 - LGEEPA Regulation on Air Pollution Prevention and Control (*Reglamento de la Ley General del Equilibrio Ecológico y Protección al Ambiente en Materia de Prevención y Control de Contaminación Atmosférica*)
 - National Water Law (*Ley de Aguas Nacionales*)
 - Water Pollution Prevention and Control Regulation (*Reglamento para la Prevención y Control de la Contaminación de Aguas*).
 - LGEEPA Regulation on Hazardous Waste (*Reglamento de la Ley General del Equilibrio Ecológico y Protección al Ambiente en Materia de Residuos Peligrosos*).
 - Executive order establishing the classification and coding of goods whose import and export is subject to regulation by the Ministry of the Environment, Natural Resources and Fisheries.
 - Executive order establishing the procedure for returning hazardous waste (SIRREP)
- f) Regulation on Ground Transportation of Hazardous Materials and Waste (*Reglamento para el Transporte Terrestre de Materiales y Residuos Peligrosos*) of the Ministry of Communication and Transportation (*Secretaría de Comunicaciones y Transporte—SCT*).

5.1 Customs Law and Regulation

The purpose of the Customs Law is to regulate and control the entry and exit of merchandise and the vehicles in which it is carried or driven into and out of the country; customs clearance; and acts or facts arising from such movements (38). The most relevant provisions of this Law and Regulation relating to the regulation and control of the movement of chemicals, including mercury, mercury-containing substances and mercury wastes; the documents or records generated by these movements; and the mechanisms of verification or control, are described below.

5.1.1 Importer Registration

Anyone involved in importing operations must be registered as an importer with the Ministry of the Treasury and Public Credit (*Secretaría de Hacienda y Crédito Público*—SHCP) (45). The Revenue Administration Service (*Servicio de Administración Tributaria*—SAT) of this Ministry maintains this registry for the purpose of obtaining and generating statistical information with which to identify the importers as well as the identity, quantity and origin of goods they import, among other data.

Among other obligations, importers must have an inventory control component of their accounting system that distinguishes between domestic and foreign goods. They must possess any information, documentation and/or supporting evidence necessary to prove the country of origin of goods they import.

5.1.2 Declaration

Anyone wishing to import or export goods must file a declaration on the official SHCP form, through a customs broker or representative (26). The required information includes importer or exporter identity; nature of the goods; country of origin or destination. For each item, the following are provided: name, tariff classification, quantity; and any other required permits. For goods subject to non-tariff regulations and restrictions, e.g., toxic substances requiring a Cicoplafest import permit, compliance with such regulations and/or restrictions must be proven. In the case of hazardous waste, the import or export is subject to authorization from the Ministry of the Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales*—Semarnat).

The commercial invoice attesting to the value of the goods must be submitted along with the declaration. Specifically for imports, the documents certifying the origin of the goods are also required. Where imported goods can be identified individually, the serial, part, make or model numbers must be indicated, or failing that, the technical or commercial specifications sufficient to identify the goods and distinguish them from other goods. Maquiladoras and companies with export programs authorized by the Ministry of the Economy (*Secretaría de Economía*—SE, previously the Ministry of Trade and Industrial Development) do not have to identify goods imported under the temporary regime, provided that the imported products are components, inputs or semi-finished items covered by the authorized maquila program (9). These could include mercury-containing items, e.g. bulbs or capsules for thermostats or switches used in assembling other equipment or devices.

Maquiladoras or companies with SE-authorized export programs may opt to use a single consolidated declaration (*pedimento consolidado*) to cover various import transactions (27). Exporters can also use a consolidated export declaration. Import or export operations covered by these forms must be accompanied by copies of the invoices for each individual transaction.

5.1.3 Returns, Losses and Waste

The programs covering maquiladoras and exporters authorized by the SE to operate under the temporary import regime establish the proportion of inputs forming part of finished products, as well as the proportion of losses and defects to be generated by these companies' production processes. Each time a company exports goods, or returns unused inputs or waste generated by its operations, the proportion of inputs included in these goods and wastes, as well as the quantities of inputs returned, are deducted from previous import declarations, until each declaration is used up (10). In theory, these companies may not export goods nor return inputs or waste if they do not have an open import declaration file. Waste generated in these companies' operations may be destroyed or disposed of in Mexico. However, this requires the prior authorization of the customs authorities, which may not be granted if hazardous materials, or materials or waste harmful to public safety or health, the environment, flora, or fauna are involved. When these companies generate hazardous waste, they must return it to the country of origin of the substances or materials from which they were generated, for which purpose they must obtain authorization from Semarnat.

Maquiladoras and companies with export programs authorized by the SE must file annual reports with the customs authorities on the quantities of goods returned; the proportion of temporary imports they represent; any losses and/or waste not returned, and any intended for the domestic market.

5.1.4 Inspection

The customs procedures include random inspection of imported or exported goods under a procedure known as a *reconocimiento aduanero* (44). The purpose of this mechanism is to verify the truth and accuracy of the information provided on the declarations, in terms of quantities, units of measure, and other quantitative data on the goods, the description, nature and other characteristics thereof, and the inclusion of proper identification data. Samples of chemicals are taken and sent to the SHCP central laboratories along with the corresponding Material Safety Data Sheets (MSDS), in order to determine whether the actual substance matches the one appearing on the declaration and the container labels (2).

The customs broker is responsible for the truth and accuracy of the data and reports filed, and for their correct tariff classification, as well as for fulfilling all other obligations under the non-tariff regulations and restrictions governing the goods. All customs brokers or representatives are identified by unique bar codes that must be printed on the declarations they process (17).

SHCP may order audits to ensure that the import and export of goods, the information provided on declarations or manifests, and the payment of foreign trade taxes, countervailing duties, and other duties, are in compliance with the Customs Law. It may also demand documents and reports on imported or exported goods, and, as applicable, on the use made thereof. It may continuously inspect and monitor the handling, transportation or possession of the goods anywhere on national territory (15). This may imply a physical inspection of the importer's or exporter's establishment, files and databases.

5.1.5 Statistics

Since 1993, the SAT has been operating the Comprehensive Automated Customs System (*Sistema Automatizado Aduanero Integral*—SAAI), an automated system controlling the operation of the country's 47 customs offices (77). This system covers the entire process, from electronic self-declaration of import and export declarations by customs brokers and representatives, to the entry or exit of goods to and from national territory.

For the purposes of the SAAI, import and export declarations are filed in both paper and electronic formats, the latter on floppy disks. On a monthly basis, customs brokers and representatives provide the customs authorities with statistical information on the declaration, stored on magnetic media.

Once the database for each of the country's customs offices is updated, it is transmitted to the central offices of the SAT in Mexico City for consolidation and processing. The monthly foreign trade figures are then issued and transmitted to the following entities:

- Banco de México: for the balance of trade
- National Institute of Statistics, Geography and Informatics (*Instituto Nacional de Estadística, Geografía e Informática*—INEGI): for use in generating foreign trade statistics
- SE: for development of non-tariff restrictions and regulations for control of foreign trade, as well as programs supporting this activity.

The complete information is received by SHCP, as the database operator, and by the SE. INEGI and Banco de México publish partial statistics derived from this database (46). To obtain complete information on any specific item, such as the import regime, importer or exporter identity, quantities imported or exported, or commercial value, one must apply to the SE, presenting valid reasons why the information is being requested and the intended use thereof. Since much of the information on foreign trade is considered sensitive or even confidential, private applications for such information are often denied (79).

5.2 General Health Law

The General Health Law and its Regulation on Public Health Control of Activities, Establishments, Products and Services (*Reglamento en Materia de Control Sanitario de Actividades, Establecimientos, Productos y Servicios*) defines the system of public health control and regulation, whose purpose is to establish the inspection and enforcement mechanisms governing activities, products, and services that pose a risk to human health (83). In particular, public health regulation and control applies to pesticides, fertilizers, and toxic substances, as well as the activities involved in their production, management, import and export, and the establishments carrying out such activities.

All establishments carrying out activities subject to public health regulation and control require a public health license or permit in order to operate. Applications for such licenses or permits must include a description of the substances or materials that will be managed by the applicant, including commercial and chemical name, Chemical Abstract Service (CAS) number, chemical composition, and Spanish MSDS (82). It is not necessary to keep special logs or records apart from those required

by accounting practices, nor to file periodic reports on the volumes handled or the use of the products in question.

Even where pesticides, fertilizers and toxic substances are subject to public health control and regulation, their registration and import and export are not authorized directly by the Ministry of Health (*Secretaría de Salud*), but rather by an interministerial commission called Cicoplafest.

5.3 Cicoplafest

The Intersecretarial Commission for the Control of the Process and Use of Pesticides, Fertilizers and Toxic Substances (*Comisión Intersecretarial para el Control del Proceso y Uso de Plaguicidas, Fertilizantes y Sustancias Tóxicas*—Cicoplafest) was created on 15 October 1987, with the objective of providing a forum for coordination among the various ministries involved in making and enforcing regulations and policies on pesticides, fertilizers and toxic substances, according to their powers under the relevant laws and regulations (49). The ministries of health; economy; agriculture, ranching, rural development, fisheries and food; and environment and natural resources are represented.

This commission issues permits and registrations for pesticides and nutrients, as well as authorizations to import and export pesticides, fertilizers, and toxic substances within its purview. Pesticides, fertilizers and toxic substances whose importation is subject to regulation by the bodies making up Cicoplafest are listed in the executive order (as amended) establishing the non-tariff regulations governing the importation of such substances, and identifying their tariff classifications in terms of code and description under the Tariff of the General Import Tax Law (*Ley del Impuesto General de Importación*) (48). Only the following compounds of mercury are listed in this executive order: phenylmercury acetate or propionate, mercury cyanate, and mercury thiocyanate, which have been regulated since 1998. Elemental mercury was added to the list only on 17 December 2001.

All permits, registrations and authorizations issued by Cicoplafest are entered into a database containing information on the authorized quantities of each regulated tariff classification and the companies holding such authorization. However, these companies are not required to report the real quantities of pesticides, fertilizers or toxic substances they manage under such authorizations, and therefore no information exists on the real quantities, only the authorized quantities.

5.4 Federal Firearms and Explosives Law and its Regulation

All operations involving explosives and related chemicals, including production, purchase and sale, transportation, storage, import, export, and use, are subject to control and enforcement by the Ministry of National Defence (*Secretaría de la Defensa Nacional*—Sedena) (67). This ministry is responsible for granting permits for these activities. One of the substances regulated by these provisions is mercury fulminate.

5.4.1 Permits

Permits for the production and management of explosives are of three types (43): 1) general, where the activity is carried out on a continuing basis; 2) regular, for each purchase-sale transaction for

which a general permit has already been issued; and 3) special, for anyone who may at some point in the 18 a regulated operation involving explosives. Applications to produce explosives must identify the chemicals involved as raw materials, the finished product specifications, and the quantities involved. Applications for permits for other regulated activities must include information on the materials in question and their quantities (3).

Establishments producing and selling fireworks may sell up to 10 kg total to the public without a permit (4).

Regular and special permits are issued for the import and export of explosives and related substances (5). When these materials are exported, the import permit for the destination country is also required (6). In order to ascertain whether the goods to be exported or imported actually correspond to the permits, each shipment of such materials must be reviewed by Sedena personnel before it enters or leaves the country (34). Authorized carriers of these materials must demand authorized and official copies of the relevant permits from the shippers and/or receivers (33). This does not always occur in practice, at least in the case of imports by land. In general, trucks are secured with locks and are not opened until arriving at their destination, or when they are subject to a review for purposes of the random inspection mechanism (70).

5.4.2 Record-keeping

Persons or companies authorized to produce, manage and/or use explosives and related chemicals must keep a log of all operations performed with these materials, numbered and authorized by Sedena. For each operation, the number and type of the corresponding permit must be indicated (8).

5.4.3 Monthly Reports

Holders of general permits must file detailed monthly reports of their activities, and must keep the documentation relating to their authorized activities on file for five years (7). Production, sales, purchaser identity, warehouse entry and exit records, and inventory must all be noted. Holders of special permits must also file this information while the permit is in effect.

5.5 General Law on Ecological Balance and Environmental Protection

The General Law on Ecological Balance and Environmental Protection (*Ley General del Equilibrio Ecológico y la Protección al Ambiente*—LGEEPA) elaborates on the provisions of the Political Constitution relating to the preservation and restoration of ecological balance and environmental protection. The object of this law is to define the principles of environmental policy and the instruments for its application; to promote sustainable development, and to establish the foundations for the prevention and control of air, water and soil pollution (19). This law was published in the Official Gazette of the Federation (*Diario Oficial de la Federación*—DOF) on 28 January 1988 and was amended twice, on 13 December 1996 and 31 December 2001.

The LGEEPA grants a range of powers to the Federation, acting by the Semarnat, in particular (28). Under this Law, the Ministry regulates high-risk activities; the generation, management and final disposal of materials and wastes that are hazardous to the environment or ecosystems; air pollution

from all sources, and the prevention and control of air pollution from fixed and mobile sources under federal jurisdiction; as well as the use and exploitation of national waters, their distribution and control, and the preservation of their quantity and quality.

The LGEEPA contains various provisions directly or indirectly related to the management, transfer and disposal of mercury, mercury-containing materials, and mercury waste. These general provisions are further detailed in the corresponding regulations and other provisions, as listed below:

- LGEEPA Regulation on Environmental Impact
- LGEEPA Regulation on Air Pollution Prevention and Control
- National Water Law
- Water Pollution Prevention and Control Regulation
- LGEEPA Regulation on Hazardous Waste
- Executive order establishing the classification and coding of merchandise whose import and export is subject to regulation by the Ministry of the Environment, Natural Resources and Fisheries
- Executive order establishing the procedure for returning hazardous waste (SIRREP)

Many states have laws and regulations that were drafted on the model of the LGEEPA. States lacking LGEEPA regulations use the federal LGEEPA as suppletive law. Unless clearly specified otherwise, the following discussion of federal issues also applies to the states.

5.5.1 LGEEPA Regulation on Environmental Impact

In order to carry out works and activities that may cause ecological imbalance or exceed the limits or conditions set out in the Mexican Official Standards (NOM) relating to the protection of the environment and the preservation and restoration of ecosystems, it is necessary to file an environmental impact statement (EIS). This allows Semarnat to assess the environmental impact of such works or activities, and to impose requirements with a view to preventing or minimizing their negative effects on the environment (22).

Works and/or activities requiring prior environmental impact authorization include the following:

- works or activities in the petroleum/petrochemical, chemical, steel, paper, and cement industries;
- facilities for the treatment, containment or disposal of hazardous waste and radioactive waste;
- industrial parks in which high-risk activities may be carried out;
- works or activities corresponding to matters under federal jurisdiction that may cause grave and irreparable ecological imbalance, or harm to public health or ecosystems, or that may exceed the limits or conditions set out in the legal provisions relating to the protection of the environment and the preservation of ecological balance.

The EIS must also contain a detailed description of the works, processes, operations or activities to be carried out, the expected pollutant releases and transfers into air, water, and soil, and the wastes to be generated. It must describe the possible effects on any ecosystem that may be affected by the work or activity in question, as well as any preventive, mitigation or other measures necessary to avert or minimize the negative effects on the environment (71).

For activities considered high-risk, a risk study must be conducted in order to determine the most probable types of accidents and their effects; this study serves as the basis for the development of accident prevention programs (24). High-risk activities are considered to be those involving reportable quantities of substances considered high-risk, as per the two lists published by the Ministry of Government (*Secretaría de Gobernación*) in the DOF for 28 March 1990 and 4 May 1992 (80). These lists contain toxic substances (list 1) and flammable or explosive substances (list 2), respectively. Only the following mercury compounds appear: methoxymethyl mercury acetate (CAS 151-38-2), phenylmercury acetate (62-38-4), mercury chloride (7546-30-7) and ethylmercury phosphate (2235-25-8). Elemental mercury is not on these lists.

In the following cases, it is not necessary to file a formal EIS, but rather a simplified statement called a preventive report (*informe preventivo*) (25): a) where there exist NOMs or other provisions regulating emissions, discharges, natural resource use and, in general, all relevant environmental impacts potentially arising from the work or activity; b) where the works or activities in question are explicitly covered by a partial urban development plan or environmental land-use plan assessed by the Ministry under the terms of the following article [ed: of the LGEEPA], or c) where the facilities in question are located in authorized industrial parks. In these cases, Semarnat analyzes the preventive report and determines whether or not an EIS must be filed.

Once the EIS or preventive report is reviewed, Semarnat issues the corresponding decision to either deny the authorization to for the work or activity as requested, authorize it as requested, or authorize the work or activity conditional on modifications to the project or additional prevention and/or mitigation measures, as the case may be.

Works or activities under federal jurisdiction that are not subject to the environmental impact assessment procedure, are still subject to the environment-related regulations and NOMs, any applicable natural resources law, as well as any provisions set out in permits, licenses, authorizations or concessions required under such provisions.

Environmental impacts potentially caused by works or activities not under federal jurisdiction are assessed by the Federal District or state authorities, with the involvement of the relevant municipalities. The environmental impact procedures followed in the states are practically the same as those used at the federal level, since they are the ones set out in the LGEEPA. Although there are differences between the federal and state EIS forms, the purpose of both is essentially the same, and the discussion here applies equally to both.

5.5.2 LGEEPA Regulation on Air Pollution Prevention and Control

Semarnat has a number of programs and activities to control, reduce, or prevent air pollution. These include an up-to-date inventory of air pollution sources under federal jurisdiction, and coordination of national and regional inventory development with local governments (12).

The operation of fixed sources under federal jurisdiction, or located in zones under federal jurisdiction, that may emit odors, gases, or solid or liquid particles into the atmosphere requires a prior Semarnat license or authorization (11). The following are considered fixed sources under federal jurisdiction: establishments in the chemical, petroleum and petrochemical, paint and dye, automotive, pulp and paper, metallurgical, glass, electrical power generation, asbestos, cement and lime, or hazardous waste treatment industries that are located in the metropolitan area of the Federal District; works or activities located in a state, whose air emissions cause pollution or affect environmental balance in another state; works or activities located on national territory that may affect the environmental balance of other countries; and works or activities which, due to their nature and complexity, require federal involvement.

States are responsible for prevention and control of air pollution generated by sources not under federal jurisdiction (13).

The operation of fixed sources under federal jurisdiction requires authorization in the form of an operating license, which is valid for an indefinite period of time. The persons responsible for these sources must keep inventory of their pollutant releases (42).

When the LGEEPA Regulation on Air Pollution Prevention and Control first took effect in November 1988, air pollution emissions, but no other environmental impacts, were regulated by means of an operating license (*licencia de funcionamiento*). However, under the criteria and strategies of the Environment Program 1995–2000, an Integrated Direct Regulation and Environmental Management System (*Sistema Integrado de Regulación Directa y Gestión Ambiental—SIRG*) was created, one of whose basic features is the Comprehensive Environmental License (*Licencia Ambiental Unica—LAU*) (61).

5.5.2.1 Operating License

The operating license is basically a permit or authorization to operate an air emission source. It is the mechanism originally designed to support record keeping on this type of pollutant release. Federal operating licenses, however, are no longer issued; fixed sources holding them can either apply for the LAU or update their operating license if they modify their processes or increase their production (62). Applicants for an updated operating license must provide information on their processes and operations, raw material consumption, production levels, and sub-product and hazardous waste generation; they must provide an inventory of air pollutant emissions (composition of pollutants and quantities released) (18).

Most states continue to use this form when authorizing new fixed sources, and when updating those that modify their processes or increase their production levels and are not under federal jurisdiction.

5.5.2.2 Comprehensive Environmental License

The LAU is an instrument for direct regulation of establishments under federal jurisdiction as regards air pollution prevention and control. It covers the entirety of the environmental obligations of each establishment, in a single procedure, in the areas of (62):

1. air emissions;
2. hazardous waste generation;
3. hazardous waste treatment;
4. environmental impact;
5. environmental risk;
6. wastewater discharges.

Fixed sources under federal jurisdiction must apply for the LAU: a) prior to setting up or commencing operations (new license); or b) when they are already operating but fail to comply with any of their environmental obligations to the Federation (regularization). Establishments may also apply for the LAU voluntarily (relicensing), where a) they wish to hold a LAU, or b) they are required to hold one or more of the licenses, permits and/or authorizations subsumed under the LAU.

Applicants for the LAU must submit, *inter alia*, the information listed above for the operating license.

A LAU is issued once and definitively, and it must be renewed when an establishment changes industry or relocates. It must be updated for a production increase, plant expansion or change of company name.

Holders of an operating license or LAU must submit an Annual Operating Report (*Cédula de Operación Anual*—COA), no later than the month of April of each year. This authorization also establishes the frequency at which air pollutant emissions from the authorized source must be measured, and in some cases, the maximum contaminant limits (MCL). In the states, the COA filing deadline ranges from November to February of each year.

5.5.2.3 Annual Operating Report

The COA is a multimedia report on pollutant releases and transfers occurred during the previous calendar year (56). Filing of this report is one of the obligations set out in the operating license or LAU. The purpose of the COA is to update the information on an industrial establishment's operations and facilitate its supervision by the environmental authorities. The COA must be submitted within the first four months of each year as established by the license in question or as provided by each state.

The COA contains the following basic information:

- pollutant release and transfer quantities to air, water and soil;
- for generating companies, quantities of such substances transferred outside the establishment, whether for treatment, recycling, reuse or final disposal;

- pollution prevention and control activities, and projected pollutant volumes for the subsequent reporting period;
- information on *in situ* treatment methods.

The COA form consists of five sections, of which only the first two are mandatory:

- I. General technical information (mandatory)
- II. Air pollution (mandatory)
- III. Water use and wastewater discharge (optional)
- IV. Hazardous waste generation, treatment and transfer (optional)
- V. Annual releases and transfers of listed pollutants (optional).

The last section of the COA is the basis of the pollutant release and transfer register (PRTR), whose planned purpose is to compile information on releases and transfers of priority pollutants. This section is organized by substance in order to facilitate the tracking of pollutants. This section is applicable to establishments releasing or transferring any of the 105 substances listed in NMX-AA-118-SCFI-2001 (78). Currently, the filing of this section of the COA is voluntary.

A COA is also required at the state level, on a form modeled on that of the federal operating license. Except for those located in Ciudad Juárez, Chihuahua, practically all maquiladoras are under state jurisdiction as regards air emissions; thus, there is no tracking of mercury releases into water and air.

5.5.2.4 Measurement of Pollutant Releases

Generators of air pollutant emissions are required to measure them at the frequency set out in the license they hold, and to report them at least once a year on the COA (41). Air pollutant emissions must be measured in accordance with the sampling and quantification procedures established by the NOMs. There are 14 NOMs governing air pollution emissions from fixed sources, of which ten set MCLs for specific industries, and four establish them for processes or fixed sources in general (60). The specific standards apply to pollution emissions from: sulfuric acid production plants; cement plants; dodecylbenzenesulfonic acid production processes; volatile organic compounds from the water/oil separation process in petroleum refineries; installation of gasoline recovery systems at service stations in the Valle de México and test methods; glass production processes; chemical recycling processes at pulp mills; new auto body coating operations, and manufacturing of solvent based air dry paints. The general NOMs apply to solid particles from fixed sources; industrial diesel used by fixed sources in the Mexico City Metropolitan Area; indirect and direct combustion heating devices; and specifications for fossil fuels used by fixed sources. These standards also specify the measurement procedures and methods for the corresponding emissions.

There is no specific NOM covering mercury emission limits. Special provisions exist to control mercury emissions from hazardous waste and biological waste incinerators. A draft NOM for cement plants burning hazardous waste as auxiliary fuel is slated for publication. For these processes, a MCL of 0.07 mg/m³ of mercury has been set. This condition was established recently, since previously, the MCL applied to the sum of the cadmium and mercury concentrations (55).

Fixed sources not regulated by the ten aforementioned NOMs are only required to measure their particle and combustion gas emissions, if any, unless special conditions have been imposed. Such special conditions include one applicable to incinerators, and a forthcoming restriction on cement plants burning hazardous waste as auxiliary fuel.

5.5.3 *National Water Law and Regulation*

The purpose of the LAN is to regulate the use and exploitation of national waters, their distribution and control, and to preserve their quantity and quality. The entity responsible for enforcing the LAN is the National Water Commission (*Comisión Nacional del Agua*—CNA). This Commission is a deconcentrated body of Semarnat; among its functions are those of administering national bodies of water and taking all steps necessary to preserve their quality and quantity.

Wastewater discharges into national bodies of water, and wastewater infiltration into soil where groundwater may be affected, are under federal jurisdiction (31). The MCLs for pollutants in wastewater discharges are defined or set out in mandatory NOMs (59). NOM-001-ECOL-1996 sets MCLs for wastewater discharges into national bodies of water and property, while NOM-002-ECOL-1996 sets MCLs for discharges into urban and municipal sewer systems. The CNA may establish special discharge conditions and MCLs for certain types of discharges and bodies of water (37). Control of wastewater discharges into drainage and sewer systems is the responsibility of the states and municipalities.

A CNA permit is required to discharge wastewater into bodies of water under federal jurisdiction (50). Applicants must complete form CNA-01-001, providing information including the origin, quantity and quality of the water supply, the type and method of wastewater discharge, the type of treatment, the body of water to receive the discharge, and the physicochemical characteristics of the discharge. In its decision, the CNA imposes the particular conditions applicable to the discharge, e.g. MCLs different from those set out in NOM-001-ECOL-1996. Enforcement of the MCLs in wastewater discharges under federal jurisdiction is the responsibility of the Office of the Federal Attorney General for Environmental Protection (*Procuraduría Federal de Protección al Ambiente*—Profepa).

Regarding wastewater discharges into urban and municipal sewer systems, there is no one criterion applicable in all the states. In some states, these systems are administered by state-level bodies or commissions, while in others, administration has been devolved to the municipalities. In general, one applies for discharge permits at the municipal level with the representative of the body responsible for this operation. Some municipalities have application forms providing information on the processes and operations of the establishment generating the discharge; the chemicals used; the level of water consumption and the uses made of the water; the type of discharge; the quantity of wastewater to be discharged; and the expected concentrations of the contaminants listed in NOM-002-ECOL-1996. In other municipalities, it is sufficient to submit a letter requesting the permit, indicating only the level of water consumption and the quantity of wastewater to be discharged. MCLs in discharges into sewer systems are enforced by the state or municipal body responsible for water pollution control in that state or municipality (14), although in most cases, due to a lack of resources, there is no control or record of discharge generators under their jurisdictions.

5.5.4 LGEEPA Regulation on Hazardous Waste

Semarnat authorization is required in order to engage in an operation or activity involving hazardous waste (16). This includes operations carried out by the generator; the party providing collection, shipping and/or storage services; and the party operating reuse, recycling, treatment, incineration and/or final disposal systems for hazardous waste. The management and control of non-hazardous solid and industrial waste is a state and municipal responsibility.

The LGEEPA and its regulation clearly establish that the hazardous waste generator is responsible for management and final disposal. It requires the generator to obtain various authorizations, keep certain kinds of records, and file regular reports on its activities. The generator has the following obligations, among others (36):

5.5.4.1 Registration

The company must register as a hazardous waste generator with Semarnat, with a copy to Profepa, using form INE-04-004a, “Notice of Registration as Hazardous Waste Generator” (*Aviso de Inscripción como Empresa Generadora de Residuos Peligrosos*) (88). When a company registers as a hazardous waste generator, Semarnat assigns it an environmental registry number, which must appear on all reports that it files with the authority. Applicants must mention the type and quantity of hazardous waste to be generated, identified by INE number as per NOM-052-ECOL-93 (87) and by code and category as per the following table.

NOM-052-ECOL-93 defines the hazardousness characteristics of hazardous waste. It establishes thresholds above which a waste is considered hazardous due to its toxicity in the environment, which are determined by the toxicity characteristic leachate procedure (TCLP); and it contains lists of hazardous waste identification numbers.

Table 1
Hazardous Waste Codes for Filing Form INE-04-004a

CATEGORY	TYPE	CODE	CATEGORY	TYPE	CODE
USED OILS	DIELECTRICS	O5	OILY SLUDGES		L6
	LUBRICANTS	O1	SLUDGES FROM:	GALVANOPLASTY	L3
	HYDRAULICS	O3		PAINT PROCESSES	L5
	SOLUBLE	O2		METAL TEMPERING	L4
	METAL TEMPERING	O6		PROCESS WATER TREATMENT	L2
	OTHERS (SPECIFY)	O4		WASTEWATER TREATMENT	L1
				OTHERS (SPECIFY)	L7
TARS	CATALYSTS	B1	SOLIDS	FABRICS, LEATHERS OR ASBESTOS CAPSULES	SO1
	DISTILLATION	B2		AUTOMOTIVE MAINTENANCE	SO2
	OTHERS (SPECIFY)	B3		WITH HEAVY METALS	SO5
BIOLOGICAL- INFECTIOUS	CULTURES AND STRAINS	B11		FILTER CAKING	SO3
	SHARP OBJECTS	B12		OTHERS (SPECIFY)	SO4
	PATHOLOGICAL WASTE	B13		SOLVENTS	ORGANICS
	NON-ANATOMICAL WASTE	B14	ORGANOCHLORIDES		S2
	BLOOD	B15	ACIDS		C1
SLAGS WITH HEAVY METALS	FINE	E1	CORROVISVE SUBSTANCES	ALKALIS	C2
	GRANULAR	E2	OTHER HAZARDOUS WASTES (SPECIFY)		O
RESIDUAL PROCESS LIQUIDS	CORROSIVE	LR1			
	NON-CORROSIVE	LR2			

Hazardous wastes are defined in terms of their hazardousness characteristics as corrosive, reactive, explosive, toxic in the environment, inflammable and biological/infectious (CRETIB). For purposes of identification, hazardous waste is classified by generator, industry, and process, as well as by non-specific source as per Tables 1–4 of NOM-052. Table 5 of this NOM lists the leachate characteristics making a waste hazardous due to its toxicity in the environment. For mercury, it sets an MCL of 0.2 mg/l, identified by number INE C.1.06. Hazardous wastes not appearing in any of the aforementioned tables are identified by their CRETIB characteristics and their INE number as per NOM-052.

5.5.4.2 Logs and Reports

Generators must keep a monthly log of hazardous waste generation and a daily log of entries and exits of hazardous waste to and from the storage area (35). Although there is no official form for these logs, they generally include the date, the quantities involved, and the origin or destination of the hazardous waste, as well as the balance or inventory after each movement and at the end of each month. Generators must make these logs available at all times should Profepa wish to examine them.

Generators must also file a semi-annual report on hazardous waste movements on form INE-04-006d, “Semi-annual Report on Waste Sent for Recycling, Treatment or Final Disposal” (*Reporte Semestral de Residuos Enviados para su Reciclaje, Tratamiento o Disposición Final*) (84). This report must be filed even when there was no movement of hazardous waste during the reporting period. It is filed with Semarnat on the required form, and a copy is submitted to Profepa voluntarily or when this agency so requires in the course of an inspection. It identifies the service companies by name and authorization number, the types and quantities of hazardous wastes delivered during the reporting half-year, and the authorization numbers of the carriers.

5.5.4.3 Manifest of Transfer, Shipping and Receipt

In order to transfer hazardous waste to a carrier for shipment to a treatment or final disposal facility, generators must produce, or request from the treatment or final disposal company, a shipping document called “Hazardous Waste Transfer, Shipping and Receipt Manifest” (*Manifiesto para la Entrega, Transporte y Recepción de Residuos Peligrosos*) on form INE-04-005 (85). This manifest contains the following information:

- a) Generator identification, registration number and Semarnat license, if any.
- b) Description of each hazardous waste delivered, including name and CRETIB characteristics, type and quantity of containers, and total quantity of waste. Although the form used for this manifest does not require it, the name and identification number as per the list kept by the Ministry of Communication and Transportation (*Secretaría de Comunicaciones y Transportes*—SCT), contained in NOM-002-SCT2/1994 or the North American Emergency Response Guidebook, whichever applies, are also sometimes noted.
- c) Information for emergencies.
- d) Certification by the generator, with name and signature, that the description of the waste lot shipped is accurate.
- e) Identification of each carrier involved, SCT and Semarnat authorization numbers, vehicle identification, and route.
- f) Certification by carrier with name, signature and date, of receipt of the wastes described in the manifest.
- g) Identification of the recipient, domicile of the treatment or final disposal facility.
- h) Certification by the recipient, with name, signature, title and date, of receipt of the waste described in the manifest, as well as any comments.

Although Article 23 of the Regulation states that “the generator shall acquire from the Ministry the manifest forms required for carriage of the waste, with payment of the corresponding charges”, in practice, service companies print manifest forms with their own numbering sequence. In some cases, generators use blank photocopies of the form, and insert numbers manually (53).

The manifest is completed in one original with three copies. Where the recipient’s facilities are located in Mexico, the original must accompany the shipment to its destination, so that the recipient may certify receipt of the waste or make any comments thereon; it is then returned to the generator in attestation of the final receipt of the waste. One copy is for the carrier, the second for the recipient, and the third is kept on file by the generator until it receives the original back from the recipient. Where, after a period of 30 calendar days following transfer of the hazardous waste to the carrier, the generator has not received the original manifest signed by the recipient, the generator is required to report this fact to Semarnat, attaching a copy of the manifest it still retains. Where the hazardous waste recipients are located abroad, the generator must keep the documents attesting to the release of the hazardous waste shipment from Mexican customs to the destination country.

Generators must keep the original manifest on file for ten years. Carriers must keep their copy for five years, and recipients must keep theirs for ten years (20).

5.5.4.4 Service Providers

The LGEEPA Regulation on Hazardous Waste defines management service companies as natural or legal persons who provide services relating to any of the operations involved in waste management. These companies may provide carriage, temporary storage, reuse, recycling, incineration, or any type of treatment, final disposal or controlled landfilling (23).

All these companies require Semarnat authorization in order to operate. Treatment, landfilling and disposal facilities are bound by the environmental impact assessment procedure. In this case, Semarnat determines whether an EIS or only a preventive report is required. In its decision, Semarnat sets the conditions with which the authorized companies must comply, as well as the logs and records they must keep, and the types and frequency of reports they must file (40).

With the exception of carriers, most service companies are themselves hazardous waste generators, and therefore the obligations of any hazardous waste generator apply to them. Carriers and recipients of hazardous waste must also file a semi-annual report on hazardous waste they receive during the period (21).

Carriers use form INE-04-006d, “Semi-annual Report on Hazardous Waste Received for Recycling, Treatment or Final Disposal” (*Reporte Semestral de Residuos Peligrosos Recibidos para Reciclaje, Tratamiento o Disposición Final*).

All other service companies, except for landfill facilities, file the semi-annual report on form INE-004-006c, “Semi-annual Report on Hazardous Waste Received for Recycling or Treatment” (*Reporte Semestral de Residuos Peligrosos Recibidos para Reciclaje o Tratamiento*).

Hazardous waste landfill facilities file a monthly report on hazardous waste received on the form “Monthly Report of Hazardous Waste Contained at Final Disposal Sites” (*Reporte Mensual de Residuos Peligrosos Confinados en Sitios de Disposición Final*).

Although Article 34 of the Regulation establishes the generator’s obligation to file monthly reports on hazardous wastes sent to landfills, in practice this has never been done, since the forms were never published.

5.5.4.5 Hazardous Waste Importing and Exporting

A Semarnat authorization is required to import or export hazardous waste (29). The requirement for importing is that the hazardous waste must be for recycling or reuse, never for final disposal; for exporting, the hazardous waste must have the authorization of the destination country (39). These authorizations, called *guías ecológicas*, are issued for each volume or shipment imported or exported (30).

Mexico is a State Party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, whose general objective is to set strict controls on transboundary movements of hazardous waste and other waste, in order to protect human health and the environment from the harmful effects that may be caused by the generation and management of such waste (52). For this reason, the requirements of the Basel Convention must be added to those of the LGEEPA and its hazardous waste regulation as conditions for export authorization.

Applications for hazardous waste import or export authorizations are made to the Office of the Deputy Minister for Management of Environmental Protection (*Subsecretaría de Gestión para la Protección Ambiental—SGPA*), Pollutant Management Division (*Dirección General de Manejo Integral de Contaminantes*), and must cover the following requirements, among others (86):

- a) The application must be filed on form INE-04-002/003, “Manifest to Import or Export Hazardous Materials or Waste” (*Manifiesto para Importación o Exportación de Materiales o Residuos Peligrosos*) provided by the SPGA.
- b) Proof of domicile of the recipient or importing company, as the case may be.
- c) Technical specifications and composition of the hazardous waste to be imported or exported.
- d) For imports, authorization as a hazardous waste management service company.
- e) For exports, letter of acceptance of the hazardous waste by the importing company in the destination country.
- f) For exports, OECD export notification form and/or Basel form, provided by the SGPA.

Once hazardous waste has been imported or exported, the person responsible for the transboundary movement must notify Semarnat, indicating the real quantities of hazardous waste involved. For imports, this may be done by a simple memo, while for exports, a transboundary waste movement document on the Basel form is required.

Hazardous waste generated by processes or operations using raw materials imported into the country under the temporary import or maquiladora regime must be returned to the country of origin of the raw materials (35), but an exception to the aforementioned export procedure applies to raw material imports from the United States. In this case, there is an alternative export procedure called “Notice of Hazardous Waste Return” (*Aviso de Retorno de Residuos Peligrosos*), on which the Mexican Hazardous Waste Tracking System (*Sistema de Rastreo de Residuos Peligrosos—SIRREP*) is based (57).

5.5.5 Mexican Hazardous Waste Tracking System (SIRREP)

Based on Annex III of the La Paz Agreement, called “Agreement of Co-operation Between the United States of America and the United Mexican States on Co-operation Regarding the Transboundary Shipments of Hazardous Wastes and Hazardous Substances,” Mexico’s National Institute of Statistics (*Instituto Nacional de Estadística—INE*) and the US EPA developed the HAZTRAKS system in 1995. It has been jointly operated by EPA and INE as well as the Semarnat state offices in the Mexican northern border states since 1995. HAZTRAKS was developed to meet the need for binational capacity to efficiently track transboundary movements of hazardous waste (58). According to official and civil society sources, this system has never served the purposes for which it was created.

With the burgeoning of the maquiladora sector on Mexico’s northern border, and the concomitant increase in transboundary hazardous waste movements, as well as the need to improve the quality of information on these movements and the methods for obtaining it, INE developed SIRREP in 1998 to replace HAZTRAKS. An alternate procedure applicable to exports of hazardous waste generated from raw materials imported under the temporary regime, called the “Notice of Hazardous Waste Return,” was developed (54).

The notice of return procedure is relatively simple. The applicant files a notice of return for each hazardous waste it intends to export, using form INE-04-012 and providing general information on the generator and recipient; identification of the waste by name, CRETIB characteristics, INE number, generic code and EPA code, and shipping data. In practice, the EPA code is rarely used for returned waste.

In the notices of return, the generic code is reported as per the classification given in Table 2, “Classification of Waste by Generic Code.”

The notices are filed in original and copy on a floppy disk. The authorization is issued by returning a copy bearing a seal and notice number to the applicant. Once the hazardous waste is exported, the exporter files a copy of the export declaration with the authority, bearing the notice of return number for each hazardous waste.

Companies located in Mexico’s northern border states file notices of return with the Semarnat state offices. In the rest of the country, they file them with the SGPA in Mexico City.

SIRREP is designed to generate a database containing the Notices of Return and the export declarations. It is designed to work as follows: the information from these documents is entered into

the tracking system and is consolidated every month at the SGPA in Mexico City, where the central SIRREP database is updated (72). In theory, the SGPA transmits the central database of documents, declarations and registered companies to the Profepa office in Mexico City and the EPA region VI office each month. The SGPA also receives the database of US hazardous waste manifests and the manifests of treatment, storage and disposal (TSD) facilities from the EPA region VI office. The state database operators review their databases periodically to detect missing export declarations, and notify Profepa thereof. This is not done in practice(70a).

Table 2
Classification of Waste by Generic Code

Code	Type of Waste	Code	Type of Waste
Solvents		Sludges	
S1	Organic	L1	Wastewater treatment
S2	Organichloride	L2	Process water treatment
Used oil		L3	Galvanoplasty
O1	Lubricant	L4	Tempering
O2	Soluble	L5	Paint processes
O3	Hydraulic	L6	Oily
O4	Other	L7	Others
Residual process liquids		Solids	
LR1	Corrosive	So1	Textile, leather, asbestos, tyvek, etc.
LR2	Non-corrosive	So2	Automotive
Corrosive substances		So3	Filter caking
C1	Acids	So4	Various
C2	Alkalis	Tars	
Slags		B1	Catalysts
E1	Fine	B2	Distillations
E2	Granulated	B3	Others

5.5.6 Hazardous Material Imports/Exports

The hazardous chemicals requiring import or export permits from Semarnat are those that are regulated under the Cicoplafest scheme, and they are authorized through that Commission. The remaining goods subject to Semarnat control for import and export are flora and fauna species and their products listed in the Executive Order establishing the classification and coding of goods whose import and export is subject to regulation by the Ministry of the Environment, Natural Resources and Fisheries, published in the DOF for 30 November 2000.

This executive order specifies that shipments shall be inspected by Profepa personnel stationed at points of entry and exit to and from national territory, with reference to a procedure manual issued by Semarnat for such purpose, although no such manual has yet been officially published.

5.6 Regulation on Ground Transportation of Hazardous Materials and Wastes

The SCT is responsible for enforcing this regulation, whose purpose is to regulate ground transportation of hazardous materials and waste, except those within the purview of the Mexican Army (75).

All units intended for ground transportation of hazardous materials and waste must have an SCT permit. For transfer of hazardous materials and waste, they must provide the following documentation: shipping document for hazardous substances, materials or waste (SCT form); and transfer, shipping and receipt manifest for transportation of hazardous waste (Semarnat form). The SCT shipping document for hazardous substances, materials and waste requests general information on the shipper, the carrier and the point of destination, as well as a description of the materials carried by commercial and chemical name and by the classification given in NOM-002-SCT2/1994, "List of most commonly carried hazardous substances and materials" (*Listado de sustancias y materiales peligrosos más usualmente transportados*) (74).

The primary objective of the SCT shipping document is to be able to identify hazardous material and waste shipments for purposes of emergency response. There is never any requirement to keep a record of these movements nor to produce reports, except for the ones filed with Semarnat in regard to hazardous waste transportation.

6.0 Extent of Cross-Border Trade in Mercury Products and Wastes

To determine the extent of Mexico's international trade in mercury and mercury products, it is necessary to consult the official foreign trade databases created with import and export documents. In the case of cross-border movements of mercury-containing wastes, the information sources must be the data contained in the hazardous waste import/export manifests, or in the notices of return and notifications given by the importers and exporters thereof, as the case may be.

6.1 Mercury and its Compounds

6.1.1 Publications

All information concerning foreign trade is first obtained by SHCP through the SAAI, which is shared with the SE (47). These two ministries relay summaries of this information to INEGI, Banco de México and Banco de Comercio Exterior (Bancomext), for different purposes and with different content in each case. Each of these entities processes SHCP database and extracts the information of interest to it. INEGI is the body responsible for integrating the Mexican Statistical and Geographical Information Systems (*Sistemas de Información Estadística y Geográfica*) and for promoting and guiding IT development in the country.

As a result of the collaboration between SHCP, Banco de México, SE and INEGI, a bulletin of monthly foreign trade statistics on Mexico is published (1). The purpose of this publication is to provide up-to-date information on the country's trade transactions with the rest of the world. The report includes data on the main characteristics of Mexico's foreign trade structure, and the volume and value of goods exchanged with other nations. It provides figures on the balance of trade by country and geoeconomic zone. Based on the information compiled and processed during the year, INEGI also publishes a foreign trade yearbook, *Anuario Estadístico del Comercio Exterior*(63), containing information on exports and imports of goods. The yearbook details the entry and exit of goods involved in the maquiladora process, and provides synoptic tables for handy reference on relevant aspects of foreign trade.

For its part, the SE publishes foreign trade statistics on the Internet through the Commercial Information System (*Sistema de Información Comercial*) (77), which is also found in the Banco de Comercio Exterior databases. These databases also contain the names of the exporters and importers of each item, specifically identified by tariff classification. All information contained in the aforementioned documents is available to the public, most of it at no charge. Sections containing more specific information can be obtained by annual subscription.

6.1.2 Limitations

These being general interest publications, they do not contain the complete SAAI data, nor do they separately itemize all tariff classifications; instead, these are grouped by sector or type of goods. For example, they do not provide separate data on foreign trade in mercury oxide, mercury chloride, nor mercury fulminate, among other compounds of this metal (76).

To take one example: mercury oxide is classified under item 2825.90.99 as follows:

- *Chapter 28*: Inorganic chemicals; inorganic or organic compounds of precious metals, radioactive elements, rare earth metals or isotopes.
- *Heading 2825*: Hydrazine and hydroxylamine and their inorganic salts; other inorganic bases; other metal oxides, hydroxides and peroxides.
- *Subheading 282590*: Others.
- *Item 28259099*: Others

In contrast, the SAAI database, and hence the SHCP and SE database, does contain enough information to identify each imported or exported item, since it identifies them by item number and by description or real name. Thus, for example, although the INEGI and Bancomext publications do not contain specific information on mercury oxide, which is simply classified as “2825.90.99: Other”, the original SAAI database contains the description “mercury oxide; 2825.90.99: Other.”

However, some mercury-containing devices that are components of other equipment or devices, such as thermostats, thermometers, manometers, etc., are not classified separately, but rather grouped under a single heading with other devices of the same type that do not contain mercury. Examples include rough glasswork for thermometers, which are classified as follows:

- *Chapter 90*: Optical, photographic or cinematographic measurement, control or precision instruments and devices; medical/surgical instruments and devices; parts and accessories for these instruments and devices.
- *Heading 9025*: Densimeters, areometers, hydrometers and similar floating instruments, thermometers, pyrometers, barometers, hygrometers and psychrometers, even if recorders, including combinations thereof.
- *Sub-heading 902511*: Thermometers and pyrometers, not combined with other instruments, liquid, direct read.
- *Item 90251101*: Glass for production of glass thermometers, ungraduated, with or without vacuum, with or without mercury.

Since elemental or metallic mercury is also an important metal in the country’s mining operations, all foreign trade in this element is itemized separately, with data on commercial value, country of origin or destination, year (since 1990 in electronic format), importer and exporter.

Therefore, one may conclude that, except for elemental mercury and some of its compounds described by name in the import and export documents, even when the tariff classification is “other,” it is possible to ascertain the volume of transboundary trade. For other substances or items whose description does not clearly indicate that they contain mercury, it is impossible to determine the volume of international trade.

6.2 Mercury-containing Wastes

The hazardous waste import and export manifests and the notices of return provide information on the quantities of hazardous waste authorized for import, export or return. This information is consolidated, processed and updated in the central SGPA database each month. The persons or companies authorized to carry out these transboundary movements must report the real quantities of hazardous waste imported, exported or returned. However, not all hazardous waste exporters strictly fulfil this obligation (68). A new return is not supposed to be authorized if the interest party has not reported its transboundary movements under prior permits; however, as the databases are not updated it is not possible to discern whether the information has not been received or processed, and thus sometimes authorizations are granted without having received the corresponding reports. For that reason, only authorization figures are available, not the real quantities of hazardous waste exported or returned.

Concerning hazardous waste imports, the only hazardous wastes currently imported into Mexico are zinc-rich baghouse dust from certain steel plants, lead acid batteries, and used catalytic converters, all of which are to be reprocessed in Mexico (70a, 72). The companies importing these hazardous wastes issue monthly reports on the quantities imported. The information must be requested by applying to the SGPA, since it is confidential. As some of these wastes are not classified as hazardous in the United States, the EPA does not need to be notified of its export into Mexico. However, even where the EPA does classify it as hazardous waste, such as the zinc dust, HAZTRAKS does not contain up-to-date information on these zinc dust movements. In the case of zinc dust, the last data recorded by the EPA in this system dates back to 1995 (65).

The difference in the classification of hazardous waste in Mexico and the United States makes it difficult to exchange information on the transboundary movement of hazardous waste.

7.0 Existing Control and Reporting Mechanisms for Import and Export of Mercury-Related Products and Waste

The Customs Law, the Cicoplafe procedures, the Federal Firearms and Explosives Law and the LGEEPA and their respective regulations contain provisions establishing various mechanisms for the control and recording of transboundary movements of mercury and its compounds for manufacture or production, and the hazardous wastes derived from mercury or containing it. These mechanisms are discussed above under the section for each legal provision, and therefore only a brief summary is provided below.

7.1 Customs Law

Import and export declarations, as well as the commercial invoices for the goods they cover, are key documents making it possible to control and record the transboundary movement of goods. These documents identify the goods being imported or exported, the quantities thereof, and the recipient.

Since importers are required to keep an inventory control system as part of their accounting records, it is possible to track goods imported into the country at least until their first destination, i.e., the importer. Except for maquiladoras and companies whose export programs are authorized by the SE, importers are not required to report the destination of the goods they import; they can distribute them as they see fit, without being subjected to tracking mechanisms.

Maquiladoras and companies with export programs authorized by the SE and operating under the temporary import regime must return the products produced from the goods they import, as well as their wastes and surpluses. The proportion of inputs declared in the authorized programs may be deducted from the total on the import declarations.

7.2 Cicoplafest

A Cicoplafest permit is required to import or export the pesticides, fertilizers and toxic substances listed in the Executive Order establishing the non-tariff regulations applicable to the importation of such substances and identifying the tariff headings in terms of their code and description under the Tariff of the General Import Tax Law.

Since this Commission is essentially a coordinating body, it lacks the power to impose requirements additional to those set out in the laws, regulations and standards enforced by the bodies of which it is composed (51). Thus, where import and export control and registration is concerned, its role has been to review, and as applicable, authorize applications to import the materials regulated in this way. It does not receive reports of the actual quantities imported or exported, so it can only quantify the total authorized (69). The mercury compounds listed in the executive order are limited to phenylmercury acetate or propionate, mercury cyanate and mercury thiocyanate, which have been regulated since 1998. Elemental mercury was added to the list only on 17 December 2001.

7.3 Federal Firearms and Explosives Law

Regular and special permits for import and export of explosives and related chemicals issued by Sedena, as well as customs import and export declarations, commercial invoices, and, as applicable, import permits from the recipient countries, are items used to control and record the transboundary movement of this type of materials and substances. Only the holders of general permits for the production, management or use of explosives and/or fireworks are allowed to engage in these import and export operations. Among the substances regulated by these provisions is mercury fulminate.

In order to ascertain that the goods exported or imported correspond to the permits, each shipment of such materials must be reviewed by Sedena personnel before it can enter or leave the country; at least in the case of imports, this is not always done as provided. Authorized carriers of these materials must demand authorized copies of the permits from the shippers and receivers.

Import and export permit holders must keep logs of these operations, and file monthly reports on the movements of these materials.

7.4 General Law on Ecological Balance and Environmental Protection

The LGEEPA establishes mechanisms for the control and recording of transboundary hazardous waste movements, involving authorization procedures to import and export this type of waste, which are administered by the SGPA. Control and tracking of the movements of hazardous wastes generated by maquiladoras or companies operating under the temporary import regime are controlled by means of notices of return under the SIRREP system. In other cases, a hazardous waste import and export manifest is used, along with authorizations known as *guías ecológicas*, issued for each volume or shipment. Additional forms used for exporting hazardous waste are the notification and manifest covering transboundary hazardous waste movements under the Basel Convention.

The holders of authorization for transboundary movements of hazardous waste must report the actual quantities of waste involved in these operations.

8.0 Feasibility of Transboundary “Cradle-To-Grave” Tracking of the Transboundary Movement of Mercury-Related Products and Wastes

The LGEEPA and its Regulation on Hazardous Waste provide the basic framework for tracking hazardous wastes from generation or import to disposal or export. In this tracking process, Profepa, by virtue of its inspections, plays a more effective role in practice than Semarnat, even though this is the only source of its information. Profepa has inspected nearly 33 percent of hazardous waste generators and management service providers (70).

Tracking begins with the generation entry made by the generator in its daily log of movements into and out of its temporary hazardous waste warehouse, in which case the balance or inventory must be updated. Profepa inspectors may check the physical hazardous waste stocks against the balance or inventory recorded in this log. If there is a surplus or deficit, the agency may presume that there is a scheme for clandestine disposal of hazardous waste and proceed accordingly.

The transfer of hazardous waste out of the generator’s temporary warehouse to a service company, whether for reuse, recycling, treatment or final disposal, and whether in the country or abroad, are documented in the daily log and in the transfer, shipping and receipt manifest in the case of export or return. Except in the case of exports or returns, generators must receive the original of the receipt manifests signed by the recipient; if they do not, they must notify Semarnat, which in turn should notify Profepa so that it may investigate accordingly. During a Profepa inspection, the records of transfers out of the warehouse may be compared with the quantities indicated on the manifests, and the latter are checked for the recipients’ signatures. Any discrepancy between the compared quantities may lead to an investigation. If a manifest does not bear the acknowledgement of receipt signature and Semarnat was not notified accordingly, Profepa presumes that the hazardous waste was not delivered, and was therefore disposed of clandestinely.

In the case of hazardous waste exports or returns, the person responsible must file a copy of the authorized export declaration with Semarnat. This does not always occur, or at any rate not promptly, and hence the SIRREP databases are not up-to-date, at least as regards the actual quantities of hazardous wastes exported to other countries. Profepa requires a copy of the declaration released by customs in the destination country as proof that the hazardous waste has crossed the border, which only evidences that customs released the shipment; in no case does it evidence the final disposal of the waste..

In the case of hazardous waste imports, tracking begins with the import declaration, the commercial invoice and the transfer, shipping and receipt manifest produced for the movement of the hazardous waste from the customs entry point to the facilities of the importer, who is the “generator” for legal purposes, or to the company that will provide the reuse or recycling service.

Both the generator and the domestic service companies, including the carrier, file monthly or semi-annual reports of hazardous waste movements with Semarnat. Previously, these reports indicated each movement occurred during the reporting period by date and type of waste. In the event of an inspection, it was then possible to compare them with the warehouse logs and with the manifests produced during this period. Currently, it is only required to report the total quantity of each

hazardous waste managed during the reporting period, identifying the service company and the carrier or generator, but without indicating the date of each movement nor the quantity of hazardous waste managed on each occasion. Nor is it necessary to file a copy of the transfer, shipping and receipt manifests documenting such movements. Thus, Semarnat has no way to ascertain the truth of the information provided on these periodic reports.

These reports are filed with the Semarnat state offices or the SGPA in Mexico City, depending on the domicile of the generator and service companies. If the generator and recipient, for example, are located in different states, the reports go to different Semarnat state offices. Each Semarnat state office enters the information into electronic forms and sends it to the SGPA, where it is consolidated with the central database.

In theory, it should be possible to compare the information contained in the generator, carrier and recipient reports, where the recipient is domestic, or the import or export declarations for transboundary movements; however, there is no computer program to support these comparisons. Even if such a program were to exist, Semarnat does not currently have the capacity to enter all this data, and so its databases are not up-to-date. Profepa could make these comparisons if it were, for example, to conduct inspections of the generator and recipient and to compare the information in the logs, manifests and reports. However, this would only be possible where the generator and recipient are located in the same state, since otherwise, the inspecting Profepa office would not have access to the documents generated or filed in a different state. In addition, in the case of an inspection where the generator, carrier and recipient are in different Mexican states, the waste tracking would take place in at least three different inspection actions, which would make information sharing considerably difficult and delayed. Moreover, Profepa state offices do not exchange such information, nor do they currently have the capacity to do so.

Although the LGEEPA Regulation on Hazardous Waste provides that transfer, shipping and receipt manifests must be acquired from Semarnat, this does not occur in practice. Rather, each service company prints its own manifests with its own folio numbers, while the generators may use photocopies of the forms published in the DOF, again with their own numbering systems. This means that there is no single numerical sequence of manifests used, and different manifests may bear the same folio number. This situation makes it difficult to distinguish between manifests legitimately produced by a generator or service company to document legal hazardous waste movements, and spurious manifests produced with the intent of hiding clandestine hazardous waste disposal. For example, in the state of Sonora, the Profepa office detected false manifests whereby hazardous waste receipt was attributed to a legal service company.

All of the above—added to the fact that recipients may be, and often are, located in different states from generators—makes it difficult, sometimes practically impossible, to determine whether the receipt signature on a manifest is legitimate or not, or whether hazardous waste was actually delivered to the recipient's authorized facilities. This creates a serious gap in the authorities' capacity to track hazardous waste.

In the case of exports, there is a similar lack of information enabling the authorities to ensure that the hazardous waste exported is delivered to the premises of the treatment, storage or disposal companies as claimed. This is because the exporter has no obligation to file a copy of the EPA

manifest signed by the recipient. Even if it did, there would be no way to determine whether the copies came from legitimate or spurious manifests. Apparently, the tracking of such shipments is also impossible with HAZTRAKS, mainly because the EPA is interested in ascertaining the volumes of hazardous wastes imported, not the recipients thereof (89).

9.0 Summary and Analysis

9.1 Customs Law

Mechanism	Type of Information	Quantity and Quality of Information	Manageability of Information	Comments
Import and export declarations	Identify goods to be imported and exported under the Tariff of the General Import and Export Law and the quantities thereof.	The information is of a legal nature. Good quality and quite reliable. The proper identification of the goods and quantities is checked randomly. Providers of incorrect information are liable to penalties.	Good: the data is entered, consolidated and processed electronically.	Some mercury-containing items are not specifically identified. Efficient tracking is not guaranteed. Statistics are published in part.
Importer inventory control system	Warehouse entry and exit records for imported goods and inventory thereof.	Average. Subject to verification by means of audits.	Manual in many cases.	No way to track the final destination of goods.
Maquiladora and export programs	Maximum quantities of inputs to be imported, estimated proportion of losses and waste, and maximum production volumes.	Does not apply. The information is provided for the purposes of authorizing the programs.	Good: provided in electronic form.	No way to track the final destination of the goods.

9.2 Cicoplafest

Mechanism	Type of Information	Quantity and Quality of Information	Manageability of Information	Comments
Import and export permits	Identifies goods and quantities for which authorization is requested.	Does not apply, since these data are for purposes of obtaining authorization.	Poor: it is filed on paper and data entry is not immediate.	<p>The great majority of mercury compounds are not regulated. To date, only elemental mercury and three of its compounds are regulated.</p> <p>No way to track the final destination of the goods.</p>

9.3 Federal Firearms and Explosives Law

Mechanism	Type of Information	Quantity and Quality of Information	Manageability of Information	Comments
Import and export declarations	Identifies explosives and fireworks and the quantities exported or imported.	The information is of a legal nature. Very good quality and quite reliable. Sedena personnel generally checks the correct identification of the goods and quantities. Providers of incorrect information are liable to penalties.	Poor: it is filed on paper and data entry is not immediate.	Only one mercury compound, mercury fulminate, is regulated. Efficient tracking is not guaranteed.
Activity records	Type of operations performed, goods and quantities managed.	Good overall.	Poor: manual in many cases.	Efficient tracking is not guaranteed.
Monthly report	Operations performed, goods and quantities managed.	Good overall.	Poor: filed in manual form.	Efficient tracking is not guaranteed.

9.4 LGEEPA

Mechanism	Type of Information	Quantity and Quality of Information	Manageability of Information	Comments
Environmental impact statement	Description of processes and operations to be performed. Chemicals used. Expected production. Estimates of air emissions, wastewater discharges, and hazardous waste generated.	Does not apply, since the data provided are for purposes of authorization. The figures are maximum estimates. Scattered information in the regional offices.	Good, since provided on paper and diskette.	No way to track the final destination of the chemical substances being used or the waste generated.
Operating license and/or LAU	Description of processes and operations to be performed. Chemicals used. Expected production. Estimates of air emissions, wastewater discharges, and hazardous waste generated.	Does not apply, since the data provided are for purposes of authorization. The figures are maximum estimates.	Good for cases under federal jurisdiction, since provided in electronic format. State requests are filed on paper.	No way to track the final destination of the chemical substances being used or the waste generated.
COA	Quantities of air, water and soil pollutant releases and transfers. Transfers outside the establishment.	Only requires submitting the part relating to air emissions. The transfer section is voluntary. Only a limited number of sources are required to measure mercury emissions.	Irregular, since the information is provided in paper and electronic formats. Data entry is not immediate.	No way to track the final destination of the chemical substances being used or the waste generated.
Wastewater discharge permits	Quantities discharged and pollutants present in discharge.	Does not apply, since the data provided are for purposes of authorization.	Generally filed in paper format.	Insufficient elements to track pollutants in the discharges.

.....cont. LGEEPA

Mechanism	Type of Information	Quantity and Quality of Information	Manageability of Information	Comments
Generator registration	Estimated quantity of hazardous waste to be generated; INE identification no. and waste code; CRETIB characteristics; type of treatment or final disposal.	In general, the composition of the waste is not identified and the information submitted is based on estimates.	Paper format, data entry not immediate.	In some cases, it is impossible to identify the wastes that contain mercury or the concentration thereof. No way to track the final destination of the waste.
Generation logs	Entries and exits from temporary warehouse, origin and destination of hazardous wastes, and warehouse inventory.	Very good overall. Subject to verification by Profepa.	Generally manual.	Contains elements to begin tracking the final destination of the waste.
Transfer, shipping and receipt manifests	Description and quantities of hazardous wastes; identification of service companies.	Very good overall. Subject to verification by Profepa.	Manual	No control over printing, and there is no single numerical sequence. Contains elements for tracking the final destination, but lacks mechanisms to ensure efficiency.
Import and export manifests, notices of return.	Description and quantities of hazardous wastes; identification of service companies.	Does not apply, since the information is provided for the purpose of obtaining authorization. The hazardous waste quantities are estimates.	Good, since data provided in electronic format.	Contains elements to begin tracking the final destination of the waste.
Import/export notifications, notices of return.	Description and quantities of hazardous wastes; identification of service companies.	Very good overall since based on real quantities.	Generally submitted on paper and data not entered immediately.	These notifications are not always filed, so not all information on these movements is available.

9.5 Regulation on Ground Transportation of Hazardous Materials and Waste

Mechanism	Type of Information	Quality and Reliability of Information	Manageability of Information	Comments
Shipping document	Identification of quantities and substances, and service company information.	Very good overall since based on real quantities.	Submitted on paper, no data entry.	In some cases it is not possible to identify wastes containing mercury. Insufficient elements for tracking the final destination of the waste.

10.0 Conclusions and Recommendations

A variety of legal provisions in Mexico establish procedures for regulation and control of operations involving mercury, as well as substances, products and hazardous waste containing it. However, most of these procedures are not designed to generate information and records making it possible to track movements of these materials from cradle to grave.

The Federal Firearms and Explosives Law is one legal provision that does provide some mechanisms for tracking the use and disposal of the materials it regulates. However, since very few explosives or fireworks contain mercury (e.g., mercury fulminate), the law has limited applicability to it.

The SAAI is the most complete information source available on imports and exports occurring from month to month. This database indicates the goods and quantities imported and exported, as well as the importers and exporters. However, due to the manner in which some goods are identified and classified under the Tariff of the General Import and Export Law, it is not always possible to distinguish or describe articles or devices containing mercury separately, since they are grouped under a single heading with similar items or devices not containing mercury. This is the case, for example, with glass for glass thermometers, with or without mercury, which are all classified under a single tariff heading. This feature of the goods identification and classification system makes it impossible to ascertain the total volume of imports and exports of mercury and its compounds.

In any event, the recording mechanisms established by the Customs Law and regulation do not make it possible to track the movement of imported goods beyond the importer's premises. As for exports, there is no way to determine the fate of goods once they leave the country.

The LGEEPA contains various provisions specifically designed to gather the information necessary to track hazardous waste, including waste derived from mercury or containing it. However, there are some gaps and deficiencies that make it difficult to use these tracking features fruitfully and undermine the institution's capacity to track wastes "from cradle to grave," that is, from its generation or importation into the country through its final disposal, whether domestically or abroad.

To start with, Semarnat has not thus far exhibited the capacity to enter and process all mandatory data filed by generators and service companies in relation to their hazardous waste activities, i.e. generation, shipping, storage, reuse, recycling, treatment and disposal. At best, the databases are not updated, and in some cases there are backlogs of over a year. In addition, some information is simply unavailable, such as that concerning the real quantities of hazardous waste exported or returned, since the persons responsible for these operations do not always report them.

The new monthly and semi-annual report form that must be filed by service companies and generators, respectively, creates another significant gap in the chain of information necessary to manage hazardous waste. Hazardous wastes are identified on these forms by the INE number and the generic codes for each waste type. In some cases, it is impossible to determine from the INE number or generic code whether a hazardous waste contains mercury. Thus, an opportunity is lost being lost to collect information that could serve to determine the fate of some mercury-containing hazardous waste.

Semarnat does not receive copies of the transfer, shipping and receipt manifests with the periodic hazardous waste movement reports, so it cannot use the manifests to verify the accuracy of the data contained in these reports. Profepa, on the other hand, can make this verification during its inspections. However, the new report forms call for the total quantity of each hazardous waste managed during the reporting period, not for each movement, as previously. It is no longer possible to directly compare the quantities reported with those contained in the manifests, and this hampers the management of the information. Furthermore, neither Semarnat nor Profepa verify that the waste code or number has been properly identified.

An additional obstacle to tracking hazardous waste, even for Profepa, is that the service companies and hazardous waste generators file their monthly and semi-annual reports, respectively, with the Semarnat office in the state in which they are domiciled. For example, a generator in Sonora that sends its waste to a landfill site located in Nuevo León files its semi-annual report with the Semarnat Sonora state office, while the landfill company files its report with the Nuevo León state office. Neither Semarnat nor Profepa has a program for comparing data on a single waste contained in inspection reports filed in different states.

Moreover, there is no control over the printing of manifests. Any company can print them and arbitrarily assign folio numbers. As a result, it is difficult to distinguish between a legitimate manifest and a spurious one.

Finally, concerning hazardous waste exports, neither Semarnat nor Profepa has the information necessary to determine the fate of waste once it crosses the border.

The difference in the classification of hazardous wastes among the countries makes it highly difficult to exchange hazardous waste information among them.

Based on the above, and considering that the key control and reporting mechanisms for the improper disposal of hazardous materials and waste involve the generation, handling, transportation and final disposal of hazardous waste, this section will only include recommendations to improve the tracking of movements of such waste.

1. Official control should be established over the issuance of transfer, shipping and receipt manifests, with a unique numbering system, so that no two manifests can have the same number or folio.

2. Manifests should only be available directly from Semarnat, which should keep a record of the form numbers issued to generators and service companies. In this way, it will be possible to identify the legitimate user of the manifest from its number. To improve the information management, the folio numbers may also be printed with bar codes.
3. The above measure could be complemented by updating the register of generators and service companies. Each manifest would include the numbers of the generator, carrier and recipient, also using bar codes. Due to the magnitude of this measure, the updating of companies receiving the final disposal of waste could be included.
4. Sufficient resources must be allocated to enable Semarnat to enter and process the data it receives in a timely manner. This would have the advantage of being able to authorize or deny the import, export or return of waste, depending on whether the applicant has given prior notice of the shipments.
5. Profepa should establish a central-server database, in which the regional offices could enter information on waste obtained in the corresponding inspections, allowing for the full and timely tracking of the waste, and of the handling thereof, from the generator, carrier and to the final recipient. This database would allow for the detection of discrepancies in the information on persons involved in the waste handling, in order to determine the need to establish new inspections with regard thereto.
6. The monthly and semi-annual reports filed by the generators and service companies should indicate the quantities of waste involved in each movement and the corresponding manifest numbers. These reports would also be useful for generators and service providers with bar codes.
7. The homologation of North American hazardous waste classifications should be considered, which could require legislative changes that the countries are not always willing to undertake. A relatively simple automatic reporting procedure could be attempted, for the movement of waste classified as hazardous in one country but not in the other.

This procedure could establish that importers or exporters of this type of waste are required to report such movements to the respective environmental authorities of the country where the waste is not deemed hazardous, and to obtain confirmation of receipt of such notice. The classification, number and codes and the country where the waste is hazardous would be used.

For example, if a waste classified as non-hazardous in the United States or exempt from the paperwork required for handling hazardous waste is imported into Mexico, or exported from Mexico where it is classified as hazardous, the

importer/exporter in Mexico would have to notify the EPA of the movement undertaken and obtain confirmation of such notice. Similarly, in the case of a waste classified as hazardous in the United States but not in Mexico, the U.S. importer/exporter of the waste would be required to give notice of the movement to Semarnat and/or Profepa. This would generate a database that could be shared among the three countries in the region.

The Mexican and U.S. working groups on the transboundary movements of hazardous waste, under Annex III of the La Paz Agreement, could develop this procedure and define the details thereof.

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