



**Ministry of Environment
Government of Pakistan**



DRAFT

NATIONAL MERCURY WASTE MANAGEMENT PLAN OF PAKISTAN

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In collaboration with

**UNITED NATIONS ENVIRONMENT PROGRAM (UNEP) Chemicals Branch,
Geneva, Switzerland**

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Islamabad, June, 2010**

DRAFT NATIONAL MERCURY WASTE MANAGEMENT PLAN

GOALS AND OBJECTIVES

The overall goal of the National Waste Management Plan for mercury is to improve the quality of life of people of Pakistan and to conserve aquatic resources by reducing mercury releases to environment through ensuring provision for mercury alternatives at all levels at an affordable cost and in an equitable, efficient and sustainable manner. The objectives of the plan are:

1. Replace mercury products with mercury alternatives in future.
2. Ensure protection and safety of all people working/using mercury for different purposes.
3. Encourage community participation and empowerment in planning, implementation, monitoring and operation of safe disposal of mercury.
4. Promote cost effective and appropriate technological option for proper handling of mercury.
5. Increase public awareness about mercury releases, their toxicity and proper disposal through media and formal education.
6. Promote public-private partnership for enhancing access to Environmentally Sound Management system for mercury disposal.
7. Application of Basel convention technical guidelines on mercury uses sectors like Chlor alkali industry, Health sector (especially dental amalgams) and light sources sector.
8. Up gradation and enforcement of relevant legislation in the country.
9. To encourage NGOs and individual researchers to identify regional mercury hazards and entertains their suggestion.

1. EXISTING NATIONAL FRAME WORK FOR THE MANAGEMENT OF HAZARDOUS WASTE

.1. National Environment Policy

.1.1. Waste Management Plan

According to this plan, pollution caused by liquid and solid waste in the country would be prevented and reduced. For this purpose, the government may;

- a) Strictly enforce the National Environmental Quality Standards (NEQS) and self monitoring and reporting system.
- b) Encourage reduction, recycling and reuse of municipal and industrial solid and liquid wastes.
- c) Develop and enforce rules and regulations for proper management of municipal, industrial, hazardous and hospital waste.
- d) Develop and implement strategy for integrated management of municipal, industrial, hazardous and hospital waste at national, provincial and local level.
- e) Sustainable management of pesticides/agrochemicals.
- f) Coordinate with NGOs and individual researchers to highlight different mercury hazards in country.

.2. Relevant laws

.2.1. Toxic or hazardous substances

- The Pakistan Penal Code (1860)
- The Explosives Act (1884)
- The Factories Act (1934)
- The Agriculture Pesticide Ordinance (1971) Rules (1973)

.2.2. Solid Wastes and Effluents

- The Factories Act (1934)
- The Balochistan, NWFP, Punjab and Sindh local Government ordinance (s) (1979/80).
- Pakistan Environmental Protection Act, 1997.
- Hospital waste management Guidelines 2005.
- Solid waste management Guidelines 2005.

1.3. National Environmental Quality Standards (NEQS) for mercury (mg/L)

1.3.1. For Municipal and Liquid Industrial Effluents (mg/L)

Parameter	Into Land Waters	Into Sewage Treatment	Into Sea
Mercury	0.01	0.01	0.01

1.3.2. For Industrial Gaseous Emission (mg/Nm³)

Parameter	Source of emission	Existing standards	Revised standards
Mercury	0.01	0.01	0.01

1.4. Pakistan Environmental Protection Act, 1997

1.4.1. Prohibition of Import of Hazardous Waste under Section 13

No person shall import hazardous waste into Pakistan and its territorial waters, Exclusive Economic Zone and historic waters.

1.4.2. Handling of Hazardous Substances Section 14

Subject to the provisions of this act, no person shall generate, collect, consigns, transport, treat, dispose off, store, handle or import any hazardous substance except ____

- a) Under a license issued by the Federal Agency and in such manner as may be prescribed; or
- b) In accordance with the provision of any other law for the time being in force or of any international treaty, convention, protocol, code, standard, agreement or other instrument to which Pakistan is a party.

2. NATIONAL AGENCIES/DEPARTMENTS RESPONSIBLE FOR HAZARDOUS WASTE

- Ministry of Environment
- Federal & Provincial EPA's
- Ministry of Commerce
- Ministry of Industries and Production
- Federal Board of Revenue
- Ministry of Health
- Ministry of Science and Technology
- Ministry of Food and Agriculture.
- Ministry of Petroleum and Natural Resources.
- City District Governments.

2.1 Regulatory Authorities

Regulatory authorities for all hazardous substances and waste including mercury are EPA's (Federal & Provincial).

3. SECTORAL MANAGEMENT PLAN FOR MERCURY

3.1. Plan for Chlor-alkali Sector

Mercury is used as a catalyst in industrial processes to produce chlorine and caustic soda (in mercury-cell of Chlor-alkali plants). In Pakistan, few industries which were using mercury few years back, have now phased-out mercury from their industrial processes. Currently, Ittehad chemical industry is using mercury for its industrial processes.

Following guidelines can help in proper management of mercury and its uses for different industrial processes.

1. As a start, any Industry that uses mercury in its operation should have a specific written plan for dealing with mercury. This plan ought not only to demonstrate compliance with all government regulation but fulfill environmental standards, as necessary.
2. Industry should have a clear policy for the quantity of mercury used and releases through its practices and products.
3. Each industry using mercury should prepare a mercury balance each year. Reporting how much mercury entered the process and how much was emitted.
4. Industry management should also be generally aware of the movement of its emission into the upper atmosphere or local atmosphere and its deposition respectively.
5. Industry should also know precisely where and how its mercury waste is disposed off.
6. The Workers dealing with transport, storage, use and disposal of mercury containing chemicals must be fully and clearly informed about the possible hazards of mercury at any stage.
7. All mercury containers must be kept tightly closed when not in used. Liquid mercury and mercury containing waste must be stored in a cool place.
8. Mercury collection drums must be protected from rain fall and secured from theft and/ or to protect against unauthorized opening.
9. Post clear visible signs in the mercury storage area. Access to the storage area should be limited.
10. Mercury storage site should have a fire alarm system.

11. Segregate mercury and mercury containing items/waste from all other types of waste.
12. With regard to the mercury-cell process, mercury releases to the air from the cell room. Preventive measures and good management practices can significantly reduce these emissions.
13. Preventing or limiting the use of obsolete technology and/ or requiring the use of the best available technology to reduce or prevent mercury releases.
14. Membrane cell technology being the cost efficient because of lower electricity input required and eliminating the use and emission of mercury during manufacture should be preferred.
15. The primary mercury emissions to air occur during virtually any maintenance procedure that opens the system, as well as from the end-box ventilation system and the hydrogen gas vent. Several control techniques may be employed to reduce mercury levels in the hydrogen streams and in the end box ventilation systems. The most common techniques are (1) gas stream cooling, (2) mist eliminators, (3) scrubbers, and (4) adsorption on activated carbon or molecular sieves.
16. Pollution control measure should consider a wide range of pollutants including mercury, particularly when construction of new facilities.
17. Industry should have a good understanding of its mercury waste situation. how much mercury waste is generated, what type of waste (sludge's, filter cake, tailings, ash, slag, etc.) as generated, what is the approximate mercury content of the different types of waste, as under what conditions may waste be stored?
18. Any mercury containing waste or materials stored on-site by an industry or commercial operation must be in air tight and water proof containers and that the organization must have complete records, and a written and schedule for proper disposal of the materials.
19. There should be a well-ventilated, designated location for the storage of waste mercury collection drums.
20. Establishing schedule for; mercury removal for processing, proper management and disposal.
21. There must be emergency management procedure, such as how to deal with mercury spill and with worker who has been exposed to high levels of mercury.
22. The Industry should have a program for monitoring air concentrations of mercury in the workplace, worker exposure and for dealing quickly with any evidence of harmful exposure.

23. Industry should construct waste water treatment plant to control industrial mercury effluents.
24. Primary use of the receiving water body (drinking, fishing etc.) must not be disturbed in addition to meet National Environmental Quality Standards (NEQs) of 0.01 mg/l for wastewater discharge.
25. Industry should check regularly the health of their workers from hospitals regarding the toxicity/exposure.
26. Industrial management should ensure the handling and storage of mercury/mercury waste as per capacity and ability. Extra quantity should be informed immediately.
27. Emergency team should be established and trained by experts.
28. Industry should focus on recovery system in which the sludge containing mercury should be processed properly.
29. Strict rules for implementation of OSHA (Occupational Safety and Health Administration) rules, regulation/requirements/SOPs regarding handling of mercury.
30. Awareness is a must at the very basic level and amongst the working class.
31. Social surveys must be carried out in communities which are either directly affective by or located in and around industrial units using mercury products.
32. All PPE's must be easy and cheap to acquire as this will encourage proper maintenance over a longer period of time. This will also prevent the poor workers from selling of their assigned PPE's in exchange for money.
33. Disposal of mercury waste must again be according to the strictest of OSHA regulations and must be classified as hazardous waste in any form.

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