Environmental Management Guidelines for 10th of Ramadan City

Volume I
Government Guidelines

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Prepared for
The Competent Environmental Ministries, Authorities and Agencies of 10th of Ramadan City, and its Industrial Investors

with the assistance of
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Appendices

Chapter 1
Introduction to Volume I

This chapter presents an overview of Volumes I and II of these guidelines and explains the objectives for each It describes the application of the guidelines to the 10th of Ramadan City and briefly explains the different environmental management responsibilities of government and industry Last it explains the differences in the way the guidelines apply to existing firms in the 10th of Ramadan and the way they apply to new or expanding firms

1 1 New Industrial Cities

It is the policy of the Arab Republic of Egypt (ARE) to concentrate future industrial growth in designated areas New industrial cities have been established to attract industry and help relieve the pollution and congestion in cities along the Nile The ARE has created tax incentives to induce industries to locate in such cities The process is well underway, industrial cities such as the 10th of Ramadan and the 6th of October are growing rapidly

The concentration of numerous industries in one area has caused a new set of pollution problems If left unchecked (as in the case of Helwan), these can severely affect public health and the environment The cumulative impact of industrial discharges to the ambient environment can poison the water that is drunk and the air that is breathed by workers and residents of these cities Fortunately industrial discharges can be managed to achieve legal standards and acceptable risk levels These guidelines are designed to assist industry and government in achieving that goal

1 2 Government Guidelines and Industry Guidelines

The guidelines for the environmental management of the 10th of Ramadan are produced in two volumes

- Volume I contains guidelines for government
- Volume II contains guidelines for industry

The two sets of responsibilities are complementary but different

Government The competent ministries are responsible for implementing the environmental policy mandates of the ARE as reflected in its laws and regulations Government is to manage the regulatory programs called for in Law No 4 (Law for the Environment) The law directs specific agencies of the government to perform specific program management duties

Industry Industry, on the other hand, is directed by the law to comply with governmental program mandates Each individual facility must manage its discharges to meet legal standards embodied in its licenses The law directs these facilities to keep records and to report periodically to the competent ministries

Volume I contains guidelines for government authorities who have environmental management responsibilities in the 10th of Ramadan Volume I is intended to assist them in the performance of their various environmental management duties and responsibilities under the law Where the law is silent or unclear, the guidelines will prescribe 'best management practices "

Volume II is written for industry and should be consulted by firms seeking specific guidance on how they can comply with the law in an efficient and cost-effective manner

Both Volumes I and II are published in loose-leaf binders so that future changes in laws and programs may be easily incorporated in the guidelines

1 3 Application to 10th of Ramadan City

The application of these guidelines is limited to 10th of Ramadan City in order to focus attention on operational issues The competent authorities may wish to make changes before extending these guidelines to other cities

Under these guidelines the 10th of Ramadan Municipal Authority is given administrative responsibility for implementing the environmental program If management responsibility for the municipality is shifted from the Ministry of Housing Utilities and New Communities (MHUNC) to the Sharkia Governorate the guidelines require that the governorate shall be substituted for the Municipal Authority

1 4 Key Government Actors

In fulfilling its coordinating role under Law 4 the Egyptian Environmental Affairs Agency (EEAA) will cooperate regularly with the 10th of Ramadan Municipal Authority to compile an agenda for action by the competent ministries The agenda will include license applications, discharge fee assessments and amendments, reviews of inspection and sampling and analysis reports, environmental impact assessment actions, and sanction recommendations

The competent ministries include, among others

- Ministry of Housing, Utilities and New Communities
- Ministry of Industry and Metallurgical Resources
- Ministry of Public Works and Water Resources
- Ministry of Health

The Ministry of Environment is represented by EEAA

1 5 Application of Guidelines to Existing Industry and New Industry

Firms proposing to locate or expand in the 10th of Ramadan City must comply with EEAA's Environmental Impact Assessment (EIA) Guidelines (derived from Law 4) The EIA Guidelines have been incorporated into the guidelines presented in this volume For firms that propose to locate or expand in the 10th of Ramadan, the EIA Guidelines are an environmental *planning* exercise in the use of the most effective mitigation techniques and technologies

Once a firm s planned development or expansion is approved by government authorities, the EIA Guidelines cease to apply At that point the firm becomes subject to the whole body of regulation that governs the activities of existing industry in the 10th Ramadan and elsewhere in Egypt

Chapter 2
Principal Environmental Laws

This chapter presents a brief overview of the principal Egyptian environmental laws with respect to industrial air pollution industrial wastewater discharge control, solid waste management, and hazardous waste management, and an explanation of the application of the Environmental Impact Assessment provisions to new or expanding industrial firms in 10th of Ramadan City It also describes regulatory requirements for monitoring and recordkeeping

2 1 The Laws at a Glance

The most recent and comprehensive of the Egyptian environmental laws is Law No 4 of 1994 (Law for the Environment) which created a new Egyptian Environmental Affairs Agency (EEAA), established the Environmental Impact Assessment (EIA) procedure, and created an intricate web of standards and monitoring recordkeeping, and enforcement mechanisms with respect to air pollution, hazardous and solid waste management, and EIA

Laws governing water pollution were introduced earlier Law 93 of 1962 pertains to wastewater discharges into public sewers and Law 48 of 1982 relates to discharges to the Nile and to waterways

A brief summary of these laws and their Executive Regulations is presented in Exhibit 2-1

Exhibit 2-1 Summary of Principal Laws and Regulations			
Law	**Executive Regulations**	**Implementing Agency**	**Principal Provisions**
Law 4/1994 on the Environment	Decree 338/1995	EEAA	▸ Defines EEAA's responsibilities ▸ Sets ambient air quality standards ▸ Sets air emission standards ▸ Sets indoor air quality standards ▸ Prohibits promiscuous disposal of solid waste ▸ Requires a license for handling hazardous waste ▸ Contains general rules and procedures for generation, collection and storage, transporting and treatment and disposal of hazardous wastes ▸ Stipulates EIA requirements ▸ Specifies registry and inspection requirements ▸ Defines penalties for violations
Law 93/1962 on Drainage of Liquid Wastes	Decree 649/1962	Ministry of Housing, Utilities and New Communities	▸ Requires industries to connect to public sewer if available ▸ Requires a license for wastewater discharges to public sewers ▸ Sets discharge standards for discharges to public sewers ▸ Sets discharge standards for discharges by surface drainage ▸ Specifies discharge monitoring requirements ▸ Specifies penalties for violations
Law 48/1982 on Protection of the River Nile and Waterways from Pollution	Decree 8/1983	Ministry of Public Works and Water Resources	▸ Prohibits untreated wastewater discharges to surface and ground waters ▸ Sets ambient water quality standards for potable and non-potable water sources ▸ Sets discharge standards for discharges to fresh (potable) surface waters and groundwater ▸ Sets discharge standards for discharges to non-potable surface waters ▸ Specifies monitoring requirements ▸ Specifies penalties for violations

2 2 Current Industrial Environmental Management Programs

2 2 1 Industrial Air Pollution

Air quality and emissions regulations are contained in the Executive Regulations of the Law for the Environment (Law 4/1994), also known as Prime Minister's Decree 338/1995 Article 36 of Decree 338 states that polluting industries ' shall be committed towards avoiding emissions or leakage of air pollutants at or above the maximum limits allowed by current laws and decrees "

- Annex 5 of the Regulations contains ambient air quality standards for criteria pollutants (sulfur dioxide, carbon monoxide nitrogen dioxide, ozone, particulates, and lead)
- Annex 6 stipulates emission standards, universal for some pollutants and differentiated by type of industry for others
- Annex 8 contains maximum limits of air pollutants inside work premises according to industry type

Exceedance of permissible limits can result in a fine of LE 1,000 to LE 20 000 Inspectors of the EEAA or the municipal authority report violations to the Ministry of Housing Utilities and New Communities

2 2 2 Industrial Wastewater Discharges

Egyptian wastewater discharge regulations are contained in Law 93 of 1962 (Executive Regulations in Minister of Housing and Utilities Decree 649 of 1962) and Law 48 of 1982 (Executive Regulations in Minister of Irrigation [now Public Works] Decree 8 of 1983)

Law 93 generally governs discharges to sewer networks Law 48 generally governs discharges both to open waterways e g the Nile and its canals and to groundwater Therefore the 10th of Ramadan industries which principally discharge to the sewer network are governed by Law 93 Law 48 jurisdiction can be invoked for industrial dischargers whose spills or stored wastes threaten groundwater it can also be invoked against the Municipal Authority itself when its post-treatment discharges to the desert pose a threat to groundwater Direct discharges to open waterways do not currently exist in the 10th of Ramadan

Law 93 of 1962

Article 7 of Law 93 states that no industrial establishment may discharge wastewater to the public sewage system without a license from the Ministry of Housing and Utilities Chapter 5 of Decree 649/1962 (implementing Law 93) lists the types of industrial establishments that are subject to such a license, namely

- food processing industries
- slaughterhouses
- tanneries
- dye houses
- painting workshops
- textile industries
- chemical factories
- iron and steel mills
- factories using radioactive materials

Chapter 6 of the same Decree lists effluent standards for licensed dischargers into public sewers

Article 9 of Law 93 stipulates the procedure for wastewater discharge *monitoring* Analysis of wastewater samples from polluting enterprises shall be performed according to a schedule decreed by MHUNC and approved by the Ministry of Health but no less frequently than twice a year If the analysis proves that effluent standards are exceeded, the polluter has six months to determine the appropriate method of treatment, otherwise its license may be canceled

Law 48 of 1982

Article 6 of Decree 8/1983 (implementing Law 48) prohibits all untreated industrial wastewater discharges into potable water surfaces and underground water reservoirs (Discharges to groundwater are of particular concern to industries in the 10th of Ramadan City and are subject to Law 48 sanctions) Discharges of treated wastewater into the waterways requires a license from the Ministry of Public Works described in Article 12 of that Decree Article 5 of Law 48 stipulates that licenses shall be granted only for the construction of facilities discharging to open waterways or to groundwater that are equipped with appropriate wastewater treatment installations

Section 6 of Decree 8 (implementing Law 48) also sets different types of standards for wastewater discharges Article 60 thereof sets ambient water quality standards for potable water sources Articles 61 and 62 thereof contain effluent standards for treated industrial wastewater to be discharged into fresh (potable) surface waters and groundwater Article

65 thereof describes criteria for drainage water discharged into fresh surface waters Articles 66 and 67 thereof set criteria for domestic and industrial wastewater discharges to non-potable surface waters Articles 68 and 69 thereof contain ambient water quality standards for non-potable surface waters

Under Law 93, violations of wastewater discharge standards (including discharging without a license) carry a penalty of LE 50 to 100 The penalty for surface drainage without a license is LE 10-50 In cases of recurrence of a violation, the penalty is doubled If a violator fails to comply with regulatory requirements within a specified period the municipal authority is authorized to carry out the necessary abatement measures administratively at the expense of the violator or may cancel the license, or both

Under Decree 8/1983 (Article 24), the Ministry of Health is authorized to take wastewater samples at least once every three months from companies licensed to discharge treated wastewater directly into open waters

2 2 3 Solid Waste Management

The basic law for solid waste collection, treatment, and disposal is Law 38 of 1967 with amendments by Law 31 of 1976 This law regulates collection and disposal of waste from houses, public places commercial and industrial areas and forbids disposal of garbage in any place not specified by the local council (a requirement later reaffirmed under Law 4, per the next following paragraph) MHUNC is responsible for the implementation of the law and may submit rules for its execution Solid waste management in the 10th of Ramadan City is the responsibility of the municipal authority

Article 37 of Law 4/1994 and Article 38 of Decree 338/1995 prohibit dumping treating or burning of solid waste except in places specially designated for such purposes by a municipal authority Violations can be reported by EEAA inspectors the municipal authority, organizations and private citizens Penalties range from LE 1,000 to LE 20 000

2 2 4 Hazardous Waste Management

Article 25 of Decree 338/1995 (implementing Law 4/1994) requires a license for handling hazardous substances and wastes Handling" includes generation collection and storage, transport, treatment and disposal The Ministry of Industry is the designated authority that issues these licenses to industries such as those located in the 10th of Ramadan Hazardous waste licenses are issued by other sectoral ministries, as follows

- Ministry of Agriculture for pesticides and fertilizers
- Ministry of Health for pharmaceutical and laboratory substances and waste and domestic insecticides
- Ministry of Petroleum for petroleum substances and waste
- Ministry of Electricity, Authority for Nuclear Energy for radioactive substances and waste
- Ministry of the Interior for inflammable and explosive substances

Each ministry also works with the Ministry of Health and EEAA to develop the regulatory guidelines for managing the hazardous waste under its jurisdiction

Article 26 of the Decree lays out the procedure for granting a hazardous waste license The license is valid for up to five years and may be revised earlier than its expiration date if determined necessary by EEAA

Article 27 allows the licensing authority to cancel a license that has been issued against a 'cash payment' on the basis of

- falsifying information on the application
- violation of the license's conditions
- unforeseen dangerous environmental impacts from the activity
- non-use of known protective or control technologies, or
- a general ban on handling a certain hazardous substance or waste

Article 28 of Decree 338/1995 contains general rules and procedures for generation collection and storage transporting and treatment and disposal of hazardous waste

The sanctions are severe for violations of the Law 4 s hazardous substances and waste provisions Handling of regulated hazardous substances or waste without a license or violation of a license is punished by no less than 5 years in prison and a fine of LE 20 000 to LE 40 000 Failure to maintain accurate hazardous waste registers may lead to no less than one year in prison and a fine of LE 10 000 to LE 20 000

2 2 5 Environmental Impact Assessment for New or Expanding Industrial Facilities

Article 19 of Law 4 stipulates that certain establishments requiring licenses are subject to EIA to be conducted by a licensing authority Article 19 of Decree 338/1995 emphasizes that the EIA provision of Law 4 is applicable not only to new establishments but also to expansions and renewals of existing establishments Annex 2 to Decree 338 lists the types of establishments that require an EIA on the basis of four criteria

- type of industrial activity
- consumption of natural resources
- siting
- type of energy used

The new EIA guidelines promulgated by EEAA in 1997, describe the EIA procedure as follows The developer submits to the competent administrative authority" (CAA) a letter of intent to undertake a specific project Depending upon the type of project and how it is classified, the developer will also need to supply other documentation

- Projects on the ' white list" need an Environmental Screening Form, but no EIA will be required

- Projects on the "gray list" need an Environmental Screening Form to determine whether a scoped EIA will be needed for certain identified impacts/processes

- Projects on the ' black list need a full EIA, to be conducted according to relevant sectoral guidelines

The CAA, whose identity depends on the type of establishment (for most industries, it is the Ministry of Industry) determines whether the proposed activity falls into the category claimed by the developer and submits the documents to EEAA

EEAA with the assistance of outside technical experts reviews and evaluates the documents and provides environmental clearance for the facility to the CAA EEAA is also responsible for ensuring that all specified environmental impact mitigation measures are in place prior to the launch of the facility s operation The developer can appeal the decision (but not the classification of the project) to the Permanent Appeals Committee

2 2 6 Registry and Inspection Requirements

According to Article 17 of Decree 338/1995, establishments must maintain an Environmental Register to record the extent of their impact on the environment The model register is described in Annex 3 of the Decree

Registers are to be retained for ten years from the date of their review by a EEAA representative Establishment owners must notify EEAA immediately of any deviation in the criteria and specifications of discharged pollutants and the respective control procedures

EEAA is authorized (by Article 18 of Decree 338) to conduct inspections and to take and test samples to verify the information given in the Register These inspections are conducted annually A facility has 60 days to correct any violations noted Failure to comply may lead to the following sanctions

- closure of the enterprise
- suspension of the damaging activity
- a lawsuit for compensation for damages resulting from the violation

Chapter 3
Integrated Environmental Management Program for the 10th of Ramadan City

3 1 Integrated Environmental Management Explained

The environmental management program designed for the 10th of Ramadan is an integrated program that blends the management features of the command-and-control (CAC) system with those of the market-based or economic incentive (MBI) system The 10th of Ramadan Municipal Authority will have primary administrative responsibility for the program and will meet with EEAA (in furtherance of its coordinating role as contemplated by Law 4) to assemble a periodic regulatory agenda to manage the program The competent ministries, represented by knowledgeable environmental managers, will meet regularly at EEAA's regional office to address this regulatory agenda in accordance with the responsibilities of each ministry as outlined in Egypt's environmental laws

Egypt's CAC System In Egypt, as in most countries the CAC system for industrial environmental management covers the following environmental media water air, hazardous substances and waste and solid waste The CAC regulations also include a requirement that new industries conduct an environmental impact assessment before construction can begin In Egypt the media-specific and EIA programs each contain their own standards licenses monitoring and sanctions These are detailed in the subsequent chapters of these guidelines

MBI System An MBI system is composed of policy instruments that use economic incentives and disincentives to influence environmental behavior In the context of the 10th of Ramadan the system will incorporate

- multi-media discharge fees covering industrial wastewater air emissions and hazardous waste
- financial incentives to motivate industry to make environmental investments

- an industrial waste exchange to help link buyers and sellers of waste materials so as to promote reuse and recycling

- deposit-refund systems for selected wastes

Strategically integrated into the overall management program, these MBIs provide additional incentives and assistance for firms to comply with environmental requirements They also enhance the ability to use local environmental investments to leverage additional funds from donor agencies or financial institutions, and to establish fair and equitable mechanisms to finance environmental management activities

Coordination of CAC and MBI Systems Coordination between the two systems is perhaps best reflected in the multi-media discharge fee Under the fee program, a number of significant parameters within several media can be successfully managed when combined with the CAC elements of standards, licenses and monitoring This integrated system forms an important part of the environmental management strategy for the 10th of Ramadan and is detailed at length in these guidelines

3 2 Introduction to Market-Based Incentives

Markets are powerful mechanisms for allocating resources Each day, millions of production and consumption decisions are made on the basis of the price signals that markets send Based partially on the prices they face for their outputs and inputs, firms decide what goods and services to produce and how to produce them Similarly, consumers' decisions on what goods and services to buy are influenced heavily by prices

3 2 1 Definition of Market-Based Instruments (MBIs)

Market-based instruments can be defined as policy tools that create price signals to encourage firms and consumers to make decisions that help achieve environmental objectives MBIs increase the cost of behavior that harms the environment and reduce the cost or increase the value of behavior that protects the environment

Policy tools classified as market-based instruments include the following

- *Environmental charges* Environmental charges require polluters to pay a fee for the pollution they produce They 'internalize' the social costs of pollution by forcing polluters to include the damage to the environment that they cause in the prices for their products

- *Financial incentives* Financial incentives are subsidies paid to firms that undertake environmental protection projects Incentives, such as grants, soft loans or other forms of subsidies, reduce the cost firms incur for the project They thus reduce any adverse impacts on the firms' financial performance or provide an incentive for firms to undertake the project

- *Industrial waste exchanges* Industrial waste exchanges create markets where buyers and sellers of industrial waste can conduct transactions Frequently, what one firm considers a waste by-product has value to another firm as an input to its processes Industrial waste exchanges help such firms to connect and explore mutually beneficial transactions to reuse and recycle waste materials instead of disposing of waste in or on the land

- *Deposit-refund systems* Deposit-refund systems combine a charge on a product when it is bought with a refund when the residual waste from the product (or an empty container) is returned to specified sites Their purpose is to create a segregated collection system for wastes that should be reused, recycled or managed in a special way to reduce human health or environmental risks In effect, the refund creates an economic value for the safe handling of potentially polluting materials

Other types of MBIs include user fees for raw materials and environmental services emissions and effluent trading programs, input and output taxes, and market stimulation for recycled goods through for example government procurement practices

3 2 2 Strengths of Market-Based Instruments

Market-based instruments are increasingly the policy tool of choice for achieving environmental objectives, usually as a complement to command-and-control approaches The reasons depend on the circumstances of the specific application Some of the most important advantages attributed to MBIs are

- *Increased cost effectiveness* MBIs are often able to achieve the same environmental goals as command-and-control regulations, but at a lower cost Command-and-control generally requires all firms to meet the same environmental standards, even though the costs of doing so may differ greatly among the firms MBIs provide flexibility for firms to choose the most cost-effective response to the price signals

- *More encouragement for innovation* MBIs do not dictate the control strategies and technologies that firms adopt Instead they

provide incentives for companies to seek and adopt new technologies that better suit the particular operations of each firm The long-term importance of encouraging innovation cannot be over-stressed The ability to stimulate technological innovation is, in the long-term, probably the most important measure of the value of an environmental policy

- *Greater incentive for continuous improvement* Many MBIs provide continual incentives for firms to perform better than the regulated standards Command-and-control approaches do not necessarily provide incentives for continuous improvement once the regulated standards are met

- *Revenue generation* Many MBIs generate revenues that can be used to finance environmental programs, services and infrastructure They can also generate revenues for general government operations, however, this use of market-based instruments usually encounters significant opposition

For these reasons, the environmental management program for the 10th of Ramadan City takes an integrated approach That is, it combines both market-based instruments and command-and-control elements MBIs complement command-and-control activities in several ways

- MBIs will put greater pressure on firms to comply with Egypt's environmental standards Economic incentives and disincentives, coupled with the threat that standards will be enforced will provide more motivation for firms to comply than either enforcement or economic incentives alone

- Programs to assist industry with compliance will be funded from revenues generated from multi-media discharge fees and by leveraging through an Environmental Fund An industrial waste exchange and financial incentives are two types of assistance that will be provided to industry

- MBIs will bring additional enforcement resources to bear on firms environmental performance because municipal authorities will be collecting the discharge fees and enforcing the terms under which financial incentives are given

- Fee revenues will provide financial resources to assist the Municipal Authority in implementing and administering the environmental management program

3 3 MBIs in the 10th of Ramadan City

The market-based incentives recommended for the 10th of Ramadan are designed to

provide industry with

- economic incentives, both negative and positive, to comply with Egypt's environmental laws and regulations
- economic incentives to reduce discharges below the regulated standards if it is economically desirable to do so
- economic incentives to monitor and report discharges in accordance with regulations
- flexibility to choose the most cost-effective ways of reducing discharges to the environment, including pollution prevention
- value-added programs to help achieve compliance

provide the Municipal Authority with

- revenues to help implement the environmental management program
- a potential means to help finance an upgraded central sewage treatment system
- data to monitor environmental discharges and ambient quality
- flexibility to respond to environmental concerns that may arise in the future

Four key design principles underlie the system of market-based incentives for 10th of Ramadan

- *Revenue recycling* Fees (negative incentives) are partially offset by subsidies (positive incentives) so industry receives some of the economic benefit of actions that help achieve environmental objectives
- *Leverage* Revenues from the fees are used to leverage additional funds from bilateral donor agencies, international financial institutions, commercial banks and other sources to help meet environmental objectives

- *Equity* Market-based incentives are designed to impose costs on polluters in proportion to their contribution to pollution

- *Phased implementation* The system is phased in gradually as institutional capacity strengthens and information becomes available

3 3 1 Revenue Recycling

Although economists have been advocating market-based incentives for several decades, governments everywhere have been slow to implement them on a large scale Two important reasons behind this reluctance are

- Environmental fees that are large enough to induce behavioral change can have adverse impacts on industrial competitiveness and result in undesirable distributional effects

- Financial incentives alone can be a drain on government budgets

Revenue recycling is a way of addressing both these concerns It combines environmental fees and financial incentives in a way that creates a balance of penalties for polluters and rewards for those who invest in environmental protection The penalties (fees) generate revenues for the government while the rewards (incentives) offset some of the costs of the fees industry must pay, as long as the rewards are spent on environmental protection

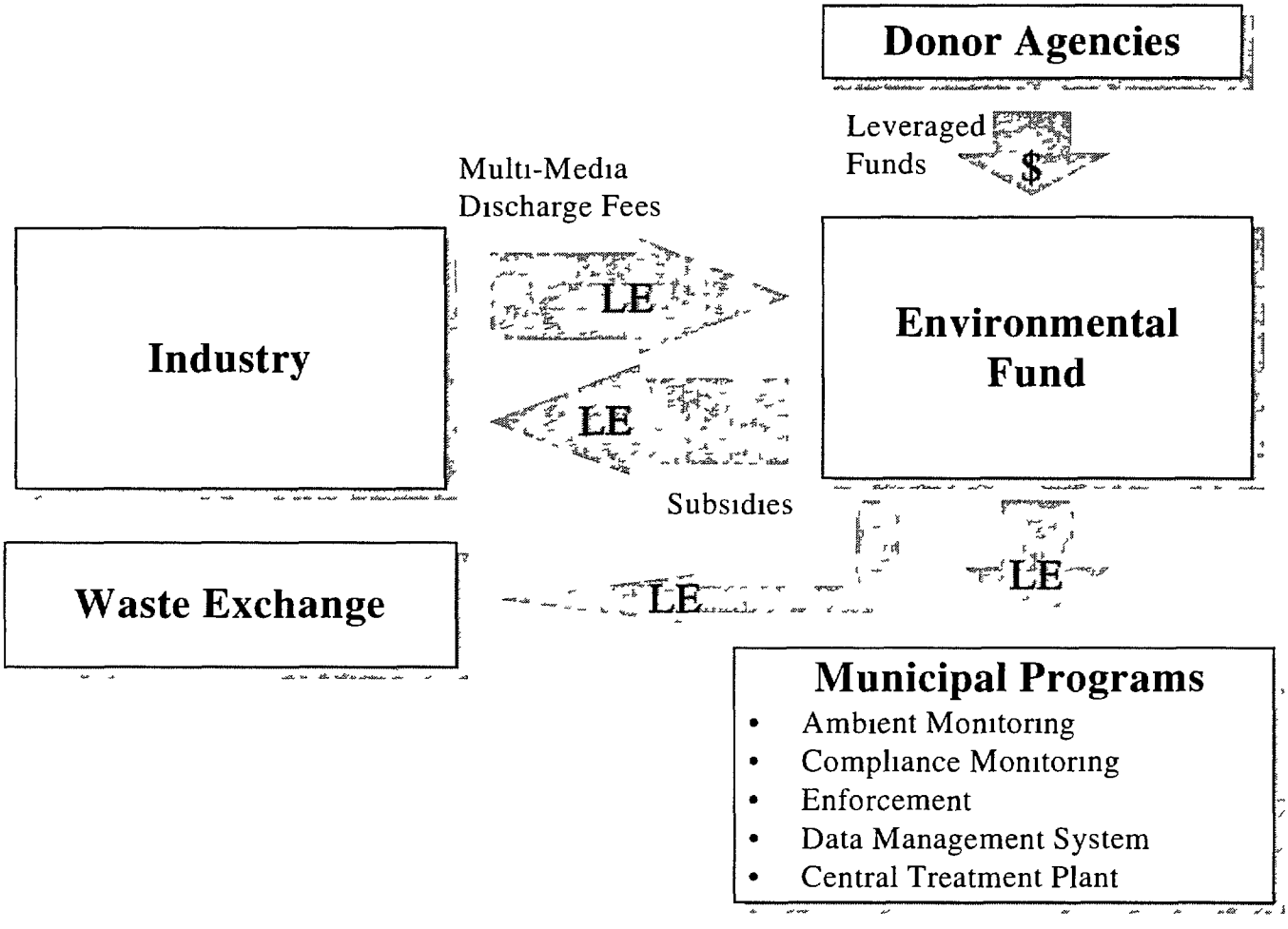
Revenue recycling has proven successful in a number of cases One good example is the French system of wastewater fees and financial incentives for industry and municipalities The French system is based on the concept of Qui pollue paye qui epure est aide ' (those who pollute pay and those who control pollution are supported) The polluter pays principle is implemented in the form of a wastewater fee based on salinity toxicity nitrogen phosphorus halogenated hydrocarbons and metals Revenues flow to six River Basin Agencies that use the funds to provide financial assistance (grants or loans) to public and private bodies for pollution control activities Grants cover 30 to 50% of investment costs Under certain conditions loans covering 10 to 20% of investment costs may also be extended The result has been the provision of US $6 5 billion in assistance in the period 1992-1996 Over 10 000 local water authorities now have wastewater treatment plants, up from a handful in 1965

Revenue recycling is also a key feature of the system of market-based incentives recommended for the 10th of Ramadan City Exhibit 3-1 illustrates the way in which the MBIs are designed to recycle revenues Revenues raised from industry by the multi-media discharge fee will be

channeled through the Environmental Fund Resources from the Fund will be used to assist both industry and the Municipal Authority Industry will receive assistance through the financial incentives and an industrial waste exchange The Municipal Authority will receive assistance for various activities in implementing the environmental management program

Any revenues from donor agencies will augment the flow of funds from sources within the 10th of Ramadan (see Section 3 3 2 below)

Exhibit 3-1 Revenue Recycling by the 10R Market-Based Incentives



3 3 2 Leverage

An added benefit to the market-based incentives is an enhanced ability to leverage funds from bilateral and multilateral donor agencies international financial institutions, commercial lenders and others To the extent that it can be developed, leveraging will increase the financial resources available for environmental protection in the 10th of Ramadan and help free revenues to support both financial assistance to industry plus costs for central treatment, monitoring, enforcement, and other environmental responsibilities of the Municipal Authority

Market-based incentives create a flow of funds from industry to the Environmental Fund Once fee revenues are in the Fund, they are clearly earmarked for environmental purposes, thereby facilitating leveraging Leveraging can then occur because

- Donor agencies often require or desire that their funds be matched by local financing since it improves the likelihood that a project will be successful The 10th of Ramadan Environmental Fund will be a source of local financing to match donor aid

- Some donor agencies view local environmental funds as an effective way to channel their money to worthwhile local projects without the cost of building detailed on-site knowledge Donor agencies rely on the local fund managers to assume some administrative duties They benefit from the fund managers local presence and more detailed knowledge of the recipients to monitor projects more efficiently and effectively

- Commercial lenders may be unwilling to extend loans for environmental projects, particularly when the investments are for end-of-pipe control systems that do not contribute to firms productive capacity However if firms receive financial support from the Environmental Fund there is a greater chance that commercial loans will be forthcoming for the balance of the investment costs

Leveraging may however impose special requirements on how the Environmental Fund is managed These requirements are discussed more fully in Chapter 13 on the Environmental Fund

3 3 3 Equity

Multi-media discharge fees will be based on two components a fixed fee and a variable fee Both components can be considered fair and consistent with the polluter pays principle (PPP) The PPP, sometimes known as the no-subsidy principle asserts that polluters should bear the costs of

pollution prevention and control measures in proportion to their contribution to environmental degradation

- *Fixed Fee Component* The fixed component of the fee will generate revenue from all firms to finance general activities that support the integrated environmental management program for the 10th of Ramadan City These activities include ambient environmental quality monitoring, facility monitoring, enforcement and the development and maintenance of the data management system Since all firms contribute to the need for these activities, all firms should help finance them

- *Variable Component* The variable component of the fee will be based on each firm's discharges to air, water and land Firms with greater discharges will be assessed higher fees

Fairness is built into the system by allowing only firms who have paid their fees to participate in the assistance programs funded by fee revenues The assistance programs include the financial incentives and the industrial waste exchange

Although financial incentives are sometimes thought to be inconsistent with the PPP there are several reasons why the incentives proposed for the 10th of Ramadan City can be considered consistent with the principle

- The recipients of the incentives will be the ones who pay the fees and generate the revenues to fund the incentive program

- The incentives will be limited to the period when new environmental standards are being implemented

- The incentives will not be so great as to distort international trade and investment

These latter two points are necessary for consistency with the polluter pays principle as defined by the Organization for Economic Co-operation and Development

3 3 4 Phased Implementation

A phased approach to implementing the market-based incentives is recommended for several reasons

- *Information and Data Availability* Much of the data needed to assess and respond to environmental concerns in the 10th of Ramadan are not currently available These data are also needed to administer a sophisticated market-based incentive program A

key objective of the environmental management program is to generate these data for the 10th of Ramadan The system of market-based incentives will assist this process

During Phase I, the recommended MBIs will provide various incentives for firms to monitor and report on their discharges The MBIs will also provide financial resources for ambient environmental quality monitoring As firms begin monitoring and reporting their discharges, it will become possible to increase the program's sophistication to provide more finely-tuned incentives for environmental protection

- *Institutional Capacity* Some countries have sophisticated systems of discharge fees that exceed the current administrative and enforcement capacities of their environmental authorities The result is that the discharge fees have little impact on polluters' behavior and generate little revenue to support environmental programs The market-based incentives recommended for the 10th of Ramadan avoid this problem

  In Phase I the fees are relatively simple to administer but evolve in later phases as the Municipal Authority strengthens its capacity to collect and enforce discharge fees monitor and enforce environmental performance and administer other types of market-based incentives

- *Priority Environmental Concerns* Given the available information and professional judgement wastewater discharges appear to be of more immediate concern than air emissions or hazardous waste in 10th of Ramadan

  Phase I thus targets wastewater discharges with strong incentives for reductions while establishing basic fees for air emissions and hazardous waste Later phases increase the incentives for controlling air emissions and hazardous waste

3 4 Consolidated Environmental License

The integrated environmental management program for the 10th of Ramadan City introduces an administrative tool not previously used in Egypt The Consolidated Environmental License organizes into one document the separate air, water, and waste environmental licenses for ease of administration While the License does not have any independent legal status, it provides the Municipal Authority and the Egyptian Environmental Affairs Agency, as well as the licensed industry with a one-stop-shop for all of the relevant environmental licenses for industries in Egypt A single consolidated application form will identify all

applicable licenses and collect all of the pertinent information much of which flows from the requirements of the Annual Registry of Environmental Impact required under Law 4

The Municipal Authority and EEAA distribute the completed application to all of the competent authorities who, in turn, issue their specific licenses citing the applicable standards, specifications and other conditions for compliance

Enforcement Action is brought by the competent authority for a violation of the air, water or waste section of the Consolidated License based on different statutes For example, violations to the conditions of the industrial wastewater discharge license granted by the Municipal Authority are governed by Law 93 If, for example, a factory has no air emissions the air section of the Consolidated Environmental License is marked "Not Applicable "

Before applying for a Consolidated Environmental License, the applicant must already have been issued an Investment License and Business License For a *new* industry, applicant has already submitted an acceptable EIA document, as required by the EIA guidelines, and produces the licensing requirements of the completed ministry(ies)

Exhibit 3-2 Implementation Phases for the Market-Based Incentives	
Objectives	**System Features**
Phase I	
▫ Encourage firms to monitor and report discharges	▫ Fee reductions for firms that monitor and report discharges ▫ Firms that monitor and report wastewater discharges become eligible for loadings-based fee
▫ Encourage firms to reduce discharges of most concern ▫ Generate revenue for implementing the EMS, upgrading central sewage treatment systems, and assisting industry with compliance	▫ Firms with lower wastewater discharges pay lower fees ▫ Fixed fees for wastewater discharges, emissions, hazardous waste generation ▫ Only firms that have paid fees are eligible for financial incentives and industrial waste exchange
▫ Assist industry to reduce discharges of most concern	▫ Grants for pollution prevention and wastewater treatment systems ▫ Industrial waste exchange
Later Phases	
▫ Provide more fine-tuned incentives for discharge reductions	▫ Wastewater discharge fee moves from presumed discharges to actual discharges for all firms ▫ Air emissions fee moves from a fixed fee to a quantity-based fee
▫ Address discharges of less immediate concern	▫ Higher fees for hazardous waste generation and air emissions ▫ Implement deposit-refund systems for selected wastes
▫ Assist industry to reduce all discharges	▫ Grants for projects reducing any form of discharge ▫ Continue industrial waste exchange

Chapter 4
Institutional Roles and Responsibilities

This chapter summarizes the roles and responsibilities of key institutions under the existing integrated environmental management programs, as well as their specific responsibilities in administering the Integrated Environmental Management Program for New Communities Only those agencies with jurisdiction over the 10th of Ramadan City are included here

4 1 Institutions with Environmental Management Responsibilities in 10th of Ramadan City

The integrated environmental management program for the 10th of Ramadan City covers the following environmental media water quality and wastewater management, air quality and air pollution control and waste management (both industrial solid and hazardous wastes) The program applies to new industries (or expansions of existing industries) through the EIA program as well as existing industries The integrated program aims to harmonize standards and coordinate activities in licensing monitoring and enforcement

Exhibits 4 1 through 4-5 provide a snapshot of the legal authority of different institutions under the media-specific and EIA programs A distinction is made between a lead role (denoted by ●) and a support role (denoted by ○) In general a lead role is defined as the setting of standards issuance of licenses inspection for compliance monitoring and enforcement of sanctions for non-compliance All other responsibilities are considered support

Sections 4 2 through 4 9 explain the specific responsibilities assigned to the government authorities under the new integrated environmental management program for the 10th of Ramadan City The summary descriptions for each government authority should be used in combination with the administrative procedures described in Chapter 5

Exhibit 4-1 Air Quality and Pollution Control						
	EEAA	**MOIND/ GOFI**	**MOH**	**MOME**	**MOI**	**10R MA**
Standards						
Ambient	●		○			
Emissions	●		○			
Control	●	○				
Noise		●				
Licensing						
Operation		●	○			○
Emit air pollutants	●					○
Monitoring						
Ambient air quality	●					○
Stack emissions	●	○				○
Indoor air quality				●		○
Enforcement	●				●	○

Key ● Lead responsibility, ○ - Support responsibility

EEAA Egyptian Environmental Affairs Agency GOFI General Organization for Industrialization in the Ministry of Industry MOIND - Ministry of Industry MOH - Ministry of Health MOME - Ministry of Manpower and Employment MOI Ministry of Interior 10R MA 10th of Ramadan Municipal Authority

Exhibit 4-2 Water Quality and Pollution Control						
	EEAA	**MHUNC**	**MOH**	**MPWWR**	**MOI**	**10R MA**
Standards Groundwater Surface water Drainage Control	●	●	● ●			
Licensing Drainage to sewer Drainage to land				●		●
Monitoring Groundwater quality Drainage to sewer		○	○	●		○ ●
Enforcement Law 4 provisions Law 48 provisions Law 93 provisions	●			●	○	●

Key ● - Lead responsibility ○ - Support responsibility

EEAA Egyptian Environmental Affairs Agency MHUNC - Ministry of Housing Utilities and New Communities MOH - Ministry of Health MPWWR - Ministry of Public Works and Water Resources MOI Ministry of Interior 10R MA 10th of Ramadan Municipal Authority

Exhibit 4-3 Hazardous Substances and Waste Management							
	EEAA	**MOIND**	**MOME**	**MOH**	**MHUNC**	**MOI**	**Gov**
Standards							
Substances	○	●		○			
Controls		●					
Transportation		○		●			
TSD facilities*			●		●		
Licensing							
Handling/transport		●	○				
Treatment facilities	●	○		○			●
Disposal facilities	○	○		○	●		
Monitoring							
Generation	●	○					
TSD facilities*	●	○					
Storage site	●	○					
Enforcement	●	●				○	

Key ● - Lead responsibility ○ - Support responsibility

* Treatment storage and disposal

EEAA Egyptian Environmental Affairs Agency MOIND - Ministry of Industry MOME - Ministry of Manpower and Employment MOH Ministry of Health MHUNC - Ministry of Housing Utilities and New Communities MOI Ministry of Interior Gov - Governorate

Exhibit 4-4 Solid Waste Management			
	EEAA	**MOI**	**10R MA**
Standards			
Landfills	●		
Incinerators	●		
Licensing			
Landfills	○		●
Incinerators	○		●
Monitoring			
Removal records			●
Enforcement		○	●

Key ● - Lead responsibility, ○ Support responsibility

EEAA - Egyptian Environmental Affairs Agency MOI - Ministry of Interior 10R MA 10th of Ramadan Municipal Authority

Exhibit 4-5 Environmental Impact Assessment				
	EEAA	**MOIND/GOFI**	**MHUNC**	**10R MA**
Standards				
Applicable projects	●			
Licensing				
Review of EIA	●	○	○	○
Approval of EIA	●			
Operation		●		○
Enforcement	●			

Key ● Lead responsibility ○ Support responsibility

EEAA Egyptian Environmental Affairs Agency GOFI General Organization for Industrialization in the Ministry of Industry MOIND Ministry of Industry MHUNC Ministry of Housing Utilities and New Communities 10R MA - 10th of Ramadan Municipal Authority

4 2 Environmental Advisory Committee

The Environmental Advisory Committee is an administrative body established to coordinate the activities of all competent authorities in their regulation of industrial enterprises in the 10th of Ramadan City It is chaired by the Municipal Authority, and EEAA plays a major support and coordinating role Other members of the Environmental Advisory Committee include environmental experts from the competent ministries such as the Ministry of Industry/General Organization for Industrialization, the Ministry of Housing, Utilities and New Communities, the Ministry of Health the Ministry of Public Works and Water Resources, the Ministry of Manpower and Employment, and others as appropriate

It is recommended that the 10th of Ramadan Investors Group nominate an ex-officio representative to the Environmental Advisory Committee The industry investors' representative would be a non-voting participant in discussions except for sanction recommendations to the competent ministries following the evaluation of a firm's Corrective Action Report in response to a Notice of Violation and any matters dealing with establishing or modifying waste discharge fees

The Environmental Advisory Committee's functions are to serve as a coordinating body for all regulatory actions by the competent authorities and to develop a regulatory agenda of action items to be addressed by the competent authorities The action items include

- license applications and renewals
- multi-media discharge fee assessments and amendments
- monitoring and inspection protocols
- review of inspection sampling and analysis reports
- review and approval of Environmental Impact Assessments for new and expanding factories
- recommendation of sanctions for violations to environmental statutes

The Environmental Advisory Committee meets monthly to address the regulatory agenda Ministerial representatives must possess environmental expertise and must spend at least one day per month in the 10th of Ramadan City to attend the Environmental Advisory Committee meeting It is expected that as EEAA opens its Regional Branch Office that this office will provide the support and coordination, as well as carry out EEAA s responsibility under Law 4

4 3 10th of Ramadan Municipal Authority

The 10th of Ramadan Municipal Authority will serve as the principal administrative authority for implementing the proposed integrated environmental management program for industry in its jurisdiction Within the Municipal Authority, the principal programmatic responsibilities rest with the Environment Department, which will have separate units for licensing, monitoring and inspection, information management, and technical services The Finance Department will have responsibility for the assessment of discharge fees, billings, and collections

The responsibilities of the Municipal Authority include

- ***Issuance and Renewal of Environmental Licenses*** - Distributes Consolidated Environmental License applications, reviews completed license applications, determines environmental license requirements, forwards the Environmental License application to the competent authorities (the Municipal Authority is the competent authority for licensing wastewater drainage into the sewer network), issues the Consolidated Environmental License to the establishment (signed jointly by the Municipal Authority and the Egyptian Environmental Affairs Agency) calculates the multi-media discharge fee assessment, bills and collects the assessment from the establishment, and notifies the industrial establishment of the need each year to renew its Consolidated Environmental License

- ***Monitoring Compliance with Environmental License*** - Prepares the inspection and compliance monitoring protocols according to the conditions in the Consolidated Environmental License directs Licensee in its self-monitoring and reporting requirements enters data from the Annual Registry of Environmental Impact into the centralized data management system organizes and conducts both scheduled and unscheduled inspections of industrial establishments (accompanied by representatives of competent authorities) enters inspection findings in data management system determines any violations of the conditions in the License and informs the competent authorities for them to issue a Notice of Violation (the Municipal Authority is the competent authority for issuing a Notice of Violation to wastewater drainage conditions) and explains the violation s nature to the industrial establishment in a technical conference

- ***Enforcement of Sanctions*** - Reviews the Corrective Action Report submitted by the industrial establishment in response to a Notice of Violation, determines whether the establishment has satisfactorily taken corrective action to address the noted violation

and advises the competent authority (that issued the Notice of Violation) when the determination is made that the corrective action was not taken, notifies the industrial establishment of the sanctions to be imposed as determined by the competent authority (the Municipal Authority is the competent authority for invoking sanctions for violations to Law 93), processes any appeals made by the establishment to the sanctions imposed, and suspends or revokes the Consolidated Environmental License until such time that the sanction has been met and no further corrective action is necessary

4 4 Egyptian Environmental Affairs Agency

The Egyptian Environmental Affairs Agency (EEAA) has the authority under Law 4 to

- with respect to new projects and expansions of existing projects, establish the specifications and conditions to be complied with by owners of projects and establishments before construction begins and during the operation of these projects, in order to assure compliance with standards
- carry out inspections to determine the compliance with such specifications and conditions
- enforce the provisions of Law 4 and impose sanctions against those found in violation

Under the integrated environmental management program for 10th of Ramadan EEAA plays a coordination and oversight role In this role, EEAA convenes the Environmental Advisory Committee and ensures that the necessary actions are taken by the competent authorities The Chairman of EEAA is authorized to close down an establishment suspend any activity found damaging to the environment, and file a law suit in Egyptian courts seeking compensation to remedy the damage resulting from a violation of any environmental statute

Under the 10th or Ramadan City integrated environmental management program EEAA has a critical planning coordination and oversight role Given the multi-media nature of the program and the numerous ministries involved in environmental matters in the city EEAA will ensure that all new and expanding industries conform to the EIA program requirements all existing industries comply with the conditions of their Consolidated Environmental Licenses, and all competent authorities act judiciously on media-specific licenses and their enforcement through the regulatory agenda of the Environmental Advisory Committee (see Section 4 2)

The responsibilities of EEAA include

- ***Issuance and Renewal of Environmental Licenses*** - Assists the Municipal Authority in consolidating the media-specific license conditions, co-signs the Consolidated Environmental License, and transmits all EIA records for 10th of Ramadan industrial establishments to the Municipal Authority for conformity

- ***Monitoring Compliance with Environmental License*** - Reviews the Annual Registry of Environmental Impact for each industrial establishment to determine its conformity with environmental standards, accompanies the Municipal Authority inspectors in their compliance monitoring activities (particularly as they relate to air pollution emissions and control), and issues Notice of Violation for firms violating their air emissions standards and the pollution control conditions of their Consolidated Environmental License

- ***Enforcement of Sanctions*** - Determines appropriate sanctions for violations to Law 4 provisions, initiates enforcement action against firms found violating Law 4 and which fail to take corrective action in the specified time period and rules on any appeals to EEAA s enforcement actions (Chairman's responsibility)

4 5 Ministry of Housing, Utilities and New Communities

The responsibilities of the Ministry of Housing Utilities and New Communities (MHUNC) in the administration of the integrated environmental management program for the 10th of Ramadan City flow from Law 93 In addition the 10th of Ramadan City as a new industrial city reports to the New Communities Authority Finally the National Organization of Potable Water and Sanitary Drainage (NOPWASD) assists the Municipal Authority in preparing and executing investment projects and supports the Municipal Authority in analyzing wastewater samples taken at the point of discharge to the sewer network For most aspects of Law 93 the authority for licensing rests with the Municipal Authority

The responsibilities of MHUNC include

- ***Issuance and Renewal of Environmental Licenses*** - Determining suitable location and conditions for the disposal of hazardous wastes (in consultation with the EEAA and Ministry of Health)

- ***Monitoring Compliance with Environmental License*** - Supports the Municipal Authority in analyzing wastewater samples taken from the effluent of industrial establishments, as well as the influent and effluent of the oxidation ponds

- ***Enforcement of Sanctions*** - None

4 6 Ministry of Industry

The Ministry of Industry's role falls into two categories 1) licensing new industrial establishments through the General Organization for Industrialization (GOFI), and 2) licensing and enforcing industries that handle hazardous substances and waste

The responsibilities of Ministry of Industry include

- ***Issuance and Renewal of Environmental Licenses*** - Issues the media-specific licenses for industries that handle (generate and store) or treat hazardous substances and wastes (according to the list of regulated substances and classified wastes published jointly by the Ministry of Industry, Ministry of Health and EEAA), and preparing the conditions of the hazardous waste license that will be incorporated into the Consolidated Environmental License

- ***Monitoring Compliance with Environmental License*** - Accompanies the Municipal Authority inspectors in their compliance monitoring activities (particularly as they related to hazardous waste management), and issues Notice of Violation for firms violating the hazardous waste management conditions of their Consolidated Environmental License and reviews (in consultation with EEAA) the hazardous waste directories

- ***Enforcement of Sanctions*** - Determines appropriate sanctions for violations of Law 4 provisions on hazardous waste including permit violations, submission of incorrect data dangerous effects that are unforeseen and unwillingness to use appropriate technology May suspend operations cancel a permit or impose fines of LE 10 000 to 20 000 and/or jail detention of not less than one year

4 7 Ministry of Health

The Ministry of Health's role in the integrated environmental management program is limited to supporting the licensing monitoring and enforcement responsibilities of EEAA the Municipal Authority and

other competent authorities In particular, the Ministry's Center for Environmental Monitoring and Occupational Health maintains a water quality and air quality laboratory

The responsibilities of the Ministry of Health include

- ***Issuance and Renewal of Environmental Licenses*** - Reviews and approves the list of regulated substances, and classified wastes (published jointly by the Ministry of Health, Ministry of Industry and EEAA) for which a license to generate and store is required

- ***Monitoring Compliance with Environmental License*** - Supports the Municipal Authority and EEAA in conducting ambient air quality monitoring

- ***Enforcement of Sanctions*** - None

4 8 Ministry of Public Works and Water Resources

Because of the lack of surface water in the 10th of Ramadan City, the Ministry of Public Works and Water Resources has no specific role other than to support the Municipal Authority and EEAA in conducting ambient ground water quality monitoring (Its authority over licensing discharges to surface water, ground water, and land are not included because they are not applicable in the 10th of Ramadan City) Groundwater monitoring is accomplished through the Ministry s Research Institute for Ground Water

The responsibilities of Ministry of Public Works and Water Resources include

- ***Issuance and Renewal of Environmental Licenses*** - None

- ***Monitoring Compliance with Environmental License*** - Supports the Municipal Authority and EEAA in conducting sampling and analysis of ambient ground water with particular emphasis on the resources below and near the oxidation ponds

- ***Enforcement of Sanctions*** - May issue protective orders directed to the Municipal Authority if it is determined that discharges from the oxidation pond to the desert are threatening deep wells and other groundwater resources

4 9 Ministry of Manpower and Employment

The Ministry of Manpower and Employment s principal role in the integrated environmental management program is in the inspection of indoor air quality at industrial establishments

The responsibilities of Ministry of Manpower and Employment include

- ***Issuance and Renewal of Environmental Licenses*** - Approves the license for industries to treat hazardous wastes (according to the list of regulated substances and classified wastes published jointly by the Ministry of Industry Ministry of Health and EEAA)

- ***Monitoring Compliance with Environmental License*** - Supports the Municipal Authority and EEAA in conducting sampling and analysis of indoor air quality to ensure compliance with the standards set forth in Decree 338 and supports the Municipal Authority in inspecting industrial establishments licensed to handle hazardous substances and wastes in terms of safety and emergency response plans

- ***Enforcement of Sanctions*** - None

4 10 10th of Ramadan Board of Trustees

The only responsibility of the Board of Trustees related to the integrated environmental management program is to appoint a committee composed of representatives of the Municipal Authority and the Investors Group to manage the Environmental Trust Fund Specific guidelines for the Fund are found in Chapter 13

Chapter 5
Administrative Procedures

This chapter describes the administrative procedures for licensing monitoring, and enforcing environmental regulations in the 10th of Ramadan City These three elements form the "command-and-control" foundation for the integrated environmental management program The procedures for each are presented in flow diagrams in Exhibits 5-1, 5-4, and 5-5 They represent part of the continuous process of managing the environmental impacts of industrial establishments in 10th of Ramadan

5 1 Procedures for Issuance and Renewal of Environmental Licenses

All industrial establishments, regardless of size or type, are subject to the environmental licensing procedures Exhibit 5-1 shows the process flow for issuing and renewing a Consolidated Environmental License It depicts the responsibilities of the industrial establishment the 10th of Ramadan Municipal Authority (and its governing Environmental Advisory Committee) and the EEAA and concerned ministries The specific responsibilities of each party within each step of the process are described below

Step 1 Compile Registry of Environmental Impact

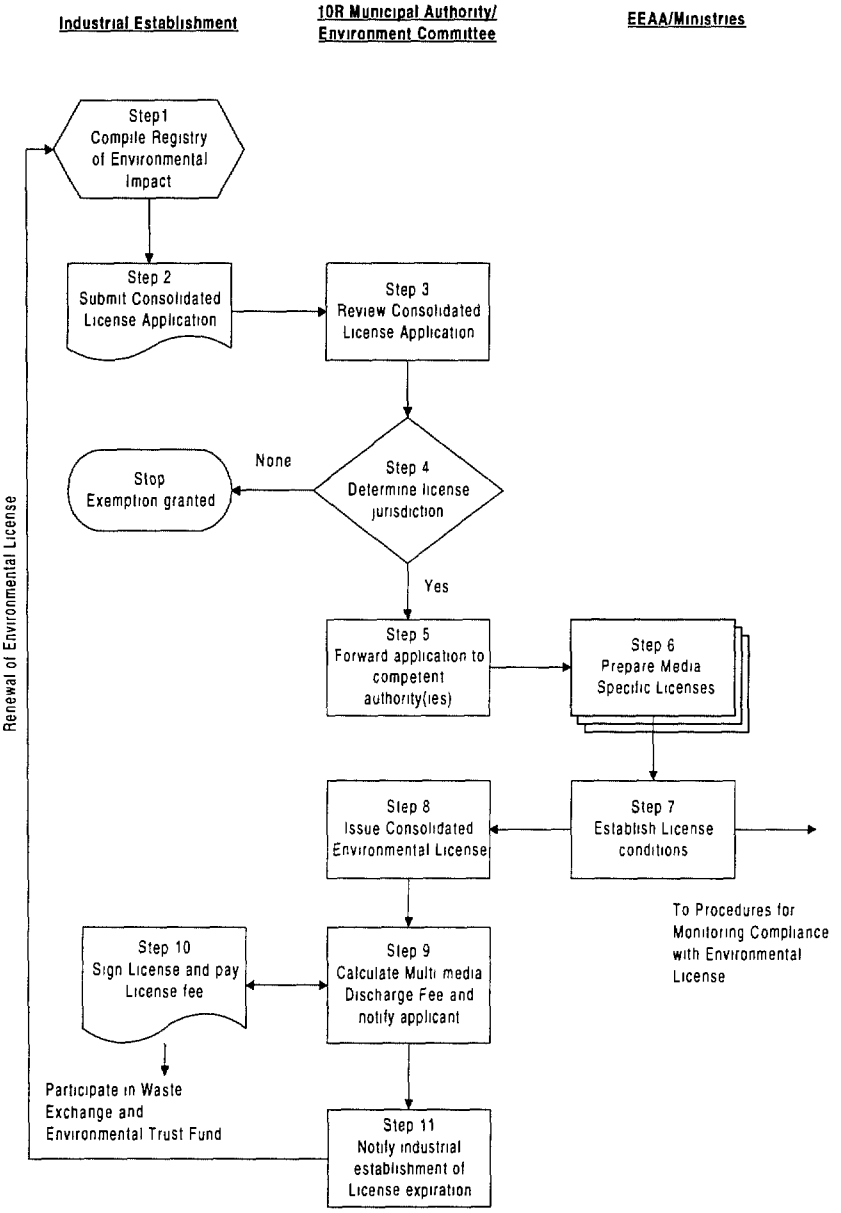
Before applying for an environmental license the owner/operator of the industrial establishment must compile all of the relevant environmental data Decree 338 Article 17 requires that owners maintain a register to record the extent of their establishment s impact on the environment The registry is to contain the following information

- emissions and/or discharges
- specifications of discharges after the treatment process including the pollutant removal efficiency
- management and safety procedures applicable to the industrial establishment

- periodic tests and measurements and their results (self-monitoring)
- the name of the person in charge of environmental management and monitoring (Environmental Management Officer)

The information covers air emissions, wastewater discharges, solid and hazardous wastes Appendix 1 contains an outline that should be followed by the establishment when recording and reporting such information Decree 338 also requires that the establishment maintain the Annual

Exhibit 5 1
Procedures for Issuance and Renewal of Environmental Licenses



Registry of Environmental Impact on a permanent basis Whenever new data are registered, such as a change in emissions or discharges, the establishment must maintain the record for a period of ten (10) years

Step 2 Submit Consolidated License Application

The licensing process is initiated with the submission, by the owner/operator of the industrial facility, of the Consolidated Environmental License Application Form A copy of this form is included in Appendix 2 of these guidelines The application must be signed by the facility' sowner and general manager (if known at the time of application) It is submitted directly to the Environment Department in the Municipal Authority Where the information requirement is not applicable to the industrial establishment, the applicant is instructed to insert n a " (not applicable)

The Consolidated Environmental License Application form contains all of the information necessary for the 10th of Ramadan Municipal Authority to determine what the applicable environmental laws and decrees are governing the applicant's industrial activity and environmental impacts These include

- contact and business registration information
- description of industrial processes and waste streams
- environmental management system (EMS) and pollution control information

It is assumed that the applicant has already been issued an Investment License a Business License and has submitted an acceptable EIA for the project as required under the EIA Guidelines (See Chapter 10 for specific instructions for EIA)

Step 3 Review Consolidated License Application

The Environment Department in the 10th of Ramadan Municipal Authority logs (name and date) the receipt of the application The Authority gives each application a reference number (identification)

The Environment Department reviews the application to determine whether the industrial establishment has included all of the information needed to process the application The Municipal Authority has fifteen (15) days to notify the applicant of his need to supply additional information, otherwise the application is considered complete

If the application is complete the Municipal Authority moves to Step 4

If the application is incomplete the Municipal Authority returns the application (as submitted) with a detailed description of the additional information needed to process the application **Only a complete application will be processed**

Step 4 Determine License Jurisdiction

The Municipal Authority evaluates the complete license application to determine the applicable licenses and approvals that are required under environmental laws and decrees Exhibit 5-2 lists the environmental licenses that are required for industrial establishments in 10th of Ramadan City

For each application, the Municipal Authority prepares a cover memorandum that summarizes its findings and recommendations on the licensing and approvals that are required The Consolidated Environmental License Application Form contains sections for 'official use" to guide the 10th of Ramadan Municipal Authority in evaluating applications and summarizing their findings This form is included in Appendix 2

Step 5 Forward Application to Competent Authorities

The 10th of Ramadan Municipal Authority attaches the cover memorandum with a copy of the license application and completed evaluation checklist and provides copies to the Environmental Advisory Committee The application is placed on the regulatory agenda of the Environmental Advisory Committee to be reviewed at its next monthly meeting

The competent ministries and authorities are instructed that they have thirty (30) days to prepare their respective licenses and/or grant their approval and that where relevant and appropriate they are to attach criteria and the specifications upon which the license/approval is conditioned Exhibit 5-2 lists the environmental licenses and the jurisdictional authorities for each

Each member of the Environmental Advisory Committee who serves by reason of the member s status as a 'competent authority" is responsible for securing the necessary approvals from their respective ministries/agencies For example the representative of the Ministry of Industry is responsible for securing the License to Handle Hazardous Substances and Waste

Exhibit 5-2 Environmental Licenses and Approvals Required of Industries in the 10th of Ramadan

Description of License (L)/Approval (A)	Law/ Decree	Granting Ministry or Authority
Wastewater Discharge		
Discharge of Wastewater to the River Nile and Irrigation Canals (L)	Law 48	Ministry of Public Works and Water Resources
Discharge of Wastewater into Groundwater Reservoirs (L)	Law 48	Ministry of Public Works and Water Resources
Connecting to the Public Sewer Network (A)	Law 93	10R Municipal Authority
Drainage of Industrial Wastewater into the Public Sewer Network (L)	Law 93	10R Municipal Authority
Drainage of Liquid Wastes by Surface Method (L)	Law 93	10R Municipal Authority
Air Emissions		
Site Suitability with Respect to Air Emission (A)	Law 4	Ministry of Industry
Solid Waste Management		
Disposal of Solid Waste in an Approved Location (A)	Law 4	10 R Municipal Authority in agreement with EEAA/Civil Defense
Incineration of Solid Wastes (L)	Law 4	10 R Municipal Authority in agreement with EEAA/Civil Defense/10 R Municipal Authority
Hazardous Substances and Waste Management		
Handling hazardous substances and wastes (L)	Law 4	Ministry of Industry

Step 6 Prepare Media-Specific Licenses

Where a specific license is granted (e g , for the drainage of industrial wastewater to the groundwater), the granting authority s representative on the Environment Advisory Committee assumes the responsibility to process the necessary application forms within his/her ministry or agency The competent authority will notify the applicant if further review time is required, but in no case shall it exceed ninety (90) days

Step 7 Establish License Conditions

Chapters 6-9 provide more detail on the standards that must be met by industrial establishments to comply with Egyptian environmental law under the media-specific programs for wastewater, air emissions and solid and hazardous waste The standards are prepared for each applicant and can cover both the concentration of pollutants as well as the total loading for water and air discharges and solid and hazardous wastes where the carrying capacity of the environment to accept further waste loading is at issue Exhibit 5-3 provides a summary of the standards potentially applicable to industrial establishments operating in 10th of Ramadan City

The conditions spelled out in the Environmental License can require the industrial establishment to install certain pollution control or treatment systems (identified in the Environmental Impact Assessment mitigation plan) It should always detail the record keeping reporting and license renewal requirements

Exhibit 5-3 Summary of Egyptian Environmental Standards Applicable to Industries in the 10th of Ramadan City

Type of Activity	Law or Decree
Maximum Limits for Water Intended for Potable Use	Law 48 Decree 8 Article 65
Maximum Limits for Non Potable Water Quality	Law 48 Decree 8 Article 68
Water Quality Standards for Surface Water Bodies Intended for Fisheries	Law 48 Decree 8 Article 69
Maximum Limits for Discharge of Treated Industrial Wastewater	Law 48 Decree 8 Article 61
Maximum Limits for Discharge of Heavy Metals in Treated Industrial Wastewater	Law 48 Decree 8 Article 61

Exhibit 5-3 Summary of Egyptian Environmental Standards Applicable to Industries in the 10th of Ramadan City

Maximum Limits for Small Discharge of Treated Industrial Wastewater	Law 48 Decree 8 Article 62
Maximum Limits for Discharge of Sanitary Drainage and Industrial Wastewater into Non Potable Water Sources	Law 48 Decree 8 Article 66
Standards for Discharge of Industrial Wastewater to Public Sewers	Law 93 Decree 649, Article 11 Chapter 6
Standards for Drainage of Industrial Wastewater to Surface Irrigation or by Irrigating Cultivable Land	Chapter 6 Decree 649
Standards for Drainage on Sandy Soil Land	Chapter 6 Decree 649
Pre Treatment of Industrial Wastewater Prior to Drainage	Decree 649 Article 3
Standards for Certain Materials When Drained and Disposed of in the Marine Environment	Law 4 Decree 338 Annex 1
Maximum Limits for Outdoor (Ambient) Air Quality	Law 4 Decree 338 Annex 5
Permissible Limits for Pollution in Air Emissions	Law 4 Decree 338, Annex 6
Permissible Limits for Noise Pollution and Period of Exposure	Law 4 Decree 338 Annex 7
Maximum of Air Pollution Inside the Workplace by Industry Type	Law 4 Decree 338 Annex 8
Maximum and Minimum Limits for Temperature and Humidity and Period of Exposure	Law 4 Decree 338 Annex 9
Non Decomposable Pollutant Materials Prohibited from Drainage into the Marine Environment	Law 4 Decree 338 Annex 10

The standards summarized in Exhibit 5 3 together with prohibitions and design specifications for controlling or mitigating environmental impacts are attached as conditions to the Consolidated Environmental License These conditions form the basis of the compliance monitoring plan described in Section 5 2 Procedures for Monitoring Compliance with Environmental Licenses

Step 8 Issue Consolidated Environmental License

The Environmental Advisory Committee collects the licenses and approvals from the appropriate representatives and forwards them to the

Municipal Authority EEAA, as staff to the Committee, is responsible for identifying and clarifying any contradictions or inconsistencies contained in the different licenses and approvals

The Municipal Authority then prepares the Consolidated Environmental License which references all of the attached criteria and specifications for other licenses and approvals The Consolidated Environmental License is signed by both the EEAA Chairman, or his representative, and the Chairman of the 10th of Ramadan Municipal Authority, or his designated representative Appendix 2 contains a sample Consolidated Environmental License Form

Step 9 Calculate Multi-Media Discharge Fee and Notify Applicant

The Multi-Media Discharge Fee (MDF) incorporates a fee for wastewater discharges, air emissions and hazardous waste The results of a groundwater contamination assessment conducted at the 10th of Ramadan City in May 1997 suggests that industrial wastewater may pose a risk of groundwater contamination and damage to the sewage collection and treatment system Therefore, a more elaborate fee is applied to wastewater Discharge fees on atmospheric emissions and hazardous waste have a simpler design with more limited objectives these include raising revenues for ambient air quality monitoring and an industrial waste exchange No fee is applied to non-hazardous solid waste as the available documentation identifies no immediate risks associated with it

The fee structures are based on the following design criteria

- ***Equity*** Firms should pay fees in proportion to their mass loadings of pollutants and waste flows Fees should be consistent with the polluter pays principle

- ***Phased Implementation*** For some discharges there are insufficient data to implement fees with strong incentives for pollution prevention Therefore a phased approach should begin with a fee structure that encourages companies to supply the data in the near term and move towards a fee structure that provides strong incentives over an extended period

- ***Simplicity*** Fees should be simple to understand and administer and provide polluters with clear incentives to prevent or control pollution

- ***Administrative Efficiency*** Fees should be cost-effective to administer This will reduce administrative costs and increase the

amount of revenue available for financing pollution prevention projects

There are three components to the environmental license fee (MDF) for the 10th of Ramadan City

- wastewater discharge fee (WDF)
- air emissions fee (AEF)
- hazardous waste fee (HWF)

The total environmental license fee is computed as

$$MDF = WDF + AEF + HWF$$

Further details on the fees, including equations for calculating the WDF, AEF and HWF are provided in the chapters on Water Quality and Wastewater Management (Chapter 4), Hazardous Substances and Waste (Chapter 6), and Air Quality (Chapter 7)

Once the total fee (MDF) is calculated, the Municipal Authority notifies the applicant that the license is ready and the total fees that must be paid The applicant is given an opportunity to visit the offices of the Municipal Authority to discuss the license conditions if requested

Step 10 Sign License and Pay License Fee

The Consolidated Environmental License becomes valid upon signing by the applicant and payment of the license assessment The owner/operator of the industrial establishment also signs the license to acknowledge his understanding of and demonstrate his intention to comply with the conditions of the license The entire period from the submission of a completed Consolidated Environmental License Application Form to the issuance of the license itself should not exceed sixty (60) days

Step 11 Notify Industrial Establishment of License Expiration

The Consolidated Environmental License is valid for five (5) years from the date it becomes effective with fees paid at annual renewal The date for paying the annual fees and the expiration date are clearly marked on the license The Municipal Authority is responsible for notifying the licensee of the need to renew its license at least ninety (90) days prior to expiration Appendix 2 contains a Notice of Renewal/Expiration Form

In renewing the license the applicant must attach an updated copy of its Uniform Register of Environmental Impacts (see Appendix 1), which

contains information on air emissions, wastewater discharges and hazardous substances and waste handling The wastewater flow and pollutant concentration data are used to calculate the wastewater fee component of the total license fee The updated register must be accompanied by the certified results of representative wastewater samples performed by a Ministry of Health-approved laboratory

5 2 Procedures for Monitoring Compliance with Environmental Licenses

The overall process of monitoring compliance begins during the issuance of the Consolidated Environmental License The issuance of the license is conditioned on the industrial establishment meeting certain standards In this regard, the competent authorities are responsible for preparing specific restrictions and prohibitions as authorized under the different environmental laws (e g , Law 4, Law 93) The principal role of the 10th of Ramadan Municipal Authority is to consolidate the 'media-specific" (e g , air water waste) requirements into a single set of conditions included in the consolidated license, and to coordinate the periodic reporting and inspection requirements

Exhibit 5-4 shows the process flow for monitoring compliance with the Consolidated Environmental License It depicts the responsibilities of the industrial establishment the 10th of Ramadan Municipal Authority (and its coordinating body, the Environmental Advisory Committee), and the EEAA and concerned Ministries The specific responsibilities of each party are described in detail below The final steps in the compliance monitoring process serve as the initial steps in the procedures for the enforcement of sanctions (see Section 5 3)

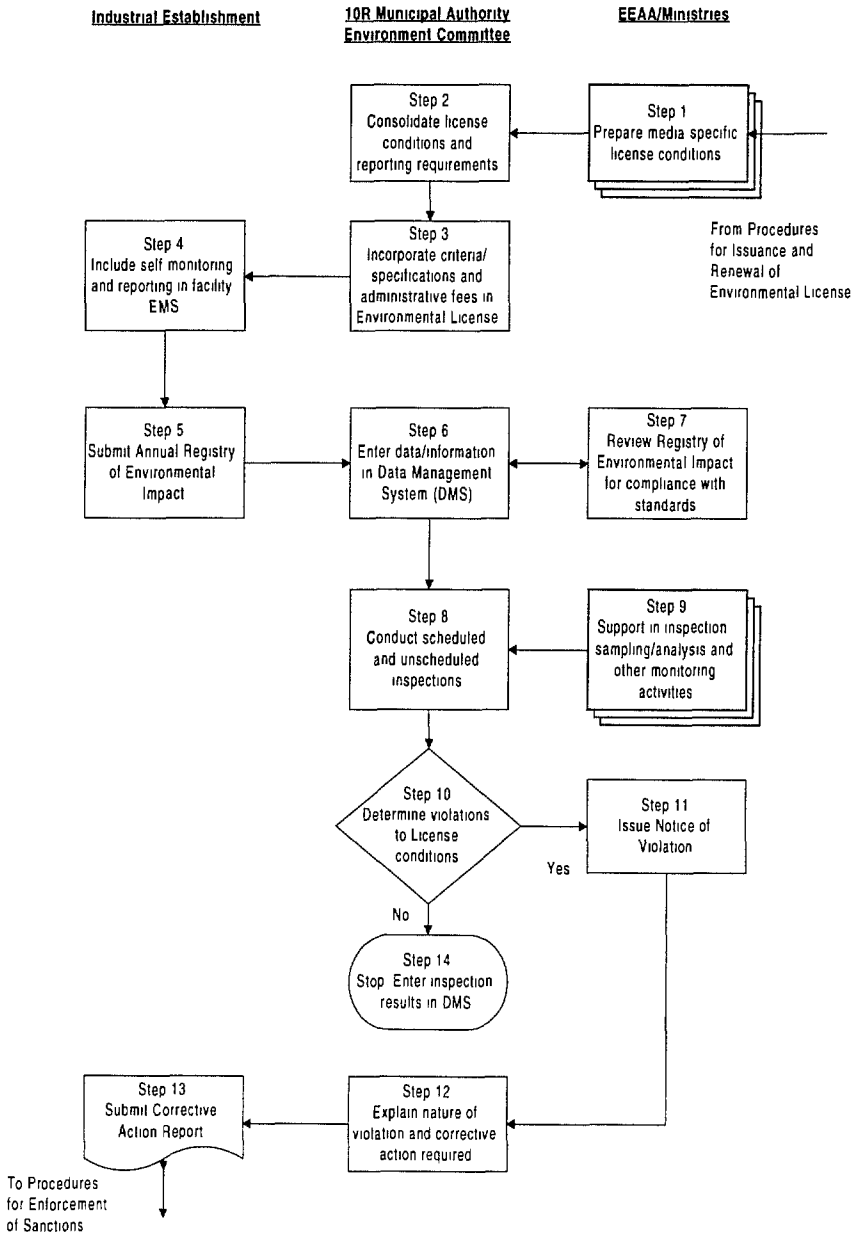
Step 1 Prepare Media-Specific License Conditions

The procedure is initiated with the submission by EEAA and the competent ministries of the standards that must be met in order to satisfy the relevant environmental laws governing each media For example Law 93 provides that the Ministry of Health through the local Health Authority, must authorize the disposal of wastewater by the surface draining or irrigation methods If the Health Authority decides not to authorize surface drainage which is the more common decision then the corresponding condition might read

> "The industrial facility is prohibited from discharging its wastewater by any means except directly to the public sewer network '

Exhibit 5 4

Procedures for Monitoring Compliance with Environmental License



The corresponding activity to incorporate into the compliance monitoring plan is to have the industry facility certify that its discharge is exclusively to the public sewer network that the wastewater contains constituents not in excess of the levels authorized by the license and that the industrial facility representative must notify the local Health Authority in advance of any wastewater that is drained by the surface method In this context, subsequent inspections by the 10th of Ramadan Municipal Authority inspectors should seek to verify that

- no surface drainage has occurred without the prior permission from the Health Authority (i e , look for evidence of discharge other than to the sewer network)
- the relevant constituents are within authorized levels

Chapters 6 through 9 provide information on the various media-specific standards that must be considered when preparing the media-specific license conditions As previously noted, Exhibit 5-3 lists the environmental standards applicable to industrial establishments in 10th of Ramadan City

Step 2 Consolidate License Conditions and Reporting Requirements

The 10th of Ramadan Municipal Authority consolidates the various monitoring plans and reporting requirements submitted by EEAA and the concerned ministries into a single compliance plan If the industrial establishment is a new facility, the monitoring plan contained in the environmental impact assessment is useful starting point The compliance plan should also include

- the scope and frequency of facility inspection
- the composition of the inspection team (e g , 10th of Ramadan Municipal Authority EEAA Regional Office, other ministries local representatives)
- the scope of the inspections (i e inspection guide)
- an outline of the industrial facility self-monitoring and reporting requirements

Initially it is expected that monitoring of actual discharges of pollutants into the environment will focus on wastewater discharged to the sewer network Note that all other forms of wastewater (other than to the sewer network) are prohibited without permission from the competent authority

Monitoring of air emissions will begin with a requirement that the industrial establishment use one of two methods to calculate its air pollution load

- estimate air emissions loading using standard emissions factors[1] or
- actual results of the analysis of representative stack (chimney) samples

Step 3 Incorporate Monitoring/Reporting Requirements into Environmental License

The 10th of Ramadan Municipal Authority presents the consolidated Compliance Monitoring Plan to the Environment Committee for review and approval by the relevant representatives of the concerned authority The concerned authorities are required to provide their input within fifteen (15) days of the request from the Environment Committee At the request of the concerned authority the 10th of Ramadan Municipal Authority may prepare the conditions for the Environmental License, including the media-specific compliance monitoring plans This delegation of responsibility should be the subject of a Memorandum of Agreement between the 10th of Ramadan Municipal Authority and an authorized representative of the concerned ministry or agency (Coordination among the competent ministries for the purpose of entrusting a specific assignment" may also be the subject of an internal memorandum of EEAA s Board of Directors pursuant to Article 3 Prime Minister's Decree No 338 1995)

Central to the environmental license conditions is the requirement that the industrial establishment maintain and report on its environmental impacts This reporting is done by submitting an updated ' Uniform Register of Environmental Impacts on an annual basis to EEAA and the 10th of Ramadan Municipal Authority In addition to maintaining an updated register the owner of an industrial establishment or his designee, must notify EEAA by registered letter of any deviation in the criteria and specifications of emitted or drained pollutants and the procedures taken to correct it These two reporting requirements must be incorporated into the conditions of all Consolidated Environmental Licenses

Step 4 Include Self Monitoring and Reporting Requirements in Facility EMS

Each industrial establishment is expected to conduct some level of self-monitoring and reporting to demonstrate its compliance with the conditions of the environmental license These requirements form a basic

[1] The *AP 42* compilation of emissions factors by the U S Environmental Protection Agency can be used

element of the environmental management system (EMS) that is described in more detail in *Volume 2 Industry Guidelines* The Uniform Register of Environmental Impacts described in Step 3 should form the centerpiece of an establishment's self-monitoring program

Step 5 Receive Annual Register of Environmental Impacts

According to Article 17 of Decree 338 implementing the Law on the Environment (Law 4) the owner of an industrial establishment is required to maintain a register indicating the impact of the establishment s activity on the environment, and in which the following data/information shall be recorded

- emissions and discharges of gaseous and liquid effluents respectively
- specifications and pollution removal efficiency of treatment units
- follow-up and environmental safety procedures as applied in the establishment
- periodic tests and measurements and their results
- the officer in charge of follow-up

This register is officially titled the "Uniform Register of Environmental Impacts " The key information that must be included is outlined in Exhibit 5-5 Although not required by law it is recommended that a summary of the Register (including data for the preceding year) be attached to the Consolidated Environmental License renewal application

Exhibit 5-5 Information Required in the Uniform Register of Environmental Impacts	
1	Establishment name and address
2	Name of person in charge of recording data in the Register and his job title
3	Time period covered by the current data
4	Type of activities and nature of primary raw materials used and production during the corresponding time period
5	Legislation to which the establishment is subject
6	Special conditions set by the EEAA concerning the establishment
7	Statement of types of emissions, the rates of drainage (per hour/per day/per month/per year), and method of disposal thereof 7 1 Gaseous Emissions 7 2 Liquid Emissions 7 3 Solid Emissions 7 4 Other Emissions
8	Frequencies of carrying out tests on all types of emissions from the establishment 8 1 Random samples for testing -Date, time and place of each sample -Frequency of sample collection -Statement of parameters to be measured (daily/weekly/ monthly) 8 2 Samples of compound waste -Date and time of sample collection -Locations and percentages of the mixture in the compound sample -Statement of parameters to be measured (daily/weekly/monthly)
9	Extracted materials after treatment processes
10	Extent of efficiency of treatment method
11	Date and signature of officer in charge
Source Decree 338 1994 Annex No 3	

Step 6 Enter Data/Information in Data Management System (DMS)

The 10th of Ramadan Municipal Authority inputs the data/information contained in the Uniform Register of Environmental Impacts into its Data Management System (DMS) The DMS is explained in more detail in Appendix 3 It is used to track and analyze the performance of the industrial establishments in 10th of Ramadan City Easy-to-enter forms, corresponding to the outline of the Uniform Register of Environmental Impacts have been developed to facilitate data entry The DMS is also designed to generate a variety of reports, including the Consolidated Environmental License, the license renewal notice and compliance monitoring reports

Step 7 Review Uniform Register of Environmental Impacts for Compliance

As noted in Article 18, Decree 338, EEAA is responsible for following-up on the data contained in the Uniform Register to ensure its conformity to actual data (e g estimated vs actual wastewater pollutant concentrations) EEAA must also take samples as necessary and conduct suitable tests to show the actual impact of the establishment's activity on the environment and determine the degree of its commitment to meeting the standards contained in its environmental license The initial review will compare the updated register with the conditions of the environmental license On-site inspection and follow-up are covered in Step 8

Step 8 Conduct Scheduled and Unscheduled Inspections

While EEAA is responsible for the validation of the information contained in the register and its conformance with the criteria and specifications in the environmental license the 10th of Ramadan Municipal Authority is tasked with the responsibility to conduct the scheduled and unscheduled inspections of the industrial establishment It is expected however that EEAA and representatives of the other concerned authorities will take part in the on-site inspections (see Step 9)

A copy of a Multi-Media Inspection and Monitoring Checklist is contained in Appendix 4 This checklist should be used in combination with a copy of the Consolidated Environmental License conditions by inspectors when visiting the industrial establishment Where sections of the Multi-Media Inspection Checklist are found not to apply, such as hazardous waste management for a facility that does not use hazardous substances no produce hazardous waste these sections of the checklist should be marked not applicable

A follow-up to the Register, encouraged under Decree 338, shall take place at least once each year, and a report on each shall be deposited with the Environmental Advisory Committee for distribution to the Municipal Authority, EEAA s concerned sectors, and the competent authorities The report shall be duly signed by the officer in charge of such inspection survey and tests as well as the date of the inspection, survey and test In case any violation or exceedance is found, EEAA notifies the concerned administrative authority to require the owner of the establishment by registered letter, to correct the violation by a specific date, depending upon its severity and the nature of the industrial operation

Chapters 6-9 contain sections on both self-monitoring and compliance monitoring for each of the media (i e , wastewater, air emissions solid waste, hazardous waste) The Municipal Authority should refer to these sections when determining the frequency and scope of facility inspections

Step 9 Support in Facility Inspection, Sampling/Analysis and Other Monitoring Activities

The inspections conducted by the 10th of Ramadan Municipal Authority will necessarily require the support and guidance of EEAA and other concerned authorities In this regard, the Municipal Authority will sign a Memorandum of Agreement with EEAA and the concerned authorities that delineates the roles and responsibilities of each For example under Law 48 the Ministry of Health is charged with the responsibility for carrying out in its laboratories and by itself once at least every three months a periodic analysis of samples of the treated industrial wastewater for those establishments licensed to discharge into the waterways (including groundwater) Since the drinking water wells in the 10th of Ramadan may be at risk the Ministry of Health may wish to monitor any further subsurface migration of contaminants or in the alternative the Groundwater Institute (within the organizational structure of MPWWR) may be contractually engaged to perform this work

Step 10 Determine Violation with License Conditions

A comparison of the results of the inspection (including analysis of samples) with the Environmental License conditions will determine whether the industrial establishment is being operated in compliance with the License If the establishment is in compliance, then the process skips to Step 14 If the establishment is found to have violated one or more of the License conditions the Municipal Authority submits this finding to the Environmental Committee and a decision is made as to which competent authority has jurisdiction and will issue the Notice of Violation (Step 11)

Step 11 Issue Notice of Violation

The nature of the violation will determine which competent authority issues the Notice of Violation However, for the most part it will be EEAA that issues the Notice of Violation (NOV) using the environmental license conditions and the data/information in the register and/or the information gathered through its inspections as the basis for issuing the NOV

The NOV is sent via registered letter to the owner of the industrial establishment It contains a description of the violation and the requirements for the industrial establishment to remedy the situation Corrective action must be performed by the date specified in the NOV and the owner of the industrial establishment is required to document its actions in a Corrective Action Report that must be submitted within a time frame prescribed in the NOV Sample formats for the NOV and the Corrective Action Report are contained in Appendix 5

Step 12 Explain Nature of Violation and Corrective Action Required

Within thirty (30) days of issuance of the NOV, the Municipal Authority invites the owner of the establishment to attend a technical conference with the appropriate members of the Environmental Advisory Committee, depending upon the nature of the violation and the corresponding legal authority that mandates corrective action For example the representative of the Ministry of Industry would be present for a technical conference related to a violation of the License to Handle Hazardous Substances and Wastes The technical conference gives the owner of the industrial establishment the opportunity to explain the circumstances leading to the violation (e g power outage resulting in a stoppage in the operation of its pollution control devices) The owner may also present its own evidence to rebut the findings of the inspection team

Failure by the owner of the industrial establishment to attend the technical conference represents a waiver of his right to such a conference the imposition of the Notice of Violation and the requirement to submit the Corrective Action Report proceed according to schedule

Step 13 Submit Corrective Action Report

The owner of the industrial establishment compiles a report showing the actual (or planned) actions taken to address the violation identified in the NOV In the event the owner has completed a corrective action(s), it must demonstrate that the industrial establishment is no longer in violation If the violation is an exceedence of the maximum limit for releasing pollutants into the environment (e g , industrial discharge standards), as evidenced by the results of the analysis of a sample, then the owner must attach to the Corrective Action Report the results of the analysis done on samples taken after the corrective action has been taken

In the event the owner has planned for the corrective action, but has not yet undertaken the action itself the Notice of Violation remains in force until such time as the action is completed and the violation no longer exists In that case, the Municipal Authority, with input from EEAA and other concerned authorities will establish a timetable for completing the corrective action

Failure by the owner of the industrial establishment to submit the Corrective Action Report as scheduled to remedy the violation, or to meet the timetable for taking the corrective action is a violation of Article 22 of Law 4 (which states that if the owner of the establishment fails to submit the Corrective Action Report within sixty (60) days, EEAA may then, in agreement with the concerned administrative authority, take the necessary legal and judiciary procedures to stop the violating activity and claim compensation as appropriate for treating the damages resulting from these violations)

Step 14 Stop Enter Inspection Results in DMS

This steps ends the process of monitoring compliance with the environmental license At this stage the Municipal Authority enters the data/information contained in the Corrective Action Report and any accompanying analysis of samples taken to demonstrate the conformity with license conditions into the DMS

5 3 Procedures for Enforcement of Sanctions

The overall process for enforcing sanctions for violations of Law 4 and the other Egyptian environmental laws is described below It begins with the last step (Submit Corrective Action Report ') in the Procedures for Monitoring Compliance with Environmental License described in the previous section Thus the issuance of a Notice of Violation is considered part of the compliance monitoring procedure but serves as a warning that failure to correct the violation will result in an enforcement action

Exhibit 5-6 shows the process flow for enforcement of sanctions It depicts the responsibilities of the industrial establishment, the 10th of Ramadan Municipal Authority (and its coordinating body the Environmental Advisory Committee), and the EEAA and concerned Ministries The specific responsibilities of each party are described in detail below

The sanctions are defined in the various environmental laws, and are subject to the determination of different ministries and agencies authorized to administer the sanctions The process concludes with the responsible ministry or agency initiating the legal proceedings against the owner of the industrial establishment

Step 1 Submit Corrective Action Report

The owner of the industrial establishment compiles a report showing the actual (or planned) actions taken to address the violation identified in the NOV In the event the owner has completed a corrective action(s) it must demonstrate that the industrial establishment is no longer in violation If the violation is an exceedence of the maximum limit for releasing pollutants into the environment (e g industrial discharge standards), as evidenced by the results of the analysis of a sample, then the owner must attach to the Corrective Action Report the results of the analysis done on samples taken after the corrective action has been taken

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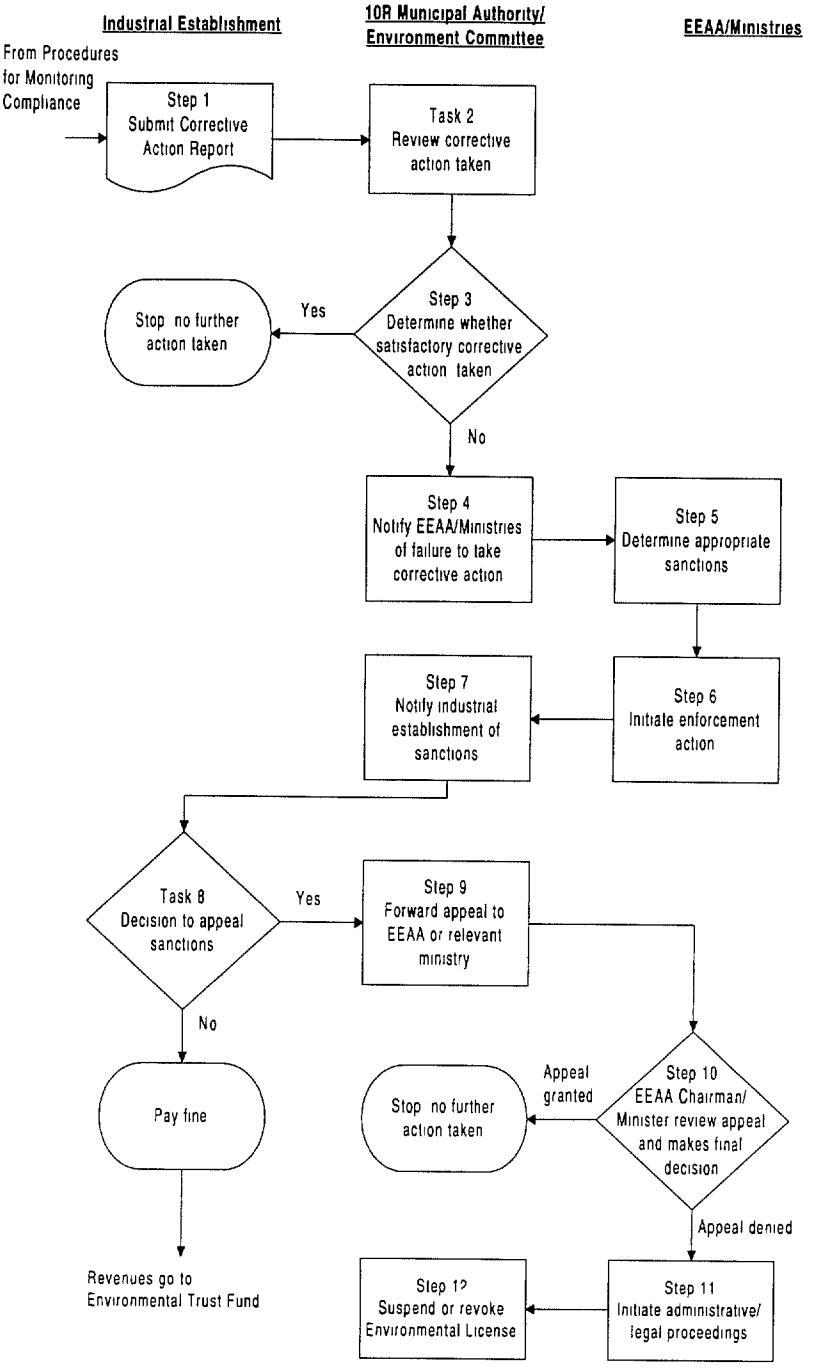
Exhibit 5 6
Procedures for Enforcement of Sanctions



Step 2 Review Corrective Action Report

The Municipal Authority records the date of submission of the Corrective Action Report and begins an internal evaluation of the report s contents Of particular concern are the following

- Was the report submitted within the specified period of time?
- Does the report address ***all*** of the violations identified in the Notice of Violation?
- Does the report provide sufficient detail of the measures taken?
- Are the measures appropriate for correcting the violation found?
- Has the establishment's owner tested any new system or apparatus to determine whether the measure achieves the desired results?

The Corrective Action Report should be accompanied by the specifications and process drawings corresponding to any new system or apparatus that is installed as part of the corrective action It should also include appropriate management practices such as periodic inspection and monitoring, in place to ensure that the violation will no longer occur If the foregoing are not included, the Municipal Authority should contact the establishment owner to request the additional information and/or documentation If the owner fails to respond adequately to such a request within 15 days, the Municipal Authority returns the report as incomplete and notifies EEAA of the situation EEAA may then administering sanctions under Law 4 as follows

- close down the establishment
- suspend the violating activity and/or
- sue in court for suitable compensation to remedy the harms resulting from the violation

Step 3 Determine Whether Satisfactory Corrective Action has been Taken

The Municipal Authority makes the determination on whether the measures taken in the Corrective Action Report are satisfactory to ensure that the violation no longer exists At the this stage in the process the subgroup of the Environmental Advisory Committee may be tasked to conduct a visual inspection of the measures covered in the Corrective Action Report

If the measures satisfactorily correct the violation the Municipal Authority and EEAA both initial their acceptance of the report and the Municipal Authority notifies, by registered letter, the owner/operator of the establishment The procedure is completed

If the measures do not satisfactorily correct the violation, the Municipal Authority notifies the appropriate authorities (Step 4)

Step 4 Notify EEAA/Ministry of Failure to Take Corrective Action

The Municipal Authority notifies the EEAA or appropriate ministry of the industrial establishment's failure to correct the violation The notification should be accompanied by a brief description of the nature and severity of the violation, with particular attention to the current or imminent damage that is caused to the environment or any public works structure (e g , public sewer) Exhibit 5-7 summarizes the types of violations and the concerned ministry/authority

Exhibit 5-7 Enforcement Responsibilities

Type of Violation	Competent Authority
Incorrect information in Registry of Environmental Impact	EEAA
Failure to allow access of government inspectors to the facility	EEAA
Operating without a wastewater discharge permit (or exemption)	Municipal Authority
Discharging wastewater other than to the sewer network	Municipal Authority
Exceedance of permissible limits for pollutants in wastewater	Municipal Authority
Failure to install or properly operate industrial wastewater pre-treatment prior to drainage (as applicable)	Municipal Authority
Exceedance of permissible limits for pollutants in air emissions	EEAA
Failure to install or properly operate air pollution control equipment (as applicable)	EEAA

Exhibit 5-7 Enforcement Responsibilities

Type of Violation	Competent Authority
Exceedance of permissible limits for indoor air pollutants in the workplace	Ministry of Manpower and Employment
Handling hazardous substance or generating hazardous waste without a license	EEAA
Treating hazardous waste without a license	EEAA
Disposal of solid wastes in unauthorized locations	Municipal Authority

Step 5 Determine Appropriate Sanctions

The concerned ministry/agency assesses the nature and severity of the violation relative to the corresponding sanctions authorized by law Chapters 6 through 9 describe the applicable sanctions for violations to the major environmental laws (i e , Law 4, Law 93 Law 48)

Step 6 Initiate Enforcement Action

The concerned ministry/agency initiates its internal enforcement action and notifies in writing the Municipal Authority of the actions it or the concerned ministry/agency plans to take Each case is given a separate enforcement action number and a copy of the enforcement notice is put in the industrial establishment s file

Step 7 Notify Industrial Establishment of Sanctions

The Municipal Authority issues the Enforcement Notice to the owner of the industrial establishment by registered mail The notice should adequately explain the nature of the violation the sanction imposed and the requirements that must be met to prevent further administrative sanctions (e g suspension of Environmental License closure of the industrial facility) Instructions should be given as to how to pay any fines imposed

Step 8 Decision to Appeal Sanctions

The owner of the industrial establishment has the right to appeal the sanction imposed on him and a procedure is provided to review the decisions made by the departments and offices of a given ministry/agency

The grounds for appeal are as follows

- insufficient amount of time provided to take the corrective action
- independent (third-party) testing results demonstrating that the corrective action was adequate to remedy the violation

All other reasons, including economic hardship and severity of sanction, are ***not*** grounds for an appeal

From the date of receipt, the owner of the industrial establishment has 10 days to appeal the sanctions in writing to the Municipal Authority Failure to appeal within 10 days shall be interpreted as a waiver of the right to appeal and the sanction shall be imposed forthwith

Step 9 Forward Appeal to EEAA or Relevant Ministry

If the Municipal Authority receives an appeal within 10 days then it forwards the appeal to the office of the highest ranking officer in the concerned ministry/agency Exhibit 5-8 lists the office to which the appeal should be forwarded

Exhibit 5-8 Office of Appeal to Imposed Sanctions

Concerned Ministry/Agency	Office of Appeal
Egyptian Environmental Affairs Agency	Chairman
Ministry of Housing Utilities and New Communities	Minister
Ministry of Industry	Minster
Ministry of Health	Minister
Ministry of Public Works and Water Resources	Minister
Ministry of Manpower and Employment	Minister
Municipal Authority	Director of New Communities Authority

Step 10 EEAA Chairman/Minister Review Appeal and Make Final Decision on Enforcement Action

The corresponding office of appeal shown in Exhibit 5-8 shall make its decision on the appeal within 30 days

Step 11 Initiate Administrative/Legal Proceedings

At this stage the concerned authority will initiate its internal administrative or legal proceedings, depending upon the sanctions The file of the industrial establishment that is maintained at the Municipal Authority remains open until the Municipal Authority is notified that a disposition of the case has been made

Step 12 Suspend or Revoke Environmental License

The Municipal Authority may, at this stage, suspend or revoke the environmental license until such time as all violations are corrected, all sanctions met, and the industrial establishment is in good standing with the concerned authority **No industrial establishment may be operated in the 10th of Ramadan City without an environmental license**

Chapter 6
Media-Specific Programs: Water Quality and Wastewater Management

This chapter presents the environmental management requirements associated with the implementation and enforcement of Egyptian water and wastewater quality laws and regulations in 10th of Ramadan City It reviews industrial and municipal wastewater discharge standards applicable in 10th of Ramadan City licensing requirements for these discharges, and associated discharge fees It provides guidance to the relevant government authorities on the implementation of the wastewater license program This chapter also presents the elements of a program to be implemented in 10th of Ramadan City for monitoring wastewater discharges through inspections sampling and analysis, and for enforcing compliance with requirements A program for monitoring ambient groundwater quality for 10th of Ramadan City is also discussed

6 1 Wastewater Discharge Standards

This section provides information on the specific standards that must be met in order to satisfy the relevant environmental laws governing wastewater discharges in 10th of Ramadan City As discussed in Section 6 2 applicable standards are incorporated into an industrial establishment s environmental license

As reviewed in Chapter 2 and summarized in Section 5 1 Egyptian regulations regarding the control of water pollution are contained in several laws including Law 93 of 1962 (Decree 649) concerning the drainage of liquid wastes (i e wastewater) and Law 48 of 1982 (Decree 8) regarding the protection of waterways from pollution Waterways include potable water areas such as the Nile River and aqueducts non potable water areas (drainage lakes ponds) and subsoil water reservoirs (groundwater) Laws also exist regarding the quality of drinking water (Supreme Committee for Water Annex IV 1-7-75) and the protection of sea water from pollution (Law 72-1968, International Conventions Law 4)

All industrial commercial residential and other liquid wastes (wastewater) in 10th of Ramadan City are required to be discharged to the public sewer The disposal of industrial commercial or residential

wastewater by surface drainage, discharge to surface waters, or discharge into groundwater (underground water reservoirs) is prohibited Consequently, although regulations, standards, and specifications exist in Egypt for the discharge of industrial wastewater onto land and to surface waters and groundwater, they are not reviewed here

6 1 1 Standards for Drainage of Industrial Wastewater to a Public Sewer

Law 93 concerns sewer systems and drainage into them Under this law, discharges of industrial wastewater to public sewers are prohibited unless a license to do so is obtained and on condition that specifications and standards are met Chapter 6 of the Decree implementing Law 93 lists the criteria and standards that must be met for authorized discharges of wastewater from commercial and industrial establishments into public sewers These standards are presented in Exhibit 6-1

Exhibit 6-1 Maximum Limits for Discharge of Industrial Wastewater to Public Sewer

(units expressed in milligrams per liter unless otherwise noted)

Parameter	1989 Revision	1994 Revision	
		< 100 m^3/day	> 100 m^3/day
Temperature (°C)	40	43	43
pH (S U)	6-10	6-10	6-10
Biochemical Oxygen Demand	400	1100	800
Chemical Oxygen	700	2200	1600
Suspended Solids	500	1200	800
Oil and Grease	100	150	100
Sulfides	10	10	10
Total Nitrogen	100	200	100
Total Phosphorus	5	50	25
Cyanide		1	1
Hexavalent Chromium		1	1
Cadmium		0 2	0 2
Phenol	0 005	1	0 5
Mercury		0 2	0 2

Exhibit 6-1 Maximum Limits for Discharge of Industrial Wastewater to Public Sewer

(units expressed in milligrams per liter unless otherwise noted)

Lead		2	1
Arsenic	-	1	0 5
Total Dissolved Solids	2000	-	-
Other Metals Ag Cu Ni Mn B Zn	-	Each 5 Total 15	Each 5 Total 15

Industrial wastewater discharged to public sewers should also be free of petroleum calcium carbide and organic solvents These wastewater should also be free of any other material which could endanger workers maintaining the public sewer network, cause damage to the sewer facility or to the treatment process, or could lead to polluting the environment Industrial wastewater should also be free of any chemical insecticides or radioactive materials (Article 11)

To ensure that the standards for discharges of commercial and industrial wastewater to the public sewer are being met, Law 93 includes requirements for periodic sampling and analysis of these wastewaters Chapter 7 of the Decree prescribes procedures for taking samples of wastewater for this analysis These procedures would be followed both by industrial establishments owners/operators as part of their self-monitoring activities and by government personnel responsible for inspecting and testing wastewater at industrial facilities (see Section 6 5) Chapter 7 of the Decree also specifies that the analyses of all samples are to be performed by the Water Division in the General Department for laboratories in the Ministry of Health

6 1 2 Pre-Treatment Requirements for Industrial Wastewater

If an industrial establishment s wastewater contains solid materials as in the cases of tanneries and flour mills the wastewater must be treated (Pre treatment) before it can be discharged to the public sewer network As specified in Decree 649 Article 3 the treatment method that must be employed is settling out of solids in sedimentation chambers If an industrial establishment s wastewater contains oil and grease as in the cases of garages and automobile shops these pollutants must be physically separated and retained before the purified wastewater can be discharged If an industrial establishment s wastewater contains flammable materials such as heavy oil (mazut) these materials must be separated and retained before the purified wastewater can be discharged

The separation chambers used to pretreat industrial wastewater must meet the specifications of the 10th of Ramadan authority (Which authority?) and must be appropriate to the nature of the industrial activity

In addition if the government authority in charge of the public sewerage believes that the wastewater being drained from an industrial establishment is damaging the public sewer or is harmful to the environment, it has the right to obligate the owner or occupant of the establishment to treat (pretreat) its wastewater before draining them into the public sewer network

While currently there are no industrial establishments in 10th of Ramadan City that have been required to treat their wastewater before discharge to the public sewer, such determinations could be made once Self-monitoring or compliance monitoring programs are in place (see Section 6 4) or when new industrial establishments are located in the city If the analysis of wastewater samples from an industrial establishment exceed the limits of criteria and specifications listed in Exhibit 6-1 above the facility must then treat its wastewater before discharging to the public sewer The Pre-treatment methods employed by industrial establishments must reduce pollutant levels to the standards specified in Exhibit 6-1 Otherwise the establishment's wastewater discharge license can be canceled

For reference the treatment of industrial wastewater is reviewed in Appendix 6 This includes a review of the types of pollutants present in industrial wastewater technologies available for pre-treating wastewater by industry type and the effectiveness of various wastewater treatment processes in removing pollutants

6 1 3 Standards for Surface Drainage of Public Sewer Wastewater

Chapter 6 of the Decree implementing Law 93 also contains specifications for the discharge of wastewater onto land (drainage by surface irrigation or by irrigating cultivable land) This includes standards for the drainage of liquid wastes from public sewer operations In 10th of Ramadan City all wastewater from commercial residential or industrial sources must be discharged to the public sewer network discharges onto land are prohibited Consequently the standards for surface drainage of wastewater are not applicable to industrial establishments in the city However wastewater effluent from the city s public sewer network is disposed by discharging onto land and therefore this discharge must conform with the provisions of the law General provisions of the law include

- Sewer wastewater may not be disposed of by surface draining or irrigation methods unless authorized by the local Health Authority
- The land where sewer wastewater wastes are drained should be situated at a distance not less than three (3) kilometers from the urban areas or the boundary of the city or village, whichever is further
- The degree of treatment of sewer wastewater should not be less than primary treatment
- The cultivation of vegetables, fruits, or plants, which are eaten raw should not be allowed on farms which are irrigated by the sewer wastewater, nor should animals be raised on such farms
- Sewer wastewater should be discharged at such a speed that will not give rise to aquatic pools

Additionally the regulations specify standards for the discharge of sewer wastewater dependent on the type of surface soil in the discharge area — sandy or clayey These standards are presented in Exhibits 6-2 and 6-3

Exhibit 6-2 Maximum Limits for Drainage of Sewer Wastewater on Sandy Land

Parameter	Standard
Precipitated materials	1 cm3 per liter per hour
Oils lubricants and resins	10 mg/l
Sulfides (estimated on the basis of sulphate)	1 mg/l

Chapter 6 Decree 649 Law 93

Exhibit 6-3 Maximum Limits for Drainage of Sewer Wastewater on Clayey Land

Parameter	Standard
pH	Between 6 9
BOD	80 mg/l
COD	50 mg/l
Total suspended solids	80 mg/l

Exhibit 6-3 Maximum Limits for Drainage of Sewer Wastewater on Clayey Land

Sulfides (estimated on the basis of sulphur)	0 1 mg/l
Oils lubricants and resins	5 mg/l
Dissolved sodium chloride	2000 mg/l
Cyanide	0 1 mg/l

Chapter 6 Decree 649 Law 93

6 2 Licenses to Discharge Industrial Wastewater to Public Sewer Systems

6 2 1 Drainage of Industrial Wastewater into the Public Sewer Network

As reviewed above commercial public, and industrial establishments in 10th of Ramadan City are subject to provisions of environmental licensing Since wastewater discharges are only allowed to the public sewer network the only type of wastewater license issued under the environmental management program will be for 'Drainage of Industrial Wastewater into the Public Sewer Network " The agency responsible for issuing the wastewater discharge license is the Municipal Authority

Chapter 5 of Decree 649/1962 specifies the types of industries that must obtain a wastewater license As previously listed in Chapter 2 these include establishments engaged in food processing tile factories soap factories slaughterhouses tanneries dying painting workshops textiles drugs and chemical manufacturing iron and steel mills factories using radioactive materials and photography and film development laboratories Other public and industrial establishments which discharge wastewater may also be required to obtain a license as determined by Municipal Authority ***Liquid wastes from these establishments may not be drained in the public sewage system without a license*** The license is issued after the government authority ascertains that the establishment is fulfilling the necessary requirements as provided for by the laws and regulations in force The government authority in charge of public sewer works has the right to stop the drainage of liquid wastes if such wastes are drained without a license (Law 93 Article 7)

The wastewater license will specific conditions that must be met by the establishment discharging wastewater These conditions include

- The industrial establishment must adhere to specified effluent standards and limitations The standards listed in Exhibit 6-1 for

discharges into public sewers are incorporated as a condition into the license

- The industrial establishment must regularly monitor their wastewater discharges as a condition of obtaining an environmental license and to demonstrate their compliance with the conditions of the license

Additionally, there are two reporting requirements that are conditions of all Consolidated Environmental Licenses

- The industrial establishment must maintain and submit annually a Uniform Register of Environmental Impacts which contains information on its wastewater discharges The Register of Environmental Impacts must be updated annually It is submitted to the 10th of Ramadan City Municipal Authority and the EEAA for review

- The owner of an industrial establishment, or his designee, must notify government authorities by registered letter of any deviation in the criteria and specifications of pollutants in their wastewater discharges and the procedures taken to correct deviations

Appendix 2 (Consolidated Environmental License Application Form) contains a discharge wastewater to the sewer network Appendix 7 contains a sample license to Discharge Industrial Wastewater to the Public Sewer Network

6 2 2 Connecting to the Public Sewer Network

In addition to obtaining a wastewater license industrial establishments in 10th of Ramadan City must obtain government approval to connect to the public sewer network The Municipal Authority is in charge of public sewerage works within 10th of Ramadan City The Department specifies the streets in the districts where the sewer network will serve and notifies the owners of properties located on them to apply for connection to the public sewer network

The owner of the industrial establishment or his representative then completes and submits the application to the Municipal Authority for review The application must contain the name of the establishment owner his nationality and place of residence The applicant must attach the following to his applications

- A survey map or a drawing of the industrial establishments at a scale not less than 1 2 500 on which the location of the establishment is indicated

- Three copies of a drawing showing the ground plan of the ground floor at a scale of 1 200, 1 100 or 1 50 on which wastewater inspection chambers, gully traps, ground stretchers and tanks are indicated

Connections must be completed within two months of a property owner having received a notice to connect from the Municipal Authority This period is also fixed to three (3) months from the date of completing the building or establishment If the period has expired without application, the Housing and Utilities Department can go ahead and connect the property at the expense of the landlord The Department of Housing and Utilities can remove connections that have been made in violation of the regulatory provisions It is prohibited to touch or change any part of the public sewer network or the connection to it

The department in charge of public sewer works in 10th of Ramadan constructs the connection from the building to the public sewer network For most establishments, this work is carried out at the expense of the landlord The department must also construct an inspection chamber at the border of the property that can be accessed during compliance monitoring activities The inspection chambers cannot be connected to the building walls and must be covered with tight-fitting lids of cast iron or reinforced concrete having an iron frame These covers should be provided with handles to facilitate lifting them up The inspection chambers must be coated with approved corrosion-resistant materials as specified in Article 3 Decree 649 Law 93

6 2 3 Drainage of Liquid Wastes by Surface Method

There are no licensing requirements for wastewater discharges onto land from the 10th of Ramadan s public sewer network under the regulations in Drainage of Liquid Wastes by Surface Method However as previously discussed authorization for this type of discharge must be obtained from the Ministry of Health and the drainage technique must fulfill all requirements specifications and standards issued by decreed from the Minister of Housing and Utilities and summarized in Section 6 1 above

6 2 4 Discharge of Wastewater to Waterways

The licensing provisions of Law 48 (1982) as they relate to the discharge of industrial and sanitary wastewater into waterways are not included in this guidance document because such discharges are prohibited and are therefore not applicable to wastewater management in 10th of Ramadan City This includes the licensing of discharges to the Nile River irrigation

canals and other surface waters, and to underground water reservoirs (groundwater)

Fees and charges related to administering wastewater licensing in 10th of Ramadan are discussed in Section 6 3 below

6 3 Wastewater Discharge Fees

Fees and charges resulting from the implementing the provisions of Law 93 are collected administratively by the 10th of Ramadan Municipal Authority Such fees and charges will have privilege over the realties on which such fees fall due, and also on their rentals (Law 93 Article 17)

As discussed in Section 5 1 a more elaborate fee is applied to wastewater than to atmospheric emissions and hazardous wastes Wastewater flow and pollutant concentration data submitted by the industrial establishment in its annual Uniform Register of Environmental Impacts is used to calculate the wastewater fee component of the total license fee

The wastewater discharge fee is designed to provide

- Incentives for firms to 1) adopt practices that prevent pollution and 2) comply with monitoring and reporting requirements
- Revenues to 1) fund financial incentives for firms undertaking pollution prevention projects 2) pay for the treatment infrastructure to deal with residual wastewater and 3) underwrite government activities as dictated in the Environmental Management System for the 10th of Ramadan City

A phased approach is used to accomplish these objectives The phased approach provides time for industry to adjust to the fees and develop discharge data needed to sharpen the incentive value of the fee system

Specifically the wastewater discharge fee is implemented in three phases

- ***Phase I*** encourages but does not require industry to monitor and report on effluent quality Presumptive charges – that is charges based on assumed pollutant loadings for each sector – are used to drive the assessment of fees in Phase I Revenues are dedicated to the Environmental Trust Fund which disburses funds to industry and the Municipal Authority for environmental activities
- ***Phase II*** moves to a fee structure based on measured discharges from individual firms This fee structure provides stronger incentives for pollution prevention as well as raises revenue Revenues remain dedicated to the Environmental Trust Fund

- ***Phase III*** involves refinements to the fee structure as needed to adjust to changing fiscal and environmental conditions

The wastewater fee applies to all industrial discharges regardless of whether the discharges are to the public sewer network (indirect discharges) or to open waterways (direct discharges) Currently direct discharges are prohibited However stipulating that the fees apply to both direct and indirect discharges will discourage direct discharging to the environment to avoid the fee and ensure the fee structure is applied fairly

The fee is based on pollutant loadings, not concentrations There are several reasons for adopting this feature First total loadings not concentrations must be controlled to protect groundwater and the sewage infrastructure Second pollution prevention beyond the concentration standards is encouraged Third dilution to meet Law No 93 standards is discouraged

Loadings are calculated as the volume discharged multiplied by the pollutant concentrations In Phases I, II and III, all industrial facilities will be required to monitor their wastewater volumes In Phase I pollutant loadings are calculated as the *presumed* pollutant concentrations for each industrial sector multiplied by *actual* discharge volumes for each facility Individual dischargers have the option of having their fees calculated on the basis of actual pollutant concentrations if they comply with the monitoring and reporting requirements of the environmental management program

In Phase II pollutant loadings will be calculated as *actual* pollutant concentrations for each facility multiplied by actual wastewater flow volumes All industrial dischargers will be required to comply with the monitoring and reporting requirements

The fee is assessed for each pollutant equivalent discharged A pollutant equivalent is defined as the pollutant loading multiplied by an equivalency factor The equivalency factors are designed to be approximate indicators of the relative risks to public health and the environment posed by each pollutant

Relative risk to public health and the environment are very difficult to estimate with any precision even in jurisdictions with substantial amounts of data available In the face of such difficulties and the lack of data in the 10th of Ramadan City the approach recommended for the City is to group Law 93 parameters and assign an equivalency factor for each group based on best judgement of the group s relative damage

The parameter groups and recommended equivalency factors are listed in Exhibit 6-4 Conventional pollutants are assigned an equivalency factor of one Since effluent is eventually reused as irrigation water and nutrients

are likely to be beneficial in that context, nutrients are assigned a lower equivalency factor of 0 5 Toxic metals and substances are assigned the highest equivalency factor of three to reflect the relatively high risk they pose to public health and the environment Toxic metals are conservative within the current treatment system and are often an indicator of low pH that can corrode the sewer infrastructure

Exhibit 6-4 Law 93 Parameter Groups and Equivalency Factors

Group		Parameters Included	Equivalency Factor
I	Conventional	BOD COD Suspended Solids Oil and Grease Sulfide	1
II	Nutrients	Nitrogen Phosphorus	0 5
III	Toxic	Arsenic Boron Cadmium Chromium (hexavalent) Copper Cyanide Lead Manganese Mercury Nickel Phenol Silver Zinc	3

Note that settleable solids temperature and pH are controlled under Law 93 but are not assigned equivalency factors Temperature and pH appear in the fee structure without equivalency factors Settleable solids are not included as a separate item in the fee structure but are closely related to some of the parameters that are assessed a fee

The wastewater fee paid by each firm is based on a four part equation as follows

Wastewater Fee for Firm I =

$[R_1 \times V_1] +$

$[R \times M_1 \times \sum_{j=1 \ldots n}(L_{1j} \times E_j \times D_{1j})] +$

$[R \times M_1 \times (\text{each } ^\circ\text{C above } 43)] +$

$[R_4 \times M_1 \times (\text{each S U (pH) unit more or less than 6-10})]$

where

R_1 = Rate per m^3 of wastewater discharge
V_i = Volume of wastewater from facility I (m^3/year)
R_2 = Rate per pollutant equivalent
M_i = 0 5 if facility I is in compliance with monitoring and reporting requirements and 1 if the facility is not
n = Number of pollutants (20) with equivalency factors
E_j = Equivalency factor for pollutant j
D_{ij} = 1 if facility I is in compliance with Law 93 standards for pollutant j and 1 5 if the facility is not in compliance for pollutant j
L_{ij} = Loading (kg/yr) of pollutant j from facility I
R_3 = Rate per °C
R_4 = Rate per S U

The loading of pollutant j is calculated as

$$L_{ij} = (C_{ij} \times V_i \times 10^3)/10^6$$

where

C_{ij} = Concentration of pollutant j at facility I (mg/l)
10^3 = liters per m^3
10^6 = mg per kg

The first part of the equation ($R_1 \times V_i$) is the fixed fee that is based on volume discharged, not pollutant loadings R_1 is the rate per m^3 of wastewater It is set at 0 15 LE/m^3 (see Exhibit 6-5)

The last three parts of the equation together comprise the variable fee Different rates apply to different characteristics of the wastewater R_2 for all pollutant loadings assigned an equivalency factor R_3 for each °C that the wastewater is above the Law 93 standard and R_4 for each unit deviation (either above or below) from the Law 93 standard on pH

The rate per pollutant equivalent (R_2) is 0 05 LE in Phase I and increases to 0 10 LE in Phase II (see Exhibit 6 5) Rates for temperature and pH are 1000 LE per degree Celsius deviation from the standard and 5000 LE per unit deviation respectively

During Phase I pollutant concentrations (C_{ij}) temperature and pH will be presumed for each sector and facilities will report wastewater quantity (V_i) only Facilities will have the option of reporting both C_{ij} and V_i if they wish and having them used in the calculation of their fee In Phase II facilities will be required to report both C_{ij} and V_i

Exhibit 6-5 Phased Implementation of Fee Rates		
Rate	**Phase I**	**Phase II**
R_1 (Discharge Volume)	0 15 LE/m^3	0 15 LE/m^3
R_2 (Pollutant Loadings)	0 05 LE/pollutant equivalent	0 10 LE/pollutant equivalent
R_3 (Temperature)	1000 LE /° C above 43°C	1000 LE/° C above 43°C
R_4 (pH)	5000 LE/S U outside 6-10	5000 LE/ /S U outside 6-10

6 4 Self-Monitoring of Industrial Wastewater

Environmental Management Guidelines for 10th of Ramadan City - Volume II Industry Guidelines provides detailed guidance to industrial establishments on how to monitor their wastewater discharges For reference the requirements for self-monitoring are summarized here

The principal burden of monitoring wastewater discharges lies with the industry generating the discharge, not with regulatory agencies As previously discussed in Sections 5 2 and 6 2, industrial establishments in 10th of Ramadan City must regularly monitor and report their wastewater discharges as a condition of obtaining a wastewater discharge license and to demonstrate their compliance with the conditions of the license This means that each industrial establishment in the city who discharges wastewater must establish their own wastewater self-monitoring program as directed in their license The basic objective of an industry's self-monitoring program is to provide a characterization and understanding of the water-borne waste materials being produced by the manufacturing processes In addition to the legal requirements of controlling wastewater discharges a good wastewater monitoring program can provide industrial establishments with a check on the operation of manufacturing processes Material losses or reduced performance of process equipment result in increased waste loads and increased costs of production Analysis of the waste streams can often pinpoint malfunctions and result in prompt correction

Best management practice dictates that certain parameters are monitored on a regular basis as part of an establishment s self-monitoring program These are listed in Exhibit 6-6 below The frequency at which these parameters should be measured or tested is also indicated on the table As appropriate these requirements will be written into each establishment s wastewater discharge license

Exhibit 6-6 Self-Monitoring Requirements for Industrial Wastewater Discharges	
Parameter	**Sampling Frequency**
Flow	Daily
pH	Daily
Temperature	Daily
Conventionals BOD COD, TSS TDS, Oil & Grease Sulfides	Quarterly
Nutrients Nitrogen, Phosphorous	Quarterly
Toxics Cyanide Arsenic, Metals, Phenols	Quarterly
Calculation of Wastewater Treatment Plant Removal Rates	Annual

BOD = biochemical oxygen demand COD = chemical oxygen demand TSS = total suspended solids TDS = total dissolved solids

Parameters listed in Exhibit 6-6 with a sampling frequency of quarterly are to be tested by the industrial establishment four (4) times per year However if an industrial establishment receives a Notice of Violation (see Section 6 8) these parameters must be measured monthly for six months after which sampling returns to quarterly testing Also the industrial establishment should coordinate with and conduct one of its quarterly sampling events each year in conjunction with the 10th of Ramadan Municipal Authority As described in Section 6 5 below the Municipal Authority will collect its own samples for analysis at this time and at one other time during the year as part of the 10th of Ramadan City s wastewater compliance monitoring program

Wastewater samples collected by the facility as part of its Self monitoring program are to be analyzed at laboratories selected by the Minister of Health and decreed by the Ministry of Housing and Utilities The industrial establishment s owner/operator may formally disagree with the result of the analysis within one month from the date he receives notification of sampling results

As previously discussed the owner of an industrial establishment is required to maintain a register indicating the impact of the establishment s activity on the environment This Uniform Register of Environmental Impacts forms the centerpiece of an industrial establishment's Self-monitoring program Once per year all of the results of wastewater self-monitoring conducted by an industrial establishment during the previous

12 months are to be compiled and submitted to the EEAA for review as part of the annual Uniform Register of Environmental Impacts and renewal of the wastewater discharge license In addition to wastewater testing results, the Register should include information on the types of discharges, the rates of drainage, production amounts/rates, and raw material used in production The EEAA will review the industrial establishment's wastewater Self-monitoring data in the Register to evaluate compliance with applicable wastewater standards and regulations and conformity with the wastewater conditions of the Consolidated Environmental License As discussed in Section 6 5 below these two components of government monitoring — inspection/testing by the Municipal Authority and review of the Register by the EEAA — serves as a check upon the accuracy of the reports of industrial dischargers

6 5 Compliance Monitoring of Industrial Wastewater

As discussed previously in Section 5 2, the overall process of government monitoring of environmental compliance begins during the issuance of the Consolidated Environmental License The issuance of the license is conditioned on the industrial establishment meeting specified standards In addition to licensing of wastewater discharges and assessing pollution fees a wastewater monitoring program is needed to assure responsible regulatory authorities of an industrial establishment's

- compliance with relevant regulations
- compliance with conditions and effluent requirements set forth in an industrial establishment s wastewater discharge license
- verify the conformity of an industrial establishment s reporting of wastewater discharges (as reported on the Uniform Register of Environmental Impacts) with its actual discharges

This is done through the inspection and sampling of an industrial establishment s wastewater as well as visual inspection of any pre-treatment works

6 5 1 Compliance Monitoring Requirements for 10th of Ramadan City

The overall objective of inspecting and sampling wastewater discharges at an industrial establishment is to obtain a complete comprehensive and thorough understanding of possible pollution problems at the facility under review As such periodic sampling is done as part of a regular

program established by government authorities to periodically and systematically review industrial operations in their region Government monitoring of wastewater discharges could also be triggered by complaints of environmental impacts from industrial operations For example, the public sewer system could develop trouble with its treatment system as a result of industrial wastewater discharges in excess of established limits

As established by the EEAA as a best management practice, inspections and sampling by government officials of industrial wastewater are to be carried out according to the schedule shown in Exhibit 6-7

Exhibit 6-7 Compliance Monitoring Requirements for Wastewater Discharges

Parameter	Sampling Frequency
Flow	Semi-Annual[1]
pH	Semi-Annual
Temperature	Semi-Annual
Conventionals BOD, COD TSS Oil & Grease, Sulfides, TDS	Semi-Annual
Nutrients Nitrogen phosphorous	Semi-Annual
Toxics Cyanide Arsenic Metals Phenols	Semi-Annual

BOD = biochemical oxygen demand COD = chemical oxygen demand TSS = total suspended solids TDS = total dissolved solids

[1] One event scheduled with industrial establishment one event without notification

Note Compliance Monitoring to be conducted by 10th of Ramadan Municipal Authority

One of the twice yearly compliance monitoring inspections is to be scheduled in advance with the industrial establishment and wastewater sampling will be conducted in conjunction with sampling by the facility as required under its quarterly self-monitoring program At the discretion of government authorities the second inspection could be conducted without notifying the industrial establishment in advance of the inspection

6 5 2 Compliance Monitoring Inspections

In general, inspectors are responsible for

- scheduling the inspection with the industrial establishment (unless it is a surprise inspection)
- adequate pre-inspection planning
- performing the compliance inspection
- completion of follow-up procedures including preparing a report on the results of the inspection
- adequate records maintenance

The types of inspections to be conducted for the 10th of Ramadan City and their objectives are discussed below

- ***Compliance Monitoring Sampling Inspection*** This inspection is based on record reviews observations such as walk-through evaluations of waste sources, visual observations of effluents and discharge points, sample collection and flow measurement, and laboratory analyses The objective of the inspection is to verify that 1) conditions in the wastewater discharge license are met (e g no surface drainage has occurred without prior permission from the local Health Authority) and 2) the relevant wastewater constituents are within authorized levels in the license

  During the inspection representative sample(s) of wastewater effluent are collected and chemically analyzed The results of the analyses are used to determine the quantity and quality of effluents verify the accuracy of the licensee s self-monitoring program and reports (Register) and provide evidence for sanctions if violations are found

  Typically the inspection would be conducted by one or two representatives of the Municipal Authority However a larger inspection team may be needed for complex facilities (such as a petroleum refinery) to cover all aspects of wastewater discharges For example the Municipal Authority may request assistance form the National Organization for Potable Water and Sanitary Drainage Also as discussed below inspections could be coordinated with other government authorities as warranted

- ***Register of Environmental Impacts Inspection*** Another aspect of the 10th of Ramadan City compliance monitoring program is the review of the Uniform Registry of Environmental Impacts Inspectors/reviewers evaluate an industrial establishment s wastewater Self-monitoring data listed in the Register to determine if there have been deviations in criteria and specifications of discharged pollutants and control procedures

specified in the wastewater discharge license This evaluation is generally based on record reviews but can include walk-through evaluations/ inspections of industrial establishments Sampling and testing should also be used to verify information in the Register

- ***Multi-Media Inspections*** In addition to wastewater inspectors may, during the same inspection event investigate an industrial establishment's compliance status with respect to air emissions solid waste management, and hazardous waste management requirements Since compliance monitoring is required once per year for air emissions and waste generation handling and disposal at industrial establishments in 10th of Ramadan City (see Chapter 7 and 8), inspections could be coordinated so that one of the two annual wastewater compliance monitoring events is conducted at the same time as monitoring of other media This reduces disruptions in the operating schedule of the facility and allows for efficiency of government efforts

6 5 3 Institutional Responsibilities for Compliance Monitoring

The 10th of Ramadan City Municipal Authority as the competent authority for industrial wastewater discharges is responsible for managing and implementing the wastewater compliance monitoring program for the city As such the Municipal Authority is responsible for conducting Compliance Monitoring Sampling Inspections of industrial establishments in accordance with the requirements of Exhibit 6-7

The EEAA and other appropriate Ministries support the Municipal Authority as needed in inspection sampling/analysis etc Additionally as previously discussed in Section 2 5 Article 18 of Decree 338 Law 4 authorizes the EEAA to conduct annual inspections of industrial establishments to assess the adequacy of a license holder s self-monitoring program and to validate information submitted annually by industries on the Register of Environmental Impacts Final determination of contravention with wastewater discharge license conditions lies with the Municipal Authority

During these inspections the EEAA is authorized to sample and test wastewater as necessary to determine the degree of an industrial establishment s commitment to meeting the standards contained in its environmental license

The Municipal Authority should coordinate with and assist the EEAA on the review and verification of the Register since the twice annual wastewater inspections lends them good knowledge of the facility and its

operations and potential variances Also the Municipal Authority must provide a copy of its completed inspection report (see Section 6 5 4), including sampling results, to the EEAA to allow them to conduct their verification monitoring

6 5 4 Preparation for Inspection

The goals for preparing to perform inspections are

- to obtain and review information essential for conducing an effective inspection
- to permit completion of the inspection in a timely manner
- to minimize inconvenience to licensees by not requiring them to either explain or produce information which is already in possession of the government authorities
- ***Review the Records and Reports*** To adequately do an inspection, the inspector must have knowledge of an industrial establishment s
  - Water uses, processing operations, including wastewater sources treatment systems, and wastewater discharge points
  - Water intake distribution uses, reuses and consumptive uses as well as the hydraulics of drainage and collection systems for process waters and wastewater
  - Nature of the processing operations such as continuous semi continuous and/or batch as well as the type of wastewater discharges
  - Major raw materials products and byproducts associated with industrial activities at the establishment

  Also before visiting the establishment the inspector must be knowledgeable of license conditions effluent limitations (standards) and Self-monitoring requirements It is also recommended that the inspector review past inspection reports

  To gain this knowledge the inspector must review applicable records and reports of the establishment He should review information on the wastewater discharge license the sewer connection application prior inspection reports and previously issued deficiency notices (if any), the licensee s Register of

Environmental Impacts and other sampling and analysis results He should also review information on the licensee's drainage and wastewater collection systems, effluent discharge points, inspection chamber locations, and manufacturing operations provided in the license application The inspector should review any registered letters sent to the EEAA notifying them of deviations in the criterion and specifications of emitted or drained pollutants and the procedures taken to correct it They should also access and review any information on the establishment to be inspected that has been entered into the Data Management System (DMS)

- ***Review the License*** The Consolidated Environmental License serves to tell the inspector what types of discharges are associated with the industrial establishment being inspected The Inspector should carry a copy of the license with him during the inspection so that it can be referenced for items requiring inspection and certification The original license should remain in the Municipal Authority's records

In preparing for the inspection the inspector should determine whether the industrial establishment to be inspected has obtained approval from the Department of Housing and Utilities to connect to the public sewer network The inspector should then check to see if the establishment has been issued a wastewater license to drain their industrial wastewater into the public sewer network

The inspector should determine if an establishment's Consolidated Environmental License is still valid (has not expired) If the license has been renewed the copy of the Register submitted with the license renewal application should be reviewed to 1) make sure it has been updated 2) verify that it is accompanied by the certified results of representative wastewater samples performed by a Ministry of Health-approved laboratory and 3) compare it against the old license to identify changes in discharges that warrant further review during the inspection

- ***Review the 'Multi-Media Inspection and Monitoring Checklist*** The Multi-Media Inspection and Monitoring Checklist has been developed to insure that all areas of concern are reviewed during the inspection This form contains a listing of the items that must be checked on each inspection to verify the establishment's compliance status The inspector will use this checklist to record information during the inspection Observations made during the inspection area are recorded directly on this form Once analytical sampling results are received a copy of the laboratory analysis results is attached to

the checklist and becomes the official report of the inspection A copy of this checklist in included as Appendix 4

The inspector should review the 'Multi-Media Inspection and Monitoring Checklist" before the inspection to ensure he is familiar with the form and the information that must be collected to complete it The inspector should also review the establishment's wastewater discharge license against the checklist to determine which sections of the checklist apply and should be filled out during the inspection

- ***Schedule the Inspection*** If the inspection is planned to coincide with a quarterly self-monitoring sampling event by the industrial establishment the inspector will contact the owner or operator of the facility to coordinate inspection dates and times The inspector will also contact the laboratory where the wastewater samples will be sent for analysis to coordinate sampling efforts

- ***Coordinate with the Laboratory*** The analyses performed on wastewater samples will depend upon the nature of the industrial operation The inspector should review facility operations against the standards for discharges of wastewater to the public sewer listed in Exhibit 6-1 and determine which pollutants are likely to be present in the waste stream being sampled The inspector should discuss with the laboratory which of the parameters in Exhibit 6-1 will be tested for and the procedures that should be followed for collecting appropriate samples

  The chemical testing program should include tests which provide quality assurance (QA) and techniques which provide quality control (QC) over the chemical analyses QA/QC measures may include for example written field sampling protocols sampling equipment decontamination procedures instrument calibration the preparation and analysis of trip blanks equipment blanks duplicate samples and maximum holding times for sample analysis The inspector and a laboratory representative should discuss and determine the type and number of quality control samples that will be required

- ***Prepare the Compliance File*** The inspector should prepare and take with him to the inspection a file of information that will aid in timely completion of the inspection The Compliance File should include

  - a copy of the wastewater license
  - a sketch or map of the facility

- a summary of names, titles locations, and phone numbers of the responsible persons (operators, municipal or industrial officials) involved with the establishment's wastewater control program
- reports from previous inspections
- previously issued deficiency notices (if any) and the establishment's response
- the establishment's most recent Register of Environmental Impacts

This "Compliance File' can then serve as a repository for information such as the inspection results report (the completed "Multi-Media Inspection and Monitoring Checklist) Afterwards, the file can be updated with information that will be needed for future inspections

- ***Assemble the Equipment*** Several days before the inspection date, inspectors should assemble all equipment and supplies needed to perform the scope of work The type of equipment that will be needed to conduct the inspection is dependent on the type of industrial establishment being inspected However typical inspection equipment will include

  - multi-Media Inspection and Monitoring Checklist' with extra paper
  - clipboard
  - ruler
  - calculator
  - tape Measure
  - stopwatch
  - handbook of flow tables flow measurement manual
  - sample bottles
  - sample labels
  - thermometer
  - square
  - level
  - compass
  - flow measuring equipment and apparatus
  - tape to seal the sampling container
  - indelible ink markers
  - pH/conductivity meters
  - sample shipping labels and forms (See Form No 1 below)
  - safety and personnel protection items
  - camera film flash

6 5 5 Facility Inspection

- ***Conduct the Opening Meeting*** Upon arrival at the industrial establishment, inspectors should meet with facility management and key staff upon arrival at the facility to inform them of the inspection's objectives scope, approach, and the expected schedule of activities

- ***Tour the Facility*** To begin the inspection, the inspector should tour the facility with knowledgeable personnel and have them describe the industrial establishment and its principal operating characteristics This will supplement the inspector's review of information before the visit

- ***Conduct the Inspection*** During the inspection, water use and resulting wastewater at the facility should be examined according to both process and non-process uses Non-process uses include washing rinsing and cooling The inspector should observe and determine all materials, both hazardous and nonhazardous that become mixed into process and non-process waters at the facility Any wastewater treatment equipment should also be inspected

  The inspector should determine if all wastewater generated at the industrial establishment are being discharged exclusively to the public sewer network The inspector should look for evidence of discharge other than to the sewer network and verify that no surface drainage has occurred This will involve examining all possible discharge points including public sewer connections and inspection chambers sumps ponds septic systems wells drains and drainage ditches The inspector should also examine floor and sink drains and determine where the floor and sink drains discharge He should note whether these drains are stained and if so by what

  During the inspection the inspector should seek to determine if there have been any changes in production processes that would change the types or loads of pollutants in the wastewater stream If so the license should be updated to reflect these modifications

  If the inspection is being conducted in conjunction with one of the industrial facility s Self-monitoring quarterly sampling events the inspector should confirm that the facility is obtaining representative samples for each wastewater discharge and that appropriate sampling and flow measurement equipment is being used and is being properly operated and maintained

- ***Sample the Wastewater*** At this point in the inspection the inspector must then determine that the wastewater discharge does

not contain constituents in excess of the levels authorized in the license This is done by sampling the establishment's wastewater discharges For reference, a general discussion of environmental sampling and analysis procedures is presented in Appendix __

Before the sampling event, government representatives should review the license to see if sampling locations are specified Where no sampling location is specified the government representative should take samples from a site that he judges to be representative of the discharge Collecting representative wastewater samples can be difficult given the variability of such sources in industrial operations The inspector should locate appropriate sampling stations and determine whether the collection of composite samples, grab samples, or both is most appropriate Wastewater samples are generally collected using a bucket or sample container that is dipped into the water In flowing waters, the container movement should be against the stream

Chapter 7, Decree 649, Law 93 prescribes procedures for taking samples of wastewater for analysis These procedures are to be followed by government personnel responsible for inspecting and testing wastewater at industrial facilities They must also be followed by facility personnel collecting samples as part of an industrial establishment's self-monitoring program as well Specifications included in the regulations are detailed below

1) *Volume of Sample* The volume of the sample taken must not be less than two liters

2) *Receptacles* The samples must be taken in bottles having lids of semi-transparent glass tightly closed

3) *Washing the Receptacles* The receptacles including the caps must be cleaned well before their use Also the inside of the receptacle must be washed repeatedly with the sampled material before filling When taking samples of liquid wastes treated by chlorine sterilized receptacles must be used

4) *Storage of Samples* The samples must be analyzed promptly after taking the sample If this is not possible ***the samples can be kept in a refrigerator for up to three hours*** The samples must be packed in ice for transport to the laboratory and must reach the laboratory with the ice unmelted

5) *Method of Taking the Samples* The sample must be taken in such a manner to represent the nature of the water as far as possible, and from an appropriate place at the end of the treatment process, or from the discharge point of the wastes of the shop or factory, or the treatment process at the place to which it is drained (public sewer system, water course, cultivatable land, etc) If there is more than one outfall from a single factory, separate samples must be taken from each outfall The receptacle must be fully filled and the cap must be tightly placed on the receptacle as soon as the sample is taken Any air bubbles or any unfilled part must not be allowed to remain between the water surface inside the receptacle and the cap The receptacle's mouth should be placed opposite the direction of the water current when taking a sample, and the sample should not be taken from the surface or the bottom, but somewhere in between

After filling the receptacle, the mouth must be labeled with the date and time the sample was taken, the name of the industrial establishment and the name of the inspector taking the sample The receptacle should then be sealed with tape

6) *Time Limits for Periodic Samples* - Periodical samples should be taken form the liquid wastes of licensed establishments at least twice per year as noted earlier

7) *Statement of Authenticity* - The person taking the sample must fill in clearly and accurately wastewater sample analysis form and dispatch it promptly with the sample A copy of the form is presented in Exhibit 6-9

8) *Authorized Laboratories for Analysis* - The samples must be sent to the Water Division in the General Department for Laboratories in the Ministry of Health or another laboratory authorized by the Ministry of Health for analysis

Exhibit 6-9
Statement of Authenticity Water Sampling Form

Wastewater Sample Analysis Form

To be dispatched to the Laboratory with the sample of liquid wastes

1) Location where sample was taken
_____

2) Date when sample was taken
_____

3) Hour when sample was taken
_____ (use 24 hour clock)

4) Water temperature at time of taking the sample
_____ °C

5) Flow rate recorded _____ liters/minute

6) Name and title of the person taking the sample _____
_____

7) General description of the sample or any other information useful for analysis
_____
_____
_____

8) Name and address of the laboratory enlisted to analyze the sample _____
_____

9) Signatures
_____
_____
_____
_____

Printed name Printed name

Source Chapter 7 Decree 649 1962

- ***Measure the Flow*** In order to better understand the nature (pollutant mass and toxicity) of wastewater discharges the flow rate is measured by the inspector at the time of sampling and is then combined with the analytical results from the laboratory to provide a full characterization The flow measurement device used to make this measurement should be appropriate to the waste stream being measured Flow measuring devices include weirs Venturi meters Parhsall flumes etc It is not within the province of this guidance manual to discuss and describe the various flow measurement devices since these details are readily available in other publications

- ***Conduct the Post-Inspection Meeting*** Inspectors should meet with facility personnel after the completion of on-site inspection activities During this meeting, the inspectors can communicate preliminary findings and discuss preliminary corrective action options appropriate for correcting environmental problems that may have been observed at the facility

6 5 6 Safety

The inspection and sampling of wastewater and other environmental media always poses a certain degree of hazard The inspector must take steps to ensure the safety of the inspection team and facility personnel by the use of proper safety equipment and the use of safe practices When performing their inspection duties, inspection personnel should properly use safety equipment such as hard hats rubber-soled, non-skid, metal-toed shoes and boots safety glasses, gloves, ear protection and possibly breathing masks or respirators Inspectors should also guard against body infections by periodically obtaining typhoid and tetanus inoculations and by using hygienic washing procedures while sampling

6 5 7 Compliance Inspection Report

Clear concise and accurate reporting is essential to the management of the compliance monitoring program It is the basis for important administrative decisions concerning program effectiveness sanctions for violations of regulations and the proper programming of future work

As previously discussed observations made during the inspection are recorded on the Multi-Media Inspection and Monitoring Checklist form The inspector should clearly identify inadequacies and deficiencies on this form Immediately upon receipt of the analytical sampling results the inspector will review the results and compare them to the standards for discharges of industrial wastewater to public sewer networks (Exhibit 6-1) The results of this comparison are entered into the appropriate spaces on the checklist which then becomes the official report of the inspection Appropriate ministries and the industrial establishment should be provided with copies of the completed inspection checklist This would include providing a copy to the EEAA to allow them to conduct their verification monitoring of the Register of Environmental Impacts

The completed checklist should remain on file at the Municipal Authority Additionally Municipal Authority personnel will enter inspection results into the data management system (DMS) The EEAA/Ministries are responsible for issuing any notices of violations or deficiencies found as a result of inspections and reviews

If the analysis results prove that wastewater discharges exceed prescribed standards, the industrial establishment has six months from the date of notification to determine and install an appropriate method of wastewater treatment or other corrective action Otherwise its license may be canceled The six-month period, can however, be extended with government approval (Law 93, Article 9)

If it is evident that a hazard exists to public health or to public installations safety through the drainage of liquid wastes into the public sewer network the industrial establishment must eliminate the causes of the damage at its own expense within a period specified by the appropriate government authority However in case of impending danger, government authorities can require that the drainage of liquid wastes in the sewage network may be stopped immediately (Law 93, Article 9)

6 6 Compliance Monitoring of Public Sewer

Problems can develop with the public sewerage system if the City is not prepared for the type of waste that is entering the public sewer or industrial establishments are not quite aware of what they are actually discharging to the treatment facility Possible problems that can arise include damage to the public sewer network endangering workers maintaining the public sewer network or environmental pollution from leakage or final discharge of treated wastewater A proper compliance monitoring program for both industrial establishments (see Section 6 5) and for the public sewer system can help detect and avoid problems before they occur and can pinpoint the source of the problem and help correct it to prevent future undesirable effects

Currently the public sewer network for 10th of Ramadan consists of a centralized drainage system that discharges collected commercial residential and industrial wastewater into a series of three unlined ponds or lagoons Wastewater treatment consists of the settling out of solids within these ponds

6 6 1 Compliance Monitoring Requirements for 10th of Ramadan

Because wastewater effluent from the city s public sewer network is disposed by discharging onto land it must conform with the specifications for the discharge of wastewater onto land included in Law 93 (drainage by surface irrigation or by irrigating cultivable land) As noted in Section 6 1 general provisions of the law include

- Sewer wastewater may not be disposed of by surface draining or irrigation methods unless authorized by the local Health Authority

- The land where sewer wastewater is drained should be situated at a distance not less than three (3) kilometers from the urban areas or the boundary of the city or village, whichever is further

- The degree of treatment of sewer wastewater should not be less than primary treatment

- The cultivation of vegetables fruits, or plants, which are eaten raw should not be allowed on farms which are irrigated by the sewer wastewater nor should animals be raised on such farms

- Sewer wastewater should be discharged at such a speed that will not give rise to aquatic pool or pending

Additionally the regulations specify standards for the discharge of sewer wastewater depending on the type of surface soil in the discharge area — sandy or clayey These standards were presented in Exhibits 6-2 and 6-3

Best management practices dictate that inspection and sampling by government officials of public sewer system wastewater be conducted periodically by the Municipal Authority Requirements and a schedule for this compliance monitoring is presented in Exhibit 6-10

Exhibit 6-10 Compliance Monitoring Requirements for Public Sewer Wastewater Discharge

Parameter	Sampling Frequency
Flow	Annual
pH	Annual
Temperature	Annual
Precipitated materials	Annual
Total suspended solids	Annual
BOD	Annual
COD	Annual
Oil lubricants resins	Annual
Sulphides	Annual

Exhibit 6-10 Compliance Monitoring Requirements for Public Sewer Wastewater Discharge	
Parameter	**Sampling Frequency**
Dissolved Sodium Chloride	Annual
Nutrients Nitrogen, phosphorous	Annual
Toxics Cyanide, Arsenic Metals, Phenols	Annual

BOD = biochemical oxygen demand COD = chemical oxygen demand
TSS = total suspended solids TDS = total dissolved solids

Additionally, sludge that accumulate in the settling ponds should be tested annually for the levels of hazardous constituents Testing should comply with the requirements for land disposal of wastes as discussed in Chapter 7

Similarly to compliance monitoring of industrial wastewater compliance monitoring of public sewer system wastewater would be conducted by the 10th of Ramadan Municipal Authority

6 6 2 Compliance Monitoring Inspections of Public Sewer Wastewater

In general compliance monitoring inspections of public sewer wastewater would follow the same steps and procedures as those discussed in Section 5 4 for industrial wastewater This would include reviewing applicable records and reports such as previous inspection reports and sampling and analysis results

The inspection should be coordinated with personnel responsible for maintaining and supervising the public sewer wastewater system Similarly to industrial establishment inspections the inspector should prepare and take with him to the inspection a file of information that will aid in timely completion of the inspection In addition to the items listed in Section 6 5 4 above the Compliance File ' for public sewer inspections should include a plot plan of treatment facilities (e g settling ponds) and a description of drainage and wastewater collection systems and monitoring stations The ' Compliance File ' will not contain a license for the discharge of wastewater onto land or a Register of Environmental

Impacts However, documentation from the local Health Authority authorizing the discharge should be included in the file and should be reviewed for compliance

6 6 3 Public Sewer Inspection

Inspectors should inspect the public sewer network and discharge from it and evaluate it against the requirements in Law 93 This would include

- assessing the efficiency of the pollution control being employed (settling) and ensuring that the system is performing up to the level of primary treatment
- determining whether building and habitation is encroaching on the distance between the city boundary and the area where the public sewer wastewater is drained
- determining whether any irrigation using public sewer wastewater is being conducted and evaluating farming practices near the point of final discharge
- measuring and evaluating the flow rate into the ponds

Sampling should be carried out of the public sewer wastewater discharges in accordance with the procedures contained in Chapter 7 Decree 649 of Law 93

Once sampling results are received inspectors should review the results and compare them against the standards for discharges of sewer wastewater onto land (Exhibits 6-2 and 6 3) The results of the comparison placed on file and entered into the DMS

After conducting the public sewer compliance monitoring inspection and data analysis the Municipal Authority should

- determine whether any violations of wastewater discharge standards have occurred
- evaluate whether any changes in operations or upgrades to the public sewer treatment system are warranted
- assess whether the results indicate problems with the quality of the city s industrial establishment s wastewater discharges
- determine what if any corrective actions are needed

The results of this evaluation should be submitted to the Environmental Committee and the competent authority

6 7 Groundwater Quality Assessment and Monitoring

Article 24 (Part One Protection of Land Environment from Pollution Chapter 1 Development and Environment) of Law 4 requires the EEAA to supervise the establishment and operation of environmental monitoring networks in order to periodically monitor pollutants in the respective media The law goes on to require that the results of this ambient environmental monitoring be made available to the relevant authorities

As mentioned in Section 5 1, the results of a preliminary groundwater contamination assessment conducted at the 10th of Ramadan City in May 1997 suggest that industrial wastewater may pose a risk of groundwater contamination and damage to the sewage collection and treatment system Groundwater is the major source of drinking water for 10th of Ramadan City and is withdrawn though a series of groundwater production wells located within and near the City Since a major source of drinking water for the City is groundwater its contamination could pose a human health risk

With drinking water wells potentially at risk for contamination best management practices dictate that a groundwater quality assessment and monitoring program is instituted in 10th of Ramadan Such a program would also fulfil requirements for the EEAA to establish environmental monitoring networks Data collected under this monitoring program would then be used to develop and implement groundwater resource protection policies and programs Since there are no bodies of surface water near the 10th of Ramadan City the protection and monitoring of surface water resources is not an issue

The basic elements of the groundwater quality assessment and monitoring program are discussed in the sections below

6 7 1 Ambient Ground Water Quality

Ambient groundwater quality is the quality of groundwater at a baseline time selected by a decision-making government agency Ambient quality may be the natural quality of groundwater or may be the natural quality as impacted by environmental contamination Ambient groundwater quality is the existing condition on which future groundwater resource management should be based Assessing the ambient condition and quality of groundwater underlying the 10th of Ramadan City is the

essential first step in developing effective programs to protect groundwater resources

Groundwater quality is assessed by means of tests that measure physical, chemical, biological, and radiological constituents of representative samples

- *Data Needs* To assess ambient groundwater quality, data and information must be collected on
  - climatic and infiltration characteristics
  - geologic and hyrogeologic properties
  - organic parameters
  - radiological parameters
  - biological parameters
  - chemical parameters

- *Methods* Assessing groundwater quality is done through the collection of samples from water sources such as wells Sampling can be done from existing wells where groundwater is accessible, including public and private wells and natural springs The number and distribution of these wells must be evaluated to determine if an adequate number and distribution of sampling points exist If not, additional monitoring wells may have to be installed These monitoring wells would be placed at strategically selected points based on estimates of flow direction and travel time

- *Evaluation of Sampling Results* Since groundwater is a primary source of drinking water in 10th of Ramadan City Egyptian standards for water sources would serve as the basis for appraisal of the ambient groundwater quality results of chemical radiological and biological analyses of groundwater Specifically the sampling results would be evaluated by comparing analytical results of testing against Standards for Water Sources Designated for Potable Use which are listed in Exhibit 6 10 below Before it can be used as a source for potable water groundwater underlying the 10th of Ramadan City must meet these standards

Exhibit 6-10 Maximum Limits for Water Resources Intended for Potable Use

Description	Limit
Color	100 units
Total dissolved solids	500 mg/l

Exhibit 6-10 Maximum Limits for Water Resources Intended for Potable Use

Temperature	5°C over normal
Smell	2 degrees when cold
Dissolved oxygen	Not less than 5 mg/l
pH	Not less than 5 and not more than 8 5
Absorbent activated carbon	10 mg/l
COD (Dichromate method)	15 mg/l
COD (Permanganate method)	6 mg/l
Ammonia	0 5 mg/l
Oil and grease	1 mg/l
Total alkalinity	Not more than 200 and not less than 50
Mercury compounds	0 001 mg/l
Iron	1 mg/l
Manganese	1 5 mg/l
Copper	1 mg/l
Zinc	1 mg/l
Industrial detergent	0 5 mg/l
Nitrate	45 mg/l
Fluoride	0 5 mg/l
Phenol	0 02 mg/l
Arsenic	0 05 mg/l
Cadmium	0 01 mg/l
Hexavalent chromium	0 01 mg/l

Exhibit 6-10 Maximum Limits for Water Resources Intended for Potable Use	
Cyanide	0 1 mg/l
Tannin and lignite	0 5 mg/l
Phosphate	1 mg/l
Carbon extracts	1 5 grams/liter
Probable counting for the colon group 100 cm^3	5000

Law 48 Decree 8 Article 65

It is assumed that all groundwater resources in the 10th of Ramadan City are designated for potable use

6 7 2 Groundwater Resource Assessment

In addition to collecting information and data on ambient groundwater quality the groundwater assessment and monitoring program should include a characterization of the physical setting of groundwater resources The following components should be characterized

- ***Regional Hydrogeologic Setting*** - Hydrogeologic factors that control the regional occurrence movement and availability of groundwater hydrogeology topography regional climate hydrography soil vegetative cover regional recharge and discharge patter regional groundwater quality geochemistry and geophysical characteristics

- ***Aquifer and Aquifer-System Occurrence*** - Areal distribution and three dimensional position of aquifers in the geologic sequence

- ***Water Table and Potentiometric Surface*** Water table the upper surface of the saturated portion of an unconfined aquifer Potentiometric surface water surface elevation to which water will rise in a well tapping a confined aquifer

- ***Hydraulic Properties*** - The properties of soil rock sediment and other geologic materials that govern the movement of water into, through and out of an aquifer

- ***Confinement and Interaction Between Aquifers*** - Ease with which leakage between aquifers can occur The greater the confinement, the less the interaction

- ***Groundwater Recharge and Discharge Characterization*** - Where, and at what rate aquifers are recharged by infiltrating precipitation and groundwater is discharged to the land surface

- ***Groundwater and Surface Water Interaction*** - Where, and at what rate water moves between an aquifer and a body of surface water

- ***Groundwater Budget*** - An accounting of all natural and anthropomorphic removals from, and additions to the groundwater reservoir

- ***Chemical and Physical Characteristics of Aquifers and Overlying and Underlying Materials*** - Materials that make up the aquifer and overlying unsaturated and underlying zones These materials have chemical and physical characteristics that impact water quality and affect the fate and transport of contaminants

6 7 3 Groundwater Quality Assessment and Monitoring Program Requirements

The requirements and schedule for implementing a groundwater quality assessment and monitoring program in 10th of Ramadan City have not yet been fully developed and are therefore not discussed in this manual

While the EEAA would supervise the design establishment and operation of a groundwater monitoring program it would be implemented by the Research Institute for Groundwater in the Ministry of Public Works and Water

6 7 4 Uses of Groundwater Data

Groundwater data play a key role in developing groundwater protection policies The data may provide an assessment of the status of available drinking water supplies or may serve as a baseline for future comparisons of groundwater quality Groundwater data are often used to encourage compliance with existing protection policies as in the case of drinking water standards (see Section 6 7 1 above) and in the development of new standards and policies

Groundwater data collected under the 10th of Ramadan City monitoring program would be used to

- evaluate compliance with standards for water resources
- set priorities for ground water protection
- develop groundwater protection policies such as procedures for wellhead protection
- develop a comprehensive groundwater protection program

Groundwater protection policies could include developing more stringent regulations on industrial wastewater discharges and possible needs for Pre-treatment public sewer discharges and treatment, and land use

6 8 Sanctions for Violations of Relevant Laws

6 8 1 Determination of Violations

As previously described in Section 5 2, after conducting a compliance monitoring inspection and data analysis, the Municipal Authority will determine whether any violations of wastewater discharge standards (including discharging without a license) have occurred If an industrial establishment is found to have violated one or more of the discharge criteria or other conditions contained in the wastewater license the Municipal Authority The competent authority will then issue the establishment a Notice of Violation Similarly, after completing reviews of annual Uniform Registers of Environmental Impacts the EEAA will determine whether an industrial establishment is being operated in accordance with the conditions of its wastewater license and whether Notices of Violations (NOV) should be issued

6 8 2 Issuance of Notice of Violation

The nature of the wastewater violation determines which government authority issues a NOV For violations of wastewater regulations the Municipal Authority will issue NOVs The NOV should be written to contain a description of the wastewater violation and the requirements for the industrial establishment to remedy the situation The date by which corrective actions should be performed by the establishment should be listed in the NOV A sample format for a NOV is contained in Appendix 5 The NOV is sent via registered mail to the industrial establishment

The industrial establishment is invited to attend a technical conference with government representatives within thirty (30) days of issuance of the NOV This provides an opportunity for the establishment to discuss the nature of the wastewater violation and appropriate corrective actions and to explain the circumstances leading to the violation The establishment

can also present its own evidence to rebut the findings of the wastewater compliance inspection Failure by the owner of the industrial establishment to attend the technical conference represents a waiver of his right to such a conference, and an admission of guilt (i e , agreement with the findings presented in the NOV)

6 8 3 Corrective Action Report

After receiving a NOV, the owner of the industrial establishment must prepare and submit for review a Corrective Action Report This report should detail the actions taken to address the wastewater violation identified in the NOV If the violation was exceeding maximum limits for pollutants discharged to the public sewer network, the results of analysis performed on samples after the corrective action was taken must be attached to the Corrective Action Report

Failure by the owner of the industrial establishment to submit the Corrective Action Report or meet the timetable for taking corrective action is a violation of Article 22 of Law 4 If this occurs the EEAA can in agreement with the Municipal Authority take the necessary legal and judiciary procedures to stop the violating activity and claim compensation as appropriate for treating the damages resulting from the wastewater violation

6 8 4 Sanctions for Wastewater Violations

The sanctions for violating Egyptian laws concerning wastewater discharges into the public sewer system are described below

- ***Connection to Public Sewer Network*** Violations concerning the connection of industrial establishment to the pubic sewer network carry a fine of not less than 10 pounds and not exceeding 50 pounds Such violations would include a facility not having connected to the public sewer network once notified to do so not having submitted a connection application and not completing a connection within two months of being notified to do so Connecting the public sewer without government approval and knowledge carries the same fine (Article 18 Law 93)

  Establishment owners or operators are not allowed to touch or change any part of the public sewer network or the connections to it Violators are subject to imprisonment for a period not exceeding three (3) months and/or a fine of not less than 50 pounds and not exceeding one hundred pounds (Article 18 Law 93)

- ***Surface Drainage without a License*** Industrial wastewater may not be surface-drained in 10th of Ramadan City In cities where such drainage is allowed, it must be licenced and must fulfil all requirements, specifications, and criteria as determined by government authorities In cities where such discharges are allowed, violation to the licensing and other provisions of surface drainage of wastewater are liable to a fine of not less than 10 pound and not exceeding 50 pounds (Article 18 Law 93)

- ***Drainage of Industrial Wastewater Without a License*** Wastewater from public and industrial establishments cannot be drained into the public sewer network without a licence to do so Violators are subject to imprisonment for a period not exceeding three (3) months and/or a fine of not less than 50 pounds and not exceeding 100 pounds The Municipal Authority has the right to stop the drainage of wastewater if such wastes are drained without a license (Law 93, Article 18)

- ***Discharge of Substance Not Contained in the License*** Establishments cannot discharge any liquids or materials into the public sewer other than those for which the sewage connections were designed to drain and which are specified in the license Violators are subject to imprisonment for a period not exceeding three (3) months and/or a fine of not less than 50 pounds and not exceeding 100 pounds (Law 93, Article 18)

- ***Drainage of Wastewater that Exceeds the Discharge Standards*** Wastewater licensed for discharge to the public sewer network must meet the standards and specification limits indicated in the license If the analysis of wastewater samples from an industrial establishment indicate that it exceeds the limits of criteria and specifications (see Exhibit 6 1) violators are subject to imprisonment for a period not exceeding three (3) months and/or a fine of not less than 50 pounds and not exceeding 100 pounds (Law 93 Article 18)

  An establishment whose wastewater discharges routinely exceed the criteria limits must treat (pretreat) its wastewater before discharge to the public sewer The Pre treatment methods employed by industrial establishments must reduce pollutant levels to the standards previously specified in Exhibit 6-1 Otherwise the establishment s environmental license can be canceled

- ***Noncompliance with Self-Monitoring Requirements*** Violators of the requirements for Self-monitoring of wastewater discharges by licensed industrial establishments are subject to imprisonment for a period not exceeding three (3) months and/or a fine of not

less than 50 pounds and not exceeding 100 pounds (Law 93, Article 18)

- ***Penalty for Recurrence of Violation*** In cases of recurrence of violations of Law 93 penalties will be doubled A violator must eliminate all violations within a period to be determined by the Municipal Authority If the violator does not eliminate or redress the problem within the period specified, the Municipal Authority can carry out these works administratively and at the establishment owner's expense, cancel the license or apply both procedures (Law 93, Article 18)

- ***Discharging to Groundwater Without Authorization*** The penalty for discharging industrial wastewater or sanitary drainage to groundwater without authorization from the Ministry of Public Works and Water Resources is imprisonment for a period of not exceeding one (1) year and a fine not less than 500 pounds and not exceeding 2,000 pounds In case of recurrence of the violation, the penalty will be doubled (Law 48 Article 16)

Chapter 7
Media-Specific Programs: Hazardous Substances and Waste

This chapter explains the environmental management requirements associated with the implementation and enforcement of the hazardous substances and waste provisions of Law 4 and Decree 338 It also outlines the prescribed performance standards that must be met by industrial establishments handling hazardous substances or wastes and describes best management practices for hazardous waste storage and treatment

7 1 Subject of Hazardous Waste Regulations

Pursuant to Article 25 Decree 338 the Ministries of Petroleum Interior Industry Health Agriculture and Electricity are currently preparing definitions of hazardous waste and lists of hazardous substances that are subject to the hazardous waste management provisions of Law 4 The definitions used hereunder shall be considered operational as 'best management practices until such times as the competent ministries finalize and promulgate their respective definitions These guidelines highlight definitions that are within the jurisdiction of the Ministry of Industry as most relevant to industries in the 10th of Ramadan These definitions are likely to approximate the definitions finally promulgated by the Ministry of Industry and are therefore sound models to enforce

The working definition of hazardous waste subject to the jurisdiction of the Ministry of Industry shall be waste with any of the following properties

- *Explosive* substances and preparations which may explode under the effect of flame or which are more sensitive to shocks or friction than dinitrobenzene
- *Oxidizing* substances and preparations which exhibit highly exothermic reactions when in contact with other substances particularly flammable substances
- *Flammable* waste having a flash point less than or equal to 55 degrees Celsius

- *Irritant* non-corrosive substances and preparations which through immediate, prolonged, or repeated contact with the skin or mucus membrane, can cause inflammation
- *Corrosive* substances and preparations which may destroy living tissue on contact
- *Harmful* substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may involve limited health risks
- *Toxic* substances and preparations which, if they are inhaled or ingested, or if they penetrate the skin, may involve serious, acute or chronic health risks and even death
- *Carcinogenic* substances and preparations which, if they are inhaled or ingested or if they penetrate the skin may induce cancer or increase its incidence
- *Teratogenic* substances and preparations which if they are inhaled or ingested or if they penetrate the skin may induce non-hereditary congenital malformations or increase their incidence
- *Mutagenic* substances and preparations which if they are inhaled or ingested or if they penetrate the skin, may induce hereditary genetic defects or increase their incidence
- *Infectious* substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms
- *Ecotoxic* substances and preparations which present or may present immediate or delayed risks for one or more sectors of the environment
- Substances and preparations which release toxic or very toxic gases in contact with water air or an acid
- Substances and preparations capable by any means after disposal of yielding another substance e g leachate which possesses any of the characteristics listed above

The following general types of wastes are categorized as hazardous under the jurisdiction of the Ministry of Industry

- Oil and grease waste (e g hydraulic oils brake fluids engine oils lubrication oils, insulations heat transmission oils, bilge oils, oil/water separator solids and sludge, etc)

- Solvent waste halogenated and unhalogenated (e g , from cleaning degreasing, machinery maintenance, solvent recovery, textile finishing, etc)
- CFC/solvent waste with CFCs (e g , from coolants, foam/aerosol propellants, coolant recovery, etc)
- Waste acidic solutions (e g , sulphuric acid sulphurous acid, hydrochloric acid, phosphoric acid, nitric acid, and other acids, electrolyte from batteries and accumulators)
- Waste alkaline solutions (e g , calcium hydroxide, soda, ammonia and alkaline)
- Catalysts containing hazardous transition metals
- Spent liquid catalysts
- Catalysts contaminated by use
- Spent activated carbon (except spent activated carbon from the treatment of potable water and processes of the food industry and vitamin production)
- Paints, varnish and printing inks containing solvents heavy metals or pesticides
- Powder paints not hardened
- Adhesives glue and sealant containing solvents pesticides or PCB
- Liquid wastes from automobiles
- Laboratory chemicals and other chemicals not specified
- Batteries containing lead cadmium or mercury
- Waste electrical and electronic assemblies or scrap with batteries containing lead cadmium or mercury
- Transformers and capacitors containing PCB or PCT
- Waste electrical and electronic assemblies or scrap with transformers and capacitors containing PCB or PCT
- Demolition waste (e g , insulation materials) filters and other materials containing free asbestos

- Industrial gases in high pressure cylinders LPG containers and industrial aerosol containers (including halons)
- Cables consisting of oil and tar
- Saturated or spent ion exchange resins
- Solutions and sludge from regeneration of ion exchanges
- Waste tarry residues (excluding asphalt cements) arising from refining distillation, and any pyrolytic treatment of organic materials
- Waste from transport or storage tank cleaning containing oil or chemicals
- Absorbents, wiping cloths, filter materials and protective clothing contaminated with hazardous waste
- Packaging containing residues of hazardous substances

In addition to the general list of hazardous waste categories an industrial sector-specific list which defines hazardous wastes for each major type of industry shall also be subject to the jurisdiction of the Ministry of Industry This list is presented in Exhibit 7 1

Exhibit 7-1 Sector-Specific List of Hazardous Wastes

Industrial Sector	Waste Fractions Considered Hazardous Waste
Mining industry	Mining waste excluding waste belonging to the hazardous waste list of the Ministry of Petroleum and the Ministry of Electricity
Chemical industry	All waste types e g off dated substances wastewater sludge solvents spent catalysts spent absorptions and filter dust
Photographic industry	All waste types e g developer activator solutions offset plate developer solutions fixer solutions bleach solutions silver containing waste from on-site treatment of photographic waste
Wood preservation	Waste containing wood preservatives e g outdated preservatives spills contaminated materials and sludge (wood treated with wood preservatives is not covered in this entry)
Pulp and paper production and processing	Bleaching sludge from hypochlorite and chlorine processes

Exhibit 7-1 Sector-Specific List of Hazardous Wastes	
Industrial Sector	**Waste Fractions Considered Hazardous Waste**
Leather industry	Degreasing wastes containing solvents, tanning liquor containing chromium, sludge containing chromium, buffing dust containing chromium
Textile industry	Halogenated wastes from dressing and finishing, dye stuff and pigments, wastes from waterproofing
Iron and steel industry	Solid wastes from gas treatment, sludge from gas treatment, other sludge, soil/dust from scrap handling, storing and cleaning
Aluminum thermal metallurgy	Tars and other carbon containing wastes from anode manufacture skimming primary smelting slags/white drosses, spent pot lining salt slags from secondary smelting, black drosses from secondary smelting
Lead metallurgy	Slags (first and second smelting), dross and skimming (first and second smelting) calcium arsenate flue gas dust other particles and dust solid waste from gas treatment sludge from gas treatment
Zinc thermal metallurgy	Slags (first and second smelting) dross and skimming (first and second smelting) flue gas dust solid waste from gas treatment, sludge from gas treatment
Copper thermal metallurgy	Flue gas dust, waste from electrolytic refining, solid waste from gas treatment sludge from gas treatment
Wastes from casting of ferrous and non-ferrous pieces	Furnace dust organic binders (off-specification outdated or unfit for its original purpose)
Manufacturing of glass and glass products	Flue gas dust
Metal treatment and coating	Spent solutions sludge
Shaping and surface treatment of metals and plastic	Waste machining oil and emulsions synthetic machining oil machining sludge sludge from grinding honing and lapping polishing sludge degreasing wastes sludge and liquids
Power production	Oil fly ash
Metal scrap shredding and cutting	Light fraction from shedding (fluff) filter dust filter sludge soil/dust from scrap handling storing and cleaning
Metal scrap incineration	Ash from the incineration of insulated copper wire and printed circuit boards
Incineration pyrolysis and vitrification of waste	Fly ash bottom ash (not slag) boiler dust solid waste sludge and liquid from gas treatment

The foregoing listed general and sector-specific waste types are to be considered hazardous unless the waste producer provides documentation to the competent authority giving evidence that a specific waste is not hazardous

In addition to *wastes* the list of specific hazardous waste *substances* and their classification codes (contained in Appendix 8) shall be considered operational and subject to the jurisdiction of the Ministry of Industry until promulgation of an official final list Similar lists are being prepared for final promulgation by the Ministries of Petroleum Interior Health, Agriculture and Electricity

7 2 Standards

Law 4 and Decree 338 promulgate the standards and regulations which govern the handling of hazardous substances and waste in Egypt

Article 28 of Decree 338 contains the general performance standards for handling hazardous substances and wastes

7 2 1 Generation and Storage of Hazardous Waste

Establishments generating hazardous waste shall meet the following requirements

- Pursue waste minimization options through adopting clean technologies and selecting environmentally cleaner product and raw materials substitutes
- Maintain a register of hazardous waste generated (see Section 7 5 on monitoring and recordkeeping)
- Establish and operate on site hazardous waste treatment units provided the EEAA approves the treatment system and the technical specifications of these units and their operational programs If safe on site treatment and disposal is technically impossible the hazardous waste generator should transport its hazardous waste off site to a disposal site determined by the Municipal Authority the Ministry of Industry and the EEAA

Storage requirements as follows

- Designate specific locations for storing hazardous wastes where safety provisions are established to protect human health and the

environment The engineering specifications for hazardous waste storage facilities shall be promulgated by decree of the Minister of Housing after consulting the EEAA

- The buildings where hazardous wastes are generated and/or stored shall be equipped with appropriate safety systems and alarms emergency and first aid equipment as determined by the Minister of Labor after consulting the EEAA, the Ministry of Health and the Civil Defense Agency in coordination with the competent administrative body

- Store hazardous wastes in special containers ensured against any possible leakage These containers should conform to the EEAA criteria for storing specific types of hazardous waste

- Properly label the hazardous waste containers so as to indicate their weight and content, warn of danger that may result from handling them in an inappropriate manner and give directions for emergency measures should an accident occur (See Section 7 2 4 and Appendix 9 on how to develop procedures for emergencies)

- Ensure that the containers are cleaned after use and not placed in public areas

- If hazardous wastes are shipped off-site a time schedule shall be set up for their collection so that the wastes are stored in containers for only a limited period of time (the best management practices suggest that this time period be no longer than one year)

Until specifications are promulgated for hazardous waste storage containment vessels tanks and holding ponds the EEAA and the Municipal Authority shall enforce best management practices for such storage and containment as found in Appendix 10

7 2 2 Transporting Hazardous Waste

Hazardous wastes may be shipped off site by either the waste generator itself or by a commercial transporter licensed by EEAA The hazardous waste transporter must comply with the following requirements

- Trucks transporting hazardous waste shall be specially equipped for this purpose and marked with clear signs indicating the hazard and principal directions for emergencies The trucks shall be cleaned after each use according to instructions of the Ministry of Health

- The trucks shall be driven by specially trained drivers Owners of trucks shall certify such training to the satisfaction of EEAA, and this requirement shall be a condition of the license to transport
- Routing of trucks transporting hazardous waste shall be determined and civil defense bodies shall be immediately notified of any changes therein, so as to enable them to act quickly and appropriately in emergencies
- Trucks transporting hazardous waste are prohibited from passing through residential and other populated areas and through city centers during daytime
- The Municipal Authority shall be notified of the address of the garage where these trucks are parked and of the numbers and dates of their permits

7 2 3 Hazardous Waste Treatment

The hazardous waste treatment storage and disposal facilities (TSDF), both on-site and off-site shall be subject to the following requirements

- The TSDF shall be located at least three kilometers away from residential areas and be surrounded with brick walls having a minimum height of 2 5 meters
- The TSDF shall have the capacity sufficient to handle all hazardous wastes transported there and shall be adequately equipped
- The TSDF site shall have a warehouse for temporary storage of hazardous wastes before their treatment and disposal It shall be constructed in accordance with the best management practices for hazardous waste storage and containment as set forth in Appendix 10
- The TSDF shall have an installation for sorting hazardous wastes in order to separate the reusable and recyclable fractions and an incinerator for burning the combustible fraction of wastes

Where there is no centralized storage treatment or ultimate disposal facility available to industry and it is not practical to expect each industrial facility to provide these services and facilities for themselves the government may have to provide these facilities When this is the case the government-owned facility must meet the same guidelines/standards as required for industry Funding for the

development and operation of the facility should be provided by the industrial users of the facility

Article 28, Decree 338 authorizes reuse of certain types of hazardous waste as fuel for energy generation and recovery and recycling of organic solvents, ferrous and non-ferrous metals, acids and alkalies, used oils, etc

If hazardous wastes cannot be re-utilized or recycled, the following treatment and disposal methods are authorized by Decree 338

1 Permanent storage such as placing hazardous waste containers inside mines or other isolated compounds

2 Volume reduction through evaporation, sedimentation and other techniques, with subsequent disposal of the sediment

3 Burial in specially designed landfills

4 Biological treatment (decomposition by micro-organisms)

5 Incineration with mitigation measures taken against release of hazardous air pollutants

Because of the wide variation in hazardous wastes no single treatment and disposal technology applies to all wastes The following is a brief description of the commonly used hazardous waste treatment technologies

- *Biological treatment* uses micro-organisms to degrade organic compounds in a waste stream
- *Carbon adsorption* is a process in which substances adhere to the surface of specially treated carbon This method is particularly effective in removing organic compounds from waste liquids
- *Dechlorination* removes chlorine from a substance by chemically replacing it with hydrogen or hydroxide ions This process is used to detoxify chlorinated substances
- *Incineration* destroys or makes waste less hazardous through burning Incineration is frequently used to destroy organic wastes
- *Neutralization* decreases the acidity or alkalinity of a substance by adding to it alkaline or acidic materials respectively
- *Oxidation* detoxifies a waste constituent by combining it with oxygen This process is used to treat wastes such as cyanides phenols and organic sulfur compounds

- *Precipitation* removes solids from a liquid waste so that the hazardous solid portion can be disposed of safely

- *Solidification and stabilization* remove wastewater from a waste or change it chemically thereby making it less permeable and less susceptible to transport by water

The hazardous waste treatment facilities shall be equipped with leachate collection systems (in cases of permanent storage, volume reduction treatment, biological treatment, and landfilling) and air pollution abatement installations (in case of incineration)

7 2 4 Emergency Procedures

Article 31 of Decree 338 requires that every establishment handling hazardous wastes have an emergency (contingency) plan for confronting any possible accidents that may occur during the production, storage, transport or treatment of these wastes This plan shall be reviewed and sanctioned by the competent ministry after consulting the EEAA and the Civil Defense Agency

The contingency plan must be designed to minimize hazards to human health or the environment from fires explosions or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air soil or surface water The plan must be carried out immediately whenever there is a fire explosion or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment

The establishment handling hazardous wastes shall inform its own workers and residents of areas surrounding hazardous waste management sites of the dangers of the hazardous substances being handled at the site and provide them with guidance on how to act in emergency situations

Establishments shall formulate a detailed contingency plan and emergency procedures in accordance with the best management practices contained in Appendix 9 The contingency plan shall be made a condition of the hazardous waste handling license and must be approved by the EEAA and the competent ministry

7 3 Licensing

Article 25 of Decree 338/1995 (implementing Law 4) requires that industrial establishments intending to handle hazardous substances and wastes obtain a license from the competent ministry The Ministries of Petroleum the Interior Industry Health Agriculture, and Electricity are

currently preparing definitions of hazardous waste and lists of hazardous substances that are subject to a license, as discussed in Section 7 2 Guidance is provided herein for firms subject to the jurisdiction of the Ministry of Industry

An application for a hazardous waste handling license will be sent to the 10th of Ramadan Municipal Authority as part of the Consolidated Environmental License Application The Municipal Authority will affix a jurisdictional memo to the application so that it may be properly assigned to the competent ministry The application will be forwarded to the Environmental Advisory Committee, which will place it on its regulatory agenda and forward to the competent ministry to formulate the license

Appendix 11 contains the form of Application for General License to Handle Hazardous Substances and Wastes and item-by-item instructions for filling it out

An enterprise has to meet the following conditions in order to be granted a hazardous waste handling license

- Fully and correctly complete the license application
- Have personnel trained in the handling of hazardous substances and waste
- Have necessary technical means and systems for safe handling of hazardous wastes including their treatment storage transportation and disposal
- Have an emergency system available to respond to hazards that may result from accidents occurring during hazardous waste handling operations (see Appendix 9 for the description of the best management practices for implementing a contingency plan and emergency procedures)
- Provide other evidence to the Municipal Authority that the handling of hazardous wastes at the facility will not result in any harmful effects to the environment and public health

The license applicant may be requested by the Municipal Authority the EEAA or the competent ministry to fulfill additional conditions to ensure safe handling of hazardous substances at the establishment

The establishment applying for a hazardous waste handling license may not handle hazardous substances and wastes in its operations before obtaining the license

The hazardous waste handling license is issued for up to five (5) years but has to be renewed every year as part of the fee assessment procedures of the Consolidated Environmental License The competent authority has discretion to determine the license term (up to 5 years) based on the potential threat to the environment, the technologies authorized, and the experience of the firm in hazardous waste management The law requires that the license be kept by the person in charge of hazardous waste handling operations at the facility and be presented upon request

The hazardous waste license may be revoked (and the establishment's activity suspended) by the Ministry of Industry (or other competent authority) upon notification by the Municipal Authority in the following cases

- if a license was issued based on the submission of incorrect information
- if the establishment has violated the conditions of the license (see the non-compliance procedures in Section 5 3)
- if dangerous environmental impacts that were unforeseen at the time of the license issuance appear to result from the handling of hazardous wastes at the facility
- if a new technology becomes available which may be installed at the establishment and which would lead to greater safety for public health and the environment
- if the EEAA concludes that it is unsafe to handle certain hazardous substances and wastes included in the license

7 4 Hazardous Waste Fees

The primary objectives of a hazardous waste generation fee in the 10th of Ramadan will be to

- finance a waste exchange that will assist companies in reducing reusing and recycling their hazardous wastes (see Chapter 10 for a description of the waste exchange program)
- encourage companies to meet the monitoring and reporting requirements for hazardous waste

In addition to the incentives provided by the waste exchange the fee itself may also provide a small incentive to reduce reuse and recycle hazardous waste It will also give firms an added incentive to reduce pollutant loadings by pollution prevention rather than pretreatment methods

However, any incentive effects resulting directly from the fee are likely to be small under Phase I of the 10th of Ramadan's environmental management program

The fee structure consists of a rate (R_w) per ton of hazardous waste Industrial establishments that comply with the monitoring, recordkeeping and reporting requirements receive a discount for compliance of 50%

The specific fee formula is

Hazardous Waste Fee for Firm i = [R_w x M_i x Q_i]

where

R_w = Rate per tonne of hazardous waste generated
M_i = 0 5 if facility i is in compliance with monitoring and reporting requirements and 1 if the facility is not
Q_i = Quantity of hazardous waste generated from facility i (tons/year)

The rate R_w, is set at 5 LE per ton of waste

All companies that pay a fee will be able to participate in the waste exchange Companies that violate the fee requirements will be excluded from the waste exchange

Once the Data Management System is operational and companies are reporting it will provide information to assess the need to revise the approach to hazardous waste For example if the data reveal a particular concern regarding one or more waste types then responses could include

- having the waste exchange target the waste(s) of concern for special efforts to find better management practices
- applying a deposit-refund to the wastes if central collection would help alleviate the concern
- adjusting the fee schedule to provide a strong incentive to reduce the waste types of concern

7 5 Monitoring and Reporting

Industrial establishments are required to maintain a Uniform Hazardous Substances and Waste Register for On-Site Usage Treatment Storage and Disposal If the generator transports hazardous wastes for off-site treatment storage and disposal it must use the Uniform Hazardous Waste Register for Wastes Transported Off-Site Appendix 11 contains both forms and item-by-item instructions for completing it The Registers

have to be submitted to the 10th of Ramadan Municipal Authority as part of the enterprise's Environmental Register *once a year* and a copy retained *for 10 years* The Register shall be appended to the annual renewal application for license fee re-calculation The Municipal Authority will notify each firm 90 days prior to the annual expiration date

Enterprises must conduct internal monitoring to ensure that all requirements of the hazardous waste handling permit are complied with (the measurement frequencies are suggested on the basis of best management practices)

- Industries must record the quantity of every type of hazardous waste generated and enter records on a *monthly* basis
- Owners and operators must check *monthly* if containers are stored in specially designated places only, properly labeled, sealed when waste is not being added, and are not leaking
- Establishments handling hazardous wastes must record quantity of each type of hazardous waste shipped off-site at the time shipments occur
- If the facility treats its hazardous wastes on-site, monitor the treatment processes *on a quarterly basis* to ensure that the hazardous waste being treated are completely degraded transformed or immobilized during the treatment process
- Hazardous waste facility operators must set up a monitoring system *with daily measurements* at and around the treatment and storage sites to detect possible leakages of hazardous substances to air or soil *They must notify the EEAA immediately of any leakages detected*

Every industrial establishment is subject to *site inspections at least once a year* conducted by the Municipal Authority (and/or EEAA and other competent authorities) The inspectors shall verify the information contained in the hazardous waste register and in the hazardous waste license

7 6 Sanctions

Law 4/1994 establishes severe sanctions for violation of its hazardous waste provisions Handling regulated hazardous wastes without a license is punishable by imprisonment of a responsible enterprise manager for no less than 5 years and a fine of LE 20 000 to LE 40 000 (Article 88 Law 4) Construction of a treatment and disposal facility without a license is subject to imprisonment of no less than one year and a fine of LE 10,000

to LE 20,000 (Article 85, Law 4) Failure to maintain accurate registers of hazardous waste generation, transport, storage, treatment and disposal may lead to imprisonment of no less than 1 year and a fine of LE 10 000 to LE 20,000 (Article 85, Law 4)

Chapter 8
Media-Specific Programs: Air Quality

This chapter outlines the main regulatory requirements of the Egyptian air program It discusses emission standards for industries as the basis of the regulatory program, monitoring and enforcement procedures and a system of economic incentives to complement the existing command-and-control instruments

8 1 Air Emission and Related Standards

8 1 1 Emission Standards

Article 36 of Decree 338 requires that *all existing establishments comply with emission standards* set forth in the Annex to the Decree Licenses are not required by the air quality program but are used as a management tool to inform firms of their direct legal requirements Thus the Consolidated Environmental License will contain a list of relevant emission standards and other technical specifications imposed by law This list will be determined by the EEAA the competent authority for administration of the air quality program

The emission standards are expressed in terms of concentration of pollutants in flue gases The standards are universal for some pollutants and differentiated by type of industry for others Certain emission standards are different for new and existing facilities (see Exhibit 8-1)

Exhibit 8-1 Air Emission Standards for Industrial Establishments		
Pollutant	**Industry Type**	**Maximum Limit (mg/m^3 in flue gas)**
Total Particulates	Carbon Industry	50
	Coke Industry	50
	Phosphate Industry	50
	Ingots Industry Extraction of Lead Zinc, Copper, and other Non Ferrous Metallurgical Industries	100
	Ferrous Industries	200 (existing) 100 (new)
	Cement Industry	500 (existing) 200 (new)
	Industrial Timber and Fibers	150
	Petroleum Industries/Oil Refining	100
	Other Industries	200
Aldehydes (measured as formaldehyde)	All	20
Antimony	All	20
Carbon Monoxide	All	500 (existing)* 250 (new)
Sulfur Dioxide	Coke/Petroleum Combustion	4000 (existing) 2500 (new)
	Non ferrous Industries	3000
	Sulfuric Acid Industry	1500
Sulfur trioxide (in addition to sulfuric acid)	All	150
Nitric Acid	Nitric Acid Industry	2000
Hydrogen Chloride	All	100

Exhibit 8-1 Air Emission Standards for Industrial Establishments		
Pollutant	**Industry Type**	**Maximum Limit (mg/m^3 in flue gas)**
Hydrogen Fluoride	All	15
Lead	All	20
Mercury	All	15
Arsenic	All	20
Heavy Metals (total)	All	25
Silicon Fluoride	All	10
Fluorine	All	20
Tar	Graphite Electrode Industry	50
Cadmium	All	10
Hydrogen Sulfide	All	10
Chlorine	All	20
Carbon	Garbage Burning	50
	Electrode Industry	250
Organic Compounds	Burning of Organic Liquids	50
	Oil Refining	0.04% of crude
Copper	All	20
Nickel	All	20
Nitrogen Oxides	Nitric Acid Industry	3000 (existing) 400 (new)
	Other Industries	300

* Article 42 of Decree 338 states the standard for existing and new sources as 4 000 and 2500 mg/m^3 respectively

8 1 2 Ambient Air Quality Standards

In addition, the law requires that the establishment of new facilities not lead to an exceedance of ambient air quality standards which are set for a limited number of criteria pollutants (see Exhibit 8-2) This requirement is part of the environmental impact assessment procedures outlined in Chapter 8 of this volume

Exhibit 8-2 Egyptian Ambient Air Quality Standards

Pollutant	Maximum Limit, micrograms/m^3 unless otherwise indicated	Averaging Time
Sulfur Dioxide	350 150 60	1 hr 24 hrs 1 year
Carbon Monoxide	30 mg/m^3 10 mg/m^3	1 hr 8 hrs
Nitrogen Dioxide	400 150	1 hr 24 hrs
Ozone	200 120	1 hr 8 hrs
Suspended Particulates (measured as black smoke)	150 60	24 hrs 1 year
Total Suspended Particulates	230 90	24 hrs 1 year
Thoracic Particulates (PM 10)	70	24 hrs
Lead	1	1 year

8 1 3 Fuel Combustion Specifications

Article 42 of Decree 338 contains technological specifications for fuel combustion The regulation prohibits uncovered burning of any kind of fuel It requires the use of combustion technologies that minimize emissions (e g carbon monoxide) from incomplete fuel combustion

8 1 4 Coal Use

The use of coal is prohibited in urban areas in general and in residential communities in rural areas The combustion of mazut and other heavy oil fractions as well as crude oil is banned in residential areas The law establishes a *sulfur content standard of 1 5% by mass* for urban and residential areas The use of high-sulfur content fuel in power plants and industries outside urban and residential areas should be contingent on the local atmospheric conditions so that the noxious pollution does not reach residential and agricultural areas and important waterways

8 1 5 Stack Height Specifications

Article 42 of Decree 338 also provides specifications for stack height

- The height of stacks that emit a total of 7-15 tons of air pollutants per hour should be 18-36 meters
- The height of stacks emitting more than 15 tons of air pollutants per hour should be at least 2 5 times higher than surrounding buildings
- In neighborhoods where public buildings such as offices, hotels or restaurants are located the stack height should exceed the tallest building by at least 3 meters

8 1 6 Indoor Air Quality Standards

Article 45 of Decree 338 requires that industrial establishments ensure that concentrations of air pollutants inside work premises (resulting either from the routine technological operations or from equipment malfunction) do not exceed the standards listed in Annex 8 of Decree 338 The indoor air quality standards and specifications for ventilation in work premises are found in Appendix 12

8 1 7 Specifications for Control Technologies

Articles 42 and 43 of Decree 338 require that the most efficient air pollution control technology be used in order to comply with applicable standards

The technology for air pollution control falls into two main categories particulate emissions control and gaseous emissions control Once emissions from a source are characterized control equipment can be selected sized installed and performance tested

Particulate Emissions Control

- *Cyclones* remove particulates by centrifugal forces generated by providing a path for the carrier gas to be subject to a vortex-like spin Cyclones are very effective at removing coarser fractions of particulate matter Types of cyclones include wet dry, axial flow and multicyclones

- *Fabric filters* are typically designed with non-disposable filter bags As the dusty airstream flows through the filter media (typically cotton polypropylene, teflon, or fiberglass), particulate matter is collected on the bag surface as a dust cake Different types of fabric filters include shaker type, reverse-air, and pulse jet

- *Wet scrubbers* use a counter-current liquid spray to remove particulates from an airstream Device configurations include plate scrubbers packed beds orifice scrubbers, venturi-type scrubbers, and spray towers individually or in combination

- *Electrostatic precipitators* operate on the principle of imparting an electric charge to particles in the incoming airstream, which are then collected on an oppositely charged plate Different types of systems are field number types hot-side and cold-side

Gaseous Emissions Control

- *Adsorption* is a physical-chemical phenomenon when gaseous pollutants are condensed on the surface of a solid or liquid such as activated carbon silica Fuller s earth and other clays Subsequently the dissolved gas can be desorbed with hot air or steam either for recovery or for thermal destruction Adsorption systems can also handle organic vapors and streams

- *Absorption* consists of a mass transfer process of pollutants from the gas stream to a liquid stream Then these captured pollutants are dissolved concentrated and removed The process depends upon physical solubility and may include chemical reactions in the liquid phase Common industrial absorbents are water caustic soda sodium carbonate and nonvolatile hydrocarbon oils Usually absorption takes place in a scrubber device

- *Chemical conversion processes* In this type of process individual pollutants are chemically transformed to benign materials inside a reactor These processes often make use of catalysts *Catalytic oxidation* is predominately used for the destruction of volatile organic compounds (VOCs) and

hydrocarbons Incineration methods may be included here as well *Thermal oxidation* operates without the use of catalysts and at temperatures of approximately 800°C or higher The higher temperature greatly increases the chemical conversion processes

Exhibit 8-3 presents a number of control options and methods to manage common pollutants such as dust and particulates, hydrogen sulfide, and sulfur dioxide emissions The most important process parameters for selecting air pollution control equipment are flue gas characteristics obtained from emissions sampling and site characterization Typically flue gas characteristics include the gas flow rate temperature, particle size distribution resistivity, composition, corrosiveness, moisture and pressure Site characteristics include the reuse/recycling of emissions availability of water, space, power wastewater (condensate) treatment and frequency of start-up

Exhibit 8-3 Selected Technology Options for Industrial Air Pollution Control

Air Pollutant	Control Option	Comments
Dust Particles	Water sprays	Effective especially with wetting agents in fossil fuel and mineral fines
	Cyclone separators	For particles larger than 5 20 microns in diameter efficiencies of 80% achieved
	Scrubbers (such as spray chambers wet cyclones mechanical scrubbers Venturi scrubbers packed towers)	Efficiencies of more than 90% achieved for particles smaller than 5 microns in diameter with simultaneous high pressure losses
	Baghouse filters	Removal efficiencies of 99% achieved for particulates popular in cement and steel plants
	Electrostatic precipitators	Removal efficiencies of 99 9% reported

Exhibit 8-3 Selected Technology Options for Industrial Air Pollution Control		
Air Pollutant	**Control Option**	**Comments**
Hydrogen Sulfide (H_2S)	Stretford process	Absorption process sodium metavanadate in the absorbing fluid gas stream should be pretreated to remove CO and CO_2
	Selexol process	Absorption process removes sulfur compounds that cannot be processed in a Stretford unit
	Claus process	Feed stream must also contain SO produces elemental sulfur maintenance and downtime potential problems
	Scot process	Catalytic converter adversely affected by high CO_2 concentrations
	Incineration	Converts hydrogen sulfide to SO
Sulfur dioxide (SO)	Wellman Lord	Produces concentrated SO after a reaction with sodium sulfate SO then converted to elemental sulfur or sulfuric acid
	Double alkali process	Uses two regenerable alkaline scrubbing (absorption) solutions sodium hydroxide and sodium sulfite
	Lime/limestone scrubbing	Produces a nonregenerable sludge that includes gypsum
Nitrogen oxides (NO_x)	Combustion control (low excess air firing staged combustion recirculation of the flue gas water injection reduced air preheat)	Controls oxygen content and temperature in the vicinity of the furnace flame
	Proper unit design (including instrumentation operation and maintenance)	To avoid the incomplete combustion of fuel for boilers furnaces heaters and diesel equipment
	Tall stacks	Care must be taken in designing tall stacks to take account of conditions of atmospheric inversion which would limit dilution

Source World Bank Office of Environmental and Health Affairs
Environmental Considerations for the Industrial Development Sector
Washington DC 1987

Generally, no single emissions control technology can solve all air pollution control problems For example, dry and semi-dry scrubbing systems may represent the most efficient acid-gas removal technology, but they must use a particulate removal system to achieve their designed efficiency ratings Also, control systems must be tailored to the air stream under consideration with enough flexibility to handle expected variations in stream conditions

8 2 Licenses

No license is specifically required in the Egyptian air quality program, as set forth in Law 4 and its Executive Regulations However, since a license is a management tool the conditions referenced in the Consolidated Environmental License shall be utilized to notify the firm of its obligation to comply with applicable emission standards fuel combustion specifications, stack height specifications, and technological specifications as presented in Section 8 1 The EEAA shall be responsible for including the standards and specifications for the air program in the Consolidated Environmental License The specifications are enforceable as direct legal mandates

8 3 Air Emissions Fee

In Phase I of the integrated environmental management program for the 10th of Ramadan the primary objective of the emissions fee is to finance ambient air quality monitoring and the enforcement of Law 4 standards Law No 4 for 1994 (Article 24) requires that Environmental monitoring networks with their stations and working units shall be established in order to periodically monitor the components and pollutants of the environment and shall make the results available to the relevant authorities An ambient monitoring system is thus a first step toward compliance with Law 4

A second objective in Phase I is to provide incentives for firms to monitor and report their atmospheric emissions in accordance with the requirements of the environmental management program Without this information a more complex fee structure based on actual emissions will not be possible Therefore the Phase I fee will facilitate moving toward a fee structure that will provide stronger incentives for emission reductions consistent with the polluter pays principle

In Phase II of implementation the air emissions fee will be revised to reflect the actual emissions of each firm and may increase in magnitude This will provide incentives for emission reductions and generate

revenues to finance grants for emission reduction projects Therefore, Phase II begins when fee revenues can be recycled to finance such grants

Since the purpose of the Phase I emissions fee is to pay for monitoring and enforcement, and all firms contribute to this need, a fixed fee per firm is applied The level of the fee is determined by the Municipal Authority's costs for these activities It is assumed that LE 1,000,000 per year will cover the Municipal Authority's costs for activities related to air emissions

To encourage firms to monitor and report their air emissions, a 50% discount on the fee is available for complying with monitoring and reporting requirements This is the same discount offered on wastewater fees for monitoring and reporting

To generate the required revenue and offer the discount a fixed air emissions fee (R_a) of LE 2 000 is assessed on each firm

The design of the Phase II emission fees will depend on the results of ambient air quality and facility monitoring data Important inputs to the fee design include

- identification of the priority air pollutants
- identification of the major sources of those pollutants
- costs to firms of reducing those pollutants
- appropriate levels of financial assistance to industry for emission reduction projects
- revenue requirements for any additional Municipal activities needed for an enhanced air quality program

The Finance Department of the Municipal Authority is responsible for calculating the air emissions fees sending bills to enterprises and collecting the revenues The revenues will go to the Environmental Trust Fund of the 10th of Ramadan (see Chapter 13) to defray certain administrative expenses connected with data management and ambient monitoring in the city and to subsidize environmental investments by industry

8 4 Monitoring

8 4 1 Ambient Monitoring

Article 24 of Law 4 provides for the establishment of *environmental monitoring networks* in order to periodically monitor pollutants in the respective media and report the results to relevant authorities The EEAA shall supervise the establishment of an ambient air quality monitoring network in the 10th of Ramadan The monitoring network should be

designed to monitor general meteorological parameters and the criteria air pollutants for which ambient air quality standards are specified in the law i e , sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, total suspended particulates and PM10, and lead

The number of monitoring stations in the 10th of Ramadan will be determined so as to provide representative data on all the criteria air pollutants The best management practices suggest that the ambient air quality measurements shall be conducted *monthly* The frequency of taking samples within a series of measurements for individual pollutants depends on the averaging times for these pollutants

Air monitoring involves collecting a measured volume of air for chemical analysis Sample collection is done in two ways

- collecting the air from the site in a container
- trapping the pollutants by passing a measured volume of air through a filter or adsorbent

Air can be directly collected either in a Tedlar bag glass bulbs or metal canisters Canisters are best suited for air sampling Air can be collected using a pump or by initially evacuating the canister Adsorbent tubes are commonly used for sampling air for organic analysis Air is passed through the adsorbent by connecting the tube to a sampling pump Particulates such as dust are collected over membrane filters of appropriate pore size Filter cassettes are used for this process

The samples shall then be analyzed using the commonly accepted techniques that are summarized in Exhibit 8-4

Exhibit 8-4 Analysis Techniques Used for Common Air Pollutants

Pollutant	Analysis Technique
Particulates	Weighing particulate matter on filters of a high volume sampler
Heavy Metals (lead)	Analysis of particulate matter by atomic absorption spectrometry
Carbon Monoxide	Infrared photometry of the sample
Ozone	Ultraviolet photometry
Sulfur Dioxide	Pararosaniline method
Nitrogen Oxides	Automated chemiluminescence analysis

The EEAA shall maintain the ambient air quality monitoring records and provide copies to the Municipal Authority and to the Environmental Advisory Committee of the 10th of Ramadan

8 4 2 Emissions Monitoring

Industrial establishments shall monitor their air emissions and report them to the Municipal Authority Industrial establishments may use either of two methods to assess their emissions

Method 1 ***direct flue gas sampling at the stack, or***
Method 2 ***indirect estimates using emission factors, fuel composition, etc***

If using Method 1, the industrial establishment shall *sample emissions from all stacks on a quarterly basis* (after establishing an initial baseline), in accordance with the averaging times for the emission standards It shall also determine whether the emissions comply with the standards

Typically one of the first steps in source emissions sampling is determining the gas flow rate at the vent exhaust port, or stack to be sampled Additionally, air velocities need to be measured using a standard pitot tube Other instruments to measure flow rates include the rotating vane anemometer double pitot tube heated thermometer anemometer and thermal anemometer

The air sampling for stack emissions monitoring shall be done at specially designed sampling ports using high-volume air samplers The amount of particulate matter is then determined by weighing the filters of the sampler *Extractive gas monitors* shall be used for gaseous emissions monitoring Extractive gas monitors can be based on absorption spectroscopy luminescence methods or electroanalysis Non-dispersive infrared analyzers (NDIRs) can monitor sulfur and nitrogen oxides hydrocarbons carbon monoxide and dioxide and other gases that absorb infrared light NDIRs are relatively inexpensive as well as broadly applicable

According to Article 17 of Decree 338 the establishment must notify the EEAA immediately by registered letter with return receipt requested of any exceedances of the emission standards

If using Method 2 the industrial establishment shall calculate its emissions through emission factors *at least annually*, unless the emission factors change and it has reason to believe that its emissions will increase in which case a further calculation shall be performed and any exceedances reported

An emission factor is a *representative value* that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant Emission factors are different for each source category and technological process, and can be found in relevant reference materials Emission factors are usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant (e g , kilograms of particulate matter per megagram of coal burned) In most cases, these factors are simply averages of all available data of acceptable quality, and are generally assumed to be representative of long-term averages for all facilities in the source category

The general equation for emission estimation is

$$E = A \times EF \times (1-ER/100)$$

where

E = emissions
A = activity rate
EF = emission factor
ER = overall emission reduction efficiency %

ER is further defined as the product of the control device s destruction or removal efficiency and the capture efficiency of the control system

The enterprise shall also control on an annual basis the efficiency of its air pollution abatement installations that are required by the general operation license obtained through the EIA process

8 4 3 Inspections

The Municipal Authority shall conduct site inspections *at least once a year* to verify the self-monitoring air emissions data by taking flue gas samples and performing other direct measurements (see Multi-Media Monitoring and Inspection Checklist included in Appendix 4) Most useful for inspection work are *electroanalytical monitors* which come in several varieties Among this group polarographic analyzers have the most widespread application

The inspections shall be conducted by EEAA inspectors who will inform the 10th of Ramadan Municipal Authority and the Environmental Advisory Committee of their findings The Committee will place any violation found on its next regulatory agenda for a sanction recommendation If a sanction is recommended by the Committee the Municipal Authority will forward the recommendation to the competent

authority (in the case of industry — the Ministry of Industry) for further evaluation and action

8 5 Registry Reporting/Documentation

Industries must demonstrate compliance with the emission standards As part of the Environmental Register required by Law 4, establishments must maintain an emissions record for all the enterprise s emissions that are regulated by an emission standard and submit it to the 10th of Ramadan Municipal Authority *once a year* It will be attached to the application for recalculation of the license fee (or renewal of the Consolidated Environmental License on its fifth anniversary) The Municipal Authority will notify each firm at least 90 days prior to the annual expiration date Exhibit 8-5 suggests a form for an emissions record which shall become part of the enterprise s Environmental Register

The emissions record has to be signed by an enterprise official responsible for environmental monitoring Emissions records should be retained for 10 years along with other components of the establishment s environmental register as required by Article 18 of Decree 338 The EEAA is the enforcement authority for the air program including timely receipt of the Environmental Register

8 6 Sanctions

Law 4 establishes fines for violations of emission standards ranging from LE 1 000 to LE 20 000 The EEAA should follow the procedures outlined in Chapter 3 to impose these penalties

Exhibit 8-5 Sample Emissions Record				
Source	Pollutant	Concentration in Flue Gas, mg/m^3	Method of Measurement or Estimate	Date, Time

Chapter 9
Media-Specific Programs: Industrial Solid Waste Management

Solid waste management in the 10th of Ramadan City is the responsibility of the Municipal Authority This chapter describes the regulatory requirements of Law 4 and Decree 338 concerning industrial solid waste management It also provides guidance to the Municipal Authority on the best management practices for the design and operation of solid waste landfills and incinerators

9 1 Legal Requirements and Best Management Practices

The basic law for the collection and disposal of non-hazardous solid waste from households, commercial and industrial establishments is Law 38 of 1967 with amendments by Law 31 of 1976 The solid waste management regulations are further developed in Article 37 of Law 4 and Articles 38 and 39 of Decree 338 The law prohibits the land disposal and burning of solid waste other than in areas especially designated by the Municipal Authority in coordination with the EEAA The regulatory requirements cover solid waste collection landfilling and incineration These Guidelines cover only the collection and landfilling of *industrial* solid waste

9 1 1 Collection

According to Article 39 of Decree 338 the municipality shall control the safety and efficiency of solid waste collection The 10th of Ramadan Municipal Authority shall maintain an accurate inventory of all solid waste collection vehicles and equipment in the city Each establishment is to determine for itself the frequency of collection and the deposit of its industrial solid waste taking care that there is sufficient space on its premises for waste accumulation and that any accumulation does not pose a threat to human health or the environment

9 1 2 Landfilling

Before the siting and design of an industrial solid waste landfill commences, it is necessary to estimate the quantity of industrial solid waste to be deposited in it This can be done using the enterprises solid waste generation data, which they report annually to the Municipal Authority (see Section 9 2) No industrial hazardous waste medical waste or any liquid waste shall be accepted at the landfill

Once the estimate of solid waste volume is made, it is possible to determine the landfill space required The landfill shall be designed for a minimum depth of solid waste of 6 meters and a minimum life of 10 years

The 10th of Ramadan Municipal Authority in agreement with the EEAA shall designate an industrial solid waste landfill site To select a landfill site, at least two potential sites in the area shall be evaluated For each potential site, a hydrogeologic and soils investigation shall be performed in terms of the potential environmental impacts of the planned landfill The landfill site shall be located a safe distance from residential and industrial areas

Budgetary cost estimates shall be prepared for each of the prospective landfill sites The cost estimates must be of sufficient detail to allow a comparison among the alternative sites The capital cost items must be annualized in accordance with sound accounting principles Items to be included in the cost estimate are

- land cost
- on-site development costs (roads fences liners etc)
- cost of closing the site when it is filled
- cost of perpetual care for the site
- anticipated annual operating cost

The total annual cost for operating the site should be reduced to a cost-per ton figure Barring any political or social constraints the site to be selected shall be the one with the lowest cost per ton

A variety of specific technologies are associated with a state of the-art landfill

- *Liner systems* Liners are low-permeability membranes designed to limit leachate[1] infiltration into groundwater Liners are made of

[1] The term leachate refers to liquids that migrate from the waste carrying dissolved or suspended contaminants If uncontrolled landfill leachate can be responsible for contaminating groundwater and surface water

low-permeability soils (typically clays) or synthetic materials (so-called geomembranes) Landfills can be designed with more than one liner, and a mix of liner types may be used Clay liners are constructed by spreading the clay in thin layers and compacting each layer to a predetermined density The minimum total thickness of these liners is usually one meter After the liner has been placed a protective earth cover of 30 cm is placed over the clay to protect it from landfill equipment

Geomembranes are being used more frequently as landfill liners The list of material available is long, but high-density polyethylene (HDPE) seems to be the most popular for landfill applications The minimum thickness for landfill use is normally 0 76 mm All geomembranes require 60 cm of clean sand over the liner to prevent puncture by landfill equipment

The thickness of each layer of solid waste depends on the density of the waste and its compaction rate

- *Closure techniques* Once a landfill reaches its capacity it must be managed to limit any potential adverse environmental effects Closure involves capping the landfill with a low-permeability material to minimize moisture infiltration and a top layer of soil

If the 10th of Ramadan Municipal Authority chooses to use the landfill for municipal solid waste as well as for industrial non-hazardous solid waste and if in the opinion of groundwater experts the installation of such a joint facility (even in an arid environment) poses a threat to either surface or ground water resources then the landfill shall also have the following equipment

- *Leachate collection systems* Leachate collection systems are installed above the liner and usually consist of a piping system sloped to drain to a central collection point where a pump is located
- *Leachate treatment* Once the leachate has been collected and removed from the landfill it must undergo some type of treatment and disposal The most common methods of leachate management are 1) discharge to the municipal sewer and 2) on-site treatment followed by discharge
- *Landfill gas control* Methane is a product of the anaerobic decomposition of organic refuse and comprises 50-60% of landfill gas emissions At and around solid waste landfills methane can migrate through soil and accumulate in closed areas where it can present a

significant explosion danger if not properly controlled Once methane is collected through a system of pipes, it is usually vented into the atmosphere burned, or recovered as an energy source

- *Groundwater monitoring* Groundwater monitoring is required to detect uncontrolled leachate releases at the landfill and to determine if remediation is needed

9 2 Monitoring and Reporting

The 10th of Ramadan Municipal Authority shall monitor the generation and on-site storage of industrial solid waste to determine 1) that the on-site storage does not pose a threat to public health or the environment, and 2) the operation of disposal facilities

9 2 1 Generation and On-site Storage Monitoring

The Municipal Authority shall monitor firms for their on-site generation, storage and removal practices as follows

Industrial establishments are required to maintain a log with monthly entries of

- type and quantity of non-hazardous solid waste generated
- volumes and dates of removal by itself or by a registered solid waste collector (most likely a private company)

Exhibit 9 1 presents a proposed form for recording solid waste generation and removal at industrial facilities

Exhibit 9-1 Industrial Solid Waste Generation and Removal Log
(Month Year)

Type of solid waste	Stored on site at beginning of month m^3	Volume generated m^3	Volume removed m^3	Removal date	Signature of collector representative	Remaining on site at end of month m^3
Total						

142

Industrial establishments are required to submit information about their volumes of solid waste generation to the Municipal Authority as part of their Environmental Register (see Section 2 2)

The Municipal Authority shall verify the industry's compliance with the reporting requirements for the generation and removal of industrial solid waste During annual on-site compliance inspections, the inspectors shall review the solid waste generation and removal log book and visually inspect on-site solid waste storage areas to ensure that they are kept in sanitary condition

The Municipal Authority shall satisfy itself that industrial solid waste is diposed only in areas especially designated for that purpose

9 2 2 Disposal Facility Monitoring

The Municipal Authority shall periodically monitor off-site industrial solid waste disposal facilities to assure the integrity of the facility and that sanitary landfill practices are employed

If the industrial solid waste landfill is also used for municipal refuse the Municipal Authority shall conduct *groundwater monitoring of landfill sites* to detect the presence degree, and migration of uncontrolled leachate and to ensure that all operational standards are complied with Groundwater samples shall be taken *monthly* and analyzed for key parameters such as BOD nutrients (nitrates, phosphates) and heavy metals (cadmium mercury, iron etc) The monitoring results shall be recorded and all violations reported to the EEAA

9 3 Sanctions

Any citizen or organization has a right to report incidents of illegal solid waste dumping and burning to the Municipal Authority For these violations the EEAA is authorized to impose a fine of LE 1 000 to LE 20 000 on the solid waste generator

Chapter 10
Waste Exchange Program

A waste exchange is primarily an information clearinghouse that facilitates the transfer of wastes from one industry establishment to a separate establishment where the wastes can be used as productive inputs This chapter describes a waste exchange program to be established in the 10th of Ramadan City The role of the Municipal Authority is to establish and administer the waste exchange The hazardous waste fee is designed to generate enough revenues to fund the waste exchange

10 1 Objectives of the Program

A waste exchange in the 10th of Ramadan City will help industry to identify and exploit opportunities to reuse and recycle industrial wastes Industry will benefit from the waste exchange through

- avoiding the hazardous waste generation fee on wastes that are reused or recycled
- potential reductions in raw materials costs for buyers of waste materials
- potential increases in revenue for sellers of waste materials
- potential reductions in waste transportation and management costs for sellers of waste materials

Environmental benefits from the waste exchange will include

- reductions in the waste going to landfill or other disposal sites
- reductions in the need for special waste treatment and disposal facilities and the need to transport these wastes
- more efficient use of resources

10 2 Operations

The waste exchange will facilitate the reuse and recycling of industrial waste by providing the following services

- *Information to Identify Potential Trades* — Providing information will be the basic function of the waste exchange Lists of potential buyers with the waste materials they are looking for and potential sellers with the waste materials they have available will be provided through a catalog

- *Matching Buyers and Sellers* — The exchange will also make direct efforts to match buyers and sellers This will involve active efforts by exchange staff to find a specific match for a waste and efforts to link generators with possible buyers with whom they could work in the future

- *Market Development* — The exchange will provide outreach to appropriate industries to attempt to find or generate interest in a particular waste stream either on a one-time or long-term basis The Data Management System (see below) will assist in identifying sectors to target

- *Education and/or Technical Assistance with Source Reduction Reuse and Recycling* — The waste exchange will undertake an education and technical assistance program to increase corporate awareness on the environmental impacts of their waste management choices and opportunities for waste reduction reuse and recycling The program will involve providing educational materials seminars and waste audits

The Municipal Authority will administer the waste exchange This will facilitate the needed links between the waste exchange the Data Management System and the hazardous waste generation fee The Data Management System will contain important information for the functioning of the waste exchange namely information on each company s generation and management of hazardous waste The Data Management System therefore will also be the database for the waste exchange Staff responsible for the Data Management System will also have responsibility for maintaining waste exchange data thereby avoiding duplicative administrative activities

The exchange is essentially a service for industry to assist in improving waste management practices thereby reducing or avoiding the hazardous waste generation fee A mechanism for industry input into the administration of the exchange is thus needed A multi-stakeholder advisory committee should be established for this purpose and should involve major users

The waste exchange will be funded from the revenues derived from the hazardous waste generation fee Hazardous waste fee revenues will be dedicated to the Environmental Trust Fund, which in turn will disburse resources for the operation of the exchange

Once the administrative structure is in place, the administrators can consider contracting out some of the services of the waste exchange For example, the waste exchange can contract local environmental consultants to conduct waste audits for companies that request them This option should be explored after reviewing the fee revenues that are available and the availability of local private sector expertise to provide the services and the efficiency gains that might result

10 3 Implementation

Twinning the waste exchange in the 10th of Ramadan City with an existing waste exchange would assist implementation by transferring lessons already learned in other jurisdictions This might be facilitated by the Environmental Pollution Prevention Project possibly with the aid of the U S Environmental Protection Agency Office of Solid Waste and Emergency Response

Establishing the waste exchange will likely require six months and the services of one full-time individual Office space and equipment (phone line computer and software fax machine and line photocopier furniture) will also be needed Major set-up activities include

- developing the database of waste buyers and sellers
- publishing some form of monthly quarterly or bi annual listing of waste exchange information to potential users
- producing promotional materials
- training staff to provide technical assistance

The database is a key component of the waste exchange It must efficiently track the wastes generators have available wastes that users are seeking to buy and the successful exchanges that are made It must be up dated and used to produce the listing of buyers and sellers At a minimum the database must contain the following fields

- a transaction number
- listing status (generator/user/exchanged)
- material name and description
- quantity of material
- frequency of material available or wanted

- date listing entered
- date material exchanged
- generator name and contact information
- industry sector of the generator
- buyer name and contact information
- industry sector of the buyer

Successful promotion is essential for the exchange to be effective Promotional activities to ensure high rates of participation in the exchange include

- including information on the exchange with information materials on the multi-media discharge fee
- providing seminars or workshops for local businesses to describe the waste exchange
- informing local companies through newsletters industry journals, or by advertising in local business magazines newspapers radio stations television stations or through various community groups
- encouraging media coverage of the exchange
- working with the industry associations to promote the exchange
- providing an educational and public awareness campaign which includes waste audits site visits information on source reduction reuse and recycling technical assistance informational Fact Sheets on waste management issues case studies of successful exchanges and an information telephone line
- giving awards to recognize companies that develop innovative waste management solutions

Once established the waste exchange will likely need two full time equivalents one individual to provide technical assistance answer phones update the database and perform research projects and the second individual to perform site visits waste audits educate the business community and execute the marketing and promoting functions

Chapter 11
Deposit-Refund Program

Under a deposit-refund system, buyers pay a deposit when they purchase a product The deposit is refunded if the buyer returns the waste resulting from the product Deposit-refund systems thus give buyers an economic incentive to return wastes to a central collection point for reuse recycling or safe disposal By doing so deposit-refund systems ensure that wastes do not end up as litter or are otherwise managed in an environmentally unsound manner

These guidelines describe a deposit-refund program that may be implemented in the 10th of Ramadan The scope of the program and implementation details must first be studied This should be done jointly by the Municipal Authority EEAA and the Environmental Advisory Committee and it should follow the establishment of the Data Management System and the start-up of the environmental management program in the 10th of Ramadan

An identification of problematic wastes in the City s waste streams is a critical first step Candidate wastes can then be analyzed for their potential commercial linkages in the community If this program is properly constructed it can add another important dimension to the economic incentive program provided in these guidelines

11 1 Deposit-Refund Program Explained

Deposit refund systems have proven useful in other jurisdictions for reducing the human health risks or environmental impacts associated with specific types of solid or hazardous waste In some cases they can be more effective for waste management than mandatory or voluntary recycling programs Landfill bans and other policy instruments to encourage good waste management practices This is particularly true when it is difficult to specify and enforce the conditions under which it is illegal to dispose of waste

Some of the earliest deposit refund systems were voluntary systems created by companies to recover valuable waste materials such as glass bottles Since then governments have imposed mandatory deposit-refund systems on a range of beverage containers and other wastes Car hulks batteries used oil pesticide containers appliances and recoverable

substances, such as solvents chlorofluorocarbons (CFCs) and sulfur are some of the wastes for which deposit-refund systems have been implemented or considered

Sufficient information is not currently available to assess and design deposit-refund systems for the 10th of Ramadan The environmental management system is designed to generate information that will be needed for this future task These guidelines describe the steps that will be needed to assess and design deposit-refund systems when that information becomes available

11 2 Identify Problematic Wastes

The first step in moving forward is to develop a characterization of wastes in the 10th of Ramadan The Data Management System once operational will provide data to support a characterization study of solid and hazardous wastes The study should

- identify which if any parts of the waste stream present risks to human health or the environment as the wastes are currently managed
- assess alternative waste management practices for those wastes

11 3 Assess Suitability of Deposit-Refund System

The design of a deposit refund system depends heavily on the wastes characteristics the market structure for the original product current waste management practices and the objectives for better managing the waste A starting point for designing a deposit refund is thus a characterization of the waste stream in the 10th of Ramadan City The Data Management System will provide this characterization once reporting requirements are in place

Important characteristics that make a particular waste type more suitable for deposit refund are described below

- *Identifiable Wastes* — For deposit refund systems to function deposits must be placed on products that result in clearly identifiable wastes Packaging is an obvious example of an identifiable waste Other examples are more complex For instance in the absence of a policy to the contrary CFCs may be vented to the air and solvents may be allowed to evaporate thereby producing no visible waste In these cases the deposit

refund system creates an incentive to recapture the waste or keep it segregated to facilitate recycling or safe disposal

Another dimension to this criterion is that the waste subject to the deposit-refund system must be distinct from other wastes For example if only selected types of used oil are eligible for refunds the people responsible for providing the refunds must be able to distinguish oil types that are eligible from types that are not eligible

- *Environmental Concerns* — Deposit-refund systems are most suitable for addressing wastes with the following environmental concerns
  - litter and other illegal dumping (e g beverage containers abandoned car hulks)
  - toxic leachate from landfill (e g batteries pesticide containers equipment with chlorobiphenyls or PCBs)
  - toxic fumes from improper burning of waste (e g scrap tires)
  - damage to the wastewater treatment system (e g spent solvents used oil)
  - risk related to dangerous reuse (e g reuse of pesticide containers for collecting or transporting drinking water)
- *Environmental Solutions* — Deposit-refund systems can facilitate the collection of wastes for reuse or recycling at a central plant Often the primary purpose of these systems is to create a large steady supply of feedstock for a central recycling plant thereby making it economically viable Batteries used oil and solvents are examples of wastes that could be managed through central plants

  Alternatively deposit refund systems can facilitate the collection of wastes that require special management to minimize environmental and public health risks Examples include PCBs and CFCs that require special destruction pesticide containers that require washing and treatment of the wash liquid or scrap tires that may be a fire hazard if sent to a landfill
- *Large Number of Waste Generators* – Deposit refund systems are particularly attractive policy instruments when there are too many waste generators to control through traditional command-and-control regulations For example it is not likely that regulatory authorities could catch the large number of people that dispose of

batteries and beverage containers or the large number of businesses that dispose of used oil and solvents Therefore enforcing bans on littering or landfill disposal would be difficult Similarly sporadic dumping of used oil or solvents into sewage drains would be difficult to detect Deposit-refund systems require only the simpler task of enforcing the payment of deposits

- *Geographical Coverage* — Deposit-refund systems typically cover a fairly wide geographic area Deposit-refund systems at the municipal level are rare There are several reasons for this First the waste must present sufficient risk to justify the costs of establishing and administering a deposit-refund system A small geographic area may not generate enough of the waste type to justify a deposit-refund system Second a deposit-refund system involves agents both before consumption to collect the deposit (such as manufacturers distributors or retailers) and after consumption to collect the waste and issue the refund (such as retailers distributors or manufacturers recycling facilities a special collection depot) Implementation is complicated when for example manufacturers distributors or recyclers are located in areas not subject to the deposit-refund system

11 4 Assess and Select Design Features

A comparative assessment of deposit refund systems and other policy tools (landfill bans waste management standards codes of practice etc) will be needed to determine whether deposit-refund systems are the best policy tool and how they should be designed The follow major design issues will require consideration

- *Controlling Illegal Activity* — Refunds create an economic value for the waste materials This value drives the return of waste but can also have undesirable side effects in the form of pirate producers These are people who attempt to collect refunds with stolen waste materials counterfeit waste or waste that is imported from regions where no deposit refund system exists Careful design safeguards and enforcement can limit abuses such as these For example setting the refund high enough to induce the return of legitimate wastes but not so high as to encourage illegal activity is essential

- *Controlling Risk in Waste Collection Storage and Transportation* — The deposit refund system will set up a waste collection and return system thereby reducing risks to the environment and human health The deposit-refund system however does not control the environmental risks associated with

storing, transporting and disposing reusing or recycling the waste Deposit-refund systems may require complementary standards for these activities

- *Selecting Collection Points* — Refunds are given when waste is returned to a central collection point The central collection points could be product retailers, distributors or manufacturers, recycling facilities or a special collection depot established for that waste Efficiency and ease of monitoring are two of the most important considerations in selecting collection points The success of deposit-refund systems is also highly dependent on selecting collection points that provide easy access for those returning the waste

- *Industry-Administered Systems* — In some cases it may be most efficient for industry to administer a deposit-refund system Deposit-refund systems first appeared as voluntary industry-administered systems to recover valuable waste materials such as glass More recently there have been cases in which industry has been motivated by a threat of regulatory action

Another approach to encouraging industry to implement deposit-refund systems is through take-back requirements Under these requirements customers have the legal right to return the waste to the retailer who sold them the product In turn retailers have the right to return those wastes to distributors and manufacturers who are legally required to take them back for safe disposal or recycling Since the requirements are very costly to retailers and industry take back requirements usually have an escape clause that allows industry to avoid the requirements if another collection and recycling system is established and results in specified performance targets Such a system may include a deposit refund system

- *Financing Administration Activities* — Costs will be incurred to collect the deposits provide refunds enforce the system and undertake other administrative activities There is a range of options for financing the system that should be considered Revenues from the fee on hazardous waste and unredeemed deposits are two funding options beyond the municipal budget

- *Setting the Levels of the Deposit and Refund* — The deposit and refund must provide sufficient incentive to achieve the desired rate of return without encouraging illegal activities In some cases a revenue generation capability is built into the system by making the deposit higher than the refund The revenue is then used to finance administration activities possibly including a

return to any private sector agents with administrative responsibilities

- *Facilitating Freelance Collectors* — An advantage of deposit-refund systems is that if the buyer does not wish to return the waste the refund offers an incentive for others to collect the waste and obtain the refund Freelance collectors are enterprises that collect waste and return them for the refund Collectors may pay people for the waste at a price less than the refund thereby making a profit for themselves and providing a service to the waste generators The result is a higher level of return Special provisions in the system design can facilitate freelance collectors, including provisions such as a premium refund for returning large quantities of waste grants or soft loans for waste collection vehicles and the licensing of collectors

11 5 Develop the Implementation Plan

The implementation plan will need to address

- the legislation or by laws needed for implementation including any standards required to ensure safe storage and transportation of the wastes
- ensuring that the infrastructure for recycling or safe disposal is in place
- a publicity campaign to ensure people understand what is required of them
- an accounting system if needed to trace the financial flows
- a monitoring and enforcement program to ensure the deposit is levied on all products sold in the municipality

Chapter 12
Environmental Planning for New and Expanding Industry

This chapter explains the procedures for implementing the environmental impact assessment requirements for new and expanding industrial establishments First it presents the basic features (or standards) of the EIA program including the types of projects and establishments covered Next it outlines the basic procedures for administering the EIA program including application review and evaluation notification of decision and appeals Last the roles and responsibilities of key government agencies involved in program implementation are summarized

12 1 Environmental Impact Assessment (EIA) Program

Law 4 states that the environmental impacts of certain establishments or projects must be evaluated before any construction works are initiated or a license is issued by the Competent Administrative Authority (CAA otherwise referred to as the licensing authority) Article 19 of Decree 338/1995 expands this requirement to expansions and renewals of existing establishments

Law 4 stipulates that an EIA is required for industrial establishments subject to the provisions of

- Law 21/1958 on the organization and encouragement of industry
- Law 65 1977 on the establishment and operation of thermal machines and steam boilers

EIAs are also required for all infrastructure projects including stations for sanitary drainage treatment and re use of water

In clarification of these provisions EEAA issued EIA Guidelines (1997) that establish a screening system for new and expanding projects dividing them into three classes or lists requiring different levels of EIA according to the severity of possible environmental impacts

1 *White list* for establishments/projects with minor environmental impacts

2 *Grav list* for establishments/projects which *mav* have significant environmental impacts

3 *Black list* for establishments/projects with substantial environmental impacts

12 2 Establishments Subject to the EIA Requirements

Exhibit 12-1 presents the principal categories of establishments relevant to the 10th of Ramadan City for each of the three lists" and their licensing authorities For establishments with no production capacity limits mentioned all sizes are included The classification may be adjusted by the EEAA in accordance with experience gathered If a project cannot be classified in any of the three categories, the developer must approach the EEAA for advice

The four principal competent authorities concerned are

- Ministry of Industry and Mineral Resources (for industrial projects)
- Ministry of Electricity (for power projects)
- Ministry of Housing Utilities and New Communities (for water and wastewater infrastructure projects)
- Governorate (for hazardous and municipal solid waste projects and other major urban development projects)

In this section Concerned Administrative Authority (CAA) refers to one of these four authorities depending on the type of the project

Exhibit 12-1 Principal Categories of Establishments Subject to the Egyptian EIA Requirements

CAA	White List	Gray List	Black List
Ministry of Industry & Mineral Resources	Textile factories situated in approved industrial sites excluding dying units Rubber and plastic factories situated in approved industrial sites Leather and shoe factories situated in approved industrial sites Plants engaged in manufacturing fish products in quantities of 1000 tons/yr or less	Steelworks with capacity of 150 tons/day or less Iron steel and non ferrous metal foundries Manufacture and assembly of motor vehicles Boiler shops and pipeline factories Electrotechnical enterprises including battery plants Cement factories using dry process with a capacity of 100 tons/hr or less (with other processes — 50 tons/hr or less) Glass manufacture Integrated chemical installations such as fertilizer lubricant pharmaceutical paint and detergent factories with capacity of 50 tons/day or less Bottling and packing of chemicals and products situated outside approved industrial sites Synthetic glue (adhesive materials) factories Pulp production with a capacity of 100 tons/day (rice straw) and 500 tons/day (sugarcane) or less Paper/paper board mills Sugar refineries Tanneries with a production of 1 million square ft/year Storage facilities for chemicals (other than oil refinery products) Projects/sites concerned with recycling/reuse of materials	Steelworks with capacity of more than 150 tons/day Electroplating plants with a production of more than 25 tons/day Cement works using dry process with capacity of over 100 tons/hr (with other processes — 50 tons/hr and above) Integrated chemical installations such as fertilizer pharmaceutical paint and detergent factories with capacity of more than 50 tons/day Pesticide manufacturing plants Pulp production with capacity greater than 100 tons/day (rice straw) and 500 tons/day (sugarcane) - Tanneries with a production of more than 1 million square ft/yr Lead smelters Refining/other treatment of vegetable oil
Ministry of Electricity	Expansion of existing electrical transmission lines	Thermal power plant with a capacity of 30 MW or less Electrical transmission lines Wind power plants	- Thermal power plant with a capacity greater than 30 MW Nuclear power plants Hydropower plants
Ministry of Housing	Small wastewater treatment plants of 1000 PE or less	Wastewater treatment plants with capacity of 1 000 1 million PE Water supply establishments Potable water stations and distribution systems	Wastewater treatment plants with capacity of more than 1 million PE
Governorates		Municipal waste landfills and treatment units Roads and highways in cities (less than 10 000 cars/day)	Urban development projects Roads/highways in cities (over 10 000 cars/day) Hazardous waste treatment and disposal

12 3 EIA Administration Procedures

Although the requirements for developers are different for White Gray and Black List projects, the procedure for EIA review and decision-making is basically the same

12 3 1 Application

The *developer* is required to

1 *Apply to the CAA*, before any construction works are initiated *with a letter of intent* to undertake a specific project indicating whether it falls under the White Gray, or Black List category

2 *Attach the documents required for the relevant listing category*

- *For White List projects* ***Environmental Screening Form "A"*** (see Appendix 14) which can be obtained at the CAA The A ' Form requires the developer to provide very basic information about the project including the cost site location preliminary construction and operation schedule capacity raw materials and energy use information It does not require an assessment of environmental impacts of the project

- *For Gray List projects* ***Environmental Screening Form "B'*** (see Appendix 14) which can be obtained at the CAA The B Form requires information on the project s objectives basic components and raw materials during the construction and operation phases The form also requires a description of project alternatives considered a brief description of the environment basic information about the main categories of pollutants or types of waste that are expected to be discharged if the project is implemented a preliminary analysis of impacts and a brief description of mitigation measures envisioned to address the identified environmental impacts

- *For Black List projects* ***three copies of the EIA report*** on the project in accordance with the relevant Sectoral Guidelines for Establishments That Need a Full EIA which are part of the EEAA s EIA Guidelines (sectoral guidelines for industrial establishments are presented in Appendix 14) The sectoral guidelines stipulate that the project proponent must develop the following sections of the EIA 1) description of the project 2) description of applicable legal and regulatory considerations 3)

description of the environmental setting 4) determination of potential environmental impacts, 5) description of project alternatives, 6) management plan to mitigate negative impacts, 7) monitoring plan and 8) description of interagency coordination and public/NGO participation The guidelines also provide an outline of a sample EIA report that includes all these components

The developer must also *provide a copy of the application package to the relevant Municipal Authority*

The CAA shall assist project proponents who submit EIA application packages by

- promptly responding to requests for Environmental Screening Forms
- establishing a special telephone number for inquiries on the EIA procedure in general and specific application requirements
- assigning staff to respond to such inquiries in writing or by phone or fax

12 3 2 Initial Review

When the CAA receives an application package from the developer it shall

- *Register* the submitted documents by name project number and date
- *Check whether the project category* (White Gray or Black List) declared by the proponent *is correct* If the CAA disagrees with the developer s classification of the project it shall ask the developer to resubmit the documents
- *Check whether the information submitted complies with the requirements* for the appropriate project category If it does not the CAA shall request additional information from the developer
- *Formally submit the application package to the EEAA* for review and evaluation
- *Notify the Municipal Authority* of the results of the initial review

12 3 3 Evaluation

According to Article 13 of Decree 338/1995 *the EEAA conducts the review and evaluation of the EIA documents*

- The EEAA shall *assign an expert team* to evaluate the submitted EIA documents The experts have to be pre-approved by the EEAA on the basis of the criteria set by the EEAA's Board of Directors

- The EEAA shall *register* the received application package in a special EIA Register at the EEAA

- *The emphasis of the evaluation shall be placed on the assessment of the environmental impacts of the proposed action* and the acceptability of those impacts on the quality of the environment particularly as compared with the impacts of other project alternatives

- The EEAA shall formally *request an opinion from the Municipal Authority* as to the specific local environmental impacts of the proposed project and possible conflicts with the existing municipal environmental programs and priorities

- The EEAA shall *review the mitigation measures* proposed by the developer and judge whether they are adequate in protecting the environmental quality The EEAA may *recommend modifications to the proposed action and/or new alternatives* that will protect the environmental quality and avoid or minimize adverse environmental impacts

- The EEAA shall modify if appropriate and *approve a list of mitigation measures* whose implementation by the developer is a mandatory condition of the project's approval

- The EEAA shall *prescribe appropriate monitoring* of the environmental impacts of the proposed project Such monitoring may be necessary during the construction startup or operation phases of the project

- *The comments on the submitted application package shall be as specific substantive and factual as possible* Although the comments do not need to conform to any particular format it would facilitate evaluation by the CAA if the comments were organized in a manner consistent with the structure of the Environmental Screening Form or the EIA report

- The EEAA shall *formally submit its opinion and comments in writing to the CAA* The EEAA may recommend *approval* of the project on the condition that the developer implement the approved mitigation measures and conduct appropriate monitoring of the project's environmental impacts *Otherwise*, a proponent of a White List project may be instructed to follow the Gray or Black List procedures thereby restarting the application process A Gray List project may be disapproved or the developer may be requested to complete a scoped EIA for certain impacts/processes of the project A Black List project may only be approved or disapproved only

If the EEAA requests a scoped EIA on a Gray List project it shall *prepare the Terms of Reference for the scoped EIA* and attach them to the written opinion submitted to the CAA

- The EEAA shall *register* its opinion proposals and comments in the EIA Register

- The EEAA has ***60 days*** to review and evaluate the EIA application package from the date of receipt of the application package from the CAA until the date the recommendations are sent to the CAA *Failure to comply with these time limitations is considered an approval of the project by the EEAA*

12 3 4 Notification of the Decision

After the *CAA* has received the opinion and comments from the EEAA it shall *officially notify the developer* of the result of the evaluation Notification shall be done by registered letter with an acknowledgment of receipt

The CAA shall also *notify the Municipal Authority* of the official decision as well as send an official copy to the EEAA which has to register it together with the previous entries on the EIA in its EIA Register The CAA shall also notify any government agency with licensing authority over the proposed project

If a scoped EIA is requested for a Gray List project or a White List project is to be re assessed under a different category the proponent shall submit a new set of documents to the CAA after which the procedure is repeated

If the project is approved it becomes subject to the regulatory requirements for existing establishments with enforcement responsibilities exercised by the relevant and appropriate government agencies

Exhibit 12 2 Summary of Government Agency Responsibilities in the EIA Process				
Phase	**CAA**	**FEAA**	**Municipal Authority**	**Permanent Appeals Committee**
Application	Provide forms to developers and respond to inquiries Receive application package from developer		Receive copy of application package	
Initial Review	Record documents Check if project category is correct if not ask developer to resubmit documents Check if information submitted complies with requirements if not request additional information Submit application package to FEAA Notify Municipal Authority of Initial Review results		Review the EIA documents	

Exhibit 12 2 Summary of Government Agency Responsibilities in the EIA Process				
Phase	**CAA**	**EEAA**	**Municipal Authority**	**Permanent Appeals Committee**
Evaluation		Review and evaluate EIA documents with particular emphasis on impacts Request opinion from Municipal Authority Approve mitigation and monitoring measures to be implemented if project is approved Submit official opinion and comments to CAA within 60 days Register documents opinion comments in special EIA Register If needed prepare TOR for scoped EIA (Gray List projects only)	Submit opinion on the EIA to the EEAA	
Notification of the Decision	Notify the developer of the final decision If needed request scoped EIA or resubmission of the documents under a different category Notify EEAA Municipal Authority other licensing authorities			

Exhibit 12-2 Summary of Government Agency Responsibilities in the EIA Process				
Phase	**CAA**	**EEAA**	**Municipal Authority**	**Permanent Appeals Committee**
Appeals		Receive appeal documents from the developer Call a meeting of the Permanent Appeals Committee within 15 days of documents receipt		Consider the appeal make decision within 60 days Notify developer EEAA CAA Municipal Authority

Chapter 13
Environmental Trust Fund

This chapter describes the sources of funding leveraging of funds and use of funds within 10th of Ramadan City It also covers the administration of the Environmental Trust Fund The scope of this chapter is limited to a basic description because critical policy decisions must be made before additional details are be added

13 1 Creation of an Environmental Fund

Many developing countries are successfully using environmental funds at the national regional and local levels to help finance environmental protection activities Law 4/1994 recognizes the valuable role that environmental funds can play in achieving Egypt s environmental objectives by authorizing the creation of an environmental protection fund at the national level (its operating procedures however have not yet been adopted) Law 4 also authorizes incentive systems and pilot programs for innovative approaches to environmental management This locally managed fund is still a pilot program and is implemented as such by these guidelines

The proposed Environmental Trust Fund for the 10th of Ramadan will become a key mechanism for

- recycling revenues from the multi media discharge fee back to industry
- providing financial incentives (assistance) for industry to comply with environmental requirements
- disbursing funds to the Municipal Authority to finance its responsibilities in the environmental management program
- leveraging funds for environmental protection from commercial lenders other levels of government bilateral donor agencies and international financial institutions

The financial incentives will play a particularly important role in the early phases of implementing the environmental management program The

early phases will require the largest investments from industry as companies bring themselves into compliance with environmental standards The need for financial assistance will thus be greatest during this period Since firms will not yet have responded to the regulated standards and fees at this point discharges will be relatively high, as will revenues flowing into the Fund from the multi-media discharge fee There is therefore a balance over time between revenues and revenue requirements As discharges decline so will revenues into the Fund and the need for financial assistance

13 2 Sources of Funding

The Environmental Trust Fund receives revenues raised from

- the multi-media discharge fee
- revenues that the Fund managers are able to leverage from bilateral donors international financial institutions and other sources

13 3 Collection and Processing of Fees and Charges

The multi-media discharge fee is applied as a license fee To obtain their license or renewal firms pay the assessed fee to the Municipal Authority The Municipal Authority directs the fee revenues to the Environmental Trust Fund

13 4 Administration of the Fund

The Fund has a two part management structure

- the Board of Trustees (or a subcommittee of the Trustees if the Board so desires) is the decision making body
- an Administrative Unit possibly within the Municipal Authority will provide day to day administrative support

The responsibilities of the Board of Trustees are to

- set policies and funding priorities
- establish project financing criteria
- monitor project selection to ensure consistency with policies priorities and criteria
- approve all disbursements over a size specified by the Board

- monitor financial control and accounting
- issue annual reports and financial statements
- undertake to have an independent audit of the Fund on a yearly basis
- pursue opportunities to leverage the Fund's resources

The Administrative Unit is responsible for day-to-day management activities including

- promote the incentives program among industry
- approve disbursements under the size specified by the Board for projects that are consistent with the Fund's policies funding priorities and project financing criteria
- monitor individual projects to ensure they meet the terms of the funding agreement
- take enforcement action when the terms of a funding agreement are not fulfilled
- assist the Board as directed

13 5 Disbursements from the Fund

The Fund will act as a flow through mechanism for revenues earmarked for specific activities These include

- revenues from the Phase I hazardous waste generation fee earmarked for the operation of the industrial waste exchange
- revenues from the Phase I air emissions fee earmarked for the Municipal Authority s activities related to air emissions

The Board of Trustees may choose to dedicate revenues from the fixed component of the wastewater discharge fee to finance the Municipal Authority s activities related to wastewater regulations

Other projects will be eligible for disbursements including firms undertaking pollution prevention and control projects through an applications procedure

Transparent procedures and criteria for funding decisions is the core of the disbursement program The Board of Trustees will develop the procedures and criteria An explicit scoring system will increase the transparency of decisions This system involves mandatory criteria judged on a pass/fail basis coupled with non mandatory criteria for which each

criterion is assigned a score Suggested criteria for the Board s consideration include

- *Mandatory Criteria*
  - targeted towards priority environmental concerns especially industrial wastewater
  - technical feasibility
  - plan for continued maintenance and operation
  - competitive procurement process
- *Scored Criteria*
  - environmental effectiveness (impact on priority environmental concerns)
  - multi-media benefits (minimal cross-media transfer of pollutants)
  - consistency with the hierarchy of reduction/prevention reuse and recycling
  - cost-effectiveness
  - degree of leverage
  - degree of technology transfer

Disbursements are in the form of direct grants since grants best overcome any weaknesses in local credit markets have relatively low administrative costs and can provide larger incentives for industry than soft loans grants for interest loan guarantees and other forms of financial assistance Grants are capped at a maximum of 50% of project costs An additional cap of 80% on assistance received from all donors shall also apply

Project proponents seeking funding assistance must submit a funding application form The Fund s administrative unit shall develop the application form after the Board of Trustees h is established funding priorities and selection criteria Once submitted the administrative unit will conduct a two stage review process

- *Stage 1 Project Screening* — Applicants shall first submit an application describing the general objectives and nature of the project The administrative unit shall first review the application for completeness and notify the applicant of any missing information The administrative unit shall then review properly completed applications and notify the applicant whether the proposed project is consistent with the general priorities established by the Board of Trustees
- *Stage 2 Detailed Review* — Applicants whose projects are deemed consistent with the funding priorities shall be invited to submit a detailed application including an assessment of

technical feasibility The administration and/or the Board of Trustees shall review the detailed applications and issue a funding decision

Funding decisions are made on a quarterly or semi-annual basis rather than a first-come, first-served basis This allows a better comparison of funding applications to determine which best meet the selection criteria The names of grant recipients and the sum awarded shall be made publicly available

Award recipients will be subject to project monitoring and reporting requirements as defined by the Board of Trustees

Appendix 1
Outline for Uniform Register of Environmental Impact

Outline for Uniform Register of Environmental Impact

1 Establishment's name and address

2 Name of person in charge of recording data in the Register and his job title

3 Time period covered by the current data

4 Type of activities and nature of primary raw materials used, and production volume during the corresponding time period

5 Legislation to which the establishment is subject

6 Special conditions set by the EEAA concerning the establishment

7 Statement of types of emissions the rates of discharge (per hour/per day/per month/per year) and method of disposal thereof

- 7 1 Gaseous Emissions
- 7 2 Liquid Discharges
- 7 3 Solid Waste Generation
- 7 4 Other Emissions

8 Frequencies of tests on all types of emissions from the establishment

- 8 1 Random samples for testing
  - date time and place of each sample
  - frequency of sample collection
  - statement of parameters to be measured (daily/weekly/ monthly)
- 8 2 Samples of compound waste
  - date and time of sample collection
  - locations and percentages of the mixture in the compound sample
  - statement of parameters to be measured (daily/weekly/ monthly)

9 Extracted materials after treatment processes

10 Extent of efficiency of treatment method

11 Date and signature of officer in charge

Appendix 2
Consolidated Environmental License Forms: Application, License, and Notice of Renewal/Expiration

EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)

APPLICATION FOR CONSOLIDATED ENVIRONMENTAL LICENSE

OFFICIAL USE ONLY

EEAA Reviewer (print name) **TITLE** **SIGNATURE**

APPROVED (date)	**REJECTED (state principal reasons)**

ADDITIONAL INFORMATION NEEDED

SECTION I APPLICANT INFORMATION

1 Name and Mailing Address of Legal Entity (Person or Business) Applying for License

Telephone Number

Fax Number

2 Applicant s Business License Number

3 Name and Mailing Address of Establishment to be Licensed (if different from Number 1 above)

Telephone Number

Fax Number

4 Basic Description of Establishment

Kompass Code _____

SIC Code _____

Type of Industry _____

Date established _____

Primary products produced

1 _____

2 _____

3 _____

4 _____

Annual production of each type

_____

_____

_____

_____

Number of full time employees _____

Number of part time employees _____

Number of production shifts per week ___

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) INFORMATION

Establishment subject to EIA requirement (check box)?

Yes ☐ No ☐

If yes check box

White list ☐

Gray list ☐

Black list ☐

List all EIA approvals granted for the Licensed establishment (including approvals for expansion or rehabilitation projects)

EIA Title and Registration Number	Approved by (Competent Administrative Authority)	Date Approved

SITE SUITABILITY WITH RESPECT TO AIR POLLUTION Per Articles 34 and 35 of Decree Number 338 of 1995 it is mandatory that sites where establishments are to be set up shall be suitable for the establishment s activities so as to fit with the environment of the area and with the land use plan as determined by the Ministry of Housing Utilities and New Communities In siting the establishment due consideration must be given to the site suitability including its distance from residential areas site topography and wind dispersion charactenstics Site suitability is assessed during the EIA procedures but explicit approval must be given by this License for site suitability with respect to air pollution

SECTION II CERTIFICATIONS

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on my inquiry of the individuals immediately responsible for obtaining the information I believe that the submitted information is true accurate and complete I am aware that there are penalties for submitting false information

Signature of Officer in Charge — Name and Official Title (print or type) — Date signed

Signature of Environmental Management Officer — Name and Official Title (print or type) — Date signed

SECTION III FACILITY LAYOUT AND BASIC PROCESS DESCRIPTION

Attach facility site plan blueprints or basic drawings of layout of primary production facility(ies) auxiliary work spaces and supporting facilities Attach basic flow diagram for each major production process

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SECTION IV WATER USAGE AND WASTEWATER MANAGEMENT

1 DAILY WATER USAGE (based on operation at full capacity)

SOURCE	DAILY VOLUME DRAWN (m^3)	PURPOSE/ACTIVITY	DAILYVOLUME USED (m^3)
Deep well	_____ (m^3/day)	Process	_____ (m^3/day)
Municipal supply	_____ (m^3/day)	Potable/drinking	_____ (m^3/day)
Other (specify)		Sanitary	_____ (m^3/day)
_____	_____ (m^3/day)	Cooling	_____ (m^3/day)
		Other (specify)	
		_____	_____ (m^3/day)

2 WASTEWATER MANAGEMENT Identify volume and type of wastewater generated by each process or activity that generates a liquid discharge Be sure to include activities related to production cleaning and maintenance on site sanitation and drainage storm water collection and drainage and cooling systems Proposed point of discharge must be marked on the basic drawings of layout and site plan (see Section III above) *A PERMIT IS REQUIRED FOR ALL DISCHARGES OF LIQUID WASTES TO WATER LAND OR THE PUBLIC SEWER SYSTEMS*

	SOURCE/ACTIVITY	PRIMARY CONSTITUENTS OF LIQUID WASTE STREAM	DAILY VOLUME GENERATED (m^3)	POINT OF DISCHARGE
1	_____	_____	_____ (m^3/day)	_____
2	_____	_____	_____ (m^3/day)	_____
3	_____	_____	_____ (m^3/day)	_____
4	_____	_____	_____ (m^3/day)	_____
5	_____	_____	_____ (m^3/day)	_____
6	_____	_____	_____ (m^3/day)	_____
7	_____	_____	_____ (m^3/day)	_____
8	_____	_____	_____ (m^3/day)	_____
9	_____	_____	_____ (m^3/day)	_____
10	_____	_____	_____ (m^3/day)	_____
11	_____	_____	_____ (m^3/day)	_____
12	_____	_____	_____ (m^3/day)	_____
13	_____	_____	_____ (m^3/day)	_____
14	_____	_____	_____ (m^3/day)	_____
15	_____	_____	_____ (m^3/day)	_____

3 INFORMATION REQUIRED FOR APPROVAL TO CONNECT TO PUBLIC SEWER NETWORK Explicit approval for connecting to the sewer network must be given by the Department of Housing and Utilities in the 10th of Ramadan City Please attach the following documents to this application form

a) A survey map or a drawing of the establishment and its immed ate location at a scale not less than 1 2 500
b) Three copies of a drawing showing the ground plan of the ground floor of the establishment at a scale of 1 200 1 100 or 1 50 on which wastewater inspection chambers gully traps ground stretchers and tanks are indicated

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(CIRCLE IF APPLICABLE LICENSE APPPOVAL	COMPETENT AUTHORITY	DATE	APPLICATION FORWARDED TO COMPETENT AUTHORITY SIGNATURE OF EEAA OFFICIAL	RECEIVED BY (SIGN AND DATE)
APPROVAL FOR CONNECTING TO THE PUBLIC SEWER NETWORK	*10TH OF RAMADAN MUNICIPAL AUTHORITY*	_____	_____	_____
LICENSE FOR DRAINAGE OF INDUSTRIAL WASTEWATER INTO THE PUBLIC SEWER NETWORK	*10TH OF RAMADAN MUNICIPAL AUTHORITY*	_____	_____	_____

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SECTION V HANDLING OF HAZARDOUS SUBSTANCES AND WASTES

1 APPLICABILITY The handling of hazardous industrial substances and wastes at the Licensed establishment is prohibited unless a Hazardous Substances and Wastes Handling License has been issued to the Licensee by the Ministry of Industry

Does/will the establishment handle any of the compounds listed in the following references?	YES	NO
a) *Table of Controlled Hazardous Substances* (Table 2)	☐	☐
b) *Table of Hazardous Wastes* (Table 3)	☐	☐

If you answered Yes to any of the above you will be required to attach a completed Application for License to Handle Hazardous Substances and Wastes A copy of this application form is attached If applicable submit completed application form with this Application for Consolidated Environmental License

OFFICIAL USE ONLY

APPLICATION FOR LICENSE TO HANDLE HAZARDOUS SUBSTANCES AND WASTES FORWARDED TO MINISTRY OF INDUSTRY

DATE	SIGNATURE OF EEAA OFFICIAL	RECEIVED FOR MINISTRY OF INDUSTRY (print name and title)	SIGNATURE	DATE RECEIVED

SECTION VI AIR EMISSIONS

1 APPLICABILITY The emissions of air pollutants does not require a separate license The following section should be completed to best of the applicant s knowledge based on facility and process design emissions testing or other reference method In case a reference method is used a copy of the calculation and full citation must accompany this application List each stack and fugitive emission source separately below

a) Emissions source	Constituents	Chimney Height (m)	Emission Rate (mg/m^3)	Control Technology	Removal efficiency (%)
1					
2					
3					
4					
5					
6					

applicant stores volatile liquids of solid material (with fine particles)that can cause fugitive emissions each must be listed separately below In most cases covering the volatile liquid or solid storage container is sufficient However if stored material requires periodic venting this must be noted

) Fugitive emission source	Method of control	Needs venting No	Needs venting Yes	Frequency (times per year)
1				
3				

II SOLID WASTES

All solid wastes produced by the applicant should be listed separately below together with the method of treatment and disposal (as applicable)

ype o waste	Quant ty Generated (tons/year	Method o T ea men	Place of F nal Disposal
2			
4			
6			

EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)

CONSOLIDATED ENVIRONMENTAL LICENSE

LICENSE NUMBER

DATE OF ISSUE

DATE OF RENEWAL ☐ _____

EXPIRATION ☐ _____

MULTI MEDIA DISCHARGE FEE PAYABLE (month)

SECTION I LICENSEE INFORMATION

1 Name and Mailing Address of Licensee — **Telephone Number** — **Fax Number**

2 Licensee s Business License Number

3 Name and Mailing Address of Licensed Establishment (if different from Number 1 above) — **Telephone Number** — **Fax Number**

4 Basic Description of Establishment

Kompass Code _____

SIC Code _____

Type of Industry _____

Primary products produced	Annual production of each product type
1 _____	_____ (___/year)
2 _____	_____ (___/year)
3 _____	_____ (___/year)
4 _____	_____ (___/year)

Number of full time employees

Number of part time employees

Number of production shifts per week

5 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) INFORMATION

Establishment subject to EIA requirement (check box)?

Yes ☐ No ☐

If yes check box

White list ☐

Gray list ☐

Black list ☐

List all EIA approvals granted for the Licensed establishment (including approvals for expansion or rehabilitation projects)

EIA Title and Registration Number	Approved by (Competent Administrative Authority)	Date Approved

6 SITE SUITABILITY WITH RESPECT TO AIR POLLUTION Per Articles 34 and 35 of Decree Number 338 of 1995 it is mandatory that sites where establishments are to be set up shall be suitable for the establishment s activities so as to fit with the environment of the area and with the land use plan as determined by the Ministry of New Urban Communities In siting the establishment due consideration must be given to the site suitability including its distance from residential areas site topography and wind dispersion charactenstics Site suitability is assessed dunng the EIA procedures but explicit approval must be given by this License for site suitability with respect to air pollution

Site suitability approval granted _____ (Signature of Ministry of Industry Official) _____ (Pnnt name and title) _____ (Date approval granted)

SECTION II CERTIFICATIONS

1 LICENSEE S OFFICER IN CHARGE I certify that I have read and understand the conditions of this Consolidated Environmental License and the attached Media Specific Licenses I also certify that I am aware that there are s gn f can penalt es incluc ng the possibility of fines and imprisonment for violations of any of the condit ons of these Licenses

_____ Signature of Officer in Charge

_____ Name and Official Title (print or type)

_____ Date

_____ Signature of Environmental Management Officer

_____ Name and Official Title

_____ Date

2a FOR EEAA

_____ Signature of EEAA Official

_____ Date

_____ Name and Title (print or type)

2b) FOR MUNICIPAL AUTHORITY

_____ Signature of Municipal Authority Official

_____ Date

_____ Name and Title (print or type)

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SECTION III GENERAL CONDITIONS

1 **APPLICABILITY** This License has been issued for the above establishment in consideration of the production and facility specifications listed above Any expansions or major renewals of the Licensed establishment are also subject to the conditions of this License Changes in production patterns or an increase in the number of staff in a way that exceeds the capacity of the work place or any essential modifications to the establishment s buildings or structures are considered to be expansions and/or renewals Additionally any modifications to the ventilation systems changes in work location or similar modifications that may result in harmful impacts to the environment or to workers are considered to be expansions and renewals

2 **DOCUMENTATION** This License shall be kept at all times on file at the head office of the Licensee A copy shall also be kept at the address of the establishment if this is different from the head office Wherever this License is kept on file the Licensee will attach copies of all approved EIAs pertaining the licensed establishment

3 **FEES** The Licensee shall pay according to a schedule set forth by the EEAA and the Municipal Authority the annual Multi Media Discharge Fee assessed for this License The Fee shall be payable by the last business day of the month indicated in the top right section of this form The Multi Media Discharge Fee the sum total of three Media Specific Fees a) the Fixed and Variable Wastewater Discharge Fee b) the Fixed Air Emissions Fee and c) the Fixed Hazardous Waste Fee The Fixed Air Emissions Fee for the Licensee is LE 000 per year The Licensee will be eligible to a 50% discount on the annual Fixed Air Emissions Fee if the Licensee complies with all emissions monitoring and reporting requirements specified in this License for the year Details on calculation of the wastewater and hazardous waste fees are provided in the Media Specific Licenses Failure to pay the assessed fees constitutes a violation of the License conditions and may result in the suspension of any activity associated with discharges and emissions

4 **CONTROLS AND EQUIPMENT** The Licensee shall comply with all applicable requirements of the air water and waste laws of the Arab Republic of Egypt In particular the Licensee shall keep all facilities and equipment regulated under this License and applicable rules in good working order through an active maintenance program Except as provided by the applicable rules or these License conditions the Licensee shall not operate any equipment or process unless the pollution controls required by either this License or the rules are in place are operating without bypass and are operating within their design parameters and in accordance with any other conditions specified in this License This requirement to operate any required pollution control equipment may be temporarily waived based on the following conditions

a) For preventive maintenance of the pollution control device if the shutdown is authorized by EEAA

b) In the event that control equipment is not operated as covered by paragraph a above the Licensee shall provide additional monitoring data if requested by EEAA An equipment malfunction that causes pollutant emissions or discharges in excess of those allowed under the conditions of this License shall constitute a violation and penalties may apply The Licensee must notify EEAA of any emissions or discharges in excess of the permissible limits established in the laws or executive regulations by certified letter and shall keep records of such instances for review by inspectors Equipment malfunctions due to Acts of God or other uncontrollable events shall not constitute violations

5 **SELF MONITORING AND REPORTING** The Licensee is required to maintain on site at all times a completed Uniform Register of Environmental Impacts form Per Article 17 of Decree 338 implementing the Law for the Environment (Law Number 4 of 1994) the register must record the following information

a) Establishment name and address
b) Name of person in charge of recording data in the Register and her/his job title
c) Time period covered by the current data
d) Type of activities and nature of primary raw materials used and production during the corresponding time period
e) Legislation to which the establishment is subject
f) Special conditions set by the EEAA concerning the establishment
g) Statement of types of emissions the rates of drainage (per hour/per day/per month/per year) and method of disposal thereof
   1) Gaseous Emissions
   2) Liquid Emissions
   3) Solid Emissions
   4) Other Emissions
h) Frequencies of carrying out tests on all types of emissions from the establishment
   1) Random samples for testing
      Date time and place of each sample
      Frequency of sample collection
      Statement of parameters to be measured (daily/weekly/ monthly)
   2) Samples of compound waste
      Date and time of sample collection
      Locations and percentages of the mixture in the compound sample
      Statement of parameters to be measured (daily/weekly/ monthly)
i) Extracted materials after treatment processes
k) Extent of efficiency of treatment method and
l) Date and signature of officer in charge

The Licensee must notify EEAA by registered letter with return receipt requested of any significant deviations in the criteria or specifications of pollutants released by the licensed facility and procedures taken to correct such deviations Additionally the Licensee must submit an updated Uniform Register of Environmental Impacts to EEAA and the competent administrative authority on an annual basis in conjunction with the renewal of the annual Consolidated Environmental License The Licensee must keep past Register forms on site for a period of 10 years effective from the date of the signature of the EEAA inspector who reviewed it

6 **VIOLATION OF LICENSE CONDITIONS** In the case that EEAA or other competent administrative authority detect a violation of any of the conditions of this License EEAA or the Municipal Authority will notify the competent administrative authority (as applicable) of the violation found and recommend the issuance of a Notice of Violation to the Licensee The Notice of Violation (NOV) will be sent to the Licensee by registered mail Upon receipt of the NOV the Licensee has sixty (60) days to undertake corrective action and submit a Corrective Action Report explaining actions taken to correct the violation The Corrective Action Report must also demonstrate through sampling results or otherwise that the licensed facility is no longer in violation A Corrective Action Report form will be attached to the NOV The Licensee may also be called to a Technical Conference in order to explain the circumstances leading to the violation or present evidence that the presumed violation did not occur

7 **PENALTIES FOR NON-COMPLIANCE** If the Licensee does not correct the violation and submit the Corrective Action Report within sixty (60) days from the date of receipt of the NOV EEAA in agreement with the competent administrative authority will take the required legal steps as authorized by Law Number 4 for 1994 (Law for the Environment) to a) close the facility b) suspend the damaging activity and/or c) file a lawsuit demanding suitable compensation to remedy the damages resulting from the violation In the case a violation(s) is proven to occur monetary or criminal penalties may be applied as authorized by Section 4 of Law Number 4 Penalties are specific to the air water or waste regulation violated Applicable penalties are specified in the conditions below and in the attached Media Specific Licenses All penalties stipulated by Law Number 4 are without prejudice to any more severe penalties stipulated in another law Finally the Licensee understands that per Article 103 of Law Number 4 every Egyptian citizen and organization concerned with the environment is granted the right to report violations of Law 4 and its implementing regulations

8 **INTENTIONAL VIOLATIONS** Any person who intentionally violates the conditions of this License or other provisions of Law Number 4 shall be punished by imprisonment for a period of not more than 10 years if such act results in causing permanent incurable disability to an individual The penalty shall be imprisonment if the violation results in causing this disability to three or more persons If the intentional violation(s) results in the death of a person the penalty shall be temporary hard labor and the penalty shall be permanent hard labor if violation results in the death of three persons or more

9 **RIGHT TO ENTRY** The authorized representative of EEAA and/or the competent authority upon presentation of proper credentials shall be permitted to

a Enter upon the premises of the Licensed Facility where any records are required to be kept under the terms and conditions of this License
b Have access to and photocopy at reasonable times any records required to be kept under the terms and conditions of this License
c Inspect at reasonable times any source of pollution equipment (including monitoring and pollution control equipment) practices or operations regulated and required by this License
d) Sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with this License or other applicable requirements and
e) Record any inspection by use of written electronic magnetic and photographic media

The Licensee has the right to assert a claim of confidentiality for trade secrets and commercial information that is privileged and exempt from disclosure under applicable laws of the Arab Republic of Egypt provided that no claim of confidentiality can limit the scope of or otherwise interfere with an on site inspection authorized by this License condition

10 **LICENSE RENEWAL** This License is valid for five (5) years from the date of issue (top of License) At least ninety (90) days prior to expiration the Licensee should apply for renewal of the Consolidated Environmental License To be considered for renewal a renewal application form must be submitted with an updated copy of the Uniform Register of Environmental Impacts The certified results of representative wastewater sample analyses performed by a Ministry of Health approved laboratory must be attached to the Register

11 **RIGHTS AND PRIVILEGES** This License does not convey any property rights nor exclusive privileges of any sort

12 **SEVERABILITY** The provisions of this License are severable, and, if any provision of this License is held invalid, the remainder of this License shall not be affected thereby

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SECTION IV SPECIFIC CONDITIONS PROTECTION OF THE ENVIRONMENT FROM AIR POLLUTION

1 MAXIMUM PERMISSIBLE LIMITS FOR OUTDOOR AIR POLLUTANTS Total air pollutant emissions from all activities at the Licensed establishment shall not cause an exceedance of the maximum permissible limits for outdoor air pollutants promulgated by the Executive Regulations of Law 4 of 1994 The current applicable limits are

MAXIMUM LIMITS OF OUTDOOR AIR POLLUTANTS

POLLUTANT	*MAXIMUM LIMIT (micrograms/m^3 unless otherwise indicated)*	*AVERAGING TIME*
SULFUR DIOXIDE	*350*	*1 hr*
	150	*24 hrs*
	60	*1 year*
CARBON MONOXIDE	*30 mg/m^3*	*1 hr*
	10 mg/m^3	*8 hrs*
NITROGEN DIOXIDE	*400*	*1 hr*
	150	*24 hrs*
OZONE	*200*	*1 hr*
	120	*8 hrs*
SUSPENDED PARTICULATES	*150*	*24 hrs*
(MEASURED AS BLACK SMOKE)	*60*	*1 year*
TOTAL SUSPENDED	*230*	*24 hrs*
PARTICULATES	*90*	*1 year*
THORACIC PARTICULATES (PM 10)	*70*	*24 hrs*
LEAD	*1*	*1 year*

VIOLATIONS OF ANY OF THESE PROVISIONS SHALL BE SUBJECT TO A FINE OF LE1 000-20 000 IN THE CASE OF RECIDIVISM THE PENALTY SHALL BE IMPRISONMENT AND A FINE AS CITED ABOVE

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2 MAXIMUM PERMISSIBLE LIMITS FOR AIR POLLUTANTS IN EXHAUST GAS The Licensed establishment shall not exceed the maximum permissible limits of certain air pollutants in exhaust or other type of emissions from any stationary source The current applicable limits are

POLLUTANT	INDUSTRY/ACTIVITY TYPE	MAXIMUM LIMIT (micrograms/m³ in exhaust gas)
TOTAL PARTICULATE	CARBON INDUSTRY	50
	COKE INDUSTRY	50
	PHOSPHATE INDUSTRY	50
	INGOTS INDUSTRY EXTRACTION OF LEAD ZINC COPPER AND OTHER NON FERROUS METALLURGICAL INDUSTRIES	100
	FERROUS INDUSTRIES	200 (EXISTING)
	CEMENT INDUSTRY	100(NEW)
		500 (EXISTING)
	INDUSTRIAL TIMBER AND FIBERS	200 (NEW)
	PETROLEUM INDUSTRIES/OIL REFINING	150
	OTHER INDUSTRIES	100
		200
	ALL	
ALDEHYDES (MEASURED AS FORMALDEHYDE)		20
ANTIMONY	ALL	
CARBON MONOXIDE	ALL	20
		500 (EXISTING)
	COKE /PETROLEUM COMBUSTION	250 (NEW)
SULFUR DIOXIDE		4000 (EXISTING)
	NON FERROUS INDUSTRIES	2500 (NEW)
	SULFURIC ACID INDUSTRY	3000
SULFUR TRIOXIDE (IN ADDITION	ALL	1500
TO SULFURIC ACID)	NITRIC ACID INDUSTRY	150
NITRIC ACID	ALL	2000
HYDROGEN CHLORIDE	ALL	100
HYDROGEN FLUORIDE	ALL	15
LEAD	ALL	20
MERCURY	ALL	15
ARSENIC	ALL	20
HEAVY METALS (TOTAL)	ALL	25
SILICON FLUORIDE	ALL	10
FLUORINE	GRAPHITE ELECTRODE INDUSTRY	20
TAR	ALL	50
CADMIUM	ALL	10
HYDROGEN SULFIDE	ALL	10
CHLORINE	GARBAGE BURNING	20
CARBON	ELECTRODE INDUSTRY	50
	BURNING OF ORGANIC LIQUIDS	250
ORGANIC COMPOUNDS	OIL REFINING	50
	ALL	0 04% OF CRUDE
COPPER	ALL	20
NICKEL	NITRIC ACID INDUSTRY	20
NITROGEN OXIDES		3000(EXISTING)
	OTHER INDUSTRIES	400 (NEW)
		300

VIOLATIONS OF ANY OF THESE PROVISIONS SHALL BE SUBJECT TO A FINE OF LE1 000-20 000 IN THE CASE OF RECIDIVISM THE PENALTY SHALL BE IMPRISONMENT AND A FINE AS CITED ABOVE

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3 FUEL BURNING PROHIBITIONS AND SPECIFICATIONS The Licensee shall comply with the following regulations as promulgated by Article 42 of Decree Number 338 of 1995

a) Suitable fuels shall be chosen given the design specifications of the incinerator boiler funnels chimneys and any other equipment associated with fuel burning
b) Uncovered burning is prohibited when the equipment design does not guarantee full combustion and exhausting of wastes through the chimneys according to proper engineering specifications
c) Burners and boilers shall be designed in such a way so as to ensure the complete mixing of the necessary quantity of air for fuel burning and for complete combustion of the fuel
d) Burning of coal is prohibited in urban regions and near residential areas
e) Burning of mazout and other heavy oil products as well as crude oil is prohibited in residential areas
f) The sulfur content of fuels used in urban areas and near residential areas shall not exceed 1 5% the use of fuel with high sulfur content by industry or power generating stations is permitted in regions far from inhabited urban areas provided that suitable atmospheric conditions are present and adequate distances are observed to prevent these gases from reaching the residential and agricultural areas and regions as well as water courses
g) Emissions of gases containing carbon dioxide shall be through chimneys of sufficient height so that these gases may become less concentrated before reaching ground level

CHIMNEY SPECIFICATIONS

h) The height of chimneys that emit a total of 7000 15000kg per hour of gaseous waste shall be 18 36 meters
i) The height of chimneys that emit more than 15000kg per hour of gaseous waste shall be at least more than two and a half times the height of surrounding buildings including the building served by the chimney
j) Due consideration shall be given to the height of chimneys in or near public places such as offices restaurants hotels and other commercial activities to be at least three (3) meters higher than the top of such buildings The speed of gas emission from the chimney shall also be accelerated

The Licensee shall comply with maximum permissible limits of pollutants from chimneys and other fuel burning sources as promulgated by the Executive Regulations of Law Number 4 of 1994 The current limits are

MAXIMUM LIMITS OF POLLUTANTS FROM FUEL BURNING SOURCES

POLLUTANT	*MAXIMUM LIMIT*
SMOKE	*1 ON RINGLEMANN CHART (250mg/m³)*
SUSPENDED PARTICULATES	
SOURCES IN URBAN AREAS OR NEAR RESIDENTIAL AREAS	*1 ON RINGLEMANN CHART (250mg/m³)*
SOURCES FAR FROM INHABITED URBAN AREAS	*2 ON RINGLEMANN CHART (500mg/m³)*
BURNING OF WASTE	*2 ON RINGLEMANN CHART (500mg/m³)*
SULFUR DIOXIDE	
EXISTING	*4000 mg/m³*
NEW	*2500 mg/m³*
ALDEHYDES	
BURNING OF WASTE	*20 mg/m³*
CARBON MONOXIDE	
EXISTING	*4000 mg/m³*
NEW	*2500 mg/m³*

VIOLATIONS OF ANY OF THESE PROVISIONS SHALL BE SUBJECT TO A FINE OF LE1 000-20 000 IN THE CASE OF RECIDIVISM THE PENALTY SHALL BE IMPRISONMENT AND A FINE AS CITED ABOVE

4 EMISSIONS FROM DIESEL/GASOLINE ENGINES All machines engines and vehicles that produce exhaust used by or associated with the Licensee and the licensed establishment must comply with the maximum pollutant emissions limits promulgated by the Executive Regulations of Law Number 4 of 1994 The current limits are

FOR VEHICLES REGISTERED BEFORE 1995		*FOR VEHICLES LICENSED IN 1995 OR LATER*	
CARBON MONOXIDE	*7% IN VOLUME AT A SPEED OF 600-900 ROTATIONS PER MINUTE*	*CARBON MONOXIDE*	*4 5% IN VOLUME AT A SPEED OF 600-900 ROTATIONS PER MINUTE*
UNBURNED HYDROCARBONS	*1000 PARTS PER MILLION AT A SPEED OF 600-900 ROTATIONS PER MINUTE*	*UNBURNED HYDROCARBONS*	*900 PARTS PER MILLION AT A SPEED OF 600 900 ROTATIONS PER MINUTE*
SMOKE	*65% DEGREE OF DARKNESS OR THE EQUIVALENT IN OTHER UNITS AT MINIMUM ACCELERATION*	*SMOKE*	*50 % DEGREE OF DARKNESS OR THE EQUIVALENT IN OTHER UNITS AT MINIMUM ACCELERATION*

ANY PERSON WHO VIOLATES THE ABOVE PROVISIONS SHALL BE SUBJECT TO A FINE OF LE?00-300 ADDITIONALLY THE COURT MAY ORDER A SUSPENSION OF THE LICENSE FOR A PERIOD OF NOT LESS THAN ONE WEEK AND NO MORE THAN SIX MONTHS AND IN CASE OF RECIDIVISM THE COURT MAY ORDER THE LICENSE TO BE REVOKED

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5 AIR POLLUTANT EMISSIONS IN THE WORKPLACE The Licensee take take all necessary precautions to prevent the leakage or emission of air pollutants inside the work premises except within the permissible limits as defined by in Annex Number 8 of Decree Number 338 of 1995 (attached) whether they result from the nature of the establishment s performance of its activities or from malfunctioning equipment The Licensee must also provide the necessary protective measures for workers in accordance with the conditions of occupational health and safety including the appropriate choice of machinery equipment material and fuel taking into account the period of exposure to these pollutants Adequate ventilation must also be ensured and chimneys and other methods of air purification installed The provision of adequate ventilation inside work premises shall be accomplished in two ways

a) General ventilation General ventilation is a suitable method for the treatment of solvent fumes of low toxicity It is not suitable for highly toxic substances nor for pollutants that are irregularly emitted or in large quantities It is generally not suitable for dealing with dust and fumes General ventilation systems shall be designed after identifying the volumes of evaporated substances and computing the required volumes of air that need to be moved to cause a change of air that is sufficient to maintain concentrations of pollutants below the maximum permissible limits The technical engineering aspects shall be taken into consideratoin when establishing the ventilation system Specialized engineers shall supervise the execution of the system and shall use the recommendations set forth in the following reference American Conference of Governmental Industrial Hygienists Committee on Ventilation Industrial Ventilation *A Manual of Recommended Practice* 13th editino A C G I H Lansing Michigan 1974

b) Local ventilation Local ventilation consisting of a hood pipes and air purification device is more effective in controlling different types of pollutants Regardless of design the speed of air at the pollution source should be sufficient to remove the pollutant before it is dispersed to the workplace Technical and engineering aspects should be taken into consideration in designing the local ventilation system and implementation by specialized engineers making use of the above-mentioned reference for general ventilation

Whenever general and local ventilation systems are used maintenance should be supervised periodically by specialized engineers and efficiency measurements should be carried out during periodic maintenance

VIOLATIONS OF ANY OF THESE PROVISIONS SHALL BE SUBJECT TO A FINE OF LE1 000-20 000 IN THE CASE OF RECIDIVISM THE PENALTY SHALL BE IMPRISONMENT AND A FINE AS CITED ABOVE

TEMPERATURE AND HUMIDITY IN THE WORKPLACE The Licensee shall take all necessary measures to keep the temperature and humidity in the workplace within the maximum permissible limits specified in Annex 9 of Decree Number 338 of 1995 In cases where it is necessary to work beyond these limits the Licensee shall secure the appropriate protective measures for the workers by special clothing or other means Closed and semi-closed places within the establishment must have adequate ventilation relative to their size and capacity as well as the type of activity performed there to ensure circulation and purity of the air at a suitable temperature The following table indicates the quantities of air necessary for ventilating public places

TYPE OF PLACE OR ACTIVITY	*QUANITITY OF EXTERNAL AIR (without the use of air conditioners) (m³ per minute per person)*
ACES WITH HIGH CEILINGS BANKS LECTURE HALLS PLACES OF WORSHIP LARGE BLIC PLACES THEATERS NON SMOKING ROOMS	140-280
APARTMENTS HAIRDRESSERS BEAUTY PARLORS HOTEL ROOMS ROOMS WITH LIMITED SMOKING	280-420
FETERIAS SMALL RESTAURANTS PUBLIC WORK PREMISES HOSPITAL ROOMS RESTAURANTS ROOMS WIITH MEDIUM LEVELS OF SMOKING	420 560
VATE WORK PREMISES OFFICES CLINICS ROOMS WITH HIGH LEVELS OF SMOKING	560 850
GHT CLUBS OR CROWDED ROOMS WITH HIGH LEVELS OF SMOKING	850 1700

UITABLE SPACE FOR EACH PERSON SHALL NOT BE LESS THAN 4 25m³
UITABLE FLOOR AREA FOR EACH PERSON SHALL NOT BE LESS THAN 1 4m²
LATIONS OF ANY OF THESE PROVISIONS SHALL BE SUBJECT TO A FINE OF LE1 000-20 000 IN THE CASE OF RECIDIVISM THE PENALTY SHALL BE IMPRISONMENT AND A FINE AS CITED ABOVE

SMOKING IN THE WORKPLACE The Licensee shall take adequate measures to prevent smoking in closed places except within specially-designated zones A special zone must be reserved for smokers in such a way not to affect the air in other areas Smoking in places other than these special zones shall be considered an administrative infringement for which violators shall be liable to disciplinary action as applicable in given establishments

THE DIRECTOR IN CHARGE OF THE LICENSED ESTABLISHMENT SHALL BE SUBJECT TO A FINE OF LE1 000-20 000 IF THIS PROVISION IS VIOLATED IN THE CASE OF RECIDIVISM THE PENALTY SHALL BE IMPRISONMENT AND A FINE AS CITED ABOVE

SE OF PESTICIDES The Licensee is prohibited from spraying or using pesticides or any other chemical compound for agriculture public health or other purposes unless it is done according to the conditions regulations and safety measures specified by the Ministry of Agriculture Ministry of Health and EEAA as follows

a) It is mandatory to notify health units as well as vetennary units of the types of sprays and antidotes before spraying
b) Necessary first aid supplies shall be provided
c) Protective clothing and materials shall be provided for laborers carrying out the spraying
d) Citizens shall be warned about being in sprayed areas
e) Spraying shall be carried out by laborers trained for this type of work
f) Special consideration shall be given to refrain from spraying by airplane except in cases of extreme necessity as determined by the Minister of Agriculture

ANY PERSON WHO VIOLATES THESE CONDITIONS IS SUBJECT TO A FINE OF LE200-20 000 IN THE CASE OF RECIDIVISM THE PENALTY SHALL BE IMPRISONMENT AND A FINE AS CITED ABOVE

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9 BURNING OF GARBAGE Dumping treating or burning of garbage and non hazardous solid waste is prohibited (with the exception of infectious waste generated by medical care in clinics hospitals and health centers) except in places specially designated for this purpose by the municipal authority Specially-designated places shall be located far from residential industrial and agricultural areas and waterways in accordance with the specifications norms and at the minimum allowable distances from these areas as follows

a) Burning of waste shall take place in special incinerators having the following specifications
   i) they shall be located opposite to the direction of wind prevailing in residential communities
   ii) they shall be at least 1500 meters from the nearest residential area
   iii) the capacity of the incinerator or incinerators shall be sufficient to burn the garbage transported thereto within 24 hours
   iv) incinerator sites shall be in places with adequate space for receiving the amounts of garbage expected from the nature of activities
   v) they shall have a water source available for emergency situations and other uses
   vi) they shall have the necessary equipment for storing overturning and disposing ashes by burying them so they shall not be dispersed into the air or leak into subterranean water

b) Infectious wastes from medical clinics and health centers shall be burned on site in incinerators specially designed for this purpose and capable of handling the generated quantities without storing them near the incinerator If necessary and with the approval of the local competent authority as well as the EEAA the waste of these units may be transported to the nearest hospital that is provided with an incinerators or incinerators provided they can handle additional waste This waste shall be transported in sealed containers that prevent the dispersal of their contents into the air provided that these containers shall be burned together with their contents of waste

c) In all cases incinerators shall be technically adequate to prevent ashes or their emissions from dispersing except within the permissible limits as prescribed under paragraphs 2 and 3 above

VIOLATIONS OF ANY OF THESE PROVISIONS SHALL BE SUBJECT TO A FINE OF LE1 000-20 000 IN THE CASE OF RECIDIVISM THE PENALTY SHALL BE IMPRISONMENT AND A FINE AS CITED ABOVE

10 GARBAGE STORAGE All garbage containers and vehicles used at or by the licensed establishment shall be kept clean at all times Garbage collecting bins shall be covered tightly so that no offensive odors shall be emitted from them and to avoid attracting flies or similar insects or for attracting stray animals Their garbage contents shall also be collected and transported at suitable intervals according to the conditions of the establishment It is mandatory that the quantity of garbage shall not exceed the storage capacity of these bins at any time The competent local authority shall control the implementation of these provisions and may inspect the establishment for compliance

11 STORAGE TRANSPORT AND DISPOSAL OF OTHER NON HAZARDOUS SOLID WASTE All bodies and individuals on or from the Licensed establishment when carrying out exploration digging construction or demolition work or while transporting waste substances or soil shall take necessary precautions to store or transport this waste in a safe way to prevent it from being dispersed The authority granting permits for building or demolition shall indicate the following requirements on the permit

a) Stacking of waste on site shall be safely carried out so as not to form any impediment to traffic and pedestrian movement Waste liable to dispersal into the air shall be covered to avoid air pollution

b) Waste substances and soil resulting from digging demolishing and construction work shall be transported in special containers or receptacles by using trucks provided and licensed for this purpose and which fulfill the following conditions
   i) trucks shall be fitted with special containers or with tight covers to prevent the spreading of dust soil and waste substances into the air or their falling off on the road
   ii) trucks shall be provided with special loading and unloading equipment
   iii) trucks shall be in good condition conforming to regulations for safety efficiency and lighting and shall be equipped with comprehensive safety systems

Locations assigned to receive this transported waste shall be at a minimum distance of 1 5 kilometers from residential areas I and at a lower contour level Also they shall be leveled after complete filling with waste Local authorities shall determine the locations to which waste shall be transported It is prohibited for the Licensee to transport or dispose of its waste except in locations specially prepared for disposal and designated as such by the concerned local authorities *ANY PERSON WHO VIOLATES THE ABOVE PROVISIONS SHALL BE SUBJECT TO A FINE OF LE200-300 ADDITIONALLY THE COURT MAY ORDER A SUSPENSION OF THE LICENSE FOR A PERIOD OF NOT LESS THAN ONE WEEK AND NOT MORE THAN SIX MONTHS AND IN CASE OF RECIDIVISM THE COURT MAY ORDER THE LICENSE TO BE REVOKED*

12 RECORD OF TRANSFER OF NON HAZARDOUS SOLID WASTE The Licensee shall maintain a record of all removal and transfer of solid wastes from the establishment Such records shall be available for inspection and review by the Municipal Authority and/or EEAA

13 RADIOACTIVE SUBSTANCES Levels of radioactivity and the concentration of radioactive substances shall not exceed the permissible limits to be issued by decree by the Minister of Electricity and Power

SECTION V SPECIFIC CONDITIONS NOISE LIMITATIONS

The Licensee shall abide by the permissible limits of sound intensity while performing production service or other activities and particularly when using tools equipment horns or loudspeakers The current maximum permissible limits for the volume of sound inside the work premises and in closed public places are listed below These limits apply to the total volume of all sounds emanated from the licensed establishment during a given period of exposure

MAXIMUM PERMISSIBLE LIMITS OF SOUND INTENSITY INSIDE THE WORKPLACE

PLACE /ACTIVITY	*MAXIMUM ALLOWABLE LIMIT DECIBEL (A)*
WORK PREMISES WITH UP TO 8 HOUR SHIFTS WITH THE AIM OF LIMITING NOISE HAZARDS TO HEARING	90
PLACES OF WORK THAT REQUIRE HEARING SIGNALS AND GOOD AUDIBILITY OF SPEECH	80
PLACES OF WORK FOR THE FOLLOW UP MEASURING AND ADJUSTING OF OPERATIONS WITH HIGH PERFORMANCE	65
PLACES OF WORK WITH COMPUTERS OR TYPEWRITERS OR SIMILAR EQUIPMENT	70
PLACES OF WORK FOR ACTIVITIES THAT REQUIRE ROUTINE MENTAL CONCENTRATION	60

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MAXIMUM PERMISSIBLE LIMITS OF SOUND INTENSITY INSIDE FACTORIES AND WORKSHOPS

INTENSITY OF NOISE SHALL NOT EXCEED 90 DECIBELS (A) DURIN G A REGULAR 8 HOUR WORKSHIFT
IN CASES OF NOISE IN TENISTY HIGHER THAN 90 dB(A) THE PERIODS OF EXPOSURE SHALL BE REDUCED AS FOLLOWS

NOISE INTENSITY LEVEL dB(A)	*95*	*100*	*105*	*110*	*115*
PERIOD OF EXPOSURE (HOURS)	*4*	*2*	*1*	*½*	*1/4*

NOISE INTENSITY AT ANY ONE TIME DURING WORKING HOURS SHALL NOT EXCEED 135 dB(A)
IN CASES OF EXPOSURE TO PERIODS OF NOISE DURING A SHIFT THE TOTAL OF

$$\left(\frac{A1}{B1} + \frac{A2}{B2} + \right)$$

SHALL NOT EXCEED THE NUMBER ONE WHERE A IS THE PERIOD OF EXPOSURE TO A LEVEL OF NOISE PER HOUR AND B IS THE PERMISSIBLE PERIOD OF EXPOSURE AT THAT SPECIFIC NOISE LEVEL PER HOUR

- IN CASES OF INTERMITTENT NOISE COMING FROM HEAVY HAMMERS THE EXPOSURE PERIOD (NUMBER OF KNOCKS DURING THE 8 HOUR SHIFT) PERMITTED DEPENDS ON THE NOISE INTENSITY ACCORDING TO THE FOLLOWING TABLE

NOISE INTENSITY (dB(A))	*NUMBER OF PERMISSIBLE KNOCKS DURING DAILY WORKING HOURS*
135	*300*
130	*1000*
125	*3000*
120	*10000*
115	*30000*

NOISE COMING FROM HEAVY HAMMERS SHALL BE CONSIDERED INTERMITTENT IF THE PERIOD BETWEEN KNOCKS IS ONE SECOND OR MORE IF THE PERIOD IS LESS THAN ONE SECOND THE NOISE SHALL BE CONSIDERED CONTINUOUS IN WHICH CASE THE PREVIOUS FOUR CONDITIONS SHALL APPLY

ANY PERSON WHO VIOLATES THESE CONDITIONS IS SUBJECT TO A FINE OF LE100-500 AND THE MACHINES AND EQUIPMENT IN VIOLATION SHALL BE CONFISCATED

SECTION VI SPECIFIC CONDITIONS PROTECTION OF THE WATER ENVIRONMENT FROM POLLUTION

The Licensed establishment is prohibited from discharging wastewater or waste liquids to the land or water unless the Licensee has secured the required license or approval from the competent administrative authonty The required licenses and approvals for the disposal of liquid wastes are as follows

LICENSE FOR DISCHARGE OF WASTEWATER TO THE RIVER NILE AND IRRIGATION CANALS MINISTRY OF PUBLIC WORKS AND WATER RESOURCES
LICENSE FOR DISCHARGE OF WASTEWATER INTO GROUNDWATER RESERVOIRS MINISTRY OF PUBLIC WORKS AND WATER RESOURCES
APPROVAL FOR CONNECTING TO THE PUBLIC SEWER NETWORK COMPETENT LOCAL AUTHORITY
LICENSE FOR DRAINAGE OF INDUSTRIAL WASTEWATER INTO THE PUBLIC SEWER NETWORK COMPETENT LOCAL AUTHORITY
LICENSE FOR DRAINAGE OF LIQUID WASTES BY SURFACE METHOD COMPETENT LOCAL AUTHORITY

If issued these licenses and approvals should be attached to this Consolidated Environmental License and kept on file at the Licensee s head office and at the licensed establishment (if different from head office) at all times *DISPOSING OF LIQUID WASTES WITHOUT THE REQUIRED LICENSES OR APPROVALS SHALL BE SUBJECT TO THE PENALTIES SPECIFIED THEREIN*

SECTION VII SPECIFIC CONDITIONS HANDLING OF HAZARDOUS SUBSTANCES AND WASTES

1 **ADDITIONAL LICENSE REQUIREMENTS** The handling of hazardous industrial substances and wastes at the Licensed establishment is prohibited unless a Hazardous Substances and Wastes Handling License has been issued to the Licensee by the Ministry of Industry If issued the Hazardous Substances and Wastes Handling License should be attached to this Consolidated Environmental License and kept on file at the Licensee s head office and at the licensed establishment (if different from head office) at all times The Licensee shall at all times conform to the conditions set forth in its License to Handle Hazardous Substances and Wastes *IF THE LICENSEE IS FOUND TO BE USING STORING TREATING DISPOSING OR OTHERWISE HANDLING HAZARDOUS SUBSTANCES OR WASTES WITHOUT THE REQUIRED LICENSE FROM THE MINIISTRY OF INDUSTRY THE LICENSEE WILL BE SUBJECT TO A PENALTY OF DETENTION FOR A PERIOD OF NOT LESS THAN ONE YEAR OR A FINE OF LE10 000-20 000 OR BOTH*

WASTE MINIMIZATION The Licensee shall take all procedures to guarantee the minimum possible generation of hazardous wastes through the following

a) Installing clean technology and substitution of process inputs that produce non hazardous wastes where practicable
b) Developing suitable management systems and precautionary measures to limit the risk of accidental spill or leakage to the environment and
c) Employ reuse and recycling of hazardous wastes including exploring opportunities through the 10th of Ramadan Waste Exchange

SECTION VIII SPECIFIC CONDITIONS OTHER

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EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)	**NOTICE OF RENEWAL/EXPIRATION**

ISSUED TO (Name and Mailing Address of Licensee)	**CONSOLIDATED ENVIRONMENTAL LICENSE NUMBER**
Telephone Number	
Fax Number	**(Check which applies, insert date)** **DATE OF RENEWAL** □ _____ **date** **DATE OF EXPIRATION** □ _____ **date**

THIS IS TO OFFICIALLY NOTIFY YOU THAT YOUR ***CONSOLIDATED ENVIRONMENTAL LICENSE,*** *NUMBER* _____ *WILL* ***OFFICIALLY EXPIRE/REQUIRE RENEWAL*** *(CIRCLE WHICH APPLIES)* ***ON*** _____

YOU ARE HEREBY REQUESTED TO SUBMIT ***AT LEAST NINETY (90) DAYS PRIOR TO THE DATE OF EXPIRATION*** *CITED ABOVE* ***YOUR LETTER REQUEST FOR LICENSE RENEWAL*** *TO THE EEAA OFFICIAL WHO S SIGNATURE APPEARS AT THE BOTTOM OF THIS PAGE YOUR RENEWAL REQUEST SHOULD BE SUBMITTED WITH AN* ***UPDATED COPY OF THE UNIFORM REGISTER OF ENVIRONMENTAL IMPACTS*** *FOR THE LICENSED ESTABLISHMENT ADDITIONALLY YOU MUST ATTACH THE* ***CERTIFIED RESULTS OF ANALYSIS, BY A MINISTRY OF HEALTH-APPROVED LABORATORY, OF A REPRESENTATIVE WASTEWATER SAMPLE*** *FROM THE LICENSED ESTABLISHMENT*

REQUESTS FOR LICENSE RENEWAL WHICH DO NOT CONTAIN THE DOCUMENTS CITED ABOVE WILL BE RETURNED TO THE APPLICANT WITHOUT CONSIDERATION

THE ***FEE FOR LICENSE RENEWAL*** *IS LE_____ PLEASE SUBMIT PAYMENT OF THE RENEWAL FEE AND ANY OUTSTANDING FEES OR PAYMENTS TO EEAA ALONG WITH YOUR REQUEST FOR RENEWAL*

PLEASE TAKE CARE TO SUBMIT YOUR REQUEST FOR RENEWAL IN A TIMELY MANNER NOTE THAT ***SEVERE PENALTIES MAY APPLY TO ESTABLISHMENTS OPERATING WITHOUT THE NECESSARY ENVIRONMENTAL LICENSES AN EXPIRED LICENSE IS CONSIDERED INVALID***

ISSUED BY

Signature of Officer-in-Charge	Name and Title (print or type)	Telephone Number	Fax Number

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Appendix 3
Data Management System

Introduction

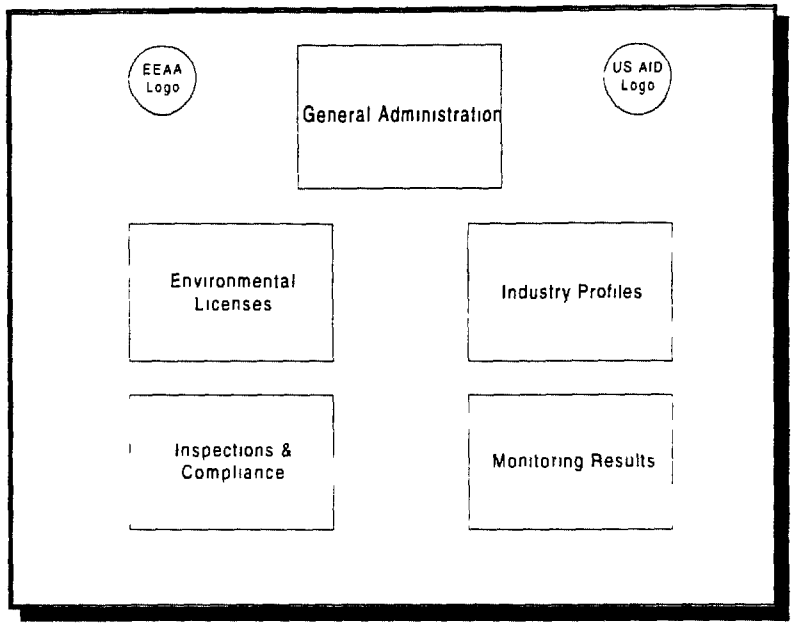
This document outlines the hardware software training necessary for implementing the 10th of Ramadan Data Management System In creating a Data Management System or DMS the cultural and institutional context largely determine the details of the secondary and tertiary decisions Design hierarchy for the implementation followed three stages The primary considerations include a functional needs analysis of the Municipality gaining the commitment of the senior administration defining the functions to be automated and setting priorities for automation Secondary decisions include defining the types of systems their numbers and the schedule for implementation Tertiary factors include detailed system configurations vendor selection data base structures and relationships The DMS is designed to evolve with the needs of the Municipality

The guiding principles for the DMS are Sustainability Replicability of the DMS in other Municipalities and Compatibility with local national and pan national organizations and systems The stated goal is to implement a DMS empowering the administration to better manage sustainable growth within the 10th of Ramadan Municipality

Custom Software Modules

Custom software is required to meet the needs of the municipality The Modules are natural extensions of the existing and planned institutional framework at 10th of Ramadan Ranking criteria for specific functions within the municipality include availability of data evolving legal requirements and the perceived need for change Previous missions have identified a variety of Data Sources and these are summarized in the archive of trip reports The proposed core functionality of the DMS is summarized by the diagram below An overview of custom modules for the municipal administration follows

DMS Welcome Screen



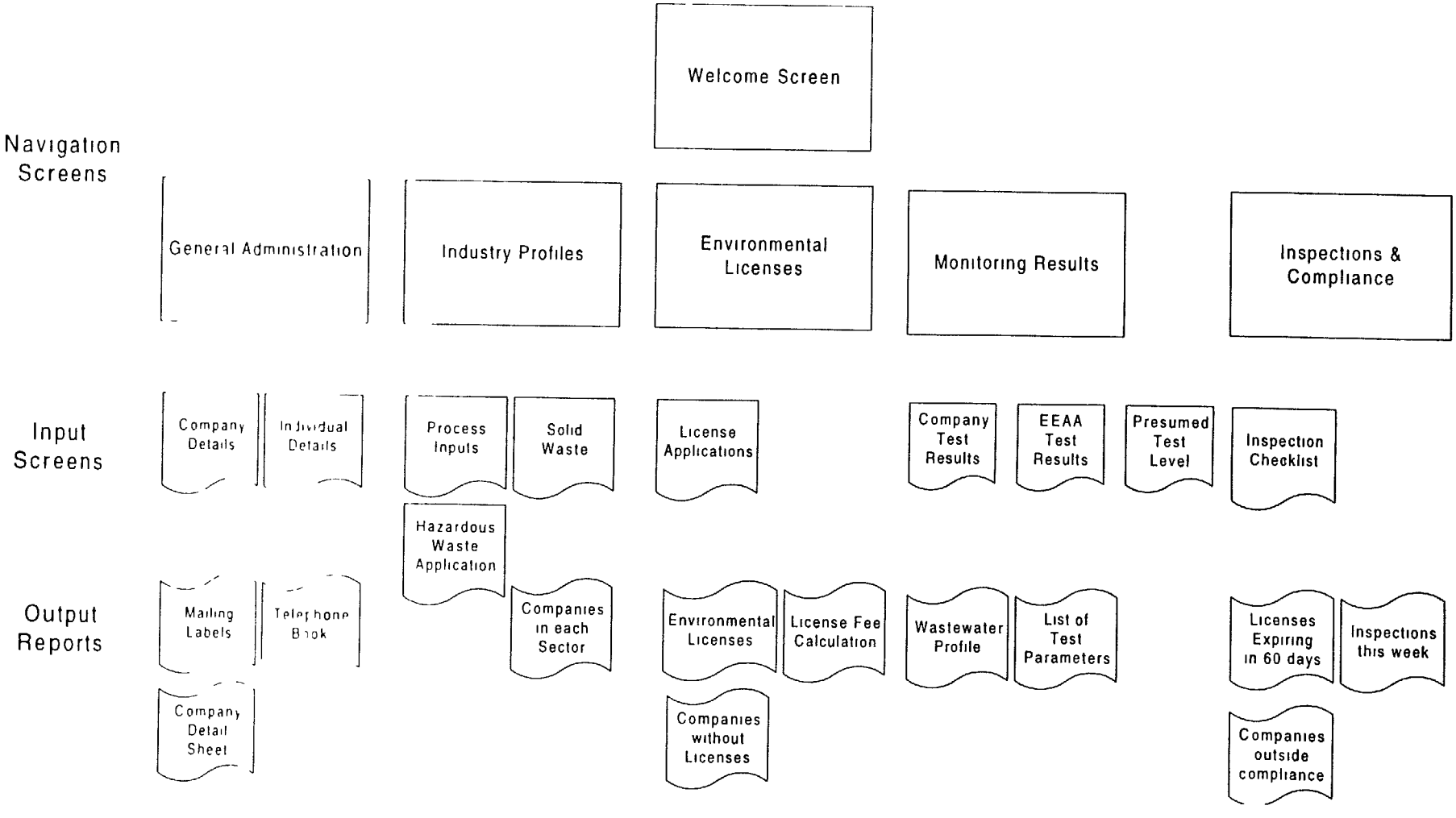
General Administration Module

The General Administration Module manages company contact information This module holds a relational key for tying data from the other modules together Input forms include Company Detail and Individual Detail screens Outputs include a Telephone Book of companies Mailing Labels and Company Detail Sheets

Industry Profile Module

The Industry Profile Module holds more detailed information about facilities identifying products and processes The Industry Profile Module lists raw materials used in production processes and utilities excluding the municipal water supply Process outputs are included if they are byproducts including solid waste generation Data entry screens for process materials and energy are complemented by reports on material quantities held and sector summaries

DMS Overview



Environmental License Module

The Environmental License Module stores information provided by companies applying for Environmental Licenses On screen data entry forms correlate directly with paper forms submitted by applicants, simplifying the process of data entry Environmental Licenses are generated and discharge fees can be calculated from either presumed values or actual measured values Management reports of Companies Without Licenses are viewed on screen or printed License Fees are calculated based on formulae in Market Based Incentives As the Environmental License program matures notices of license expiration can easily be generated

Environmental Testing Module

The Environmental Testing Module stores information on the type location and results of measurements tests and samples on physical and chemical parameters, measurements and analyses Both EEAA measurements and company reported measurements are stored in a single data file

A record for each company is created as companies are added to the General Administration Module with Presumed values of wastewater contaminant levels taken as system default values

Inputs Screens for Wastewater Air and Water analyses with the ability to separately track samples tests and analytes Reports are easily linked to a spreadsheet for graphical displays of measurements over time

Future expansion to spatial mapping in GIS software is anticipated through geo-coding fields in the open architecture of the Access Database Information can be accessed either spatially or by facility in both tabular and graphical formats

Environmental Inspection Module

The Environmental Inspection Module stores and displays information gathered during compliance audits Input fields are required by Law 4 Outputs are Compliance Summaries and Inspection Schedules Discharge licenses and citations are generated

Business License Module (Optional)

The Business License Module stores information submitted by companies seeking new or renewed business licenses Business Licenses, monthly summary reports of licenses pending issued and expired may be generated on demand

Ambient Measurements Module (Optional)

The Ambient Emissions Module tracks sample and test data from on-site and laboratory testing The Ambient Emissions Module serves as a baseline and is currently performed under the Municipal Health Department's mandate Periodically data are centrally collected and forwarded to the pan-national WHO monitoring program

Water Use and Billing Module (Optional)

The Water Use and Billing Module has input screens for entering periodic water consumption data Outputs include water use history by facility by industry sector and with hot-links to the GIS system maps of water use patterns Water consumption reports and bills may be generated Future integration with the tax collection department is foreseeable

Off-the-Shelf Software Overview

Operating System

Windows 95 (Arabic/English version) is the operating system of choice and offers the following features

- Universal software compatibility
- Stability
- Multiple language support
- Built in networking
- A large base of applications software
- Extensive hardware compatibility

Access Control, Security and Networking

The initial implementation of the DMS is envisioned to begin with a single operator and one PC in the office of the Environmental Department A stand alone system does not require a network The most straightforward method of securing data on a single workstation is through encryption and password level access both supported on the Windows 95 platform

General Management Tools

The Microsoft Office 97 Professional edition provides municipal users with basic word processing and number crunching capability Newsletter production may require desktop publishing software and possibly high resolution or color printing

Information Visualization Tools and Mapping Software

CAD and GIS are used for infrastructure mapping for the Water Supply Wastewater collection and Road Networks Land Use Analysis is performed with vector and raster imaging systems for creating displaying and editing spatially distributed data Inputs are existing electronic data files scanned or digitized maps satellite and aerial overlays Outputs include Land Use Plans water distribution and wastewater collection system maps

Environmental and Planning Departments need to see the spatial distribution of pollution data Portable Global Positioning System units with built in data loggers allow samples and measurements to be located spatially and temporally

A variety of mapping software is available in Egypt with local training and support for these advanced applications a significant consideration in selecting the final suite of application software

Off The Shelf Software Specifications

Operating System	English and Arabic Windows 95
	Windows NT Server for Secure Networking
	(NT is not required for the initial implementation)

General Software	System Maintenance Utilities Microsoft Office '97 - Professional Edition for word processing, data entry screens, graphics production and simple summary reporting Desktop publishing software for newsletter creation may also be considered	
Custom Software based linked	The Custom data management modules are Access database files	
Mapping and Analysis tools	AutoCAD Rel 14 or equivalent GIS Mapping with relational database link	$ 2 495 00

Hardware Overview

Two hardware configurations are outlined below Data entry is less demanding of hardware resources and carries a lower price point Analysis visualization and planning require Pentium class workstations running dual English and Arabic Windows 95 or Windows NT operating systems

Data Entry Station

The final number of data entry stations will be determined by the organizational structure and the municipalities work load These basic systems are adequate for data entry maintenance and reporting

Pentium 100 MHZ CPU or better 16 MB RAM 1 GB Hard Drive 3 5 Floppy disc drive CD ROM Drive Sound Card & Speakers PCI Graphics card with 2 MB RAM 14 Monitor 10 MB/s Network Card (not required for initial implementation)

Data Analysis Station & Network Server

Data Analysis Stations are more powerful and are designed to process the larger amounts of graphical data encountered in CAD and GIS applications This configuration anticipates future use as a Windows NT Network Server

Pentium 200 MHZ CPU (or better) 64 MB RAM 2 GB Hard Drive 3 5 Floppy disc drive 2 GB Tape Backup CD ROM Drive Sound Card & Speakers

33 6 k Modem PCI Graphics card with 2 MB RAM, 21" Monitor, 10 MB/s Network Card (not required for initial implementation)

Printers and Plotters

Departmental needs for hardcopy drive the number and type of printers and plotters required In general, each workgroup or department needs at least one local printer

Custom Software Data Structures

A General Administration Module

Kompass Code
Parent Company Kompass Code
Land Register Number
Company Registration Number
Plant Name (Arabic)
Plant Name (Latin)
Plant District
Plant Address (Arabic)
Plant Address (Latin)
Plant Postal Code
Contact 1 First Name (Arabic)
Contact 1 Last Name (Arabic)
Contact 1 Title (Arabic)
Contact 1 First Name (Latin)
Contact 1 Last Name (Latin)
Contact 1 Title (Latin)
Contact 1 Phone
Contact 1 email
Contact 2 First Name (Arabic)
Contact 2 Last Name (Arabic)
Contact 2 Title (Arabic)
Contact 2 First Name (Latin)
Contact 2 Last Name (Latin)
Contact 2 Title (Latin)
Contact 2 Phone
Contact 2 email
Plant Latitude
Plant Longitude
Plant Fax
Last Updated
Data Source

B Industry Profile Module

Company Information

Kompass Code
SIC Code
Additional sector classification code(s)
Kompass Sector Code
Type of Industry
Number of Full Time Employees
Number of Part time employees
P2 Audit (Y/N)
Date of P2 Audit
Age of Factory
Age of Equipment
Date Factory Established
Legal Status
Last Updated
Data Source

Production

Kompass Code
Product Name 1 2 3 4
Annual Production (units) 1 2 3 4
Marketable Waste 1 2 3 4
Marketable Waste Volume 1 2 3 4
Major Activities / processes 1 2 3 4
Exports to Europe (Y/N)
Exports to the United States (Y/N)
Operation Periods
Working hours per day
Shifts per day
Working days / year
Employment
Last Updated
Data Source

Utility Inputs
Kompass Code
Date of Reading
Electricity Consumption (kWHrs/month)
Natural Gas Consumption (m3/month)
Fuel Oil No 2 (l/month)
Fuel Oil No 6 (l/month)
Steam (lbs / month)
Others (consumption/month)
Last Updated

Raw Materials
(excluding Water use)
Kompass Code
Material 1 2 3 4
Unit Price 1 2 3 4
Monthly Quantity 1 2 3 4
Units
Recycled Materials
Municipal Meter Number
Municipal Reading End Date
Municipal Bimonthly Consumption (m^3)
Well Water (Y/N)
Well diameter (mm)
Estimated monthly well water consumption

C Environmental License Module

Kompass Code
Date Application Submitted
Date Issued
Expiration Date (calculated)
License Fee (calculated) (L.E.)
Point Source 1 2 3 4 (text description)
(ADDITIONAL FIELDS FROM LICENSE APPLICATION FORM)

Solid Waste Generation
Kompass Code
Solid Waste Source 1 2 3 4
Average Daily Volume 1 2 3 4
Date
Notes
Kompass Code
Matrix (Air Soil or Water)
Date of measurement
Time of Measurement
Type of measurement
CAS Number
Measurement Value
Units
Data Source

D Environmental Testing Module

Wastewater Samples
Kompass Code
Sample Location (text)
Sampled by (EEAA or Company)
Name of Sample Taker 1
Name of Sample Taker 2
Date Sampled
Time Sampled
CAS Number
Value
Units
Notes
Data Source

Analytical Parameters
CAS Number
Analyte Name (Arabic)
Analyte Name (Latin)
Preferred Reporting Units
Legal Limit of Contaminant Level

E Environmental Inspection Module

Kompass Code
Date Inspected
Inspector Name 1
Inspector Name 2
Text
Point Source 1,2,3,4 (text description)
(ADDITIONAL FIELDS FROM INSPECTION FORM)

F Business License Module (Optional)

(FIELDS FROM INSPECTION FORM)

G Ambient Measurements Module (Optional)

Per WHO format

H Water Use and Billing Module (Optional)

Kompass Code
Municipal Meter Number
Municipal Reading End Date
Municipal Bimonthly Consumption (m^3)
Well Water (Y/N)
Well diameter (mm)
Estimated monthly well water consumption

IX Example Data Entry Forms

Company Details Form
Company Profile Form
Utility Inputs Form
Raw Materials Used
Water Use Form
Wastewater Generation Form
Solid Waste Generation Form
Hazardous Waste Generation Form
Environmental License Application Form
Environmental License Form
Environmental License Fee Notification Letter

Environmental Compliance Inspection Form
Company Wastewater Test Report
EEAA Wastewater Test Report

Notification of License Expiry
Business License Form

Municipal Water Bill

Appendix 4
Multi-Media Inspection and Monitoring Checklist and Environmental Sampling and Analysis

Before going to the facility, compare the conditions contained in the Consolidated Environmental License with the items below Only fill-out applicable media-specific sections (and items) found in the License conditions

Air Emissions

1 Does the facility maintain an emissions record? If YES, does it include all the pollutants identified in the Environmental License?

2 Does the facility conduct routine emissions monitoring? If YES describe, giving monitoring frequency and substances monitored

3 Does the facility use technical references to estimate its emissions? If YES describe the methodology and technical references used for each pollutant loading

4 Do the records show any contravention with the emission standards established in Decree 338? If YES have the corrective measures been undertaken?

5 Verify the data in the emissions record by direct measurement of concentrations of air pollutants relevant to the type of industrial activity concerned

Pollutant	Concentration (mg/m^3 in flue gas)		
	stack 1	stack 2	etc
Total Particulates			
Aldehydes (measured as formaldehyde)			
Antimony			
Carbon Monoxide			
Sulfur Dioxide			
Sulfur Trioxide			
Nitric Acid			
Hydrogen Chloride			
Hydrogen Fluoride			
Lead			
Mercury			
Arsenic			
Silicon Fluoride			
Fluorine			
Tar			
Cadmium			
Hydrogen Sulfide			
Chlorine			
Carbon			
Volatile Organic Compounds			
Copper			
Nickel			
Nitrogen Oxides			

6 Does the facility submit its emissions record to the Municipal Authority at least once a year?

7 Does the facility operate any combustion processes? If YES, supply the following information for each
   a) Process designation_____
   b) Fuel burned_____
   c) Sulfur content of fuels burned_____

8 What air pollution abatement equipment is used at the facility? Does the facility maintain operation/repair records for each installation? For each installation, describe
   a) Designation (which substances is it designed to abate?)_____
   b) Installation date_____
   c) Treatment efficiency_____

9 Has the facility made any recent modifications to air emissions sources? If YES, describe

Wastewater Discharges

1 Identify all points of wastewater discharge at the facility (into public sewage, groundwater, evaporation ponds, septic tanks draining ditches, etc)

2 Identify the makeup of each discharge stream (industrial process effluent boiler cooling water sanitary waste, etc)

3 Identify the treatment methods used for each discharge type

4 Summarize the information from items 1 through 3 in a chart

Facility Wastewater Flow Characterization Chart

Identify Wastewater Discharge	Identify Makeup Streams to Each Discharge	Identify Treatment Methods for Each Discharge

5 Does the facility measure its wastewater flow? What instruments does it use (water meters, wastewater flow meters, other)?

6 Does the facility take samples of its wastewater discharges? If YES, for each type of discharges fill in a form describing sample collection practices used at the facility

Facility Sample Collection Chart

Type of Discharge

Parameter Analyzed	Type of Sample (grab or comp)	Frequency of Collection (times per week)	Time and Days when Collected

7 Describe the maintenance and calibration program for field instruments used for wastewater discharge monitoring (e g pH meters temperature apparatus sample collection apparatus)

8 List outside laboratories used to perform permit analysis (if applicable) Which parameters do they analyze?

9 Does the facility maintain a record of its wastewater discharges? Does it submit the record to the Municipal Authority at least once a year?

10 If the facility discharges wastewater into the public sewage system does it have a valid permit from the Municipal Authority to do so?

11 Does the facility pre treat the effluents before they are discharged into the sewer?

12 Has the facility received any violation notices or fines from the Municipal Authority since the last inspection? If YES, describe

13 If the facility discharges wastewater using the surface draining method, does it have a valid permit from the local Health Authority to do so?

14 Does the facility have a groundwater monitoring program? If YES
   a) Has groundwater contamination been detected at the facility?
   b) What parameters are measured and how frequently are groundwater measurements obtained?
   c) Who performed the analysis?

15 Verify the data in the wastewater discharge record by taking a wastewater sample at the point(s) of discharge for pollutants relevant to the type of industrial activity concerned

Parameter	**Concentration (mg/l, unless otherwise noted)**
Temperature, degrees C	
pH, value from 1 to 14	
Total dissolved solids	
Total suspended solids	
BOD	
COD	
Sulfides	
Cyanides	
Phosphates	
Nitrates	
Fluorides	
Phenol	
Ammonia	
Free chlorine	
Sulfates	
Formaldehyde	
Lubricants oils and resins	
Heavy metals (total)	
Total silver and mercury	

16 List permit exceedances, bypasses or overflows since the last inspection

Date	Type of Incident	To Whom Reported Agency? Corporate?

Hazardous Waste

1 Does the facility have a license to handle hazardous wastes?

2 What hazardous waste categories does the facility handle? What are their annual generation volumes? Are all of them reported in the license application?

Waste	Labeling Classification	Annual Volume	Reported in License Application?

3 Does the facility receive hazardous waste from a foreign and other off-site source? If YES, list wastes and sources

4 Does the facility maintain a Uniform Hazardous Substances and Waste Register on-site?

5 Does the facility submit hazardous waste reports to the EEAA Regional Environmental Office (copy to the Municipal Authority) summarizing generation volumes off-site shipments and/or on-site treatment storage or disposal of hazardous waste? How often?

6 What sampling and test methods does the facility use to test its waste for toxic characteristics? List methods

7 List wastes shipped off-site for treatment or disposal (all chemical waste and contaminated material whether regulated or not) on the attached page

8 Does the facility have treatment, storage, or disposal arrangements for each waste listed?

Name of Treatment/Storage/ Disposal Company	Type of Arrangements and Dates

9 Does the facility accumulate hazardous waste in drums or other containers?
If YES
- a) What types of containers are used (e g , drum portable tank)?
- b) Are wastes stored for on-site treatment?
- c) Are containers shipped off-site for treatment/disposal? If so, how long do they await shipment?
- d) Are containers dated when first used for waste?
- e) Are waste containers labeled? Who applies the labels? When?
- f) Are containers closed when waste is not being added?
- g) Are container areas inspected for leaking containers? How often? Are written records kept?

10 Does the facility store hazardous wastes in tanks?
If YES
- a) Complete the following table for each tank

		Tank 1	Tank 2	Tank 3
I)	Contents			
ii)	Waste stored for on-site treatment reuse, or recycle			
iii)	How often is tank completely emptied?			
iv)	Marked "Hazardous Waste ?			
v)	Waste feed cut-off or bypass system			
vi)	Open top			
vii)	Describe dike (i e , concrete, earthen, none)			
viii)	Is there a drainage control system?			
ix)	Is there a standby tank?	_____	_____	_____

- b) How often is the following tank-related equipment inspected?
  - I) Discharge control_____
    Waste feed cut-off_____
    Bypass systems_____
    Drainage systems_____
  - ii) Gauges for temperature_____ Pressure_
  - iii) Tank level_____
  - iv) Seams valves, pumps for corrosion_____

v) Dikes for erosion or leakage_____

c) Are written inspection records kept?

11 Does the facility treat its hazardous wastes on-site?
If YES,

a) Can the operator demonstrate that hazardous wastes being treated are completely degraded, transformed, or immobilized in the treatment zone?
b) What are the technologies used?
c) Is runoff from the treatment facility collected?
d) Is the runoff analyzed to see if it is a hazardous waste?
e) If the runoff is considered hazardous, how is it handled?

12 Are hazardous wastes disposed on-site in landfills surface impoundments waste piles, land treatment units, mines/caves concrete vaults, or bunkers?
If YES,

a) Specify which units and what wastes each unit has received

Unit	**Waste**	**Volume**
_____	_____	_____
_____	_____	_____

b) Does the facility test wastes to ensure that they do not exhibit any harmful characteristics at the point of disposal?

13 Does the facility have, at each hazardous waste area

a) Internal communications such as paging system?
b) Emergency alarm system accessible at the waste areas?
c) Portable fire control equipment?
d) Water supply sprinklers spray system?
e) Soda ash sand absorbent etc ?

14 How often are emergency alarms and communications systems tested?

15 Does the facility have a Contingency Plan for emergencies involving hazardous waste?
If YES

a) What is the date of last revision?
b) Who is the facility s emergency coordinator (name and title)?

16 Has the facility trained all employees involved with hazardous wastes? Are written training records kept?____ For how long?

17 Is the training program written?____ Is it a separate program for operators, supervisors, and emergency team members who are involved with hazardous waste?
_____ Or part of a general training program?

18 Has the facility experienced any hazardous waste emergencies since the last inspection?

19 Has the contingency plan been activated? If so, were countermeasures effective in controlling emergency? If they were not, has the contingency plan been amended?

20 Does the facility retain its documents (inspection records, registers, operating records, reports) for 10 years as required by law?

Solid Waste

1 How does the facility dispose of its non-hazardous solid waste? (Check all that apply)

City Pick-up____ Private Landfill_____
Private Hauler_____ On-Site Landfill_____
Company Truck_____ On-Site Incinerator_____
Municipal Landfill_____ Open Burning_____
Other (describe)_____

Environmental Sampling and Analysis

Collection of Samples

The objective of sampling is to collect a portion of material small enough to be transported conveniently and handled in the laboratory while still accurately representing the material being sampled This objective implies that the relative proportions or concentrations of all pertinent components will be the same in the sample as in the material being sampled and that the sample will be handled in such a way that no significant changes in composition occur before the tests are made It is essential that the sampler collecting the samples and the laboratory person analyzing the samples consult with each other before the event This helps ensure that samples and analytical methods that are selected and used will answer the questions that prompted the sampling Additionally, the sampler or should

handle samples in such a way that they do not deteriorate or become contaminated The sampler should sample carefully to insure that analytical results represent the actual sample composition

Type of Samples The types of samples that can be collected include grab and composite samples A grab or catch sample is a sample collected at a particular time and place It represents the composition of the source at that time and place However, when a source is known to be fairly consistent in composition over time or distances in all directions, then the sample may be said to represent a longer time period or larger volume or both In such circumstances, a pollutant source may be represented quite well by single grab samples Examples are some water supplies and some surface waters

Representative samples of some pollutant sources can be obtained only by making composites of samples collected over a period of time or at several different sampling points The term composite sample refers to a mixture of grab samples collected at the same sampling point at different times These types of samples are very useful for estimating average concentrations, particularly for industrial wastewater discharges with variable composition and pollutant load due to operating schedules

Sampling Protocol Sampling protocols are written descriptions of the detailed procedures to be followed in the collection, packaging, labeling preservation transportation, storage, and documentation of samples Sampling protocols should be developed and used by samplers when conducting sampling Sampling protocols should contain written instructions for all sampling activities including observations at the sample site, and field documentation of sampling techniques These protocols should always specify that sampling devices be decontaminated between successive samples to avoid cross contamination

Sample Containers The type of container used is very important in environmental sampling and analysis Samples should be collected in containers that are appropriate for the specific analysis such as borsilicate glass plastic or other inert materials One material may be preferred over the other For example trace levels of metals may sorb onto the walls of glass containers thus giving results that are lower than actual levels Also plastic containers should be avoided if a sample is to be analyzed for organic compounds

Sample containers must be thoroughly cleaned before use Mechanical cleaning (e g water and brushes) is usually carried out first followed by cleaning with chromic acid Chromic acid cannot be used to clean plastic containers Dilute hydrochloric acid is usually used to clean plastic containers

Sample Preservation Once collected, samples undergo inevitable chemical and biological changes In general, the shorter the time that elapses between collection of a sample and its analysis, the more reliable the analytical results will be When the interval between sample collection and analysis is long enough to produce changes in either the concentration or the physical state of the constituent being measured, preservation practices should be followed Preservation practices help retard the chemical and biological changes that occur after sample collection Preservation methods include pH control, chemical addition the use of amber and opaque bottles, refrigeration, and filtration Zero head-space (air-space) is important in preserving samples with volatile organic compounds, to avoid the loss of volatile materials, sample containers should be completely filled Preservation is especially important with all types of water samples (e g , wastewaters and natural waters) Certain types of analyses are more likely than others to be affected by sample storage before analysis For example aluminum cadmium, chromium, copper, iron lead manganese, silver, and zinc can be lost by adsorption on, or ion exchange with, the walls of glass containers Samples that are to be analyzed for these substances should have nitric acid added to them as a preservative Exhibit 4-1 below list examples of preservation methods and container requirements by constituent

Exhibit 4-1
Examples of Sampling Requirements

Analysis	Container	Minimum Sample Size ml	Preservation	Maximum Storage Recommended
BOD	P,G	1000	Refrigerate	6 hours
Carbon, organic, total	G	100	Analyze immediately, or refrigerate and add HCl to pH<2	7 days
Chemical Oxygen Demand (COD)	P G	100	Analyze as soon as possible or add H_2SO_4 to pH <2 refrigerate	7 days
Cyanide, total	P G	500	Add NaOh to pH>12, refrigerate in dark	24 hours if sulfide present
Hardness	P,G	100	Add HNO_3 to pH<2	6 months
Metals general	P(A) G(A)	-	For dissolved metals filter immediately, add HNO, to pH<2	6 months/6 months
Chromium VI	P(A), G(A)	300	Refrigerate	24 hours
Mercury	P(A) G(A)	500	Add HNO, to pH<2 4°C refrigerate	28 days
Nitrate	P G	100	Analyze as soon as possible or refrigerate	48 hours
Oil and grease	G,wide-mouth calibrated	1000	Add H_2SO_4 to pH<2, refrigerate	28 days
Organic compounds Pesticides	G(S) TFE-Lined cap	-	Refrigerate	7 days 40 d after extraction
Phenols	P G	500	Refrigerate add H_2SO_4 to PH<2	28 days
Oxygen dissolved (electrode)	G BOD bottle	300	Analyze immediately	0 5 hours
pH	P,G	-	Analyze immediately	Analyze immediately
Phosphate	G(A)	100	For dissolved phosphate filter immediately, refrigerate	48 hours
Solids	P G	-	Refrigerate	7 days
Sulfate	P G	100	Refrigerate	28 days

Analysis	Container	Minimum Sample Size ml	Preservation	Maximum Storage Recommended
Sulfide	P,G		Refrigerate add 4 drops zinc acetate/100 mL, add NaOH to pH>9	28 days
Turbidity	P,G	-	Analyze same day, store in dark up to 24 hours, refrigerate	24 hours

P=plastic (polyethylene or equivalent) G=glass G(A) or P(A)=rinsed with HNO3 G(B)=glass, borosilicate G(S)=glass, rinsed with organic solvents

Source *Standard Methods for the Examination of Waste and Wastewater,* 15th edition, American Public Health Association, 1992

Sample Labels Each sample container should be labeled to prevent misidentification Gummed paper labels or tags are generally adequate The label should indicate the number of the sample, the date and time it was collected the place it was collected, and the name of the sample collector Labels should be affixed to sample containers before or at the time of sampling The label should be filled out with waterproof ink at the time of collection

Field Log Book A record should be made of every sample collected Record all information pertinent to the field investigation or sampling in a bound log book It is desirable to record sufficient information so that the sampling could be reconstructed without reliance on the collector s memory The sampler should record sufficient information to provide positive sample identification at a later date, including the type of sample (e g air water soil waste) the number of the sample the date hour and exact location the name of the sample collector and any other data that may be needed for correlation (such as water temperature weather conditions water level stream flow post-sampling handling etc) Additional information to be recorded in the field log book includes the purpose of sampling the volume of sample collected field observations and measurements and the name and address of the contact person at facility The field log book should be protected and kept in a safe place

The sampler should further identify the location where the sample was collected by fixing the sampling point on a map of the facility

Laboratory Analysis Request Record The sampler should prepare a sheet that accompanies the samples to the laboratory This record should include the following information sample number date time and location of collection, sample type, and analysis to be performed on each sample

Sample Delivery To minimize the potential for volatilization or biodegradation between sampling and analysis, soil and water samples should be kept as cool as possible without freezing Samples can be packed in ice Samples should be delivered to the laboratory for analysis as soon as practical

When samples arrive at the laboratory, laboratory personnel should inspect them for breakage or other problems, assign them a laboratory number for analysis and log them into a laboratory log book The samples are then placed in an appropriate storage room or cabinet until analyzed Environmental samples are often kept in a refrigerated storage room at the laboratory to aid in sample preservation

Quality Control Samples Field quality control samples provide the basis from which sampling bias (usually contamination) can be estimated and sampling precision calculated These samples are handled exactly the same way as environmental samples This includes using identical sampling devices sampling protocols, storage containers, shipping procedures and preservation techniques Various types of field quality control samples are presented below

Trip Blank Blanks detect and measure extraneous material that may be introduced during sampling Trip blanks (or transport blanks) are test samples of analyte-free media They are taken from the laboratory to the sampling site and returned to the laboratory unopened They are used to measure cross-contamination from the container and preservative during transport field handling and storage

Field Blank A field blank is a sample of media similar to that of the sample but which is free of the analyte of interest A field blank is exposed to the sampling environment at the sampling site and measures accidental sample contaiminatin during the whole process (sampling transport sample preparation and analysis) Field blank water samples consist of triple distilled water that is carried to the sampling site and exposed to the air so that any contamination from the air can be measured and accounted for

Equipment Blank An equipment blank (or rinsate blank) is a sample of analyte-free media that has been used to rinse the sampling equipment Equipment blanks are collected after equipment decontamination and before sampling They document adequate decontamination of the sampling equipment after its use

Background Samples Background samples are samples of the same media being tested They are taken near the time and place of the sample of interest They measure the background presence of analytes of interest Background air samples would include upwind air samples, background soil samples would include soil collected in an area known to be free of contamination

Safety Considerations Because sample constituents can be toxic, samplers should take adequate precautions during sampling and sampling handling Toxic substances can enter through the skin, and, in the case of vapors through the lungs Inadvertent ingestion can occur via direct contact with foods Precautions may be limited to wearing gloves or may include coveralls or other protective apparel Eye protection should always be worn When toxic vapors might be present the sampler should sample only in well-ventilated areas or use a respirator In a laboratory samples should be opened in a fume hood Never have food near samples or sampling locations, always wash hands thoroughly before handling food

If flammable organic compounds may be present take precautions Prohibit smoking near samples, sampling locations, and in the laboratory Keep sparks flames and excessive heat sources away from samples and sampling locations When in doubt as to the level of safety precautions needed samplers should consult an appropriately trained industrial hygienist

Air Sampling

There are two major applications in monitoring air pollutants source or emissions testing and atmospheric or ambient air sampling Ambient air sampling is used in determining the nature and magnitude of air pollution in a community or region Source sampling (i e emissions testing) is the procedure where a representative sample is removed from a larger, contaminant-bearing gas stream confined in a duct or stack This sample is then subjected to further analysis, and the pollutant concentrations are related to the parent gas stream through mathematical calculations to determine total quantities This is done using emission factors

Both applications require that the sampling device chosen, its location duration of sampling and pollutant identification are appropriately defined before taking any measurements Further the sampling team must have an understanding of the process, nearby atmospheric conditions, topology, and pollution loading from other sources

Air sampling involves collecting a measured volume of air for chemical analysis This is done in tow ways (1) collecting the air form the site in a container, or (2) trapping the pollutants by passing a measured volume of air through a filter or adsorbent Air can be directly collected either in a Tedlar bag, glass bulbs, or metal canisters Canisters are best suited for air sampling Air can be collected using a pump or by initially evacuating the canister Adsorbent tubes are commonly used for sampling air for organic analysis Air is passed through the adsorbent by connecting the tube to a sampling pump Particulates such as dust are collected over membrane filters of appropriate pore size Filter cassettes are used for this process

Typically one of the first steps in source (emissions) sampling is determining the gas flow rate at the vent, exhaust port, or stack to be sampled Additionally, air velocities need to be measured using a standard pitot tube Other instruments to measure flow rates include the rotating vane anemometer, double pitot tube, heated thermometer anemometer and thermal anemometer Exhibit 4-2 lists some standard sampling methods to measure particulate and gaseous pollutants

Exhibit 4-2
Air Sampling Devices and How They Work

Physical Principle		Collection Device [Particulate or Gas]
1	Filtration	Fiber filters salycyclic acid naphthalene packed containers granular filters controlled pore filters high volume samplers [particulate]
2	Impingement	Wet impingers cascade impactors dry impingers, single-jet impactors [particulate]
3	Sedimentation	Sedimentation in stagnant air thermal precipitators [particulate]
4	Centrifugal Force	Cyclones [particulate]
5	Precipitation	Electrostatic precipitators thermal precipitators [particulate]
6	Absorption (Chemical)	(Water) impinger [ammonia sulfur dioxide] fritted glass scrubber or sulfanilic acid [hydrogen sulfide]
7	Adsorption	Carbon column [nitrogen carbon dioxide hydrogen sulfide sulfur dioxide]
8	Condensation or Successive Cold Traps	Gross sample of all polluting gas constituents

Source Derived from The World Bank *Industrial Pollution Control* 1988

Exhibit 4-3 displays standard sampling techniques for six air pollutants

Exhibit 4-3
Sampling Techniques Used for Common Air Pollutants

Pollutant of Concern	Sampling Technique
Total Suspended Particulates	High-volume sampler
Heavy Metals	Dust fall jars
Carbon Dioxide	Non-dispersive infrared analyzer
Hydrocarbons	Flame ionization monitors
Sulfur Oxides	Chemical absorption method or flame ionization method
Nitrogen Oxides	Chemical absorption method

Source Derived from The World Bank *Industrial Pollution Control* 1988

Water Sampling

The types of water that are frequently sampled in an environmental field investigation include surface waters (rivers, lakes artificial impoundments, runoff etc), ground water and spring water, process waters drinking (potable) water, and wastewaters (industrial effluents landfill leachate domestic sewage etc)

Ground Water Ground water samples are generally taken from wells which may already exist (e g production wells or drinking water wells) Samples should be collected after the well has been pumped sufficiently to ensure that the sample represents the ground water source Ground water samples can also be obtained by installing a monitoring well during the field investigation A ground water monitoring well is constructed by drilling a borehole in the ground using a motorized drill rig until the water table is reached Casing is usually installed to line the well and prevent it from collapsing The monitoring well is then developed by pumping or purging to allow representative samples to be collected and then sampled

Ground water samples are collected using devices known as bailers Bailers are cylindrical containers which are thoroughly cleaned and are then lowered into a well or spring to collect a sample Collected water is then transferred to sample containers Ground water samples can also be collected using a pump (e g suction or submersible)

Parameters that are frequently measured in ground water include

- pH, temperature, and electrical conductivity
- metals such as arsenic, cadmium, chromium, lead and mercury
- volatile organic compounds
- hydrocarbons
- polycyclic aromatic hydrocarbons

Surface Water Surface water samples are generally collected using a bucket or sample container that is dipped into the water In flowing waters, the container movement should be against the stream

When samples are collected from a river or stream observed results may vary with depth, stream flow and distance from shore If integrated samples (top to bottom or side to side) are not taken, grab or catch sample should be taken in the middle of the stream and at mid-depth Lakes and reservoirs are subject to considerable variations from normal causes such as seasons, rainfall, and runoff The location, depth, and frequency of sampling depends on local conditions and the purpose of the investigation Surface scum should be avoided Generally, samples should be collected beneath the surface in quiescent areas

Parameters that are frequently measured to determine surface water quality include

- color, odor pH and temperature
- total organic carbon (TOC)
- chemical oxygen demand (COD), biological oxygen demand (BOD)
- nitrogen, ammonium, nirite nitrate
- phosphorus sulfate sulfide
- sodium potassium
- iron magnesium manganese
- arsenic lead copper silver zinc chromium cadmium mercury nickel
- digestibility
- fish toxicity
- detergents
- phenols cyanides

Wastewater The need to monitor and control the quality of industrial wastewater cannot be over-stressed It is important to characterize wastewater discharges from industrial facilities to determine the pollutant loading (quantity) discharged into the receiving body of water or treatment plant

Collecting representative wastewater samples can be difficult given the variability of such sources Depending on the sampling objectives, the collection of composite samples be appropriate Wastewater samples can be collected similarly to surface water

The analysis performed on any specific wastewater sample will depend upon the nature of the industrial operation Parameters often measured to evaluate wastewater quality are listed in Exhibit 4-4 below

Exhibit 4-4
Industrial Wastewater Parameters

pH	Phenols
Alkalinity and Acidity	Cyanide
Total Hardness	Copper
Chloride	Zinc
Sulfate	Iron
Phosphate	Manganese
Suspended Solids	Chromium
Volatile Solids	Nickel
Total Solids	Lead
Settleable Solids	Biochemical Oxygen Demand (BOD)
Total Nitrogen	Chemical Oxygen Demand (COD)

In order to better understand the nature (pollutant mass and toxicity) of wastewater discharges the flow rate is measured at the time of sampling and is then combined with the analytical results on pollutants from a laboratory to provide a full characterization This is followed by an assessment of the wastewater impacts these discharge concentrations have on the receiving body of water

Solid Wastes

In general chemical physical and biological methods are used to characterize the air and water effluent from solid waste disposal areas In addition any hazardous materials should be identified and monitored closely Solid waste streams are measured in terms of volume and mass From a transport and disposal standpoint both volume and mass are important Usually a fixed-volume hauler (a transport vehicle) can be used to measure volumes and solid wastes The total weight of the hauler

and solid wastes is recorded and the hauler weight is subtracted from the total reading

Land disposal may also cause leaching of pollutants to nearby groundwater or soil Leachates are measured by collecting drainings from storage facilities, disposal piles and landfills Flow and concentration characteristics are determined by passing samples through single or multiple weirs Pollutant concentrations are then multiplied by flow rates to obtain the total weight of pollutants over a fixed time period

Soil Samples

Soils can become contaminated in a number of ways including inappropriate waste management practices, such as dumping, and accidents, such as spills Contaminated soil poses a health risk because of the potential for direct contact, volatilization and release of hazardous vapors, and migration to air (dust), surface water (runoff), or ground water (leaching)

Soil samples can be collected from the surface, near-surface, or at depth A spade or simple boring device such as a hand auger can be used to collect samples from the surface to a depth of approximately three feet Samples are obtained directly from the auger cuttings Samples below three feet can be collected using a motorized drill rig to complete a borehole Soil samples are collected from the borehole using a tube device such as a split barrel sampler Sediment sampling usually involves using devices that drill cores or dredge bottom grab samples from the bottom of surface water bodies

Soil profiles evaluate changes in site conditions and pollutants with depth Profiles are developed by completing a small excavation or borehole and by collecting logging and classifying a small sample of subsurface soil at varying depths

Possible parameters for measurement in soil examinations include

- particle size distribution water content
- pH electrical conductivity redox potential
- total organic carbon (TOC)
- arsenic lead chromium cadmium mercury, nickel
- hydrocarbons
- volatile organic compounds (VOCs)

Field Screening

Field screening techniques are, in general, methods of data gathering which result in real-time acquisition of data Field screening is done for the purpose of characterizing physical attributes of a site and to assess the presence of specific chemicals or chemical classes at a site Chemical field screening techniques generally provide relative concentrations for chemical classes With some techniques they can provide chemical-specific information Field screening techniques generally allow rapid multiple measurements at relatively low cost

Field analytical methods are chemical analysis methods capable of providing chemical-specific quantitative or semi-quantitative data in the field or a non-laboratory setting

Laboratory Analysis

Analytical measurements should be conducted in accordance with standard analytical methods These standard methods consist of documented and detailed procedures or protocols that laboratories follow in analyzing samples Selecting and using analytical standard methods is an integral part of the field investigation planning

Validated standard methods for environmental analysis are available from many international sources Hundreds of analytical methods have been developed and validated over the years These standard methods include procedures for measuring a sample's physical properties, chemical concentrations and biological components Physical properties include color electrical conductivity acidity alkalinity and turbidity

Chemical methods exist for the determination of metals inorganic nonmetallic constituents such as cyanide and dissolved oxygen and organic compounds such as phenols oils and grease volatile aromatic organics and polynuclear aromatic hydrocarbons

Biological methods include identification of aquatic organisms and plankton counting These standard methods specify requirements such as apparatus and analytical equipment reagents and solutions sample preparation equipment calibration and measurement interfering factors and calculation of results

Current environmental analysis relies heavily on instrumentation Organic pollutants are primarily determined by gas chromatography (GC) gas chromatography/mass spectrometry (GC/MS) and high performance liquid chromatography (HPLC) methods Organic pollutants in waters soils, sediments, sludges, solid wastes, and other matrices must be extracted out of collected samples before injection into a GC

Methodologies for inorganic anions and metals include atomic absorption (AA), emission spectroscopy, and ion chromatography (IC)

Appendix 5
Notice of Violation Form
and
Corrective Action Report Form

EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)

NOTICE OF VIOLATION

ISSUED TO (Name and Mailing Address of Licensee)

Telephone Number

Fax Number

CONSOLIDATED ENVIRONMENTAL LICENSE NUMBER

DATE NOTICE SENT BY REGISTERED MAIL

VIOLATION DETECTED *YOU ARE BEING ISSUED THIS NOTICE OF VIOLATION OF THE FOLLOWING CONDITIONS OF YOUR ENVIRONMENTAL LICENSE(S)*

1 Description of violation (reference License condition section and number)

2 Method of detection (include date and time of detection)

3 Laboratory analysis results (if applicable, attach official laboratory report)

RESPONDING TO THIS NOTICE *UPON RECEIPT OF THIS NOTICE, YOU HAVE SIXTY (60) DAYS, FROM THE DATE THIS NOTICE WAS RECEIVED, TO UNDERTAKE CORRECTIVE ACTION AND TO SUBMIT TO THE MUNICIPAL AUTHORITY A CORRECTIVE ACTION REPORT EXPLAINING YOUR ACTIONS TAKEN TO CORRECT THE VIOLATION(S) NOTED ABOVE THE CORRECTIVE ACTION REPORT MUST DEMONSTRATE THROUGH SAMPLING RESULTS OR OTHERWISE, THAT THE LICENSED ESTABLISHMENT IS NO LONGER IN VIOLATION WITH ANY OF THE CONDITIONS CITED ABOVE PLEASE USE THE ATTACHED CORRECTIVE ACTION REPORT FORM*

IF YOU DO NOT CORRECT THE VIOLATION AND SUBMIT THE CORRECTIVE ACTION REPORT BY _____, EEAA IN AGREEMENT WITH THE COMPETENT ADMINISTRATIVE AUTHORITY, WILL TAKE THE REQUIRED LEGAL STEPS, AS AUTHORIZED BY LAW NUMBER 4 FOR 1994 ("LAW FOR THE ENVIRONMENT"), TO A) CLOSE YOUR ESTABLISHMENT B) SUSPEND THE DAMAGING ACTIVITY, AND/OR C) FILE A LAWSUIT DEMANDING SUITABLE COMPENSATION TO REMEDY THE DAMAGES RESULTING FROM THE VIOLATION

TECHNICAL CONFERENCE (optional) *YOU ARE HEREBY CALLED TO A TECHNICAL CONFERENCE ON _____ _____(INSERT DATE AND TIME) AT THE OFFICES OF THE MUNICIPAL AUTHORITY AT _____ ___ (INSERT ADDRESS) IN ORDER TO EXPLAIN THE CIRCUMSTANCES LEADING TO THE VIOLATION(S) OR SHOULD YOU CHOOSE TO PRESENT EVIDENCE THAT THE PRESUMED VIOLATION DID NOT OCCUR IF THE FINDING OF VIOLATION IS OVERTURNED THIS NOTICE OF VIOLATION WILL BE VOIDED*

ISSUED BY

Signature of Officer-in Charge | Name and Title (print or type) | Telephone Number | Fax Number

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EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)

CORRECTIVE ACTION REPORT

ISSUED TO (Name and Mailing Address of Licensee)

Telephone Number

Fax Number

CONSOLIDATED ENVIRONMENTAL LICENSE NUMBER

DATE NOTICE OF VIOLATION RECEIVED BY REGISTERED MAIL

ACKNOWLEDGMENT OF NOTICE OF VIOLATION *THIS IS TO FORMALLY ACKNOWLEDGE THAT I HAVE RECEIVED AND READ, AND THAT I UNDERSTAND THE CONTENTS OF THE NOTICE OF VIOLATION ISSUED BY EEAA FOR*

Description of violation (reference License condition section and number)

_____

_____

_____

_____

TECHNICAL CONFERENCE (if applicable) *I HEREBY AFFIRM THAT I (OR MY DESIGNATED REPRESENTATIVE MS/MR _____) WILL APPEAR AT THE TECHNICAL CONFERENCE WITH EEAA ON THE DATE AND TIME CITED IN THE NOTICE OF VIOLATION AT THE TECHNICAL CONFERENCE, I WILL (check one)*

☐ *EXPLAIN THE CIRCUMSTANCES LEADING TO THE VIOLATION*

☐ *PRESENT EVIDENCE THAT THE PRESUMED VIOLATION DID NOT OCCUR*

DESCRIPTION OF CORRECTIVE ACTION(S) TAKEN *I HEREBY CERTIFY THAT WE HAVE UNDERTAKEN THE FOLLOWING ACTIONS TO REMEDY THE ABOVEMENTIONED VIOLATION(S)*

VIOLATION	CORRECTIVE ACTION (describe in detail or attach separate sheet)	DATE IMPLEMENTED	LABORATORY RESULTS (if applicable, attach official laboratory report(s))

CERTIFICATIONS *I CERTIFY THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION CONTAINED IN THIS REPORT AND ALL ATTACHED DOCUMENTS, AND THAT BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THAT THE SUBMITTED INFORMATION IS TRUE, ACCURATE, AND COMPLETE I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION*

Signature of Officer-in-Charge	**Name and Official Title (print or type)**	**Date**
Signature of Environmental Management Officer	**Name and Official Title (print or type)**	**Date**

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Appendix 6
Treatment of Industrial Wastewater

Treatment involves changing the form or composition of a waste stream through physical, chemical and/or biological means to reduce or eliminate the amount of pollutants Examples include air pollution control through the scrubbing of stack gases, and physical and chemical treatment of wastewaters through filtration and chemical oxidation, respectively There is now available a vast array of proven waste treatment technologies designed to control specific emissions and lessen environmental impacts from industrial facilities

The choice of equipment and system characteristics for a particular solution depend on the level of control required, which in turn is usually set by national regulation or in some cases the loan guidelines of the international multi-lateral development banks Furthermore, specific site conditions and the environmental baseline of the region (e g , proximity of communities atmospheric conditions, and fragile ecosystems that may be adversely affected by pollutants) are important criteria in planning treatment systems This section discusses, in general, treatment systems for addressing wastewater streams

Liquid effluents from industrial plants consist primarily of cooling water and wastewater originating from the process or other sources containing waste byproducts dissolved or suspended in the water Cooling water is used to cool industrial processes and is generally uncontaminated except for the increase in temperature and for traces of chromates used to protect surfaces from corrosion However because cooling water is typically at temperatures higher than those in receiving water care must be taken to keep temperature differences as small as possible As discussed in Chapter 6 wastewater discharge standards and water quality standards govern the safe discharge of industrial effluents The World Bank recommends that effluent temperatures should be no more than 3°C higher than the receiving water [1]

Industrial wastewaters typically contain numerous pollutants including solids, metals, organic and inorganic compounds oil and grease, dissolved gases and sludges Technologies available to industry for wastewater management can be divided into three basic categories

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[1] World Bank *Environmental Guidelines* Washington DC September 1988

- *Physical processes* extract or separate pollutants from effluent waste streams Examples range from settling ponds to activated carbon adsorption, clarification evaporation processes such as air stripping, and other filtration and separation processes, such as ion exchange and membrane processes Activated carbon is used to remove the toxic substances, such as metals and pesticides, that may be present in wastewaters

- *Biological processes* harness micro-organisms (and sometimes plants) to break down organic pollutants into less harmful components and reduce the overall organic load Biological treatment methods include aerobic and anaerobic digestion, stabilization ponds, and aquaculture

- *Chemical treatment* technologies make pollutants less harmful or decompose them altogether Some of the chemical processes used to treat water for a particular use or reuse include chemical oxidation and reduction, coagulation-precipitation processes, neutralization, and ozonation

Industrial wastewater treatment is usually conducted on-site Four of the more common physical-chemical treatment processes are adsorption, filtration, coagulation/precipitation, and clarification/flotation Exhibit 6-1 lists 12 classes of pollutants commonly found in industrial wastewater and the various technologies that can be used to treat these pollutants For example, soluble constituents such as organics, pesticides and oils/grease can be removed by activated carbons or solvent extraction Suspended solids on the other hand, can be tackled by filtration, flotation or coagulation Inorganics and metals are removed by precipitation membranes or ion exchange

The effectiveness of various wastewater treatment processes in removing classes of contaminants is given in Exhibit 6-2

In cases where a single treatment process may not be adequate to meet discharge standards, multiple process systems are used This is most likely when the wastewater pollutants consist of dissolved organic and inorganic constituents and a high concentration of suspended solids Here sedimentation often precedes filtration as a means to reduce the quantity of solids that are to be removed by filtration Physical and chemical processes usually precede or follow biological treatments in order to improve system performance and to make biological processes more efficient

Many industries have unique wastewater characteristics that favor the use of one treatment process over another A plastics manufacturer, for

example, would require adsorption, chemical coagulation/precipitation and granular filtration, a steel maker would probably choose between chemical coagulation/precipitation and membrane or a cheaper granular filtration Exhibit 6-3 presents illustrative treatment options for twelve industry segments

Exhibit 6-1
Industrial Wastewater Pollutants and Applicable Treatment Technologies

Treatment Technology	Suspended solids	Colloidal solids	Dissolved inorganic	Metals	Cyanides	Phenols	Aromatic organics	PCB compounds	VOCs	Pesticides	Oxygenated compounds	Oil/grease
Activated carbon adsorption Granular Powdered						● ●	● ●	● ●	● ●	● ●	● ●	● ●
Chemical coagulation, precipitation with sedimentation	●	●		●			●	●		●		●
Filtration Granular Membrane Ultrafiltration	●	● ●		● ● ●				●		●		●
Reverse osmosis			●	●							●	
Electrodialysis			●	●							●	
Air stripping							●		●			
Flotation	●	●		●						●		●
Solvent extraction						●	●	●	●	●		
Chemical oxidation (Cl_2 or H_2O_2)					●	●						
Ultra violet/ozone oxidation					●	●	●		●			
Evaporation			●	●					●			
Crystallization	●	●	●	●								

Source *Pollution Engineering* September 1992

Exhibit 6-2
Contaminant Removal by Selected Wastewater Treatment Technologies

Contaminant	Treatment Technology	Removal Efficiency (Percent)	Relative Reliability	Relative Adaptability	Relative Cost
Oil (fat) and grease	Dissolved air flotation	90	Very high	Very high	Medium
	Coalescing filter	99	High	High	Medium
	Clarification	80	Very high	Very high	High
Dissolved gases	Air stripping	80	High	High	Medium
	Steam stripping	95	Very high	High	Medium
	Flue gas stripping	95	High	Medium	Medium
	Biological oxidation	High	Medium	Medium	Low
Dissolved organics	Activated sludge	95 BOD/40 COD	High	Medium	Low
	Trickling filter	85 BOD	High	Medium	Low
	Aerated lagoon	80 BOD	Medium	Medium	Low
	Rotating contractor	90 BOD/20 50 COD	High	Medium	Low
	Anaerobic digestion	60 95 BOD	High	Medium	Low
	Wet air oxidation	64 BOD/74 COD	Medium	High	Very high
	Photolytic oxidation	99 BOD	Medium	Very high	Very high
	Carbon adsorption	99 BOD	Medium	High	Medium
	Chemical oxidation	90 BOD/90 COD	Very high	Very high	High
	Electrolytic oxidation	95 BOD/61 COD	Medium	Very high	High
Suspended solids	Clarification	50	High	High	Low
	Pressure filtration	95	High	High	Very high
	Multimedia filtration	95	Very high	High	High
Dissolved solids	Clarification	Low except for metals	High	Medium	Medium
	Distillation	99	Medium	Low	Very high
	Reserve osmosis	60 95	Medium	Medium	Medium
	Ion exchange	High	High	Low	High
	Electrodialysis	10 40	Medium	Medium	Very high
Sludges	Thickening	Product 6 8% solids	Very high	High	Medium
	Anaerobic digestion	Low	High	Medium	Medium
	Vacuum filtration	Product 20 35% solids	High	High	High
	Sludge drying beds	Product 90% solids	Medium	Low	Medium
	Evaporation basins	Product 95% solids	Very high	Low	Low
	Filter press	Product 35% solids	Very high	High	High
	Aerobic digestion	Low	Low	Low	High

Note BOD biological oxygen demand COD chemical oxygen demand
Source Adapted from Hamilton Standard Division of United Technologies *Oil Shale Report Wastewater Treatment Control Technology* Assessment prepared for the U S Congress Office of Technology Assessment Washington DC July 1978

Exhibit 6-3
Wastewater Treatment Processes for Various Industry Types

	Inorganic chemicals	Inorganic chemical (plastics)	Iron and steel	Electrical/electronic components	Metal finishing	Leather tanning and finishing	Pulp and paper	Rubber processing	Pharmaceuticals	Textile industrial	Dye manufacturing	Electric power plants
Activated carbon adsorption												
Granular		●				●			●		●	
Powdered		●				●			●		●	
Chemical coagulation precipitation with sedimentation	●	●	● ●	●	●	●	●	●	●	●	●	●
Filtration												
Granular	●	●	●	●	●	●	●	●	●	●	●	●
Membrane			●	●	●							
Ultrafiltration										●		
Reverse osmosis											●	
Electrodialysis												
Air stripping		●							●			
Flotation	●		●			●	●	●				●
Solvent extraction												
Chemical oxidation (Cl_2 or H_2O_2)		●									●	
UV / ozone oxidation		●										
Evaporation									●			
Crystallization												
Catalytic decomposition												

Source *Pollution Engineering* September 1992

Appendix 7
License to Discharge Industrial Wastewater to the Public Sewer Network
Application and License Forms

(Not included)

Appendix 8
Ministry of Industry
List of Dangerous Substances

Ministry of Industry
List of Dangerous Substances

CHEMICAL NAME	CAS-NO	CLASSIFICATION
Acenaphthene	82-32-9	still not classfied (SNC)
Acenaphthylene	208-96-8	SNC
Acephate	30560-19-1	Xn, R22
Acetaldehyde	75-07-0	Fx, Xn, R12 Xi, R36/37, Carc3, R40
Acetamide	60-35-5	Carc3, R40
Acetone	67-64-1	F R11
Acetonitrile	75-05-8	F, R11 T,R23/24/25
Acetophenone	98-86-2	Xn, R22 Xi, R36
Acetyl Chloride	75-36-5	F R11 R14 C,R34
Acifluorofen, Sodium	62476-59-9	SNC
Acrolein	107-02-8	F R11 T,R25 Tx,R26 C,R34
Acrylamide	79-06-1	Carc2 R45 Mut R46 T,R24/25-48/23/24/25
Acrylic Acid (specific limits)	79-10-7	R10 C R34
Acrylonitrile (specific limits)	107-13-1	Carc2 R45 F,R11 T,R23/24/25 Xi,R38
Adipolnitrile	111-69-3	SNC
Alachlor	15972-60-8	Xn R22 Carc3,R40 R43
Aldicarb	116-06-3	Tx R27/28
Aldicarb Sulfone	1646-88-4	SNC
Aldrin	309-00-2	T R24/25-48/24/25 Carc3 R40 N R50/53
Allyl Alcohol	107-18-6	R10 T R23/24/25 Xi,R36/37/38 N R50
Allyl Chloride	107-05-1	F R11 Tx R26 N,R50
Aluminum Phosphide	20859-73-8	F R15/29 Tx R28 R32
Aminopyridine	504-24-9	SNC

CHEMICAL NAME	CAS-NO	CLASSIFICATION
Ammonia	7664-41-7	R10 T,R23
Ammonium Acetate	631-61-8	SNC
Ammonium Methacrylate	16325-47-6	SNC
Ammonium Sulfamate	7773-06-0	SNC
Aniline (specific limits)	62-53-3	XN, R20/21/22 Carc, R40 T, R 48/23/24/25 N, R50
ortho-Anisidine	90-04-0	Carc2, R45 Tx, R26/27/28 R33 N, R51/53
Anthracene	120-12-7	SNC
Antimony	7440-36-0	Xn, R20/22
Antimony Trioxide	1309-64-4	Carc3, R40
Arsenic, Inorganic	7440-38-2	T, R23/25
Asbestos (Various CAS NR)	1332-21-4	Carc1, R45 T, R48/23
Azobenzene	103-33-3	Xn, R20/22
Barium (Various CAS NR)	7440-39-3	Xn, R20/22
Barium Cyanide	542-62-1	SNC
Baygon (Propoxur)	114-26-1	T, R25
Benefin	1861-40-1	SNC
Bentazon	25057-89-0	Xn, R22 Xi, R36
Bentazo(a)Anthracene	56-55-3	Carc2, R45
Benzaldehyde	100-52-7	Xn, R22
Benzene	71-43-2	Carc1, R45 F, R11 T, R48/23/24/25
Benzidine	92-87-5	Carc1, R45 Xn, R22
Benzo(a)Pyrene	50-32-8	Carc2, R45 Mut, R46 Rep, R60 Rep2, R61
Benzo(a)Pyrene	192-97-2	SNC
Benzo(b)Fluoranthrene	205-99-2	Carc2, R45
Benzo(ghi)Perylene	191-24-2	SNC

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CHEMICAL NAME	CAS-NO	CLASSIFICATION
Benzo(j)Fluoranthrene	205-82-3	Carc2, R45
Benzo(k)Fluoranthrene	207-08-9	Carc2, R45
Benzoic Acid	65-85-0	SNC
Benzo Trichloride (Trichloromethylbenzene)	98-07-7	Carc2, R45 Xn, 522 t, R23 Xi, R37/38 R43
Benzyl Chloride	100-44-7	Xn, R22 T,R23 Xi, R37/38-41 Carc3,R40
Beryllium	7440-41-7	Carc2, R49 T, R25-48/23 Tx, R26 Xi, R36/37/38 R43
Beryllium Sulfate	13510-49-1	SNC
Biphenyl	92-52-4	Xi, R36/37/38 N,R50/53
Bis(2-Chloroethoxy) Ether	111-91-1	SNC
Bis(2-Chloroisopropyl) Ether	39638-32-9	SNC
Bis(2-Chloroethyl) Ether	111-44-4	R10 Tx, R26/27/28 Xn, R40
Bis(Chloromethyl) Ether	542-88-1	SNC
Bisphenol (4,4'-Isopropylidendiphenol)	80-05-7	Xi, R36/37/38 R43
Boron	7440-42-8	SNC
Brominated Dibenzo Furans		SNC
Bromochloro Methane	74-97-5	SNC
Bromodichloro Methane	75-27-4	SNC
p-Bromodiphenyl Ether	101-55-3	SNC
Bromo Ethane	74-96-4	Xn, R20/21/22
Bromoform	75-25-2	T,R23 Xi, R36/38
Bromo Methane	74-83-9	T R23 XI R36/37/38 N,R50/53-59
Bromotrichloro Methane	75-62-7	SNC
1,3 Butadiene	106-99-0	Carc2, R45 Fx,R12
n-Butanol (specific limits)	71-36-3	R10 Xn, R20

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CHEMICAL NAME	CAS-NO	CLASSIFICATION
Butyl Benzyl Phthalate	85-68-7	SNC
Butylate	2008-41-5	SNC
Butyl Chloride	507-20-0	SNC
Butyl Phthalyl Butyl Glycolate	85-70-1	SNC
Cacodylic Acid (Arsenic Compounds)	75-60-5	T,R23/25
Cadmium	7440-43-9	SNC
Calcium Cyanide	592-01-8	Tx,R28 R32
Captan	133-06-1	Xi,R36 Carc3,R40 R43
Carbaryl	63-25-2	Xn,R22
Carbofuran	1563-66-2	Tx,R26/28
Carbon Disulfide (specific limits)	75-15-0	F,R11 Xi,R36/38 T,R48/23 Rep3,R62 Rep3,R63
Carbon Tetrachloride (specific limits)	56-23-5	T, R23/24/25-48/23 Carc3,R40 N,R59
Carbonyl Sulfide	463-58-1	SNC
Carbosulfan	55285-14-8	SNC
Carboxin	5234-68-4	SNC
Chloral Hydrate	302-17-0	T,R25 Xi,R36/38
Chloramben	133-90-4	SNC
Chlordane	57-74-9	Xn, R21/22 Carc3,R40 N,R50/53
Chlorimuron-Ethyl	90982-32-4	SNC
Chlorine	7782-50-5	T,R23 Xl,R36/37/38
Chlorine Cyanide	506-77-4	Fx,R12 Tx,R26
Chlorine Dioxide	10049-04-4	SNC
Chlorite	14998-27-7	SNC
p-Chloro Aniline (Dichloro Anilin)	106-47-8	T,R23/24/25 R33
2-Chloro Acetophenone	532-27-4	SNC

CHEMICAL NAME	CAS-NO	CLASSIFICATION
Chloro Benzene (specific limits)	108-90-7	R10 Xn,R20
Chloro Benzilate	510-15-6	Xn,R20
1-Chloro Butane	109-69-3	F,R11
2-Chloro Butane	78-68-4	SNC
Chloro Cyclo Pentadiene	41851-50-7	SNC
Chloro -1,1- Difluoro Ethane	75-68-3	SNC
Chloroform (specific limits)	67-66-3	Xn,R22-48/20/22 Xi, R38 Carc3,R40
Chloro Methane	74-87-3	Fx,R12 Carc3,R40 Xn,R48/20
Chloromethyl Methyl Ether	107-30-2	Carc1,R45 F,R11 Xn,R20/21/22
beta-Chloro Naphthalene	91-58-7	SNC
2-Chloro Phenol	95-57-8	Xn,R20/21/22
p-Chloro Phenyl Methyl Sulfide	123-09-1	SNC
p-Chloro Phenyl Methyl Sulfane	98-57-7	SNC
p-Chloro Phenyl Methyl Sulfoxide	934-73-6	SNC
2-Chloro-1,1,1,2-Tetrafluoro Ethene	2837-89-0	SNC
o-Chloro Toluene	95-49-8	Xn,R20
Chloro Sulfuron	64902-72-3	SNC
Chromium III	16065-83-1	SNC
Chromium VI	7440-47-3	SNC
Cobalt	7440-48-4	Xn,R42/43
Copper Cyanide (specific limits)	544-92-3	Tx,R26/27/28
Creosote (partly classified)	8001-58-9	Carc2,R45
Cyanide, Free	57-12-5	Tx,R26/27/28 R32
Cyanogen (Dicyan)	460-19-5	F,R11 T,R23
Cyanogen Bromide	506-68-3	Tx,R26/27/28 R32

CHEMICAL NAME	CAS-NO	CLASSIFICATION
Cyanogen Chloride		SNC
Cyclohexanone (specific limits)	108-94-1	R10 Xn,R20
Cyclohexyl Amine (specific limits)	108-91-8	R10,Xn,R21/22 C,R34
2,4-Diamino Toluene	95-80-7	Carc2,R45 Xn,R21 T,R25 Xi,R36 R43
Diazomethane	334-88-3	Carc2,R45
Dalapon, Salt (2,2 Dichlorpropionsyre)	75-99-0	Xn,R22 Xi,R38-41
Dibenzo (a,h,) Anthracen	53-70-3	Carc2,R45
Dibenzo (a,c) Fluoroanthrene	5385-75-1	SNC
Dibenzo Furan	132-64-9	SNC
1,2 diBromo-3-Chloropropane	96-12-8	Carc2,R45 Mut,R46 T,R25 Xn,R48/20/22
1,4-diBromo Benzene	106-37-6	SNC
diBromochloro Methane	124-48-1	SNC
diBromodiChloro Methane	594-8-3	SNC
p,p-diBromo Diphenyl Ether	2050-47-7	SNC
1,2-Dibromo Ethane (specific limits)	106-93-4	Carc2,R45 T,R23/24/25 Xl,R36/37/38
diBromo Methane (specific limits)	74-95-3	Xn,R20
diButyl Phthalate	84-74-2	SNC
diChloro Acetic Acid	79-43-6	C,R35
1,2-diChloro Benzene (specific limits)	95-50-1	Xn,R22 Xi,R36/37/38 N,R50/53
1,3-diChloro Benzene	541-73-1	Xn,R22
3,3-diChloro Benzidine	91-94-1	Carc2,R45 Xn,R21 R43 N,R50/53
diChloro diFluoro Methane	75-71-8	SNC
p,p-diChloro diPhenyl diChloro Ethane	72-54-8	SNC

CHEMICAL NAME	CAS-NO	CLASSIFICATION
p,p- diChloro diPhenyl diChloro Ethylene	72-55-9	SNC
1,1-diChloro Ethane (specific limits)	75-34-3	F,R11 Xn,R22 Xi,R36/37
1,2 diChloro Ethane (specific limits)	107-06-2	Carc2,R45 F,R11 Xn,R22 Xi,R36/37/38
1,1-diChloro Ethylene (specific limits)	75-35-4	Fx,R12 Xn,R20-40
cis 1,2-diChloro Ethylene	156-59-2	SNC
trans 1,2 diChloro Ethylene	156-60-5	SNC
1,1-diChloro-1-Fluoro Ethane	1717-00-6	SNC
diChloro Methane	75-09-2	Carc3,R40
2,4-diChloro Phenol	120-83-2	Xn,R22 Xi,R36/38
2,4 -diChloro Phenoxy Acetic Acid	94-75-7	Xn,522 Xi,R36/37/38
4-(2,4-diChlorophenoxy) Buturic Acid	94-82-6	Xn,R21/22
1,2-diChloro Propane	78-87-5	F,R11 Xn,R20/22
2,3-diChloro Propanol	616-23-9	SNC
1,3 diChloro Propene	542-75-6	R10 Xn,R20/21 T,R25 Xi,R36/37/38 R43
1,1-diChloro-2,2,2-Trifluoro Ethane	306-82-2	SNC
di(2-Ethylhexyl) Phthalate	117-81-7	SNC
diEthyl Phthalate	84-66-2	SNC
diEthyl-para-Nitropheyl Phosphate	311-45-5	SNC
diEthyl Sulfate	64-67-5	Carc2,R45 Mut2,R46 Xn,R20/21/22 C,R34
diEthylene Glycol Dinitrate	693-21-0	E,R3 Tx,R26/27/28 R33
diEthylene Glycol Monobutyl Ether	112-34-5	Xi,R36
diEthylene Glycol Monobutyl Ether Acetate	124-17-4	SNC
diMethyl Amino Azobenzene	60-11-7	SNC

CHEMICAL NAME	CAS-NO	CLASSIFICATION
diMethyl Amine	124-40-3	Fx,R12 Xi,R36/37
n,n-diMethyl Aniline	121-69-7	T,R23/24/25 R33
3,3-diMethyl Benzidine	119-93-7	Carc2,R45 Xn,R22
diMethyl Carbamoyl Chloride	79-44-7	Carc2,R45 Xn,R22 Xi,R36/37/38
n,n-diMethyl Formamide	68-12-2	Rep2,R61 Xn,R20/21 Xi,R36
2,4-diMethyl Phenol (Xylenol)	105-67-9	T,R24/25 C,R34
2,6-diMethyl Phenol (Xylenol)	576-26-1	T,R24/25 C,R34
3,4-diMethyl Phenol (Xylenol)	95-65-8	T,R24/25 C,R34
diMethyl Phthalate	131-11-3	SNC
diMethyl Sulfate	77-78-1	Carc2,R45 T,R25 Tx,R26 C,R34
diMethyl Tere Phthalate	1206-61	SNC
m-diNitro Benzene	99-65-0	Tx,R26/27/28 R33 N,R50/53
o-diNitro Benzene	528-29-0	Tx,R26/27/28 R33 N,R50/53
4,6-diNitro -orthoCresol	534-52-1	Tx,R27/28 R33 Xi,R36 Mut3,R40 R44
4,6-diNitro -orthoCyclo Hexyl Phenol	131-89-5	T,R23/24/25
2,4-diNitro Phenol	51-28-5	T,R23/24/25 R33
2,4-diNitro Toluene	121-14-2	T,R23/24/25 R33
diNitro Toluene Mixture		
1,4-Dioxane (specific limits)	123-91-1	F,R11 R19 Xi,R36/37 Carc3,R40
diPhenamide	957-51-7	Xn,R22
diPhenyl Amine	122-39-4	T,R23/24/25 R33
1,2-diPhenyl Hydrazine	122-66-7	T,R23/24/25 R33
diSulfoton	298-04-4	Tx,R27/28 N,R50/53
1,2-Epoxy Butane	106-88-7	F,R11 Xn,R20/21/22 Xi,R36/37/38 Carc3,R40
Ethyl Acetate	141-78-6	F,R11

CHEMICAL NAME	CAS-NO	CLASSIFICATION
Ethyl Benzene (specific limits)	100-41-4	F,R11 Xn,R20
Ethyl Carbamate	51-79-6	Carc2,R45
Ethyl Chloride	75-00-3	Fx,R12
Ethylene Diamine (specific limits)	107-15-3	R10 Xn,R21/22 C,R34 R43
Ethylene Thiourea	96-45-7	Rep2,R61 Xn,R22
Ethyl Ether (Diethylether)	60-29-7	Fx, R12 R19
Ethylene Glycol (specific limits)	107-21-1	Xn,R22
Ethylene Amine (Aziridin)	151-56-4	Carc2,R45 Mut2,R46 F,R11 Tx,R26/27/28 C,R34
Ethyl Phthalyl Ethyl Glycolate	84-72-0	SNC
Ethyl-p-Nitorphenyl Phosphor Thioate	2104-64-5	Tx,R27/28 N,R50/53
Fluoranthen	206-44-0	SNC
Fluorene	86-73-7	SNC
Fluorine	7782-41-4	R7 Tx,R26 C,R35
Fluoridone	57756-60-4	SNC
Formaldehyde (specific limits)	50-00-0	T,R23/24/25 C,R34 Carc3,R40 R43
Formic Acid (specific limits)	64-18-6	C,R35
Furan	110-00-9	SNC
Furfural (specific limits)	98-01-1	T,R23/25
Glysophate	1071-83-6	SNC
Hexabromo Diphenyl Ether	36483-60-0	SNC
Hexachloro Benzene	118-74-1	CarC2,R45 T,R48/25
Hexachloro Butadiene	87-68-3	SNC
alpha-Hexachloro Cyclohexane	319-84-6	Xn,R21 T,R25 Carc3,R40
beta-Hexachloro Cyclohexane	319-85-7	Xn,R21 T,R25 Carc3,R40
delta-Hexachloro Cyclohexane	319-86-8	Xn,R21 T,R25 Carc3,R40

CHEMICAL NAME	CAS-NO	CLASSIFICATION
n-Hexane	110-54-3	F,R11 Xn,R48/20
Hydrazine (specific limits)	302-01-2	Carc2,R45 R10 T,R23/24/25 C,R34 R43
Hydrogen Chloride	7647-01-0	C,R35 Xi,R37
Hydrogen Cyanide	74-90-8	Fx,R12 Tx,R26
Hydrogen Sulfide	7783-06-4	Fx,R12 Tx,R26
Hydroquinone	123-31-9	Xn,R20/22
Isobutyl Alcohol (specific limits)	78-83-1	R10 Xn,R20
Lead, Inorganic	7439-92-1	SNC
Mercury, Inorganic (specific limits)	7439-97-6	Tx,R26/27/28 R33
Methanol (specific limits)	67-56-1	F,R11 T,R23/25
Methyl Acrylate	96-33-3	Xi,R36/37/38
Methyl Chloro Carbonate	79-22-1	F,R11 T,R23 Xi, R36/37/38
2-Methyl-4-Chloro Phenoxy Acetic Acid	94-76-6	SNC
4,4-Methylene Bis (2-Chloroaniline)	101-14-4	CarC2,R45 Xn,R22 N,R50/53
Methylene Diphenyl Iso Cyanate (MDI)	0101-68-8	Xn,R20 Xi,R36/37/38 R42
Methyl Ethyl Ketone	78-93-3	F,R11 Xi,R36/37
Methyl Iodine	74-88-4	Xn,R21 T,R23/25 Xi,R37/38 Carc3,R40
Methyl Iso Butyl Ketone	108-10-1	F,R11
Methyl Iso Cyanate	624-83-9	Fx,R12 T,R23/24/25 Xi,R36/37/38
Methyl Mercury (specific limits)	22967-92-6	Tx,R26/27/28 R33
2-Methyl Phenol (specific limits)	95-48-7	T,R24/25 C,R34
3-Methyl Phenol	108-39-4	T,R24/25 C,R34
4-Methyl Phenol	106-44-5	T,R24/25 C,R34

CHEMICAL NAME	CAS-NO	CLASSIFICATION
Methyl Tert Butyl Ether	1834-04-4	SNC
Naphthalene	91-20-3	SNC
Nickel Carbonyl	13463-39-3	Rep2,R61 F,R11 Tx,R26 Carc3,R40
Nickel Refinery Dust		
Nickel Soluble Salts	7440-02-0	Carc3,R40 R43
Nickel Subsulfide	12035-72-2	SNC
Nitric Acid	7697-37-2	O,R8 C,R35
Nitrate	14797-55-3	SNC
Nitric Oxide	10102-43-9	SNC
Nitrite	14797-65-0	SNC
Nitro Aniline	88-74-4	T,R23/24/25 R33 R52/53
Nitro Benzene (specific limits)	98-95-3	Tx R26/27/28 R33
4-Nitro Biphenyl	92-93-3	Carc2,R45
Nitrogen Dioxide	10102-44-0	Tx,R26 Xi,R37
p-Nitrophenol	100-02-7	Xn, R20/21/22 R33
2-Nitropropane (specific limits)	79-46-9	Carc2,R45 R10 Xn,R20/22
n-Nitro-di-n-Butyl Amine	924-16-3	SNC
para Chloro Phenyl Methyl Sulfide	123-09-1	SNC
para Chloro Phenyl Methyl Sulfoxide	934-73-6	SNC
Pentabromo Diphenyl Ether	32534-81-9	SNC
Penta Chloro Benzene	608-93-5	F,R11 Xn,R22
Pentachloro Cyclo Pentadiene	25329-35-5	SNC
Pentachloro Ethane (specific limits)	76-01-7	Carc3,R40 T,R48/23 N,R51/53
Pentachloro Nitro Benzene	82-68-8	R43
Pentachloro Phenol	87-86-5	T,R24/25 Tx,R26 Xi,R36/37/38 Carc3,R40 N,R50/53

CHEMICAL NAME	CAS-NO	CLASSIFICATION
Phenol (specific limits)	108-95-2	T,R24/25 C,R34
Phenylene Diamine (specific limits)	25265-76-3	T,R23/24/25 R43
Phenyl Mercury Acetate	62-38-4	T,R25-48/24/25 C,R34
Phosphine	7803-51-2	SNC
Phthalic Anhydride (specific limits)	85-44-9	Xi,R36/37/38
Polychlorinated Biphenyls (specific milits)	1336-36-3	R33 N,R50/53
Potassium Bromate	7758-01-2	CarC2,R45 O,R9 T,R25
Potassium Cyanide (specific limits)	151-50-88	Tx,R26/27/28 R32
Propylene Glycol	57-55-6	SNC
Propylene Glycol Monoethyl Ether	52125-53-8	SNC
Proylene Glycol Monomethtl Ether	107-98-2	R10
1,3-Propylene Oxide (Oxetan)	503-30-0	F,R11 Xn,R20/21/22
Propylene Amine	75-55-8	CarC2,R45 F,R11 Tx,R26/27/28 Xi,R41
Pydrine	51630-58-1	SNC
Pyrene	129-00-0	SNC
Pyridine (specific limits)	110-86-1	F,R11 Xn,R20/21/22
Quinone	106-51-4	T,R23/25 Xi,R36/37/38
Sulfuric Acid	7664-93-9	C,R35
Selenious Acid	7783-00-8	T,R23/25 R33
Selenium Compounds	7782-49-2	T,R23/25 R33
Selenium Sulfide	7446-34-6	T,R23/25 R33
Silver	7440-22-4	SNC
Silver Cyanide	506-64-9	SNC
Sodium Azide	26628-22-8	Tx,R28 R32
Sodium Fluoroacetate	62-74-6	Tx,R26/27/28

CHEMICAL NAME	CAS-NO	CLASSIFICATION
Styrene (specific limits)	100-42-5	R10 Xn,R20 Xi,R36/38
Tetrabromo Diphenyl Ether	40088-47-9	SNC
1,2,4,5 Tetrachloro Benzene	95-94-3	SNC
Tetrachloro Cyclo Pentadiene	695-77-2	SNC
1,1,2,2-Tetrachloro Ethane (specific limits)	79-34-5	Tx,R26/27 N,R51/53
Tetrachloro Ethylene (specific limits)	127-18-4	CarC3,R40
2,3,4,6-Tetrachloro Phenol (specific limits)	58-90-2	T,R25 Xi,R36/38
Tetra Ethyl Lead (Lead Alkalytes) (specific limits)	78-00-2	Rep1,R61 Rep3,R62 Tx,R26/27/28 R33
Thallic Oxide	1314-32-5	Tx,R26/28 R33
Toluene (specific limits)	108-88-3	F,R11 Xn,R20
1,2,4 Tribromo Benzene	615-54-3	SNC
Tribromo Chloro Methane	594-15-0	SNC
Tribromo Dipehnyl Ether	49690-94-0	SNC
Tributyl Tin Oxide (specific limits)	56-35-9	Xn,R21 T,R25-48/23/25 Xi,R36/38
Trichloro Acetic Acid (specific limits)	76-03-9	C,R35
Tricresol (specific limits)	1319-77-3	T,R24/25 C,R34
1,2,4 Trichloro Benzene	120-82-1	SNC
1,1,1 Trichloro Ethane	71-55-6	Xn,R20 N,R59
1,1,2 Trichloro Ethane (specific limits)	79-00-5	Xn, R20/21/22
Trichloro Ethylene (specific limits)	71-01-6	Carc3,R40
2,4,5 Trichloro Phenol (specific limits)	95-95-4	Xn,R22 Xi,R36/38 N,R50/53
2,4,6 Trichloro Phenol	88-06-2	Xn,R22 Xi,R36/38, Carc3,R40

CHEMICAL NAME	CAS-NO	CLASSIFICATION
2,4,5 Trichloro Phenox Acetic Acid	93-76-5	Xn,R22 Xi,R36/37/38
1,2,3 Trichloro Propane	96-18-4	Xn,R20/21/22
1,1,2 Trichloro Propane	598-77-6	SNC
Triethyl Amine	121-44-8	F,R11 Xi,R36/37
Triethylene Glycol Monobutyl Ether	143-22-6	SNC
Triethylene Glycol Monoethyl Ether	112-50-5	SNC
Triethylene Glycol Monomethyl Ether	112-35-6	SNC
2,2,4-Trimethyl Pentane	540-84-1	SNC
Trinitro Benzene	25388-32-6	E,R2 Tx,R26/27/28 R33
2,4,6 Trinitro Toluene	118-96-7	E,R2 T,R23/24/25 R33
Vinyl Acetate	108-05-4	F,R11
Vinyl Bromide	593-60-2	Fx,R12
Vinyl Chloride	75-01-4	Carc1,R45 Fx,R12
Red Phosphorus	7723-14-0	F,R11 R16
Xylenes (specific limits)	1330-20-7	R10 Xn,R20/21 Xi,R38
Zinc and Compounds	7440-66-6	F,R15-17
Zinc Diphosphide	1314-84-7	R,R15/29 Tx,R28 R32
Zinc Cyanide	557-21-1	Tx,R26/27/28 R32

SNC- Still Not Classified

Appendix 9
Hazardous Waste Emergency Response Procedures

Contingency Plan and Emergency Procedures

Contingency Plan

Each owner or operator must have a contingency plan for his facility The contingency plan must be designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil or surface water

The provision of the plan must be carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment

Content of Contingency Plan The contingency plan must describe the actions facility personnel must take in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil or surface water at the facility

The plan must describe arrangements agreed to by local police departments fire departments, hospitals contractors, and other government and local emergency response teams to coordinate emergency services

The plan must list names addresses and phone numbers (office and home) of all persons qualified to act as emergency coordinator and this list must be kept up to date Where more than one person is listed one must be named as primary emergency coordinator and others must be listed in the order in which they will assume responsibility as alternates

The plan must include a list of all emergency equipment at the facility (such as fire extinguishing systems spill control equipment communications and alarm systems (internal and external) and decontamination equipment) where this equipment is required This list must be kept up to date In addition the plan must include the location

and a physical description of each item on the list, and a brief outline of its capabilities

The plan must include an evacuation plan for facility personnel where there is a possibility that evacuation could be necessary This plan must describe signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes (in cases where the primary routes could be blocked by releases of hazardous waste or fires)

Copies of Contingency Plan A copy of the contingency plan and all revisions to the plan must be

- Maintained at the facility
- Submitted to all local police departments, fire departments, hospitals, and other appropriate government and local emergency teams that may be called upon to provide emergency services

Amendment of Contingency Plan The contingency plan must be reviewed, and immediately amended if necessary, whenever

- The facility permit is revised
- The plan fails in an emergency
- The facility changes – in its design, construction, operation, maintenance or other circumstances – in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents or changes the response necessary in an emergency
- The list of emergency coordinators changes or
- The list of emergency equipment changes

Emergency Coordinator At all times, there must be at least one employee either on the facility premises or on call (i e available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures This emergency coordinator must be thoroughly familiar with all aspects of the facility's contingency plan, all operations and activities at the facility the location and characteristics of waste handled the location of all records within the facility, and the facility layout In addition this person must have the authority to commit the resources needed to carry out the contingency plan

Emergency Procedures

Whenever there is an imminent or actual emergency situation, the emergency coordinator (or his designee when the emergency coordinator is on call) must immediately

- Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel
- Notify appropriate State or local agencies with designated response roles if their help is needed
- Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount, and areal extent of any released materials He may do this by observation or review of facility records or manifests, and, if necessary, by chemical analysis
- Concurrently, the emergency coordinator must assess possible hazards to human health or the environment that may result from the release, fire, or explosion This assessment must consider both direct and indirect effects of the release, fire, or explosion (e g , the effects of any toxic, irritating or asphyxiating gases that are generated, or the effects of any hazardous surface water run-off from water or chemical agents used to control fire and heat-induced explosions)
- If the emergency coordinator determines that the facility has had a release, fire or explosion which could threaten human health or the environment, outside the facility, he must report his findings as follows
  - If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate local authorities He must be available to help appropriate officials decide whether local areas should be evacuated
  - He must immediately notify the government official designated as the on-scene coordinator for that geographical area The report must include
    - Name and telephone number of reporter
    - Name and address of facility
    - Time and type of incident (e g , release, fire)
    - Name and quantity of material(s) involved, to the extent known
    - The extent of injuries, if any, and

— The possible hazards to human health, or the environment, outside the facility

- During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other hazardous waste at the facility These measures must include, where applicable stopping processes and operations, collecting and containing release waste, and removing or isolating containers

- If the facility stops operations in response to a fire, explosion or release, the emergency coordinator must monitor for leaks, pressure buildup, gas generation or ruptures in valves, pipes, or other equipment wherever this is appropriate

- Immediately after an emergency, the emergency coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility

- The emergency coordinator must ensure that in the affected area(s) of the facility

  - No waste that may be incompatible with the released material is treated, stored or disposed of until cleanup procedures are completed

  - All emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed

- The owner or operator must notify the appropriate government authorities that the facility is in compliance with above requirements before operations are resumed in the affected area(s) of the facility

- The owner or operator must note in the operating record the time date and details of any incident that requires implementing the contingency plan Within 15 days after the incident he must prepare and keep on file a written report on the incident The report must include

  - Name address and telephone number of the owner or operator
  - Name address, and telephone number of the facility
  - Date time, and type of incident (e g , fire, explosion)
  - Name and quantity of material(s) involved
  - The extent of injuries if any

- An assessment of actual or potential hazards to human health or the environment, where this is applicable
- Estimated quantity and disposition of recovered material that resulted from the incident

Draft Example

Contingency and Emergency Response Plan

General Information

Facility Name and Location

Owner and Operator

Description of Facility Operations
(Provide general description)

The hazardous waste storage facilities in the Solvent Recovery department consist of appropriately designed closed liquid storage tanks The hazardous waste storage and treatment facilities in the Environmental Controls department consist of appropriately designed closed liquid storage tanks, liquid incinerators (thermal oxidizers) a solid waste incinerator (rotary kiln), and container storage area All incinerators have combustion gas quench and scrubber systems

Attachment 1 is the facility site plan

Emergency Officer In the event that the Contingency Plan must be implemented the persons listed in Attachment 2 have been designated as the Emergency Officers These persons are to be contacted in the order given

The Emergency Officer in charge has complete authority to commit the necessary resources of the company in the event an emergency requires implementing the Contingency Plan The Emergency Officer will coordinate the overall emergency response and establish the command center

Implementation The decision to implement the Contingency Plan depends upon whether or not an imminent or actual incident could

threaten human health or the environment This condition may be the result of a fire, spill, storm, explosion, power failure, equipment failure hazardous vapor release, or other cause The Contingency Plan will be implemented when there is an emergency event involving hazardous waste at one or more of the units covered at this facility

The following list of situations or conditions that may cause the implementation of the Contingency Plan is to be used as guidance for the Emergency Officer

- Fire and/or Explosion
  - A fire that causes a threat or actual release of toxic vapors from the boundary of the TSD unit
  - The fire spreads and could possibly ignite materials at other locations on-site or could cause heat-induced explosions
  - The fire could possibly spread to off-site locations
  - Use of water or water and chemical fire suppressants could result in contaminated run-off
  - An imminent danger exists that an explosion could occur, causing a safety hazard because of flying fragments or shock waves
  - An imminent danger exists that an explosion could ignite other hazardous waste at the facility
  - An imminent danger exists that an explosion could result in release of toxic material
  - An explosion has occurred where the detrimental effects threaten or actually do leave the boundaries of the TSD unit
- Spill or Material Release
  - The spill could result in release of flammable liquids or vapors thus, causing a fire or explosion hazard
  - The spill could cause a threat or actual release of toxic liquids or vapors from the boundary of the TSD unit
  - The spill cannot be contained on-site, resulting in off-site soil contamination and/or surface water pollution

Emergency Response Procedure

- *Notification* In the event of an emergency situation, all plant personnel are notified by a public address announcement and a coded steam whistle Both pronouncements indicate the location of the emergency The plant emergency response teams immediately respond to the emergency When deemed necessary, the appropriate federal, state, or local agencies, and the fire or police departments will be notified These agencies, with telephone numbers, are listed in Attachment 3

- *Identification of Hazardous Materials* The Emergency Officer will identify the character, exact source, amount and area extent of the release The initial identification method will be to utilize visual analysis of the material and location of the release In addition, documentation or records may be used for identification purposes If, for some reason, the released material cannot be identified, samples will be taken for chemical analysis

- *Assessment* The Emergency Officer will assess the possible hazards, both direct and indirect, to human health or the environment from a release, fire, or explosion involving hazardous waste If the Emergency Officer determines that human health or the environment could be threatened, this Contingency Plan will be implemented and the appropriate local authorities will be notified for possible local evacuation The Emergency Officer will also contact the appropriate response agencies if appropriate and report the following

  - Name and telephone number of the reporter
  - Name and address of the facility
  - Time and type of incident (e g , release fire)
  - Name and quantities of known material(s) involved
  - Extent of injuries, if any
  - Possible hazards to human health or the environment outside the facility

- *Control Procedures* The following actions will be taken, as appropriate in the areas affected by a major emergency involving a fire or explosion

  - The sounding of a plant wide steam whistle and/or public address system announcement

  - Operations in the area affected will cease immediately

  - All feed lines and additional equipment will be shut down, as necessary and practical

- Assess personnel injury and seriousness of injury
- The area will be cleared of all personnel not actively involved in the emergency These persons are to report to the designated assembly points for accountability
- Injured personnel will be attended to and medical treatment will be administered by trained medical personnel
- Routine vehicular traffic and hazardous operations in the area will be terminated until the emergency no longer exists and safety is restored

The need for evacuation procedure will depend on several factors including the nature of the hazard, the characteristics of the waste involved, wind direction, etc The Emergency Officer, along with other emergency response personnel, will determine the appropriate plant evacuation procedure and will advise plant personnel via the public address system

The need for off-plant area evacuation will be determined by the Emergency Officer and civil authorities (sheriff and fire officials) The officials will determine the area to be evacuated and determine means of notification

An appropriate "all clear' signal will be given when the emergency has been resolved and the safety of personnel is no longer endangered The Emergency Officer will determine when the emergency has passed and will signal the appropriate all clear "

The following actions will be taken, as appropriate, in the areas affected by a major emergency involving chemical spill or material release

- The Emergency Officer will obtain the following information
  - Personnel injured and seriousness of injury
  - Location of the spill or leak, the material involved and the source
  - The approximate amount spilled, an estimate of the liquid and/or gas discharge rate and the direction the liquid flow or gaseous cloud is moving

- Whether or not a fire is involved

- Clean-up personnel will

  - Make sure all unnecessary persons leave the hazard area

  - Put on protective clothing and equipment as required

  - Remove all ignition sources and use spark and explosion proof equipment if flammable waste is involved

  - If possible, safely stop the leak

  - Remove all surrounding materials that could be reactive with materials in the waste

  - Use absorbent material to contain, divert, and clean up a spill if it has not been contained by other means

  - Place all containment and clean-up materials in appropriate containers for proper treatment or disposal

  - Place all recovered liquid wastes and contaminated soil in the correct container or vessel for proper treatment or disposal

- *Prevention of Recurrence or Spread of Fires Explosions or Releases* Actions to prevent the recurrence or spread of fires, explosions, or releases include stopping operations collecting and containing released waste, and isolating containers

  In addition if the hazardous waste operations cease in response to an emergency, the Emergency Officer will instruct plant personnel to monitor valves, pipes drums, and other equipment for leaks, pressure build-up gas generation or rupture

  In the event of an incident that triggers the contingency plan an accident investigation will be conducted to determine the cause of the incident and evaluate the measures to prevent a similar occurrence

- *Storage and Treatment of Released Material* Immediately after an emergency, the Emergency Officer will have appropriate

personnel make arrangements for proper treatment storage, or disposal of recovered waste contaminated soil, surface water or any other contaminated material

- *Incompatible Wastes* The Emergency Officer will ensure that materials which may be incompatible with the released material are properly moved, segregated, stored, or disposed of

- *Post Emergency Equipment Maintenance* After an emergency involving implementation of this Contingency Plan, all emergency equipment used will be cleaned so that it is suitable for reuse Before operations are resumed an inspection of all safety equipment used will be conducted

- *Container Spills and Leakage* Material from leaking drums will be collected and redrummed (by persons adequately protected) Refer to the *Control Procedures* section for a discussion of emergency response procedures for container spills and leakage

- *Tank Spills and Leakage* The contents of leaking tanks will be transferred to other suitable containers and/or tanks Refer to the *Control Procedures* section for a discussion of emergency response procedures for tank spills and leakage Before a leaking tank is put back in service, repairs will be made to stop the leak

- *Surface Impoundments Spills and Leakage* This facility does not have hazardous waste surface impoundments, therefore, this section is not applicable

Emergency Equipment Attachment 4 will provide a list of emergency equipment maintained at the facility

Coordination Agreements The facility maintains a fully equipped fire fighting system and an on-site staffed hospital The need for outside assistance for most emergency situations is not anticipated However the company has established formal arrangements with outside emergency response groups in the event of a major emergency situation Copies of these arrangements are included in Attachment 5

The police department will be contacted for off-site evacuation traffic control etc , in the event the facility s own security force is not sufficient The police department will be advised and directed by the facility s Emergency Officer or security personnel The police department is cognizant of the facility layout, the location of entrance and exit roadways, and the facility security fence and gate arrangements

The company has its own medical staff available for emergency situations In the event that the company's on-site medical staff or medical facilities are not sufficient, the company may direct patients to the County Hospital for emergency treatment The County Hospital emergency staff is cognizant of the properties of the hazardous materials handled The company's medical staff and knowledgeable process scientists are made available for consultation if personnel exposure assistance is needed by the hospital staff

In the event of a major fire or spill that cannot be controlled by the company, personnel assistance will be requested of the city's fire department In the event the outside fire department is called in the facility's Emergency Officer will direct all emergency response activities on the plant site The fire department is aware of the properties of the hazardous wastes handled the facility layout, location of tankage and roadways, and have been trained in fire control of fuels and solvents

Evacuation Plan Evacuation of the hazardous waste storage and treatment area may be called by the Emergency Officer

Evacuation of an area is signaled by instructions over the public address system Personnel are instructed to assemble in designated areas for head count prior to release Evacuation of the plant site is signaled by use of the plant steam whistle This is followed by an announcement over the public address system

For all hazardous waste management units the primary evacuation route is through the main office building For all hazardous waste management units the alternate evacuation route is through Gate 5 (the north gate) or any of the other existing perimeter exits dependent of the situation to be determined by the emergency officer

Required Reports Any emergency event (e g fire explosion etc) that requires implementation of the Contingency Plan will be reported in writing within 15 days to the appropriate regulatory official The report will include

- Name address and telephone number of the owner or operator
- Name address and telephone number of the facility
- Date time and type of incident (e g fire explosion)
- Name and quantity of material(s) involved
- The extent of injuries if any

- An assessment of actual or potential hazards to human health or the environment, where this is applicable, and
- Estimated quantity and disposition of recovered material that resulted from the incident

List of Attachments

1 Facility Site Plans

2 Emergency Officers
Includes names, phone numbers (both work and home) and home addresses

3 Emergency Contacts
Law Enforcement phone numbers
Fire Department phone numbers
Hospital phone numbers
Government Agencies phone numbers

4 Emergency Equipment List

5 Copies of formal arrangements with fire and police departments

Appendix 10
Specifications and Management Requirements for Hazardous Waste Storage Facilities

General Facility Standards

Owners and operators also must ensure that their wastes are properly identified and handled, that facilities are secure and operating properly, and that personnel working at facilities are trained in hazardous waste management To satisfy these conditions, owners and operators must take the following actions

- ***Conduct Waste Analyses*** -- Waste analyses are conducted prior to treatment storage, and disposal This ensures that owners or operators possess sufficient information on the properties of the waste they manage to be able to treat, store, or dispose of them in a manner that will not pose a threat to human health or the environment The regulations require owners or operators to perform detailed chemical and physical analysis of their wastes to develop and follow a written waste analysis plan that specifies tests and test frequencies, and to test any incoming wastes

- ***Install Security Measures*** -- The security requirements were developed to prevent the unknowing entry of people and minimize the potential for the unauthorized entry of people or animals onto the active portions of facilities To meet these security objectives a barrier surrounding the active portion of the facility with controlled entry systems or 24-hour surveillance must be installed and warning signs posted Owners or operators also must take precautions to avoid fires, explosions, generation of toxic gases, and any other events that would threaten human health safety and the environment Owners and operators are exempt from these requirements 1) if unauthorized or unknowing entry will not result in injury and 2) if the disturbance of waste or equipment will not result in environmental damage

- ***Conduct Inspections*** -- The regulations require an owner or operator to develop and follow a written inspection schedule to assess the status of the facility and detect potential problem areas Any observations made during the inspections are recorded in the

facility's operating log and kept on file for three years All problems found must be remedied

- ***Conduct Training*** -- The purpose of the training requirement is to reduce the potential for mistakes that might threaten human health and the environment This is accomplished by ensuring that facility personnel acquire expertise in the areas to which they are assigned The requirements specify when facility personnel must be trained (e g six months after beginning a job) the records to be maintained, and the minimum frequency with which the initial training received by the employees must be updated Both on-the-job training and in-house training programs may be used to meet the training requirements There must be a hazard communication plan, medical surveillance program health and safety plan for employees, decontamination procedures, and to provide a minimum of 24 hours of safety training The training requirement may be waived if the employee has had equivalent training or work experience

- ***Properly Manage Ignitable, Reactive, or Incompatible Wastes*** -- In general, all ignitable or reactive wastes must be protected from sources of ignition or reaction or treated to remove the cause of concern Owners or operators also must make sure that treatment storage, or disposal of ignitable, reactive, or incompatible waste does not result in damage to the containment structure (container, tank, surface impoundment, landfill cell, or pit) and/or threaten human health or the environment Incompatible wastes must not be placed in the same containment structure if there is the potential for reaction

- ***Comply With Location Standards*** -- Location standards prohibit siting a new facility in a location where flood or seismic events could affect a waste management unit Bulk liquid wastes are also prohibited from placement in salt domes salt beds or underground mines or caves

General Operating Requirements

These operating procedures are the tools to ensure that wastes are properly managed The operating requirements are discussed below

Containers

Drums and containers are frequently used to accumulate and store wastes In the past, persons using waste drums often put them somewhere out of sight, without any further concern about what might happen to residues in the containers The drums eventually weathered and corroded, releasing their contents, posing threats to human health and the environment Recognizing that elementary and straightforward precautions may eliminate these problems, basic good management practices are necessary The container regulations, therefore, include

- Using containers in good condition Wastes in leaking or damaged containers must be recontainerized
- Ensuring the compatibility of the waste with the container (i e , corrosive wastes should not be stored in metal containers)
- Handling containers properly to prevent ruptures and leaks
- Preventing the mixture of incompatible wastes
- Containers must be placed in a containment system that is capable of containing leaks and spills This system must have sufficient capacity to contain ten percent of the volume of all containers or the volume of the largest container, whichever is greater (this applied only to those holding liquids containers holding solids are not factored into this volume determination)
- When closing a container all hazardous waste and hazardous waste residues must be removed unless the container is to be disposed of as hazardous waste
- After closure all contaminated equipment or soil must be decontaminated or removed

Tanks

Tanks are stationary devices designed to contain an accumulation of hazardous waste and constructed primarily of non-earthen materials General operating requirements fall into five basic areas

- ***Tank Assessment*** -- An assessment must be completed to evaluate the tank system's structural integrity and compatibility with the wastes that it will hold The assessment covers design standards, corrosion protection, tank tests waste characteristics, and the age of the tank

- ***Secondary Containment and Release Detection*** -- Unless the tank does not contain free liquids and is located in a building with impermeable floors, secondary containment and release detection is required Secondary containment systems must be designed, installed and operated to prevent the migration of liquid out of the tank system, and to detect and collect any releases that do occur Commonly used types of containments include liners vaults and double-walled tanks

  Owners and operators of interim status tank systems can demonstrate that an alternate design, location, and operating practice will prevent the migration of hazardous wastes or constituents while the tank system is in use

- ***Operating and Maintenance Requirements*** -- Persons using tanks, either to store or treat wastes must manage the tanks to avoid leaks, ruptures spills, and corrosion This includes using freeboard or a containment structure (e g , dike or trench) to prevent and contain escaping wastes and having a shut-off or bypass system installed to stop liquid from flowing into a leaking tank

- ***Response to Releases*** -- Tanks with leaks or spills must be emptied immediately The area surrounding the tank must be visually inspected for leaks and spills Based on the inspection further migration of the waste must be stopped and visibly contaminated soils and surface water must be properly disposed All major leaks must be reported followed by a report describing the fate of the released materials

- ***Closure and Post Closure*** -- All contaminated soils and other hazardous waste residues must be removed from the tank storage area at the time of closure

Surface Impoundments

All surface impoundments are required to have

- The installation of two or more impermeable liners
- A leachate collection system between the liners
- Ground-water monitoring

Variances for these requirements may be acceptable if the owner or operator demonstrates that alternative design and operation, together with location characteristics, will prevent migration of hazardous constituents into ground water

In addition, requirements for proper design, construction, and operation of surface impoundments apply These requirements include preventing liquids from escaping from the top (overfilling, run-on) or sides (dikes) of surface impoundments Liners must be constructed properly, of appropriate materials and thickness During construction and installation, liners and cover systems must be inspected for uniformity damage, and imperfections After installation all units must be examined weekly to ensure that the integrity of the unit is maintained and that no potentially hazardous situations have developed If the liquid in a surface impoundment suddenly drops for no apparent reason, or if a dike leaks, the surface impoundment must be removed from service and, if the leak cannot be stopped the impoundment must be emptied

The closure and post-closure requirements for surface impoundments include removing or decontaminating all waste residues, and properly covering and maintaining the impoundment to prevent leaks from occurring

Waste Piles

Permitted waste piles must have an impermeable base with a liner designed and constructed to prevent any migration of wastes out of the pile into adjacent soil or waters A leachate collection system immediately above the liner also must be installed

Run-on and run-off systems must be constructed to prevent water from flowing onto the active portion of the waste pile Construction of liners and cover systems must be monitored to ensure that they are properly installed During operation the owner or operator must inspect the waste pile once a week to ensure that there is no deterioration and that the leachate collection system is functioning properly

Containment Buildings

Design and Operating Standards

(a) All containment buildings must comply with the following design standards

(1) The containment building must be completely enclosed with a floor, walls, and a roof to prevent exposure to the elements, (e g , precipitation, wind, run-on), and to assure containment of managed wastes

(2) The floor and containment walls of the unit, including the secondary containment system if required under paragraph (b) of this section, must be designed and constructed of materials of sufficient strength and thickness to support themselves, the waste contents, and any personnel and heavy equipment that operate within the unit, and to prevent failure due to pressure gradients, settlement, compression, or uplift, physical contact with the hazardous wastes to which they are exposed climatic conditions and the stresses of daily operation including the movement of heavy equipment within the unit and contact of such equipment with containment walls The unit must be designed so that it has sufficient structural strength to prevent collapse or other failure All surfaces to be in contact with hazardous wastes must be chemically compatible with those wastes If appropriate to the nature of the waste management operation to take place in the unit, an exception to the structural strength requirement may be made for light-weight doors and windows that meet these criteria

(i) They provide an effective barrier against fugitive dust emissions under paragraph (c) (1) (iv) and

(ii) The unit is designed and operated in a fashion that assures that wastes will not actually come in contact with these openings

(3) Incompatible hazardous wastes or treatment reagents must not be placed in the unit or its secondary containment system if they could cause the unit or secondary containment system to leak corrode, or otherwise fail

(4) A containment building must have a primary barrier designed to withstand the movement of personnel waste, and handling equipment in the unit during the operating life of the unit and appropriate for the physical and chemical characteristics of the waste to be managed

(b) For a containment building used to manage hazardous wastes containing free liquids or treated with free liquids (the presence of which is determined by the paint filter test, a visual examination, or other appropriate means), the owner or operator must include

(1) A primary barrier designed and constructed of materials to prevent the migration of hazardous constituents into the barriers (e g , a geomembrane covered by a concrete wear surface)

(2) A liquid collection and removal system to prevent the accumulation of liquid on the primary barrier of the containment building

(i) The primary barrier must be sloped to drain liquids to the associated collection system

(ii) Liquids and waste must be collected and removed to minimize hydraulic head on the containment system at the earliest practicable time that protects human health and the environment

(3) A secondary containment system including a secondary barrier designed and constructed to prevent migration of hazardous constituents into the barrier, and a leak detection system that is capable of detecting failure of the primary barrier and collecting accumulated hazardous wastes and liquids at the earliest practicable time

(i) The requirements of the leak detection component of the secondary containment system are satisfied by installation of a system that is, at a minimum

(A) Constructed with a bottom slope of 1 percent or more

(B) Constructed of a granular drainage material with a hydraulic conductivity of $1x10^{-2}$ cm/sec or more and a thickness of 12 inches (30 5 cm) or more or constructed of synthetic or geonet drainage materials with a transmissivity of $3x10^{-5}$ m^2/sec or more

(ii) If treatment is to be conducted in the building, an area in which such treatment will be conducted must be designed to prevent the release of liquids, wet materials, or liquid aerosols to other portions of the building

(iii) The secondary containment system must be constructed of materials that are chemically resistant to the waste and liquids managed in the containment building and of sufficient strength and thickness to prevent collapse under the pressure exerted by overlaying materials and by any equipment used in the containment building (Containment buildings can serve as secondary containment systems for tanks placed within the building under certain conditions A containment building can serve as an external liner system for a tank, provided it meets certain requirements

(c) Owners or operators of all containment buildings must

(1) Use controls and practices to ensure containment of the hazardous waste within the unit, and, at a minimum

(i) Maintain the primary barrier to be free of significant cracks gaps, corrosion or other deterioration that could cause hazardous waste to be released from the primary barrier

(ii) Maintain the level of the stored/treated hazardous waste within the containment walls of the unit so that the height of any containment wall is not exceeded

(iii) Take measures to prevent the tracking of hazardous waste out of the unit by personnel or by equipment used in handling the waste An area must be designated to decontaminate equipment and any reinsate must be collected and properly managed

(iv) Take measures to control fugitive dust emissions such that any openings (doors, windows, vents cracks, etc) exhibit no visible emissions In addition all associated particulate collection devices (e g fabric filter electrostatic precipitator) must be operated and maintained with sound air pollution control practices This state of no visible emissions must be maintained effectively at all times during normal operating conditions, including when vehicles and personnel are entering and exiting the unit

(2) Obtain certification by a qualified registered professional engineer that the containment building design meets the requirements of paragraphs (a) through (c) of this section

(3) Throughout the active life of the containment building, if the owner or operator detects a condition that could lead to or has caused a release of hazardous waste, must repair the condition promptly, in accordance with the following procedures

(i) Upon detection of a condition that has led to a release of hazardous waste (e g , upon detection of leakage from the primary barrier) the owner or operator must

(A) Enter a record of the discovery in the facility operating record

(B) Immediately remove the portion of the containment building affected by the condition from service

(C) Determine what steps must be taken to repair the containment building, remove any leakage from the secondary collection system, and establish a schedule for accomplishing the cleanup and repairs

(D) Within 7 days after the discovery of the condition, notify the regulatory agency of the condition, and within 14 working days, provide a written notice to the regulatory agency with a description of the steps taken to repair the containment building, and the schedule for accomplishing the work

(ii) The regulatory agency will review the information submitted, make a determination regarding whether the containment building must be removed from service completely or partially until repairs and cleanup are complete and notify the owner or operator of the determination and the underlying rationale in writing

(iii) Upon completing all repairs and cleanup the owner or operator must notify the regulatory agency in writing and provide a verification signed by a qualified registered professional engineer, that the repairs and cleanup have been completed according to the written plan submitted in accordance with paragraph (c)(3)(I)(D) of this section

(4) Inspect and record in the facility's operating record at least once every seven days data gathered from monitoring equipment and leak detection equipment as well as the containment building and the area immediately surrounding the containment building to detect signs of releases of hazardous waste

(d) For containment building that contains both areas with and without secondary containment, the owner or operator must

(1) Design and operate each area in accordance with the requirements enumerated in paragraphs (a) through (c) of this section

(2) Take measures to prevent the release of liquids or wet materials into areas without secondary containment

(3) Maintain in the facility's operating log a written description of the operating procedures used to maintain the integrity of areas without secondary containment

Closure and Post-closure Care

(a) At closure of a containment building, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc) contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste

(b) If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components subsoils, structures, and equipment as required in paragraph (a) of this section the owner or operator finds that not all contaminated subsoils can be practicably removed or decontaminated he must close the facility and perform post-closure care in accordance with the closure and post-closure requirements that apply to landfills

Additional Operating Requirements

General Inspection Requirements

(a) The owner or operator must inspect his facility for malfunctions and deterioration operator errors and discharges which may be causing – or may lead to – (1) release of hazardous waste constituents to the environment or (2) a threat to human health The owner or operator must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment

(b)

(1) The owner or operator must develop and follow a written schedule for inspecting monitoring equipment, safety and

emergency equipment, security devices, and operating and structural equipment (such as dikes and sump pumps) that are important to preventing, detecting, or responding to environmental or human health hazards

(2) He must keep this schedule at the facility

(3) The schedule must identify the types of problems (e g , malfunctions or deterioration) which are to be looked for during the inspection (e g , inoperative sump pump, leaking fitting, eroding dike, etc)

(4) The frequency of inspection may vary for the items on the schedule However it should be based on the rate of deterioration of the equipment and the probability of an environmental or human health incident if the deterioration, malfunction or any operator error goes undetected between inspections Areas subject to spills, such as loading and unloading areas, must be inspected daily when in use

(c) The owner or operator must remedy any deterioration or malfunction of equipment or structures which the inspection reveals on a schedule which ensures that the problem does not lead to an environmental or human health hazard Where a hazard is imminent or has already occurred, remedial action must be taken immediately

(d) The owner or operator must record inspections in an inspection log or summary He must keep these records for at least three years from the date of inspection At a minimum, these records must include the date and time of the inspection, the names of the inspector, a notation of the observations made and the date and nature of any repairs or other remedial actions

Personnel Training

(a)

(1) Facility personnel must successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures the facility s compliance with the requirements of this part The owner or operator must ensure that this program includes all the elements described in the document required under paragraph (d)(3) of this section

(2) This program must be directed by a person trained in hazardous waste management procedures and must include instruction which teaches facility personnel hazardous waste management

procedures (including contingency plan implementation) relevant to the positions in which they are employed

(3) At a minimum, the training program must be designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment and emergency systems, including where applicable

(i) Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment

(ii) Key parameters for automatic waste feed cut-off systems

(iii) Communications or alarm systems

(iv) Response to fires or explosions

(v) Response to ground-water contamination incidents

(vi) Shutdown of operations

(b) Facility personnel must successfully complete the program required in paragraph (a) of this section within six months after the date of their employment or assignment to a facility, or to a new position at a facility, whichever is later Employees must not work in unsupervised positions until they have completed the training requirements of paragraph (a) of this section

(c) Facility personnel must take part in an annual review of the initial training required in paragraph (a) of this section

(d) The owner or operator must maintain the following documents and records at the facility

(1) The job title for each position at the facility related to hazardous waste management and the name of the employee filling each job

(2) A written job description for each position listed under paragraph (d)(1) of this section This description may be consistent in its degree of specificity with descriptions for other similar positions in the same company location or bargaining unit but must include the requisite skill education, or other qualifications, and duties of employees assigned to each position

(3) A written description of the type and amount of both introductory and continuing training that will be given to each person filling a position listed under paragraph (d)(1) of this section

(4) Records that document that the training or job experience required under paragraphs (a), (b), and (c) of this section has been given to, and completed by, facility personnel

(e) Training records on current personnel must be kept until closure of the facility, training records on former employees must be kept for at least three years from the date the employee last worked at the facility Personnel training records may accompany personnel transferred within the same company

General Requirements for Ignitable, Reactive, or Incompatible Wastes

(a) The owner or operator must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste This waste must be separated and protected from sources of ignition or reaction including but not limited to open flames, smoking, cutting and welding hot surfaces, frictional heat, sparks (static, electrical, or mechanical) spontaneous ignition (e g , from heat-producing chemical reactions), and radiant heat While ignitable or reactive waste is being handled, the owner or operator must confine smoking and open flame to specially designated locations "No Smoking" signs must be conspicuously placed wherever there is a hazard from ignitable or reactive waste

(b) Where specifically required by other sections of this part the owner or operator of a facility that treats stores or disposes ignitable or reactive waste or mixes incompatible waste or incompatible wastes and other materials must take precautions to prevent reactions which

(1) Generate extreme heat or pressure fire or explosions or violent reactions

(2) Produce uncontrolled toxic mists fumes dusts or gases in sufficient quantities to threaten human health or the environment

(3) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions

(4) Damage the structural integrity of the device or facility

(5) Through other like means threaten human health or the environment

(c) When required to comply with paragraph (a) or (b) of this section, the owner or operator must document that compliance This documentation may be based on references to published scientific or engineering literature, data from trial tests (e g bench scale or pilot scale tests) waste analyses, or the results of the treatment of similar wastes by similar treatment processes and under similar operating conditions

Labeling Requirements

Managers must ensure that labels are affixed to all containers of hazardous materials The information required on the container label includes

- The identity of the hazardous material
- The hazard warnings of the hazardous material
- The name and address of the waste generator
- The start date for accumulation and storage

Appendix 11
Hazardous Waste Management Forms:

Application to Handle Hazardous Substances and Wastes

Uniform Register for On-Site Usage, Treatment, Storage and Disposal

Uniform Register for Wastes Transported Off Site

MINISTRY OF INDUSTRY AND METALLURGICAL RESOURCES (official seal)

APPLICATION FOR GENERAL PERMIT TO HANDLE HAZARDOUS SUBSTANCES AND WASTES

EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)

SECTION I APPLICANT INFORMATION

1 Name of Establishment	2 Telephone Number	3 Fax Number	4 Tax Identification Number

5 Address of Establishment	6 Establishment Contact (Person to be contacted regarding waste activities)
	7 Address of Establishment Contact (if different from #5)

8 Contour Map attach to permit application contour map(s) of establishment location	9 Report of Subterranean Water Levels attach to permit application map(s) or other certification of underground water resources within ___ km radius of establishment location

10 Previous Experience Handling Hazardous Substances and/or Waste

☐ No previous experience ☐ Previous experience (attach copies of certifications of previous experience)

SECTION II WORKER SAFETY AND INSURANCE PROVISIONS

11 Number of Workers to be Handling and/or Exposed to HazardousSubstances/Wastes	12 Medical and Accident Insurance (attach copy of policy)		13 Frequency of Employee Medical Checkups	14 Employee Safety Training
	Insurance Company(ies)	Number of workers insured		(Attach copy of training program)

15 Emergency Plan attach copy of the detailed Emergency Plan including safety equipment and procedures

SECTION III COMMUNITY HAZARD NOTIFICATION AND COMPENSATION CERTIFICATION

15 Community Hazard Notification Attach copy of Community Hazard Notification and Emergency Warning Procedures	16 Community Already Notified? ☐ Yes ☐ No (if no projected date of official notification _____)

17 COMPENSATION CERTIFICATION I understand that it is my legal duty to compensate citizens in the areas surrounding my establishment for the treatment of any injuries which may potentially result from accidents leakages or other improper handling of hazardous substances and wastes at my establishment

Signature of Officer in Charge	Name and Official Title (print or type)	Date signed

SECTION IV HAZARDOUS SUBSTANCE ACTIVITIES (Mark X in the appropriate boxes Refer to instructions)

18 MANUFACTURE HAZARDOUS SUBSTANCES	19 USE HAZARDOUS SUBSTANCES IN PRODUCTION OR ASSOCIATED PROCESSES
TO BE COMPLETED	TO BE COMPLETED

SECTION V HAZARDOUS WASTE ACTIVITIES

20 GENERATE HAZARDOUS WASTES	21 TREATMENT STORAGE OR DISPOSAL OF HAZARDOUS WASTES	22 TRANSPORT HAZARDOUS WASTES (Indicate mode in boxes a-e)
☐ 1 More than 1000kg per month	☐ 1 For own waste only	☐ 1 For own waste only
☐ 2 100 1 000kg per month	☐ 2 For commercial purposes	☐ 2 For commercial purposes
TO BE COMPLETED	TO BE COMPLETED	Mode of Transportation ☐ Road ☐ Rail ☐ Air ☐ Water ☐ Other specifiy _____ TO BE COMPLETED

SECTION VI CERTIFICATION AND COMMITMENTS (To be signed by authorized representative of Applicant)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on my query of those individuals immediately responsible for obtaining the information I believe that the submitted information is true accurate and complete I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

I also understand that by submitting this application I hereby commit to the following

a) Not to mix hazardous substances and waste with other types of wastes that may result from social and productive activities

b) To maintain registers (including comprehensive statements of hazardous substances and waste quantities types sources frequencies and periods of their collection and storage means of their transportation and treatment) to provide these information on request, and not to destroy these registers for a period of five years from the date of starting them

c) To undertake all procedures that ensure the proper packaging of hazardous substances and wastes during the collection transportation and storage phases

Last I commit to ensuring that no harmful effects shall result to public health and/or the environment from the activity for which I am applying for a permit.

Signature of Applicant s Authorized Representative	Print Name and Title	Date

SECTION VII COMMENTS (Please include any additional comments you feel are necessary to complete this application)

MINISTRY OF INDUSTRY AND METALLURGICAL RESOURCES (official seal)	**APPLICATION FOR GENERAL PERMIT TO HANDLE HAZARDOUS SUBSTANCES AND WASTES**	EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)

Instructions for Completing the Form

The Ministry of Industry and Metallurgical Resources and the Egyptian Environmental Affairs Agency require generators and transporters of hazardous waste and owners or operators of hazardous waste treatment, storage and disposal facilities to complete the following information

SECTION I APPLICANT INFORMATION

Item 1 Establishment Name Enter the establishment's full name Name should match that registered with the Ministry of Industry and Metallurgical Resources (MIMR)

Item 2 Telephone Number Enter the establishment's telephone number

Item 3 Fax Number Enter the establishment's fax number

Item 4 Tax Identification Number Enter the establishment's tax identification number

Item 5 Address Enter the full mailing address of the establishment

Item 6 Establishment Contact Enter the name and title of the person to be contacted regarding waste activities

Item 7 Address of Establishment Contact Enter the full mailing address of the establishment contact (if different from the address in Item 5

Item 8 Contour Map Attach contour map(s) of the establishment location to the permit application

Item 9 Report of Subterranean Water Levels Attach map(s) or other certification of underground water resources with _____ kilometer radius of establishment location

Item 10 Previous Experience Handling Hazardous Substances and/or Waste If you have previous experience with handling hazardous substances and/or waste, check "Yes" and attach copies of certificates of previous experience If you have no previous experience with handling hazardous substances and/or waste, check "No "

SECTION II WORKER SAFETY AND INSURANCE PROVISIONS

Item 11 Number of Workers to be Handling and/or Exposed to Hazardous Substances/Wastes Enter the number of workers who have handled or have been exposed to the waste specified The establishment shall be responsible for informing the workers who handle these substances of their dangers and the necessary precautions to be taken when handling them to ensure their full awareness of all this information and that they have received adequate training

Item 12 Medical and Accident Insurance Enter name of insurance company (or companies) and the number of workers insured under the policy or (policies) Attach a copy (or copies) of the policy to the application Establishments producing these dangerous substances shall insure their workers for amounts to be determined by decree from the Minister of Manpower in coordination with the Ministry of Insurance and Social Affairs, after consulting the EEAA and the Ministry of Health Due considerations shall be given to determining the insurance amounts for the degree and extent of danger to which each category of worker is exposed to in each productive unit

Item 13 Frequency of Employee Medical Checkups Indicate the frequency of periodic employee medical checkups The staff of these establishments shall be subject to periodic medical checkups and shall be treated for occupational diseases at the expense of their employers

Item 14 Employee Safety Training Enter any employee safety training that workers have received and attach a copy of the training program to the application

MINISTRY OF INDUSTRY AND METALLURGICAL RESOURCES (official seal)	**APPLICATION FOR GENERAL PERMIT TO HANDLE HAZARDOUS SUBSTANCES AND WASTES**	EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)

SECTION III COMMUNITY HAZARD NOTIFICATION AND COMPENSATION CERTIFICATION

Item 16 Community Hazard Notification Attach copy of Community Hazard Notification and Emergency Warning Procedures to the application It is the responsibility of the establishment to inform residents of regions surrounding production sites where dangerous wastes are handled of likely and possible dangers and hazards from these substances and the method for facing them, along with ensuring that they have become aware of the warning and alarm systems whenever an accident occurs, and how to act in case of the occurrence of accidents

Item 17 Community Notification If the community has already been notified, check "Yes" If the community has not already been notified, check "No" and enter projected date of official notification

Item 18 Compensation Certification Read and enter an original signature of the Officer-in -Charge, and enter the name and official title of the Officer-in-Charge, and enter the date signed Establishments producing and handling these hazardous substances shall compensate injured citizens in the areas surrounding production or storage sites for the injuries resulting from (text ends- no next page)

SECTION IV HAZARDOUS SUBSTANCE ACTIVITIES

Item 19 Manufacture Hazardous Substances

Item 20 Use Hazardous Substances in Production or Associated Processes

SECTION V HAZARDOUS WASTE ACTIVITIES

Item 21 Generate Hazardous Wastes

Item 22 Treatment, Storage, or Disposal of Hazardous Wastes

Item 23 Transport Hazardous Wastes

SECTION VI CERTIFICATION AND COMMITMENTS (To be signed by authorized representative of Applicant)

Read and enter an original signature of the Applicant's Authorized Representative Enter the name and title of representative and the date signed

SECTION VII COMMENTS

MINISTRY OF INDUSTRY AND METALLURGICAL RESOURCES (official seal)	**UNIFORM HAZARDOUS SUBSTANCES AND WASTE REGISTER FOR ON-SITE USAGE, TREATMENT, STORAGE AND DISPOSAL**	EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)

Instructions for Completing the Form

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MINISTRY OF INDUSTRY AND METALLURGICAL RESOURCES (official seal)	**UNIFORM HAZARDOUS SUBSTANCES AND WASTE REGISTER FOR ON-SITE USAGE, TREATMENT, STORAGE AND DISPOSAL**	EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)

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SECTION VII COMMENTS

MINISTRY OF INDUSTRY AND METALLURGICAL RESOURCES (official seal)

UNIFORM HAZARDOUS WASTE REGISTER FOR WASTES TRANSPORTED OFF SITE

EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)

TO BE FILLED OUT BY GENERATOR

1 Generator's Name and Mailing Address Telephone Number	2 Generator's MIMR Hazardous Substances and Waste Handling (HSWH) Permit Number SpecialPermit Conditions	3 Register Number Time period covered
4a Transporter 1 Company Name Telephone Number	4b Transporter 1 MIMR HSWH Permit Number	4c Generator Transporter Contract Reference Number
5a Transporter 2 Company Name Telephone Number	5b Transporter 2 MIMR HSWH Permit Number	5c Generator Transporter Contract Reference Number
6a Transporter 3 Company Name Telephone Number	6b Transporter 3 MIMR HSWH Permit Number	6c Generator Transporter Contract Reference Number
7a Designated Facility for Final Treatment and Disposal (include name and address) Telephone Number	7b Final Treatmentand Disposal Facility MIMR HSWH Permit Number	7c Generator Disposer Contract Reference Number

8 Description of Waste (use Basel Convention Annex I and III categories)		9 Containers				10 Total Quantity of Waste	11 Projected Method of Final Treatment and Disposal
8a Category Number	8b Category Description	9a Number	9b Type	9c Weight/ Volume	9d Containers Labelled? (yes/no)		

12 Continuation Sheets (use attached continuation sheets for additional wastes) Continuation sheets attached? ____ No ____Yes (number of sheets ___)

13 Special Handling Instructions and Additional Information

14 GENERATOR S CERTIFICATION I hereby declare that the contents of this consignment are fully and accurately described above and are classified packed marked and labeled and are in all respects in proper condition for transport by highway according to applicable national and international regulations

If I am a large quantity generator I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment storage or disposal currently available to me which minimizes the present and future threat to human health and the environment. OR if I am a small quantity generator I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford

Printed/Typed Name and Title	Signature	Date

TO BE FILLED OUT BY TRANSPORTER(S)

15 Acknowledgement of Receipt of Materials Transporter 1 _____ (company name)

Received by (print name and title)	Signature	Date Received

16 Acknowledgement of Receipt of Materials Transporter 2 _____ (company name)

Received by (print name and title)	Signature	Date Received

17 Acknowledgement of Receipt of Materials Transporter 3 _____ (company name)

Received by (print name and title)	Signature	Date Received

18 Discrepancy Indication Space (note any differences in waste quantities types and/or containers from that reported in Item 8 11)

19 Facility Owner or Operator Certification of Receipt of Hazardous Materials Covered by this Register Except as Noted in Item 18

Received by (print name and title)	Signature	Date Received

275

MINISTRY OF INDUSTRY AND METALLURGICAL RESOURCES (official seal)	**UNIFORM HAZARDOUS WASTE REGISTER FOR WASTES TRANSPORTED OFF SITE (*CONTINUATION SHEET*)**	EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)

GENERATOR

20 Generator's Name	21 Generator s Hazardous Substances and Waste Handling Permit Number	22 Register Number Continuation Sheet Number ____ of ____

23 Addtional Wastes		24 Containers				25 Total Quantity of Waste	26 Projected Method of Final Treatment and Disposal
23a Category Number	23b Category Description	24a Number	24b Type	24c Weight/ Volume	24d Containers Labelled? (yes/no)		

27 Special Handling Instructions and Additional Information

TRANSPORTER

28 Acknowledgement of Receipt of Materials Transporter _____ (company name)

Received by (print name and title)	Signature	Date Received

29 Acknowledgement of Receipt of Materials Transporter _____ (company name)

Received by (print name and title)	Signature	Date Received

FACILITY

30 Discrepancy Indication Space (note any differences in waste quantities, types and/or containers from that reported in Items 23 26)

Appendix 12
Indoor Air Quality Standards

Maximum Limits of Air Pollutants Inside Work Premises According to Industry Type

Limits are given for the concentrations of chemical substances in the air to which workers may be exposed day after day without the development of hazards to health These are divided into three types

Mean-Time Exposure Limit

The limit to which workers may be exposed on each ordinary working day (8 hours) for 5 days a week throughout the period of their working life without the occurrence of any health impairments

Short-Term Exposure Limit

The limits to which workers may be continuously exposed for short time periods The limit for each short-term exposure is for a period of 15 minutes and may not be exceeded at any time during the working period It shall not be repeated more than four times on the same day The period between each short-term exposure and the next one shall be at least 60 minutes

Ceiling Limit

The ceiling limit shall not be exceeded even by a moment

When absorption through skin is a factor in increasing exposure, the remark + skin is recorded next to the limits Concerning dust that merely causes annoyance without tangible harmful health effects the limit shall be 10 mg/m^3 for inhalable particles Concerning simple asphyxiant gases that have no significant physiological effects, the influencing factor shall be the oxygen concentration in the atmosphere, which shall not be less than 18%

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Acetaldehyde	100	180	150	270	
Acetic Acid	10	25	15	37	
Acetic Anhydride	5	20			+ skin
Acetone	750	1780	1000	2375	
Acetonitrile	40	70	60	105	+ skin
Acetylene Tetrabromide	1	15	1 5	20	
Acetyl Salicylic Acid (Aspirin)		5			
Acrolein	0 1	0 25	0 3	0 8	
Acrylamide		0 3		0 6	+ skin
Acrylic Acid	10	30			
Acrylonitrile	2				+ skin
Aldrin		0 25		0 75	+ skin
Allyl Alcohol	2	5	4	10	+ skin
Allyl Chloride	1	3	2	6	
Metal Aluminum and its Oxides	10		20		
Pyro Powders	5				
Soldering Smoke Fumes	5				
Soluble Salts	2				
Alkylates	2				
Amino Pyridine	5 5	2	2	4	
Ammonia	25	18	35	27	
Ammonium Chloride (Fumes)		10		20	
Amyl Acetate- Normal	100	530	150	800	
Amyl Acetate- Secondary	125	670	150	800	

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Aniline and analogous compounds	2	10	5	20	+ skin
Antimony and its compounds (counted as Sb)		0 5			
ANTU		0 3		0 9	
Arsenic and its soluble compounds (counted as Arsenic)		0 2			
Arsenic Gas	0 05	0 2			
Petroleum Asphalt Fumes		5		10	
Atrazine		5			
Azinphos Methyl		0 2		0 6	+ skin
Barium and its soluble compunds (counted as Barium)		0 5			
Benzene (Petrol)	10	30	25	75	
Benzyl Chloride	1	5			
Beryllium		0 002			
Diphenyl	0 2	1 5	0 6	4	
Bismuth Telluride		10		20	
Anhydrous Tetra Sodium Borate		1			
Deca Hydrates		5			
Penta Hydrate		1			
Boron Oxide		10		20	
Boron Tribromide	1	10	3	30	
Boron Trifluoride	1	3			ceiling
Bromine	0 1	0 7	0 3	2	
Bromine Penta Fluoride	0 1	0 7	0 3	2	

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Bromoform	0 5	5			
Butadiene	1000	2000	1250	2750	
Butane	800	1100			
Butyl Acetate- Normal	150	710	200	150	
Butyl Acetate- Secondary	200	950	250	1190	
Butyl Tri Acetate	200	950	250	1190	
Butyl acrylate	10	55			
Butyl Alcohol- Normal	50	150			+ skin
Butyl Alcohol- Secondary	100	305	150	450	
Tru Butyl Alcohol	100	300	150	450	
Butyl Amines	5	15			+ skin
Tetra Butyl Chromate (counted as Chromium Oxide- CrO_3)		0 1			+ skin ceiling
Butyl Lactate	5	25			
Butyl Mercaptan	0 5	1 5			
Cadmium Dusts and Salts (counted as Cadmium)	0 05				ceiling
Cadmium Fumes	0 05				ceiling
Calcium Carbonate				20	
Calcium Hydroxide		5			
Calcium Oxide		2			
Carbaryl		5		10	
Carbofuran		0 1			
Carbon Black		3 5		7	
Carbon Dioxide	5000	9000	15000	27000	
Carbon Disulfide	10	30			+ skin

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Carbon Monoxide	50	55	400	440	
Carbon Tetra Chloride	5	30	20	125	
Carbon Tetra Bromide	0 1	1 4	0 3	4	
Chlordane		0 5		2	+ skin
Chlorinated Camphene		0 5		1	+ skin
Chlorinated Diphenyl Oxide		0 5		2	
Chlorine	1	3	3	9	
Chlorine Dioxide	0 1	0 3	0 3	0 9	
Chloro Acetaldehyde	1	3			ceiling
Chlorobenzene	75	350			
Chloro Diphenyl (42% chlorine)		1		2	
Chloro Diphenyl (45% Chlorine)		0 5		1	
Chloroform	10	50	50	225	
Dichloro Methyl Ether	0 001	0 005			
Chloropicrin	10	45			
Chlorthiophos		0 2		0 6	+ skin
Chromium and its compounds (counted on the basis of Chromium)		0 5			
Hexvalent Chromium Compounds (counted on the basis of Chromium)		0 005			
Volatile Coal Tar Products Soluble in Benzene		0 2			
Cobalt and Cobalt Dust and Fumes		0 1			
Copper Fumes		0 2			

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Cooper Dust and Mists (counted as Copper)		1		2	
Raw Cotton Dust		0 2		0 6	
Cresolate	5	22			+ skin
Cyanide Salts, counted as Cyanide		5			+ skin
Cyanogen	10	20			
Cyanogen Chloride	0 3	0 6			ceiling
Cyclohexane	300	1050	375	1300	
Cyclopentadiene	75	200	150	400	
Cyclopentane	600	1720	900	2580	
D D T		1		3	
Decaborane	0 05	0 3	0 15	09	+ skin
Diazinon		0 1		0 3	+ skin
Diazomethane	0 2	04			
Diborane	0 1	0 1			
Dichloracetylene	0 1	04			ceiling
Ortho Dichloro-benzene	50	300			ceiling
Para-Di-Chlorobezene	75	450	110	675	
1 2 Dichloro Ethylene	200	790	250	1000	
Dichloroethyl Ether	5	30	10	60	+ skin
Dichlorvos	0 1	1	0 3	3	+ skin
Dicrotophos		0 25			+ skin
Dieldrin		0 25		0 75	+ skin
Diethanolamine	3	15			
Di Methyl Aniline	5	25	10	50	+ skin
Dinitro Benzene	0 15	1	05	3	+ skin

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Dinitro Orthocresyl		0 2		0 6	+ skin
Di-Nitrotoluene		1 5		5	+ skin
Dioxin	25	90	100	360	+ skin
Di Propylene Glycol (Methyl Ether)	100	600	150	900	+ skin
Diquat		0 5		1	
Diselvirum		2		5	
Endosulfan		0 1		0 3	+ skin
Endrin		0 1		0 3	+ skin
Epichlorohydrin	2	10	5	20	+ skin
Ethyl Acetate	400	1400			
Ethanol	1000	1900			
Ethanol Amine	3	8	6	15	
Ethyl Benzene	100	435	125	545	
Ethyl butyl ketone	50	230	75	345	
Ethyl Chloride	1000	2600	1250	3250	
Ethylene Dichloride	10	40	15	60	
Ethylene diamine	10	25			
Ethylene Oxide	10	20			
Ethylene Dichloride	10	40	15	60	
Ethylene Glycol Particles		10		20	
Vapor	50	125			ceiling
Ethyl Mercaptan	0 5	1	2	3	
Ferrous Vanadium Dust		1		0 3	
Glass Fiber Dust		10			
Fluorides (counted on the basis of Fluorine)		2 5			

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Fluorine		2	2	4	ceiling
Formaldehyde	2	3			ceiling
Formic Acid	5	9			
Gasoline	300	900	500	1500	
Heptachlor		0 5		2	+ skin
Heptane	400	1600	500	2000	
Hexachloro Cyclopentadiene	0 01	0 1	0 03	0 3	
Hexachloro-Naphthalene		0 20		0 60	+ skin
n Hexane	50	180			
Hexane Isomers	500	1800	1000	3000	
Hydrogen Bromide	3	10			
Hydrogen Cyanide	10	10			ceiling
Hydrogen Fluoride	3	2 5	6	5	
Hydrogen Sulfide	10	14	15	21	
Iodine	0 1	1			ceiling
Iron Oxide Fumes (counted as Iron)	3	5		10	
Isopropyl Alcohol	400	980	500	1225	
Iron Penta Carbonyl	0 1	0 8	0 2	0 16	
Isobutyl Alcohol	50	150	75	225	
Lead Dusts and Fumes- Non Organic (as Lead)		0 15		0 45	
Lead Arsenate		0 15		0 45	
Lead Chromate		0 05			
Lindane		0 5		0 5	+ skin
Liquid Petroleum Gases	1000	1800	1250	2250	
Magnesium Oxide Fumes		10			

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Malathion		10			+ skin
Manganese Dust and Compounds (as Manganese)		5			ceiling
Managanese Fumes		1		3	
Manganese Tetra Oxide		1			
Mercury (as Mercury)					+ skin
Alkyl Compounds		0 01		0 03	
Fumes of all other Compounds except Alkyl		0 05			
Aryl Compounds and Inorganic Compounds		0 1			
Methomyl		2 5			+ skin
Methoxychlor		10			
Methyl Alchohol	200	260	250	310	+ skin
Methyl Bromide	5	20	15	60	
Methylene-Ketone Butyl	5	20			
Methyl Chloride	50	105	100	205	
Methyl Chloroform	5350	1900	450	2450	
Divinyl Methylene					
MDI Isocyanite	0 02	0 2			ceiling
Methylene Chloride	100	360	500	1700	
Ethyl Methyl Ketone	200	590	300	885	
Hydrazine Methyl	0 2	0 35			+ skin
Isocyanite Methyl	0 02	0 05			+ skin
Mercaptan Methyl	0 5	1			
Parathion Methyl		0 2		0 6	+ skin
Mevinphos	0 01	0 1	0 03	0 3	+ skin

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Monocrotophos					
Naphthalene	10	50	15	75	
Nickel Cabonyl (as Nickel)	0 05	0 53			
Nickel Metal		1			
Soluble Compounds of Nickel		0 1		0 3	
Nicotine		0 5		1 5	+ skin
Nitric Acid	2	5	4	10	
Nitric Oxide	25	30	35	45	
p-Nitroaniline		3			+ skin
Nitrobenzene	1	5	2	10	+ skin
Nitro Chlorobenzene		1		2	+ skin
Nitrogen Dioxide	3	6	5	10	
Nitrogen Trifluoride	10	30	15	45	
Nitroglycerine	0 02	0 2	0 05	0 5	+ skin
Nitrotoluene	2	11			+ skin
Octachloro-naphthalene		0 1		0 3	+ skin
Mineral Oil mist		5		10	
Osmium Tetra Oxide (as Osmium)	0 0002	0 002	0 0006	0 006	
Oxalic Acid		1		2	
Oxygen Difluroide	0 05	0 1	0 15	0 3	
Ozone	0 1	0 2	0 3	0 6	
Paraffin Wax Fumes		2		6	
Bronchial (Size of Inhalable particles		0 1			
Parathion		0 1		0 3	+ skin

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Naphthalene Pentachloride	0 5		2		
Pentachlorophenol		0 5		1 5	+ skin
Ethylene Dichloride	50	325			
Phenol	5	19	10	38	+ skin
Phenotheazene		5		10	+ skin
p-Phenylenediamine		0 1			+ skin
Phenyl hydrazine	5	20	1	45	+ skin
Phenyl Mercaptan	0 5	2			
Phosgene	0 1	0 4			
Phosphine	0 3	0 4	1	1	
Phosphoric Acid		1		3	
Yellow Phosphorus		0 1		0 3	
Picric Acid		0 1		0 3	+ skin
Platinum Metal		1			
Platinum Salts (soluble as Platinum)		0 002			
Potassium Hydroxide		2			ceiling
Propionic Acid	10	30	15	45	
Propyl Alcohol	200	500	250	625	+ skin
Pyrethrins		5		10	
Pyridine	5	15	10	30	
Rotenone		5		10	
Selenium Salts		0 2			
Selenium Hexafluoride	0 05	0 2			
Silicon				20	
Silicon Carbide				20	

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Silver Metal		0 1			
Soluble Silver Salts		0 01			
Sodium Azide	0 1	0 3			ceiling
Sodium Disulfite		5			
Sodium Fluoroacetate		0 05		0 15	+ skin
Sodium Hydroxide		2			ceiling
Sodium Metabisulfute		5			
Stilbene	0 1	0 5	0 3	1 5	
Protein Decomposing Enzymes (100% Pure Crystalline Enzyme)		0 00006			ceiling
Sulur Dioxide	2	5	5	10	
Sulfuric Acid		1			
Sulfur Hexafluoride	1000	6000	1250	7500	
Sulfur Monochloride	1	6	3	18	
Sulfur Pentafluoride	0 025	0 25	0 075	0 75	
2, 4 5 - T		10		20	
TEPP	0 004	0 05	0 01	0 2	+ skin
1 1 2, 2 Tetra chloroethane	5	35	10	70	+ skin
Tetra Lead Ethyl (as Lead)		0 1		3	+ skin
Tetryl		1 5		3	+ skin
Soluble Thalium Salts (as Thalium)		0 1			+ skin
Thiram		5		10	
Tin and its Inorganic Compounds (except Tin Oxide) (as Tin)		2		4	

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Tin Organic Compounds (as Tin)	0 1		0 2		+ skin
Titanium Dioxide				20	
Toluene	100	375	150	560	+ skin
Toluene Di Isocyanite	0 02	0 14			ceiling
Orthotoluidine	2	9			
Trichloro acetic acid	1	5			
1 2 4 - Trichloro Benzene	5	40			
Trichloro ethylene	50	270	150	805	
Naphthalene Trichlorine		5		10	
2 4 6 - Trinitrotoluene		0 5		3	+ skin
Trimethyl Benzene	25	125	35	170	
Tri-Phosphate Orthocresyl		0 1		0 3	
Natural Uranium and its Soluble and Non-Soluble Compounds (as Uranium)		0 2		0 6	
Inhalable Vanadium Dusts and Fumes (counted as Vanadium)					
Vanadium Oxide		0 5			
Vinyl Chloride	5	10			
Warfarin		0 1		0 3	
Soldering Fumes		5			
Solid Timber Dusts		1			
Soft Timber Dusts		5		10	
Xylene	100	435	150	655	+ skin
Zinc Chloride Fumes		1		2	

Substance	Exposure Limits Mean Time ppm	mg/m³	Short Term ppm	mg/m³	Remarks
Zinc Oxide Fumes		5		10	
Zirconium Compounds (counted as Zirconium)		5		10	

Limits of Exposure to Mineral Dusts

Silica- Silicon Dioxide

A **Crystalline**

- Quartz limit

$$= \frac{\text{300 million particles per cubic foot}}{\text{percentage of Quartz concentration in dust} + 10}$$

- Inhalable (less than 5 microns) **dust limit**

$$= \frac{\text{10 mg per cubic meter}}{\text{percentage of Quartz concentration in dust} + 3}$$

- Crystobalite and Tridimite limits

Half the value calculated for Quartz should be used

B **Non-Crystalline**

- Limit 20 million particles per cubic foot

Asbestos

Limits for asbestos dusts with fiber lengths greater than 5 microns

Amosite	0 5 fibers per cm^3 of air
Crocidolite	0 2 fibers per cm^3 of air
Other Kinds	2 fibers per cm^3 of air

Talc

Fibrous Type	2 fibers per cm^3 of air
Non-Fibrous Type	20 million particles per cubic foot of air

Mica

20 million particles per cubic foot of air

Natural Graphite

15 million particles per cubic foot of air

Coal

- Inhalable Dust

If the percentage of silica is less than 5%

= 20 million particles per cubic foot of air

If the percentage of silica is greater than 5%

$$= \frac{10\ mg/m^3}{\text{Percentage of silica in inhalable dust} + 2}$$

Limits for Nuisance Causing Dust

If less than 1% quartz

Limits for total dust	= 30 million particles per cubic foot = 10 mg per cubic meter
Limits for inhalable dusts	= 5 mg per cubic meter

If the percentage of quartz exceeds 1%, the limits for quartz are applicable

Examples of nuisance dusts

- Alumina
- Calcium Carbonate
- Marble Limestone
- Calcium Silicate
- Portland Cement
- Synthetic Graphite
- Gypsum - Calcium Sulfate
- Magnesium Sulfate
- Kaolin
- Metallurgical Wool Fibers
- Zinc Oxide
- Cellulose Fibers
- Mists of Vegetable Oils - Except Irritating Oils

Limits for Raw Cotton Dust

Mean Time limit	= 0 2 mg/m^3
Short term limit	= 0 6mm/m^3

Limits for Carcinogens

Substance	Limits	Remarks
Acrylonitrile	2 ppm	+ skin
Asbestos	See mineral dusts	
Bis Chloro Methyl Ether	0 001 ppm	
Chromate (Clearing Chromate Ore)	0 05mg/m^3	as Chromium
Hexvalent Chromium - some compounds that are non-soluble in water	0 05mg/m^3	as Chromium
Volatile Materials in Coal Tar	0 2mg/m^3	as materials soluble in benzene
Nickel Dusts and Fumes	0 1mg/m^3	as Nickel
Acidified Nickel Sulfate	5 ppm	
Vinyl Chloride	10 ppm	
Benzene	2ug/m^3	
Beryllium	5 ppm	+ skin
Carbon Tetrachloride	10 ppm	
Chloroform	0 1 ppm	+ skin
Hydrazine	5 ppm	+ skin
Hydrazine Vinyl	0 5 ppm	+ skin
Hydrazine Dimethyl (1 1)	0 2 ppm	
Dimethyl Sulfate	0 1 ppm	+ skin
Hydrazine Methyl	upper limit	+ skin
Ethylene Oxide	1 ppm	
Formaldehyde	1 ppm	
Hexa Chlorobutadiene	0 02 ppm	
Methyl Iodide	2 ppm	+ skin

Substance	Limits	Remarks
2- Nitrpropane	10 ppm	
beta- Propiolactone	0 5 ppm	
Aminopropylene	2 ppm	+ skin
o-Tolidine	2 ppm	+ skin
Vinyl Bromide	5 ppm	
Vinyl Dioxide	10 ppm	
Cyclohexene		

Carcinogenic Substances with No Known Limits that Workers are Not Allowed to Touch or Deal with in Any Way

1 Octaphenenyl Amino (Parasenyl Amino)
- Benzidine
- Chloromethyl ether
- Beta-naphthylamine

2 Dinitro Phenyl

Industrial Materials or Operations Suspected of being Carcinogenic

Amitrole
Production of Antimony Trioxide
Production of Arsenic Trioxide
Benzo (A) Pyrene
Production of Cadmium Oxide
3 3 - Dichloro Benzidine
Carbamyl Chloride Dimethyl
Ethylene Dibromide
Phosporamide Hexamethyl
N - Nitrosodimethylamine
N - Amino Phenyl Beta Naphthol

Ventilation in Work Premises

Ventilation aims to maintain the concentration of pollutants below permissible maximum limits The provision of adequate ventilation inside works premises shall be accomplished in two ways

- General ventilation
- Local ventilation

General Ventilation

General ventilation is a suitable method for the treatment of solvent fumes of low toxicity It is not suitable for highly toxic substances or for pollutants that are irregularly emitted or in large quantities It is generally not suitable for dealing with dust and fumes

General ventilation systems shall be deigned after identifying the volumes of evaporated substances and computing the required volumes of air that need to be moved to cause a change of air that is sufficient to maintain concentrations of pollutant substances below the maximum permissible limits The technical engineering aspects shall be taken into consideration when establishing the ventilation system Specialized engineers shall supervise the execution of this system and shall use the recommendations set forth in the following reference book

> *American Conference of Governmental Industrial Hygienists Committee on Ventilation Industrial Ventilation A Manual of Recommended Practice* 13th ed A C G I H , Lansing MI 1974

Local Ventilation

Local ventilation is more effective in controlling different types of pollutants It consists of a hood a set of pipes and an air purifying apparatus that cleans the air before its emission to the outside with a fan to keep the air in motion Whatever the design of the hood might be the speed of air at the pollution point source should be sufficient to remove it before being dispersed into the work premises

Technical and engineering aspects should be taken into consideration in designing the local ventilation system and its implementation by specialized engineers making use of the above-mentioned reference for general ventilation

Whenever general or local ventilation systems are used, maintenance should be supervised periodically by specialized engineers Efficiency measurements should be carried out during the periodical maintenance

Appendix 13
Sample Solid Waste Management Log

EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (official seal)	**SOLID WASTE MANAGEMENT LOG**	10TH OF RAMADAN MUNICIPAL AUTHORITY (official seal)

NAME OF LICENSED ESTABLISHMENT	ADDRESS	CONSOLIDATEDENVIRONMENTAL LICENSE NUMBER	DATE OF ISSUE

INCINERATOR ON SITE (check one)? ☐NO ☐YES (IF YES, DATE APPROVED BY MUNICIPAL AUTHORITY _____)

INSTRUCTIONS This form should be kept on file with the Consolidated Environmental License The form should be updated on a weekly basis by the Environmental Management Officer or his/her designee This form applies to non-hazardous solid wastes only Approximations of weight volume and constituents, may be made based on visual inspection or actual measurement Per Law Number for of 1994 (Law for the Environment"), the 10th of Ramadan Municipal Authority retains the right to review this form and ask questions about its content during routine or unplanned inspections

WEEK ENDING (date)	VOLUME GENERATED (m3)	TOTAL WEIGHT (kg)	PRIMARY CONSTITUENTS (approximate %)							METHOD OF DISPOSAL			EMO INITIALS
			Organic material	Paper/ Paperboard	Plastics	Metals	Construction/ demolition waste	Soil	Other (specify)	RECYCLED (kg)	INCIN-ERATED (kg)	SENT TO LANDFILL (kg) (write name of landfill in box below)	

Appendix 14
EIA Forms and Guidelines

This appendix contains two forms

- Environmental Screening Form "A"
- Environmental Screening Form ' B"

and

- Guidelines for Complete Environmental Impact Assessment for Industrial establishments

Environmental Screening Form "A"

General Information

Project title

Type of project (Residential, Commercial, Tourism, Industrial other)

Project developer/applicant

Name of owner & contact person

Address

Telephone No Fax No

Estimated capital investment, LE

Competent licensing authority

New project or extension of existing project

Project Phases and Expected Starting Date

Construction
Operation
Future expansion

Brief Project Description

Production capacity
Raw materials
Sources of energy

Project Site Location

Address
Total project area m^2

Any Additional Information

Certification

I hereby certify that the information given is accurate and true to the best of my knowledge, and in case of any consequent changes, prompt notification will be made to the EEAA

Certified by

I D No /Passport No

Reference **Date**

Environmental Screening Form "B"

Information to be Completed by EEAA Officials	
Receipt Date	Date of Application
Serial Number	

General Information

Project title

Type of project (Residential Commercial, Tourism, Industrial other)

Investor/applicant

Project developer/applicant

Reference

Address

Telephone No Fax No

Estimated capital investment LE

Competent licensing authority and address

New project or extension of existing project

Project Phases and Expected Starting Dates

Construction

Operation

Future expansion

Brief Project Description

Project's basic features

Objectives

Justification

Basic components

Technology systems (accompanied as much as possible with layout and operational charts and diagrams showing inputs & outputs, including wastes)

Alternatives Considered

Sites

Technologies

Designs

Materials

Are there available studies of similar projects? (indicate source)

Project Location and Site

Address

Total area m^2

Please attach a detailed map with a suitable scale to indicate clearly the site transportation routes and pipelines its boundaries and neighboring uses

Brief Description of the Construction Phases and Basic Construction Methods

Inputs During Construction and Operation

In case of industrial projects -- raw materials for other projects state type of resources see Table 1

Table 1
Inputs During Construction and Operation Phases

Operation phase	Construction phase	Inputs
		Water - sanitary
		Water - process
		Water - other uses
		Energy/electricity
		Energy/renewable sources
		Manpower
		Other

Outputs During Construction and Operation Phases

End products (for industrial projects) or other outputs (for all projects) see Table 2

Table 2
Outputs During Construction and Operation

Operation phase	Construction phase	Emissions, discharges and wastes	Type of output
		Sulphur dioxide	Air
		Particulate matter	Air
		Smoke	Air
		Odor	Air
		Noise	Air
		Others	Air
		Sewage	Water
		Industrial waste	Water
		Domestic waste	Solid waste
		Industrial waste	Solid waste
		Hazardous waste	Solid waste

Other information deemed important particularly with regard to safeguarding personnel and environment, e g safety and firefighting facilities

Brief Description of the Environment (Baseline Information)

General area description and most important features

Present infrastructure and services

Fragile or sensitive ecosystems (critical or high-valued ecosystems) that are present

Description of archeological & historical areas

Description of protected areas

Description of recreational and tourism areas

Preliminary Analysis of Impacts

Air Quality (potential effects on air quality)

Construction phase

Operation phase

Site

Neighboring area

Transboundary

Clarify whether projects or sites that are considered sensitive exist nearby the project sites (as hospitals schools residential areas etc)

Water Quality

Will the activity cause a significant change to the water availability, use hydrology drainage temperature or quality?

Are there existing hazard probabilities? Explain the type quantity and impact

Will the activity affect surface water use?

Fisheries

Tourism and recreation

Soil Quality

Would the activity provoke a significant change on land use, landscape, fertility, vegetation cover, biodiversity, or quality?

Please identify the impact of changes of soil quality on different activities

Please explain if there are any other potential or significant impacts resulting from this activity

Mitigation Measures

Air Emissions

Wastewater

Solid and Hazardous Waste

Other Mitigation Measures

Inter-institutional and Public Involvement

Is there any contact with public authorities or others concerning the project?

Certification

I hereby certify that the information given is accurate and true to the best of my knowledge and in case of any consequent changes prompt notification will be made to the EEAA

Certified by

I D No /Passport No

Reference **Date**

Guidelines for Complete Environmental Impact Assessment for Industrial Establishments

Introduction

The present guidelines describe a number of stages and required information that the ministry/agency can use to develop specific Terms of Reference for a full EIA of an industrial establishment

1 Description of the Proposed Project

Provide information on the following

- Location of all project-related sites, transportation corridors, etc
- General layout of facilities at establishment-related sites
- Maps with appropriate scales to illustrate the general setting of establishment sites and transportation corridors, as well as surrounding areas likely to be environmentally affected These maps shall include topographic contours as available as well as locations of major surface waters roads towns, and administrative boundaries

Describe processes

- Flow diagrams of processes/operations batch or continuous, type of machines
- Raw materials and auxiliary substances (water consumption), raw material storage
- Power supply
- Pre-construction construction and operation and maintenance activities staffing and support facilities and services
- Daily/weekly operating hours
- Finished goods production (unit per year) capacity
- Water production (oil and chemicals waste) waste storage
- Wastewater with effluents quantified
- Air emissions quantified
- Noise
- Reclamation (e g return of the land to a natural state) activities such as in mining establishments
- Required off-site investments
- Life expectancy for major components

2 Description of the Environment

Assemble, evaluate, and present baseline data on the environmental characteristics of the study area Include information on any change anticipated before the project commences Such "baseline' conditions are those expected to exist in future, even if the proposed establishment does not take place In relation to baseline studies it is important to avoid compiling irrelevant data

The following issues should be considered (For industrial areas, where these issues have been studied, further baseline data might not be necessary for an individual establishment)

2 1 Physical/Chemical Environment

- Geology geological layers seismic history topography oils
- Climate and meteorology, prevailing winds
- Ambient air quality, major polluters in the area
- Surface water hydrology, flood hazards
- Water resources
- Coastal parameters
- Receiving water quality, ability to assimilate effluent discharges and maintain water quality standards for desired uses
- Other significant pollutant sources in the area and prospects for their mitigation

2 2 Biological Environment

- Flora and fauna rare or endangered species within or in areas adjacent to the establishment
- Sensitive habitats
- Species of commercial importance affected by the establishment

2 3 Sociocultural Environment (include both present and projected aspects when appropriate)

- Nearby communities year-round and seasonal land use, planned development activities community structure population employment and labor market, income distribution goods and services recreation public health
- Cultural properties archeologically and historically significant sites
- Indigenous peoples and traditional tribal lands

3 Legislative and Regulatory Considerations

Describe pertinent regulations and standards governing environmental quality, health and safety protection of sensitive areas protection of endangered species, siting, land use control, etc , at the international, national, regional and local levels Is the establishment in accordance with national, regional local development and management plans?

4 Determination of the Potential Impacts of the Proposed Project

Identify all significant changes which the project would incur These would include but not be limited to, changes in employment opportunities, wastewater effluents air emissions, solid wastes, land use, infrastructure, exposure to disease, risk of industrial hazards noise, traffic, and sociocultural behavior Also, assess the impacts from changes caused by the project on baseline environmental conditions In this analysis, distinguish between positive and negative impacts direct and indirect impacts and immediate and long-term impacts Identify the impacts that are unavoidable, irreversible, or imminent Wherever possible, a quantitative description of impacts in terms of environmental costs and benefits is useful

Impact analysis for industrial projects should be divided between construction impacts and operation impacts For industrial manufacturing plants there are potential construction impacts of housing construction works and operation impacts from process operations (e g , stack emissions effluent discharges noises industrial hazards)

Assess the risk of occurrence of potential industrial hazards (e g accidental spills fires explosions impoundment structural failure gaseous releases) Consider the ability of the community to provide emergency response services for potential industrial hazards Also it is necessary to consider the ability of the establishment and the community to provide medical services to respond to emergencies

Based on the above an assessment of the potential impact follows

The beginning stage is characterization of the extent and quality of available data explaining significant information deficiencies and any uncertainties associated with the prediction of impacts For information that could not be obtained until after the project execution commences provide TOR for studies to monitor operations over a given period and modify designs and/or operational parameters based upon updated impact analysis

5 Alternatives to the Proposed Project

Describe the alternatives that were examined in the course of developing the proposed project The concept of alternatives extends to siting, design, fuels, raw materials and technology selection, construction techniques and phasing, and operating and maintenance procedures Include the "no action" alterative

Alternatives should include the following

- The "no action" alternative
- Alternative means of meeting industrial product requirements
- The alternative of upgrading existing facilities
- Alternative routes and sites
- Alternative design and alternative methods of construction

Describe how alternatives compare in terms of potential environmental impacts

- Capital and operating costs
- Suitability under local conditions and monitoring requirements

When describing the impacts, indicate which are irreversible or unavoidable and which can be mitigated

To the extent possible it is necessary to quantify the costs and benefits of each alternative and incorporate the estimated costs of any associated mitigating measures A comparative description of the reasons for selecting the proposed project over the other alternative should be prepared

6 Development of a Management Plan to Mitigate Negative Impacts

For the proposed establishment a recommendation of feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels is required Also include measures for emergency response to accidental events (e g ruptures leaks tanker truck accidents fires explosions) as appropriate Estimate the impacts and costs of these measures and of the institutional and training requirements to implement them Consider compensation to affected parties for impacts that cannot be mitigated Prepare a management plan including work programs, budget estimates maintenance schedules, staffing and training requirements and other necessary support services to implement the mitigating measures

7 Development of a Monitoring Plan

A detailed plan to monitor the implementation of mitigating measures and the impacts of the project during construction and operation should be prepared Include in the plan an estimate of capital and operating costs

8 Secure Interagency Coordination and Public/NGO Participation

Secure coordination with other government agencies involved in EIA, obtain the views of local NGOs and affected groups, and keep records of meetings and other activities communications and comments

9 Environmental Assessment Report

Provide an environmental assessment report that is concise and limited to significant environmental issues The main text should focus on findings conclusions, and recommended actions, supported by summaries of data collected and citations for any references used in interpreting those data

Also, organize the environmental assessment report according to the outline below

1 Executive Summary
2 Policy, Legal and Administrative Framework
3 Description of the Proposed Project
4 Description of the Environment
5 Significant Environmental Impacts
6 Analysis of Alternatives
7 Mitigating Management Plan
8 Monitoring Plan
9 Interagency and Public/NGO Involvement
10 Non technical Summary of the Report for Political and Public Use
11 List of References
12 Appendices
List of Environmental Assessments Prepared
Records of Interagency and Public/NGO Communications
Data from Unpublished Reference Documents