






National Solid Waste Management Programme (NSWMP) Egypt

Working Document: ESIA Standards

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ANNEXES

List of Abbreviations

BP Bank Procedures
CAA Competent Administrative Authority
CAP Compliance Action Plan
DANIDA Danish International Development Agency
EA Environmental Assessment
EEAA Egyptian Environmental Affairs Agency
EHS Environmental Health and Safety
EIA Environmental Impact Assessment
EPAP Egypt Pollution Abatement Project
ESIA Environmental and Social Impact Assessment
EMP Environmental Management Plan
ER Executive Regulations
GP Guidelines Procedures
IFC International Final Corporation
METAP Mediterranean Environmental Technical Assistance Program
MSEA Ministry of State for Environmental Affairs
NGO Non Governmental Organization
OP Operational Policy
RBO Regional Bank Office
SWM Solid Waste Management
TOR Terms of Reference
WB World Bank

1 THE EGYPTIAN LEGAL AND ADMINISTRATIVE FRAMEWORK FOR EIA

1.1 LEGAL PROVISIONS

The legal basis for EIA was established by Law No 4 of 1994, the Law on Protection of the Environment. It is implemented through its Executive Regulations issued by Prime Ministerial Decree No. 338 of 1995, modified by decree no 1741/2005. These came into full force in 1998. Law No. 4 of 1994 and its Executive Regulations require carrying out an EIA for new projects and for the expansion and renovation of existing infrastructure. Provisions within the law also cover pollution control of existing activities, including the monitoring of environmental impacts by project proponents who must maintain environmental registers as specified by the Egyptian Environmental Affairs Agency (EEAA).
The Competent Administrative Authority (CAA) should assess the environmental impacts of the facilities where they review the documents submitted by the project proponent and then forward it to EEAA. EEAA is responsible for review the EIA and notify the CAA of its opinion and required conditions to be taken in order to ensure environmental protection.

1.2 ADMINISTRATIVE FRAMEWORK

Sectoral ministries and governorates are the relevant administrative authorities for EIA in Egypt, as they possess the executive powers in relation to development authorization. Additionally, they are required by Law 4 and its executive regulations to conduct project screening. Under the initial implementation of Law 4 and its executive regulations, the screening of all projects was carried out by the EEAA Central EIA Department on the basis of screening forms submitted by the relevant administrative authorities. Subsequently, the system became sufficiently well established to permit a degree of decentralization1.

1.3 GUIDELINES AND PROCEDURES

General guidelines for EIA were issued by the EEAA in 1995 with assistance from the Danish International Development Agency DANIDA. They describe in detail the procedures for EIA as identified in Law 4 and its executive regulations. The updated EIA Guideline has been prepared in cooperation with the World Bank and with the support of the Environmental Sector Program. The Ministry has reviewed and modified the EIA system adopted with numerous developed countries and World Bank system adopted in projects financing. The guidelines and procedures became effective in July 2009.
The EIA procedural guidelines include: (a) timing and processing procedures, (b) screening and scoping guidelines, (c) sectoral issues to be considered, (d) definition and requirement of the environmental management plans (EMPs), (e) review of EIA and conflict resolution mechanisms, (f) powers of the EEAA to further regulate the EIA process, and (g) lists of activities subject to mandatory EIA. According to these guidelines, all projects are to be screened for their potential impacts and classified into: (a) category C; (b) category B; or (c) category A.
The guidelines describe the screening method which is based on three lists of project types: white list projects (category A) with minor environmental impacts; gray list projects (category B) which may result in substantial environmental impacts, and black list projects (category C) for which complete EIA is mandatory due to the magnitude and nature of the potential impacts. The guidelines include two screening forms, form A for white list projects and form B for gray list projects. For gray list projects, the EEAA may require a “scoped EIA”, whose scope is specified by EEAA on the basis of the information presented by the developer in form B.
The Egyptian system has, since its establishment by law 4/1994, prepared non-exhaustive guiding lists for projects of the three categories. EEAA reviews the lists and forms periodically

[1] Role of CAA in the EIA system is presented at Guidelines Principles and Procedures for EIA, 2nd edition, January 2009, chapter 3 and list of some of the CAA is presented in Annex 3.

whenever required and takes needed actions based on accumulated experience and in consultation with concerned entities.
Table 1 gives an overview of possible waste management projects and the categories they are most likely allocated to. It has to be added that especially under international standards (e.g. IFC, World Bank) the type of project is not necessarily determining the category. More important are the scope of the project, the impacts (e.g. will there be resettlement or not) and the location of the project (e.g. situated in a critical habitat area or not).
Concerning hazardous waste Egyptian and international standards correspond in the project categories. Solid waste management facilities would be categorized as B in Egypt, but might be categorized as A according to international standards.

Table -1 Categories for Waste Management Projects

Egyptian Legislation		International Standards	
Category	**Projects**	**Category**	**Projects**
C	Sanitary landfills Recycling of batteries, including mobile phone batteries Projects/sites of sludge treatment Central incinerator serving several hospitals or health care facilities (e.g. El Qasr Elainy Hospital Incineration) Facilities involved in solid or liquid hazardous waste recycling or reuse Hazardous wastes treatment or disposal facilities (e.g. Al Nasarya Hazardous Landfill)	**A**	Waste-processing and disposal installations for the incineration, chemical treatment or landfill of hazardous, toxic or dangerous wastes. Municipal solid waste processing and disposal facilities* Project with potential significant adverse environmental or social risks and/or impacts that are diverse, irreversible, or unprecedented.
B	Facilities involved in recycling, reuse and processing liquid or solid non-hazardous wastes (e.g. MSW recycling in Giza Governorate) Industrial waste treatment units for individual facilities	**B**	Projects with potential limited adverse environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.
A	-	**C**	Minimal or no adverse impacts

*depends on the financial institution (i.e. EBRD lists this as a category A project, whereas the EU does not list it in their Annex I, but in Annex II)

In addition, EEAA – EIA general guidelines state that for some category B projects, EEAA might request an EIA study limited to certain components, impacts or processes of the project in accordance with the Terms of Reference prepared by EEAA, which should be published on EEAA's website.
These general guidelines also include a general outline of the content of a full EIA report and ten brief sectoral guidelines which define the content of EIA reports for projects that require a full EIA. These sectoral guidelines were developed as part of the framework of the "Organization Support Program" (OSP) funded by DANIDA and the "Support for Environmental Assessment and Management" (SEAM) project funded by the UK Department for International Development (DFID).

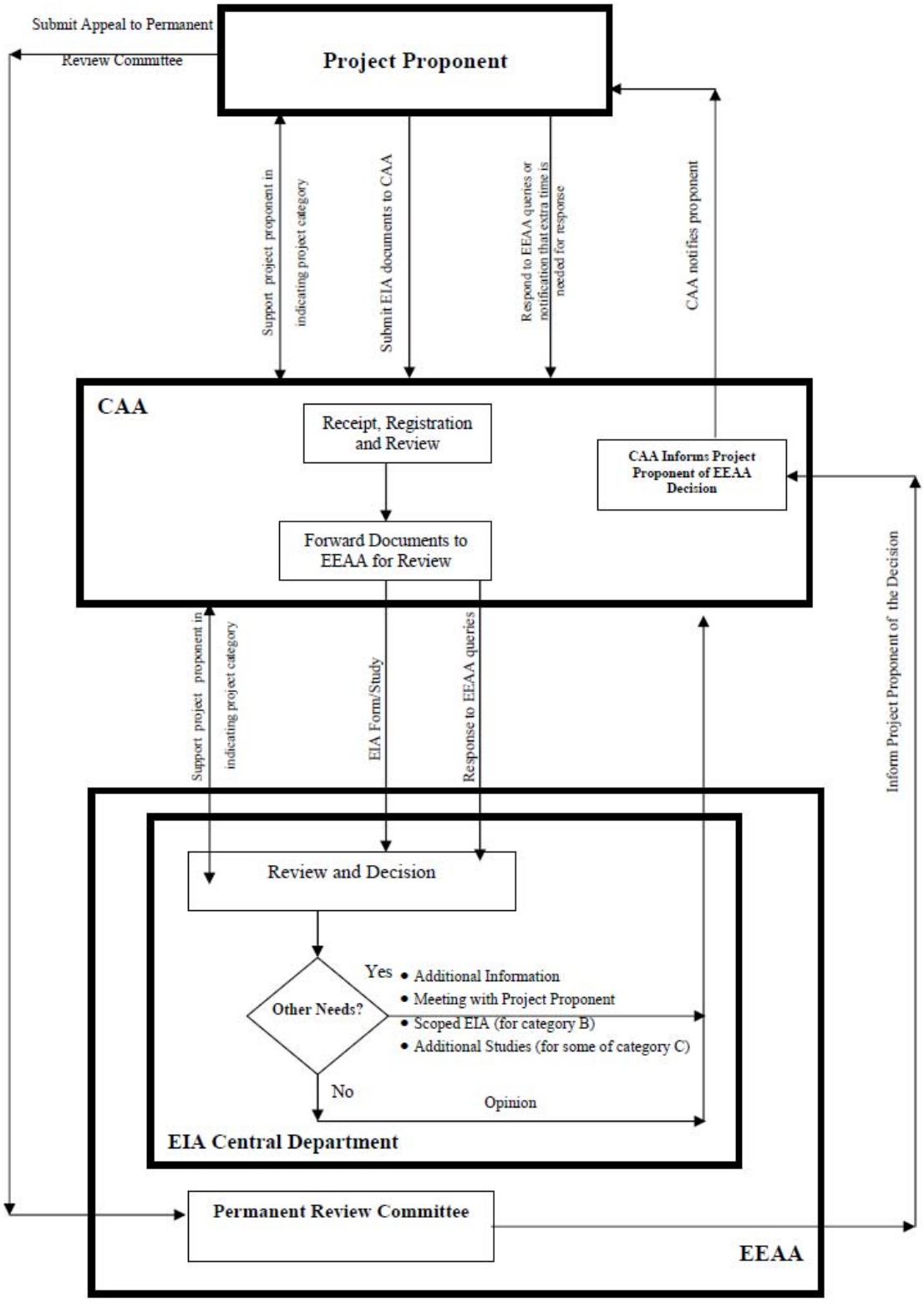
1.4 EIA PROCEDURES

Each of the three categories has specific requirements for impact assessment, yet they have similar processing procedures (as shown in Figure 1):

- The CAA directs the project proponent, on his request, to the correct project category using the illustrative lists and informs him/her of the related requirements. In case the project is not included in the EIA indicative lists, consultation with EEAA is undertaken in order to identify the project category. EEAA will have the final decision regarding the classification and should provide the proponent with its opinion in writing via the CAA.
- The project proponent applies to the CAA, before any construction work is initiated, with a letter of intent and attaches four copies of the required documents (forms/study) in Arabic, the official language for the review. A CD with the study is also submitted for category C projects. If an English version of the EIA exists, it should be submitted as well.
- The CAA checks the EIA documents to ensure that they are complete, that the selected category is correct, that the project is compatible with the general plans for the CAA and that the submitted information is in compliance with what is required. If the project is not correctly categorized, the CAA directs the proponent to the right category and requests the resubmittal of the required documentation.
- The CAA formally forwards three copies of the documents to EEAA for review and evaluation. Such forwarding of the EIA documents is considered a non-objection to the project according to criteria other than environmental ones.
- EEAA reviews and evaluates the documents and provides its remarks and conditions needed for mitigation and minimizing negative impacts. EEAA notifies the CAA of its decision (approval, objection or information requests, etc.) within 30 days of EEAA's receipt of completed documents; otherwise it is considered an implicit approval. For projects deemed of high impacts by EEAA, an independent advisory entity will be considered by EEAA for additional advice. The review could require site inspection or meetings with the proponent or his delegate to discuss specific points of the study.
- EEAA registers the documents, its opinion and recommendations in the EIA register at EEAA and notifies the CAA of its decision. The CAA officially notifies the project proponent of the results via a registered letter with an acknowledgment of receipt and communicates the final result of the review. The result can be:
    - An approval of the EIA form/study, while indicating the environmental requirements (specified in the approval), with which the project proponent should comply.
    - An objection of the EIA and a recommendation to refuse the project. Reasons for objection are included and are usually related to environmental reasons related to the project and the maximum carrying capacity for pollution in the project area.
    - Further requests from the proponent

- Additional information or clarifications could be requested from the project proponent. The date of the receipt of the needed information to EEAA via the CAA is considered a new review process with a 30 days period.
- For some category B projects, EEAA might request an EIA study limited to certain components, impacts or processes of the project in accordance with the Terms of Reference prepared by EEAA.
- In case of some category C projects, EEAA could request additional studies such as a risk assessment or cumulative pollution load (information to be provided through EEAA) to ensure compliance with allowable limits.
- The CAA follows-up and ensures the implementation of the EEAA decision and related conditions.

Figure 1 EIA System Procedure



2 WASTE MANAGEMENT IN EGYPT

2.1 INSTITUTIONAL FRAMEWORK

Waste management responsibilities are going through different governmental organizations in Egypt. The Central Government establishes policies, legislations and enforcement. For example, the Ministry of State for Environmental Affairs (MSEA) provides an overview and annual report on its activities in all environmental aspects2. While the technical arm of MSEA, the Egyptian Environmental Affairs Agency (EEAA) provides guidelines and policies to deal with solid waste, EEAA has provided the National Strategy for Municipal Solid waste in 2000, in order to provide integrated solid waste management in Egypt. In addition, MSEA and EEAA host a General Directorate for solid waste management. The mandate of this directorate is the formulation of policy directives and the provision of guidelines for proper management of municipal waste. The Ministry of Finance is responsible for approving budget allocations for operational costs. Furthermore, a steering committee comprising of MSEA, the Ministry of finance and the Ministry of Local Development overlooks implementation issues related to waste management.

Municipal solid waste (MSW) collection and transportation services are the responsibility of the governorates and municipalities. These services are either carried out directly by the municipalities or through private sector, informal sector (known as Zabbaleen), and non-governmental organizations (NGOs). For industrial waste or Construction and Demolition waste (C&D), the collection and transportation is usually carried out by either the informal sector or the private sector. Finally, the treatment and disposal of waste is supervised by municipalities, either directly or through private company[3].

2.2 LEGAL FRAMEWORK

The legal framework regulating solid waste management (SWM) in Egypt is multi-faceted and falls under the jurisdiction of different ministries. Egypt does not have a SWM law. SWM legal framework is scattered in many pieces of legislation. The two most significant pieces of legislations are Law No. 38/1967 on General Public Cleaning and Law No. 4/1994 for the Protection of the Environment and their amendments.
Some legislation has been updated until year of 2010. These are:

- Law No. 10/2005 establishing a solid waste collection fee system;
- Prime Minister Decree No 1741/2005 amending the Executive Regulations of Law 4/1994 and covering regulations for the selection of sites for recycling and land filling and equipment requirements for waste collection and transfer;
- Law 9/2009 amending Law 4/1994 for regulating collection, treatment and disposal of hazardous waste;
- Presidential Decree No 86/2010 regulating the closure of existing dumping sites and the landfill at Greater Cairo and allocation of five new sites outside the residential and commercial belt of Greater Cairo.

2.3 CLASSIFICATION OF WASTE

Waste in general is controlled by a diverse number of legislations and regulations through different governmental organizations. Most of these laws and regulations focus on the management of solid waste. In Law 4/1994, only Article 39, and Article 41 in its Executive Regulations (which was amended by Prime Minister Decree No 1741/2005) provide information on the construction and demolition waste. Non-hazardous industrial waste is not recognized as

[2] MSEA(2009) Egypt state of environment, 2009. The Ministry of State for Environmental Affairs (MSEA)
[3] SWEEPNET (2010) Country Report on the solid waste management: Egypt. The regional solid waste exchange of information and expertise in Mashreq and Maghreb countries (SWEEPNET)

a different category within the above laws and regulations. In addition, the hazardous waste (industrial and healthcare waste) is defined and its storage collection, transport and final disposal by Law 4/1994 and its amendments. There is no mention of electronic waste (e-waste) in any of the Egyptian Laws and Regulations.

2.4 DISPOSAL OF WASTE

Law 4/1994 and its amendments prohibit illegal dumping and open burning of waste practices other than in the designated areas. The places appropriate for receiving transported wastes, the competent local for the site determination area are also defined within the Executive Regulation of Law 4/1994. Within the designated dumping and landfill areas, Zabbaleen are usually present to source out valuable materials to be sold through the informal market. In addition, Law 4/1994 and its Executive Regulations provide guidelines for the healthcare waste incineration, as well as for hazardous waste landfill. The only hazardous waste landfill was in collaboration with EEAA and Governorate of Alexandria and the Ministry for Foreign Affairs of Finland. The landfill is based in Alexandria, and follows the international standards for hazardous waste landfill.

2.5 LAW ENFORCEMENT AND PENALTIES

Law 38/1967 authorizes Law Enforcement with the implementation of the law by competent employees in local government, as identified by decree from the Minister of Justice. In 1976, the Minister of Justice issued decree number 3137, which identified the local government employees as having authority to enforce Law 38/1967.
In addition, Law 38/1967 specifies penalties for violating the law. It establishes a fine up to LE 100 for violating the terms of the law, although fines can be higher if authorized by other laws. Law 4/1994 and its amendments provide penalties for open burning of waste, illegal dumping of waste and unauthorized waste management facilities from LE 1000 to LE 20,000.

3 INTERNATIONAL STANDARDS

World Bank Operational Policies and IFC Performance Standards vary slightly, but are generally aligned in terms of broad expectations of what constitutes an acceptable ESIA process.

The following IFC Performance Standards on Social and Environmental Sustainability are relevant to the Project include:

- OP 4.01 - Environmental Assessment;
- OP 4.02 - Environmental Action Plans;
- OP 4.04 - Natural Habitats;
- OP 4.11 - Physical Cultural Resources;
- OP 4.12 - Involuntary Resettlement.

The following IFC Performance Standards are relevant to the Project:

- Performance Standard 1: Social and Environmental Assessment and Management System;
- Performance Standard 2: Labour and Working Conditions;
- Performance Standard 3: Pollution Prevention and Abatement;
- Performance Standard 4: Community Health, Safety and Security;
- Performance Standard 5: Land Acquisition and Involuntary Resettlement;
- Performance Standard 6: Biodiversity Conservation and Sustainable Natural Resource Management;
- Performance Standard 8: Cultural Heritage.

It has to be noted that OP 4.10: Indigenous Peoples and IFC "Performance Standard 7: Indigenous People" (PS7) were not included. OP 4.10 and PS7 are very specific on ethnic or social group of people within the national context. In Egypt, it is unlikely to find that kind of ethnic categorization.
The KfW Entwicklungsbank's "Sustainability Guideline" (Guideline of KfW Entwicklungsbank for conducting business in an environmentally, socially and climate friendly manner) assesses not only environmental and social impacts, but also has a section specific to climate adaptation and protection.

Concerning waste management the World Bank and IFC both use the General Environmental, Health and Safety (EHS) Guidelines, which address waste management in Section 3. Furthermore, World Bank and IFC provide Industrial Sector EHS Guidelines for Waste Management Facilities. The KfW Entwicklungsbank bases its assessment on the EHS Guidelines as well. Additionally, the climate assessment for waste management is subject to the "*Sektorinformation zur Klimaprüfung der KfW Entwicklungsbank - Abfallwirtschaft & Ressourceneffizienz*" (Sector information for the climate assessment of the KfW Entwicklungsbank – Waste Management and Resource Efficiency).

4 GAP ANALYSIS OF EGYPTIAN ESIA LEGISLATION AGAINST INTERNATIONAL STANDARDS (WORLD BANK, IFC AND KFW ENTWICKLUNGSBANK)

4.1 GAP ANALYSIS – ESIA

A detailed comparison of international ESIA standards (World Bank, IFC, KfW Entwicklungsbank) with the Egyptian standards, especially legislation concerning environmental and social assessment, can be found in Annex A (Table 2).

Table 2 lists the findings of the gap analysis for the general ESIA standards. The necessary actions that need to be taken in order to fill the gaps are explained in more detail in chapter 4.

Table -2 Gap Summary – ESIA

Issue	Gap	Action
Scoping	The scope is based only on input usage by the facilities, without any mention to the effect on the social environment	Identify the social impacts for category B & C during scoping
Public Consultation / Stakeholder Engagement	Public consultation in Egypt is limited to Category C projects and then only twice (during scoping and once the draft EIA is prepared)	For category C and B projects identify, inform and involve stakeholders (NGOs, affected communities etc.) as early as possible (e.g. according to IFC's Handbook "Stakeholder Engagement: A Practice Handbook for Companies Doing Business in Emerging Markets") Long term: Amend Article 13 with adding public consultation and/or NGOs for Category B & C applications
Documenta-tion of Public Consultation Process	No procedure to document and assess public consultation process	Document the public consultation process
Grievance Mechanism	No specific procedures for Grievance Mechanism within the EIA application	As part of the public consultation process a grievance mechanism has to be established for the project affected people (see also IFC's Stakeholder Engagement Handbook for this)
Labor and Working Conditions	Egyptian laws are very general concerning health and safety	Health and safety guidelines need to comply with World Bank EHS Guidelines
Child labor	No specific laws related to child labour within the waste management industry or concerning hazardous work	Make sure that children under the age of 18 will not be employed in hazardous work
Supply chains	No supply chain concept with the waste management policy and legislation	Supply chains also have to comply with international standards concerning child and forced labor. The Project Proponent is responsible for making sure of this.
Community, Health and Safety	The Egyptian Constitution is very general on this point.	In order to make sure that this issue is properly addressed the risks and impacts to the health and safety of the affected communities need to be evaluated and if necessary preventive measures have to be established.

Issue	Gap	Action
Resettlement	No specific guidelines for resettlement	Physical and economic displacement is an issue that needs to be addressed. Compensation has to be at full replacement costs. This includes people who have no legal rights to the land and vulnerable groups. Affected people should be not worse off than before the beginning of the project. In the case of resettlement, a resettlement action plan is required and a grievance mechanism needs to be established. How to properly address issues of resettlement can be found in the World Bank's "Involuntary Resettlement Sourcebook". An important issue to address in Egypt are the Zabbaleen. As the Waste Management Programme in Egypt will most likely displace these people at least economically, special considerations have to be taken in order to address their needs.
Biodiversity & Conservation	There is no special consideration for biodiversity and conservation issues in the EIA Guidelines. The only specification in Egyptian Law about Biodiversity and Waste Management addresses that there has to be a certain distance between landfills and national parks.	In case of impacts on critical habitat, adequate measures to avoid and mitigate these impacts have to be taken

4.2 GAP ANALYSIS – WASTE MANAGEMENT

A detailed comparison of international standards (World Bank / IFC) for waste management with the Egyptian standards and additional requirements / considerations due to the KfW Entwicklungsbank climate assessment can be found in Annex A (Table 3 and 4).

Table 2 lists the findings of the gap analysis for the waste management issues. The necessary actions that need to be taken in order to fill the gaps are explained in more detail in Chapter 4.

Table -3 Gap Summary – Waste Management

Issue	Gap	Action
Litter & clandestine dumping (Municipal solid waste)	There is no specific defining function that carries out the implementation of the Law 4/1994, especially that municipalities are responsible for providing designated areas for disposal of MSW The law enforcement towards Solid Waste Management especially between governmental agencies have not been implemented.	Memorandum of Understanding between the EEAA and the Ministry of Local Development on the responsibility of deploying the environmental laws and regulation, with defining the responsibilities of taking enforcement. Awareness of each governmental agencies roles and responsibilities need to have more clarifications

Issue	Gap	Action
Air emissions: dust, bioaerosols, and odors (Municipal solid waste)	There is no specification on who is responsible to carry out monitor on vehicles and containers. No specification on trucks carrying waste	A mechanism between EEAA and the municipalities to enforce quality measures of waste management either carried out by the local authorities or by contractors Guidelines and specification of trucks carrying waste to be covered during transportation There will also be a need to increase awareness between Zabbaleen on these issues
Air Emissions: Vehicles (Municipal solid waste)	There are no specific measures in the Egyptian System to minimize and to control vehicle air emission during waste collection and transport, including minimizing the distance travelled of vehicles, weighing, quality and quantity of the solid waste.	Inspection on waste vehicles weights and safety measures.
Waste receipt, unloading, processing and storage (Municipal solid waste)	Waste management facilities do not have a weigh bridge to monitor waste data There is no accurate waste data on generation, treatment and disposal.	Monitoring into waste management facilities EEAA to introduce waste data base, with collaboration with municipalities. Zabbaleen can play an essential role by identifying the areas of high waste generation, due to their experience.
Contaminated runoff (Municipal solid waste)	Regulations and management strategies related to the management of contaminated runoff of the solid wastes	To define the liability of waste carriers of any spillage within the environmental laws and regulations
Litter (Municipal solid waste)	There are no specific guidelines on waste collection Illegal dumping as well as solid waste accumulation in city streets are the common practices.	EEAA to produce guidelines on frequently of waste collection based on geographical and social characteristics
Air emissions (Municipal solid waste)	There are no specific recommendations concerning the dust control, pre treatment waste as well as extraction system for dust removal during unloading, processing	Provide guidelines for waste work environment for waste and resources management When it is necessary, the recommendations are made according to the International Standards (World Bank/IFC).
Noise and vibration (Municipal solid waste)	No specific limits for the waste industry	To provide limits for noise and vibration in waste management facilities based on international standards
General occupational & environmental health issues associated with waste scavenging (Community health and safety)	There are no guidelines for waste management industry in Egypt. There is no data on incidents and health problem related to the waste and resources industry	Establish an outlines for safety procedures within the waste industry in Egypt Establish database of the industry to includes data on: number of workers in the industry, annual incidents, and occupational disease within sector There are studies on the mortality rate of Zabbaleen that can be used as a guidance

Issue	Gap	Action
Air Emissions (Biological Treatment)	There is neither measurement nor specification on odour nuisance and limits	Provide guidelines on defining nuisance emissions, measurements and limits
Air emissions (Municipal solid waste thermal treatment facilities)	No technical and environmental specification on thermal treatment facilities No legal requirement for energy recovery of thermal treatment	Policy on thermal treatment of waste with providing technical specification for different thermal technologies, e.g. pyrolysis and gasification Legal requirements of gaseous emission from thermal treatment To provide Incentives to recover energy and heat from thermal treatment facilities of waste
Ash and other residuals (Municipal solid waste thermal treatment facilities)	Thermal treatment ashes and residual has no classification within the Egyptian legal system No specification for collection, storage, treatment and disposal of bottom ash/residual of thermal treatment facilities.	To identify definition of thermal treatment technologies outputs Identify residual and ashes in the legal system Introduce treatment and recovery methods of thermal treatment residuals Provide legal framework of final disposal of thermal treatment residuals
Leachate Generation (Landfilling)	No requirement for landfill site engineering or leachate collection, treatment and disposal	To establish clear guidelines for engineered landfill , with leachate drainage Provide identification to leachate generation from landfill, with classifying leachate as hazardous waste Provide legal requirement for leachate collection, storage and treatment on and off the landfill site
Groundwater and leachate monitoring (Landfilling)	No requirement on monitoring leachate generation on landfill sites	To introduce legal requirement of keeping record of leachate generation, storage, and treatment, either on or off the site
Landfill gas emissions (Landfilling)	No legal definition of landfill gas No legal requirement to monitor landfill gas	To commence legal definition of landfill gases, and capture To provide guidelines on collect landfill gas To introduce incentives for generating energy from landfill gas
Closure and post-closure (Landfilling)	No legal requirement of usage of landfill site before and after closure No specification for the cover and monitoring plan for closed landfill site	To introduce landfill site post closure and closure action plane guidance To implement legal requirement for landfill site usage after closure To introduce legal requirement for specific monitor plan for gaseous emissions, and leachate from the site after closure

Issue	Gap	Action
Biological and physical-chemical treatment	Law 4/1994 and its amendments state that several methods can be used to treat hazardous waste, either by biological, physical and/or chemical treatment (Article 28, Executive Regulation). However, it does not give specific procedures for legal recruitment for mentioned treatment. There is only one engineered hazardous waste landfill in Egypt, which is supported by FINNIDA, and it is run by international standards	To provide more guidelines of different hazardous waste treatment Provide legal requirement for each treatment method, for its air emission, wastewater and final disposal of the treated waste
Closure and post-closure (Hazardous waste)	No legal requirement of usage of landfill site before and after closure No specification for the cover and monitoring plan for closed landfill site	To introduce landfill site post closure and closure action plane guidance To implement legal requirement for landfill site usage after closure To introduce legal requirement for specific monitor plan for gaseous emissions, and leachate from the site after closure
Pathogens and vectors (Industrial waste – non-hazardous; occupational health and safety)	There is no specific guidelines on the biological hazard of waste facilities	To introduce guidelines on safety precaution and required health and safety equipment for waste management industry

5 GAP FILLING MEASURES

Previous Tables 2 and 3 provide an overview on the gaps between the international ESIA standards (World Bank, IFC, KfW Entwicklungsbank) and the Egyptian system. Table 2 identified gaps in general ESIA, while Table 3 identified the gaps within waste industry. Waste management in Egypt has recently been brought to the attention of the public due to the lack of integrated services in the waste management sector. Waste legislation and guidance were brought to solve part of the problem, with no integration with other environmental, economical and social scales.

The main gaps concerning the general ESIA issues can be found in the public consultation process and resettlement issues. These are very important components of the ESIA process and need to be addressed according to international standards. Especially the issue of the Zabbaleen communities needs to be addressed. A support program to provide assistance to the Zabbaleen and possibly training to integrate them into the new Egyptian waste management program needs to be established.

Concerning the waste management, Egypt lacks an overall strategy and standards (e.g. air and noise emissions). Furthermore, there is also potential to reduce waste and increase recycling as well as having a positive effect on climate change.

6 POTENTIAL ENVIRONMENTAL IMPACTS OF THE NSWMP

All solid waste management plans and programs fall in the scope of Strategic Environmental Assessment (SEA) according to EU Directive 2001/42/EC. The objective of SEA is to "provide a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development […]."

The NSWMP is addressing a set of environmental and public health issues caused by the deficient performance of waste management. The assessment shows that in recent years there has been little progress in developing collection, transportation and disposal. Collection coverage rates are between 50 to 70%, only 8 disposal sites are sanitary landfills and none are serving the rural areas. Targets have not been achieved and a decline in the performance of treatment facilities. The most significant treatment facilities are composting facilities and these are able to treat about 10% of the waste stream. Recycling, mainly due to the informal sector activities are at a stable rate and targets as set forth in the preceding plan have been partially achieved.

The NSWMP identifies a potential of green house gas (GHG) mitigation arising from the improved waste management plan that could decrease with about 10-15% of the country's overall emissions.
Thus, in the absence of a NSWMP and its implementation and assuming that current trends of waste management would prevail, the environmental impacts would be significant and manifold. Impacts on materials are not significant when compared to other countries in the region, Egypt having a thriving informal materials recycling industry that brings benefits in terms of materials recovery. The most significant negative impacts are identified as follows:

- Low waste collection coverage, littering, illegal dumping, uncontrolled disposal is a threat to public health intoxication and vector born infectious diseases;
- Current practices would impact the environment through gaseous, liquid and solid emissions into the air, water and soil. Typical air emissions include dust, bio-aerosols, landfill gas emissions, toxic fumes in case of fire and odours. Typical water and soil contamination are caused by leachate and runoff water when there is no bottom insulation at disposal sites or waste accumulations. Water and soil contamination is a significant especially in the delta areas where both of these resources are scarce;
- Landfill gas collection is not a common practice, causing methane to escape in the air. Methane generation is likely to take place also at the inefficient composting facilities. Methane is a 21 times more powerful green house gas as compared to carbon dioxide;
- The negative impacts of littering are present in all areas of Egypt where collection coverage is week. Tourist areas along the river Nile and the Red Sea are also impacted from littering.
- Environmental and health impacts are usually most severe in the poorest regions of the countries and Egypt is no exception to this. Poor communities in Egypt, especially the informal sector that is often engaged in various waste management activities, suffer most severely from the environmental and health impacts of waste management.
- Deficient waste management in Egypt is not known to have a significant noise impact or impact on cultural heritage.
- Protection of environment is part of the key objectives of the NSWMP, environmental considerations being an integral part of the planning exercise. The plan has numerous direct and indirect positive impacts on the environment.

The NSWMP will run until 2017 and consists of a combination of soft and hard measures. The key components are:

1. Institutions, Policy and Legislation
2. Investment Programming & Implementation

3. Professional Development
4. Planning Services & Infrastructure
5. Civil Society Participation
6. Implementation

The programme proposes a new institutional home for waste management, the Egyptian Executive Agency for Integrated Solid Waste Management (ESWA) under the Ministry of Local Development, in part to be the engine of waste management modernization while keeping the responsibility of implementation at the level of governorate and local authority, but also as a policy consultation structure. The Institution ensures that there is input and efficient communication among the Ministries of State for Local Development and Environmental Affairs at the various levels of policymaking, planning, implementation, compliance control and monitoring.

All NSWMP workstreams are directed to prepare and implement environmentally sound waste management. Among the most important from the point of view of safeguarding the environment are Workstream 3.3. Policy development, which at all times must take into account environmental and climate change dimensions; and Workstream 3.4. Legislation and regulation that establishes “environmental inspection and enforcement” as one of the attributes of the Egyptian Environmental Affairs Agency that functions under the Ministry of State for Environmental Affairs and guarantees the independent role for the compliance control.

Component B and D together are about choosing, developing, implementing and operating the modernized physical system for waste management in Egypt. Thus these are the activities having the most significant environmental impact. The current budget available for investment is limited and the type, the investment favoured are those that may create replicable models. Choosing the concrete projects is one of the tasks defined in the plan and it is a requirement that all plans must include ESIAs at the concept phase and assessments must be carried out through cooperation between local stakeholders and experts.

Among the chosen physical facilities, there may be landfill sites, transfer stations, supply of equipment for collection, transportation, closure and rehabilitation of existing disposal sites, waste treatment, recycling or composting facilities and supporting equipment and technical assistance needed for implementation. All physical structures will need to go through a construction phase and operation phase, ESIAs will need to cover both of these phases and potential transboundary impacts of the investment project chosen and supported by the ESWA. Potential locations selected for the initial investments include the Delta, Upper Egypt and in tourist areas. Component D aims to ensure that the applied technical standards and planning practices for the initial investments are appropriate.

Therefore at this stage it may be inferred that the initial and later investment projects and their implementation will bring a significant net positive public health and environment impact to Egypt. The typical significant environmental impacts associated with these during construction phase are:

- air emissions due to dust from mobile equipment and at the construction sites; and
- noise and vibration nuisance caused by mobile equipment and at the construction sites.

Impacts on biodiversity, flora, fauna, landscape and cultural heritage and health impacts associated with facilities are typically and best mitigated at the site selection phase. Value and vulnerability of the selected area should be carefully considered in the project-specific ESIAs. Certain site-location characteristics may be essential in cost-effective solutions for mitigating other impacts as well such as water pollution through leachate.

The typical impacts during operation of the facilities and improved environmental waste management are identified already in the NSWMP and are detailed below:

- protection of public health: Improved waste collection coverage decreases littering, illegal dumping, uncontrolled disposal the health impacts typically associated with accumulation of waste in residential or close to residential areas;
- protection of water resources and improvement of the quality of the soil mainly through treatment and final disposal in sanitary landfills;
- reduction of GHG: landfill gas collection and improve efficiency of biodegradable waste treatment reduce methane generation and the climate impact of waste management;
- increased value of the tourist areas through a cleaner environment; and
- sustainable development of the economy.

In addition to those identified in the NSWMP further positive impacts are expected to be:

- improved recycling and increased materials recovery;
- job creation, provided that the implemented waste management concepts strengthen the already functioning structures that are often labour-intensive; and
- sanitary landfills eliminate water and soil emissions, incidents of fire and reduce significantly air emissions and odor.

The noise and vibration impact during operation of the facilities is expected not to be significant. The noise and vibration impacts should be considered and mitigated through choice of collection solution, equipment, frequency and timing for primary and secondary collection. Component C (Professional Development) of the plan that is concerned with capacity building is not likely to have any direct environmental impact but is crucial as a strategy to increase knowledge of the ESWA capacity to perform and judge ESIAs based and to make environmentally sound investment decisions.

Component E (NSWMP Civil Society Participation) ensures a participatory approach to the planning that goes well beyond the scope strategic environmental assessment consultations. This component is designed for raising the profile of waste management, civil society engagement and behaviour change, acknowledging fully the importance of the public for waste management being the users of the service and the group impacted by lack of its performance.

Component F (Implementation) has no environmental impact of its own, since its detailing the actions and timing of all components described.

The current NSWMP comes to replace the previous strategy that was developed in 2001 immediately after the need for the plan was identified in 1999-2000; but its implementation was deficient. The NSWMP interacts horizontally with the National Action Plan for Environmental Protection, may be one of the strategies for Nationally Appropriate Mitigation Approach and will likely interact with other national plans and strategies as the process unfolds. Vertically it is the starting point for a series of regional waste management plans that will need at their own stages of development to follow SEA procedures. The NSWMP goes all along to the practical level of selecting, developing, implementing and operating investment projects in waste management and for these projects specific ESIA's are duly required.

ANNEX A: Gap Analysis

Gap Analysis

- Table A-1 gives an overview of the used documents (laws, regulations, guidelines etc.) and their abbreviations.
- Table A-2 provides a comprehensive Gap Analysis concerning environmental and social assessment in general.
- Table A-3 looks at general waste management aspects, based on the World Bank's General Environmental, Health and Safety Guidelines.
- Table A-4 breaks down the environmental and social assessment concerning waste management, based on the Sectoral EHS Guidelines for Waste Management Facilities

The last column in Tables A2, A3 and A4 identify and highlight the **gap**, should there be one, and list the **action** that needs to be taken in order to meet international standards. The **notes** provide further explanations, recommendations or other additional information concerning the gap, action or issue in general.

TableA-1 Sources and Abbreviations of ESIA Standards

	Legislation & Guidelines Egypt	World Bank (WB)	IFC (World Bank Group)	KfW Entwicklungsbank
General Environmental and Social Impact Assessment (→ Table A-2)	Law 4/1994 for the Protection of the Environment, amended by Law 9/2009 *(The Environmental Law)* Prime Minister's Decree No. 338 of 1995 Issuing the Executive Regulations of the Environment Law promulgated by Law 4/1994 *(Exec. Reg.)* Procedural Guidelines for Egyptian Environmental Impact Assessment, issued by EEAA *(Proced. Guidelines)* Law No.102 of 1983 on Protected Areas Law No.124 of 1983 on Fisheries and Aquatic Life Law No. 53 of 1966 on Agriculture Law No. 48 of 1982 on Protection of the Nile Against Pollution	Operational Policies *(OP)* Involuntary Resettlement Sourcebook (2004) *(Resettlement Sourcebook)* Environmental Assessment Sourcebook *(Env. Assess. Sourcebook)* Environmental, Health, and Safety Guidelines (2007) (also IFC) *(EHS Guidelines)*	Performance Standards (PS) on Environmental & Social Sustainability (2006) *(PS)* Guidance Notes: Performance Standards on Environmental & Social Sustainability (2007) *(Guidance Note)* Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets (2007) *(Stakeholder Engagement)* Doing Better Business Through Effective Public Consultation (1998) *(Public Consultation)* Handbook for Preparing a Resettlement Plan (2002) *(Handbook Resettlement)*	Richtlinie der KfW Entwicklungsbank für ein umwelt-, sozial- und klimagerechtes Engagement („Nachhaltigkeitsrichtlinie") Januar 2011 *(NRL)* [English Version: Guideline of KfW Entwicklungsbank for conducting business in an environmentally, socially and climate friendly manner ("Sustainability Guideline") January 2011]

	Legislation & Guidelines Egypt	World Bank (WB)	IFC (World Bank Group)	KfW Entwicklungsbank
	Law No. 117 of 1983 on Protection of Antiquities Law No. 93 of 1962 and its amendment Ministerial Decree No.44/2000 discharge over the sewer network Law No. 12 of 2003 on Labour The Constitution of Arab Republic of Egypt , 1971 Minister of Manpower and Immigration Decree No. 118/2003 on industrial and commercial sector in which children prohibited to work according to their age			
General Waste Management Assessment (→ Table A-3)	Law 4/1994 for the Protection of the Environment, amended by Law 9/2009 *(The Environmental Law)* Law No. 38/1967 on General Public Cleaning Law No. 12 of 2003 on Labour	General Environmental, Health and Safety Guidelines – Chapter 1.6: Waste Management (2007)		Sektorinformation zur Klimaprüfung der KfW Entwicklungsbank Abfallwirtschaft + Ressourceneffizienz (April 2011) *(Klimaprüfung AW u. RE)*
Waste Management Facilities Assessment (→ Table A-4)	Law 4/1994 for the Protection of the Environment, amended by Law 9/2009 *(The Environmental Law)* Law No. 38/1967 on General Public Cleaning Law No. 12 of 2003 on Labour	Environmental, Health, and Safety Guidelines for Waste Management Facilities (2007)		Sektorinformation zur Klimaprüfung der KfW Entwicklungsbank Abfallwirtschaft + Ressourceneffizienz (April 2011) *(Klimaprüfung AW u. RE)*

TableA-2 Gap Analysis

ISSUE	Egyptian System	World Bank (WB)	IFC (World Bank Group)	KfW Entwicklungsbank	
Screening / Categoriza-tion	A screening process is in place and consists of three categories: (a) projects that require the preparation of a full EIA (**Category C** - Black); (b) projects that require only a summary description of the project, its impacts and appropriate mitigation measures (**Category B** - Grey); (c) projects that do not require an EIA (**Category A** - White). EEAA reviews all Category A (Form A) and B (Form B) projects for their potential impacts and determines the need for an EIA or a limited environmental analysis. Category B and C projects are required to assess impacts on human health, physical, biological, socioeconomic and physical cultural resources and transboundary emissions. *(Exec. Reg., Article 10&11; EIA Procedures Guidelines, p. 66)*	**A** Significant adverse env. impacts that are sensitive, diverse, or unprecedented, impacts may affect area broader than sites or facilities subject to physical works → EA = **normally an EIA** **B** Potential adverse env. impacts, generally site-specific; few if any are irreversible → EA = **scope narrower than for Category A** **C** Minimal or no adverse env. impacts; **no further EA action required** **FI** – Financial intermediary *(OP 4.01, 8)*	Potential significant impacts → **Comprehensive SEIA** Limited impacts → **Narrower scopes of assessment** Minimal or no adverse impacts → **No further assessment** *(PS 1, 9-11)* *(Guidance Note 1, G14)*	**Environmental and Social Assessment** **Category A** Significant adverse impacts that are unprecedented or irreversible → **ESIA, ESMP** and (for private project sponsors) **ESMS** are compulsory **Category B** Potential adverse impacts, but less severe than category A → scope of **ESIA** to be determined from case to case **Category C** Minimal or no adverse impacts → **no further ESIA action** required *(NRL 3.2)* **Climate Assessment** - Climate Proofing: project dependent on temperature, wind, precipitation etc.; potential for adaptation measures (yes/no) - Emission Saving: adds significantly to GHG emissions; potential to reduce GHG emissions (yes/no) *(NRL 3.2.7& Annex 2)*	**Gap:** **Action:** **Note:**

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Scoping	Individual **scoping** based on sectoral guidelines. Classification According to Law4/1994 is based on the nature of the project, energy & resources consumption, geographical location, and input and output effects on surrounding environment. Category C or Black list is the highest, while Category A or White is lowest *(Law 4/1994Executive Regulations Annex 2 & EIA Procedures Guidelines, p. 9)*	**Not explicitly mentioned, but self-evident due to other requirements.**	**"Scoping** is the first activity carried out for the Env. Assessment. The main aim of scoping is to make a preliminary identification of the env. and social impacts that may be caused by the project, and who and what they may affect." *(Public Consultation, Guidance Note 4)*	**Scoping** of environmental, social and climate effects in close collaboration with the project sponsor *(NRL 3.1.2)*	**Gap:** The scope is based only on input usage by the facilities, without any mention to the effect on the social environment **Action:** Identify the social impacts for category B & C **Note:** Waste management facilities are coming under Category B, although it may face NYMBY by local residents.
Environmental and Social Management Plan (ESMP) **(PS 1, 13-15)** or **Environmental and Social Action Plan (ESAP)** **(PS 1, 16)**	Egyptian EIA procedural guidelines require the development of an **EMP**. However, no specific requirements are given in the guidelines for EMP implementation arrangements such as budget or the staffing of the implementing agency for Category A, and more detailed requirements for Category B & C, e.g. emission monitoring and EMP institutional structure. *(EIA Procedures Guidlines , p. 12-23)*		"Where the client identifies specific mitigation measures and actions necessary for the project to comply with applicable laws and regulations and to meet the requirements of PS 1 through 8, the client will prepare an **Action Plan**." *(PS 1, 16)* "For **Category A** projects, the project sponsor prepares an **Environmental Action Plan** (EAP)." *(Public Consultation, Guidance Note 5)*	**ESMP** is compulsory for Category A projects *(NRL 3.2.4)* Recommendations from the ESIA are to be listed in an action-oriented way in the **ESMP**. The ESMP shall also include the social and environmental monitoring. *(NRL 3.3.1)*	**Gap:** **Action:** **Note:**
Community / Stakeholder	The environmental legislation provides for	"Involve stakeholders, including project-affected	**"Community engagement** is an on-going process	Public disclosure of documents and hearings	**Gap:**

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Engagement (& Public Consultation) **(PS 1)**	NGOs to be represented in the Board of the EEAA and the sectoral guidelines and TORs for EIA require proponent to hold **public consultations** with all interested and/or affected parties. However, it is not required to document the outcomes of the consultation. *(EIA Procedures Guidelines, p. 23)* Public Consultations (two phases) are only conducted for Category C projects. For category C projects consultations occur twice: (a) during the scoping phase, and (b) once a draft EA report is prepared (conduct a workshop). *(EIA Procedures Guidelines, p. 27)* Guidelines for Public Consultation during the EIA process is described in the 2nd edition of Guidelines of Principles and Procedures for Environmental Impact Assessment (January 2009).	groups and local NGOs, as early as possible, in the preparation process and ensure that their views and concerns are made known to decision makers and taken into account. Continue consultations throughout project implementation as necessary to address EA-related issues that affect them." *(OP 4.00, Table A1, A7)* "**Consultation** with affected people and NGOs should be **integral to all Category A** projects, and are **advisable for many Category B** projects in order to understand the acceptability of proposed mitigation measures to affected groups. (…) Where projects involve socially and politically sensitive land acquisition or resettlement, these issues should be fully addressed in either the EMP or resettlement action plan (RAP) or indigenous peoples development plan (IPDP)." *(Env. Assess. Sourcebook, Ch. 1, Update No. 25)*	involving the client's disclosure of information. When local communities may be affected by risks or adverse impacts from a project, the engagement process will include **consultation** with them." *(PS 1, 19)* **"Public consultation** should occur **as early as possible** and in a timely manner." *(Public Consultation, Guidance Note 1)* - Inclusive & culturally appropriate - Tailored to language preferences of affected communities, their decision-making process, needs of disadvantaged or vulnerable groups - Free, prior and informed consultation *(PS 1, 21 & 22)*	are compulsory for category A projects. *(NRL 3.3.5)* The scope of the public **consultation** process is to be determined during the scoping process. Consultation shall take place early on and last throughout the whole duration of the project. The process shall be culturally appropriate and comprehensive. In relevant cases, stakeholder with an interest in the climate assessment shall be consulted as well. *(NRL 3.6)*	Involve the NGOs and public communities with all the EIA a application B & C in their area from the start of the project **Action:** Amend Article 13: with adding public consultation and/or NGOs for Category B & C applications **Note:** This will eliminate public anger towards new developments and will give more transparency to the planning process
Documentation of Public Consultation	The EIA proposal needs to address the public consultation with	Disclose draft resettlement plans, **including documentation of the**	"The client will **document the process**, in particular the measures taken to	The KfW Entwicklungsbank orients itself, amongst others, by internationally	**Gap:** Identify measures to

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Process	considering public representatives, although it does not give a clear idea how and where the public consultation can reach all the community, and provide clear clarification on the project *(EIA Procedures Guidelines, p. 26)*	**consultation process**, in a timely manner, before appraisal formally begins, in an accessible place and in a form and language that are understandable to key stakeholders. *(OP 4.00, Table A1, D8)*	avoid or minimize risks to and adverse impacts on the affected communities." *(PS 1, 22)* Submit **Public Consultation & Disclosure Plan** to IFC *(Public Consultation, Guidance Note 3)*	proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and ILO standards. *(NRL 3.1.1, 3.4)*	assess the progress public consultation **Action:** Identify how, where and who can attend the public consultation **Note:**
Stakeholder Identification & Analysis	The EIA guidelines state the need to have stakeholders, but there is no clear measures to identify who are the stakeholders who can affect the project	Participation and Social Assessment: Tools and Techniques (1998) *(page 77 ff)*	"**Stakeholder identification** broadly involves the determination of the various individuals or groups who may have an interest in the project or who may affect or be affected by the project." *(Guidance Note 1, 15)*	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and ILO standards. *(NRL 3.1.1, 3.4)*	**Gap:** Identification of stakeholder who can affect directly and indirectly the project **Action:** Identify the legal definition within the concerned environmental laws and regulations of the stockholder identification and analysis **Note:**
Stakeholder Engagement Plan (SEP)		**Not (explicitly) required**	Validation Methods for Stakeholder Identification and Analysis: **Public Consultation and Disclosure Plan** & **Stakeholder Engagement Plan** *(Guidance Note 1, Annex D)* "For projects with multiple stakeholder groups and issues, preparing a more	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and ILO standards. *(NRL 3.1.1, 3.4)*	**Gap:** **Action:** **Note:**

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			formal **Stakeholder Engagement Plan** in advance is advisable." *(Stakeholder Engagement, p. 34)*		
Public Disclosure of Documents	Disclosure policy for Category B projects: - The scoped EIA for category B projects are to be posted on EEAA website, excluding any sections that include sensitive information related to commercial, technical and security issues. Electronic copies of category B forms and scoped - EIA will be stored in the electronic library of EEAA EIA Central Department and the original forms and scoped studies will be stored by the RBOs who are responsible for the areas where the projects are located. Disclosure policy for Category C projects: - Before the public consultation on the draft EIA, a draft technical summary in Arabic should be disclosed to all concerned parties. - After the EIA process is complete, the EIA report will be stored in the EEAA's central library or that of the RBO of	"Disclose **draft EA** in a timely manner, before appraisal formally begins, in an accessible place and in a form and language understandable to key stakeholders.**"** *(OP 4.00, Table A1, A11)*	"Where the client has undertaken a process of Social and Environmental Assessment, the client will publicly disclose the **Assessment document**." *(PS 1, 20)* "The client will disclose the **Action Plan** to the affected communities. In addition, the client will provide **periodic reports** that describe progress with implementation of the Action Plan on issues that involve ongoing risk to or impacts on affected communities, and on issues that the consultation process or grievance mechanism has identified as of concern to those communities. (…) These reports will be **in a format accessible to the affected communities**. The frequency of these reports will be proportionate to the concerns of affected communities but **not less than annually**." *(PS 1, 26)*	**Public disclosure of documents** and hearings are compulsory for category A projects. *(NRL 3.3.5)*	**Gap:** **Action:** **Note:**

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	the project's region. Moreover, the executive summary of the final EIA will be available on EEAA's website. - The project proponent should identify in a letter attached to the EIA the parts that he/she does not wish to disclose. These include sections that may have sensitivity related to trade, technology, or security. *(Guidelines of Principles and Procedures for Environmental Impact Assessment, January 2009; Law 9/2009)*				
Grievance Mechanism	Law 4/1994 and its amendments do not have any requirement to the community or the public to object to the project. The EIA guidelines only require public consultation through municipalities for facilities under Category C. Applicant has to respond to these comments and provide response to EIA application to EEAA. *(Guidelines of Principles and Procedures for Environmental Impact Assessment, January 2009; Law 9/2009)*	"Provide [project-affected persons, host communities and local NGOs] opportunities to participate in the planning, implementation, and monitoring of the resettlement program, especially in the process of developing and implementing the procedures for determining eligibility for compensation benefits and development assistance (…), and for establishing **appropriate and accessible grievance mechanisms**." *(OP 4.00, Table A1, D4)*	"The client will respond to communities' concerns related to the project. If the client anticipates ongoing risks to or adverse impacts on affected communities, the client will **establish a grievance mechanism** to receive and facilitate resolution of the affected communities' concerns and grievances about the client's environmental and social performance." *(PS 1, 23)* If **security** is involved, a "grievance mechanism should allow the affected community to express concerns about the security	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and ILO standards. *(NRL 3.1.1, 3.4)*	**Gap:** No specific procedures for Grievance Mechanism within the EIA application **Action:** Implement procedures for public consultation, specifically for Category B and C **Note:**

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			arrangements and acts of security personnel." *(PS 4, 13)*		
Monitoring & Recording **(PS 1)**	**Monitoring** is provided for under the EIA Guidelines, including performance indicators to "demonstrate the sustainability of the project." Parameters and indicators recommended to be included in the monitoring system include: (a) quality of water, (b) noise and air quality, (c) relevant health indicators, (d) waste management and (e) complaints received if any. *(Guidelines of Principles and Procedures for Environmental Impact Assessment, January 2009)* The developer maintains records and the EEAA undertakes follow up inspections. During the post construction field investigation (before the operation license): (a) CAA reviews the requirements that the facility should abide with through checking the EIA approval and (b) field visit is undertaken to check the compliance with requirements. *(Law 4/1994)*	"Environmental **monitoring** during project implementation provides information about key environmental aspects of the project, particularly the environmental impacts of the project and the effectiveness of mitigation measures. (…) Therefore, the EMP identifies monitoring objectives and specifies the type of monitoring... " *(OP 4.01, Annex C, 3)*	"As an element of its Management System, the client will establish procedures to **monitor and measure the effectiveness** of the management program. In addition to recording information to track performance and establishing relevant operational controls, the client should use dynamic mechanisms, such as inspections and audits, where relevant, to verify compliance and progress toward the desired outcomes." *(PS 1, 24)*	Category A projects require **monitoring** of the environmental and social impacts during implementation and operation. This applies also to relevant climate aspects. *(NRL 3.3.2)* In cases where protective measures are not entirely foreseeable, the **monitoring** process has to be adaptable. *(NRL 3.5.2)* Obligations to inform and **report** are to be agreed upon together with project sponsor. In case of an ESMP, the ESMP is the basis for the monitoring. *(NRL 3.7)*	**Gap:** **Action:** **Note:**

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Labor and Working Conditions **(PS 2)**	Law 12/2003 to provide general safety precaution to employees Law12/2003 states that each facility has to provide the required training for its employees to deal with hazardous material and health and safety requirements	"Employers and supervisors are obliged to implement all reasonable precautions to protect the **health and safety** of workers." *(EHS Guidelines, 2.0)* <u>Occupational Safety includes:</u> - General Facility Design and Operation - Communication and Training - Physical Hazards - Chemical Hazards - Biological Hazards - Radiological Hazards - Personal Protective Equipment - Special Hazard Environments - Monitoring *(EHS Guidelines, 2.0)*	"PS 2 recognizes that the pursuit of economic growth through employment creation and income generation should be balanced with **protection for basic rights of workers**." *(PS 2, 1)* "The applicability of this PS is established during the SEA process, while implementation of the actions necessary to meet the requirements of this PS is managed through the client's Social and Env. Management System." *(PS 2, 3)*	Amongst eight others, the KfW Entwicklungsbank especially pursues the following principle: - Promoting **labor health and safety** *(NRL 3.4.1)* The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and **ILO standards**. *(NRL 3.1.1, 3.4)*	**Gap:** **Action:** **Note:**
Grievance Mechanism for Workers	Law 12/2003 provides a framework to employees to object if they have any concerns.	Not mentioned	"The client will provide a **grievance mechanism for workers** (and their organizations, where they exist) to raise reasonable workplace concerns. The client will inform the workers of the grievance mechanism at the time of hire, and make it easily accessible to them. (…)" *(PS 2, 13)*	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, IBRD/IDA's Safeguard Policies, **IFC's Performance Standards**, and **ILO standards**. *(NRL 3.1.1, 3.4)*	**Gap:** **Action:** **Note:**
Child labor	Law 12/2003 provides an outline that children under 17 are not allowed to work	Not mentioned	"The client will not employ children in a manner that is economically exploitative,	Amongst eight others, the KfW Entwicklungsbank especially pursues the	**Gap:** No specific laws related to

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	in full time job Minister of Manpower and Immigration Decree No.118 /2003 identify sectors in which children are not allowed to work. It is only mentioned that it is prohibited to employ children in plastic recycling from wastes or burning plastics		or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. Where national laws have provisions for the employment of minors, the client will follow those laws applicable to the client. Children below the age of 18 years will not be employed in dangerous work." *(PS 2, 14)*	following principle: - Ban on forced labor, worst forms of **child labor**, discrimination (employment and occupation); promotion of freedom of association and the protection of the right to organise *(NRL 3.4.1)*	child labour within the waste management industry **Action:** To identify waste treatment facilities that children are prohibited to work in **Note:**
Forced labor	Law 12/2003 identifies the outline for the relationship between the employers and employees	Not mentioned	The client will **not employ forced labor**, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. (…)" *(PS 2, 15)*	Amongst eight others, the KfW Entwicklungsbank especially pursues the following principle: - Ban on **forced labor**, worst forms of child labor, discrimination (employment and occupation); promotion of freedom of association and the protection of the right to organise *(NRL 3.4.1)*	**Gap:** **Action:** **Note:**
Supply chains	Law 4 /1994 assesses the facilities for applying to EIA according to its usage of resources, however there is no specification on deploying the supply chain concept.	Not mentioned	"The adverse impacts associated with **supply chains** will be considered where low labor cost is a factor in the competitiveness of the item supplied. The client will inquire about and address child labor and forced labor in its supply chain, consistent with paragraphs	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and **ILO standards**. *(NRL 3.1.1, 3.4)*	**Gap:** No supply chain concept with the waste management policy and legislation **Action:** Identify waste as resources Give incentives to recyclables or re manufactured products

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			14 and 15 above." *(PS, 18)*		**Note:**
Pollution Prevention and Abatement **(PS 3)**	Emissions, wastewater discharge, noise and indoor air pollution standards are defined in the Executive Regulations for Law No. 4 of 1994. *(Exec. Reg., Annex 5-10)*	Environmental Guidelines include: - Air Emissions and Ambient Air Quality - Energy Conservation - Wastewater and Ambient Water Quality - Water Conservation - Hazardous Materials Management - Waste Management - Noise - Contaminated Land *(EHS Guidelines, 1.0)* *Pollution Prevention and Abatement Handbook (PPAH) (1999)*	"During the design, construction, operation and decommissioning of the project (…) the client will consider ambient conditions and apply pollution prevention and control technologies and practices (techniques) that are best suited to **avoid** or, where avoidance is not feasible**, minimize or reduce adverse impacts on human health and the environment** while remaining technically and financially feasible and cost-effective." *(PS 3, 3)* *Environmental, Health, and Safety General Guidelines and IFC Sector HSE Guidelines*	Amongst seven others, the KfW Entwicklungsbank especially pursues the following principles: - **Prevention and abatement of pollution**, including climate-damaging emissions and pollution - Considering probable and foreseeable consequences of **climate change** *(NRL 3.4.1)*	**Gap:** **Action:** **Note:**
Community Health, Safety and Security **(PS4)**	Egyptian Constitution states that: "The State shall guarantee cultural, social and health services, and work to ensure them for the Villages in particular in an easy and regular manner in order to raise their standard." This comes through	Community Health and Safety includes: - Water Quality and Availability - Structural Safety of Project Infrastructure - Life and Fire Safety - Traffic Safety - Transport of Hazardous	"The client will evaluate the risks and impacts to the **health and safety of the affected community** during the design, construction, operation, and decommissioning of the project and will establish preventive measures to address them in a manner commensurate with the identified risks and	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the **Worldbank's EHS Guidelines**, **IFC's Performance Standards**, and ILO standards. *(NRL 3.1.1, 3.4)*	**Gap:** **Action:** **Note:**

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	different laws and regulations so that the government ensure delivering these rights. Article 19 of Law 4/1994 states that each person has to provide an Environmental Impact Assessment (EIA) study to provide an overview of the new facility environmental impacts and how it will reduce its impacts on surrounding environment	Materials - Disease Prevention - Emergency Preparedness and Response *(EHS Guidelines, 3.0)* ***Voluntary Principles of Human Rights***	impacts. These measures will favor the prevention or avoidance of risks and impacts over minimization and reduction." *(PS 4,4)* When the client directly retains employees or contractors to provide security to safeguard its personnel and property, it will **assess risks** to those within and outside the project site posed by its security arrangements. […]**A grievance mechanism should allow the affected community to express concerns** about the security arrangements and acts of security personnel. (*PS 4, 13)*		
Resettlement **(PS 5)**	The Egyptian Constitution states the promise to provide a decent life for all Egyptians, although there is no specific laws for resettlement		"Involuntary resettlement refers both to **physical displacement** (relocation or loss of shelter) and to **economic displacement** (loss of assets or access to assets that leads to loss of income sources or means of livelihood) as a result of project-related land acquisition. (…)" *(PS 5, 1)* "The client will consider feasible alternative project designs to avoid or at least	Amongst eight others, the KfW Entwicklungsbank especially pursues the following principle: - Prevention / minimization of **involuntary resettlement** and mitigation of negative social and economic impacts due to changes in land use by restoration of livelihoods of the affected population *(NRL 3.4.1)*	**Gap:** No specific guidelines for resettlement for waste management employees, especially Zabbaleen **Action:** Identify social and economic needs to Zabbaleen for resettlement in new communities Identify the role and experience of Zabbaleen **Note:**

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			minimize physical or economic displacement, while balancing environmental, social, and financial costs and benefits." *(PS 5, 7)*		Zabbaleen can play a strong role in waste management in Egypt as long as they have economic and social resettlement from the current position
Compensation at "full replacement cost" (physical & economic displacement)		"The resettlement plan or resettlement policy framework includes measures to ensure that the displaced persons are (…) (iii) provided prompt and effective **compensation at full replacement cost** for losses of assets attributable directly to the project." *(OP 4.12, 6a)* *(Resettlement Sourcebook, Ch. 4)*	"When displacement cannot be avoided, the client will offer displaced persons and communities compensation for loss of assets **at full replacement cost** and other assistance to help them improve or at least restore their standards of living or livelihoods" *(PS 5, 8)*	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and ILO standards. *(NRL 3.1.1, 3.4)*	**Gap:** **Action:** **Note:**
Compensation for people without legal title / rights		"Displaced persons may be classified in one of the following three groups: (…) those who have **no recognizable legal right or claim** to the land they are occupying." *(OP 4.12, 15c)* *(Resettlement Sourcebook, Ch. 5)*	"Displaced persons may be classified as persons (…) (iii) who have **no recognizable legal right or claim** to the land they occupy." *(PS 5, 14)* "In the case of physically displaced persons under paragraph 14 (iii), the client will offer them a choice of options for adequate housing with security of tenure so that they can resettle legally without	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and ILO standards. *(NRL 3.1.1, 3.4)*	**Gap:** **Action:** **Note:**

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			having to face the risk of forced eviction." *(PS 5, 18)* "The census must encompass all people adversely affected by the project, regardless of their legal status—landowner, holder of land rights, tenant, **illegal squatter**—or whether they are actually living on an affected site at the time of the census. In other words, **lack of legal land title does not disqualify people from resettlement assistance**." *(Handbook Resettlement, Section II, Step 2)*		
Census		"Upon identification of the need for involuntary resettlement in a project, the borrower carries out a **census** to identify the persons who will be affected by the project" *(OP 4.12, 14)* *(Resettlement Sourcebook, Ch. 10)*	"Where involuntary resettlement is unavoidable, the client will carry out a **census with appropriate socio-economic baseline data** to identify the persons who will be displaced by the project, to determine who will be eligible for compensation and assistance, and to discourage inflow of people who are ineligible for these benefits." *(PS 5, 11)* "The **census** of people affected by the project is a key initial stage in the preparation of the RAP."	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and ILO standards. *(NRL 3.1.1, 3.4)*	**Gap:** **Action:** **Note:**

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			(Handbook Resettlement, Section II, Step 2)		
Resettlement Action Plan (RAP)		All projects that entail resettlement require a **Resettlement Plan.** *(Resettlement Sourcebook, Ch. 2)* "The scope and level of detail of the **resettlement plan** vary with the magnitude and complexity of resettlement." *(OP 4.12)* "a **resettlement plan** or **abbreviated resettlement plan** is required for all operations that entail involuntary resettlement unless otherwise specified" *(OP 4.12, 17a)* **Abbreviated Resettlement Action Plan** *(OP 4.12, Annex A, 22)*	"In the case of Type I transactions (acquisition of land rights through the exercise of eminent domain) or Type II transactions (negotiated settlements) that involve the physical displacement of people, the client will develop a **resettlement action plan** or a **resettlement framework** based on a Social and Environmental Assessment that covers, at a minimum, the applicable requirements of this PS **regardless of the number of people affected**." *(PS 5, 12)*	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and ILO standards. *(NRL 3.1.1, 3.4)*	**Gap:** **Action:** **Note:**
Grievance Mechanism (Resettlement)		"Displaced persons and their communities, and any host communities receiving them, are provided timely and relevant information, consulted on resettlement options, and offered opportunities to participate in planning, implementing, and monitoring resettlement. Appropriate and accessible **grievance mechanisms** are established for these	"The client will establish a **grievance mechanism** consistent with PS 1 to receive and address specific concerns about compensation and relocation that are raised by displaced persons or members of host communities, including a recourse mechanism designed to resolve disputes in an impartial manner."	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and ILO standards. *(NRL 3.1.1, 3.4)*	**Gap:** **Action:** **Note:**

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		groups." *(OP 4.12, 13a)*	*(PS 5, 10)*		
Monitoring & Evaluation (Resettlement)		"The borrower is responsible for adequate **monitoring and evaluation** of the activities set forth in the resettlement instrument." *(OP 4.12, 24)* *(Resettlement Sourcebook, Ch. 10)*	"The client will also establish procedures to **monitor and evaluate the implementation of resettlement** plans and take corrective action as necessary." *(PS 5, 12)*	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and ILO standards. *(NRL 3.1.1, 3.4)*	**Gap:** **Action:** **Note:**
Vulnerable groups (Resettlement)		<u>Concerning Involuntary Resettlement:</u> "To achieve the objectives of this policy, particular attention is paid to the needs of **vulnerable groups** among those displaced, especially those below the poverty line, the landless, the elderly, women and children, indigenous peoples, ethnic minorities, or other displaced persons who may not be protected through national land compensation legislation." *(OP 4.12, 8)*	"… the client will identify individuals and groups that may be differentially or disproportionately affected by the project because of their **disadvantaged** or **vulnerable status**. Where groups are identified as disadvantaged or vulnerable, the client will propose and implement differentiated measures so that adverse impacts do not fall disproportionately on them…" *(PS 1, 12)* "This status may stem from an individual's or group's race, color, sex, language, religion, political or other opinion, national or social origin, property, birth or other status. The client should also consider factors such as gender, ethnicity, culture, sickness,	Amongst eight others, the KfW Entwicklungsbank especially pursues the following principle: - Prevention of adverse impacts on the living situation of communities, especially indigenous peoples and other **vulnerable groups**, as well as guaranteeing the rights, living conditions and values of indigenous peoples *(NRL 3.4.1)*	**Gap:** **Action:** **Note:**

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			physical or mental disability, poverty or economic disadvantage, and dependence on unique natural resources." *(PS 1, 12, Footnote)* Concerning Consultation: "The client will tailor its consultation process to (…) the needs of **disadvantaged** or **vulnerable groups**." *(PS 1, 21)*		
Biodiversity Conservation **(PS 6)**	Annex 11, Law 4/1994 states that a distance of 5km is required between waste management facilities and national parks	"The **conservation of natural habitats** [defined in OP 4.04, Annex A], like other measures that protect and enhance the environment, is essential for long-term sustainable development. The Bank therefore supports the protection, maintenance, and rehabilitation of natural habitats and their functions in its economic and sector work, project financing, and policy dialogue. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development.**"** (*OP 4.04)*	"PS 6 recognizes that **protecting and conserving biodiversity** - the variety of life in all its forms, including genetic, species and ecosystem diversity - and its ability to change and evolve, is fundamental to sustainable development. The components of biodiversity (…) include ecosystems and habitats, species and communities, and genes and genomes, all of which have social, economic, cultural and scientific importance. This PS reflects the objectives of the Convention on Biological Diversity to conserve biological diversity and promote use of renewable natural resources in a sustainable manner."	Amongst eight others, the KfW Entwicklungsbank especially pursues the following principle: - Preserving and protection of **biodiversity** and tropical forests as well as sustainable management of natural resources *(NRL 3.4.1)*	**Gap:** **Action:** **Note:**

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			(PS 6, 1) *IFC's Biodiversity Guide*		
Biodiversity Action Plan	Law 4/1994 provide the details of landfill site specifications, but there is no specification of usage after closure	**Not (explicitly) required**	"In projects with significant biodiversity issues (e.g. sensitive habitats or endangered species), a **Biodiversity Action Plan** should be prepared to highlight these issues and illustrate how they will be addressed. […]" *(Guidance Note 6, G9)* *(Guidance Note 6, Annex A)*	The KfW Entwicklungsbank orients itself, amongst others, by internationally proven standards and safeguards, such as the Worldbank's EHS Guidelines, **IFC's Performance Standards**, and ILO standards. *(NRL 3.1.1, 3.4)*	**Gap:** There is no role of landfill sites to participate in biodiversity plan **Action:** Identify the role of waste management facility, such as landfill in the biodiversity plan of Egypt **Note:**
Cultural Heritage **(PS 8)**	Annex 2, Executive Regulations of Law4/1994 identify that any project has to assess its impact if it is located within heritage area. The EIA Guidelines state that any project will be updated to the highest categories, e.g. project under Category A will be updated to Category B *(Executive Regulation of Law 4/1994, Annex 2)*	"The Bank assists countries to avoid or mitigate adverse impacts on **physical cultural resources** from development projects that it finances. The impacts on physical cultural resources resulting from project activities, including mitigating measures, may not contravene either the borrower's national legislation, or its obligations under relevant international environmental treaties and agreements." *(OP 4.11, 3)*	"PS 8 recognizes the importance of **cultural heritage** for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this PS aims to protect irreplaceable cultural heritage…" *(PS 8, 1)* "… cultural heritage refers to **tangible** forms of cultural heritage (…) as well as unique natural environmental features that embody cultural values (…). However, for the purpose of paragraph 11	Amongst eight others, the KfW Entwicklungsbank especially pursues the following principle: - Protection and preservation of **cultural heritage** *(NRL 3.4.1)*	**Gap:** **Action:** **Note:**

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			below, **intangible** forms of culture (…) are also included." *(PS 8, 3)*		

Waste Management Assessment
KfW Measures Concerning Waste Management

The KfW Entwicklungsbank measures concerning waste management are mainly additional actions which are derived from the climate assessment. The climate assessment consists of two parts:

1. Climate adaptation
2. Climate protection (through the reduction of greenhouse gases)

The climate assessment will appraise if any climate adaptation or protection measures are necessary and / or useful. In most cases, these measures come with additional costs that need to be considered as well in order to determine if the proposed measures are feasible. And since waste management facilities have the primary goals of health, environmental and resource protection, climate protection is only a secondary objective. But compared to other sectors, the costs for mitigating greenhouse gas emissions in the waste sector are minor.

The KfW Entwicklungsbank developed a tool for calculation greenhouse gas in solid waste management in order to calculate the impacts of different waste management strategies.

Egyptian System Measures Concerning Waste Management

As mentioned previously, Egypt doesn't have a specific solid waste management (SWM) law. SWM legal framework is scattered in many pieces of legislation. The two most significant pieces of legislations are Law No. 38/1967 on General Public Cleaning and Law No. 4/1994 for the Protection of the Environment and their amendments (see pages 5-7).
In terms of national management policy, Egypt has produced the following[4]:

- The National Strategy for Integrated Municipal Solid Waste Management (2000);
- Egypt's Country Report published by METAP (Mediterranean Environmental Technical Assistance Program) Regional Solid Waste Management Project (2004);
- A strategic framework for the municipal solid waste recycling sector (2006).

In addition, The Ministry of State for Environmental Affairs (MSEA) has published in 2001 the National Environment Action Plans (NEAP), 2002/2017, in which representing Egypt's agenda for environmental actions (including waste management policies and strategies. NEAP puts managing MSW and agriculture waste, healthcare waste, construction and demolition waste as its first priority, while managing hazardous and industrial solid wastes comes as second priority.

[4] SWEEPNET (2010) Country Report on the solid waste management: Egypt. The regional solid waste exchange of information and expertise in Mashreq and Maghreb countries (SWEEPNET)

The Plan loped in consultation with central and local public bodies, and non-government agencies. It is designed to be one of the three entry points to a strategic coordinating framework for future environmental activities in support of sustainable development. As stated earlier, the Plan is an Agenda for Action over 15 years. The priorities to be addressed in each 5-year plan will naturally depend on the overall policy set by the government for each of these plans and the NEAP is the main environmental source document for line ministries as they develop their sectoral action plans for the next 5-years. NEAP is entering its final phase of implementation.

Table 3 Gap Analysis: General Waste Management

ISSUE	Egyptian System	World Bank (WB) / IFC (World Bank Group)	KfW Entwicklungsbank	
		MUNICIPAL SOLID WASTE		
		Waste Collection and Transport		
Litter and clandestine dumping	- The local government authorities (municipalities) are responsible for the general cleaning and / or a contractor licensed by the local authority to collect, transfer, and dispose of solid waste in accordance with set specifications. - If a local authority acquires solid waste services, the contractor is responsible for the actions of the garbage collectors he hires. Law 4/1994 and its amendment Law 9/2009 ban the open burning and litter of solid waste in undesignated areas. Municipalities and EEAA collaborate to final disposal and segregation of MSW.	Recommended management strategies to minimize litter and clandestine dumping include: - Encourage use of containers or bags for waste at the point of collection for each household and establishment; - Implement a regular collection schedule with sufficient frequency to avoid accumulation of garbage; - Use vehicles appropriate for the geographic conditions and waste types to maximize reliability of collection (e.g., compactor trucks may be appropriate for neighbourhoods with wide streets and low-density trash, while smaller vehicles may be appropriate for neighbourhoods with narrow streets and higher-density garbage); - Encourage **separation of recyclable materials** at the point of generation, so that the collection points do not become sorting points for informal sector waste pickers; - Cover collection and transfer vehicles along the entire route of transport to avoid windblown litter; - Clean vehicles used for waste hauling before transportation of any goods, including compost; - Encourage residents to put waste out at designated times and locations; - Where possible, blocking off access to dumping sites and fining illegal dumpers.		**Gap:** There is no specific defining function that carries out the implementation of the law 4/1994, especially that municipalities are responsible for providing designated areas for disposal of MSW **Action:** Memorandum of Understanding between the EEAA and the Ministry of Local Development on the responsibility of deploying the environmental laws and regulation, with defining the responsibilities of taking enforcement. **Note:** At the current condition, especially at the urban areas, the solid waste

ISSUE	Egyptian System	World Bank (WB) / IFC (World Bank Group)	KfW Entwicklungsbank	
				collection are not collected regularly and only 40-90 % wastes are collected and the rest are scattered throughout towns and streets (According to the Country Report on the Solid Waste Management, SWEEPNET, July 2010). However the law enforcement toward Solid Waste Management especially between governmental agencies have not been implemented. Awareness of each governmental agencies roles and responsibilities need to have more clarifications
<u>Air Emissions</u> Dust, bio-aerosols, and odours	Law 4/1994 and its amendments Law 9/2009 estates that : - Downwind if near of the residential areas. With minimum 1.5 km for waste management collection and disposal sites, while agriculture and animal waste management can be distanced 0.5km from residential areas. - Have a fence with a minimum height of 1.8m - Health and safety procedures, with odour control within the facility In addition, the Law states that all vehicles used have to be cleaned regularly and waste collection containers to be cleaned and with an option to be covered to avoid bad	<u>Recommended management strategies to minimize dust, bio-aerosols, and odors include:</u> - Establishing frequent waste collection schedules; - Instituting a washing program for waste collection vehicles and for company-owned waste collection and transfer containers; - Promoting the use of bags to reduce the odors from soiling of waste collection and transport equipment.		**Gap:** There is no specification on who is responsible to carry out monitor on vehicles and containers. No specification on trucks carrying waste **Action:** A mechanism between EEAA and the municipalities to enforce quality measures of waste management either carried out by the local authorities or by contractors

ISSUE	Egyptian System	World Bank (WB) / IFC (World Bank Group)	KfW Entwicklungsbank	
	odour and flies.			Guidelines and specification of trucks carrying waste to be covered during transportation **Note:** There will be a need to increase awareness between Zabbaleen on these issues
Air Emissions Vehicles	Law 4/1994 and its amendment Law 9/2009 define vehicles' emission, which is carried out by Ministry of Interior Affairs.	Emissions from on-road vehicles may be regulated through national or regional programs. In the absence of these, specific measures to prevent, minimize, and control vehicle air emissions during waste collection and transport include the following: - Optimize waste collection routes to minimize distance travelled and overall fuel use and emissions - Implement transfer stations for small vehicles to consolidate waste into large vehicles for transportation to a treatment or disposal facility; - Waste collection and transport vehicle owners and operators should implement the equipment manufacturers' recommended engine maintenance, along with the mechanical maintenance for the safe operation of the vehicle, including proper tire pressure.; - Drivers should also be instructed on the benefits of driving practices which reduce both the risk of accidents and fuel consumption, including measured acceleration and driving within safe speed limits (working with garbage truck drivers can save as much as 25% on fuel use and reduce maintenance by 15%). Additional fleet management recommendations are presented in the **General EHS Guidelines**.	Driver training and low-emission vehicles are desirable, but their overall contribution to climate protection is negligible. But due to the high costs of waste collection, **analyzing and optimizing the collection system** is an essential and useful step in order to optimize costs. (*Klimaprüfung AW u. RE, 1)*	**Gap:** There are no specific measures in the Egyptian System to minimize and to control vehicle air emission during waste collection and transport, including minimizing the distance travelled of vehicles, weighing, quality and quantity of the solid waste. **Action:** Inspection on waste vehicles weights and safety measures. **Note:** At the National level, the MSEA through EEAA is collaborating with the International Agency to reduce the gas emission from the vehicles at some big cities in general, without specifying the air emission of solid waste transport vehicles.

ISSUE	Egyptian System	World Bank (WB) / IFC (World Bank Group)	KfW Entwicklungsbank	
		Waste Receipt, Unloading, Processing, and Storage		
Waste Receipt, Unloading, Processing, and Storage	Law 4/1994 and its amendment Law 9/2009 states that - the control of the incoming waste receipt, Include: waste collection bins shall be tightly covered to prevent them from giving off offensive odours or becoming a source for the proliferate of flies and other insects or a focus of attraction from stray animals. - Waste facility to segregate some of household hazardous waste, such as batteries, pesticides empty containers and empty detergents containers.	Control of the incoming waste stream is necessary to ensure safe and effective processing, treatment, and disposal of the waste and the quality of end products (e.g., compost). While procedures may vary depending on the nature of the waste and necessary processing methods, recommended measures include: - Visually evaluate, weigh, and document incoming waste loads; - Reject or, if the facility is equipped to process the waste, segregate potentially hazardous materials or wastes identified, including infectious waste, and manage as a hazardous or infectious waste, as applicable; - Analyze suspected hazardous materials before acceptance so that they are segregated relative to compatibility and so that they can be adequately treated and disposed of; If possible, isolate size reduction equipment (e.g., shredders or grinders) in an explosion-proof area with proper ventilation and pressure relief to reduce the impacts of potential explosions that could be caused by materials such as gas cylinders and ignitable liquids that may be present in MSW. Visual inspection of the incoming waste, along with sorting and removal procedures, can minimize this potential hazard; - Separate recoverable secondary materials for **recycling** and organic waste for composting to the extent practical.	**Recycling** is one of the three most efficient measures to **reduce GHG emissions**. It saves energy needed for producing new materials instead of reusing recycled materials. Furthermore, recycling saves resources and lessens environmental impacts connected to the production of raw materials. (*Klimaprüfung AW u. RE, 1)*	**Gap:** Waste management facilities does not have a weigh bridge to monitor waste data There is no accurate waste data on generation, treatment and disposal. **Action:** Introduce waste monitoring into waste management facilities EEAA to introduce waste data base, with a collaboration with municipalities. **Note:** Zabbaleen can play an essential role by identifying the areas of high waste generation, due to their experience.
Contaminated Runoff	Law 4/1994 and its amendment Law 9/2009 states that waste collection bins shall be tightly covered to prevent them from giving off offensive odours	Recommended contaminated runoff management strategies include: - When siting, consider the proximity of waste handling and storage areas to water supply wells for people and animals, irrigation canals, and surface water bodies that support aquatic life and the ability to prevent contaminated leachate and drainage from entering surface and ground water;		**Gap:** There are no specific regulations and management strategies related to the management of contaminated runoff of the solid wastes

ISSUE	Egyptian System	World Bank (WB) / IFC (World Bank Group)	KfW Entwicklungsbank	
		- Use impermeable materials for roads, waste processing and storage areas, and vehicle washing areas, and install curbs to prevent runoff to permeable areas; - Collect runoff and leachate from areas used for waste storage, and treat runoff to meet applicable environmental standards before discharge to surface water or the municipal sewage system (e.g., screen to remove large material, install silt traps to remove particulates, and remove separate-phase liquids with an oil/water separator). Discharge to the municipal sewage system (via pipe or tanker truck), where available, is preferred for runoff from waste storage and handling areas; - Re-use collected water in on-site disposal processes to the extent practical or store with collected leachate awaiting treatment. In addition, management strategies for contaminated runoff from vehicles include: - Cover containers during transport, - Ensure vehicle equipment is designed to collect drainage and that it is held in a sump container until the vehicle reaches a safe discharge location.		**Action:** to define the liability of waste carriers of any spillage within the environmental laws and regulations **Note:** As indicated, at current situation, around 35% of wastes is accumulates on city streets and illegal dumping sites, including in waterways, and drains.
Litter	Some measured are recommended to minimize solid waste during waste receipt, unloading, processing and storage ((specified in the Executive Regulations for Law 38 of 1967 (MoH 134/1968) include: - Garbage bin shall be placed in a manner appropriate to the streetscape and the quantity of expected waste. - The garbage shall be collected and transported at suitable intervals in keeping with the conditions of each area.(Article 11) - Storage containers / bins should have suitable capacity for the waste	The following measures are recommended to prevent, minimize, and control litter and solid waste during waste receipt, unloading, processing, and storage: - Provide adequate storage for waste not immediately treated or disposed of; - Implement good housekeeping procedures; - Consider use of enclosed/covered areas for waste tipping, shredding, compacting, etc.; - Install catch fences and netting to trap windblown litter.	Concerning adaptation to climate change: Increased wind speed and occurrences might cause litter to be blown away. Planting vegetation or installing structures to protect waste from wind and / or to catch drifting waste (e. g. in fences) should be considered. (*Klimaprüfung AW u. RE, Annex 3)*	**Gap:** There is no specific guidelines on waste collection **Action:** EEAA to produce guidelines on frequency of waste collection based on geographical and social characteristics **Note:** Although the measured are

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	generated, using hard metal or similar materials, tight cover with handles, must be kept inside buildings and kept clean and washed after each use (Article 6). - Collection of the containers must be made by resistant materials, void of holes and kept clean. (Article 12) - Local Council shall determine the period and time for waste collection. (Article 11) - Garbage sorting is only allowed at designated areas and prohibited in vehicles. (Article 13) Law 4/1994 and its amendment Law 9/2009 states that local authority to provide places for waste collection every 24hours after complete study on the location and its specifications			recommended under the law, but the litter control as well as the prevention for un-immediate waste disposal is not been introduced. Therefore, the illegal dumping as well as solid waste accumulation in city streets are the common practises.
Air Emissions	Law 4/1994 and its amendment Law 9/2009 air emissions in the work environment (Annex 8).	The following measures are recommended to prevent, minimize, and control vehicle emissions and emissions of dust, odors, and bioaerosols during waste receipt, unloading, processing, and storage: - Select vehicles and containers that minimize air emissions during waste loading and unloading; - Design drop-off points to minimize queuing of vehicles; - Sweep waste management areas and roads frequently and use water spray for dust control where needed; - Pre-treat wastes as needed (e.g., solidification, encapsulation, or wetting sufficient to reduce dust but without forming leachate); - Use enclosed waste handling and storage areas for malodorous wastes or wastes that generate hazardous dust (e.g., asbestos). Enclosed waste storage and handling areas are preferred for all wastes;		**Gap:** There are no specific recommendations concerning the dust control, pre treatment waste as well as extraction system for dust removal during unloading, processing **Action:** Provide guidelines for waste work environment for waste and resources management **Note:** When it is necessary, the recommendations are

ISSUE	Egyptian System	World Bank (WB) / IFC (World Bank Group)	KfW Entwicklungsbank	
		- Use extraction system to remove dust from working areas, buildings, and storage vessels, and treat as needed to control particulate emissions (e.g., bag filter); - Remove, treat, or dispose of all biological / malodorous wastes in an expeditious manner; - Use odor-neutralizing sprays where necessary; - Use negative pressure in processing buildings and appropriate air filtration (e.g., biofilter) to remove odor.		made according the International Standard (World Bank/IFC).
Noise and Vibration	Law 4/1994 and its amendment Law 9/2009 noise estates the limits in the work environment and residential and industrial areas (Annex 7).	Recommended noise management strategies include: - Construct a buffer zone between the facility and the external environment or locate facilities away from sensitive receptors; - Include noise and vibration considerations during design, including use of models to predict noise levels at specified noise-sensitive locations, using standardized sound power levels for construction plant; - Maintain site roads in good condition to reduce noise and vibration from vehicle movements; - Use acoustic screens around fixed/mobile plant and equipment; - Select equipment that has low noise emission levels; - Fit silencing equipment to plant, e.g. baffles/mufflers; - Use buildings to contain inherently noisy fixed plant equipment (e.g., locate waste shredder in the tipping hall, and enclose tipping hall on all sides) and consider use of sound-insulating materials in construction.		**Gap:** No specific limits for the waste industry **Action:** To provide limits for noise and vibration in waste management facilities based on international standards **Note:**
COMMUNITY HEALTH & SAFETY				
General Occupational & Environmental Health Issues Associated	Law 12/2003 provides the framework to both employers and employees for a safe working environment. The law has generic guidelines for safe and healthy working environment for industrial and	The following principles should be considered in managing the occupational, health, and safety risks of informal labourers: - Waste scavenging should not be allowed under any circumstances in hazardous and non-		**Gap:** There are no guidelines for waste management industry in Egypt.

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with Waste Scavenging	commercial sectors	hazardous industrial waste management facilities; - Facilities dedicated to the management of MSW should work with government entities in the development of simple infrastructure that can allow for the sorting of waste, helping groups of scavengers form cooperatives or other forms of micro-enterprises, or formally contracting them to provide this function. The outright displacement of scavenging workers as an occupational health and safety management strategy, without the provision of viable alternatives, should be avoided; - Operators of existing facilities with scavenging workers should exercise commercially viable means of formalizing their work through the creation of management programs that include: • Allowing only registered adults on the site, excluding children and domestic animals. Striving to provide alternatives to access to childcare and education to children; • Providing protective gear, such as shoes. face masks, and gloves; • Arranging the disposal layout and provide sorting facilities to improve access to recyclables while reducing their contact with other operations, thus minimizing potential hazards; • Providing water supply for washing and areas for changing clothes; • Implementing education campaigns regarding sanitation, hygiene, and care of domestic animals; • Providing a worker health surveillance program including regular vaccination and health examinations.		There is no data on incidents and health problem related to the waste and resources industry **Action:** Establish an outline for safety procedures within the waste industry in Egypt Establish database of the industry to include data on: number of workers in the industry, annual incidents, and occupational disease within sector **Note:** There are studies on the mortality rate of zabbaleen that can be used as a guidance[5]

[5] Fahmi, W. S. And Keith, S. (2006) Cairo's Zabaleen garbage recyclers: Multi-nationals' takeover and state relocation plans. Habitat International, Vol30 (4): 809-837.

Table A-4 Gap Analysis: Waste Management Facilities

ISSUE	Egyptian System	World Bank (WB) / IFC (World Bank Group)	KfW Entwicklungsbank	
		MUNICIPAL SOLID WASTE		
		Biological Treatment		
Leachate and Runoff	Law 4/1994 and its amendment Law 9/2009 state the limits of discharges on the sea, while Law 48/1982 states the limits on the River Nile and underground water reservoirs. The latter is controlled by Ministry of Irrigation and Water Resources. Law 93/1962 and it amendment Ministerial Decree No.44/2000 states the limits of discharge over the sewer network, and is controlled by the Ministry of Housing, Utilities, and Urban Development	<u>The following measures are recommended to prevent, minimize, and control leachate generation and discharge from biological treatment operations:</u> - Install a drainage layer underneath the processing area to provide adequate leachate drainage from composting organics. This may consist of a bed of coarse material such as wood chips, or alternatively the processing platform may permanently incorporate a drainage layer designed to withstand the loading, working and removal of material. For small-scale compost facilities or in dry areas, an adsorbent material can be incorporated in the compost and at the base of the pile; - The material processing or storage areas of the facility should have a leachate barrier system that forms a secure barrier between the groundwater, soil, and substrata and the composting or stored organics, as well as systems for collecting and treating leachate; - Design and maintain the slope and orientation of windrows and/or leachate drains such that free drainage of leachate to a collection drain is facilitated and ponding of leachate is avoided; shape the piles and windrows to maximize run-off and hence reduce infiltration; - Store leachate in a lined earthen basin or in aboveground storage tanks; - For anaerobic digestion, maximize recycling of waste water to the reactor; - Measure total organic carbon (TOC), chemical oxygen demand (COD), nitrogen (N), phosphorus (P) and chlorine (Cl) levels in the inlet and outlet flows from an anaerobic digester. When a better control of the process is required, or a better quality of the waste output, monitoring of additional parameters may be necessary; - Operate an anaerobic digester under thermophilic digestion conditions, in order to increase the pathogen destruction, biogas production rate (hence higher energy recovery) and the retention time - Maintain ideal composting conditions such as:	Concerning adaptation to climate change: Increasing temperatures might increase evaporation and biodegradation. Monitoring of humidity and additional irrigation should be considered. (*Klimaprüfung AW u. RE, Annex 3)*	**Gap:** **Action:** **Note:**

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		• Carbon: nitrogen (C:N) ratio between 25:1 and 35:1 • Moisture content of 50 to 60 % of total weight during treatment (and less than 50 % for marketing following screening) • Balance between particle size and void space to promote rapid decomposition. Void space should be sufficient to achieve a 10 to 15 % oxygen level within the pile in aerobic systems • Optimum temperature levels which can range between 32 and 60°C. Pathogen destruction can be achieved by attaining and maintaining a temperature of 55°C for three days in a vessel composting system or 15 days in a windrow system • pH of between 6 and 8.		
Air Emissions	Law 4/1994 and its amendment Law 9/2009 air emissions in the work environment (Annex 8).	<u>The following measures are recommended to prevent, minimize, and control air emissions from biological treatment:</u> - Use mist spray to keep down dusts, especially during and prior to loading or other handling procedures. - Use windrow turning equipment that is specially designed to minimize air emissions, as opposed to wheeled loaders or conveyor loaders that drop wastes into piles. - For highly odorous wastes, use closed feed bunkers constructed with a vehicle sluice; for less odor-intensive wastes, use automated and rapid action doors (opening times of the doors being kept to a minimum) in combination with an appropriate exhaust air collection device resulting in an under pressure in the treatment hall. - Enclose leachate drains to reduce the emission of odors. - Minimize the amount of water added to compost (e.g., by covering compost material) to avoid anaerobic conditions that can cause hydrogen sulfide odors if the compost mixture contains sulfur-containing materials.		**Gap:** There is neither measurement nor specifications on odour nuisance and limits **Action:** Provide guidelines on defining nuisance emissions, measurements and limits **Note:**
Fire	Law 12/2003 provide guidelines over health and safety requirement in work environment.	<u>Recommended fire prevention and control strategies include:</u> - For composting, avoid conditions that can lead to spontaneous combustion (e.g., moisture between 25 – 45 % and temperatures above about 93ºC. This can be achieved for example by keeping windrows less than about 3m high and turning them when the temperature exceeds 60ºC); - Collect biogas for use or treatment (e.g. energy recovery or flaring); - Provide a fire alarm system, including temperature sensors in the waste being treated; - Design the facility for access by firefighting equipment, including	Concerning adaptation to climate change: Increasing temperatures might lead to an increased risk of fire. Increased fire prevention measures and extinguishing installations should be considered. (*Klimaprüfung AW u.*	**Gap:** Economical and environmental benefits of biogas are not addressed into the Egyptian policies. **Action:** To establish limits of biogas discharge

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		clear aisles among windrows and access to an adequate water supply.	*RE, Annex 3)* Collecting biogas for energy recovery reduces GHG emissions. Even though the collection of gas is not as efficient as the incineration of waste, it is especially an option for already existing landfills. (*Klimaprüfung AW u. RE, 1)*	To provide incentives for technologies captures biogas for energy recovery **Note:** A socio–economic benefits need to be addressed to provide full business case for investors
		Municipal Solid Waste Thermal Treatment Facilities		
Municipal Solid Waste Thermal Treatment Facilities	**Gaps** Law 4/1994 and amendments in Law 9/2009 state in Article 38 of the Executive Regulations that one of the treatment methods for rubbish and solid waste is thermal treatment with or without thermal recovery. Article 38 also states that incineration is required as a treatment method with specific requirements in Annex 11. However, Annex 11 provides specification for solid waste management and recycling in general terms.	see below		**Gap:** **Action:** To provide technical guidelines of thermal treatment for municipal solid waste. Legal requirement of municipal solid waste thermal treatment facilities regarding air emissions, wastewater, and residual wastes **Note:**
Air Emissions	Law 4/1994 and its amendment Law 9/2009 state air emissions limits to the environment (Annex 6).	<u>The following measures are recommended to prevent, minimize, and control air emissions:</u> - Conduct waste segregation and/or presorting to avoid		**Gap:** No technical and environmental

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		incineration of wastes that contain metals and metalloids that may volatilize during combustion and be difficult to control through air emission technology (e.g., mercury and arsenic); - Follow applicable national requirements and internationally recognized standards for incinerator design and operating conditions, mainly rapid quenching of the flue gas after leaving all combustion chambers and before entering any dry particulate matter air pollution control device but also combustion temperature, residence time, and turbulence. Standards for stationary incinerators which include temperature and afterburner exit gas quenching (i.e. rapid temperature reduction) requirements are preferred in order to nearly eliminate dioxins and furans; - Introduce wastes into the incinerator only after the optimum temperature is reached in the final combustion chamber. - The waste charging system should be interlocked with the temperature monitoring and control system to prevent waste additions if the operating temperature falls below the required limits; - Minimize the uncontrolled ingress of air into the combustion chamber via waste loading or other routes; - Optimize furnace and boiler geometry, combustion air injection, and, if used, NOX control devices using flow modeling; - Optimize and control combustion conditions by the control of air (oxygen) supply, distribution and temperature, including gas and oxidant mixing; the control of combustion temperature level and distribution; and the control of raw gas residence time; - Implement maintenance and other procedures to minimize planned and unplanned shutdowns; - Avoid operating conditions in excess of those that are required for efficient destruction of the waste; - Use auxiliary burner(s) for start-up and shut-down and for maintaining the required operational combustion temperatures (according to the waste concerned) at all times when unburned waste is in the combustion chamber. - Use a boiler to transfer the flue-gas energy for the production of electricity and/or supply of steam/heat, if practical; - Use primary (combustion-related) NOX control measures and/or selective catalytic reduction (SCR) or selective noncatalytic reduction (SNCR) systems, depending on the emissions levels		specification on thermal treatment facilities No legal requirement for energy recovery of thermal treatment **Action:** To establish policy on thermal treatment of waste with providing technical specification for different thermal technologies, e.g. pyrolysis and gasification Legal requirements of gaseous emission from thermal treatment To provide Incentives to recover energy and heat from thermal treatment facilities of waste **Note:** Socio–economic benefits need to be addressed to provide full business case for investors

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		required; - Use flue gas treatment system for control of acid gases, particulate matter, and other air pollutants; - Minimize formation of dioxins and furans by ensuring that particulate control systems do not operate in the 200 to 400 degrees Celsius temperature range; identifying and controlling incoming waste composition; using primary (combustion-related) controls; using designs and operation conditions that limit the formation of dioxins, furans, and their precursors; and using flue gas controls; - Consider the application of waste- to-energy or anaerobic digestion technologies to help off-set emissions associated with fossil fuel based power generation.		
Ash and Other Residuals	Law 4/1994 and its amendment Law 9/2009 state that waste incineration can be used as a treatment method, with no more specification	The following measures are recommended to prevent, minimize, and control solid waste from incineration: - Design the furnace to, as far as possible, physically retain the waste within the combustion chamber (e.g. narrow grate bar spacing for grates, rotary or static kilns for appreciably liquid wastes), and use a waste throughput rate that provides sufficient agitation and residence time of the waste in the furnace at sufficiently high temperatures, including any ash burn-out areas, in order to achieve a total organic carbon (TOC) value in the ash residues of below 3 wt percent and typically between 1 and 2 wt percent. - Manage bottom ash separately from fly ash and other flue gas treatment residues to avoid contamination of the bottom ash for its potential recovery; - Separate remaining ferrous and non- ferrous metals from bottom ash as far as practicably and economically viable, for their recovery; - Treat bottom ash on or off-site (e.g., by screening and crushing) to the extent that is required to meet the specifications set for its use or at the receiving treatment or disposal site (e.g., to achieve a leaching level for metals and salts that is in compliance with the local environmental conditions at the place of use); - Bottom ash and residuals should be managed based on their classification as hazardous or non-hazardous materials. Hazardous ash should be managed and disposed of as hazardous waste. Non-hazardous ash may be disposed of in an MSW landfill or considered for recycling in construction materials.		**Gap:** Thermal treatment ashes and residual has no classification within the Egyptian legal system No specification for collection, storage, treatment and disposal of bottom ash/residual of thermal treatment facilities. **Action:** To identify definition of thermal treatment technologies outputs Identify residual and ashes in the legal system Introduce treatment and recovery methods of thermal treatment residuals

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				Provide legal framework of final disposal of thermal treatment residuals **Note:**
Water Effluents	Law 4/1994 and its amendment Law 9/2009 state the limits of discharges on the sea, while Law 48/1982 states the limits on the River Nile and underground water reservoirs. The latter is controlled by Ministry of Irrigation and Water Resources. Law 93/1962 and it amendments. Ministerial Decree No.44/2000 states the limits of discharge over the sewer network, and is controlled by the Ministry of Housing, Utilities, and Urban Development	Cooling systems generate cooling tower blowdown, which is addressed in the **General EHS Guidelines**. In addition, flue gas treatment generates wastewaters requiring treatment and disposal. To prevent, minimize, and control water effluents, wastewater from flue gas treatment should be treated as necessary, e.g., using filtration coagulation, precipitation, and filtration to remove heavy metals, and neutralization.		**Gap:** **Action:** **Note:**
Noise	Law 4/1994 and its amendment Law 9/2009 state the limits of noise in the work environment (Annex 7).	Measures to address noise impacts are addressed in the **General EHS Guidelines**. Additional recommended measures to prevent, minimize, and control noise from incineration include use of silencers on air coolers and chimneys, as necessary.		**Gap:** **Action:** **Note:**
		Landfilling		
Landfill Siting	Annex 11 from Law4/1994 and its amendments states that (with correlation to Law 38/1967): - Municipalities to carry out a study on geographical characteristics of selected sites and measure capacity for waste disposal - Site is downwind of residential	<u>The location of the landfill should take into account potential impacts associated with releases of polluting substances including the following:</u> - Proximity to residential, recreation, agricultural, natural protected areas, or wildlife habitat and areas prone to scavenging wildlife, as well as other potentially incompatible land uses: • Residential development should be typically further than 250 m from the perimeter of the proposed landfill cell development to minimize the potential for migration of underground gaseous	Waste facilities should never be sited in areas that carry risks such as flooding, land slides, high ground water levels or intense precipitation. (*Klimaprüfung AW u. RE, 2.2.1)*	**Gap:** **Action:** **Note:**

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	and industrial areas with at least 1.5km distance - Distance of 1km from flood channels, underground water wells - 2km distance of water ways - 3km away from coastline and lakes - 5km distance from natural parks and River Nile sides - To have easy access to road networks, with a distance of main rods up to 1km, and secondary roads up to 250m. - To all the usage of waste to cover obliterated water channels, by using layers of dust for up to 15cm , with very good firmness.	emissions • Visual impacts should be minimized by evaluating locational alternatives o Siting should be further than 3 km of a turbojet airport and 1.6 km of a piston-type airport or as permitted by the aviation authority fully considering potential threats to air safety due to attraction and presence of birds - Proximity and use of groundwater and surface water resources; • Private or public drinking, irrigation, or livestock water supply wells located downgradient of the landfill boundaries should be further than 500 m from the site perimeter, unless alternative water supply sources are readily and economically available and their development is acceptable to regulatory authorities and local communities • Areas within the landfill boundaries should be located outside of the 10-year groundwater recharge area for existing or pending water supply development. • Perennial stream should not be located within 300 m downgradient of the proposed landfill cell development, unless diversion, culverting or channeling is economically and environmentally feasible to protect the stream from potential contamination. - Site geology and hydrogeology; • Landfills should be located in gently sloped topography, amenable to development using the cell (bund) method), with slopes which minimize the need for earthmoving to obtain the correct leachate drainage slope of about 2% • Groundwater's seasonally high table level (i.e., 10 year high) should be at least 1.5 m below the proposed base of any excavation or site preparation to enable landfill cell development • Suitable soil cover material should be available on-site to meet the needs for intermediate (minimum of 30 cm depth) and final cover (minimum of 60 cm depth), as well as bund construction (for the cell method of landfill operation). Preferably, the site would have adequate soil to also meet required cover needs (usually a minimum of 15 cm depth of soil) - Potential threats to landfill site integrity from natural hazards such as floods, landslides, and earthquakes: • Landfills should be sited outside of a floodplain subject to 10-year floods and, if within areas subject to a 100- year flood,		

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		amenable to an economic design which would eliminate the potential for washout • There should be no significant seismic risk within the region of the landfill which could cause destruction of berms, drains or other civil works, or require unnecessarily costly engineering measures; otherwise, side slopes should be adjusted accordingly to prevent failure in the event of seismic activity • No fault lines or significantly fractured geologic structure should be present within 500 m of the perimeter of the proposed landfill cell development which would allow unpredictable movement of gas or leachate • There should be no underlying limestone, carbonate, fissured or other porous rock formations which would be incompetent as barriers to leachate and gas migration, where the formations are more than 1.5 m in thickness and present as the uppermost geologic unit above sensitive groundwaters.		
Leachate Generation	Law 4/1994 and its amendment Law 9/2009 state the limits of discharges on the sea, while Law 48/1982 states the limits on the River Nile and underground water reservoirs. The latter is controlled by Ministry of Irrigation and Water Resources. Law 93/1962 and it amendment Ministerial Decree No.44/2000 states the limits of discharge over the sewer network, and is controlled by the Ministry of Housing, Utilities, and Urban Development	The following measures are recommended to prevent, minimize, and control leachate generation from MSW landfills: - Site landfills in areas with stable geology and avoid siting near particularly vulnerable or sensitive ecosystems and groundwater and surface water resources; - Design and operate the landfill in accordance with applicable national requirements and internationally recognized standards to minimize leachate generation, including the use of low-permeability landfill liners to prevent migration of leachate as well as landfill gas, a leachate drainage and collection system, and landfill cover (daily, intermediate, and final) to minimize infiltration; - Treat leachate onsite and/or discharge to municipal wastewater system. Potential treatment methods include aerated lagoons, activated sludge, anaerobic digestion, artificial wetlands, re-circulation, membrane filtration, ozone treatment, peat beds, sand filters, and methane stripping; - Minimize the daily exposed working face and use perimeter drains and landfill cell compaction, slopes and daily cover materials to reduce infiltration of rainfall into the deposited waste; - Prevent run-on of precipitation into the active area of the landfill (e.g., by use of berms or other diversions); systems should be designed to handle the peak discharge from a 25-year storm; - Collect and control run-off from the active area of the landfill; the system should be designed to handle the discharge from a 24-		**Gap:** No requirement for landfill site engineering or leachate collection, treatment and disposal **Action:** To establish clear guidelines for engineered landfill , with leachate drainage Provide identification to leachate generation from landfill, with classifying leachate as hazardous waste Provide legal requirement for leachate collection, storage and treatment on and off the landfill site

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		hour, 25-year storm. Runoff is typically treated together with leachate from the site.		**Note:**
Groundwater and Leachate Monitoring	Law 48/1982 states the limits on the River Nile and underground water reservoirs, which is controlled by Ministry of Irrigation and Water Resources	Recommended measures for groundwater and leachate monitoring include the following: - Measure and record the quantity and quality of leachate generated. Changes in leachate quantity or quality not attributable to weather or other factors may indicate changes in the liner, leachate collection, or landfill cover systems; - Install groundwater monitoring wells outside the landfill perimeter at locations and depths sufficient to evaluate whether leachate is migrating from the landfill into the uppermost groundwater unit. This groundwater monitoring network should usually include, at a minimum, one monitoring well located in the upgradient groundwater flow direction from the landfill and two monitoring wells located in the down gradient direction. The groundwater monitoring system should be consistent with applicable national regulations and internationally recognized standards. Regularly sample the monitoring wells and analyze for constituents, selected based on: • The types, quantities, and concentrations of constituents in wastes managed in the landfill • The mobility, stability, and persistence of waste constituents their reaction products in the unsaturated zone beneath the waste management area • The detectability of indicator parameters, waste constituents, and reaction products in ground water; • The constituent concentrations in the groundwater background.		**Gap:** No requirement on monitoring leachate generation on landfill sites **Action:** To introduce legal requirement of keeping record of leachate generation, storage, and treatment, either on or off the site **Note:**
Landfill Gas Emissions	Law 4/1994 and its amendment Law 9/2009 state air emissions limits to the environment (Annex 6).these limits are for industrial activities, but does not include landfill gas	Recommended methods to control and monitor landfill gas emissions include the following: - Include landfill gas collection system designed and operated in accordance with applicable national requirements and recognized international standards including recovery and pre-use processing or thermal destruction through an efficient flaring facility. Prevent condensation from accumulating in extraction systems by arranging the pipe work to fall to a removal point such as a knock out-pot.	Collecting gas for energy recovery reduces GHG emissions. Even though the collection of gas is not as efficient as the incineration of waste, it is especially an option for already existing landfills.	**Gap:** No legal definition of landfill gas No legal requirement to monitor landfill gas **Action:** To commence legal

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		- Use landfill gas as fuel if practical, or treat before discharge (e.g., by using enclosed flare or thermal oxidation if methane content is less than about 3 % by volume). - Use gas blowers (boosters) of sufficient capacity for the predicted gas yield and constructed of materials appropriate for landfill gas duty; blowers should be protected by flame arrestors at both gas inlet and outlet. - Install and regularly sample boreholes surrounding the landfill to monitor for migration of landfill gas. Carbon financing may also be considered, including opportunities implemented through the host- country Joint Implementation of the United Nations Network Convention on Climate Change. <u>Recommended methods to control dust and odor emissions include the following:</u> - Compact and cover waste promptly after discharge from the vehicle delivering the waste - Minimize open tipping face area - Dispose of odorous sludge in covered trenches - Restrict acceptance of loads known to be particularly odorous - Restrict tipping activities during periods of adverse weather (e.g., wind toward sensitive receptors) - Seal sump covers - Aerate leachate storage areas	(*Klimaprüfung AW u. RE, 1)*	definition of landfill gases, and capture To provide guidelines on collect landfill gas To introduce incentives for generating energy from landfill gas **Note:**
Litter	Annex 11 from Law4/1994 and its amendments states that (with correlation to Law 38/1967): - Municipalities to carry out a study on geographical characteristics of selected sites and measure capacity for waste disposal - Site is downwind of residential and industrial areas with at least 1.5km distance	<u>The following measures are recommended to prevent, minimize, and control dispersal of litter:</u> - Avoid siting of facilities in particularly exposed, windy areas - Provide perimeter planting, landscaping, or fences to reduce wind; - Pin waste by use of dozers and landfill compactors immediately after discharge from the vehicles delivering the waste; - Use soil or artificial cover materials so that deposited waste is held in place. More frequent application of cover may be required during high winds or in exposed areas; - Use scaring techniques or natural predators to control scavenging birds; - Provide an emergency tipping area/foul weather cell for lightweight wastes such as paper; - Construct temporary banks and bunds immediately adjacent to the tipping area, install strategically placed mobile catch fences	Concerning adaptation to climate change: Increased wind speed and occurrences might cause litter to be blown away. Planting vegetation or installing structures to protect waste from wind and / or to catch drifting waste (e. g. in fences) should be considered. (*Klimaprüfung AW u. RE, Annex 3)*	**Gap:** **Action:** **Note:**

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		close to the tipping area or on the nearest downwind crest, and/or fully enclose of the tipping area within a mobile litter net system; - Install wind fencing upwind of the tipping area to reduce the wind strength as it crosses the facility ; - Temporarily close the facility to specific or all waste or vehicle types when weather conditions are particularly adverse.		
Closure and Post-Closure	Annex 11 from Law4/1994 and its amendments states that (with correlation to Law 38/1967) the requirement of landfill sites for MSW, however there is no clear requirement for the end of life of landfill sites, and its usage after closure	Closure and post-closure planning activities should include the following elements: - Development of a closure plan which specifies the necessary environmental objectives and controls (including technical specifications), future land use (as defined in consultation with local communities and government agencies), closure schedule, financial resources, and monitoring arrangements; - Evaluation, selection, and application of closure methods consistent with post- closure use and which should include the placement of a final cover to prevent further impacts to human health and the environment; - Application of final cover components that are consistent with post closure use and local climatic conditions. The final cover should provide long term environmental protection by preventing direct or indirect contact of living organisms with the waste materials and their constituents; minimize infiltration of precipitation into the waste and the subsequent generation of leachate; control landfill gas migration; and minimize long term maintenance needs. - Financial instruments in place to cover the costs of closure and post-closure care and monitoring.		**Gap:** No legal requirement of usage of landfill site before and after closure No specification for the cover and monitoring plan for closed landfill site **Action:** To introduce landfill site post closure and closure action plane guidance To implement legal requirement for landfill site usage after closure To introduce legal requirement for specific monitor plan for gaseous emissions, and leachate from the site after closure **Note:**
INDUSTRIAL HAZARDOUS WASTE				
Waste	Law4/1994 and its amendments states that:	Recommended measures to prevent spills and releases during waste transport and to facilitate emergency response if an		**Gap:**

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Collection and Transport	- Hazardous waste collection (especially the medical waste collection and transport) has to be done by licenced company Transport - The transporter requires a license and necessary documentation attesting that the vehicles meet the required specifications for transporting the specific HW indicated in the license. - Transport of hazardous waste is required to have clear signs indicating the characteristics of the Hazardous Waste transported. These signs are normally referred to in Egypt as 'Placards'. - Vehicles are not allowed to access during daytime into residential areas.	accident should occur are provided in the **General EHS Guidelines**. <u>Additional recommendations specifically applicable to hazardous waste collection and transport operations include:</u> - Follow applicable national regulations and internationally accepted standards for packaging, labeling, and transport of hazardous materials and wastes; - Use tanks and containers specially designed and manufactured to incorporate features appropriate for the wastes they are intended to carry; - If drums or other containers are used to transport waste, containers should be in good condition and compatible with the waste and are adequately secured in the transport vehicle; - Adequately label all transport tanks and containers to identify the contents, hazards, and actions required in various emergency situations.		**Action:** **Note:**
Waste Receipt, Unloading, Processing, and Storage	Law4/1994 and its amendments state that: - <u>To look into reuse and of HW either by other industrial process or to be used to recover energy</u> - <u>To provide a framework to reduce hazardous waste generation</u>	<u>Recommended measures to control waste receipts and general measures to mitigate risks at industrial hazardous waste management facilities include:</u> - Establish and maintain a close relationship with the waste generator to understand the process generating the waste and to monitor any changes in the process or waste characteristics; - Sufficient personnel with the requisite qualifications should be available and on duty at all times. All personnel should undergo specific job training; - Obtain a thorough understanding of the incoming waste. Such knowledge needs to take into account the waste characteristics and variability, the origin of the waste, the treatment and disposal under consideration, the nature of the waste residuals, if any, that may be generated during treatment, and potential risks associated with waste treatment and disposal; - Implement a pre-acceptance procedure that includes, as applicable, tests of the incoming waste and documentation of the waste source (e.g., the processes producing the waste, including the variability of the process), and identifying the appropriate		**Gap:** **Action:** **Note:**

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		treatment/disposal; - Implement an acceptance procedure that includes, as applicable, procedures that limit the acceptance of waste to only that which can be effectively managed including effective disposal or recovery of residuals from waste treatment. Only accept waste if the necessary storage, treatment capacity, and disposition of any treatment residuals (e.g. acceptance criteria of the output by another treatment or disposal facility) are assured. The reception facility should include a laboratory to analyze incoming waste samples at the speed required by facility operations to determine if the waste is acceptable; - In the case of treatment, analyze the waste out according to the relevant parameters important for the receiving facility (e.g. landfill or incinerator).		
Spills and Releases	Law4/1994 and its amendments state that the authorized contractors or companies registered for handling the hazardous waste should follow the procedure including the inspection of the containers checks leakage, deteriorating containers, proper labeling, material separation process, handling equipment and personnel equipment.	Mitigation measures, including physical protection, overfill protection, tank integrity, and secondary containment for tanks are addressed in the **General EHS Guidelines**. Additional recommended measures include: - Segregate hazardous wastes and materials from nonhazardous wastes and materials; - Separate incompatible wastes, such as certain alkaline and acidic wastes that would release toxic gases if mixed; keep records of testing; store waste in separate drums or vessels based on their hazard classification; - Lock out valves controlling material and waste transfer when not in use; - Waste containers should be suitably labeled to include details of their contents and that their locations are recorded in a tracking system; - Transfer or decant only one type of material at any one time; - Conduct regular training and exercises for site staff regarding emergency procedures; - Provide sufficient firewater containment to prevent uncontrolled discharge of water off site in the event of a fire.		**Gap:** **Action:** **Note:**
Fires and Explosions	Law4/1994 and its amendments states that hazardous waste management sites should have emergency plan according to the nature of each waste	Recommended measures to prevent and prepare for fires and explosions are presented in the **General EHS Guidelines**. Additional recommended measures include: - Fire fighting equipment appropriate to the type of waste received at the site should be available; - Minimize the storage of flammable liquids on site (e.g. fuel,		**Gap:** **Action:**

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		flammable wastes); - Use of a nitrogen atmosphere for organic waste liquid with a low flashpoint stored in tanks; - Perform crushing and shredding operations under full encapsulation and under an inert or exhausted atmosphere for drums and containers containing flammable or highly volatile substances; - Provide an emergency tipping area for waste loads identified to be on fire or otherwise deemed to be an immediate risk; - Prepare and annually review a fire risk assessment.		**Note:**
Air Emissions	Law4/1994 and its amendments states that for HW incineration, especially for healthcare waste has to follow the legal requirement of air emission limits (Annex 6)	Hazardous waste incineration facilities should minimize leaks from hazardous waste transfer equipment (e.g. pumps, piping, etc) through the implementation of leak detection and repair program. Additional guidance on VOC emissions prevention and control is addressed in **the General EHS Guidelines**. Guidance on emissions prevention and control is also addressed above under the MSW section.		**Gap:** **Action:** **Note:**
Water Effluents	Law4/1994 and its amendments states that - To wash vehicles used for transport and wash water treated as hazardous waste	General measures for runoff control are addressed under MSW above and in the **General EHS Guidelines**. <u>In addition, the following methods are recommended for prevention, minimization, and control of water effluents:</u> - Collect and treat wash water and runoff from waste storage and handling areas as potentially hazardous, unless analytical tests determine otherwise; - Segregate runoff from areas storing incompatible wastes.		**Gap:** **Action:** **Note:**
		Biological and Physical-Chemical Treatment		

Gaps

Law 4/1994 and its amendments state that several methods can be used to treat hazardous waste, either by biological, physical and/or chemical treatment (Article 28, Executive Regulation). However, it does not give specific procedures for legal recruitment for mentioned treatment. There is only one engineered hazardous waste landfill in Egypt, which is supported by FINNIDA, and it is run by international standards

Actions:

- **to provide more guidelines of different hazardous waste treatment**
- **provide legal requirement for each treatment method, for its air emission, wastewater and final disposal of the treated waste**

Hazardous Waste	Law4/1994 and its amendments states usage of incineration	<u>To minimize potential environmental, health, and safety impacts, the following general measures should be considered:</u>		**Gap:**

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Incineration	especially for disposal of medical hazardous waste. Annex 6 provide legal requirement for gaseous emission of incineration.	- Design and operate incinerators in accordance with applicable national requirements and internationally accepted standards. These standards typically require destruction efficiencies of 99.99 % to 99.9999 %, depending on the hazard characteristics of the waste; - Implement stringent waste selection procedures so that only wastes that can be effectively managed are accepted; - Continuously monitor incinerator parameters including waste feed rate, total hydrocarbons, temperature (measured at the end of the residence zone), and CO and oxygen (measured a the stack); - Install an automatic system to prevent feeding of hazardous waste to the incinerator when operating conditions deviate from the acceptable range (e.g., during startup and shutdown or upset conditions).		**Action:** **Note:**
Air Emissions		<u>Recommended measures to prevent, minimize, and control air emissions include:</u> - Continuously monitor CO and O_2 to evaluate proper combustion conditions; - Closely track chlorine content of the waste feed and the feed rates of these and other potential pollutants; - Periodically monitor concentrations of PCDDs, PCDFs, other combustion products, and heavy metals in flue gas; - Reduce the generation and emission of PCDDs and PCDFs, if/when chlorine containing wastes are incinerated, by ensuring rapid cooling of flue gas as well as good turbulence of the combustion gas, high temperature, adequate oxygen content, and adequate residence time. De-NOX systems can also reduce PCDD and PCDF emissions; - Additional emission controls (e.g., activated carbon) should be installed if necessary; - Treat combustion gases to remove metals and acid gases (e.g., by wet scrubbers); - Control fugitive emissions from the combustion zone (e.g., by sealing the combustion zone or maintaining the combustion zone pressure below atmospheric pressure); - Minimize fugitive emissions of ash (e.g., use of closed systems to handle fine dry material and use of closed containers for transfer to the disposal site). - Consider the application of waste- to-energy technologies to		**Gap:** **Action:** **Note:**

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		help conserve resources and off-set emissions associated with fossil fuel based power generation.		
Water Effluents	Law 4/1994 and its amendment Law 9/2009 state the limits of discharges on the sea, while Law 48/1982 states the limits on the River Nile and underground water reservoirs. The latter is controlled by Ministry of Irrigation and Water Resources. Law 93/1962 and it amendment Ministerial Decree No.44/2000 states the limits of discharge over the sewer network, and is controlled by the Ministry of Housing, Utilities, and Urban Development	Recommended measures to prevent, minimize, and control water effluents include: - Periodically monitor concentrations of PCDDs and PCDFs if/when chlorine containing wastes are incinerated, and other combustion products and heavy metals in wastewater; - Minimize discharge of process wastewater to the extent possible while maintaining required air emission control; - Treat wastewater before discharge (e.g., using settling, precipitation of metals, and neutralization).		**Gap:** **Action:** **Note:**
Ash and Residues	Law4/1994 and its amendments states the final disposal of residual and ash in sanitary landfill	Recommended measures to prevent, minimize, and control solid wastes include: - Treat ash and other solid residue from incineration of industrial hazardous wastes as hazardous unless it can be demonstrated that they are not hazardous; - Periodically monitor concentrations of PCDDs, PCDFs, other combustion products, and heavy metals in pollution control residues, and ash or slag; - Reduce the potential for leaching from ash residues (e.g., by solidification or vitrification) prior to final disposition.		**Gap:** **Action:** **Note:**
Landfilling	Law4/1994 and its amendments state the usage of engineered landfill to prevent any leakage, or by injection salt mines or old oil wells.	General recommended measures to prevent, minimize, and control potential environmental impacts from landfilling of industrial hazardous wastes include: - Design and operate the landfill in accordance with applicable national requirements and internationally accepted standards; - Divide the landfill into different cells to separate wastes with different properties; - Maintain records of the wastes received, including sources, analytical results, and quantity; - Record on a map the location and dimensions of each landfill cell and the approximate location of each hazardous waste type within the landfill cell.		**Gap:** **Action:** **Note:**
Leachate	Law 4/1994 and its amendment Law 9/2009 state the	Storm water controls are addressed under MSW landfills, above, and in the General EHS Guidelines. In addition, recommended		**Gap:**

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Generation	management of hazardous waste treatment by reduction and minimisation of hazardous waste from generation point of source	measures to prevent, minimize, and control leachate generation include: - Install a liner system, preferably consisting of two or more liners with a leachate collection system above and between the liners, to prevent migration of wastes out of the landfill to the adjacent subsurface soil or ground water or surface water at anytime during the active life of the landfill and after closure, as long as the wastes remain hazardous. The liners should be: • Constructed of low-permeability materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients, physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation; o Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; • Installed to cover all surrounding earth likely to be in contact with the waste or leachate. - Install a leachate collection and removal system immediately above the upper liner to collect and remove leachate from the landfill so that leachate depth over the liner does not exceed 30 cm. The leachate collection and removal system should be: • Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the landfill; • Designed and operated to function without clogging through the scheduled closure of the landfill. - In a two-liner system, install a leak detection system between the liners. This leak detection system should be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate; - At final closure of the landfill or upon closure of any cell, cover the landfill or cell with a final cover designed and constructed to: • Provide long-term minimization of migration of liquids through the closed landfill;		**Action:** **Note:**

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		• Function with minimum maintenance; • Promote drainage and minimize erosion or abrasion of the cover; • Accommodate settling and subsidence so that the cover's integrity is maintained; and • Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils.		
Groundwater and Leachate Monitoring	Law 4/1994 and its amendment Law 9/2009 state the limits of discharges on the sea, while Law 48/1982 states the limits on the River Nile and underground water reservoirs. The latter is controlled by Ministry of Irrigation and Water Resources. Law 93/1962 and it amendment Ministerial Decree No.44/2000 states the limits of discharge over the sewer network, and is controlled by the Ministry of Housing, Utilities, and Urban Development	Groundwater monitoring is addressed under MSW landfills, above. In addition, recommended measures for leachate and site inspections and monitoring include: - During construction, inspect the liners for uniformity, damage, and imperfections. - Inspect the landfill regularly (e.g., after storms and weekly during operation and quarterly after closure) to detect evidence of any of deterioration, malfunctions, or improper operation of run-on and run-off control systems, such as erosion of the final cover; proper functioning of wind dispersal control systems, where present; and the presence of leachate in and proper functioning of leachate collection and removal systems.		**Gap:** **Action:** **Note:**
Closure and Post-Closure	Law4/1994 and its amendments state the requirements of hazardous landfill sites for, however there is no clear requirement for the end of life of landfill sites, and its usage after closure	Landfill facility operators should plan for the closure and postclosure care of the facility as described previously (see Municipal Solid Waste – Landfills).		**Gap:** No legal requirement of usage of landfill site before and after closure No specification for the cover and monitoring plan for closed landfill site **Action:** To introduce landfill site post closure and closure action plane guidance To implement legal requirement for landfill site usage after closure To introduce legal

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				requirement for specific monitor plan for gaseous emissions, and leachate from the site after closure **Note:**
INDUSTRIAL WASTE (NON-HAZARDOUS)				
Notes: **Non-hazardous waste generally is treated and disposed accordingly as municipal solid waste. Therefore, the collection, processing, transport, treatment is following the guidelines, procedures and recommendations of the municipal solid waste (see the table above; Municipal Solid Waste)**				
OCCUPATIONAL HEALTH & SAFETY				
Accidents and Injuries		Mitigation measures for accidents and injuries are partially addressed in the **General EHS Guidelines**. <u>In addition, the following procedures are recommended to prevent, minimize, and control accidents and injuries at waste management facilities:</u> - In landfills, conduct compaction of wastes in thin layers using heavy equipment and place regular cover material over each compacted layer of waste, so that any underground fires within a waste cell are not able to spread throughout the landfill and lead to significant cave-ins; - Ventilate landfill gas so that underground fires and explosions do not occur; - Use maximum side slopes of 3:1 in non-seismic areas and lower slopes (e.g., 5:1) in seismic areas, with regular drainage of water so that saturated conditions do not develop and lead to slope subsidence; - Provide workers with appropriate protective clothing, gloves, respiratory face masks and slip-resistant shoes for waste transport workers and hard-soled safety shoes for all workers to avoid puncture wounds to the feet. For workers near loud equipment, include noise protection. For workers near heavy mobile equipment, buckets, cranes, and at the discharge location for collection trucks, include provision of hard hats; - Provide all landfill equipment with enclosed air conditioned cabs and roll-over protection; - Provide refuse collection vehicles and landfill equipment with	Concerning adaptation to climate change: Increasing temperatures might lead to increased temperatures at the workplace. Increased ventilation and cooling should be considered. (*Klimaprüfung AW u. RE, Annex 3)*	**Gap:** **Action:** **Note:**

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		audible reversing alarms and visible reversing lights; - Improve the storage of solid wastes at the source so that the loads to be collected are well contained and not too heavy; - Locate exhaust pipes on waste collection vehicles so that exhaust does not discharge into the breathing zone of workers on the riding steps; - Design collection routes to minimize, or possibly eliminate, crossing traffic that is going in the opposite direction; - Provide two-hand constant-pressure controls for collection vehicles with compaction mechanisms; - Restrict access to disposal sites such that only safety - trained personnel with protective gear are permitted to high-risk areas; - Segregate people from operating trucks in recycling and transfer stations; - Use automated systems to sort and transfer waste to the extent practical in order to minimize contact with the waste; - Provide workers with communications tools, such as radios. Special signaling codes have been developed for communications on landfill sites; - Minimize sorting from the ground by providing conveyor belts and/or tables that facilitate sorting; - Establish engineering and materials norms for special facility and stationary equipment design requirements that minimize exposure to hazards (e.g., ventilation, air conditioning, enclosed conveyor belts, low loading and sorting heights, non- skid flooring, safety rails on stairs and walkways, spill protection and containment, noise control, dust suppression, gas alarm systems, fire alarm and control systems, and evacuation facilities).		
Chemical Exposure	Annex 8 of Executive Regulation, Law4/1994 states the limits of the chemical exposure in the work environment	Chemical hazards encountered at waste management facilities are similar to those at other large industrial facilities, such as toxic and asphyxiating gases, and are addressed in the **General EHS Guidelines**. However, the full composition of wastes and their potential hazards is often unknown. Even municipal solid waste (MSW) often contains hazardous chemicals, such as heavy metals from discarded batteries, lighting fixtures, paints, and inks. <u>The following procedures are recommended to prevent, minimize, and control chemical exposure at waste management projects:</u> - Control and characterize incoming waste (see waste receipt, unloading, processing and storage); - Provide adequate personnel facilities, including washing areas		**Gap:** **Action:** **Note:**

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		and areas to change clothes before and after work; - Ventilate enclosed processing areas (e.g., dust in waste size reduction areas, VOCs driven off by high temperatures during composting); - Monitor breathing zone air quality in work areas at processing, transfer and disposal facilities. Direct-reading instruments that measure methane and oxygen deficiency are of primary importance; these include combustible gas indicators, flame ionization detectors, and oxygen meters. At waste treatment/disposal facilities, volatile organics should also be analyzed in the biodegradation gases being collected and/or vented. In waste handling, sorting, and composting facilities, monitoring for organic dust is needed; - Prohibit eating, smoking, and drinking except in designated areas; - Provide air filtered and air conditioned cabs for heavy mobile equipment used at landfills as necessary.		
Dust	Annex 5 of Executive Regulations, Law4/1994 states the limits of the chemical exposure in the work environment	Waste processing can generate nuisance and hazardous dust, including organic dust. Dust control measures discussed in Section 1.1 above, will also help to reduce worker exposure to dusts. General mitigation measures for dust are also addressed in the **General EHS Guidelines**.		**Gap:** **Action:** **Note:**
Pathogens and Vectors	Law 12/2003 states that each employer has to provide safety precautions against pathogenic and biological hazard	<u>The following measures are recommended to prevent, minimize, and control pathogens and vectors:</u> - Provide and require use of suitable personal protective clothing and equipment; - Provide worker immunization and health monitoring (e.g. for Hepatitis B and tetanus); - Maintain good housekeeping in waste processing and storage areas; - Use automatic (non- manual) waste handling methods if practical; - For landfills, promptly emplace, compact and cover of wastes in defined cells, especially for waste with the potential to attract vermin and flies, such as food wastes (especially animal by-products if accepted at the facility) and tannery wastes; - Clean and wash with disinfectant the cabins of heavy mobile		**Gap:** There is no specific guidelines on the biological hazard of waste facilities **Action:** To introduce guidelines on safety precaution and required health and safety equipment for waste management industry

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		equipment used at regular intervals; - For composting, maintain aerobic conditions and proper temperatures in the windrows. Isolate workers from sporedispersing components of the composting process such as mechanical turning (e.g., by using tractors or front-end loaders with enclosed air-conditioned or heated cabs). Aeration systems are preferred over manual turning; - Maintain adequate temperature and retention time in biological treatment systems to achieve pathogen destruction (e.g., 55ºC for at least 3 consecutive days in most compost situations and 55ºC for 15 days in windrows); - Grade the area properly to prevent ponding (to minimize insect breeding areas); - Use integrated pest-control approaches to control vermin levels, treating infested areas, such as exposed faces and flanks with insecticide, if necessary; - Provide and require use of dust masks or respirators under dry and dusty conditions (e.g., when compost is being turned). Charcoal-filled respirators also reduce odor perception; - Provide prompt medical attention for cuts and bruises. Cover open wounds to prevent contact with the incoming loads or feedstock; - Fully enclose the waste management site with fencing so that no livestock or wildlife is able to come in contact with the waste, which contains significant potential to enable the spread of livestock and zoonotic disease, as well as spillover disease to wildlife. Provide daily cover of wastes to minimize the attraction to birds, which can become infected with avian influenza and other bird diseases that can then be carried off-site.		**Note:**
PERFORMANCE INDICATORS AND INDUSTRY BENCHMARKS				
Environmental Performance				
Emissions and Effluents		Air emissions standards for waste management facilities from the European Union and the United States [see Environmental, Health, and Safety Guidelines for Waste Management Facilities, pp. 29-31] These emissions and effluent values are assumed to be achievable under normal operating conditions in appropriately designed and operated facilities through the application of		**Gap:** **Action:** **Note:**

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		pollution prevention and control techniques discussed in the preceding sections of this document. These levels should be achieved at all times as described in the above-referenced standards. Deviation from these levels in consideration of specific, local project conditions should be justified in the environmental assessment.		
Environmental Monitoring	Law 4/1994 states that each facility has to keep an "Environmental Register" which has all the information on environmental monitoring for its gaseous emissions	Environmental monitoring programs for this sector should be implemented to address all activities that have been identified to have potentially significant impacts on the environment, during normal operations and upset conditions.		**Gap:** **Action:** **Note:**
		Occupational Health and Safety Performance		
Occupational Health and Safety Guidelines	Law 12/2003 identifies the occupational health and safety guidelines for industrial activities	Occupational health and safety performance should be evaluated against internationally published exposure guidelines, of which examples include the Threshold Limit Value (TLV®) occupational exposure guidelines and Biological Exposure Indices (BEIs®) published by American Conference of Governmental Industrial Hygienists (ACGIH), the United States National Institute for Occupational Health and Safety (NIOSH), Permissible Exposure Limits (PELs) published by the Occupational Safety and Health Administration of the United States (OSHA), Indicative Occupational Exposure Limit Values published by European Union member states, or other similar sources.		**Gap:** **Action:** **Note:**
Accident and Fatality Rates	Law 12/2003 requires keeping a record of incidents with the industrial facilities.	Projects should try to reduce the number of accidents among project workers (whether directly employed or subcontracted) to a rate of zero, especially accidents that could result in lost work time, different levels of disability, or even fatalities. Facility rates may be benchmarked against the performance of facilities in this sector in developed countries through consultation with published sources (e.g. US Bureau of Labor Statistics and UK Health and Safety Executive).		**Gap:** **Action:** **Note:**
Occupational Health and Safety Monitoring	Law 12/2003 requires keeping register with employee accidents and any related health hazards for monitoring	The working environment should be monitored for occupational hazards relevant to the specific project. Monitoring should be designed and implemented by credentialed professionals as part of an occupational health and safety monitoring program. Facilities should also maintain a record of occupational accidents		**Gap:** **Action:**

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		and diseases and dangerous occurrences and accidents. Additional guidance on occupational health and safety monitoring programs is provided in the **General EHS Guidelines**.		**Note:**