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**THE GREATER CAIRO AIR POLLUTION
MANAGEMENT AND CLIMATE CHANGE
PROJECT**

**A Healthcare Waste Management Audit
for Kasr El Aini French Hospital)**

Executive Summary

30th January 2025

EXECUTIVE SUMMARY

1. Introduction

The report is part of the Greater Cairo Air Pollution Management and Climate Change Project, focusing on reducing air emissions and improving waste management systems in participating hospitals. This audit specifically assesses the Healthcare Waste Management (HCWM) system at Kasr El Ainy French Hospital, aiming to enhance compliance with national and World Bank standards.

Kasr El Ainy French Hospital is a large healthcare facility located in Cairo, with a history dating back to 1826. The hospital has a capacity of about 800 beds and serves as a teaching hospital affiliated with Cairo University.

The audit aims to assess the overall effectiveness of the hospital's Healthcare Waste Management system, identify gaps and risks, including occupational health and safety (OHS) risks, evaluate compliance with national legislation and the World Bank Environmental and Social Standards (ESS), and recommend improvements for better waste management practices.

The report outlines the hospital's level of compliance with ESSs, identifies key gaps and risks related to waste management practices (such as exposure to infectious waste, sharps injuries, and hazardous chemical spills), and proposes a corrective Environmental and Social Action Plan (ESAP).

Mitigation measures include implementing robust waste segregation protocols, providing personal protective equipment (PPE), conducting regular training sessions on waste handling, and ensuring proper waste storage and disposal methods. Aligning with best practices, such as those outlined by the World Bank ESS, ensures both worker safety and environmental protection.

It also includes recommendations for integrating OHS best practices, such as staff training, use of personal protective equipment, and adherence to waste segregation protocols to enhance safety and compliance.

2. Approach & Methodology

The audit involved site visits, document reviews, and interviews with hospital staff. The methodology focused on evaluating the hospital's compliance with environmental and social standards, particularly relating to waste management and evaluating occupational hazards related to waste management.

3. Environmental & Social Findings – Kasr El Ainy Hospital

ESS 1: Environmental Management Licenses and Permits

Waste Management System (WMS)

The hospital's WM is fragmented between different departments, namely, the hospital's health Care Waste, Infection Protection and Control, Health Care Waste Management, Engineering and Hospitality Departments and lacks a cohesive management approach. There is no comprehensive waste system in place that clearly defines roles, responsibilities, and processes for waste segregation, collection, treatment, and disposal.

Organizational Capacity: The WM team is understaffed, and there is no dedicated committee to oversee waste management. Responsibilities are split among various departments, leading to poor coordination.

Risk Management:

Lack of Comprehensive Risk Assessment: The hospital does not have a formal, written procedure for screening, identifying, analyzing, and assessing the potential risks associated with its healthcare waste management activities. Risks include environmental hazards, such as the generation of hazardous waste, and occupational risks, such as needle-stick injuries and exposure to hazardous substances.

Gaps in Risk Mitigation: While the OHS department manages some aspects of risk identification, there is no integrated approach that considers broader community and environmental health risks. The current system is primarily reactive, focusing on managing immediate risks rather than adopting a strategic, long-term approach to risk mitigation.

Compliance with National Regulations

Licensing and Legal Compliance: The hospital has been issued a license for hazardous waste and substances handling (License No. 1593) by the General Environmental Health Authority under the Ministry of Health. However, this license has not been updated due to financial constraints, which raises concerns about ongoing compliance with legal requirements.

Register of Hazardous and Non-Hazardous Waste: There is no dedicated register for hazardous and non-hazardous waste as required by Egyptian Environmental Law (Law 4/1994, Article 33). This register is essential for tracking the generation, storage, and disposal of hazardous waste and ensuring compliance with national regulations.

Transport and offsite disposal of waste: The hospital uses authorized contractors for the offsite transport and disposal of waste, in line with legal requirements. However, the audit identified deficiencies in documentation and tracking processes, which are crucial for ensuring that waste is disposed of in compliance with national and international regulations.

Organizational Capacity

Insufficient Resources: The existing HCW department is understaffed and lacks the resources necessary to effectively implement and monitor waste management practices.

Need for Capacity Building: There is a significant need for capacity building within the hospital's waste management system. The audit recommends establishing a dedicated waste management committee and enhancing staff training programs to ensure all personnel involved in waste management are adequately trained and competent in their roles.

Monitoring and Review

Inadequate Monitoring Systems: The hospital lacks a robust system for regularly tracking and evaluating its environmental and social performance, including healthcare waste management. There are no established methods for ensuring that waste segregation, labeling, and storage practices are consistently followed.

Absence of Performance Indicators: The audit highlighted the absence of key performance indicators (KPIs) related to waste management, such as the amount of generated waste, segregation efficiency, and accident rates. This lack of monitoring makes it difficult to assess the effectiveness of current practices and implement necessary improvements.

ESS 2: Labor and Working Conditions

PPE Availability and Quality: The PPE provided is inadequate, with cloth aprons that do not offer sufficient protection against hazardous waste. Workers are exposed to health risks due to insufficient protective measures.

Working Environment: The waste treatment and storage areas have poor ventilation and inadequate infrastructure, leading to unsafe working conditions.

Grievance Mechanism: There is no formal grievance mechanism for waste management staff, making it difficult for workers to voice concerns.

ESS 3: Resource Efficiency and Pollution Prevention and Management

Despite the existence of a dedicated department responsible for waste management, there is a significant gap in managerial supervision and control over the whole healthcare waste management process. Currently, the department only exercises control and supervision from the point of waste receipt at the basement till offloading for final disposal.

Waste Segregation: The hospital uses a basic three-bin system, but the supply of color-coded waste bags is inconsistent. Misuse of bags due to poor quality and supply issues leads to improper segregation and increased risks.

Waste Treatment: The hospital uses Newster technology for treating hazardous waste, which is compliant with legal requirements. However, this unit is rented and not owned by the hospital. The storage facilities for hazardous waste are inadequate, lacking proper ventilation and containment.

Waste Collection and Transportation: Waste is generally collected on time, but the transportation vehicles are inadequately maintained, posing a risk of contamination.

ESS 4: Community Health and Safety

Emergency Preparedness: The hospital's emergency response system is not fully integrated with waste management operations. Fire safety measures, especially in waste treatment areas, are basic and not regularly maintained.

Security Measures: Security around waste management areas is inadequate, raising concerns about unauthorized access and potential community exposure to hazardous materials.

ESS 10: Stakeholder Engagement and Information Disclosure

Stakeholder Engagement: The hospital's communication with stakeholders, including the local community, is limited. There is a need for more regular updates and involvement in decision-making processes related to waste management and environmental health.

4. Corrective Environmental and Social Action Plan

The Corrective ESAP provides a list of corrective actions derived from the findings identified. These actions address gaps in the hospital's environmental, social, and occupational health and safety performance. The following table outlines necessary steps to align the hospital's performance with national and international standards. Each action includes an assigned risk rating, responsibility, timeline, and estimated cost, forming the basis for an Environmental and Social Management Plan (ESMP)

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
1	<p>Environmental and Social Management System (ESMS) and Policy</p> <p>Waste Management Policy and Plan</p>	High	<ul style="list-style-type: none"> • Prepare a waste management plan • Waste management procedures • Prepare a clear overarching waste management policy statement with clear commitments to handle all wastes in such a manner that it does not cause harm, injury or cause offence to staff, to community or to the environment. • Develop clear, actionable OHS policy within the waste management system. This policy should incorporate specific risk assessment procedures for each type of waste and define the roles of departments in managing these risks. 	<ul style="list-style-type: none"> • Hospital Manager • OHS Managers Training department • Infection Prevention and Control (IPC) department • Hospitality department • Engineering department 	2 months
2	<p>ESMS and Policy</p> <p>Healthcare waste Risk identification</p>	High	<ul style="list-style-type: none"> • As part of the WMP, conduct regular assessment of waste's management related risks (quarterly) and review update annually or as need be, to the WMP. • Allocate sufficient financial and human resources to make it to achieving appropriate management of environmental and occupational health and safety risks related to waste management. • Establish regular communications with the health care workers, any 	<ul style="list-style-type: none"> • Hospital Manager • OHS Managers • Training department 	2 months to develop for the first time Risk assessment will be reviewed on a quarterly basis

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			local communities affected and, where relevant, other stakeholders.		
3	Environmental and Social Management System Compliance with legal requirements	High	Develop the Risk register with the full data of proper hazard identification, risk mitigation and information as legally required. Re issue the hazardous waste handling permit of the hospital from the Health Directorate of the Ministry of Health	<ul style="list-style-type: none"> • Top management • HCW manager 	3 Months
4	Labor and Working Conditions Internal Grievance Redress Mechanism (GRM)	Low	Develop a workers' GM which allows workers to freely complain, the GM should define a proper timeline for the treatment of complaint, depending on their nature, as well as accessible channel. This can be done in line of the national regulation and the ESS2 Implement a comprehensive communication strategy to raise awareness among employees about the existing grievance mechanism, as consultations have revealed that many employees and workers are not aware of it. Use various channels such as email newsletters, staff meetings, and informational posters to promote the grievance procedure, encourage open dialogue, and provide clear instructions on how to access and utilize the system.	HR Team	3 months
5	Labor and Working Conditions	Moderate	Conduct a thorough space utilization analysis, with a gender-sensitive approach	Management	3 months

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
	Workers Facilities		<p>to ensure the design and location accommodate all genders. Explore options for creating separate changing rooms for cleaning workers to uphold hygiene standards and enhance worker well-being, addressing the current absence of suitable facilities. Explore alternative solutions such as mobile changing rooms.</p> <p>The number of changing rooms should align with the number of workers and accommodate any projected increases in workforce capacity. These rooms must be adequately equipped and ventilated.</p> <p>Apply routine inspections of rooms to ensure ventilation and pest control are maintained.</p>		
6	Labor and Working Conditions GBV/SEASH policies	Medium	<p>Policy Development: Develop and implement GBV/SEASH policies tailored to the hospital's unique environment. These policies should clearly define GBV and SEA/SH, outline prohibited behaviors, and establish reporting and response procedures.</p> <p>Training and Awareness: Provide comprehensive training to all hospital staff, including healthcare providers, administrators, and support staff, on recognizing, preventing, and responding to GBV and SEASH incidents. Training should emphasize the</p>	HR Team	2 months

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<p>importance of patient rights, confidentiality, and trauma-informed care.</p> <p>Establish Confidential and Anonymous Reporting Channels for GBV: Create secure and confidential communication channels where individuals can report GBV concerns or incidents anonymously. This will ensure privacy and encourage survivors to come forward without fear of retaliation or exposure.</p> <p>Ensure safe referral mechanisms are established to deal with reported GBV cases: this could be done through establishing protocols between the Hospital and the national Council for Women (NCW) to use the latter's hotline of the Women's Complaints and the multiple associated services.</p> <p>5. Promote Awareness of GBV Reporting Channels and Support Services: Ensure that the confidential reporting channels and referral pathways for GBV support are widely communicated and easily accessible, emphasizing their availability and how to use them.</p>		
7	Labor and Working Conditions Management of third-party service providers	High	<p>Enhance Documentation of Employment Contracts:</p> <ul style="list-style-type: none"> • Ensure that all contractors provide formal employment contracts for their 	<ul style="list-style-type: none"> • Procurement Team • Hospitality Department 	2 months

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<p>workers, detailing terms of employment, including medical and social insurance coverage. This documentation should be reviewed and verified regularly.</p> <p>Improve Insurance Coverage Compliance along with other labor rights for the workers of the third party:</p> <ul style="list-style-type: none"> • Require contractors to establish and document compliance with legal requirements for medical and social insurance coverage for all workers. This should include provisions for pension and compensation for work-related injuries or death benefits. <p>Establish Monitoring and Auditing Procedures:</p> <ul style="list-style-type: none"> • Develop procedures to allow the Hospital relevant department (Hospitality Department) to monitor contractors' compliance with labor laws, focusing specifically on employment contracts and insurance coverage, working hours, workers age, payment...etc. • Conduct regular audits and spot checks to detect any non-compliance and ensure adherence to labor standards. <p>Establish and apply gradual penalty</p>		

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			system/scale for the third-party service providers to ensure compliance and enforcements.		
8	Labor and Working Conditions PPE	High	<ul style="list-style-type: none"> • To address the insufficient PPE replacement frequency, it is crucial to implement a robust monitoring system to ensure timely replacements. Additionally, providing adequate resources and training to supervisors can help reinforce the importance of maintaining proper hygiene standards. • Ensure a clear and detailed PPEs policy • Ensure risk assessment/ job hazard assessment to evaluate the risks and job hazards at the various departments and the control measures needed including specific PPEs • PPEs specifications for waste handling workers: Heavy duty gloves long up to elbows for waste collectors and transporters, waste treatment unit, and waste storage area workers. Heavy duty gloves should be cleaned and disinfected before removal. Surgical gloves in laboratories and pharmacies as well as communicating with 	<ul style="list-style-type: none"> • Top Management • Purchase department • OHS department 	1 month

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<p>patients. Also, in case of chemicals handling double gloves from surgical gloves or nitrile/ neoprene gloves can be used.</p> <p>Over all non-permeable to liquids + Aprons plastic or disposable. In case of heavy-duty aprons, they should be disinfected before undressing.</p> <p>In case of chemical wastes and risk of exposure, eye protection or complete eye and face shields.</p> <p>Masks from suitable material to protect against gases and particulate matter (disposable filters can be used).</p> <p>Safety shoes made from durable leather or fibre, the shoes with long necks, with extra strengthened soles and can be easily cleaned and disinfected.</p> <p>Emergency and firefighting team: firefighting blankets, oxygen masks with portable oxygen cylinders.</p> <ul style="list-style-type: none"> • Aside from the training provided on the PPE use as part of the induction training, frequent refreshers, preferably quarterly, should be provided to all workers 		

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<p>and employees involved in the waste management processes.</p> <ul style="list-style-type: none"> • Provide adequate training based on how to identify the needed PPE, how to use and maintain it. 		
9	<p>Labor and Working Conditions Defective OHS Training for staff involved in waste management processes</p>	Medium	<ul style="list-style-type: none"> • Assess the specific OHS training needs of all waste management workers to identify gaps and prioritize training programs. • Design a structured OHS training curriculum tailored for waste management workers, covering essential topics such as hazardous waste handling, PPE use, emergency procedures, and health risks. • Facilitate certification for all OHS technicians in the department as per national legal requirements (MD 134/2003). • Schedule ongoing training sessions for both waste management workers. This could include refresher courses and updates on new regulations. • Develop a system to monitor the effectiveness of training programs and evaluate participants' understanding and application of OHS practices. Use feedback 	<ul style="list-style-type: none"> • Top Management • OHS managers • Training department 	2 months

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<p>to improve future training initiatives.</p> <ul style="list-style-type: none"> • Keep detailed records of all training sessions conducted, including attendance, materials covered, and outcomes. This documentation will be essential for compliance reviews and audits. • Formulate a formal OHS training policy that outlines the responsibilities of the OHS Department and management in providing training, as well as the expectations for workers regarding participation in OHS training. Expand OHS training programs to cover emergency response, proper handling of hazardous waste, and first aid for waste management workers. 		
10	Labor and Working Conditions IPC department	Medium	<ul style="list-style-type: none"> • Ensure adequate IPC staff number, with the required qualifications in the form of education, training, experience and certification. • Establishment of the IPC committee with the head of the hospital or the vice manager as the head of the committee, regular meeting of the committee at least once per month, with minutes of meetings to be 	<ul style="list-style-type: none"> • Top Management • HR department • IPC department 	6 months

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<p>recorded and signed by the head of the committee.</p> <ul style="list-style-type: none"> • Ensure preparation and implementation of an IPC program with an IPC plan and standard operating procedures that are updated to latest scientific knowledge and standards, especially related to waste management 		
11	Labor and Working Conditions Health Surveillance Program	Medium	<ul style="list-style-type: none"> • Ensure sufficient medical insurance coverage • Ensure communication with the Health Insurance Organization (HIO) to perform the periodic medical examination of the employees based on job hazard analysis • Ensure medical records are kept and monitored, with a copy in the OHS department. • Ensure development of specific programs for health surveillance of the healthcare waste workers, specifically: <ul style="list-style-type: none"> • Manual handling and musculoskeletal program <p>Others according to the risk assessment</p>	<ul style="list-style-type: none"> • Top Management • OHS department • HIO • HR department 	6 months
12	Labor and Working Conditions Waste Management office space ventilation, illumination	High	<p>Rehabilitation of office for the WM department team with adequate ventilation, illumination and space, and resources as computers, printers monitoring screen for cameras</p>	<ul style="list-style-type: none"> • Top Management • Engineering Department • Waste Management Department 	6 Months

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
13	Resource Efficiency and Pollution Prevention Management Waste Management, Monitoring and Tracking	High	The waste management department that is comprised of only 3 employees (the secretary, treatment unit operator, officer) and the manager, shall have supervisory role on the care service company work, such that the hospital should recruit additional number of employees, ensure sufficient training in HCW management and provide resources to perform its work.	<ul style="list-style-type: none"> • Top Management • HCW manager 	6 months
13	Resource Efficiency and Pollution Prevention Management Waste Management, Monitoring and Tracking	High	Monitoring and management the waste stream through Cameras and new technologies as QR code systems for tracking and efficient monitoring A computerized electronic management system to monitor the HCW amounts, generation trends, segregation efficiency. etc is supplied.	<ul style="list-style-type: none"> • Purchasing department • IT of the hospital • Security department • Training Department 	6 months
14	Resource Efficiency and Pollution Prevention Management Storage of Waste at Waste Generation point	High	Procure the following equipment <ul style="list-style-type: none"> • 811 red waste baskets (30 liters each) • 811 black waste baskets (30 liters each) • 14 red 340 liters trolleys 770 • 2 black 340 liters trolleys 770 • made from high density polyethylene and UV resistant with flat cover • 3D wheels with hard rubber frame and reinforcing lining for wheels 	<ul style="list-style-type: none"> • Top Management • Engineering department • OHS department 	6 months

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<ul style="list-style-type: none"> • Full compliance with EN 840 • Compliant with noise limiting requirement through the use of rubber frame and stable build • All components need to be made of material that allows for recycling at the end-of-life and have lids. 		
15	Resource Efficiency and Pollution Prevention Management Intermediate storage Rooms	High	<p>Upgrade the waste storage rooms in the zones each floor of the hospital to include the following:</p> <ul style="list-style-type: none"> • Upgrade/replace ceramic flooring and walls that can be easily cleaned and disinfected • Upgrade drain where necessary • Fire abatement and suppression equipment • Locks for doors • Water source • Sewerage system • Adequate illumination, ventilation and air conditioning. • Insect proof on all openings • Provision of necessary missing trolleys as required (covered in separate item) • A barrier at the entrance to secure the room from insects' entrance, rodents and other pests as well as to prevent the fluids from exiting the room during cleaning • Labelled with the 	<ul style="list-style-type: none"> • Top Management • HCW manager Care service company • Engineering department • OHS department • IPC department • Civil defense department 	6 months

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<p>biological hazard sign and the Hazardous waste storage room posted on the entrance.</p> <ul style="list-style-type: none"> • Resources for cleaning, disinfection, as well as PPEs and waste collection bags are adequately stored inside or near to the storage room • Conduct routine inspections of storage rooms to ensure proper ventilation and effective pest control measures are consistently maintained, safeguarding both the safety and quality of stored materials 		
16	Resource Efficiency and Pollution Prevention Management Basement Central Storage Room	High	<p>Upgrade the waste storage rooms in the basement including the following:</p> <ul style="list-style-type: none"> • Upgrade/replace ceramic flooring and walls that can be easily cleaned and disinfected. • Upgrade drain where necessary • Fire abatement and suppression equipment • Locks for doors • Water source • Sewerage system • Adequate illumination, ventilation and air conditioning. • Insect proof on all openings • A barrier at the entrance to secure the room from 	<ul style="list-style-type: none"> • Top Management • HCW manager • Care service company • Engineering department • OHS department • IPC department • Civil defense department 	6 months

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<p>insects' entrance, rodents and other pests as well as to prevent the fluids from exiting the room during cleaning</p> <ul style="list-style-type: none"> • Labelled with the biological hazard sign and the Hazardous waste storage room posted on the entrance. • Resources for cleaning, disinfection, as well as PPEs and waste collection bags are adequately stored inside or near to the storage room • Establish a fully equipped first-aid station 		
17	Resource Efficiency and Pollution Prevention Management Service Elevators	High	Service elevators need to be fixed or changed to avoid breakdowns according to priced BOQ	<ul style="list-style-type: none"> • Engineering Department • Procurement Department 	6 months
18	Resource Efficiency and Pollution Prevention Management Healthcare Waste Treatment Unit	High	<p>Installing a treatment unit, preferably a shredder and sterilizer unit compliant with national (WMRA, Ministry of Health) guidelines</p> <p>Monitoring of heavy metals and biological parameters to ensure effectiveness of treatment including: pH, Biochemical oxygen demand (BOD5), Chemical oxygen demand (COD), Cadmium (Cd), Chromium (Cr), Lead (Pb), Mercury (Hg), Chlorine, total residual, Phenols, Total coliform bacteria, Polychlorinated</p>	<ul style="list-style-type: none"> • Top Management • Engineering department 	<p>6 months</p> <p>Monthly Monitoring</p>

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			dibenzodioxin and dibenzofuran, temperature		
19	Resource Efficiency and Pollution Prevention Management Pathway taken by healthcare waste in the basement	High	<p>It is recommended that the waste incinerator is removed and the space is used optimally for storage of treated healthcare waste. This will allow separation and compliance with legal requirements and best practices that prohibit the mixing of regular waste (or treated healthcare waste which can be treated as regular) with untreated healthcare waste.</p> <p>A recommended layout was prepared by the consultant with the assistance of the engineering department.</p>	<ul style="list-style-type: none"> • Hospital manager • Engineering Department • Waste Department 	12 months
20	Labor and Working Conditions Basement Renovation	High	<p>Removal, demolition and restoration work for the basement, including but not limited to the following:</p> <ul style="list-style-type: none"> • Supply and installation of green gypsum suspended ceilings in bathrooms, changing rooms and unclean service rooms • Lighting and installation of a suspended ceiling • Supply and installation of granite or non-slip porcelain floors • Supply and installation of ceramic tiles for walls. The item includes ceramic adhesive and including anti-bacterial and anti-fungal grout between the tiles. • Supply and installation of all bathroom accessories, 	<ul style="list-style-type: none"> • Hospital Manager • Engineering Department 	12 Months

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<p>including sinks, toilet, wash basins and hot and cold-water supply outlets, and drainage.</p> <ul style="list-style-type: none"> • high-quality, washable paints for walls and ceilings that are anti-bacterial and anti-fungal, taking into account cleaning and preparing the surfaces well for paint • supply and installation of 2- leaf fire rated (120 mins) metal door for waste and treatment rooms 		
21	<p>Resource Efficiency and Pollution Prevention Management</p> <p>Waste water plant</p>	High	<ul style="list-style-type: none"> • Develop and implement a waste water treatment system with a wastewater and water quality monitoring program • Suitable technology will be determined through a specialized hired consultant. • Recommended technology for waste water treatment according to the national (MD 44/2000) and international (WHO Safe management of wastes from health-care activities, 2nd edition) <p>The onsite waste water treatment unit should be a unit that include physical, chemical and biological processes to remove contaminants from the raw sewage and waste water from the hospital such that a treated effluent is</p>	<ul style="list-style-type: none"> • Top Management • OHS manager • Engineering department 	<p>6 months</p> <p>Monthly monitoring</p>

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<p>produced that is compliant in its constitution to the effluent discharges into the municipal sewerage system (law 93/1962 Article 16, and the MD 44/2000 regarding modification of the executive regulation of the Law 93/1962).</p> <p>Centralized onsite treatment is recommended for Kasr El Ainy hospital to allow more advanced treatment, and improve the quality of the wastewater discharged to the network or to allow its reuse in the hospital premises.</p> <p>Basic centralized systems consist of primary treatment ¹ (sand catchment and screen to remove large particles) and an anaerobic secondary treatment system.</p> <p>Typical secondary treatment systems² include:</p>		

¹ The purpose of this first stage is to prevent the damage or clogging of wastewater treatment equipment and to produce a generally homogeneous liquid capable of being treated subsequently biologically or mechanically. A raked screen is used to remove large objects, after which the velocity of incoming wastewater is reduced to allow the settlement of sand, grit and stones. Floating material, such as grease and plastics, is skimmed off, and primary sedimentation tanks are installed to allow faecal solids to settle.

² The task of secondary treatment is to remove dissolved carbon and nitrogen components by microbial digestion. Bacteria and protozoa consume biodegradable soluble organic material (e.g. sugars, fats, organic short-chain carbon molecules) and bind much of the less soluble fractions into floc particles. These microorganisms require oxygen and a substrate on which to live. These two essentials are provided in a variety of designs, which broadly fall into different systems: fixed-film or suspended growth. In fixed-film systems, such as trickling filter, rotating biological contactors, fluidized bed reactors or biological aerated filter, the biomass grows on media and the sewage passes over its surface. Oxygen is either supplied to the biota by spraying or trickling the wastewater over the filter materials, or the system is mechanically aerated. In suspended growth systems, the biota is living on the sludge (called activated sludge). The activated sludge is mixed with the sewage and aerated in a tank or basin. This then passes to a clarifier, where the activated sludge can settle. Some of the sludge will be returned to the aeration tank; some will be disposed of or will undergo further treatment, depending on the local situation and regulations.

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<ul style="list-style-type: none"> • baffled flow reactors • anaerobic filters • Imhoff tank <p>Up-flow anaerobic sludge blanket reactor</p> <p>Monthly monitoring for quality parameters including: pH, Biochemical oxygen demand (BOD5), Chemical oxygen demand (COD), Oil and grease, Total suspended solid (TSS), Cadmium (Cd), Chromium (Cr), Lead (Pb), Mercury (Hg), Chlorine, total residual, Phenols, Total coliform bacteria, Polychlorinated dibenzodioxin and dibenzofuran, temperature</p>		
22	Stakeholder Engagement and Information Disclosure	Low	<p>It is crucial to consistently share information about the Healthcare Waste Management system the hospital follows, along with the hospital's commitments in this area, with both internal and external stakeholders. Tailoring communication and actions to address the specific needs and interests of each stakeholder group is essential.</p> <p>Internal Stakeholders</p> <ol style="list-style-type: none"> 1. Establish Clear Communication Channels: 	<ul style="list-style-type: none"> • HR/Public Relations • Team/Hospital Management 	3 months

Fixed-film systems can provide higher removal rates for organic material and suspended solids, and are normally used for health-care wastewater treatment. The removal of nitrogen is by biological oxidation from ammonia to nitrate. This is achieved by nitrification involving nitrifying bacteria such as Nitrospira sp. and Nitrosomonas sp. This is followed by reduction from nitrate to nitrogen gas (denitrification), which is released to the atmosphere. Denitrification requires anoxic conditions and might be carried out during the tertiary treatment in a sand filter or a reed bed. Nitrification and denitrification require carefully controlled conditions to encourage the appropriate microbiological communities to form.

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<ul style="list-style-type: none"> - Action: Develop internal communication channels (e.g., newsletters, intranet updates) to keep staff informed about HCWM practices and changes. - Goal: Facilitate timely and clear communication within the hospital. <p>2. Implement Internal Feedback Systems:</p> <ul style="list-style-type: none"> - Action: Create mechanisms (e.g., suggestion boxes, regular surveys) for staff to provide feedback on HCWM practices. - Goal: Encourage staff input and improve practices based on internal feedback. <p>External Stakeholders</p> <p>1. Enhance Public Reporting and Disclosure:</p> <ul style="list-style-type: none"> - Action: Implement clear and accessible public reporting mechanisms for HCWM-related information (e.g., annual reports, online dashboards). - Goal: Ensure 		

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			<p>transparency and build trust with the public and regulatory bodies.</p> <p>2. Engage with Regulatory and Environmental Agencies:</p> <ul style="list-style-type: none"> - Action: Establish regular communication with external regulatory bodies and environmental agencies to ensure compliance and address concerns. - Goal: Maintain regulatory compliance and foster good relationships with oversight bodies. <p>3. Community Outreach and Education:</p> <ul style="list-style-type: none"> - Action: Conduct community outreach programs and educational campaigns about HCWM practices and their benefits. - Goal: Increase community awareness and support for HCWM efforts. <p>The development of a comprehensive stakeholder engagement plan that identifies key stakeholders, aligns objectives, identifies communication channels</p>		

ID	Aspect	Risk Rating	Action	Responsibility	Timescale for Implementation
			and engagement plans for a dedicated period of time, allowing fostering collaboration among all departments towards shared goals.		