



Submitted To:



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

**A Healthcare Waste Management Audit
 for Ain Shams Specialized Hospital**

Executive Summary

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Executive Summary

1. Introduction

The Healthcare Waste Management (HCWM) Audit for Ain Shams Specialized Hospital was conducted under the Greater Cairo Air Pollution Management and Climate Change (GCCC) Project. This project aims to improve HCWM systems to mitigate health and environmental risks associated with waste management.

The audit's objectives include assessing the overall effectiveness of the hospital's waste management practices, identifying and mitigating risks to workers, patients, and the community, and recommending actions for compliance with national and international standards, namely, the World Bank Environmental and Social Standards (ESSs) and Environmental, Health, and Safety Guidelines. The audit's boundaries are confined to the hospital's premises.

Ain Shams Specialized Hospital is a key healthcare provider in Egypt, located on a 28,000 m² area. The facility includes 554 beds and serves diverse medical needs.

The approach of this audit included document review, site visits, and stakeholder engagement to evaluate HCWM processes such as waste segregation, handling, storage, treatment, transportation, and disposal.

The report outlines the hospital's compliance with ESSs, identifies gaps, and proposes a corrective Environmental and Social Action Plan (ESAP) to address identified gaps.

2. Environmental & Social Findings – Ain Shams Specialized Hospital

ESS 1: Environmental Management, Licenses and Permits

Environmental and Social Management System: Ain Shams Specialized Hospital does not have a separate environmental and social management system (ESMS). The environmental, social, and occupational health and safety management functions related to waste management activities are split between the Occupational Health and Safety (OHS) department, Quality Management (QM) department, and infection prevention and control (IPC). The management systems include procedures that comply with national legislation and international guidelines, including the World Bank Group's Environmental, Health, and Safety (EHS) guidelines and healthcare facility waste management standards.

Identification of Environmental and OHS Risks Related to HCWM: The hospital has written procedures to identify, analyze, and assess potential risks related to healthcare waste management. Environmental risks assessed include contamination of water sources, air pollution from dysfunctional incinerators, soil contamination, and the spread of pathogens due to poorly handled infectious waste. Occupational health risks identified include infections, needle-stick injuries, ergonomic issues, and exposure to hazardous chemicals.

Compliance with National Permitting, Licensing, and Approvals: The hospital complies with national laws for hazardous waste management, including maintaining a hazardous waste register, forming a healthcare waste management committee, and adhering to the Ministry of Health's Decree 753/2015.

Organizational Capacity and Competency: The OHS department is responsible for overseeing healthcare waste management and handling and are supported by a dedicated waste management team. Responsibilities include managing waste delivery to the treatment area, overseeing hazardous waste treatment, and delivering treated waste to authorized contractors. The Infection Prevention and Control (IPC) department trains staff on safe waste handling and infection control protocols.

Monitoring and Review: The hospital conducts regular internal monitoring/audits, including waste management evaluations, as part of its ISO 9001:2015 certified quality management system. These include waste management reviews, patient health and safety assessments, and grievance analyses. Audit results are reported internally to senior management on a quarterly and annual basis

ESS 2: Labor and Working Conditions

Ensuring Compliance and Fair Practices in Waste Management: The OHS department includes a Department Head, 12 waste workers, and 12 supervisors aged 28-40. Workers are divided into daily-wage and recruited groups. The standard work shift is 7 hours; however, all workers and supervisors also work an additional 7-hour overtime shift to compensate for the department's understaffing. Workers however expressed satisfaction due to long idle times during operations and appreciate the extra pay.

All employees have written contracts adhering to Egyptian Labor Law No. 12 of 2003, renewed annually. Contracts, managed under the Ministry of Finance payroll system, range from permanent to temporary, with transitions requiring approval from relevant authorities. The hospital operates under the Egyptian Civil Service Law No. 81 of 2016 but has no specific code of conduct. Criminal background checks are conducted, and individuals under 18 or in forced labor situations are not employed.

Employees are entitled to medical insurance and are assigned social insurance numbers for accessing benefits like pensions and work-related injury compensation. Interviews revealed no preferential employment practices.

Concerns Regarding Working Conditions and Health & Safety: The waste treatment unit at Ain Shams Specialized Hospital faces several concerns regarding working conditions and health and safety. The unit lacks first-aid kits, leaving workers without immediate medical assistance for injuries such as cuts from sharp objects, increasing the risk of infections.

Workers' PPE kit, including boots, gloves, and masks, has not been replaced for two years, reducing its effectiveness and compromising safety. Additionally, uniforms are unsuitable for high-heat environments, exacerbating discomfort and exposing workers to heat-related risks.

Poor ventilation and ineffective air conditioning are not effective enough to mitigate the excessive heat produced by the machinery. This inefficiency results in elevated temperatures within the workspace, further exacerbating the discomfort and potential health risks faced by the workers. Prolonged exposure to such high temperatures can lead to heat-related illnesses, decreased productivity, and increased fatigue.

Changing rooms: According to site observations and interviews with a sample of workers and supervisors, the waste management staff lack sufficient changing rooms. Although there are lockers available for storing personal belongings, there is no designated area for changing.

Additionally, there are no designated lounge areas or common where the staff can spend time during their working hours. This lack of proper facilities extends to the absence of a suitable space for lunch breaks.

While this is the case, interviewees confirmed the presence of adequate space behind the building where changing rooms and a break room to accommodate the waste management staff.

Grievance Redress Mechanism: The hospital’s grievance mechanism consists of a structured, tiered approach, beginning with direct managers and escalating through HR, hospital management, Ain Shams executive management, and ultimately to the Ain Shams University management or the National Complaints Portal. Grievances are documented in a comprehensive log and are typically resolved within 15 days. While grievances mainly involve individual concerns, the system lacks formal anti-retaliation policies.

Consultations with staff revealed satisfaction with the mechanism’s accessibility and responsiveness, fostering trust. Plans are underway to enhance the grievance system to meet GAHAR certification requirements within six months. The system is currently under review for improvement.

Diversity, GBV, and SEASH Policies: Ain Shams Specialized Hospital has zero tolerance for Gender-Based Violence (GBV) and Sexual Exploitation, Abuse, and Sexual Harassment (SEASH), and is committed to creating a safe and inclusive work environment for all. Based on the HR head’s awareness, there have been no recorded GBV or SEA/SH incidents in the past, however, additional verification of this information could not be obtained.

Among the waste management staff, there is only one female supervisor, recently transferred from another department but with 20 years of experience at the hospital. During interviews, she shared that the working environment fosters a sense of community, and instances of GBV or SEASH are very rare in the hospital's history. She added that she has not personally experienced, nor witnessed, any harassment during her tenure. It was also emphasized that the hospital maintains a strong stance on the issue, with a strict zero-tolerance policy toward harassment.

Subcontractor’s Legal Labor Compliance: In overseeing legal compliance, a representative from the Ministry of Finance within the hospital is hired to ensure that subcontractors adhere to regulations, including tax compliance, provision of worker insurance, and compliance with Labor laws prohibiting child or forced labor, aligning with Egyptian Labor Law standards.

There isn't a formal grievance mechanism in place specifically tailored for subcontractors or suppliers. However, in cases where complaints pertain to payment-related issues, individuals have the option to escalate their concerns either to the Governmental Service Authority in Ministry of Finance or directly to the Head of Ain Shams University.

ESS 3: Resource Efficiency and Pollution Prevention and Management

Waste Generation: Solid healthcare waste at Ain Shams Specialized Hospital is categorized into three types: hazardous healthcare waste (HCRW), general waste (HCGW), and others. The hospital generates approximately 0.8 to 0.9 tons of hazardous waste and 1.2 tons of non-hazardous waste

daily. The waste is collected, transported to the treatment unit, treated through shredding and sterilization, and finally disposed of.

Mercury waste is generated occasionally, such as thermometer breakage, and is collected using syringes before being added to the hazardous waste stream.

Electronic waste, including obsolete medical equipment and computers, is securely stored and either sold at auction or transported to the Nasserya landfill every six to nine months, with components labeled, weighed, and categorized for proper tracking.

Chemical waste is stored in labeled yellow bags and transported to the Nasserya landfill, while pathological waste, such as body parts, is refrigerated or buried following religious customs. Refrigerated pathological samples are retained for at least 30 days before disposal.

Waste Segregation and Collection: A nationwide standardized three-bin system is implemented for waste segregation at the point of generation. General non-hazardous waste is collected in black bags, potentially infectious waste in red bags, and sharps in puncture-resistant containers, which are subsequently disposed of in red bags. Waste bags are labeled with the source department, closure date and time, and the name of the responsible individual. Critical areas such as the operating theatre and ICU are closely monitored by the infection control department.

Intermediate Storage: The hospital buildings have intermediate storage rooms or "dirty utility rooms". However, these rooms are currently not utilized due to poor maintenance, including inadequate ventilation, lighting, and water supply. As a result, the hospital does not use intermediate waste storage, and waste is directly transported from the source of generation to the storage and treatment facilities. It is recommended to rehabilitate these utility rooms to enhance operational efficiency.

Transport of Waste: Waste is transported within the hospital using trolley bins along designated routes to the treatment area. However, these vehicles often experience issues such as broken wheels and covers, necessitating replacement with more durable models. Currently, waste travels long distances between storage and treatment facilities, highlighting the need for improvements in transport systems.

Treatment of Hazardous Waste: Hazardous healthcare waste is treated using shredding and sterilization through frictional heat treatment technology in a closed vessel. This method complies with national laws and best practices, offering cost efficiency by enabling treated waste to be classified as non-hazardous and reused. Treated waste is stored temporarily before being handed over to an external licensed contractor for offsite transport and disposal.

Storage of Hazardous Solid Waste: Hazardous waste is stored in a dedicated, ventilated room. Medical waste is segregated into red bags, while chemical waste is stored in yellow bags. Proper logs are maintained to document waste management and disposal activities.

Treated waste is tested regularly by Ministry of Health laboratories and complies with legislation. It is classified as non-hazardous and sent to cement factories for use in kilns.

E-waste is evaluated for reusable components, securely stored, and either auctioned or sent to the Nasserya landfill.

Mercury waste occurring occasionally, such as thermometer breakages, is carefully collected and added to the hazardous waste stream

Storage of Non-Hazardous Waste: Non-hazardous waste is stored in separate, ventilated rooms until collection by a third-party contractor. While emergency kits and eyewash facilities are available, waste bags were observed to be stacked on the floor instead of in closed containers, highlighting the need for improved storage practices.

Wastewater Management: The hospital does not have a wastewater treatment program or quality monitoring. Liquid waste, including wastewater from cleaning activities, is discharged untreated into the municipal sewer system. Recommendations include establishing an onsite wastewater treatment unit with physical, chemical, and biological processes to meet national and WHO guidelines.

Record Keeping and Tracking of Waste: The hospital relies on manual recording of waste data, which is prone to inaccuracies. Recommendations include implementing a smart medical waste management system that provides real-time data using sensors, cameras, and specialized software

Emissions to Soil and Groundwater assessment: The facility uses impermeable flooring in all work and treatment areas, preventing contamination risks. Waste is managed by authorized contractors, with receipts kept as records. Renovation of intermediate storage rooms is recommended to allow easy cleaning.

ESS 4: Community Health and Safety

Emergency Preparedness and Response Plan: The hospital's comprehensive emergency preparedness and response plan, developed by the OHS department, primarily addresses fire risks and general emergencies, including pandemics like COVID-19. The plan includes protocols for infectious disease outbreaks, utilizing PPE, and proper waste handling. Training is mandated for all relevant staff, with updates and revisions based on public health guidelines and risk assessments. The plan also emphasizes the need for additional drills and training on pandemic response and safe handling of healthcare waste. However, there is a noted deficiency in the training coverage required by the Civil Defense Department, especially in waste treatment and storage areas.

COVID-19 Response and Waste Management Procedures: In response to COVID-19, Ain Shams established a sewing workshop to produce medical gowns and face masks, aiming for self-sufficiency and resource efficiency. The workshop has become a permanent part of the hospital's operations. Waste management during pandemics includes increased hazardous waste and special precautions for isolated wards.

Signage: Signage within Ain Shams Hospital provides guidance on OHS, emergency exits, biohazards, radiation hazards, IPC standards, and wayfinding. However, signage, especially for waste segregation and PPE, is currently insufficient and requires enhancement. A comprehensive signage system compliant with ISO 7010:2012 is needed, including prohibition, warning, safe condition, and fire safety signs in both Arabic and English.

Food Hygiene & Safety: The IPC department includes food handlers in standard IPC training sessions, covering hand hygiene, injury reporting, and food safety. Waste from the kitchen is stored in a cooled storage room and collected daily. The kitchen staff complies with PPE usage and maintains cleanliness standards.

Offsite Transport of Waste: Risks from offsite waste transport include traffic safety from unauthorized drivers or unapproved routes, community exposure to waste due to inappropriate vehicles, and illegal waste disposal. These risks are considered low as the hospital uses licensed contractors and complies with national regulations.

ESS 10: Stakeholder Engagement and Information Disclosure

Stakeholder Consultation Activities: The Consultant conducted semi-structured interviews with key stakeholders. This included the Head of OHS, waste workers, female nurses in the Renal department, and the Head of HR. Patients were excluded from consultations to respect their privacy. The main outcomes included the following:

- The Head of the OHS Department highlighted issues with waste transportation, citing risks of errors and delays due to the decentralized treatment area and the lack of real-time tracking. He recommended replacing the outdated Newster machine and emphasized the need for infrastructure upgrades, including ventilation, air conditioning, and worker amenities such as changing rooms and break areas. He also noted that PPE has not been replaced for two years due to budget constraints and stressed that addressing these concerns would improve job satisfaction and worker dignity.
- During interviews with waste workers and supervisors, they highlighted several concerns regarding their working environment. They emphasized the absence of a first-aid kit in the waste treatment unit, deteriorated PPE compromising safety, inadequate ventilation, and ineffective air conditioning, all of which contribute to discomfort and health risks. Uniforms are unsuitable for high-heat conditions, further exacerbating the issues. Workers expressed frustration over the lack of changing rooms, lounge areas, and spaces for lunch breaks, comparing their situation unfavorably to other departments. Despite understaffing, they showed willingness to work extra shifts due to the additional pay.
- Female nurses in the Renal department emphasized their roles in waste management, detailing training by the IPC department on waste segregation and handling. They described effective coordination with the waste department for collection. The nurses reported no experiences of gender-based discrimination or GBV and SEA/SH and appreciated the hospital's open communication environment, which fosters security and inclusivity.
- The discussion with the Head of HR highlighted key aspects of HR policies and processes, including recruitment, salary structures, compliance with labor laws, and employee benefits designed to promote a fair and safe work environment. The structured grievance mechanism currently in place primarily addresses individual issues, with no significant recurring themes. However, it was noted that formal policies to protect employees from potential retaliation after filing grievances are absent. To meet the requirements for GAHAR certification, which Ain Shams aims to achieve within six months, the grievance system is undergoing review and planned improvements are underway.

Stakeholder Engagement Activities: The hospital lacks a formal stakeholder engagement plan for waste management. However, patient feedback mechanisms are managed by the Public Relations department. These include surveys and complaint channels through social media or telephone. Community feedback is promptly addressed to foster transparency and trust.

3. Corrective Environmental and Social Action Plan

The Corrective Environmental and Social Action Plan (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 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	Findings	Action Summary	Risk Rating	Timescale
1	Environmental and Social Management System (ESMS)	No formal overarching OHS and environmental policy in place.	Develop a written waste management policy with clear roles, responsibilities, and communication across the hospital.	Low	2 months
2	Integrated Waste Management System	Lack of supervision across all waste management stages.	Assign a lead waste management officer, establish a committee, and implement an electronic monitoring system for HCW.	Medium	2 months
3	GBV/SEASH Policies	GBV/SEASH policies exist but lack comprehensive training and accessible reporting mechanisms.	Train staff on GBV/SEASH awareness, establish reporting mechanisms, and ensure confidentiality and trauma-informed care.	Low	2 months
4	Changing Rooms	No changing or break rooms for waste management staff.	Develop and construct gender-sensitive changing and break rooms for waste management staff.	Moderate	3-4 weeks
5	Contractor Oversight	Inadequate monitoring of subcontractors regarding labor conditions and compliance.	Establish labor standards policy, create a code of conduct, and implement monitoring/auditing of subcontractors.	Low	2 months
6	PPE Shortages	Significant shortages in PPE for waste	Conduct risk assessments, provide missing PPEs, and train staff on PPE use and maintenance.	High	2 months

ID	Aspect	Findings	Action Summary	Risk Rating	Timescale
		management staff.			
7	Health Surveillance Program	Lack of periodic medical examinations and tailored surveillance programs.	Develop tailored health surveillance programs, including noise monitoring and heat stress assessments, and periodic medical examinations.	Low	1 month
8	Ventilation	Non-functional centralized ventilation system in the waste treatment unit.	Replace the central air conditioning and exhaust systems in the waste treatment unit.	High	6 months
9	Shredder and Sterilizer	Existing equipment is over 10 years old, leading to frequent breakdowns.	Procure new shredder and sterilizer machines to replace outdated ones.	Low	4 months
10	Wastewater Treatment	No wastewater treatment program or monitoring system in place.	Procure (using a bidding process) and install an onsite wastewater treatment unit using suitable technology that meets national and international standards.	High	6 months
11	Indoor Air Quality Measurements	No air quality measurements in waste treatment areas.	Conduct regular indoor air quality measurements in high-risk areas like the waste treatment unit.	Medium	6 months
12	Waste Storage and Transport	Unused intermediate storage rooms and improper transport equipment.	Renovate intermediate storage rooms, provide wheelie bins, and implement electric transport vehicles for onsite waste movement.	High	6 months
13	Smart Medical Waste System	Manual waste tracking system prone to inaccuracies and inefficiencies.	Install a centralized system for real-time monitoring and management of medical waste.	High	6 months
14	Emergency Preparedness	Inadequate training and drills for waste workers in	Conduct training for waste workers, improve drills, and ensure communication posters are available in waste management areas.	Medium	6 months

ID	Aspect	Findings	Action Summary	Risk Rating	Timescale
		emergency response.			
15	Signage	Deficiency in safety signage across the hospital.	Update and enhance hospital signage to meet international standards.	Medium	3 months
16	Stakeholder Engagement	No structured engagement plan for internal and external stakeholders.	Develop communication channels, implement feedback systems, and engage with regulatory and community stakeholders on HCWM.	Low	3 months

The following are additional recommendations to improve the overall occupational health and safety in the hospital:

ID	Aspect	Description of Finding	Guidance for Improvement
1	Personal Protective Equipment (PPE)	Deteriorated PPE (e.g., gloves, masks) due to lack of timely replacement, reducing effectiveness in worker protection.	<ul style="list-style-type: none"> • Immediate Replacement: Procure and distribute new PPE to replace deteriorated items promptly. • Regular Inventory Checks: Establish a schedule for regular inspections of PPE inventory to identify and address shortages or wear and tear. • Training on Maintenance: Provide training to staff on proper usage, cleaning, and storage of PPE to prolong its lifespan and ensure effectiveness. • Budget Allocation: Allocate a dedicated budget for routine PPE replacement to avoid future shortages.
2	Work Hours	Long working hours due to understaffing, leading to worker fatigue and increased risk of errors or injuries.	<u>Optimize staffing levels, reorganize schedules, and introduce shorter shifts to balance workloads and reduce fatigue.</u>
3	Health Surveillance	Insufficient monitoring of heat-related and respiratory health conditions in waste treatment areas.	<ul style="list-style-type: none"> • Establish a periodic health surveillance program • Maintain detailed records of health assessments and ensure timely follow-up for any detected issues.

4	PPE Compliance	Instances of non-compliance with PPE usage, exposing workers to avoidable hazards.	<ul style="list-style-type: none"> • Strict Enforcement: Establish and enforce a mandatory PPE usage policy with clear penalties for non-compliance. • Training and Awareness: Conduct regular training sessions to educate workers on the importance of PPE and the risks of non-compliance. • Supervision and Monitoring: Assign supervisors to monitor PPE usage and address non-compliance in real time. • Accessible PPE: Ensure that PPE is readily available and in sufficient quantities to eliminate excuses for non-compliance. • Feedback Mechanism: Implement a system for workers to report challenges or issues with PPE, such as discomfort or fit, to encourage adherence.
5	Noise Protection	Lack of hearing protection in high-noise areas such as waste treatment units, risking hearing loss.	Same as for PPE compliance in previous point
6	Spill Response	Insufficient training on chemical spill response, increasing risk of mishandling hazardous materials.	Train workers on chemical handling and spill response. Equip areas with spill kits and ensure staff understand their use.
7	Incident Reporting	Lack of a near-miss reporting system to proactively identify and mitigate potential safety hazards.	<ul style="list-style-type: none"> • Provide training to staff on identifying near-misses and the importance of reporting them for proactive hazard mitigation. • Incorporate near-miss and incident reporting as a core component of the hospital's health and safety management system.

4. Environmental and Social (E&S) Requirements for Proposed Interventions

To implement the interventions, a number of environmental and social requirements need to be met. The following E&S requirements/tools/instruments will be developed and thereafter implemented:

1. Consultant/TOR provisions for Consulting services for stakeholder engagement tools
2. **Environmental and Social Action Plan (ESAP)**
 - Establishment of a waste management team.
 - Training for GBV/SEASH policies.
 - Health surveillance programs.
 - GRM development with transparent procedures, anti-retaliation policies, and feedback mechanisms.
 - Provisions for stakeholder engagement, internal communication tools, and public outreach.
 - Investment requirements
3. **Environmental and Social Management Plan (ESMP)**
 - Suppliers to develop ESMPs for shredders, sterilizers, and wastewater treatment units, addressing emissions and pollutant thresholds.
 - Contractors to develop ESMPs for rehabilitation of intermediate storage rooms and onsite waste transport facilities.