

DRAFT REPORT

Environmental Impact Assessment Gap Closure Support of
the Kiambu Hospital Project in Kenya
For Kiambu Road Investment Ltd

14 October 2019



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Environmental Impact Assessment Gap Closure Support for Kiambu Hospital Project

For and on behalf of: Kiambu Road Investment Ltd

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Position: Director

14 October 2019

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Annex - Photolog

1. INTRODUCTION

1.1 BACKGROUND

Pharos Architects engaged Green By Choice Ltd (Environmental Consulting Firm) on behalf of Kiambu Road Investment Ltd to carry out an Environmental Impact Assessment (EIA) for the proposed Kiambu Hospital Project (KHP) in line with the local environmental legislations of Kenya for permitting purposes.

The EIA Project Report (dated August 2017) prepared by Green By Choice Ltd was approved by National Environment Management Authority (NEMA) and KHIL was issued an EIA Licence for KHP to commence construction.

1.2 EIA CRITICAL REVIEW

IBIS undertook a Critical Review of the EIA Project Report against IFC Performance Standards and sector specific WGB EHS Guidelines which identified gaps to international standards of low and medium critical level. No gaps of high significance were identified during the review. This is detailed in an EIA Gap Analysis Report (November 2018) submitted to KRIL.

KRIL retained IBIS as an independent Environmental and Social Consultant to provide EIA Gap Closure Support for the following gaps identified by the EIA Gap Analysis Report:

- Gap #2: insufficient social and biodiversity baseline;
- Gap #4: lack of Healthcare Waste Management System (excluding waste site audit);
- Gap #6: lack of an Emergency Preparedness and Response Plan;
- Gap #7: insufficient Environmental Management Plan including the Security Management Plan (SMP) and biodiversity measures; and
- Gap #8: lack of a Stakeholder Engagement Plan (SEP).

1.3 METHODOLOGY

Supplementary information on the local social and biodiversity setting was acquired through:

- Field observation during the site appreciation and site handover visits. Interview of a Fauna Expert with a focus on Rare Threatened and Endangered (RTE) species. No sampling done (including traps).
- Collection of public information regarding the local setting. Household survey was not carried out.

Preparation of E&S Plans documentation was based on the following assumptions:

- Compliance with Applicable Standards;
- All existing Plans from KRIL to be used as a basis (no reinventing the wheel approach); and
- Short and highly illustrative.

1.4 APPLICABLE STANDARDS

E&S Applicable Standards:

- IFC Performance Standards (PS1 to PS4) and WBF EHS Guidelines (including the General EHS Guideline and EHS); and
- Applicable environmental, social, health and safety and labour related laws, regulations and standards in Kenya.

1.5 LIMITATIONS

No baseline survey was carried out given that construction had already started. Information (published & unpolished) available online was used, therefore IBIS assumes no responsibility or liability for errors in the data utilized, or statements from sources outside of IBIS.

2. BASELINE SUPPLEMENT

2.1 BIODIVERSITY BASELINE

2.1.1 Fauna

KRIL site was previously occupied by Rock City Amusement park. The amusement park was later abandon and due to inactivity on site, it offered a sanctuary for small mammals such as rodents and various bird species as well as reptiles (frogs, lizards etc). Due urban development activities in the surrounding areas, the natural habitats in the area has either been modified or lost. No animal species on the IUCN RED LIST is expected to have bene present at the Project site.

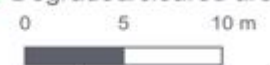
The Project site is adjacent to Karura & Eastern Salient block of Karura Forest Reserve (gazetted urban forest). According to Karura Forest Strategic Management Plan (2016-2020), the forest host twenty variety of mammals such as sykes monkey, bush bucks, suni, Harvey's duikers, epauletted-bat etc. This is in addition to reptiles such as pythons, cobras, monitor lizards among others. *Colobus guereza kikuyense*, an endangered sub-species of the colobus monkey was introduced in the forest from degraded habitats on the fringes of the Aberdares as part of the Colobus Reintroduction Project. The forest is fenced. There are no regulations requiring a conservation zoning around Karura Forest. Most of the perimeter of Karura Forest is already occupied by buildings and roads.

Historical map below gives an illustration the proposed site and the surroundings prior to construction commencing.



Legend

- Approx. Site boundary
- Karura Forest
- Infrastructures area
- Degraded/cleared areas



Historical view of the site before construction start
 Kiambu Road Investment Ltd
 Muthaiqa - Kenya

CLIENTS



DATE: November 2019

PROJECT: 0063-800



Reference Coordinates System: WGS 84 EPSG:4326; Imagery: Google Earth (September 2018), Layers: OSM layers and site boundaries observed during site visit

Size:
 A4

2.2 SOCIAL BASELINE

2.2.1 *Population*

According to the 2009 Kenya National Population and Housing Census, the population of Nairobi County was 3,138,369 people. The population will increase significantly at a growth rate of between 4.7% and 4.8% annually as per the County Integrated Spatial Plan.

Karura ward (Westland constituency) where the project is located has a population of 26,453 people and a population density of 693 people per square kilometer.

2.2.2 *Amenities*

Piped water supply from Nairobi Water & Sewerage Company (NWSC) is available in the area. The water supply is intermittent and not reliable, therefore an alternative water supply to supplement is required for the hospital.

Road network in the area is paved. Kiambu road and feeder roads serve the project site.

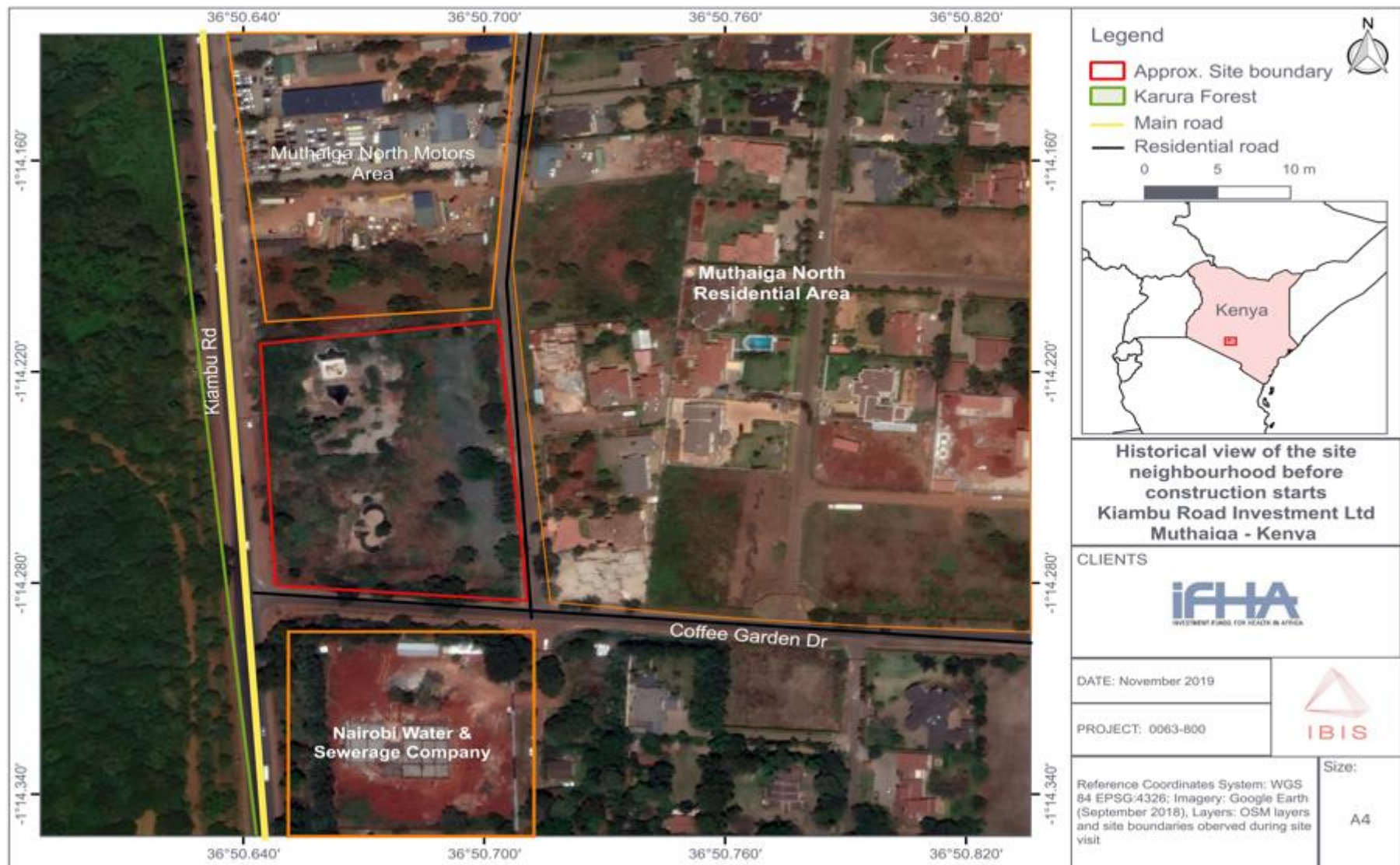
Grid electricity is available and connected by Kenya Power. Standby generators on major premises provide back-up power in the event of an outage.

Healthcare facilities present within the vicinity of Muthaiga North are Gertrudes children hospital and Karura health centre. Other healthcare facilities that population in Muthaiga North can access are located in Parkland, Kiambu and along Thika road.

Muthaiga North is not covered by a sewer system. Septic tank is the main wastewater disposal system implemented by premises in the area.

Private companies contracted by Nairobi City County and registered by the National Environment Authority (NEMA) collect household waste for proper disposal at Dandora dumpsite.

Historical map below illustrates the proposed Project site and the surroundings before construction started in February 2019.



3. E&S PLANS DEVELOPMENT

3.1 ENVIRONMENTAL MANAGEMENT PLAN

This EMP outlines the contents of construction and operational phase. It constitutes a contract document for use by the contractor and their personnel during construction as well as by personnel of KRIL during operations.

KRIL and Sentrim Contracts Ltd, through its Project Management Team, is responsible for implementing the EMP and ensuring it is communicated to all personnel. The EMP is intended as a quick reference for Project personnel and regulators to monitor compliance and is structured to allow updates and revision as work continues.

3.1.1 *Purpose of the EMP*

The primary purpose for this EMP is to establish the Environmental Management Procedures to be implemented by Sentrim Contracts Ltd, KRIL and Project Management Team. This EMP provides the management procedures associated with both planned activities for the construction and operations of the hospital as well as accidental events.

The purpose of the EMP is to:

- Outline environmental management measures to be implemented during construction of the hospital;
- Provide concise and clear instructions to Project personnel regarding procedures for protecting the environment and minimizing environmental impact;
- Provide a reference document for personnel when planning and / or conducting specific activities;
- Document environmental concerns and appropriate protection measures; and
- Provide a reference to applicable legislative requirements.

3.1.2 *Scope of the EMP*

The focus of the EMP is the protection of environment, social, health and safety during construction of Kiambu Hospital. It targets activities under the direct control of KRIL where activities may give rise to significant environmental impacts.

The EMP acknowledges the social and cultural dimensions of responsible environmental management alongside the biological and physical, reflecting a holistic view of KRIL as a “human ecosystem”.

3.1.3 Key Roles

KRIL Representatives

- Provide health, safety and environmental leadership for the Project to set a safety culture;
- Ensure all statutory, legislative and internal governance processes are applied to the Project delivery throughout the Project life;
- Participate in safety, health and environmental inspection visits during the construction phase.

Kiambu Hospital Project Manager

- Ensure sufficient resources (people, time and fiancé) to plan, execute and monitor environmental aspects of the Project;
- Responsible for the management of relationship between the appointed contractors, consultants, regulatory authorities and the general public; and
- Ensure the Project implements environmental plans and comply with all legislative and contract requirements.

Kiambu Hospital Project Monitor

- Ensure compliance with EMP including procedures and legislation;
- Ensure organization of labour, plant and equipment to perform the work in accordance with the environmental requirements; and
- Monitor implementation of agreed actions resulting from audits and inspections.

Kiambu Hospital Project Environmental Health & Safety Advisor

- Advise the Project Management Team of statutory and other environmental requirements and alert them in a timely manner regarding problems that may delay Project completion or harm the environment.
- Undertake monthly audits ensuring compliance with EMP, contractual obligations and local legislations;
- Advise KRIL on the suitability of actions to be taken arising from audits of the Project.

Sentrim Project Director and Site Agent

- Ensure the Project is constructed in accordance with the civil contract and environmental, health and safety requirement stated in the contract and this EMP;
- Ensure all sub-contractors are aware of the Project Environmental Policy and the requirements of this EMP;
- Implement agreed actions resulting from audits or inspections.

Sentrim HSE Supervisor

- Ensure compliance with this EMP and legislation;
- Develop Project specific management plans e.g. Construction Environmental Management Plan;
- Identify Project aspects and undertake Environmental Health & Safety Risk Assessment;
- Ensure statutory audits are carried and reports shared with KRIL and Project Management Team;
- Complete and submit all necessary applications for statutory consents and renewal of expired permits and licenses;
- Provide induction training and regular toolbox talks for all personnel on site;
- Undertake weekly inspections of the works as a minimum; and
- Ensure close liaison with Environmental Consultant is maintained.

3.1.4 Project EMP

Table 3.1 below present the Project EMP in detail.

Table 3.1 – Project EMP

CATEGORY	ASPECTS	POTENTIAL IMPACTS/ RISKS	MITIGATION MEASURES	MONITORING INDICATORS	RESPONSIBILITY	INDICATIVE TIMEFRAME
Dust -	<p>Dust created by excavation, filling and piling activities</p> <p>Dust created by demotion activities</p> <p>Dust created by the general construction</p> <p>Processing of materials, by sanding and cutting</p> <p>Dust created by cutting, blasting and drilling of concrete.</p>	<ul style="list-style-type: none"> Nuisance to workers, neighbours and general public Health risk to workers Loss of visual amenity Potential damage to adjacent properties Nuisance to neighbours 	<ul style="list-style-type: none"> Use water sprinklers on the site roads to reduce dust. Workers/operatives to use appropriate PPE. Use fine mist water spray on demolition. Minimize drop heights for loading and unloading operations. Introduce hard surfacing or paving of haul routes. Introduce external perimeter fencing/scaffold screening to contain dust. Cover loads during transport. Limit soil stockpile heights and slopes, protect from wind, cover if necessary. Re-vegetate cleared areas. Sequence of demolition works to minimise dust (internal first, then external structure/frame). Consider speed limit on site 	Number of complaints	Sentrim Contracts Ltd	Throughout the construction phase
Noise and vibrations	<p>Earthworks, use of heavy machinery</p> <p>Grinding, coring of concrete work</p>	<ul style="list-style-type: none"> Disturbance to adjacent neighbours and general public Health risk to worker 	<ul style="list-style-type: none"> Maintenance and regular checking of the equipment condition. Use mufflers on equipment and plant. 	Number of complaints	Sentrim Contracts Ltd	Throughout the construction phase

CATEGORY	ASPECTS	POTENTIAL IMPACTS/ RISKS	MITIGATION MEASURES	MONITORING INDICATORS	RESPONSIBILITY	INDICATIVE TIMEFRAME
	<p>Concrete pump pouring</p> <p>General site plant, tools and equipment use.</p> <p>Piling activity</p>		<ul style="list-style-type: none"> • Liaison with neighbours if required to confirm appropriate time for noisy activity - Limit work within the day/sensitive hours. • Operatives to use appropriate PPE. • Introduce acoustic screening. • Consider enclosing plants in the acoustic box. • Identify noise levels prior to commencement. • Locate construction plant away from site boundaries. • If possible, locate the areas of noisy activities away from the sensitive receiver i.e. houses • Turn off plant when not in use. • Regular monitoring of the 'noisy' activities and recording of noise levels. • For vehicles consider speed limit on site. 			
Air Quality	<p>Fumes discharge from site equipment and vehicles.</p> <p>Emissions of fumes, toxins and adhesives released into the air during painting, coating</p> <p>Emissions of fumes created by hot works</p>	<ul style="list-style-type: none"> • Nuisance to the neighbourhood. • Potential for the sanitary hazard. • Risk to the human health (workers and neighbourhood). • Localised pollution of air. • Disturbance to adjacent neighbours and public. 	<ul style="list-style-type: none"> • Regular maintenance and service for vehicles • Turn the engines off when plant not in operation. • Replace plant with excessive fumes from the site. • Implement the suitable waste management system. 	<p>Equipment maintenance records</p> <p>Number of complaints reported</p>	Sentrim Contracts Ltd	Throughout the construction phase

CATEGORY	ASPECTS	POTENTIAL IMPACTS/ RISKS	MITIGATION MEASURES	MONITORING INDICATORS	RESPONSIBILITY	INDICATIVE TIMEFRAME
	Odour from organic waste, toilets		<ul style="list-style-type: none"> Consider using of non-solvent (water) based paints. Implement hot work permit system. 			
Water	<p>Wastewater from site facilities (sewerage) and from site cleaning activities e.g. painting and plastering.</p> <p>Rainfall creating mud.</p> <p>Discharge of the site drainage to the watercourse or local drainage</p> <p>Water contaminated by concreting works, demolition and cleaning of equipment.</p>	<ul style="list-style-type: none"> Potential contamination of the ground from the concrete batching plant cleaning. Siltation of local waterways Pollution of tarmac road by mud spread by construction vehicles movement. 	<ul style="list-style-type: none"> Minimise exposed ground around the site. Divert upstream runoff away from the site. Excavation stockpiles to be located away from water runoff, channels or kerbs. Never hose down concrete or material spillage into natural or stormwater drains. Limit the excavation activities during rainy season. Truck tyres to be cleaned before leaving site. 	A well-maintained storm water drainage	Sentrim Contracts Ltd	Throughout the construction phase
Waste	<p>Waste generated by site activities.</p> <p>General site housekeeping and waste storage/removal.</p>	<ul style="list-style-type: none"> Increase landfill deposit. Potential pollution to the ground. 	<ul style="list-style-type: none"> Prepare site specific waste management plan. Review disposal options prior commencement of the work. Segregate materials as they are generated. Remove organic waste at regular intervals. Provide bins and skips for site. 	Waste skips on site. Littering and housekeeping.	Sentrim Contracts Ltd	Throughout the construction phase

CATEGORY	ASPECTS	POTENTIAL IMPACTS/ RISKS	MITIGATION MEASURES	MONITORING INDICATORS	RESPONSIBILITY	INDICATIVE TIMEFRAME
			<ul style="list-style-type: none"> Identify reclaim and reuse materials where possible – implement recycling scheme. Use licensed waste carriers. Segregate hazardous from non-hazardous waste. Use covered/secured bins to minimize risk of vermin and pollution from the rainfall. 			
Spillage	<p>Leakage of chemicals, oil, fuels and fluids from equipment</p> <p>Uncontrolled disposal of and spillage during application of chemicals treatment ad finishes</p>	<ul style="list-style-type: none"> Contamination of runoff and ground. 	<ul style="list-style-type: none"> Ensure material data sheets are read and understood with correct handling methods used and emergency procedures ready to be carried out. Implement regular checks and monitoring of the condition of the storage areas incl. storage containers. Fuel, oil, chemicals of fluids stored in the designated hard standing areas, with bunding, spill trays. 	Spillage incidents reported.	Sentrim Contracts Ltd	Throughout the construction phase
Biodiversity (flora & fauna)	Excavation works or other construction activities	<ul style="list-style-type: none"> Possible damage or reduction of plants and trees. Possible disturbance to existing wildlife habitats 	<ul style="list-style-type: none"> Location of the invasive construction activities (i.e. hot work) or facilities (concrete mixing plant) away from sensitive areas (Karura forest). Landscape open area using indigenous species. 	Implementation of biodiversity measures	Sentrim Contracts Ltd	Throughout the construction phase

CATEGORY	ASPECTS	POTENTIAL IMPACTS/ RISKS	MITIGATION MEASURES	MONITORING INDICATORS	RESPONSIBILITY	INDICATIVE TIMEFRAME
			<ul style="list-style-type: none"> Retain trees within the site perimeter that do not interfere with layout of the proposed hospital. 			
Occupational Health & Safety	Hazards and risk control Fire safety Machine safety Transport safety Chemical safety Electrical safety	<ul style="list-style-type: none"> Unsafe working environment Accident and incidents may result in injury and lost time. Damage to equipment, vehicles and structure. Project delay and possible fines. 	<ul style="list-style-type: none"> Develop and implement OSH management system. Implement finding from OSH audits and inspections Train workers on safe work procedures. 	Zero-harm Number of workers trained in safety Number of accident and incidents reported and investigated.	Sentrim Contracts Ltd	Throughout the construction phase
Landscape and visual impact	Aesthetics and landscape change	Disturbance and nuisance to neighbours	<ul style="list-style-type: none"> Undertake local community engagement and consultation. Site accommodation, temp hoarding and support structures to be located in a way that minimise disruption. 	Re-vegetation of open grounds. Landscaping of the Project site.	Sentrim Contracts Ltd	Throughout the construction phase
General	Site office operation (electricity, waste, paper)	Pressure on existing utilities and infrastructure	<ul style="list-style-type: none"> Employ local labour and ensure that their labour conditions comply with local regulations Turn off equipment, tools, machinery, power, etc when not required or in use 	Implementation of resource efficiency initiatives.	Sentrim Contracts Ltd	Throughout the construction phase

CATEGORY	ASPECTS	POTENTIAL IMPACTS/ RISKS	MITIGATION MEASURES	MONITORING INDICATORS	RESPONSIBILITY	INDICATIVE TIMEFRAME
			<ul style="list-style-type: none"> Purchase in bulks (quantity of material) to minimise transport needs, but to avoid unnecessary buys. 			
Security	Security related threats to construction sites	<p>Theft of equipment, materials and/or tools</p> <p>Vandalism and arson</p> <p>Trespassers both accidental and intentional</p>	<ul style="list-style-type: none"> Assign supervisory security responsibilities within the site/project management team and encourage security awareness among all workers. Illuminate the job site perimeter fence, high value storage areas, building entrances and the site offices to effectively deter trespass, theft and vandalism. Secure the site perimeter with appropriate fencing (as per risk assessment) as a first line of defense Control site access by establishing the minimum practical number of access points and monitor those entry points. Restrict site entry only to authorized personnel. Provide guards at all entry points (personnel). Consider limiting onsite vehicle access. Provide parking areas off site for employees and visitors. 	Number of reported security incidents	Sentrim Contracts Ltd	Throughout the construction phase

CATEGORY	ASPECTS	POTENTIAL IMPACTS/ RISKS	MITIGATION MEASURES	MONITORING INDICATORS	RESPONSIBILITY	INDICATIVE TIMEFRAME
			<ul style="list-style-type: none"> • Ask employees and subcontractors to take personal responsibility for a secure site and engage them to immediately report any incidents of theft or vandalism. • Use a licensed and bonded security guard service to patrol the site both during and outside of working hours. It is suggested that guard rounds are digitally recorded to ensure they are actually being performed. Provide guards with an effective means of communication with local law enforcement agencies and project management 24 / 7. • Where practical, secure all available high value materials and secure / immobilize vehicles and equipment. Consider installing hidden ignition disable switches to prevent theft. 			

3.1.5 *Statutory Consents, Licenses and Permits*

No construction works will commence without obtaining the relevant consents or authorization.

A schedule of consents, authorization, permits and licenses required by the Project will be prepared. Sentrim and Project Management Team will be responsible for identifying any further statutory consents required for construction and commissioning. Where Sentrim applies for consents or licenses, KRIL and Project Management Team will be provided with copies as soon as possible after receipt. All relevant commitments and conditions on licenses would be transferred onto a register to ensure that they are delivered and their implementation is monitored.

Record of all consultations with statutory and non-statutory organizations will be maintained. All correspondence (sent & received) and meeting notes with copy KRIL. An index of all correspondences will be kept for ease of access on consultation schedule.

3.1.6 *Environmental Incident & Corrective Action Reporting*

All environmental incidents will be reported and investigated in accordance with Sentrim's management procedure for incident reporting and investigation. Incidents should be reported directly to the HSE Supervisor or HSE Officers. Incidents will be recorded in an incident form and maintained on site.

All personnel including visitors to the site are responsible for:

- Bringing any incidents, they identify within the Project site;
- Initiate or assist with immediate remediation measures to the best of their capabilities consistent with ensuring their safety and others.

Sentrim will investigate, report and take action to prevent a recurrence, maintain a register on site of all reported incidents, improvement orders, and actions by Regulatory Authorities. Summary of monthly incidents will be compiled and submitted to KRIL.

When an unforeseen hazard occurs during construction work that is a threat to the environment or has the potential to be, Sentrim will be taken immediate measures to make the hazard safe.

3.1.7 Environmental Audits, Inspections and Corrective Actions

Audits

Develop an audit plan based on construction programme. The audit plan should include both weekly and monthly environmental inspections and project environmental audit. A copy of the audit plan should be circulated to the Project Management Team for information.

The HSE Supervisor will undertake the weekly inspection whereas an independent E&S Consultant will perform the monthly site inspections during the construction phase.

Audits should be carried out by an external consultant quarterly. Environmental matters identified as being non-compliant with the EMP, Construction Environmental Health and Safety Plan (CEHSP) and legislations. Non-compliances or findings from all audits and inspections should be reported to KRIL. An Action Plan for monitoring close-out and ensuring issues and actions identified are communicated to relevant personnel should be developed.

All audit reports should be copied to the Project Management Team within three working days of completing an audit. Environmental inspection, audits and close-out will be made available for review by KRIL.

Site Inspection

On a weekly basis environmental performance matters would be inspected by HSE supervisor. These inspections would review compliance of all site activities against the EMP as well as reviewing overall site practice highlighting area for potential improvements in addition to good performances that could be identified as good practice. The weekly inspections would be conducted by Sentrim's HSE Supervisor and recorded.

Key issues emerging from the inspections would be communicates to the site operatives via site meetings and a report within 24 hours.

Corrective Actions

Corrective actions would be reported ton KRIL and Project Management Team and remedial actions instigated as soon as practicable.

3.1.8 *Induction and Training Requirements*

All personnel on site will receive mandatory environmental (as well as health and safety) training including:

- Induction training covering specific environmental site aspects such as waste management, emergency response, water management, good housekeeping etc;
- Details of community liaison issues and how to deal with any concerns raised by third parties
- Environmental awareness training; and
- Toolbox talks on task specific environmental, health and safety issues.

The Project Director in liaison with the HSE Supervisor are responsible for managing the provision of environmental training in accordance with the approved training schedule.

Sentrim should clearly define their approach of identifying environmental training needs and the provision for undertaking such training to ensure the environmental competence of their personnel and also of any sub-contractor.

Sentrim Contracts Ltd (contractor) will develop and continually maintain a register detailing environmental site inductions and competencies.

3.1.9 *Record Keeping*

Maintain an Environmental File on site whose content will include (non-comprehensive list):

- Current version of EMP;
- Copies of land purchase documents;
- Environmental studies and survey;
- Consents;
- Records of consultations;
- Environmental aspects register;
- Approvals, permits and licenses;

- Specific management plans e.g. Emergency Response Procedure, Waste Management Plan;
- Details of all environmental complaints and action taken;
- Results of environmental monitoring e.g. statutory noise measurements; and
- All incident reports

A comprehensive photographic archive of the Project site would be maintained prior to, and during the construction phase.

3.1.10 Design Changes

In the event of KRIL modifying the approved designs then a review should be undertaken to determine whether the modifications would lead to a change in the significance of the environmental impacts reported in the environmental impact assessment (EIA)

The following procedure should be followed:

- Undertake a review of the design changes against the approved EIA by topic to scope the risk of there being a change to the impacts reported;
- For topics where there is a potential risk of change to the impacts and risks reported, undertaken further environmental assessment;
- A register should be maintained of all design changes considered and the accompanying document assessing the impacts of these changes; and
- Ensure commitment to this EMP is updated accordingly.

3.2 BIODIVERSITY MEASURES

The following biodiversity measures will be implemented by the Project to promote biodiversity within and without the Project site;

- Volunteer for tree planting at the neighbouring Karura Forest.
- Indigenous trees and shrubs should be used during landscaping of the Project site.
- Retain trees on the site perimeter boundary that do not interfere with Project footprint.

3.3 EMERGENCY PREPAREDNESS AND RESPONSE PLAN

3.3.1 *Scope of the Plan*

This Emergency Preparedness and Response Plan applies to Kiambu Hospital Project site in which Sentrim Contracts Ltd personnel are required to undertake works required under the civil works contract.

3.3.2 *Purpose of the Plan*

The purpose of this EPRP is to ensure incident planning and response procedures are managed effectively during construction and outlines the general procedures for initiating an emergency response that could occur as a result of project construction works or natural causes.

This plan will also provide guidance on the subsequent management and communications in response to, potential and actual emergencies which may occur.

3.3.3 *Legislative Framework*

The following legislation, regulations and standards were considered in the development of this Plan:

- Occupational Safety and Health Act, 2007;
- Work Injury Benefits Act, 2007; and
- The Factories (Building Operations and Works of Engineering Construction) Rules, L.N. No. 40/1984.

International standards and guidelines applicable include:

- ILO Convention on Safety and Health in Construction, 1988;
- IFC General Environmental Health and Safety Guideline

3.3.4 *Role and Responsibilities*

Project Director

The Project Director shall:

- Ensure effective implementation of this Plan including provision of adequate resources.
- Ensure this Plan is reviewed at least every 6 months.
- Ensure an Emergency Coordinator is appointed, and cover provided absences.
- Maintain a working knowledge of this Plan.

Site Agent

The Site Agent shall:

- Maintain working knowledge of the emergency plan and procedures.
- Maintain familiarity with this EPRP.
- Participate in the scheduled review of the EPRP.
- Ensure drills and exercises are conducted to test the plan.

Project Health & Safety Supervisor

- Maintain the Project Emergency Preparedness and Response Plan and associated processes.
- Ensure that adequate emergency response information and instruction is provided at induction.
- Conduct planned inspections to ensure emergency response equipment and facilities are complete.

Emergency Response Coordinator

On becoming aware of an emergency, the emergency response coordinator will take the following actions:

- Raise the alarm for an emergency response.
- Contact/communicate with emergency services.
- Coordinate emergency response and monitor the effectiveness.
- Communicate with the Project H&S Supervisor.
- Give the all clear when authorised to do so by the emergency services.
- Debrief Project Management Team upon completion of the emergency situation.
- Assist with the completion of the incident reporting and notification.
- Schedule emergency drills.

- Coordinate training requirements for all personnel on site.

Fire Marshals

- Conduct search sweep of the designated area, ensuring all persons have cleared the area and assembled at the emergency assembly point.
- Participate in emergency drills and attend debriefings.
- Assist the emergency response coordinator as requested.

First Aiders

- Apply and record first aid treatment where required.

3.3.5 Emergency Equipment

The site must have readily available the correct equipment to effectively respond to emergency situations. Examples are fire extinguishers,

Safe work method statements shall identify emergency equipment required for that task.

Emergency equipment must be maintained through preventive maintenance procedures (inspection and testing) to ensure that equipment is in ready condition for use.

3.3.6 Fire Safety

In order to control fire risk, several measures must be taken. These include:

- No hot work is to take place outside of a controlled hot works zone without first seeking authorisation. Fire extinguisher must be present in the event of a fire breaking out.
- Provision of fire extinguisher guided by a fire risk assessment.

3.3.7 Evacuation Routes

Evacuation exit routes will be identified for each area as the project progresses. All personnel are required to follow the safest route to the Main Evacuation point. All changes to evacuation routes are to be recorded on the site layout plan and communicated to the workforce via prestart meetings/ toolbox talks.

3.3.8 Training

All site workers must be trained on site-specific emergency procedures. This training will be done as part of site induction training and shall include the following:

- Evacuation procedures including routes and assembly areas.
- Initial emergency response actions.
- Location of first-aid kits and identification of first-aid providers.
- Emergency communications used on the site

Visitors will be accompanied by Sentrim staff at all times. Visitors will receive emergency procedure training via the visitor's induction at the sign in register located at the gate.

Emergency Response Coordinator and support team (first aider & fire marshal) must receive specific training for the duties they are to undertake. Training will include relevant topics related to their role including training on the content of the EPRP and CPR for first aiders.

The only designated access point into the site (via Kiambu road) will be manned by professional security guards at all times, whilst construction activities are present. The site will be hoarded to prevent unauthorised entry.

Evacuation drills will be undertaken at intervals not exceeding three months. A record of the drills to be maintained.

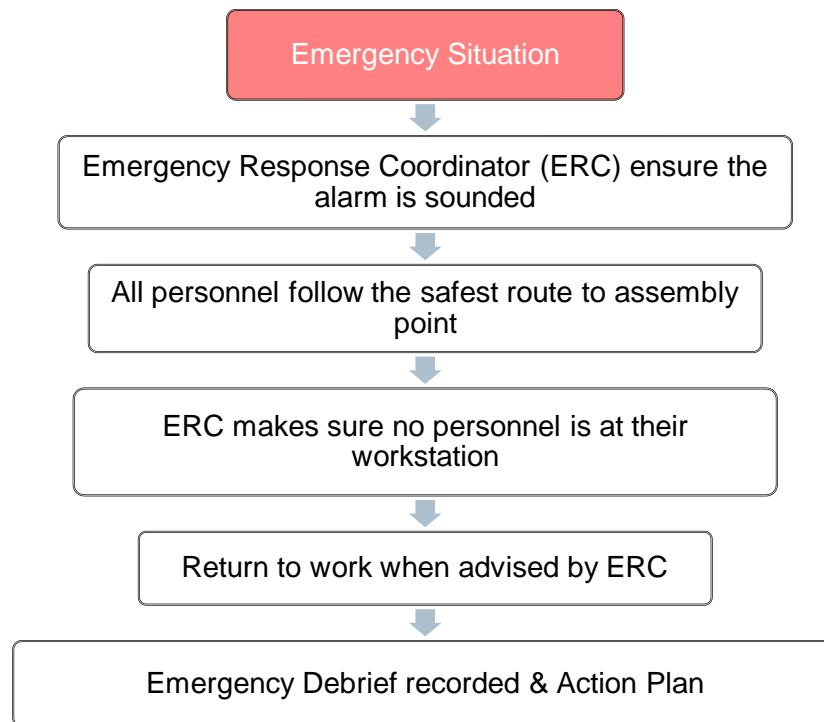
3.3.9 Reporting

HSE Supervisor will be notified by telephone as soon as practicable after incident. Project Director and Site Agent must be informed of any incident on site by the quickest possible means.

KRIL shall be notified of any incident with actual or potential significant impact or risk within 12 hours by Sentrim Contracts Ltd. Full written details of the incident shall be provided within seven days of the date on which the incident occurred. KRIL will require additional measures to be implemented to address the cause or impact of any incident

3.3.10 Emergency Response Procedure

Emergency Coordination Procedure



Response Procedure - Fire

Emergency Situation - IN THE EVENT OF FIRE

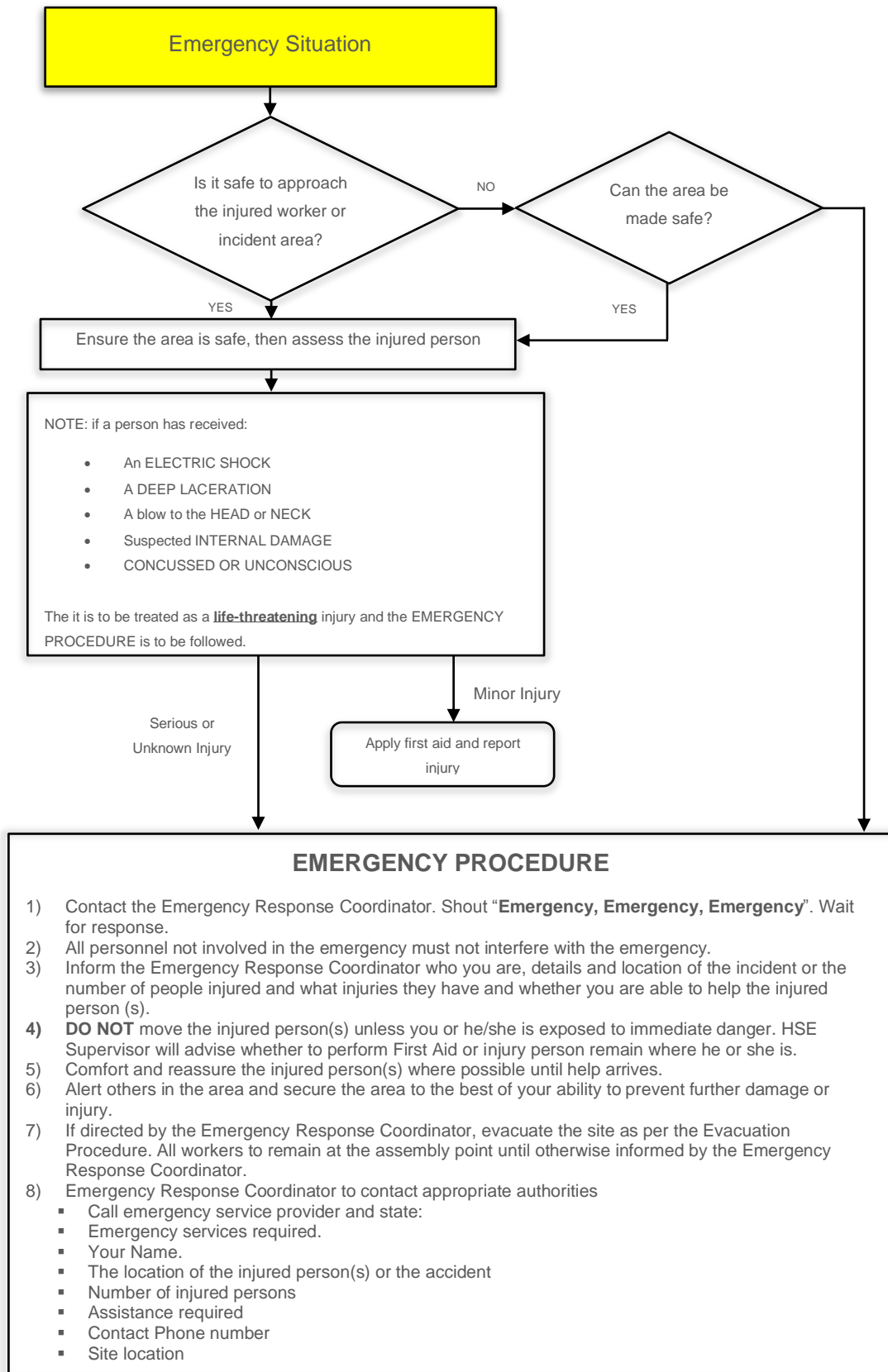
If safe to do so, attempt to extinguish the fire using the appropriate fire fighting equipment.

DO NOT fight the fire if any of the following conditions exist:

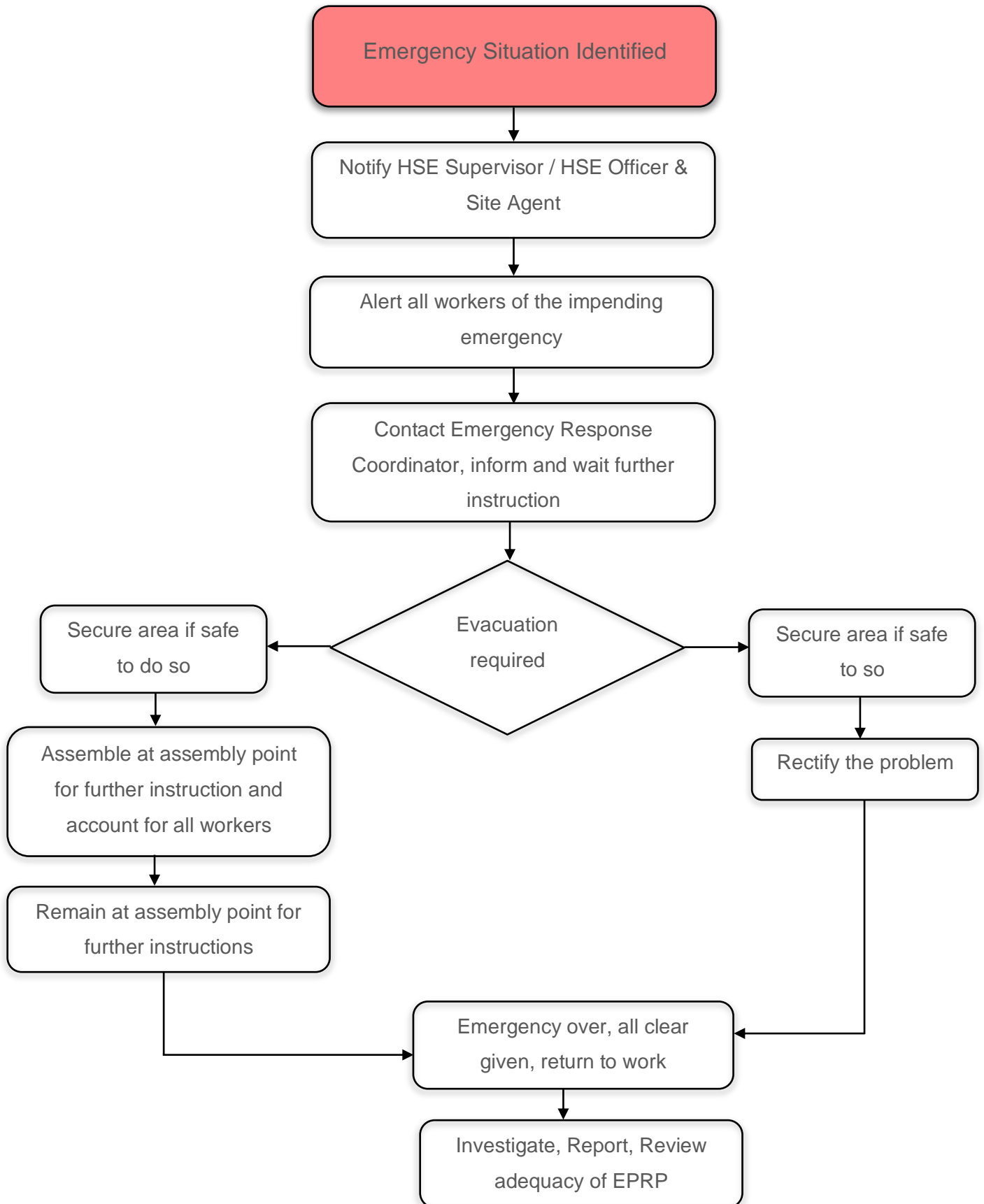
- You have not been trained or instructed in use of a fire extinguisher;
- You do not know what is burning;
- The fire is spreading rapidly;
- You do not have the proper equipment;
- You cannot do so without your means of escape;
- You may inhale toxic smoke;

If the fire is not under control within 20 second, cease the effort and alert Nairobi City County Fire Brigade

Response Procedure – Medical Emergency



Response Procedure - General Evacuation



3.4 SECURITY MANAGEMENT PLAN

3.4.1 Purpose

This Plan is designed to control worksite security to prevent unauthorized access, maintain public safety and minimise vandalism, theft and other offences.

3.4.2 Scope

This Plan applies to KRIL Project sit, workers and areas under the control of the contractor. As work progresses, the security plan will be amended as necessary and further developed.

3.4.3 Regulatory Framework

Private Security (General) Regulations, 2019. The regulation affects the status, administration and operation of private security service providers in Kenya.

International Standards

IFC Performance Standards 4: Community Health, Safety & Security. Key objective of this PS is to ensure the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimize risk to the local communities.

International Code of Conduct for Private Security Service Providers provide independent governance and oversight mechanism for signatory companies.

3.4.4 Security Arrangement

Temporary hoarding around the project site prevent unauthorised access and a single access gate along Kiambu road is main point of entry and exit. Private security guards hired by the contractor are tasked with manual access control and patrolling the site during the day and night to safeguard personnel and property.

There is surveillance or electronic security system (CCTV) used.

3.4.5 Security Procedures

Boundary Security: Temporary hoard around the Project site perimeter and a single access gate ensure unauthorised access to the site is controlled and prevented.

Access-Point Operations: Vehicle entering and exiting are checked by security guards. Those delivering materials are recorded including the delivery notes or invoices. Exit searches are also conducted by security guard on workers and vehicles.

Material Storage & Control: Cement and other construction materials are kept in a store under lock and key to be accessed upon request and authorisation by the foreman and storekeeper.

Incident Response: security incidents on site will be reported to the security guards and Site Agent. Private will be responsible for apprehending and detaining the suspect until the police arrive.

Police will be called upon when a criminal offense has taken on site, to investigate, make arrest and prosecute the suspect.

3.4.6 Communication Arrangements

Private security guards on site report directly to the Site Agent and HSE Supervisor. Contractor's Project Director communicates with the private security company management.

3.4.7 Interface with the police and government agencies

KRIL & Sentrim Contracts Ltd (contractor) will be responsible for interfacing the police and government agencies on security issues that occur on site or Project related. They will nominate an individual within the organization who will be the point of contact for security issues arising out of the Project.

3.4.8 Provisions for Compliance with Regulations & Good Industry Practice

Security personnel selection and employment

When procuring the services of a private security service provider, consider the following:

- Registered as a company, tax compliant and registered as a private security service provider.

- Security personnel have been vetted to authenticate security training, employment history, character, residence, criminal background etc.
- Security personnel have undergone mandatory security training at an institution registered by the Private Security Regulatory Authority.

Security personnel rules of conduct

Private security personnel deployed at the Project site must sign and abide by the rule of conduct. As a minimum the rule of conduct will include clauses on general conduct while on site (treatment of all people humanely and with respect for their dignity and privacy) and use of force (take reasonable steps to avoid the use of force or use force in a manner consistent with the law).

Security personnel training & equipment

Security personnel deployed on site will have undergone annual mandatory security training at an institution licensed by the Private Security Regulatory Authority in line with the Private Security Regulation Act 2019. Equipment and tools approved for use by the Authority include devices for bomb and metal detection and access control, patrol cars, security alarm system etc.

Monitoring compliance & investigation process of non-compliance acts

Compliance with legislation and contractual obligation will be monitored through audit. Audit will be carried by the contractor and non-compliances with regards changes in legislation will be communicated to the company for action.

3.4.9 Security Training Program

Code of Conduct

Train security personnel on international code of conduct for private security service provider or the Project' code of conduct. Specific topics to be covered include:

- General Conduct;
- Use of Force;
- Detention;

- Apprehending Persons;
- Prohibition of Torture or Other Cruel Inhumane Punishments; and
- Sexual Exploitation and Abuse.

The project will ensure that security personnel receive procedural or knowledge training in basic guarding skills, guard-post orders and procedures, health, safety, and environment mandatory training, and training on the SEP and relevant public and worker grievance mechanisms.

3.4.10 Grievance Mechanism

Project's internal and external grievance mechanism will be used to report any grievances or complaints against security personnel.

3.5 STAKEHOLDER ENGAGEMENT PLAN (SEP)

For the purpose of this plan, a stakeholder is defined as any individual, organization or a group potentially affected by the project or who has an interest in the Project and its impacts. The purpose of stakeholder identification is to identify and prioritize project stakeholders (who are impact either directly or indirectly in a positive or negative way) for consultation.

3.5.1 Regulatory Framework and International Standards

National regulatory requirement applicable to the implementation of the SEP include:

- The Constitution of Kenya;
- Environmental Management and Co-ordination Act Cap. 387; and
- The Environmental (Impact Assessment & Audit) Regulation, 2003.

International Standard and guideline applicable:

- IFC PS1: Assessment and Management of Environmental and Social Risks and Impacts
- UNDP The Stakeholder Engagement Manual Volume 2: The Practitioner's Handbook on Stakeholder Engagement
- United Nations Evaluation Group Principles for Stakeholder Engagement

3.5.2 Stakeholder Identification

Stakeholder identification is an ongoing process, and thus stakeholders will continue to be identified during different stages of the Project. Stakeholders have been identified based on their influence and interest on the Kiambu Hospital Project.

Key primary stakeholders group include Muthaiga North Resident Association (MNRA) and neighbouring land users such Karura Forest to the East, Nairobi Water & Sewerage Company (NWSC) to the South and motor vehicle yards to the North as well as the general public. These are considered important stakeholders particularly related to impact during construction phase such a dust nuisance and noise and potential traffic increase during construction and operation phase.

Secondary stakeholders include county and national regulatory authorities such as Ministry of Health (MoH), National Environment Management Authority (NEMA), Kenya National Highways Authority (KeNHA), Water Resources Authority (WRA), Kenya Radiation Protection Board (KRPB), Nairobi City County, National Construction Authority (NCA), Kenya Medical Practitioner and Dentists Council (KMPDC) etc.

3.5.3 Stakeholder Engagement Approach

This section provides an overview of the stakeholder engagement approach for the different phases of the Project.

3.5.1.1. Stakeholder Engagement Activities during EIA Report preparation

Public participation during the EIA process took the form of questionnaires and interviews with randomly selected neighbours around the Project site. This was done to solicit views and opinions regarding the proposed development. Issues raised included:

- Air pollution reduction during construction;
- Appropriate measures taken to reduce pressure on existing water and sewerage infrastructure;
- Locals to be give priority during employment; and
- Proper solid waste disposal.

A public meeting was held for the proposed Kiambu Hospital Project at the project site on 6 December 2017. The meeting was attended by KRIL representative, EIA Consultant, Pharos Architects, ITEC Ltd, chairmen of MNRA and residents. The objective of the meeting was to seek the residents and general public views on the proposed project. Issues discussed during the meeting included traffic congestion along Kiambu road and the intersection of Coffee Garden Drive, security, wastewater management, dust nuisance during construction, pressure on existing utilities and obstruction of Karura forest by the hospital building.

3.5.1.2. Stakeholder Engagement Activities undertaken post-EIA

MNRA held a Special general Meeting in July 2017 to discuss the planned developed of multidisciplinary hospital by KRIL and subsequent residents' participation meeting was held on 13 December 2017. The outcome of the meetings was a "Project No Objection" to the planned development on Plot L>R No 14861/8 & 9.

Meetings have been held between KRIL, MNRA and Sentrim Contracts Ltd prior to site handover and commencing construction. These meetings were not documented and therefore no record maintained.

3.5.1.3. Stakeholder Engagement Activities during Construction and Operation

Consultation activities during construction and operation phases are important in order to maintain constructive relationship both with neighbouring communities and other stakeholders.

The main engagement methods for different types of stakeholders are summarized in 3.5.1.

Table 3.5.1 – Engagement methods

PROJECT PHASE	STAKEHOLDER TYPE	ENGAGEMENT APPROACH	FREQUENCY	RESPONSIBILITY
Construction	Muthaiga North Resident Association (MNRA) and neighbouring communities	<ul style="list-style-type: none"> • Implementing grievance mechanism • Face-to-Face meetings with MNRA leadership 	Quarterly	Sentrim Contracts Ltd and KRIL
	Regulatory Authorities: - Nairobi City County - Kenya National Highway	<ul style="list-style-type: none"> • Official written correspondence • Face-to-Face meetings 	Annually	

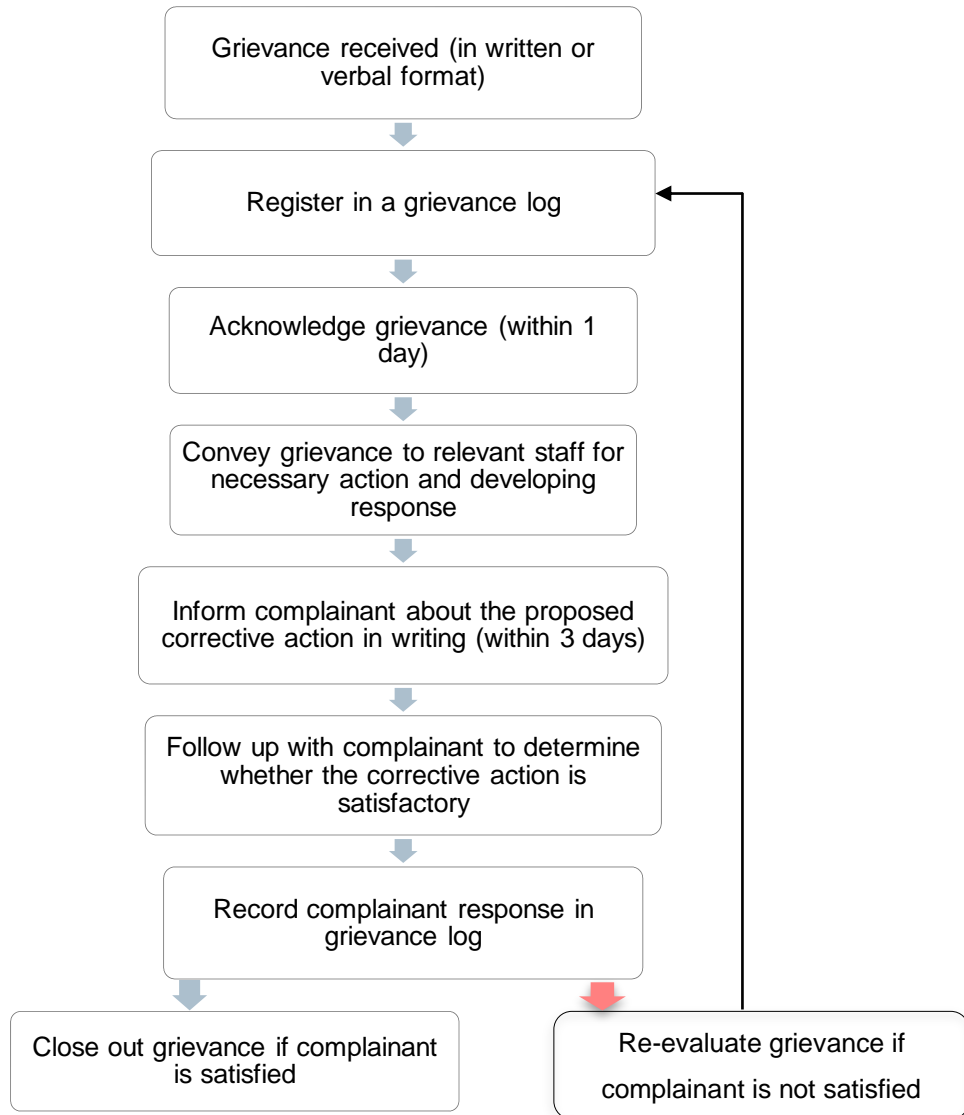
PROJECT PHASE	STAKEHOLDER TYPE	ENGAGEMENT APPROACH	FREQUENCY	RESPONSIBILITY
	Authority (KeNHA) -Radiation Protection Board -National Environment Management Authority (NEMA) -Directorate of Safety & Health Services (DOSHS) -National Construction Authority (NCA)	as need and authorities related to permitting issues		
	Construction workers	<ul style="list-style-type: none"> Implementing grievance mechanism Training on environmental, health and safety aspects 	Daily	
	Suppliers and sub-contractor	<ul style="list-style-type: none"> Face-to Face meetings Official written correspondence 	Monthly	
Operation	Muthaiga North Resident Association (MNRA) and neighbouring local communities	<ul style="list-style-type: none"> Face-to-Face meetings Implementing external grievance mechanism Official written correspondence Print and electronic advert if needed 	Quarterly	KRIL and AAR Healthcare
	Employees of Kiambu Hospital (including sub-contractors and their staff)	<ul style="list-style-type: none"> Implementation of grievance mechanism Ongoing formal meeting with nurses and doctors Emails and intranet Internal trainings 	Monthly	
	Ministry of Health (MoH) & Regulatory Authorities e.g. Kenya Medical	<ul style="list-style-type: none"> Face-to-Face meetings with MoH and Regulatory Authorities 	Annually	
	Patients and Patient's visitor	<ul style="list-style-type: none"> Establishment of a Patient Communication Unit inside the hospital in line with the Kenya National Patients' Rights Charter Customer Feedback Forms 	Daily	

3.5.4 *Grievance Mechanism*

A grievance mechanism will be established in order to ensure all grievances, objections or complaints are received from project stakeholders especially from the neighbouring community are dealt with appropriately and in a timely manner.

Stakeholders will be informed about the grievance mechanism during consultation and disclosure activities. All grievances will be recorded, responded and resolved in a defined timeframe. Grievance and comments will be submitted via face-to-face meeting, e-mail, letter, phone call. Contact information for the contractor will be provided.

A flowchart below illustrates the grievance procedure.



All grievances will be reflected in a grievance log to ensure that grievance is assigned an individual number for consistent tracking and corrective actions. The grievance log will contain:

- Date of submission of grievance;
- Reference number;
- Contact details of the complainant;
- Content of the grievance;
- Parties responsible for resolution;
- Date when investigation was initiated and completed;
- Investigation findings;

- Proposed corrective actions;
- Date of response sent to the complainant (unless it is anonymous);
- Statement of satisfaction of the complainant;
- Date of closing out of the grievance;
- Any outstanding actions for non-closed grievances.

All comments/grievances that are submitted to KRIL and Sentrin Contract Ltd Head Office will be forwarded to the site for resolution.

3.5.5 Resource & Responsibilities

The implementation of this SEP will be conducted and monitored by KRIL and Sentrin Contracts Ltd. The Site Manager and HSE Supervisor will be the focal point for resolution of stakeholder complaints and grievance cases.

3.5.6 Reporting

All feedback and grievance received will be recorded in a comment log and grievance log respectively. SEP monitoring and evaluation reports will be disclosed to stakeholders periodically by KRIL and Sentrin Contracts Ltd.

3.6 HEALTHCARE WASTE MANAGEMENT SYSTEM

3.6.1 Introduction

Provision of healthcare like any other human activity generates waste which has to be managed and disposed in a safe manner in order to minimise health risks to healthcare workers and the general public. 75% to 90% of all waste generated at health institution are managed like household waste whereas 10% to 25% is hazardous and require special arrangement for management.

3.6.2 Statement of Intent

KRIL accept that its operational activity will inevitably result in the production of waste, but also recognises that opportunity exist to minimise its impact on the environment and staff.

KRIL will ensure statutory compliance and review its procedures to improve healthcare waste management. KRIL will promote the following:

- Meet the requirements of all relevant legislations and best practice guidance.
- Training for healthcare waste management; and
- Set unified standards for healthcare waste management.

To achieve the above commitments and objectives, KRIL will:

- Ensure full compliance with waste related legislations and adherence to best practice at all times.
- Providing staff with clear and easily accessible guidance for the safe handling and disposal of waste.
- Identify specific roles and responsibilities with KRIL for the effective management of waste.
- Apply the waste hierarchy, minimise waste at source and to reuse/recycle waste where possible.
- Maintain a Duty of Care from point of generation to point of final disposal.
- Minimise risk to staff, patients, public and contracted staff from exposure to hazardous or potentially hazardous waste.

3.6.3 *Scope and Purpose*

It covers all the health care waste management related activities with the hospital. Procedures relating to specific areas of health care waste management (Health, Safety & Risk Management, Infection prevention & control etc) will be drawn upon and referenced.

This health care waste management system relates to all suppliers, contractor and sub-contractors who have specific roles to play in the management of the hospital's waste.

The purpose of this management system is to guide the management of health care waste at the hospital in a manner that does not expose staff, patients and the general public to health hazards.

3.6.4 *Statutory Framework and Best Practice Guidance*

Satisfactory implementation of this management system will assist the hospital in complying with the following statutory requirements:

- NEMA Health Care Waste Management Guidelines;
- Occupational Safety & Health Act, 2007;
- Public Health Act, 2012;
- Environmental Management & Coordination (Waste Management) Regulations, 2006.

International Best Practice Guidance

- WBG Environmental, Health & Safety Guidelines for Waste Management Facilities.
- WBG Environmental, Health & Safety General Guidelines.
- International Solid Waste Association (ISWA) Guidelines on Training Strategies for Health Care Waste Management.
- Basel Convention: Technical Guidelines on the Environmentally Sound Management of Biomedical and Health Care Wastes.

3.6.5 *Key Principles guiding this health care waste management system*

- Waste Assessment: assess all waste prior to collection for disposal. Identification criteria include quantity, risk/hazard properties and its classification.
- Waste Segregation: segregate waste at source and in some instance transport separately.
- Waste Recycling: implement waste recycling in line with waste regulation and where reasonably practicable.
- Waste Handling & Storage: formalised risk assessment will determine methods of safe handling and appropriate storage. Principles to be adopted include minimizing manual handling, ensuring no cross contamination of wastes and secure storage of wastes and ensuring hazards of all kinds are eliminated where appropriate and reasonably practicable.
- Waste Collection & Duty of Care: duty of care of all external waste contractors will be ensured through audit by the designated person.
- Contingency Planning: the hospital will put in place contingency arrangements to mitigate against planned or unplanned absence of personnel to manage health care waste, spillages, missed waste collection or equipment failure.

3.6.6 *Organisational Accountability/Responsibilities*

Administrator of the Hospital

- Designate a waste management officer or committee to develop a written waste management plan (WMP) for the hospital.
- Allocate sufficient resources (financial and personnel resources) to ensure efficient operation of WMP.
- Ensure adequate training for key personnel and designate staff responsible for coordinating and implementation of health care waste management.
- Establish good working relationship with other hospitals through proper referral, consultation and cooperation on matters health care waste management.

Housekeeping Services

- Maintain cleanliness and orderliness of the hospital.
- Assist in the preparation of waste management plan.
- Maintain records of cleaning undertaken.

- Maintain good working relationship with all hospital staff for their support and participation in implementing housekeeping services.

Maintenance and Ground Services

- Assist in the proper collection, pre-treatment and disposal of health care waste.
- Attend immediately to problems arising from the repair and installation of waste equipment.
- Carry out the operation and maintenance of drainage system and plumbing facilities at the hospital.

Waste Management Officer (WMO)

Responsible for day-to-day operations and monitoring of the waste management system. WMO reports to the hospital administrator. Working in collaboration with the Department Heads, Chief Pharmacist, Senior Nursing Officer, Supply Officer, familiarise with the correct procedures for handling and disposal of pathological, chemical and pharmaceutical waste. The responsibilities of WMO includes among others:

- Ensuring the internal collection of waste, availability of waste bags, protective clothing and collection carts and directly supervising the collection crew.
- Liaise with Department Heads to staff are aware of their responsibilities for segregation and waste storage.
- Ensure correct use of storage facilities i.e. should be kept locked but is accessible to authorized staff at all times.
- Ensure written emergency procedures are in place and staff are aware of the actions to be taken in the event of an emergency.
- Investigate and review reported incidents concerning handling of health care waste.

Department Head

Responsible for segregation, storage and disposal of waste from their departments. Among their responsibilities are:

- Ensure all doctors, nurses and clinical and non-clinical professional staff in their department are aware of the segregation and storage procedure and that all personnel comply with the highest standards in health care waste management.
- Encourage medical and nursing staff to be vigilant so as to ensure correct procedures are followed all the times.
- Liaise with WMO to monitor working practises against failures and mistakes.
- Ensure that key staff in the departments are trained in waste segregation and disposal procedures.

Hospital Engineer

- Responsible for installation and maintaining waste storage facilities and handling equipment.
- Accountable for the adequate operation and maintenance of on-site waste facilities.
- Ensures staff involved in waste treatment receive training on the principles of waste disposal, operation and maintenance and are aware of their responsibilities.

Supply Officer

Liaise with waste management officer to ensure a continuous supply of items required for waste management such as plastic bags and containers of the right quality and investigate the possibility of purchasing environmentally friendly products (e.g. PVC-free plastic items).

Chief Pharmacist

Responsible for sound management of pharmaceutical storage and pharmaceutical waste minimization. Other duties include:

- Develop appropriate procedures for pharmaceutical waste disposal.
- Coordinate continuous monitoring of procedures for the disposal of pharmaceutical waste.

- Ensure personnel involved in the pharmaceutical waste handling and disposal receive adequate training.

Radiation Officer

- Ensure personnel involved in radiation waste handling and disposal receive adequate training.
- Continuously monitoring of procedures for the disposal of radiation waste.
- Liaise with

Senior Nursing Officer

Responsible for training nursing staff, medical assistant, hospital attendants and ancillary staff in the correct procedure for segregation and storage. Other duties include:

- Liaising with the Department Heads to ensure coordination of training activities and other waste management activities specific to particular departments.
- Participate in staff introduction to, and continuous training in, and disposal of waste.
- Liaise with Department Heads to maintain the highest standards in health care waste management.

3.6.7 Health Care Waste Management Plan

A comprehensive health care waste management plan is the key ingredient to a successful waste management within the hospital. The plan should be understood or followed to be a great addition to the hospital. Training of staff to ensure familiarity and understanding of the plan is critical to the successful implementation of the plan and effective handling of the health care waste.

Procedure for Developing the Health Care Waste Management Plan

- Step 1** Review the existing government policies, laws and regulations related to health care waste management.

- Step 2** Review the hospital's current Health Care Waste Management System before drafting a health care waste management plan. Issues that need to be addressed are:
- Where waste is generated;
 - Type of health care waste generated;
 - How is waste stored and where it is stored;
 - Cost effectiveness of current handling processes.
- Step 3** Design the Plan considering it must address the existing and future needs of the hospital and capable of handling current waste streams.
- Step 4** Comprehensive training and orientation on how the plan is to be implemented. In implementing the plan, each staff should know their individual role.
- Step 5** The plan should be regularly reviewed and updated to reflect the improvements made in the management of health care waste within the hospital.

Health Care Waste Management Plan Implementation

The overall responsibility for the implementation of the health care waste management plan is the Administrator of the hospital. The implementation of the plan will involve the following activities;

- Organize and supervise training program for all staff. Key staff such as medical staff should be urged to be vigilant in monitoring the performance of waste disposal duties of non-medical staff.
- Hospital Administrator should appoint personnel responsible for waste management. Notice of this appointment should be circulated and updates issued when changes occur.
- Failure in the waste handling, segregation, storage, transport and disposal or waste management incident that result in injury must be reported immediately to the WMO.
- Feedback or report on violations and non-compliance to the WMO.

- Review the plan annually and initiate changes to upgrade the system. Interim revisions may also be made if and when necessary.
- The Hospital Administrator should prepare annual report for the disposal of health care waste providing data on waste generation, disposal requirements and the costs.

3.6.8 *Health care wastes*

“Health care waste” includes all the waste that is generated or produced as a result of any of the following activities:

- Diagnosis, treatment or immunization of patients;
- Research pertaining to the above activities; and
- Production or testing of biologicals.

Categories of Health Care Waste

General Waste: comparable to household waste, this type of waste does not pose special handling problem or hazard to human health or environment. It comes from the administrative and housekeeping functions of the hospital and may include waste generated from maintenance of the hospital. It is generally dealt with by municipal waste disposal system.

Infectious Waste: suspected of containing pathogens in sufficient quantity to cause diseases, and includes cultures and stock of infectious agents from the laboratory, wastes from surgery and autopsies on patients with infectious diseases, waste from infected patients in isolated wards etc.

Pathological Waste: consists of tissues, organs, body parts, human foetus, blood and body fluids. Recognizable human body parts are called anatomical waste.

Sharps: includes needle, syringes, scalpels, blades, broken glasses, infusion sets and any other items that can cause a cut or puncture wounds.

Pharmaceuticals Waste: includes expired, unused, split and contaminated pharmaceutical products, drugs, vaccines and sera that are no longer required and need to be disposed of appropriately.

Genotoxic Waste: includes certain cytostatic drugs, vomit, or faeces from patients treated with cytostatic drugs, chemicals and radioactive materials.

Chemical Waste: consist of discarded solid, liquid and gaseous chemicals e.g. cleaning, housekeeping and disinfection procedures. Non-hazardous chemical wastes include sugars, amino acids, organic and inorganic salts.

Radioactive Waste: included disused sealed radiation sources, liquids and gaseous materials contaminated with radioactivity, excreta of patients who have underwent radionuclide, diagnostic and therapeutic application, paper cups, straws, needles, and syringes etc.

Pressurized containers: many types of gases used at the hospital are often stored in pressurized cylinders, cartridges, and aerosol cans.

Sources and composition

Activities and processes that generate or produce health care waste include but not limited to health care service provider. The composition of waste depends on the source e.g. different units within the hospital would generate waste with characteristics such as medical ward (mostly general waste and limited quantities of infectious waste), operating theatre and surgical wards (general waste, pathological and anatomical waste), laboratories (general waste, chemical and pathological waste) and pharmaceutical and chemical store (general waste and small quantities of pharmaceutical and chemical waste).

3.6.9 Waste Handling, Collection, Storage & Transport

Waste Segregation & Storage

Segregation is the process of separating different types of waste at the point of generation and keeping them isolated from one another. Segregation at source should be the responsibility of the waste producer. Hazardous wastes should be placed in clearly marked containers that are appropriately labelled for the type and weight of the waste. Except for sharps and fluids, hazardous wastes are generally put in plastic bags, plastic lined cardboard boxes or leaked proofed containers the meet local regulation requirements.

Colour Coding Scheme for Health Care Waste

The most appropriate way of identifying the categories of health care waste is by sorting the waste into colour-coded bags or containers. Recommended colour-coding scheme for health care waste is shown in the table below.

Table 3.6.1 – Color-coding Scheme for Containers

COLOUR OF CONTAINER/BAG	TYPE OF WASTE
Black	Non-infectious dry waste
Green	Non-infectious wet waste (kitchen, dietary etc)
Yellow	Infectious and pathological waste
Yellow with black band	Chemical waste including those with heavy metals
Orange	Radioactive waste
Red	Sharps and pressurized containers

Apart from the colour-coding scheme for health care waste, the following practices should also be observed:

- Bags and containers for infectious wastes should be marked with the international infectious symbol.
- Sharps should be collected together regardless of whether or not they are contaminated. Containers should be puncture proof (usually made of metal or high-density plastic) and fitted with covers. It should be rigid and impermeable to contain not only the sharps bit also any residual liquid from syringes. To discourage abuse, containers should be tamper-proof, and needles and syringes should be rendered unusable.
- Aerosol containers may be collected with general health care waste once they are completely empty and should not be burnt or incinerated.
- Appropriate containers or bags holders should be placed in all location where particular categories of waste is generated.
- Residuals of general health care waste should join the stream of domestic refuse or municipal solid waste for proper disposal.
- Cultural and religious constraints make it unacceptable for anatomical waste to be collected in the usual yellow bags. Such waste should be disposed of in accordance with the local customs which commonly specify burial.



Storage

All health care waste should be collected and stored in waste storage area until transported to a designated off-site treatment facility. This area should be marked with warning sign: "CAUTION: BIOHAZARDOUS WASTE STORAGE AREA – UNAUTHORIZED PERSONS KEEP OUT."

Storage area should be located within the hospital and located away from patient rooms, laboratories, operations rooms and any public access area. Requirements for storage facilities are:

- There should be water supply for cleaning purposes;
- Should have impermeable hard-standing floor with good drainage, easy to clean and disinfect;
- Should have good lighting and adequate ventilation;
- Should be inaccessible to animals, insects and birds;
- Easily accessed by waste collection vehicles;
- Should be possible to lock to prevent access by unauthorized persons;
- Easily accessible to staff in charge of handling waste;
- Should be protected from the sun, rain, strong wind and floods;
- Should not be situated in the proximity of fresh food store or food preparation area;
- Floors, walls and ceilings of the storage area must be kept clean in accordance with established procedures which at a minimum should include daily cleaning of floors;
- Biodegradable general and hazardous waste should not be stored longer than 2 days to minimize microbial growth, putrefaction and odours. If the waste must be stored longer than 2 days, application of treatment like chemical disinfection or refrigeration at 4°C or lower is recommended.

Collection and Transport

Suggested collection frequency on room to room is once every shift or as often as necessary. Time of collection regardless of category should be at the start of every shift.

For on-site collection, waste should not be allowed to accumulate, a program for collection and transportation should be established as part of health care waste

management plan. Nursing and other clinical staff should ensure that waste bags are tightly closed or sealed when they are about three-quarters full. Light-gauge bags can be closed by tying the neck, but heavier gauge bags probably require plastic sealing tag of self-locking type. Bags should not be closed by stapling. Sealed sharps containers should not be placed in a labelled, yellow infectious health care waste bag.

The following recommendation should be followed by health care personnel involved in waste handling and collection:

- No bags should be removed unless they are labelled with their point of production (ward or department) and content;
- Bags or container should be replaced immediately with new ones of the same type;
- Collection practice for active solid radioactive waste shall consist of distributing orange colour-coded suitable containers with the radiation symbol coloured magenta or black. Handling, collection, transport and disposal of these materials shall be based on guidelines provided by the Ministry of Health;
- Supply of fresh collection bags or containers should be readily available at all locations where waste is generated; and
- Waste should be collected daily (or as frequently required) and transported to designated central storage site or waste transfer station.

On-site Transport

On-site transport (waste transportation within the hospital) could utilise wheeled trolleys, containers or carts that are dedicated solely for the purpose. On-site transport should meet the following requirements:

- Easy to load and unload;
- Easy to clean; and
- No sharp edges that could damage waste bags or containers during loading and unloading.

All on-site collection vehicles should be cleaned and disinfected daily with an appropriate disinfectant like chlorine compounds, formaldehyde, phenolic compounds and acids.

Workers transporting waste should be equipped with appropriate personal protective equipment including heavy-duty gloves, coveralls, thick-soled boots and leg protectors.

Off-site Transportation of Health Care Waste

The hospital will be responsible for safe packaging and adequate labelling of waste to be transported off-site for treatment or disposal.

The hospital will be responsible for hiring a NEMA certified hazardous waste transporter and ensuring the waste is properly treated and disposed at an approved facility.

Tracking of waste should be done with the implementation of a health care waste manifest system.

Health Care Waste Manifest System

All health care waste transported to an approved off-site waste treatment facility should be transported by a NEMA certified transporter. The certified transporter will maintain a completed waste manifest of all health care waste taken from the hospital for disposal. Waste transporter must provide the hospital with a copy of the manifest form for the hospital's waste records. The transporter will also maintain a copy of the same.

The manifest form will include, but not limited to the following information:

- Name, address, telephone number and Transporter's NEMA Certificate Number;
- Type and quantity of waste generated;
- Name, address and telephone number of the hospital;
- Name, address, telephone number, Licenses and Signature of Authorized Representative of the Approved facility receiving the waste;
- Date when the waste is collected and date when the waste is received by the treatment facility.

The waste transporter should have the health care waste manifest form in the vehicle while transporting waste. The waste tracking document should be available upon demand by traffic police. The transporter will provide the facility receiving the waste with a copy of the original tracking document.

Collection vehicles used for the transport of health care waste should not be used for the transportation of any other materials that could be seriously affected by contamination such as food, livestock, people or retail goods. It should be enclosed and not leak.

Routing

Quickest or shortest possible route is recommended and should be planned before the trip begins. After departure from the source, every effort should be made to avoid further handling. An effective and efficient collection system should consider the following;

- Collection scheduled either by route or zone;
- Logical planning of the route (should avoid passing the collected package of waste on congested area);
- Collection system route must be laid out from the furthest point of the designate transfer station and as collection progresses towards the collection storage area;
- Route drawn should be practicable and must consider the logical progression of health care waste throughout the area; and
- Revised routing plan should be established due to circumstances arising to alteration in the original plan.

Health Care Waste Treatment & Disposal

The following criteria should be considered when selecting an on-site or off-site treatment technology for health care waste:

- Treatment efficiency;
- Volume and mass reduction;
- Regulatory requirements;
- Training requirement for operations of the technology;
- Social and political acceptability;
- Operation and maintenance considerations;
- Locally available treatment option for final disposal;
- Occupational health, safety and environmental considerations; and
- Location/surrounding of the treatment site and disposal facility.

Incineration is the method of choice in treating health care waste. Other most common technologies and processes used in health care waste treatment are; thermal (pyrolysis, autoclave, microwave), chemical, irradiation, biological processes, encapsulation and inertization.

Waste disposal systems commonly used for health care waste disposal include:

- Sanitary Landfill: engineered method to keep waste isolated from the environment. Appropriate engineering preparation should be completed before the site is allowed to accept waste. Trained staff should be present to control operations, organize deposits and daily coverage of waste.
- Safe burial on hospital premises: in remote location within the hospital premises may be the only viable option available at the time. However, certain rules need to be established for the proper health care waste management.
- Septic/Concrete Vault: suitable for the disposal of sharps and syringes.

3.6.10 Health and Safety Practices

Safe Work Procedures

Conduct a comprehensive risk assessment of all activities in health care waste management and design safe work procedure that focus on the prevention of workers exposure or at least exposure within safe limits. Train all the personnel involved on these procedures.

Personal Protective Equipment

The following personal protective equipment will be made available to all health care personnel who collect and handle health care waste:

- Hard hats with or without visor depending on the nature of operations;
- Face masks;
- Eye protectors or safety goggles;
- Overall (coveralls);
- Industrial aprons;
- Industrial shoes or boots;

- Disposable gloves or heavy-duty gloves; and
- Respirators filters depending on the nature of operation.

Personal Hygiene

Washing facilities with soap and clean water should made available to personnel.

Response to Injury and Exposure

All staff handling health care waste will be trained on how to deal with exposure and injury. The hospital operator will develop a procedure prescribing actions to be taken in the event of an injury or exposure to hazardous substance. Essential elements of the procedure should include the following:

- Immediate first aid measure such as cleansing the wound and skin;
- Immediate report of the incident to a designated person;
- Recording of the incident;
- Blood or other tests if needed;
- Additional medical attention as soon as possible if indicated;
- Investigation of the incident and identification and implementation of remedial actions to prevent recurrence of similar incident in the future;
- Medical surveillance.

3.6.11 Emergency Response

Spill Control

The following general guidelines should be followed in case of a spillage:

- Vacate and secure the area to prevent further exposure of other individuals;
- Provide first aid and medical care for injured persons;
- Inform designated person who should coordinate the necessary actions;
- Determine the nature of the spill;
- Provide adequate protective clothing to personnel involved in the clean-up;
- Limit the spread of spill;
- Vacate all people not involved in the clean-up if the spillage involves particularly hazardous substances;

- Neutralize or disinfect the spilled or contaminated material if indicated;
- Collect all spilled and contaminated materials (sharps should never be picked by hand. Brushes and pans should be used). Spilled materials and disposable contaminated items for cleaning should be placed in the appropriate waste bags or containers.
- Decontaminate or disinfect any tools that was used.
- Seek medical attention if exposure to hazardous material has occurred during the operations.

Reporting Accidents and Incidents

Accidents or incidents including near-misses, spillages, damaged containers, inappropriate segregation and any incidents involving sharps should be reported to the hospital waster management coordinator. The report should detail the following information:

- Nature of the accident or incident;
- Place and time of the accident or incident;
- Staff directly involved; and
- Any relevant information or circumstances.

Possible actions should be taken to prevent recurrence after investigation including root cause analysis. Records of investigation and subsequent corrective actions should be maintained.

3.6.12 Communication and Training

Public education plays an important role in health care waste management. Key objectives of public education are to inform the public about the risk associated with health care waste focusing on neighbouring residents or those working in close proximity to or visiting the hospital. In communicating the hazards of health care waste to the public, the following methods will be considered:

- Information, Education and Communication (IEC) campaign materials; and
- Information poster exhibitions at the hospital, at strategic points such as waste bin location providing instruction on waste segregation.

The overall aim of training health care personnel is to develop awareness on the health, safety and environmental issues relating to health care waste and how these can affect their daily work. Training should highlight the roles and responsibilities of the health care personnel in the overall management program.

Separate training activities should be designed for the following targeted categories of personnel:

- Hospital managers and administrative staff responsible for implementing regulation on health care waste management.
- Medical doctors;
- Nurses; and
- Cleaners and waste handlers.

3.6.1.1. Training Package for each Target Group

For Personnel Providing Health Care

The training course should provide an overview of waste management policy, information on practices relevant to the trainees' responsibilities. basic principles and practical application of segregation, potential serious health hazards/risks of waste mismanagement to waste handlers and patients and an overview of the fate of after collection and removal from wards.

For Waste Handlers

Topics to be covered may include the waste management policy, health hazards, safety practices and emergency response. Period refresher training should be held to increase awareness on the need for safety.

For Health Care Waste Management Operators

Training course should include:

- Information on the risk risks related with the handling of health care waste;
- Procedures for dealing with spillages and other accidents; and
- Correct use of protective clothing.

For Staff who Transport the Waste

IN carrying out the responsibility of waste transportation, the driver and waste handler should be aware of the nature and risk of waste transported. Transport staff should be able to carry out all procedures for handling, loading and unloading of waste bags and containers, dealing with spillages or accidents, use of Personal Protective Equipment (PPE) and documentation and recording of health care waste e.g. waste manifest.

ANNEX - PHOTOLOG



Photo 1: Mugumo tree (*Ficus natalensis*) was present on site



Photo 2: Bamboo thicket with weaverbird nests.



Photo 3: Vegetation around demolished structure.



Photo 4: Abandoned swimming pools.

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