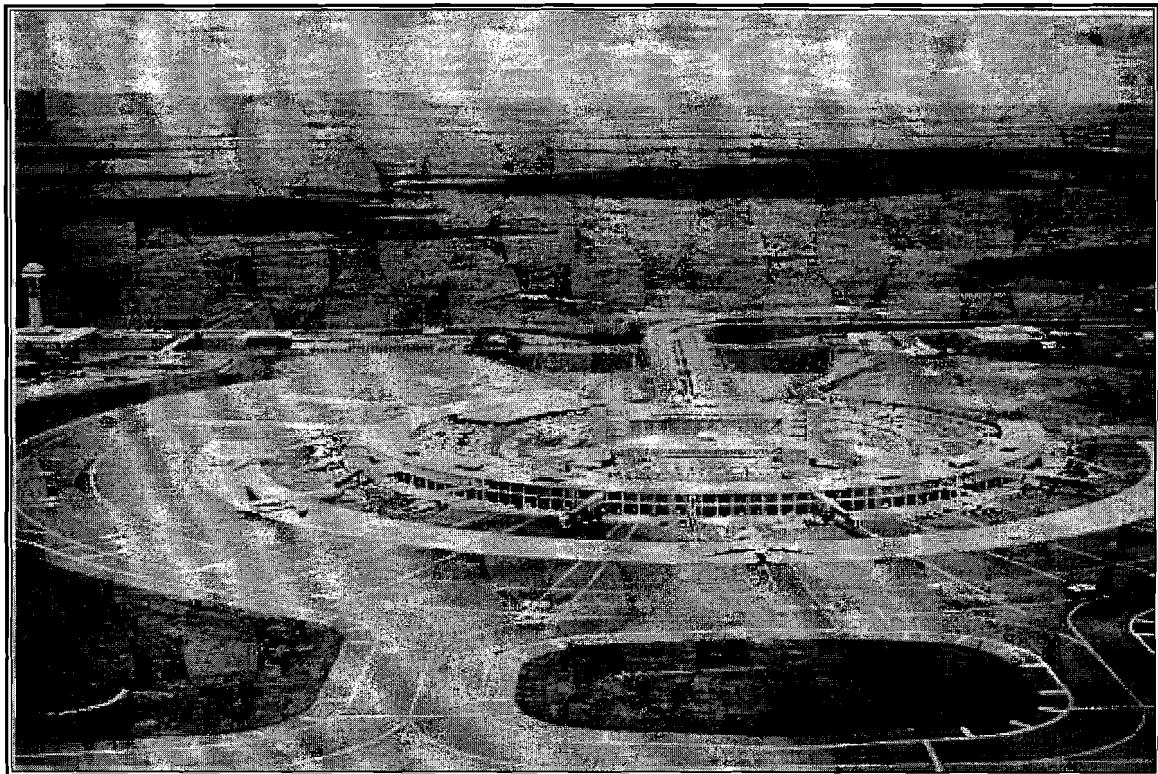


**JOMO KENYATTA INTERNATIONAL  
AIRPORT**

**ENVIRONMENTAL IMPACT ASSESSMENT  
PROJECT REPORT**

**E843**  
VOL. 9



**JK1304**

**AUGUST 2006**

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## EXECUTIVE SUMMARY

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Jomo Kenyatta International Airport (JKIA) is located approximately 13km to the east of the Nairobi Central Business District and is managed by the Kenya Airports Authority.

The area of land within the current operational boundary of JKIA covers 50,000m<sup>2</sup>. The airport was constructed in 1975 and was designed to accommodate 2.5 million passengers per year. Current traffic is 3.5 million passengers per year.

The complete traffic forecasts for JKIA were prepared in 1993 by **Sofreavia** and updated by the Belgian Airport Consultants in 2001. Based on the various calculations of planning peak hour traffic, the nominal schedules and **JKIA's** potential as a hub, it was **recommended** that:

The terminal and apron be designed, developed and operated to handle in 2014:

- 1100 arriving international passengers in the planning peak hour;
- 970 departing international passengers in the planning peak hour;
- 175 arriving domestic passengers in the planning peak hour;
- 200 departing domestic passengers in the planning peak hour.

and, in 2024:

- 1280 arriving international passengers in the planning peak hour;
- 1250 departing international passengers in the planning peak hour;
- 230 arriving domestic passengers in the planning peak hour;
- 235 departing domestic passengers in the planning peak hour.

Forecasts carried out by the Government and historic trends identify that future passenger growth at JKIA is such that expansion and modification of the existing infrastructure and facilities and increase in the air traffic movements is required. This expansion is supported through the **National Airports Masterplan Final Report prepared in 1993**.

The Government's approach to airport expansion is to follow a balanced approach which:

- **Recognises** the importance of air travel to national and regional economic prosperity, and that not providing additional capacity where it is needed would significantly damage the economy and national prosperity;
- Reflects people's desire to travel further and more often by air, and to take advantage of the affordability of air travel and the opportunities it brings;
- Seeks to reduce and minimise the impacts of airports on those who live nearby, and the natural environment;
- Ensures that, over time, aviation pays the external costs its activities impose on society at large;
- Minimises the need for airport development in new locations by making best use of existing capacity where possible;
- **Respect** the rights and interests of those affected by airport development, and
- Provides greater certainty for all concerned in the planning of future airport capacity, but at the same time is sufficiently flexible to recognise and adapt to the uncertainties in long term planning.

Assessment of alternatives has been addressed by the **Terminal Master plan, Design, and Construction Final Report volume 1-report prepared by Queen's Quay Architects International -2005**.

Key issues in the design considerations include:

- Separating departing and arriving passengers;
- Increase in the capacity of the terminal.

Four options were developed. Option 1 and 2 were developed with the premise of investigating different viable options for the airport expansion. Option 3 was then designed to take the best elements of **the** first two options to **form** a hybrid scheme.

**GIBB Africa Ltd** has prepared **this** Project Report to fulfil the legal **requirements** outlined in Section 58 to 69 of the Environmental Management and Coordination Act (EMCA) and Part **I** and **II** of the Environmental Impact Assessment and Audit Regulations. The Project Report is based on document review, field trips and discussions with the Project Architects.

The proposed project will have **positive** impacts as discussed below:

#### Enhanced airport **security**

Re-development of the primary check-in will ensure that only travelling public is allowed through a primary security check at the entrance of each terminal and after obtaining **the** boarding passes in the **Departures** Lobby, passengers proceed through a secondary **security** check as well as immigration counters for International Travellers, thus enhancing security.

#### Increased **air** traffic movements

The existing **runway** does not have sufficient capacity for the number of aircraft movements anticipated by 2014. The proposed development makes provision for construction of new **taxiways** at the eastern end of the runway in order to prevent aircraft waiting to get onto the runway, thus increasing air traffic movements.

#### Increased car parking facility

The proposed development has a provision for car parking which will increase the number of vehicles allowed at the airport.

#### Modification of **the** existing infrastructure and **facilities**

The proposed project design will contribute to improving existing infrastructure and facilities and the comfort of airport users in several ways as detailed in chapter 2 sections 2.4.

#### Visual enhancement **of** the environment

The development is proposed on previously developed land in areas already **characterised** by airport facilities, functions and infrastructure. The proposed development includes plan to landscape the developed areas using indigenous trees and lawns. This will bring about long term changes to landscape character by reconfiguration of features and elements **within** the existing boundary.

#### Improved local socio-economy

JKIA is the largest international airport in East Africa and the proposed expansion **will** contribute to the development of businesses, both local and **international** due to:

- Increased accessibility to the area could increase the number of tourists and tourism spending which will improve economy;
- Increase efficiency in air transport thus **promoting** trade;
- increased accessibility of the area could help to encourage investment and trade benefiting the local economy.

#### Creation of **employment opportunities**

Construction and development projects world-wide create employment opportunities for all cadres of staff **directly** or **indirectly** linked to the project. The proposed project, during construction will **directly** employ as a minimum, the following groups:

- Supervising engineering learn;
- Contractor staff (managerial, skilled and **unskilled** labour force);
- Suppliers of plant, machinery, materials and essential services;
- Construction **monitoring personnel** from the various government agencies.

Wherever possible, the Contractor shall use **local** labour, and women must be encouraged.

From the project assessment, the following measures are recommended to mitigate the identified potential adverse impacts:

Anticipated impact	Recommended mitigation measure
Vegetation loss:	<ul style="list-style-type: none"> <li>• The clearance of the site for construction purposes shall be kept to a minimum.</li> <li>• The Contractor shall clearly mark out the extent of clearing within the approved work-site.</li> <li>• Instruct all construction workers to restrict clearing to the <b>marked</b> areas and not to work outside defined work areas;</li> <li>• Landscaping of <b>the</b> site.</li> </ul>
Increase in mortality through bird strike.	<ul style="list-style-type: none"> <li>• KAA should increase proportionately the intensity of its bird <b>scaring</b> activities and maintain its management of <b>grassland</b> to <b>minimise</b> the risk of bird strike.</li> </ul>
Erosion control:	<ul style="list-style-type: none"> <li>• Earthworks should be controlled <b>so that land that</b> is not required for <b>the</b> construction works is not disturbed. Wherever possible, earthworks should be carried out during the dry season to prevent soil from being washed away by the rain.</li> <li>• Excavated materials and excess earth will be kept at appropriate sites approved by the supervising engineer and the earth dumping sites designed in such a manner as to facilitate natural water discharge;</li> <li>• The Contractor shall protect areas susceptible to erosion by installing necessary temporary and permanent drainage <b>works</b> as soon as possible.</li> </ul>
Air and noise pollution.	<p>The Contractor shall be responsible for the control of air emissions and dust arising from his <b>operations</b> and activities and shall ensure the <b>following</b>:</p> <ul style="list-style-type: none"> <li>• Noise level is within acceptable limits and construction <b>activities</b> shall, where <b>possible</b>, be confined to normal working hours;</li> <li>• Noise sensitive areas like offices shall be notified at <b>least</b> 5 days before construction is commenced;</li> <li>• Workers are trained on management of <b>air pollution</b> from vehicles and machinery and dust minimisation techniques;</li> <li>• All construction machinery are maintained and serviced in accordance with the <b>contractor's</b> specifications;</li> <li>• Asphalt plants and concrete <b>batching</b> plants are well seated and equipped with a dust removal <b>device</b>;</li> <li>• Dust generating activities (excavation, <b>handling</b> and transport of soils) are not carried out during times of strong winds.</li> <li>• Water is applied whenever dust emissions are visible at <b>the site</b> in <b>the</b> opinion of the opinion of the Resident Engineer;</li> <li>• Vehicles delivering <b>soil</b> materials are covered to reduce <b>spills</b> and windblown dust;</li> <li>• Vehicle speeds are <b>limited</b> to <b>minimise</b> the generation of dust on site and on diversion and access roads;</li> <li>• <b>During</b> operation phase of the airport, air and noise quality assessment should be undertaken to establish ambient <b>conditions</b> and whether any potential <b>effects</b> arising from additional air <b>traffic</b> emissions would be <b>significant</b>.</li> </ul>

Anticipated impact	Recommended mitigation measure
Water and <b>soil</b> contamination  4	<ul style="list-style-type: none"> <li>Construct oil-water interceptors or sumps to capture discharge of oils, fats and other polluting liquids from maintenance workshops, vehicle and equipment washing bays and kitchen <b>drains</b>;</li> <li>A safety and emergency response plan to be developed for all operations with emphasis on the protection of the environment prior to start up by the contractor;</li> <li>No grey water runoff or uncontrolled discharges from the <b>site/working</b> areas (including <b>washdown</b> areas) shall be permitted;</li> <li>Water containing pollutants such as cements, concrete, lime, chemicals and fuels shall be discharged into a conservancy tank for removal from site;</li> <li>Potential pollutants of any kind and in any form shall be kept, stored and used in such a manner that any escape can be <b>contained</b> and <b>the</b> water table not endangered;</li> <li>Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas (including groundwater) are not polluted;</li> <li>The Contractor shall take reasonable measures to control stormwater and the erosive effects;</li> <li>No construction <b>materials</b> shall be stockpiled within areas <b>that</b> are at risk of flooding; <b>Plastic</b> sheeting, sandbags or <b>geofabric</b> approved by the .RE shall be used to prevent <b>the</b> migration of fines.</li> </ul>
<b>Public health</b> and <b>occupational health</b> and <b>safety</b>	<ul style="list-style-type: none"> <li>Implement measures to <b>minimise</b> waste and develop a waste management plan.</li> <li>Develop a site safety <b>action</b> plan detailing safety equipment to be used, emergency procedures, restrictions on site, frequency and personnel responsible for safety inspections and controls.</li> <li>Daily site <b>inspections</b> should be done to ensure safe work practises are adhered to;</li> <li><b>All</b> workmen should be provided <b>with</b> personal <b>protective equipment</b>;</li> <li>The Conditions of Construction in the tender <b>documents</b> should stipulate health, safety and environment regulations and work procedures;</li> <li>The Contractor must appoint a foreman with knowledge on health, safety and environment regulations;</li> <li>All injuries that occur <b>on site</b> must be recorded in the accident registers and corrective actions for <b>their</b> prevention be instigated as appropriate (Section 62 of the Factories and Other Places of Work Act);</li> <li>Site personnel should be encouraged to report "near-miss incidents" in order to <b>avoid</b> potential problems and <b>increase</b> safety awareness;</li> <li><b>Statistical</b> records on accidents and incidents should be <b>collated</b> and <b>analysed</b> on a monthly basis and forwarded to the <b>Supervising</b> Consultant and / or displayed on <b>the</b> notice boards.</li> </ul>
<b>Rehabilitation</b> of material sites	<ul style="list-style-type: none"> <li>The Contractor should cordon off the quarry and borrow areas and maintain fences and "make good" of the site afterwards;</li> <li>The Contractor <b>should rehabilitate</b> the sites after completion and grading as per <b>KAA Environmental Scientist</b> preferable rehabilitation options.</li> </ul>
<b>Traffic</b> Management	<ul style="list-style-type: none"> <li>The Contractor should plan and implement traffic management programme on daily <b>basis</b>;</li> <li>Comply with all applicable legislation and by-laws with regard to road safety <b>and</b> transport.</li> </ul>
<b>Archaeological findings</b>	<ul style="list-style-type: none"> <li>The Contractor <b>should</b> secure the location 'as is' and immediately call the National Museums of Kenya's Archaeology Section.</li> </ul>
<b>Hazardous materials spill response:</b>	An effective <b>and efficient</b> hazardous material spill emergency <b>plan</b> is necessary to <b>minimise</b> any detrimental effects to the effects to <b>the</b> environment and human health.



Anticipated impact	Recommended mitigation measure
<b>Water utilisation:</b>	<ul style="list-style-type: none"> <li>• The Contractor monitor water consumption and utilisation;</li> <li>• The Contractor should <b>sensitise construction</b> workers on the importance of proper water management.</li> </ul>
<b>Additional demand for electricity supply:</b>	<ul style="list-style-type: none"> <li>• Develop an energy management plan.</li> </ul>
<b>Energy utilisation:</b>	<ul style="list-style-type: none"> <li>• Develop an energy management plan;</li> <li>• Construction machinery and vehicles should be <b>maintained</b> and used in accordance with manufacturer's specifications, to <b>maximise efficiency</b> and lower <b>use</b> of energy;</li> <li>• <b>Construction</b> workers should be <b>sensitised on the importance of</b> energy management.</li> </ul>
<b>Increased wastewater (sewage):</b>	<ul style="list-style-type: none"> <li>• Maintenance of constructed sewer and wastewater <b>handling systems</b>.</li> </ul>
<b>Production of waste:</b>	<ul style="list-style-type: none"> <li>• Develop a <b>solid waste management</b> plan prior to <b>project</b> commencing, identifying optimal waste re-use options and disposal areas; <ul style="list-style-type: none"> <li>▪ Waste should <b>not</b> be burned on <b>site</b> or dumped in <b>undesignated</b> waste disposal areas;</li> </ul> </li> <li>• <b>Minimise</b> waste production by <b>utilising</b> best available techniques for <b>site</b> preparation;</li> <li>• <b>Re-use</b> construction waste to the maximum <b>extent possible</b>;</li> <li>• Proper handling and storage procedures for hazardous wastes <b>e.g. fuel</b> oil should be stored in areas with hard <b>standing</b> and <b>containment</b> to handle spills.</li> </ul>

Construction at the site will be **on-going** for an approximate period of 36 months at a **cost** of USD. **25million**. Overall no adverse environmental impacts are foreseen that cannot **be** mitigated. A close down environmental audit should be undertaken upon completion of the Project to corroborate implementation of proposed **mitigation** measures.

NEMA approval can be issued on the basis of this report.

# 1 INTRODUCTION

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## 1.1 Background

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GIBB Africa Ltd has been **commissioned by** Queen's Quay Architects International to prepare an **Environmental Impact Assessment Project Report** for the expansions of Jomo Kenyatta International Airport, (JKIA) In Nairobi. The **Project Report** is to be submitted to the National **Environment Management Authority (NEMA)**.

The **JKIA** is East Africa's largest **airport** and was opened by the Government of Kenya in 1975, and operations began in 1978.

This Project Report has been prepared to provide sufficient and relevant information on the proposed project to enable the National Environment Management Authority (NEMA) establish whether the activities of the project **are** likely to have significant adverse environmental impacts. If the negative impacts are adequately addressed by mitigation measures, this Report can form a **basis** for the issuance of an Environmental Impact Assessment (EIA) Licence.

This Report documents the **findings** of an assessment and study of the proposed **project** site, project design and **environmental** concerns as relates to **airport** operations. Mitigation measures have been proposed for identified impacts and an environmental management plan for the implementation of the proposed measures has been presented.

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## 1.2 Objectives

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The objectives of the **Environmental** Impact Assessment (EIA) are:

- To fulfil the legal requirements as **outlined** in Section 58 to 69 of the Environmental Management and Co-ordination Act (EMCA) and Part **I** and **II** of the **EIA/Audit** Regulations;
  - To obtain background biophysical **information of** the site and legal and regulatory issues **associated with** the project;
  - To assess and predict the potential impacts during site preparation, construction and operational phases of the project;
  - To make suggestions of possible alterations to the proposed design, based on the assessment findings;
  - To propose mitigation measures for the **potential** significant adverse environmental impacts and safety risks;
  - To allow for **public participation**;
  - To lower project cost in the long term;
  - To prepare an Environmental Management and Mitigation Plan.
- 

## 1.3 Terms of reference

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The Terms of Reference for this assessment are based on the NEMA **Environmental Impact Assessment and Audit Regulations**, dated June **2003**. According to the Regulations, the Project Report should, where possible, **contain descriptions of** the following:

- *The location of the project including the physical area that may be affected by the project's activities;*
- *A summary description of the project;*

- A concise description of the national environmental legislative and regulatory framework, baseline information and any other relevant **information** related to the project;
- Objectives of the project;
- The technology, procedures and processes to **be** used in the implementation of the project;
- Materials to be used in the construction and implementation of the project;
- The activities that shall be undertaken during the **project** construction, operation and de-commissioning phases;
- Products, by-products and waste generated by the project;
- **Description of the potentially** affected environment;
- The environmental effect of the project, including the social and cultural effects and the direct, indirect, cumulative, **irreversible**, short-term and long-term **effects** anticipated;
- Alternative **technologies** and process available and reasons for preferring the chosen technology and **processes**
- Analysis of alternatives **including project site**, design and technologies and reasons for preferring the proposed site, design and technologies;
- An environmental management plan proposing the measures for eliminating, **minimising** or **mitigating adverse** impacts on the environment, including cost, time frame and responsibility to implement the measures;
- Provision of an Action Plan for the prevention and management of foreseeable accidents and hazardous **activities** in the cause of **carrying out activities** or major **industrial** and other development projects:
- Measures to prevent health hazards and to ensure **security in** the working environment for the employees and for **the** management of emergencies;
- An **identification** of gaps in the knowledge and uncertainties which were encountered in compiling the Information;
- The project budget;
- The design of the project;
- Any other **information** that **NEMA** may require.

---

## 14 Methodology

The procedure used in undertaking the **environmental** assessment included the following:

- A desk-study to **obtain** background biophysical **information** of the site and legal and associated regulatory issues;
- Interviews with the Consulting Architects;
- **Site** visits for visual assessment of the baseline conditions and public consultation;
- Assessment and prediction of potential Impacts during the site **preparation, construction** and operational phases of the project;
- Preparation of a Project Report. including the environmental management plan and **mitigation** measures.

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## 15 Registration

As required by Regulation 14 of the NEMA Regulations, GIBB Africa Ltd is registered by NEMA as a "Firm of Experts for Environmental Impact Assessment and Audit" and is therefore authorised to undertake the EIA study and submit a Project Report. See Appendix 1 for a copy of the registration certificate.

## 2 PROJECT DESCRIPTION

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### 2.1 Outline description of the proposed development site

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Jomo Kenyatta International Airport (JKIA) is located approximately **13km** to the east of the Nairobi Central Business District and is managed by the Kenya Airports Authority. The airport's main road access is through the Mombasa Road and Outer Ring Road. Bus connections from the city centre are provided at Ambassador Hotel Stage and through **various** bus stops within Jogoo Road, Outer Ring Road and Mombasa Road. There is no rail link to the airport.

The area of land within the current operational boundary of JKIA covers 50,000m<sup>2</sup>. The airport was constructed in 1975 and was designed to accommodate 25 **million** passengers per year. Current traffic is 3.5 million passengers per year.

The airport runway is aligned in an **east/west direction** and is approximately **4117m**. The majority of the airport facilities are located on the north side of the runway, with car parks and general aviation facilities located to the south. The airport facilities comprise:

- Passenger terminal building;
  - Runway and taxiway system;
  - Main passenger aircraft parking apron;
  - Short and long term car parks (the main long term car park is located to the south of the arrival passenger facilities, short term car park for pre-book customers is located along the departure terminals);
  - Air traffic control tower;
  - Administration and operational offices within the **terminal** building;
  - Ancillary facilities such as the fuel depots, flight catering, general aviation facilities, aircraft hangars and car hire.
- 

### 2.2 Background to the development

---

JKIA is East Africa's largest airport. The complete traffic forecasts for JKIA were prepared in 1993 by Sofreavia and updated by the Belgian Airport Consultants in **2001**. Based on **the** various calculations of planning peak hour traffic, **the nominal** schedules and **JKIA's** potential as a hub, it was recommended that:

The terminal and apron be designed, developed and operated to handle in 2014:

- **1100** arriving international passengers in the **planning** peak hour;
- 970 departing international passengers in the planning peak hour;
- **175** arriving domestic passengers in the **planning** peak hour;
- 200 departing domestic passengers in the planning peak hour.

and, in **2024**:

- 1280 **arriving** international passengers in the planning peak hour;
- 1250 **departing** international passengers in the planning peak hour;
- 230 arriving **domestic** passengers in the planning peak hour;
- 235 departing domestic passengers in the planning peak hour.

---

## 2.3 Reasons for the development

---

Forecasts carried out by the Government and historic trends identify that future passenger growth at JKIA is such that expansion and modification of the **existing** infrastructure and facilities and increase in the air traffic movements is required. This expansion is **supported** through the *National Airports Masterplan Final Report prepared in 1993*.

The Government's approach to airport expansion is to follow a balanced approach which:

- **Recognises** the importance of air travel to national and **regional** economic prosperity, and that not providing additional capacity where it is needed would significantly **damage** the economy and **national prosperity**;
- **Reflects** people's **desire** to **travel further** and **more** often by air, and to take advantage of the affordability of air travel and the opportunities it brings;
- Seeks to **reduce and** minimise the impacts of airports on those who live **nearby**, and the natural environment;
- Ensures that, over **time**, aviation **pays** the external costs its activities impose on society at large;
- Minimises the need for airport development in new locations by making best use of **existing** capacity where possible;
- Respect the rights and interests of those affected **by** airport development, and
- Provides greater certainty for all concerned in the planning of future airport capacity, but at the same time **is sufficiently** flexible to recognise and adapt to the uncertainties in long term planning.

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## 2.4 Design considerations

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Assessment of alternatives has been addressed **by** the *Terminal Master plan, Design, and Construction Final Report volume 1-report prepared by Queen's Quay Architects International -2005*.

Key issues in the design considerations include:

- Separating departing and arriving passengers;
- Increase in the **capacity** of the terminal.

Four options were developed. Option 1 and 2 were developed with the premise of investigating different viable options for the airport expansion. Option 3 was then designed to take the best elements of the first **two** options to **form** a hybrid scheme. The elements of various design components and stakeholder comments are in **Appendix 4**.

## 2.5 Description of the proposed development

### 2.5.1 Description of the development

The key elements of the proposed development are described in Table 2-1:

Table 2-1: Proposed development

Proposed development	Features
Walkways:	It is proposed that one ramp to the rooftop passageway is constructed for every 2 Gates.
Swing gates:	The swing gates will be developed along a tinger on two separate levels.
Passenger drop off:	The proposed development will ensure that the passengers are dropped off along a canopied island providing maximum separation from the Terminal Building.
Primary check-in:	The proposed development will ensure that only travelling public is allowed through a primary security check at the entrance of each terminal.
Ticket counters:	The proposed development will provide at each terminal the ticket counters as follows: T1 – 24, T2 – 24, T3 – 15 and T4 – 12.
Secondary Security check-in:	The proposed development will ensure that after obtaining the boarding passes in the Departures Lobby, passengers will proceed through a secondary security check as well as Emigration Counters for International Travellers.
Concessions retail:	Two new zones of Retail will be developed between T1 & T2 and T2 & T3 on Level 1. Food and Beverage areas and new stands will be provided in T4 and T3 as well.
Departure lounge:	The intent of removing the Retail areas currently in the Departures Lounge Ring to Centralised zones is to clear the Lounge areas for comfortable seating where passengers can relax before their flights. The situation will be further improved by the segregation of the Arriving Passengers to a walkway on Level 2.
Airline Lounge:	Several Airline Lounge areas will be created for Lease along the Ring Building on Level 1.
Gates:	New gates will be created along a Pier Building. Six of these Gates will operate as swing Gates available for both International and Domestic Flights. There will be 1 new dedicated Domestic Gate on the Pier Building as well as 2 Remote Domestic Gates for the Year 2014
Arrivals route:	Arriving International Passengers will be segregated from Departing Passengers. The arrivals walkway will be constructed on Level 2, the current roof level of the Ring Building up to the point where they will be brought down escalators to connect to the current bridges that lead to the Arrivals Building
Arrival bridge:	The 2 Arrivals Bridges will be refurbished with new glass cladding and new finishes.
Arrivals Immigration:	New facilities and finishes will be designed for Immigration and their associated functions. Current Airline Lounges will be relocated to the Departures Lounges.
Baggage Claim Hall:	New escalators will make it considerably easier to descend into the Baggage Claim Hall from the Immigration area. Skylights are proposed above the baggage claim devices to bring natural light into the space. The baggage claim raceways will be refurbished.
Customs:	The Customs area will be expanded to clearly define Red and Green routes. New counters and Customs offices will be provided.
Arrival Lobby:	New "acacia" tree canopies are proposed for the passenger Pickup curbs. The precast panels along the front face of the existing Arrivals Building will be removed to open up the building. Level 1 will be converted into a food court area where meters and greeters can linger.
Parking	4 Level plus Basement Parking Garage, approximately 60,000 sm. Exterior facades with row planters. An elevated Bridge will connect to the Arrivals Building.

## 2.5.2 Enabling works

### (a) Demolition of buildings

Demolitions will involve removal of:

- Masonry products;
- Concrete products;
- Roofing Material.

Recyclable products will be handled as such, including ceiling tiles, light fixtures, air-conditioning units and miscellaneous metal products.

### (b) Removal of panels

Precast concrete fins along the airside of the existing Terminal to be removed. Select Precast panels along the Landside of the Terminal, cladding for the Bridges to the Arrivals Building, along the front façade of the Arrivals Building will also be removed. Precast concrete vent block on the east and west of the Arrivals Building to be removed.

### (c) Asbestos Abatement

As apart of the construction work, identification of friable / non-friable asbestos and recommendation for removal will be carried out.

## 2.5.3 Construction programme and phasing

As apart of the engineering design work, a detailed programme for the development will be determined. Broadly this consists of phased but Inter-related construction activities over a number of years anticipated between 2006 and 2009. Subject to approvals work to expand the terminal building is planned to start in October 2006. The associated developments would be phased out in line with the programme.

A provisional development timetable for the core elements of expansion is provided in Table 2-2.

**Table 2-2:** Provisional development timetable for core elements

Element	Contract category	2006	2007	2008	2009
Taxi-way construction:	Contract 1	June 2006	April 2007	-	-
Car parking:	Contract 2	Oct 2006	Oct 2007	-	-
Terminal 4 construction:	Contract 2	Oct 2006	-	Jan 2008	-
Refurbishment:	Contract 3	-	Mar 2007	-	Dec 2009

## 2.5.4 General construction methodology

Standard construction techniques as contained in the JKIA construction code will be used. Project construction will be supervised by the Project Engineers and the Architects (Supervising Consultants /Project Managers). Construction activities have been divided into the following:

- Site preparation;
- Construction activities;
- Electrical and mechanical Installations;

Key aspects to be considered during construction are:

- Recruitment of labour. both skilled and unskilled by the contractor;

- Procurement of construction materials:
  - Importation of aggregate and stone from approved quarries;
  - Procurement of cement, sand, ballast, timber.
- Building works, including:
  - Installation of services and interiors of the building;
  - Connection to the existing water supply, sewer system, drainage, power and telecommunication network;
  - Use of heavy and light machinery.
- Energy utilisation, major energy consuming activities include:
  - Lighting;
  - Excavation;
  - Transportation;
  - Hauling and hoisting of materials;
  - Mixing raw materials;
  - Waste handling trucking and disposal;
  - Testing and commissioning of the development.
- Water utilisation, including the following activities:
  - Washing of machinery and equipment;
  - Preparing of mixtures, including water based emulsion paints;
  - Concrete works, including curing;
  - General cleaning;
  - Landscaping;
  - Controlling dust on site;
  - Domestic utilisation (sanitary facilities).
- Waste production, including the following construction waste:
  - Excavated materials from the earth works;
  - Timber from used formwork;
  - Paints, lubricants and petroleum wastes;
  - Containers, cement paper bags and other packaging materials;
  - Metal, glass, plastic containers and other unwanted materials.
- Archaeological findings and aesthetics.

Table 2-3 Construction inputs and anticipated wastes

Area of construction	Construction material/input	Anticipated waste
<b>Terminal 4 Construction</b>		
All walls and floors:	<ul style="list-style-type: none"> <li>• Reinforced Concrete;</li> <li>• Masonry and Plastered walls;</li> <li>• Insulated Glazed Curtain Wall systems.</li> </ul>	Stone cuttings from block shaping, dust and undersized/broken stones.
Slabs, beams and columns:	Reinforced Concrete + Steel.	Wastewater, used cement bags, excess oils, steel off cuts.
Formwork, roof support, doors, wardrobes and cabinets:	<ul style="list-style-type: none"> <li>• Plywood formwork,</li> <li>• Hollow Metal Doors or glazed alum framed doors.</li> </ul>	Used formwork, broken timber, sawdust, spoilt fixings and fittings.
Roof:	<ul style="list-style-type: none"> <li>• Prefin Insulated Metal roof;</li> <li>• Single ply membrane on insulation on Concrete roof;</li> <li>• Polytetrafluoroethylene.</li> </ul>	Spoilt fixings and off cuts.
Windows:	Insulated double-glazed curtain wall system.	Broken glass and timber off cuts.
Finishing and interiors:	<ul style="list-style-type: none"> <li>• Lobby Areas – Epoxy Terrazzo;</li> <li>• Seating Areas – Carpet;</li> <li>• Washrooms – ceramic tiles.</li> </ul>	Paint containers, waste paint, wastewater, waste thinner, broken tiles, veneer.



Area of construction	Construction material/input	Anticipated waste
<b>Car parking construction</b>		
Slabs, Columns, walls	Reinforced Concrete foundations, columns, walls, slabs	Wastewater, used cement bags, excess oils, steel off cuts.
Finishes	Hardened Concrete Washrooms – ceramic tiles.	Wastewater, used cement bags, excess oils, steel off cuts.
<b>Taxi-way construction</b>		
Apron	<ul style="list-style-type: none"> <li>• Heavy Duty Asphalt Pavement and Concrete Paving</li> <li>• Asphalt Pavement</li> <li>• Heavy Duty Asphalt Pavement.</li> </ul>	Wastewater, used cement bags, excess oils, steel off cuts and asphalt waste.
Taxiways		
Shoulders		

(a) **Waste disposal**

Waste material, other than that which can be recycled and re-used on site, will be disposed off to unrehabilitated quarries within the **KAA** property. The masonry work, which will not be used on site, will be given out to schools as corporate social responsibility. A waste management plan shall be completed by the contractor prior to starting any **construction** or demolition and submitted to the Chief Engineers Office for acceptance. In addition to the regulatory requirements, all materials must be disposed off in approved **landfill**.

(b) **Water supply and storage**

**Nairobi** Water and Sewerage Company **Ltd** supplies JKIA with water through a 200mm diameter pipe, which discharges water into a 1.8 million litres underground concrete tank.

KAA recently upgraded its water distribution system and water storage capacity from the current 1.8 million litres to a total of 8.35 million litres, due to anticipated high demand for water at the **airport** and the proposed **expansions** by doing the following:

- Connection, to tap water from the EPZ main line **supplying** water to the **Athi** River facilities;
- Rehabilitation of **3No.** boreholes sunk strategically located around the airport;
- Increasing of water storage **facilities** from the existing volume of 1.8 million litres to a total of 8.35 million litres. New water storage facilities include:
  - 4.0 million litres low level concrete tank, **0.65million litres** elevated (**30m**) steel tank and 0.45 million litres elevated (**10m**) **steel** tank to tap from the **boreholes** all **constructed** at JKIA;
  - Comprises of a **1.0** million litres low level concrete tank and a **0.45** million litres elevated (**10m**) steel tank constructed at **Embakasi**;
- A total of **14Km** of new water distribution pipelines have been installed. The lines are to facilitate connections of storage **facilities** to arrivals building, Fire Crash & Rescue Station and Embakasi **Terminal** Area.

(c) **Sewage and sullage**

The JKIA has **four** main sewer lines as follows:

(i) **State pavilion** sewer

These sewers serve the state pavilion and **control** tower buildings and joins the **450mm**-diameter sewer from the central and terminal buildings at manhole MH 75. The sewer is shallow near the **pavilion** and becomes very deep (**5.48m** to Invert) as it joins the main sewer. The sewer diameter is **150mm** between manholes MH67 and **MH68** and then **230mm** between manholes **MH68** and **MH75**.

(ii) Central and terminal **building** sewers

Two **main** sewers serve the central and terminal building area **with** sizes ranging from 100mm to 300mm diameter. These sewers discharge into a 450mm-diameter sewer at manhole MHt3 and subsequently into manhole MH75 where it joined by the slate pavilion sewer. The sewage subsequently flows into the wet well of the sewage **pumping** station via manholes M76, M77 and MH78.

(iii) Aircraft wastewater **catchpit** sewer

The wastewater collected from **aircraft** is disposed at the **aircraft** wastewater catchpit, manhole MH102 located **within** the solid waste dumping enclosure. A 150mm-diameter **ductile** iron sewer connects the wastewater **catchpit** to the 450mm-diameter sewer at manhole MH77, from where it flows to the sewage pumping station.

(d) **Energy supply**

The energy supply is derived from KPLC 66Kkv distribution network and thereafter stepped down to, and metered at, 11kv at the KAA main substation for distribution via 11Kv distribution board and **4NO. (11/0.415kv)** step down transformers rated at 1000KVA. Assessment of energy supply has been addressed by the *Terminal Master Plan, Design, and Construction Final Report volume I-report prepared by Queen's Quay Architects International –2005*, it is reported that an **additional load** of approximately 1400KW is expected as a result of proposed renovations and extension of the Terminals.

(e) Landscaping

The design proposals will consider in a positive way the selective application of landscape elements both on the inside and the exterior of the **terminal** buildings. **Landscaping** will be used not only **to** beautify the terminal but also as buffers between well - wishers and passenger drop off and the buildings for security reasons. Consideration will also be given to **irrigation** lines to **maintain** year round luxuriant greenery. Elements of landscaping that are planned for different areas include:

- An icream **parlor/** coffee terrace with paved sitting area;
- Ponds and fountains along drive way, and use indigenous plant materials. where applicable. **The** fountains will have elements that reflect Kenya's identity;
- Reinforcing the access into the airport through planting and possibly **incorporating** sculpturalworks with fountains;
- Landscapinglighting and **signage**.

**2.5.5** Decommissioning

The decommissioning of the **airport** is not relevant to the current development and, therefore, will not be considered by the EIA.

## 3 POLICY LEGAL AND REGULATORY FRAMEWORK

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### 3.1 Policy framework

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The Kenya Government's environmental policy aims at integrating environmental aspects **into** national development plans. The broad objectives of the national environmental policy include:

- Optimal use of natural land and water resources in improving the quality of human environment;
  - Sustainable use of natural resources to meet the needs of the present **generations while preserving** their ability to meet the needs of future generations;
  - Integration of environmental conservation and economic activities into the process of sustainable development;
  - Meet national goals and International obligations by conserving bio-diversity, arresting desertification, mitigating effects of disasters, protecting the ozone layer and maintaining an ecological balance on earth.
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### 3.2 Legal framework

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Kenya has approximately 77 statutes that **relate** to environmental concerns. Most of these statutes are sector specific, covering issues such as public **health**; **soil** erosion; protected areas; endangered species; water rights and water quality; air quality, noise and vibration; cultural, historical, scientific and archaeological sites; land use; resettlement; **etc.**

Previously, environmental management activities were implemented through a variety of instruments such as policy statements and **sectoral laws**, and also through **permits** and licences. For example, the **Physical Planning Act of 1996** empowers local authorities to request existing facilities to conduct environmental assessments, while under the Local Government Act of **1998**, **it** is an offence to emit smoke, fumes or dust which may be a source of danger, discomfort or annoyance.

With the enactment of the Environmental Management and Co-ordination Bill In December **1999**, the **institutional** framework for environmental management was strengthened. **The** Environmental Management and Co-ordination Act of 1999 (the Act) provides for **the establishment** of a National Environment Management Authority (NEMA), which **became** operational in July 2002. NEMA has statutory mandate to co-ordinate all environmental activities.

The Environmental (Impact Assessment and Audit) Regulations, **2003**, provide the basis for procedures for carrying out Environmental Impact Assessments (**EIAs**) and **Environmental Audits (EAs)**.

#### 3.2.1 Environmental Management and Co-ordination Act

**The Environmental** Management and **Co-ordination** Act (EMCA, the Act), **received** Presidential assent on 6 January 2000 and was gazetted on 14 January 2000.

The main objective of **the** Act is to:

- Provide guidelines for the establishment of an appropriate legal and **institutional** framework for the management of the environment in Kenya;
- Provide a framework legislation for over **77** statutes in Kenya that **contain** environmental **provisions**;

- Provide guidelines for environmental impact assessment, environmental **audit** and monitoring, environmental quality standards and **environmental** protection orders.

The **Second** Schedule to the Act **specifies** the projects for which an **EIA** or EA must be carried out. According to the **Act**, Section 58, all projects listed in the Second Schedule of the Act must submit a Project Report to **NEMA**.

### 3.2.2 The Factories and Other Places of Work Act

This is an Act of Parliament to make provision for health, safety and welfare of persons employed **in** factories and other places, and for matters incidental thereto and connected **therewith**.

#### (a) Building **Operations** and Works of Engineering Constructions

The **provisions** of the Factories Act relevant to **engineering** construction works are contained in the Abstract of the Act for Building Operations, and Works of Engineering Construction Rules. These are **summarised** in Table 3-1:

**Table 3-1: Minimum health and safety requirements for engineering construction works**

Legal Requirements	Description
<b>General Requirements</b>	
Give notice of particular operations or works:	Notice should be sent in <b>writing</b> to the <b>Occupational Health and Safety Officer</b> , not later than seven <b>days after commencement of construction</b> and building works except where <b>the</b> construction works will be complete in less than six weeks or notice had already been given <b>to</b> the <b>Occupational Health and Safety Officer</b> (Section 60 of the Act).
General Register:	A general register of every person undertaking building operations or construction works be kept in adherence to the prescribed form L.D.B.C.R.2. This register is kept at <b>the site</b> of operations or at the <b>office</b> of the person undertaking <b>the</b> operations or works.  The register should contain: <ul style="list-style-type: none"> <li>• The certificate of registration of the workplace;</li> <li>• Every other certificate issued by the Chief Inspector under <b>this Act</b>;</li> <li>• The prescribed particulars as to <b>the</b> finishing (<b>washing</b>, white washing, <b>colour</b> washing, painting or varnishing) <b>of</b> the facility;</li> <li>• The prescribed particulars as to every <b>accident</b> and case of occupational disease occurring in the workplace of which a <b>notice</b> is required to be sent to a labour officer under the <b>provisions</b> of any law for the time being in force;</li> <li>• All reports and <b>particulars</b> required by any other provision of <b>this Act</b> to be entered in or attached to the general register;</li> </ul> Such other <b>matters</b> as may be prescribed (Section 62 of the <b>Factories and Other Places of Work Act</b> ).
Special rules and welfare:	<b>Printed copies or prescribed abstracts of the Factories and Other Places of Work Act</b> must be kept <b>posted</b> at the site of operations or work (Section 61 of the Factories and Other Places of Work Act).
<b>Safety Requirements</b>	
Air receivers:	These should be of sound construction and be properly maintained. They should be thoroughly examined by a competent person at <b>intervals</b> of 24 months and the <b>reports</b> of such examinations attached to the General <b>Register</b> (Section 39 of the Factories and other Places of Work Act).
Cylinders for compressed, liquefied and dissolved gases:	Such cylinders should be of <b>good</b> construction, sound material, adequate strength and free from patent defect. The cylinders should conform to standards specified under the Standards Act or to a prescribed standard <b>specification</b> , approved in writing, by the Director, Kenya Bureau of Standards. They should be thoroughly examined by a competent person at regular <b>intervals</b> and a maintenance register kept (Section 39A of the amendment of the Factories and Other Places of Work Act).

Legal Requirements	Description
Notification of accidents:	The particulars of an accident causing death or disablement of a worker for more than three days from earning full wages at the work place where he was employed must be sent in the prescribed form (L.D.B.C.F 6) to the Occupational Health and Safety Officer and entered in the General Register. Certain dangerous occurrences must also be reported whether or not they cause disablement (Section 62 of the Factories and Other Places of Work Act).
Health Requirements	
Sanitary accommodation:	Sufficient and suitable sanitary conveniences must be available for persons employed. These must be kept clean and well lit (Sections 16 and 18 of the Factories and Other Places of Work Act).
Miscellaneous Requirements	
Prohibition of deduction from wages:	The occupier must not make a deduction from wages in respect of anything he has to do or provide in pursuance of the Factories Act or permit any person in his employment to receive payment from other employees for such services (Section 66 of the Factories and Other Places of Work Act).
Duties of persons employed:	An employee must not wilfully interfere with or misuse any means, appliance, convenience or other thing provided in pursuance of the Act for securing health, safety or welfare provided for his use under the Act. He must not wilfully and without reasonable cause do anything likely to endanger himself or others (Section 65 of the Factories and Other Places of Work Act).
Inspection:	The Occupational Health and Safety Officer has the power to inspect every part of the premises by day or by night. He may require the production of registers, certificates and other papers. May examine any person alone or in the presence of any other person as he thinks fit and may require him to sign a declaration of truth of the matters about which he is examined. Every person obstructing an Occupational Health and Safety Officer is liable to a penalty (Section 69 of the Factories and Other Places of Work Act).

(b) **Health**

Part IV of the Factories Act, Chapter 514, addresses provisions concerning health. These provisions are to be enforced by the Department of Occupational Health and Safety of the Ministry of Labour. Details of the various requirements are outlined in Table 3-2.

Table 3-2 Relevant provisions concerning occupational health under the Factories Act

Section	Provisions
Section 13	Every factory shall be kept in a clean state and free from effluvia arising from any drain, sanitary convenience or nuisance.
Section 14:	Overcrowding while work is carried out may cause risk to health. A factory is deemed overcrowded if the amount of cubic space per person is less than ten (10) cubic feet.
Sections 15 and 16:	Effective and suitable provisions shall be made for ventilation of the workroom, sufficient and suitable lighting in every part of the factory and passages.
Section 17:	Drainage of wet floors should be done where any process renders the floor wet.
Sections 18 and 19:	Sufficient and convenient sanitary conveniences should be provided, maintained and kept clean and separately for each sex. The local authority shall enforce this, if the Minister in the Gazette so directs.

(c) **Safety**

Part V of the Factories Act elaborately deals with safety requirements, mainly from the point of view of avoiding accidents and injuries at work. Table 3-3 outlines the safety requirements under the Act.

**Table 3-3 Relevant provisions concerning occupational safety under the Factories Act**

Section	Provisions
<b>Sections 21.22 and 23:</b>	All prime movers, transmission machinery and <b>other</b> dangerous machinery shall be securely fenced unless it is in such a <b>position</b> or of such construction as to be as safe to every <b>person</b> employed on the premises as it would be if securely fenced. Effective devices and appliances shall be provided and maintained for stopping and starting the moving parts and these should be readily and conveniently operated.
Section 25:	All the fencing and other safeguards shall be of substantial construction, constantly maintained and kept in position while the parts <b>required</b> to be fenced or safeguarded are in <b>motion or</b> use.
Section 26:	Every machinery that requires sinking or encasement shall be completely sunk or encased to prevent danger.
Section 27:	Any vessels containing dangerous liquids shall be securely covered or fenced to prevent contact with or danger of falling into such vessels. A <b>notice indicating</b> the nature of danger in a form readily understood by the workers shall be attached on the plant or vessel or the notice should be posted appropriately.
Section 28:	At least <b>18</b> inches should be allowed between a self-acting machine or materials carried <b>thereon</b> and the space over which a person is liable to pass in his employment
Section 29:	Any person working on a machine liable to cause bodily injury shall get full instruction, training and <b>if possible</b> be adequately supervised.
Sections 30 and 32:	Every hoist, lift or cranes shall be of good <b>mechanical</b> construction, sound material and adequate strength and be properly maintained and protected with enclosures <b>and</b> on it shall be marked the maximum load it can carry.
Section 31:	All chains, ropes, tackles shall be of good construction, sound material, adequate strength and free from patent defects. A table shall show the safe working load <b>of</b> every kind and <b>size</b> of the aforementioned, which shall not be exceeded.
<b>Section 34:</b>	All floors, steps, passages and gangways shall be of sound construction and properly maintained and all openings on the floor securely fenced.
Section 35:	Where a person has to work in a confined space where dangerous fumes are likely to be present, means of egress shall be <b>provided</b> . Efforts to remove the fumes should be made, <b>suitable</b> breathing apparatus should be provided or belt securely <b>attached</b> to a rope and held by a person outside should be provided to any person entering such place.
<b>Section 36:</b>	Explosion shall be prevented by enclosure of plants used in process of making any <b>explosive</b> or inflammable dust. Removal and prevention of possible <b>ignition</b> should be done.
Section 39:	Every air <b>receiver</b> shall have marked on it the safe working pressure.
<b>Section 41 and 42:</b>	Means of <b>extinguishing fire</b> should be provided In all factories and free passageway for means of escape in <b>case</b> of fire shall be provided.
Sections <b>51 and 52:</b>	In any <b>factory</b> where dust or fumes or impurities are produced, persons should be protected against inhalation and its accumulation <b>should</b> be <b>prevented</b> . No person shall be permitted to eat in such place.
Section 53:	Protective clothing should be provided to persons in any factory where <b>they</b> are exposed to wet or offensive substances. Goggles or screens should be provided to protect eyes.

**(d) Health and Safety Committee Rules**

These rules are described in Legal Notice No. 31 of the Kenya Gazette Supplement No. 25 of 14 May 2004 and apply to all factories and other workplaces that regularly employ twenty or more employees. Among other items, the rules state that:

- The **occupier** of every factory or other **workplace** shall **establish** a **Health & Safety** committee;
- The Committee shall **consist** of safety representatives from the management and the workers;
- The factory **occupier** shall appoint a competent person from the management staff to be responsible for safety, health and welfare in the factory or workplace; and the person appointed shall be the secretary to the Committee;
- Every **member** of the Health & Safety Committee shall undertake a prescribed **basic** training course in occupational health and safety **within** a period of six months **from** the date of appointment or election, and **thereafter** further training from time to **time**;
- The occupier of every factory or workplace shall cause a health and safety **audit** of the workplace to be carried out at least once in every period of twelve months **by** a registered health and safety adviser.

The above legal notice also describes the functions and duties of the Health & Safety committees, meetings and minutes, and roles in the **Committee**. It **further** describes the **duties** of the occupier and those of the Health & Safety Adviser.

**(ef) Medical Examination Rules**

These are described in Legal Notice No. 24 of the Kenya Gazette Supplement No. 22 of April 2005. The Medical Examination Rules apply to all those employees in employment or who have been in employment in every workplace to which the provisions of the Factories and Other Places of Work Act (Cap 514) apply. The Rules describe the following:

- Occupations requiring medical examination;
- Duties of employer and employees **as** to medical examination;
- **Reports** on examination;
- Certificate of redeployment;
- Certificate of fitness;
- Notification of occupational diseases;
- Offences and penalties.

**(f) Noise Prevention and Control Rules**

These rules are described in **Legal Notice** No. 25 of the Kenya Gazette Supplement No. 22 of April 2005 and state the noise regulations that **apply** to every factory, premises, place, process and operations to which the **provisions** of the Factories and Other Places of Work Act (Cap 514) applies. These Rules describe the **following**:

- Permissible noise levels;
- **Noise** prevention programme;
- **Noise** measurements and records;
- Information on noise and training **of** workers;
- **Noise** measuring equipment;
- Engineering **controls**;
- **Installation** and maintenance of machinery or plant;
- Means **of** communication;
- Hearing protection;
- Noise hazard **areas**;
- Workers responsibility in noise hazard areas;
- Duties of the occupier;
- Medical examination and hearing tests;
- Compensation and notification of occupational hearing impairment;
- Noise programme review;
- Offences and penalties.

(g) Relevant **Sectoral** Legislation

While the Act supersedes **all** other environmental **legislation**, numerous other laws and regulations influence the various aspects and activities of the **Project**, which include the following among others:

- Kenya Airports Authority Act, Cap 395;
- The Civil Aviation Act. Cap 394;
- Air passengers Tax Act, Cap 475;
- Electricity Power Act **No.11** of 1997;
- **Building Code** (1 997);
- **Petroleum Act**, Cap 116 (rev 1972);
- Water Act (2002); Cap 272
- Public Health Act. Cap 242 (rev 1986);
- Local Government Act (rev. 1986) Cap 265;
- Local Government Regulations (1963) Cap 265;
- **Workmen's Compensation Act** (rev. 1988) Cap 254;
- Employment Act & Other Labour Related Laws;
- Use of Poisonous Substances Act, Cap 247 (rev 1983).

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### 3.3 Administrative framework

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In 2001, the Government established the administrative structures to implement the Act. The main administrative structures are described in the following sections:

#### 3.3.1 The National Environment Council

The National Environmental **Council** (the Council) is responsible for policy formulation and directions for the purposes of the Act. The Council also sets national goals and objectives, and determines **policies** and priorities for the protection of the environment.

#### 3.3.2 The National Environment Management Authority

The responsibility of the National Environmental Management **Authority** (NEMA) is to exercise general **supervision** and co-ordination over all matters **relating** to the environment and to be the principal instrument of government in the Implementation of **all** policies relating to the environment.

#### 3.3.3 The Standards and Enforcement Review Committee

In addition to NEMA, **the** Act provides for the establishment and enforcement of environmental quality standards to be set by a technical committee of NEMA known as the Standards and Enforcement Review **Committee (SERC)**.

#### 3.3.4 The Provincial and **District** Environment Committees

The **Provincial** and **District** Environmental Committees also **contribute** to **decentralised** environmental management and enable the participation of local communities. These environmental **committees** consist of the following:

- Representatives from all the ministries;
- Representatives from local authorities within the **province/district**;
- Two farmers / pastoral representatives;
- Two **representatives** from **NGOs** involved in environmental management in the **province/district**;
- A representative of each regional development **authority** in the **province/district**.



### 3.3.5 The Public **Complaints** Committee

The Act (EMCA) has also established a **Public** Complaints Committee, which provides the administrative mechanism for addressing environmental harm. The Committee has the mandate to investigate complaints relating to environmental damage and degradation. **Its** members include representatives from the Law Society of Kenya, **NGOs** and the business community.

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## 3.4 Regulatory framework

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### 3.4.1 The **Environmental** Impact Assessment and Audit Regulations

The Environmental Impact Assessment and **Audit** Regulations state in Regulation 3 that The Regulations shall apply to all policies, plans, programmes, projects **and** activities specified in Part IV, Part V and the Second Schedule of the Act".

Regulation 4(1) further states that:

"...no proponent *shall* implement a *project*:

- (a) *likely* to have a negative *environmental* impact; or
- (b) for *which* an environmental *impact* assessment is required *under* the Act or these Regulations;

unless an environmental impact assessment ~~has~~ been **concluded and** approved *in* accordance **with** these **Regulations.."**

### 3.4.2 Standards and enforcement

Part **VIII** of the **Act** deals with environmental **quality** standards. It establishes a Standards and Enforcement Review **Committee** (SERC), whose functions include the establishment of standards for all environmental media.

A work plan has been set up by SERC to include committees to draw up standards for the following:

- Water **quality**;
- Waste quality;
- **Chemicals**;
- Land use;
- Biodiversity;
- Economic Instruments.

These committees are **in** the process of **finalising** their **respective** standards, however none have been gazetted. Therefore the **local** authority standards or standards promulgated under **sectoral** legislation apply.

### 3.4.3 Licenses and Permits

According to the Act, licenses and permits will be required for:

- Effluents;
- Emissions;
- Hazardous wastes;
- Registration of **toxic substances**;
- Noise;

- Noxious smells.

**Appendix 2** gives a tabulated summary of offences and penalties for non-compliance and in cases where pollution has occurred, together with the relevant provisions of the Act.

### 344 Key Regulatory Agencies

The regulatory agencies of relevance to the Project are shown in **Table 3-4** below.

Table 3-4 Regulatory **Agencies**

<b>Regulatory agency</b>	<b>Responsible Ministry</b>	<b>Requirements</b>
National Environment Management Authority (NEMA):	Ministry of Environment and Natural Resources.	Submission of Environmental Impact Assessment Project Report pursuant to Sections 58 of the Act.
Kenya Airports Authority:	Ministry of Transport.	Responsible for drawing JKIA Construction code.
Department of Occupational Health and Safety:	Ministry of Labour.	Responsible for the implementation of the Factories and Other Places of Work Act.
Kenya Civil Aviation Authority:	Ministry of Transport.	Responsible for Air safety Regulations.
Medical Officer of Health:	Ministry of Health.	Responsible for the implementation of the Public Health Act.

All lead agencies are listed in the Schedule III of the Act.

## 3.5 International conventions

Kenya has ratified or acceded to numerous International treaties and conventions, as described below:

**Vienna Convention** for the Protection of the Ozone Layer: Inter-governmental negotiations for an international agreement to phase out ozone depleting substances concluded in March **1985** with the adoption of this Convention to encourage Inter-governmental co-operation on research, systematic observation of the ozone layer, monitoring of CFC production and the exchange of Information.

**Montreal Protocol on Substances that Deplete the Ozone Layer:** Adopted in September **1987** and intended to allow the revision of phase out schedules on the basis of periodic scientific and technological assessments, the Protocol was adjusted to accelerate the phase out schedules and has since been amended to introduce other kinds of control measures and to add new controlled substances to the list.

**The Basel Convention:** Sets an ultimate objective of stabilising greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (human-induced) interference with the climate system.

**Kyoto Protocol:** Drawn up in **1997**, pursuant to the objectives of the UN Framework Convention on Climate Change, in which the developed nations agreed to limit their greenhouse gas emissions, relative to the levels emitted in **1990**.

## 4 ENVIRONMENTAL SETTING

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### 4.1 Socio-economic environment

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The land where the airport is located belongs to the Government of Kenya under the management of Kenya Airports Authority (KAA).

The airport falls within Embakasi Division, in **Nairobi** District. The airport is situated in a predominantly **industrial**, residential and military area, **although** most sections of the area are open and undeveloped for the **airport** operations.

The properties adjacent to the airport include the following:

North: Residential areas and industries.  
East: Military areas and Residents plots.  
West: Kenya Pipeline Depots and vacant land.  
South: Vacant land and residential plots.

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### 4.2 Physical environment

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#### 4.2.1 Climate

Mean maximum temperature:	25.5°C.
Mean minimum temperature:	12.5°C.
Rainfall pattern:	Bimodal, with wet seasons in March to May and mid-October to mid-December.
Mean annual rainfall:	785mm.
Relative humidity range:	40-97%.

Source: Government of Kenya, *National Atlas of Kenya*, 1991. Survey of Kenya.

#### 4.2.2 Soils

The soils within the area have been developed on **infill** from volcanic ashes and are **poorly** drained, deep, very dark greyish brown, firm, moderately strongly calcareous, slightly **sodic** clay, with a humic topsoil. (Ref: National *Atlas of Kenya*, 1985, *Survey of Kenya*).

#### 4.2.3 Topography

The area falls within the **Athi** plains, a plateau that rises from 700m in the east to 1700m above sea level in the west and is interrupted by an escarpment and series of **hill** masses, the **highest** being Kilimambogo that **rises** to 2144m above sea level (Ref: EP *Saggerson 1991: Geological Report No.98, Geology of the Nairobi Area*).

#### 4.2.4 Geology

The Middle and Upper Kerichwa Valley Tuffs cover **the** area. The **Middle** tuffs have been variously named Nairobi building stone, **Nairobi** freestone, lava, **devitrified trachyte**, pitchstone, axiolytic **phonolite** and rhyolite. They are dense welded tuffs of ash-flow **origin** with fairly uniform characteristics, important differences being in **colour** and variation of texture that are sometimes emphasised by weathering. The Upper Kerichwa Valley Tuffs are unconsolidated, rock patches are **undurated** and agglomeratic. The tuffs have irregular **jointing** which consists **mainly** of sub-vertical or curvilinear fractures that cause the rocks to break into **irregularly** shaped blocks. The joints permit the downward **percolation** of groundwater and different blocks, often in **juxtaposition**, may be variably wet and dry. The **colour** of deposits range

through white, red, maroon, blue grey and grey (Ref: EP Saggerson 1991: Geological Report No.98, Geology of the Nairobi Area).

#### 4.2.5 Hydrogeology

The area is underlain by volcanic rocks, which were deposited by the solidification of flowing lavas and ash and have very gentle slope eastwards away from the Rift Valley. The period when these deposits occurred also included periods of quiescence and stability during which erosion took place. These periods can be identified by bands of soils and sediments that are found between the lava flows. It is within these bands that groundwater is found and this is exploited by boreholes drilled in the Nairobi area.

The Upper Athi Series, which is the most important aquifer beneath most of the area, comprises a heterogeneous combination of lake beds, re-worked sediments, air-fall tuffs, ignimbrites, ashes and occasional intercalated lava flows. This aquifer is generally deep, averaging approximately 140 m below ground level (Ref: Hydrogeology of the Nairobi Area, by E.A.L. Gevaerts. Ministry of Natural Resources and Wildlife. Water Development Department. Technical Report No. 1, 1964).

#### 4.2.6 Water resources

The airport lies within the Athi River Catchment, with the tributary of the Athi River passing about 5 km east of the Airport.

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### 4.3 Biological environment

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The surrounding undeveloped area consists largely of the following:

- Bushed grassland – Grassland with scattered or grouped shrubs, the shrubs being conspicuous but have a canopy cover of less than 20%;
- Grassland – Dominated by grasses occasionally other herbs, sometimes widely scattered or grouped trees and shrubs, the canopy cover does not exceed 2%.

The airport has medium sized indigenous trees, some ferns, shrubs and grassland.

There is a variety of wild animals seen on the area, but the variety is affected by the extent of development which is taking place. Various gazelle, zebra and giraffe are frequently seen.

## 5 ASSESSMENT OF ENVIRONMENTAL IMPACTS

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### 5.1 Introduction

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Construction related activities generally cause alterations to the bio-physical and **social** environment. The proposed **project** is **not** an exception. The alterations can bring **about** positive or adverse **impacts**. The positive impacts do enhance the environmental conditions but the negative impacts can be severe if they are not identified during project planning stages and appropriate mitigation measures designed.

The impacts have been categorised as positive and adverse impacts. During **construction** phase some benefits such as improved business and creation of employment to the local communities are expected. Most of the positive impacts are anticipated during the operation phase. The negative impacts are anticipated mainly during construction. Mitigation measures for the identified impacts have also been addressed in this chapter.

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### 5.2 Impacts due to the location of the project

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The project is an **expansion** of JKIA. The airport has been in existence for over 30 years **and** the environment within the airport has been significantly altered. Therefore, negligible impacts due to location are anticipated. Impacts are expected **during** construction and operation. These are discussed in the following sections.

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### 5.3 Analysis of impacts

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An overview of the project description has been presented in **Chapter 2**.

The potential impacts of the proposed project have been listed in Table 5-1 below and **analysed** into **different** categories based on the perceived environmental impacts.

Table 5-1 Analysis of **impacts**

Environmental and <b>social</b> Impact	<b>Positive/negative</b>	Direct <b>indirect</b>	Temporary / permanent	Major / <b>Minor</b>	Occurrence Design and Construction	<b>operation</b>
Enhanced airport security.	Positive	Direct	Permanent	Major	-	✓
Increased air traffic movements.	Positive	Direct	Permanent	<b>Major</b>	-	✓
Increased car parking facility at the airport.	Positive	Direct	Permanent	Major	-	✓
Modification of infrastructure and facilities at the airport.	Positive	Direct	<b>Permanent</b>	<b>Major</b>	-	✓

Improved socio-economy.	Positive	Direct	Permanent	Major	✓	✓
Visual enhancement of the environment of the airport.	Positive/ Negative.	Direct	Permanent	Major	✓	✓
Creation of employment.	Positive	Direct	Temporary/ Permanent	Major	✓	✓
Construction material disposal.	Negative	Direct	Temporary	Minor	✓	
Vegetation loss.	Negative	Direct	Permanent	Minor	✓	
Soil erosion.	Negative	Direct	Permanent	Minor	✓	
Air and noise pollution.	Negative	Direct	Permanent	Major	✓	✓
Changes in vibration and vortex.	Negative	Direct	Permanent	Minor.	✓	✓
Water and soil contamination.	Negative	Direct	Permanent	Minor.	✓	
Public health impacts.	Negative	Indirect	-	Minor	✓	✓
Landscape scarring at quarries.	Negative	Direct	Permanent	Major	✓	✓
Road safety and delays.	Positive	Direct	Permanent	Major	-	✓
Changes in water supply.	Negative	Direct	Permanent	Major	✓	✓
Overwhelming of wastewater treatment systems.	Negative	Direct	Permanent	Major	✓	✓
Occupational health and safety problems.	Negative	Direct	Permanent	Major	✓	✓

## 5.4 Impacts during the construction and operation phase

### 5.4.1 Positive impacts

The significant **positive** impacts expected from the design, construction and operation phases include the following and **are** discussed in the subsequent **section**:

- Enhanced **airport** security;
- **Increased** air **traffic** movements;
- Increased car parking facility at the **airport**;
- Modification of the existing infrastructure and facilities at the airport;
- Visual enhancement of the environment of the airport;
- Improved local socio-economy;
- Creation of employment.

(a) Enhanced **airport security**

**Re-development** of the primary check-in will ensure that only travelling public is allowed through a primary security check at the entrance of each **terminal** and after obtaining the boarding passes in **the** Departures Lobby, passengers proceed through a secondary security check as well as immigration counters for International Travellers, thus enhancing security. Arriving and departing travellers will be segregated.

(b) Increased air traffic movements

The existing runway does not have sufficient **capacity** for the number of aircraft movements anticipated by 2014. The proposed development makes provision for construction of new taxiways at the eastern end of the runway in order to prevent aircraft waiting to get onto the runway, thus increasing air traffic movements.

(c) Increased car parking facility

The proposed development has a provision for car parking which will increase the number of vehicles allowed at the **airport**.

(d) Improvement of the existing **infrastructure** and facilities

The proposed project design will contribute to Improving existing infrastructure and facilities and the comfort of airport users in several ways as detailed in chapter 2 sections 2.4.

(e) Visual enhancement of the environment

The expansion is proposed on previously developed land, in areas already characterised by **airport** facilities, functions and infrastructure. The proposed development includes plan to landscape the developed areas using indigenous trees and lawns. This will bring about **long** term changes to landscape character by reconfiguration of features and elements within the existing boundary.

(9) Improved local socio-economy

**JKIA** is the largest international airport in East Africa and the proposed expansion will contribute to increased businesses opportunities, both locally and internationally due to:

- Increased **accessibility** could increase the number of tourists and tourism spending which will improve **economy**;
- Increased **efficiency** in air transport thus promoting trade;
- Improvement of airport recreation **facilities** could help to encourage investment and trade benefiting the local economy.

(g) Creation of employment opportunities

**Construction** and development projects world-wide creates employment opportunities for all cadres of staff directly or indirectly linked to the project. The proposed project, during construction will directly employ as a minimum, the **following** groups:

- Supervising engineering team;
- Contractor staff (**managerial**, skilled and unskilled labour force);
- Suppliers of plant, machinery, materials and **essential** services;
- **Construction** monitoring personnel from **the** various government agencies.

Wherever possible, the Contractor shall use local labour, and women must be encouraged.

The proposed project will also directly or indirectly employ a number of people during operation due to increased facilities.

#### 5.4.2 Potential adverse impacts

The following significant adverse impacts due to the proposed project have been identified and discussed in the subsequent section:

- Loss of vegetation;
- Soil erosion;
- Air and noise pollution;
- Water and soil contamination;
- Public health impacts from work operations;
- Visual intrusion at the borrow sites;
- Delays in transportation.

##### (a) Vegetation loss

The bulk of the airport land comprises runways, taxiways, car parking, and buildings. The land between the runways consists of species of semi improved grassland, managed according to standard 'long grass policy'. There are also areas of landscape mature trees associated with the entrance to JKIA.

The southern edge of the airport in the vicinity of the proposed area for the new car park (see photographs) has an area of semi improved grassland dominated by acacia trees. Construction works will involve clearing of vegetation in areas that are needed for site works. Some of these areas are habitats for different insects, butterflies, rodents and birds.

##### (b) Soil erosion

Erosion can be caused by earthworks during construction especially at borrow sites, embankments and earth dumping areas resulting in loss of topsoil.

##### (c) Air and noise pollution

Air pollution will arise from exhaust and engine emissions and from dust. Noise pollution will usually arise from blasting quarries and construction machinery. During construction, dust, noise and air pollution are expected especially from the aggregate crushers and asphalt plants, at work sites during site preparation and from construction machinery. Dust arising from construction activities has the potential to cause a nuisance. The potential nuisance can be experienced either as short-term events or long term accumulation.

During construction, noise can also be a nuisance to staff work in the offices within the premises. The level and distribution of construction dust emissions will vary according to factors such as the type, duration and location of activity, weather conditions and the effectiveness of mitigation measures.

During the operation of the airport noise will emanate from airborne, ground operations, and road traffic noise, which are likely affect those working within the airport. The increase in air pollution is mainly going to emanate from:

- Increased aircraft operations (Including take-off, landing, taxiing, engine testing, running of auxiliary power units (APUs) and ground power units (GPUs) on aprons, and engine testing);
- Increased airside and landside vehicle emissions;
- Increased refuelling of aircraft.

The dominant pollutant emissions to air associated with the above include:

- Nitrogen oxides;
- Volatile organic compounds;
- Carbon monoxide;



- Carbon dioxide;
- Sulphur dioxide; and Particulates.

(d) Vortex end vibration

With the expansion and the current developments taking place around the airport, it is expected that a few properties directly under the flight path in close proximity to the airport will be affected. Since no detailed evaluation has been undertaken at the airport in its current state, the extent of effects of vortex and vibration during expansion **is** not known.

(e) Water and **soil contamination**

**Construction** equipment generate **large** amounts of waste oil and its proper handling is critical, since haphazard storage and leakage can result in the contamination of soils, surface and ground waters. Oil products can also lead to contamination of surface and groundwater if there is a lack of fuelling, maintenance and servicing protocol for construction machinery at the Contractor's work camp.

(f) Public health impacts

Construction camps include workers' eating areas and the grounds where **equipment** is stored and **serviced** and where materials are stockpiled. These camps bring a **temporary** influx of **people** in an area or within close **proximity** to the project site. This may stimulate small scale business especially for the women who provide **catering services** to the labour force.

Local services at the airport such as water **supplies**, sanitation and waste disposal can be over stretched by the sudden increase in population during construction and later during **operation**. Proper sanitation arrangements must be made for the **labourers** during construction phase and for the project's operation phase.

(g) Landscape scarring

The project will require the use of stone and gravel from **material** sites for the base and sub-base. Materials sites (**quarry** and borrow areas) if not **reinstated** and **rehabilitated** after project completion, causes landscape scarring, which creates **unpleasant** changes in scenery when a gaping hole is left behind due to the excavation. The potential borrow sites **visited** are existing pits that have been partially exploited but not graded or rehabilitated.

(h) Road safety and delays in **transportation**

During construction, changes in baseline traffic as a result of construction activity are expected and this would slightly affect the **normal** operations of the airport.

Increase in traffic flows **associated** with construction vehicles, heavy trucks and **bulldozers** are expected to result in some traffic congestion. Furthermore, car parking spaces will be reduced temporarily during construction as the new **multi-storey** car park is being built and the existing one converted to Terminal **buildings**. This could cause minor inconveniences and expected problems will include sound nuisance, increased emission of air **pollutants**, and risk of accidents.

(i) Occupational health and safety

The occupational **health** and safety problems may result from poor handling of **equipment**, lack of proper clothing for **construction** and any other physical **injuries** emanating during both construction and operation of the airport.

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## 5.5 Mitigation of impacts

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The proposed mitigation for identified impacts is briefly described in the following sections.

(a) Controlled clearing of vegetation

The overall negative impact of the **airport** expansion on the environment will be limited considerably because the developments are within already built up airport environment. However, it is recommended that the Contractor must ensure:

- The clearance of the **site** for construction purposes is kept to a minimum. The stockpiling of materials etc **shall** be encouraged;
- There is a possibility of encountering near the proposed quarry site wildlife, this animals should be avoided and not perturbed and poaching or game hunting is forbidden;
- For the overall enhancement of the environment at the airport it is the responsibility of Contractor to ensure that **landscaping** programmes are implemented;
- The extent of **clearing** is clearly marked out and within the approved work-site. No construction **activity** shall occur outside defined work areas;
- Approval for each ancillary site prior to the commencement of related activities.

(b) Erosion control

During construction, earthworks should be controlled so that land that **is** not required for the construction works is not disturbed. Wherever possible, earthworks should be carried out during the dry season to prevent soil from being washed away by the rain. Excavated materials and excess earth will be kept at appropriate **sites** approved by the supervising engineer. Wherever possible, the earth dumping sites will be designed in such a manner as to facilitate natural water discharge.

The Contractor shall take reasonable measures to control storm water and the erosive effects. During construction the Contractor shall protect areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible.

(c) Air and **noise** pollution control

During construction, dust **emissions** should be reduced by **sprinkling** water at work sites, and quarry areas. Reduction of air **emissions** from exhausts and noise abatement should be **achieved** by contracting new equipment or well serviced and **maintained** equipment.

Dust, air pollution and noise pollution from aggregate crushers, concrete **batching** and asphalt plants (if allowed within the premises) should be reduced by **ensuring** that the plants are located downwind. Temporary **barriers** or dust nets can also be installed. **During** the construction phase regular dust monitoring should be undertaken to understand the impact of dust nuisance to the airport activities and **community**.

Air emissions from construction machinery, including dust, is regarded as a nuisance when it reduces visibility, soils private property, or is aesthetically displeasing. Dust generated by construction related activities must be minimised. The Contractor shall be responsible **for** the control of air emissions and dust arising from his operations and activities. In summary the contractor shall ensure the following:

- Noise **level** is **within** acceptable limits and construction **activities** shall, where possible, be confined to normal working hours;
- **Noise** sensitive areas like **offices** shall be notified at least 5 days before construction or rehabilitation works is due to commence in their vicinity. Any excessively noisy **activity** shall be conducted outside of office hours, where approved by the Resident

Engineer (RE).

- Workers are trained on management of **air pollution from** vehicles and machinery;
- All construction machinery are **maintained** and serviced in accordance **with** the contractor's specifications;
- Asphalt plants and concrete **batching** plants are well sealed and equipped **with** a dust removal device;
- Workers are trained on dust minimisation techniques;
- Dust generating **activities** (excavation, handling and transport of soils) are not carried out during times of strong winds. The RE shall suspend earthworks operations wherever visible dust is affecting properties adjoining the **airport**;
- Water is applied whenever dust emissions (from vehicle movements or wind) are visible at the site in the opinion of the RE.
- Vehicles delivering soil materials are covered to reduce spills and windblown dust;
- Vehicle speeds are limited to **minimise** the generation of dust on site and haul routes;
- Any complaints received by the Contractor regarding dust will be recorded **and** communicated to the RE.

During operation phase of the airport, air and noise quality assessment should be undertaken to establish ambient conditions and whether any potential effects arising from additional **air** traffic emissions would be **significant**.

(d) Control of water and soil contamination

The contractor should construct sealed areas for the storage of fuel, oils, bitumen and chemicals so as to avoid any accidental discharge that would pollute soil and water resources. Where necessary, oil-water interceptors or sumps should be constructed to capture discharge of **oils** and other polluting liquids in storage and dispensing areas. Machinery and vehicle servicing and maintenance should be done off-site at commercial workshops and service **stations** to avoid pollution incidents.

At the work sites the contractor will be expected to maintain strict surveillance of spillage of fuel products and leakage of machines. A safety and emergency response plan will need to be developed for all operations with emphasis on the **protection** of the environment **prior** to start **up**.

In addition, the contractor will be expected to ensure that no construction materials are stockpiled within the areas that are at risk of flooding and ensure **the** following:

- No grey water runoff or uncontrolled discharges from the **site/working** areas shall be permitted;
- Water containing such pollutants as cement, concrete, **lime**, chemicals and fuels shall **be** discharged **into** a conservancy tank for removal from site. This particularly applies to water emanating from concrete **batching** plants and concrete swirls;
- Potential pollutants of any kind and in any form shall be kept, stored and used in such a manner that any escape can be contained and the water table not endangered;
- Wash areas should preferably be off-site. If not possible, be placed and constructed **in** such a manner so as to ensure that the surrounding areas (including groundwater) are not polluted.
- The Contractor shall notify the RE of any pollution incidents on **site**.

(e) Public health and occupational safety

Proper maintenance and efficiency of **existing** wastewater systems should be addressed as proposed in the master plan. Moreover the entire sanitary sewer **leaving** a **building** space or land parcel must comply with sewer regulations of the Nairobi **City** Council as contained **In Part IV of the Jomo Kenyatta International Airport Draft Construction Code**.

During construction, the contractor will be required to prepare a waste management plan for the work **sites** and equipment camp at the start of the project. The contractor will need to **liaise** with the KAA Chief Engineer on suitable waste disposal locations. The site is to be kept clean,

neat and tidy at all times. No buying or dumping of any waste materials, vegetation, litter or refuse shall be permitted. The Contractor shall implement measures to minimise waste and develop a waste **management** plan to include the following:

- All personnel shall be instructed to dispose of all waste in a proper manner;
- At all places of work the contractor shall provide litter collection facilities;
- The final disposal of the site waste shall be done at the **location** that shall be approved by the RE, after consultation with local administration and **local** leaders;
- The **provision** of sufficient bins (preferably vermin and weatherproof) to store the solid waste produced on a daily basis;
- Wherever possible, materials used or generated by construction shall be recycled;
- Provision for responsible management of any hazardous waste generated **during** the construction works.

Workmen should be provided with suitable protective gear (such as dust masks, ear muffs, helmets, overalls, industrial boots etc.) particularly during quarrying, blasting, handling tar and while working on the aggregate crushers, **concrete batching** and asphalt plants. There must be fully equipped First Aid kits on site and a Safety Officer who has first aid training and knowledge of safety procedures. In addition the contractor must have insurance cover for the workmen.

The contractor will be **required** to adhere to Factories and Other Places of Work Act, especially the Building Operations and Works of Engineering Construction Rules and **its subsidiary** and supplementary regulations on Safety and Public Health in the construction activities.

The Contractor shall institute **HIV/AIDS** awareness and prevention campaign amongst his workers for the duration of the contract.

**(f) Rehabilitation of materials sites**

During excavation of **material sites**, it is advisable to cordon off the quarry and borrow areas. The contractor should be instructed to maintain fences and 'make good' of the site afterwards.

Scraped topsoil can be used for re-vegetating the sites after completion and grading.

The already identified materials sites for this project belong to the KAA. If **the contractor** chooses to exploit materials from this site then he will have to consult the KAA Environmental Scientist on the preferable rehabilitation options.

**(g) Traffic management**

- To avoid traffic delays to the airport during construction, the contractor will be required to plan and implement traffic management programme on daily basis;
- The Contractor shall comply with all applicable legislation and by-laws **with** regard to road safety and transport;
- Access to the construction site and works area shall **utilise** existing roads and tracks where possible;
- All temporary access routes shall be **rehabilitated** at the end of the contract to the **satisfaction** of the Resident Engineer;
- Damage to the existing access roads as a result of construction activities **shall** be repaired to the **satisfaction** of the Resident Engineer. The cost of the **repairs shall** be borne by the Contractor.

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## 5.6 Costs of mitigation

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Construction related costs for mitigation of environmental impacts will be included in the Bill of Quantities (BoQ) of the project.

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## 6 ENVIRONMENTAL MANAGEMENT AND MITIGATION PLAN

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### 6.1 Environmental management

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The purpose of the environmental management plan (EMP) is to ensure environmental impacts are identified, avoided, or mitigated during the planning, design, construction, and operation of all new projects.

The EMP has been developed with project knowledge and information available to date. As project commencement and scheduling plans are developed and changed, components of the EMP might require amending. This is therefore a working document, which can be updated whenever new information is received or site conditions change.

Table 6-1 presents the EMP. It outlines corresponding management strategies proposed in Chapter 5 that will be employed to mitigate potential adverse environmental impacts and assigns responsibility for the implementation of the mitigation measures.

#### 6.1.1 Objectives of the EMP

The objectives of the EMP are:

- To bring the project into compliance with applicable national environmental and social legal requirements social policies and procedures;
- a To outline the mitigating/enhancing, monitoring, consultative and institutional measures required to prevent, minimise, mitigate or compensate for adverse environmental and social impacts, or to enhance the project beneficial impacts.

#### 6.1.2 Responsibilities

In order to ensure the sound development and effective implementation of the EMP, it will be necessary to identify and define the responsibilities and authority of the various persons and organisations that will be involved in the project.

The following entities will be involved on the implementation of this EMP:

- Ministry of Transport;
- Kenya Airports Authority;
- Consultants;
- Contractor;
- National Environmental Management Authority (NEMA).

##### (a) Ministry of Transport and Kenya Airports Authority

JKIA is managed by KAA, which falls under the Ministry of Transport. Therefore, the responsibility for ensuring that mitigation measures specified in this EMP and the contract documents are implemented will lie with the KAA and its parent Ministry of Transport.

The environmental monitoring staff from KAA and if necessary, representatives from NEMA will undertake monitoring during construction and operation phases of the project.

KAA has developed JKIA Construction Code for all the all works at the airport premises, which the Contractor must comply with in the execution of the proposed works.

(b) The Resident Engineer

The Resident Engineer (RE) will be appointed by the Supervising Consultant and will be required to oversee the **construction** programme and construction activities performed by the Contractor, in compliance with the present EMP.

It is recommended that **prior** to commencement of **actual** construction; the Consultant should **submit** a work site plan that **complies** with the national environmental **guidelines** and an updated EMP for the **different** phases of the work. The environmental plan should specify in **particular** the location of borrow areas, disposal area of construction debris and arrangements for **traffic** management. The plan should take into consideration the mitigation measures proposed in this EIA Project Report.

The Supervising Consultant should also appoint an Environmental and Safety Officer or Consultant who will be responsible for the following tasks:

- Drafting environmental aspects during project implementation;
- Managing **environmental** and safety aspects at the work sites;
- **S/He shall** participate in the definition of the no working-areas and the location of campsite, borrow pits, quarries and other areas;
- Recommending solutions for **specific** environmental problems;
- **S/He shall** facilitate the creation of liaison group with the stakeholders at the airport and **shall** monitor the compliance EMP;
- Organising consultations at key stages of the project with the stakeholders and interested parties;
- **S/He will** be required to **liaise** with the KAA Environmental Officer or NEMA on the level of compliance with the EMP achieved by the **Contractor** on a regular basis for the duration of the contract;
- Controlling and supervising the Implementation of the EMP;
- Preparing **quarterly** environmental progress or "audits" reports on the status of implementation of measures and management of work sites.

(c) The Contractor

The Contractor will be required to comply with the requirements of the **EIA**, this EMP and the Part **IV** of the JKIA Construction Code **which** include specifications for Environmental standards at the airport.

(d) **National Environment Management Authority**

The responsibility of the National **Environmental** Management Authority (NEMA) is to exercise general **supervision** and **co-ordination** over all matters relating to the environment and to be the principal instrument of government **in** the implementation of all policies relating to the environment.

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## 6.2 Environmental guidelines

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In addition to the **mitigation** presented in Chapter 5 and to facilitate the use of the EMP, the **following** environmental management guidelines are presented according to the sequence of project stage **activities** as follows:

- Pre-construction;
- Site preparation;
- Site Housekeeping;
- Health, Safety and **Security**;
- Operation.

### 6.2.1 Pre-construction

The RE and the Contractor will undertake the following:

- Ensure the tender documents specify required standards and **certification** for procurement of all materials and **appliances**;
- As far as possible, ensure that the **environmentally** friendly and sustainable materials are used. Materials not to be used for construction include:
  - Wood wool slab in permanent **formwork** to concrete;
  - Calcium **silicate** bricks or tiles;
  - Asbestos in any **form**;
  - Asbestos substitutes or any naturally occurring or man-made mineral fibres;
  - Lead, lead paint or any other materials containing lead which may be inhaled, ingested or **absorbed**;
  - Vermiculite, unless it is established as being fibre-free;
  - Any products containing **cadmium** that are regarded as being **injurious** substances (refer to the UK Environmental Protection (Controls on Injurious Substances (No. 2) Regulations 1993);
  - Any other substances regarded as being deleterious building materials, which are not in accordance with statutory requirements or with current, accepted good **building** practice at the time of **specification** or construction.
- The RE should ensure that the Contractor is instructed in the use of **all** materials that may have negative environmental (including health) effects;
- Undertake a **pre-construction inspection** of each section of the proposed development. The inspection **shall** involve a site review and any identified ancillary **sites** required by the Contractor. It will serve to:
  - Identify site-specific construction or environmental problems;
  - **Identify** services any existing facility that are required to be relocated and / or reinstated;
  - Identify cut and spoil disposal or storage sites.

### 6.2.2 Stakeholder consultation

KAA shall facilitate stakeholder consultation with a view of making changes and **satisfying** progress as need arises.

### 6.2.3 Environmental training and awareness

- The Contractor must be aware of the environmental **requirements** and constraints on construction activities contained in the provisions of the EMP;
- **The** Contractor will be required to provide for the appropriate Environmental Training and Awareness as described in these guidelines in his costs and programming;
- An **initial** environmental awareness **training session** shall be held prior to **any** work commencing on site.

The training should include reference, **but** not be **restricted**, to the following:

- Basic awareness and **understanding** of the key environmental features of the work site and ways to minimise environmental impacts;
- Relevant requirements of the **EMP**;
- Prevention and handling of fire;
- **Health** risks pertinent to the site, including prevention of diseases.

### 6.2.4 Site layout plans

The Contractor **will** produce a plan **illustrating** proposed working and 'no-go' areas. The plan should include reference to the **following** aspects where pertinent as and where these are required:



- Proposed working areas;
- 'No-go' areas;
- Quarries, borrow **pits** and spoil areas;
- Labour force eating areas;
- **Sanitation/ ablution** facilities;
- Storage, spoil, stockpile and lay down areas;
- Hazardous and fuel storage areas;
- Batching plant and **workshop/equipment** areas;
- Vehicle wash areas;
- Waste disposal facilities;
- Access routes;
- Project security gates and gatehouses.

#### 6.2.5 Site security

The Contractor will need to take the following measures:

- Appropriate fencing, security gates, shelter **and/or** security guards are to be provided at the Construction Site to ensure the security of all plant, equipment and materials, as well as to secure the safety of **site staff**;
- **Site staff** that are found to be involved in incidences of **theft** or pose other security risks to the airport operations are to be dismissed and reported to **KAA**.

#### 6.2.6 Environmental programs

Environmental aspects are based on **organisational** activities and specific **operations**, and consider the current and future airport environment. The environmental programmes that will need to follow **through** during the construction and operations phases include the following:

- Environmental Audit;
- increased Aircraft Noise;
- Hazardous Materials **Spill** Response;
- Water Quality.

##### (a) Environmental Audit (EA)

The purpose of an EA is to ensure the environmental management plan during the **planning**, design, construction, and operation of the project is implemented and updated at each stage accordingly. Environmental impacts to be audited are outlined in the EMP and may include changes of air, soil and water quality, waste management impacts, personal safety, social issues and aesthetics.

##### (b) Aircraft Noise

KAA must maintain a good working relationship **with** nearby communities while balancing demands for a safe, convenient, and 24-hour service airport. Regular qualitative airborne noise, noise from ground operations and road **traffic** noise associated with the airport **noise** assessment must be undertaken to ensure compliance with local regulations.

##### (c) Hazardous materials **spill** response

The use of some hazardous **materials** is necessary for the day to day operations of the airport. The more often they are **handled** and used, the greater the possibility for accidental release into the environment. Hazardous material spills can have severe impacts on the **environment** by contaminating the soil and making their way **into** the ground water or other water supplies.

An effective and efficient hazardous material spill emergency **plan** is necessary to **minimise** any detrimental effects to the environment and human health. The purpose of **the** plan is to ensure proper assessment, management, **cleanup**, and regulatory **compliance** of any

hazardous materials spill occurring at the JKIA.

(d) Water Quality

There is always a risk that substances commonly associated with **airport operations** can enter the storm water systems, **sanitary** systems or groundwater systems as **pollutants**. To ensure compliance with water quality regulations and guidelines, wastewater systems will need to be sampled and monitored on a regular basis. The purpose is to provide information and guidelines on water quality issues.

(e) **Ozone depleting** substances

These are compounds which, upon decomposition, destructively interact with the **Earth's** ozone layer, resulting in ozone depletion. Of **particular** concern for their ozone depletion capabilities are **halons (bromofluorocarbons)** and CFCs (chlorofluorocarbons). **Halons** are used in fire extinguishing equipment, primarily for electrical fires in portable extinguishers, while CFCs are used as refrigerants in air **conditioning** and cooling systems. The purpose of the environmental management plan is to **minimise** the potential ozone **depleting** effects of **CFCs** by recovering, containing and monitoring the use of CFC containing **material/equipment**.

627 Equipment **maintenance**

It should be demonstrated that **all** equipment and facilities comply with the standards as set out in the tender and equipment spare **parts** are available in the market in the event that a replacement is required. The maintenance team will develop a programme of regular maintenance and ensure that the relevant skills are always available.

**Table 6-1 Environmental management and mitigation plan**

Environmental / Social <b>issue/aspect/activity</b>	Anticipated impact	Standard/ Guideline	Management and mitigation	Monitoring requirements	Responsibility
Vegetation loss:	Impact on ecology.	EMCA.	<ul style="list-style-type: none"> <li>• The clearance of the site for construction purposes shall be kept to a minimum. The Contractor shall clearly mark out the <b>extent</b> of clearing within the approved <b>work-site</b>.</li> <li>• Instruct all construction workers to restrict clearing to the marked areas <b>and</b> not to work outside defined work areas;</li> <li>• Landscaping of the site.</li> </ul>	Weekly reporting on mitigation measures implemented <b>and effectiveness of mitigation.</b>	Contractor/ Resident <b>Engineer/ KAA</b> Environmental Officer.
Erosion control:	Soil degradation, siltation.	EMCA, Agricultural Act: <b>Building Code.</b>	<ul style="list-style-type: none"> <li>• Earthworks should be controlled so that land that is not required for the construction works is not disturbed. Wherever possible, earthworks should be carried out during the dry season to prevent <b>soil</b> from being washed away by the rain.</li> <li>• Excavated <b>materials</b> and excess earth will <b>be</b> kept at appropriate <b>sites</b> approved by the <b>supervising</b> engineer and the earth dumping sites designed in such a manner as to facilitate natural water discharge;</li> <li>• Protect areas susceptible to erosion by installing necessary temporary and permanent drainage <b>works</b> as soon as possible.</li> </ul>	Weekly reporting on mitigation measures implemented <b>and effectiveness of mitigation.</b>	Contractor/ Resident Engineer/ <b>KAA</b> Environmental Officer.

Environmental / Social issue/aspect/activity	Anticipated impact	Standard / Guideline	Management and mitigation	Monitoring requirements	Responsibility
<b>Air and noise pollution.</b>	Degradation of air quality; Health hazard.	<b>EMCA.</b> Factories Act (Noise Prevention and Control Rules) <b>Public Health Act</b>	The Contractor shall be responsible for the control of air emissions and dust arising <b>from</b> his operations and activities and shall ensure the following: <ul style="list-style-type: none"> <li>• Noise level complies with the Noise Prevention and Control Rules;</li> <li>• Noise sensitive areas like offices shall be notified at least 5 days before construction is commenced;</li> <li>• Workers are trained on management of air pollution <b>from</b> vehicles and machinery and dust <b>minimisation</b> techniques;</li> <li>• All construction machinery are maintained and serviced in accordance with the contractor's specifications;</li> <li>• Asphalt and concrete batching plants are well sealed and equipped with a dust removal device;</li> <li>• <b>Dust</b> generating activities (excavation, handling and transport of soils) are not carried out during times of strong winds.</li> <li>• Vehicles delivering soil materials are covered to reduce spills and windblown dust;</li> <li>• Vehicle speeds are limited to <b>minimise</b> the generation of dust on site and on haul routes;</li> <li>• During operation phase of the airport, air and noise quality assessment should be undertaken to establish ambient conditions and whether any potential effects arising <b>from</b> additional air traffic emissions would be significant.</li> </ul>	Weekly reporting on health and safety <b>considerations</b> , mitigation measures implemented and effectiveness of mitigation.	<b>Contractor/ Resident Engineer/ KAA Environmental Officer.</b>
<b>Water and soil contamination</b>	Soil, water and groundwater contamination.	EMCA. Public Health Act.	<ul style="list-style-type: none"> <li>• Construct oil-water interceptors or sumps to capture discharge of oils, fuels and other polluting liquids from workshops, vehicle and equipment washing bays;</li> <li>• A safety and emergency response plan to be developed for all <b>operations</b> with emphasis on the <b>protection</b> of the environment;</li> <li>• No grey water runoff or uncontrolled <b>discharges</b> from the <b>site/working</b> areas (including <b>washdown</b> areas) shall be</li> </ul>	Weekly reporting on health and safety <b>considerations</b> , mitigation measures implemented and effectiveness of mitigation.	<b>Contractor/ Resident Engineer/ KAA Environmental Officer.</b>

Environmental/Social issue/aspect/activity	Anticipated impact	Standard Guideline	Management and mitigation	Monitoring requirements	Responsibility
Water utilisation:	<ul style="list-style-type: none"> <li>Water wastage; Increase in project costs;</li> <li>Poor hygiene and sanitation.</li> </ul>	EMCA, Building Code.	<ul style="list-style-type: none"> <li>Monitor water consumption and utilisation;</li> <li>Sensitise construction workers on the importance of proper water management.</li> </ul>	<ul style="list-style-type: none"> <li>Record and document water consumption; Report on any irregularities..</li> </ul>	Main Contractor. KAA Environmental Officer.
Additional demand for electricity supply:	Numerous power shortages.	EMCA.	<ul style="list-style-type: none"> <li>Develop an energy management plan,</li> </ul>	Develop consumption trends.	KAA Chief Engineer.
Energy utilisation:	Energy wastage.	EMCA.	<ul style="list-style-type: none"> <li>Develop an energy management plan;</li> <li>Construction machinery and vehicles should be maintained and used in accordance with manufacturer's specifications, to maximise efficiency and lower use of energy;</li> <li>Construction workers should be sensitised on the importance of energy management.</li> </ul>	<ul style="list-style-type: none"> <li>Determine energy consumption as per set targets;</li> <li>Documenting consumption levels and reporting on any irregularities.</li> </ul>	Main Contractor.
increased wastewater (sewage):	Surface and groundwater pollution.	Monitoring the performance of sewer lines, septic tanks and soak pits.	<ul style="list-style-type: none"> <li>Maintenance of constructed sewer and wastewater handling systems.</li> </ul>	Regular monitoring of the septic tanks and soak pits.	KAA Chief Engineer.
Production of waste:	Soil degradation and surface water pollution.	Water Act; EMCA; Agriculture Act.	<ul style="list-style-type: none"> <li>Develop a solid waste management plan prior to project commencing, identifying optimal waste re-use options and disposal areas;</li> <li>Waste should not be burned on site or dumped in undesignated waste disposal areas;</li> <li>Minimise waste production by utilising best available techniques for site preparation;</li> <li>Re-use construction waste to the maximum extent possible;</li> <li>Proper handling and storage procedures for hazardous wastes e.g. fuel oil should be stored in areas with hard standing and containment to handle spills.</li> </ul>	Report on all waste production and handling procedures.	Project Manager / Supervising Consultant/ Main Contractor/ Property owner.

## 7 CONCLUSION

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This Project Report has been prepared to provide sufficient and relevant information on the proposed project to enable the National Environment Management Authority (NEMA) to establish whether the activities of the project are likely to have significant adverse **environmental** impacts. If the **negative impacts** are adequately addressed by **mitigation** measures, this Report **can** form a basis for the Issuance of an Environmental Impact Assessment (EIA) Licence.

This Report documents the findings of **an** assessment and study of the proposed project site, project **design** and **neighbour's concerns**. Mitigation measures have been proposed for **identified** impacts and an environmental management plan **for** the **implementation** of the proposed measures has been presented.

Overall, it is recommended that this Project can proceed and the proposed mitigation measures implemented, as the development is consistent with the current development of the area. NEMA approval can be issued on the **basis** of this report.

The construction will be on-going in different phases for a period of approximately three years at an estimated cost of **USD. 25million**.

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## APPENDICES

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Appendix 1	Copy of NEMA Registration Certificate for GIBB Africa Ltd
Appendix 2	Summary of offences and penalties for non-compliance;
Appendix 3	Photographs
Appendix 4	Documentation from KAA
Appendix 5	Public consultation form

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**Appendix 1 Copy of NEMA Registration Certificate for GIBB Africa Ltd**

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Environmental / Social issue/aspect/activity	Anticipated impact	Standard/ Guideline	Management and mitigation	Monitoring requirements	Responsibility
			<p>permitted; Water containing pollutants such as cement, concrete, lime, chemicals and fuels shall be discharged into a conservancy tank for removal from site;</p> <ul style="list-style-type: none"> <li>• Potential pollutants of any kind and in any form shall be kept, stored and used in such a manner that any escape can be contained and the water table not endangered;</li> <li>• Equipment Storage or wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas (including groundwater) are not polluted;</li> <li>• The Contractor shall take reasonable measures to control stormwater and its erosive effects;</li> <li>• No construction materials shall be stockpiled within areas that are at risk of flooding.</li> </ul>		
<p><b>Public health and occupational health and safety</b></p>	<p>Health and safety risks from:</p> <ul style="list-style-type: none"> <li>• Public health problems;</li> <li>• Physical injury from slipping falling and handling equipment;</li> <li>• Fire;</li> <li>• Inhalation of gas, oil or paint fumes and dust;</li> <li>• Handling hazardous materials.</li> </ul>	<p>Factories Act (Building Operations and Works of Engineering Construction Rules), Public Health Act, Building Code, EMCA.</p>	<ul style="list-style-type: none"> <li>• Implement measures to minimise waste and develop a waste management plan.</li> <li>• Develop a site safety action plan detailing safety equipment to be used, emergency procedures, restrictions on site, frequency and personnel responsible for safety inspections and controls.</li> <li>• Daily site inspections should be done to ensure safe work practises are adhered to;</li> <li>• All workmen should be provided with personal protective equipment;</li> <li>• The Conditions of Construction in the tender documents should stipulate health, safety and environment regulations and work procedures;</li> <li>• The Contractor must appoint a foreman with knowledge on health, safety and environment regulations;</li> <li>• All injuries that occur on site must be recorded in the accident registers and corrective actions for their prevention be instigated as appropriate (Section 62 of the Factories and Other Places of Work Act);</li> </ul>	<p>Weekly reporting on health and safety considerations, mitigation measures Implemented and effectiveness of mitigation.</p>	<p>Main Contractor/ Resident Engineer/ KAA Environmental Officer.</p>

Environmental/Social issue/aspect/activity	Anticipated impact	Standard/Guideline	Management and mitigation	Monitoring requirements	Responsibility
			<ul style="list-style-type: none"> <li>Site personnel should be encouraged to report "near-miss incidents: in order to avoid potential problems and increase safety awareness;</li> <li>Statistical records on accidents and incidents should be collated and analysed on a monthly basis and forwarded to the Supervising Consultant and displayed on the notice boards.</li> </ul>		
Rehabilitation of material sites	Health hazard.	EMCA.	<ul style="list-style-type: none"> <li>Cordon off the quarry and borrow areas and maintain fences and "make good of the site afterwards.</li> <li>Rehabilitate the sites after completion and grading as per KAA preferred rehabilitation options.</li> </ul>	Monthly reporting on status and rehabilitation options.	Contractor/ Resident Engineer/ KAA Environmental Officer.
Traffic Management	Traffic congestion, time delays etc.	EMCA. Traffic Act.	<ul style="list-style-type: none"> <li>Plan and implement traffic management programme on daily basis;</li> <li>Comply with all applicable legislation and by-laws with regard to road safety and transport.</li> </ul>	Before the start of main construction works.	Contractor/ Resident Engineer/ KAA Environmental Officer.
Archaeological findings	Destruction of natural heritage/ loss of archaeological findings.	National Museums of Kenya	<ul style="list-style-type: none"> <li>The Contractor should secure the location 'as is' and immediately call the National Museums of Kenya's Archaeology Section.</li> </ul>	Reporting on any unusual finding.	Project Manager / Supervising Consultant and Main Contractor.
Increase in mortality through bird strike.	Increase in risk of Mortality through bird strike.	EMCA; Kenya Civil Aviation Authority.	<ul style="list-style-type: none"> <li>KAA should increase proportionately the intensity of its bird scaring activities and maintain its management of grassland to minimise the risk of bird strike.</li> </ul>	Daily reporting.	KAA Environmental Officer
Hazardous materials spill response:	<ul style="list-style-type: none"> <li>Health hazard.</li> </ul>	EMCA, Building Code.	<ul style="list-style-type: none"> <li>An effective and efficient hazardous material spill emergency plan is necessary to minimise any detrimental effects to the effects to the environment and human health. The purpose of the plan is to ensure proper assessment, management, cleanup, and regulatory compliance of any hazardous materials spill occurring at the JKIA.</li> </ul>	<ul style="list-style-type: none"> <li>Record and document water consumption;</li> <li>Report on any irregularities.</li> </ul>	Main Contractor. KAA Environmental Officer.

Offences and penalties for non-compliance with <b>provisions</b> under Environmental legislation			
item	Offences	Penalties for an offence	Additional requirements
General offence	<ul style="list-style-type: none"> <li>Offence against a provision of the Act, where no penalty is specifically provided for.</li> </ul>	<ul style="list-style-type: none"> <li>Fine of not more than Kshs 350,000.</li> <li>Imprisonment for not more than 18 months.</li> <li>Or both such fine and imprisonment.</li> </ul>	
Inspection	Offences in respect of inspection, including: <ul style="list-style-type: none"> <li>Hindering or obstructing an environmental inspector in his duties;</li> <li>failure to <b>comply with a lawful</b> order made by an inspector.</li> </ul>	<ul style="list-style-type: none"> <li>Fine of not more than Kshs 500,000.</li> <li>Imprisonment for not more than 2 years.</li> <li>Or both such fine and imprisonment.</li> </ul>	
EIA	<ul style="list-style-type: none"> <li>Failure to submit project report contrary to the requirements of Section 58 of the Act.</li> <li>Failure to prepare an EIA in accordance with the requirements of the Act.</li> <li>Knowingly give false information in an EIA report.</li> </ul>	<ul style="list-style-type: none"> <li>Fine of not more than Kshs 2,000,000.</li> <li>Imprisonment for not more than 2 years.</li> <li>Or both such fine and imprisonment.</li> </ul>	
Records	<ul style="list-style-type: none"> <li>Failure to keep records required under the Act.</li> <li>Fraudulently or knowingly altering records.</li> <li>Fraudulently or knowingly making false statements in any records required under the Act.</li> </ul>	<ul style="list-style-type: none"> <li>Fine of not more than Kshs 500,000.</li> <li>Imprisonment for not more than 18 months.</li> <li>Or both such fine and imprisonment.</li> </ul>	
Standards	<ul style="list-style-type: none"> <li>Violation of any environmental standard established under the Act;</li> <li>Contravenes any measure prescribed under the Act;</li> <li>Uses the environment or natural resources in a wasteful and destructive manner contrary to measures prescribed under the Act.</li> </ul>	<ul style="list-style-type: none"> <li>Fine of not more than Kshs 500,000.</li> <li>Imprisonment for not more than 2 years.</li> <li>Or both such fine and imprisonment.</li> </ul>	

EMCA Licences and permits

Impact Item	License or permit	Requirements	Application	Condition
<p><b>Effluents</b></p>	<p>Licence to discharge effluents</p>	<ul style="list-style-type: none"> <li>• Required by the owner or operator of any trade or industrial undertaking, which discharges an effluent.</li> <li>• Duty to supply plant information.</li> <li>• Submit to the Authority accurate information about the quantity and quality of effluents and other pollutants within 90 days after the commencement of the Act.</li> <li>• Or the Authority may demand.</li> </ul>	<ul style="list-style-type: none"> <li>• Applications to be made in the prescribed form and accompanied by the prescribed fee to the relevant local authority operating or supervising a sewerage system.</li> <li>• In the case of an owner, operator of a trade or industrial undertaking who was discharging effluents or pollutants into the environment before the Act, the application shall be made within 12 months after the commencement of the Act.</li> <li>• Where there is no sewerage system, the developer or owner shall, before being granted a license to discharge effluents, install an appropriate plant for the treatment of effluents.</li> </ul>	<p>The Authority may reject the application for an effluent discharge license, and will provide reasons within 21 days of its decision.</p> <p>The effluent discharge licence may be subject to such conditions as the Authority may determine and may vary the conditions attached to it if:</p> <ul style="list-style-type: none"> <li>• the licensee violates any provision of the Act;</li> <li>• the licensee violates any condition imposed in the licence;</li> <li>• the Authority considers it in the interest of the public or the environment to do so.</li> </ul>
<p><b>Wastes and Hazardous wastes</b></p>	<p>Licence for wastes</p>	<ul style="list-style-type: none"> <li>• Required for a person to generate hazardous wastes, handle, store, transport, classify or destroy wastes or operate a waste disposal site or plant.</li> </ul>	<p>Applications to be made in the prescribed form and accompanied by the prescribed fee to the Authority.</p> <ul style="list-style-type: none"> <li>• Any person who owns or operates a wastes disposal site or plant, or generates hazardous wastes, shall apply to the Authority for a licence within 6 months after the Act comes into force.</li> </ul>	<p>The Authority may reject the application for a licence for wastes, and will provide reasons within 21 days of its decision.</p> <p>The hazardous waste licence may be subject to such conditions as the Authority may determine.</p> <p>The hazardous waste licence may be cancelled if:</p> <ul style="list-style-type: none"> <li>• the licensee violates any provision of the Act.</li> <li>• the licensee violates any condition imposed in the licence.</li> <li>• the Authority considers it in the interest of the public or the environment to do so.</li> </ul>

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## **Appendix 2 Summary of offences and penalties for non-compliance**

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Application Reference No. 1  
Registration No. 0001  
OR OFFICIAL USE



THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT  
CERTIFICATE OF REGISTRATION AS AN ENVIRONMENTAL IMPACT  
ASSESSMENT/AUDIT EXPERT

This is to certify Ms. **GIBB (Eastern Africa)**.....  
of **P.O. BOX 300020 NAIROBI**..... (Address)  
has been registered as an Environmental Impact Assessment Expert in accordance with the provisions  
of the Environment Management and Coordination Act and is authorized to practice in the capacity of  
a Lead Expert/Associate Expert/Firm of Experts (Type) **FIRM EXPERT**.....

Dated this **10<sup>TH</sup>** day **FEBRUARY** of **2005**.....

Signature.....

(Seal)

Director General

The National Environmental Management Authority

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## Appendix 3 Photographs

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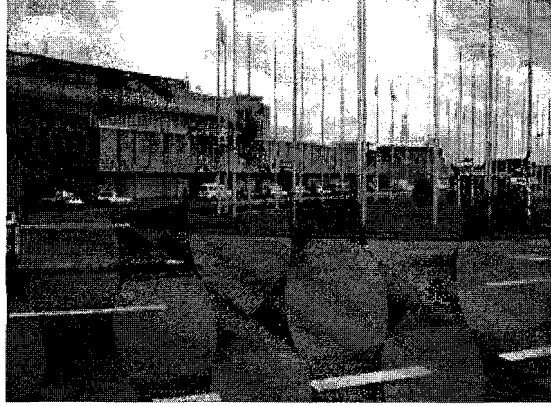



	Description	Photograph
Plate 1	Arrivals Building: Several Changes are proposed within this section.	
Plate 2	Current long stay parking area.	
Plate 3	Area proposed for the development of new parking.	
Plate 4	Section of the area proposed for development of new Terminal.	



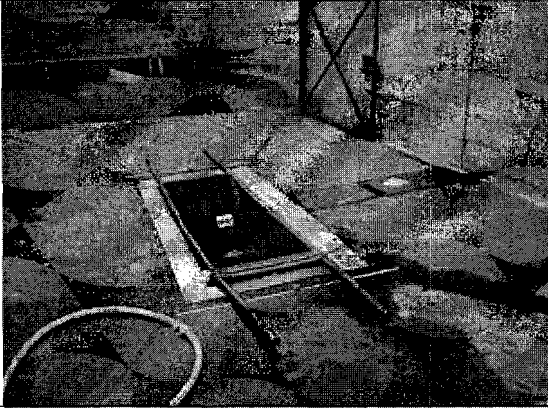



Plate	Description	Photograph
Plate 5	Aircraft wastewater catchpit sewer.	
Plate 6	Solid waste collection point.	
Plate 7	Cluttered waste next to the area used for repairs.	
Plate 8	Aeroplanes repairs section.	


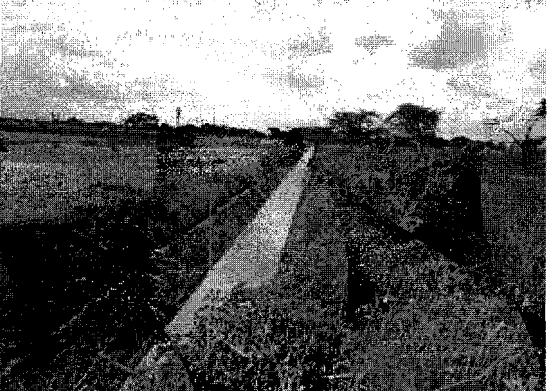



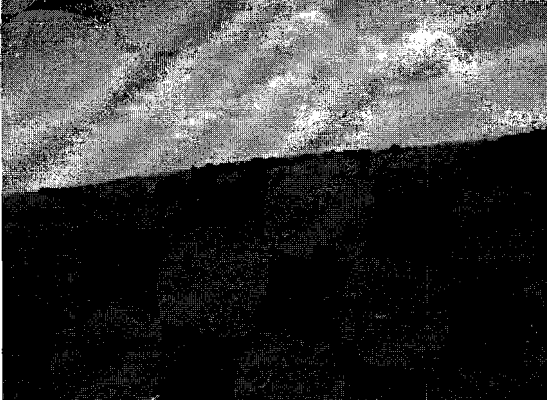

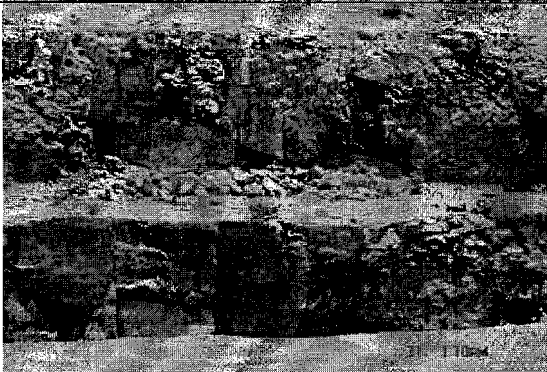
Plate	Description	Photograph
Plate 9	Section of well maintained grassland:	
Plate 10	Storm drainage within the airport.	
Plate 11	Storm drainage within the airport possible attraction of birds within the airport.	
Plate 12	Semi improved grassland, managed according to the standard "long grass policy".	

Plate	Description	Photograph
Plate 13	Area proposed for the runway.	
Plate 14	Vacant section of the airport where Base and Sub-materials for construction will be derived.	
Plate 15	Section of the old quarry where construction waste will be deposited.	
Plate 16	Section of the old quarry. Notice the accumulation of stagnant water.	

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**Appendix 4 Documentation from KAA**

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FROM :

FAX NO. :

Feb. 27 1999 09:41PM P1



**Kenya Airports Authority**

Head Office, Airport North Road  
P.O. Box 19001 (00501) Nairobi, Kenya.  
Tel: 254 - 020 - 825400/14, Fax: 254 - 020 - 822078  
E-mail: info@kenyaairports.co.ke  
www.kenyaairports.co.ke

**RE: KAA/ES/450/CON VOL.3**

**31<sup>ST</sup> MAY, 2006**

MIS QUEEN'S QUAY ARCHITECTS INTERNATIONAL  
100 Scarsdale Road, Suite 290  
Toronto, ON M3B 2R8

CANADA

Fax 1-416-203-2101

Attn.: Mr. Mohan Chai

Dear Sir,

**RE: ENVIRONMENTAL IMPACT ASSESSMENT FOR JKIA  
EXPANSION PROJECT - EXEMPTION OF THE PROJECT  
FROM PHYSICAL PLANNING ACT AND GOVERNMENT  
PLANNING REGULATIONS**

Reference is made to your email of 2<sup>nd</sup> May, 2006 on the above subject.

We have an understanding with the Department of Physical planning and the Local Government that as the Government Authority responsible for planning, design, maintenance of Aerodromes, Kenya Airports Authority does not require other approvals for development of airport facilities. The above project is therefore exempt from Physical Planning and other Government Planning Regulations.

Yours faithfully,

  
**GEORGE K. MUHOHO  
MANAGING DIRECTOR**

QUEEN'S QUAY ARCHITECTS INTERNATIONAL INC.	
PROJECT No:	04-11
Rec'd	JUN 07 2006
SAVED IN DIRECTORY	

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**Appendix 5 Public consultation form**

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## IV Comments & Opinions

We would like to thank all those who have taken the time to review the Inception Report and the **Draft** Report and **Design** Options and submitted their comments and opinions to date. We are listing these submissions in this section. Most of these will be addressed as we proceed into the next Phase of the **Contracted Work**.

The comments are listed by date.

**November 19,2004**

**Mr. J.K. Mailutha, Deputy Commissioner, JKIA**

We acknowledge receipt of the copy of the Inception Report regarding the above subject.

We have studied the report and based on the peak hour traffic, schedules and JKIA's potentially as a hub, Customs concerns are as listed here below:

- 1) **Dual Channel System.** In accordance with regulations 44/45 there must be established at every place of arrival and within the Baggage Hall at every Port "Red and Green Channels" with an inscription of the word "CUSTOMS". This is in line with International Standards.
- 2) Clear separation of arriving and departing passengers
- 3) Separate staff **Entrance/Exit** for Airport employees, separate from **arriving/departing** passengers.
- 4) **Office Space.** Lack of offices of Administration and Technical Services e.g. passenger body searches.
- 5) **Customs Warehouse.** The current facility cannot cope with the volume of goods for **imports** and transit.
- 6) Baggage Trolleys to be re-allocated. Present location poses a security risk.
- 7) Enough space to be created between the conveyor belts and examination benches.
- 8) **Departures**
  - Customs Clearance Counters
  - Administration and Technical **Offices** at all the Units
  - Units to be re-designed for Passengers to check-in with the Airline first before undergoing **Security/Customs** checks.

**December 03,2004**

**Mr. W. N. Omolo, Director General, Kenya Civil Aviation Authority [KCAA]**

KCAA has formed an Internal Committee to follow-up on Air Navigation Safety concerns that may require attention during the terminal building modernization process.

The two options presented represents a well structured expansion programme which when Implemented should improve passenger comfort, quick flow and more **aircraft** handling capacity of JKIA.

To go along with the expansion of the terminal building KCAA recommends **that improvement** should be done on the only available Runway 06/24. The **construction** of a rapid Exit Taxiway or Extension of Taxiway G to join the **end/beginning** of Runway 06/24 would allow for faster **landing** and takeoff rates as JKIA.

Further comments on the proposals from KCAA will be communicated to you as the committee work progresses.

**December 23,2004**

**Mr. Yogaish Sapra, Managing Director, Maya Duty Free Ltd**

**Re: Re-organization & upgrading of passenger terminal, J.K.I.A**

Further to your letter dated 10/12/04; ■ would like to make the following comments:

- 1). ■ would like to know if there will be a special provision of a service entrance, goods loading zones, goods lift, and goods / service corridors. ■ consider these very important for the ease of passage of goods to shops, and stores without interfering with the main passenger movement areas.
- 2). Will there be provision of storage areas close to the Duty Free Shops.
- 3). At present our stores are located in the main building area, will we have access from the area to the ring building to supply our goods.
- 4). I have noticed some small retail areas marked next to the main Duty Free Shops, for what sort of retail are these areas.
- 5). You will be moving all the Duty Free shops into the **two** designated areas in your plan, what procedure will be used to allocate the areas in these spaces.
- 6). When do you envision as the commencement date of the works.

**December 24, 2004**

**Mr. C.N. Kimemia, Ministry of Transport**



Flexibility of application of messages on selected areas i.e. both graphic (print & electronic) should be considered. Use of modern material & easy to maintain systems highly recommended.

KTB and other stakeholders would be keen to make use of the areas above to post messages intended to promote Kenya's tourism, trade & investment **attractions**. These messages would serve to provide a clear linkages with & reinforce other related messages that are disseminated in source markets through a variety of media including trade shows & exhibitions.

- 2) The balancing of **high/modern** technology & traditional Kenyan architectural styles & decorations would also add considerable value aesthetically. We are currently utilising a stand at high profile international trade shows that features **maasai** manyattas ( As agreed, I will send you a soft copy for your reference). Previously we successfully used a stand that featured smart: tents, off-white in colour with wooden uprights.
- 3) **Colour** is a key aspect of **Kenyan/African** people. Warm vibrant colours to be cleverly interspersed with neutral hues with care taken not to overdo the colour element. The current large areas of grey concrete is very "cold" and unwelcoming. The idea as discussed is to create a uniquely "Kenyan experience" to be savoured by travellers (both new & return visitors).
- 4) I quite like the idea of dedicating specific areas for landscaping, fountains & the introduction of plenty of natural light. Tropical plants should also be introduced (bringing nature into the airport) in appropriate areas in the interior e.g. adjacent to the walkways.
- 5) **Stunning/brilliant** works-of-art made from ecologically friendly material where possible, (easy to maintain) to be positioned on carefully selected areas of the airport.
- 6) An airport hotel with exhibition & conference facilities is a smart idea even if implemented at a latter phase.

We wish you every success & look forward to working with you to the successful conclusion of this very important project.

Other thoughts:

Professional blend of music, both foreign & **Kenyan/African** with a bit more of the latter would add to creating a Kenyan ambience. Piped music to be played on modern equipment. Acoustics well taken care of.

Embakasi and to move domestic passenger facilities to the current Presidential Pavilion. (alternatively, a temporary structure could be created between Unit 3 and the Pavilion for the handling of domestic passengers and baggage). Additional apron / aircraft parking positions should be created relatively close to the terminal. Passengers can be brought from / to parked aircraft by busses, just like at any other airport in the world. In order to free-up more parking space, also General Aviation could be moved to Embakasi, provided a suitable road is available / constructed within the perimeter to transfer passengers / baggage / ground services equipment / KAA vehicles etc.

- 3) The above implies that ■ strongly suggest to combine the phasing which currently proposed. In my view, the upgrade of Unit 3 and the construction of Unit 4 should be done simultaneously.

#### Drawings:

- 1) ■ do not see an expansion of the number of check-in desks. The current capacity at peak hours (at least in Unit 1) is not sufficient to say the least. ■ do understand that, with the addition of a fourth unit, the absolute number of check-in positions at JKIA will increase but nevertheless we should (at least technically) cater for the construction of extra check-in positions plus baggage handling facilities in the current units.
- 2) In the current check-in areas, there is a lack of space for airport ticketing & passenger assistance desks and (airport) information counters. The plans show that the check-in area will be increased towards the road side. I suggest that, in that expanded area, room will be created for ticketing desks and information counters. Currently, in case of cancellations, denied boarding situations etc., passengers are handled by staff from offices behind the check-in counters. Often (frustrated) passengers queue in front of these offices, disturbing and disrupting the 'normal' passenger services processes. By creating ticketing / passenger assistance offices for the airlines / handling agents, we can separate 'standard' handling from the handling of disruptions.
- 3) In the same area, today there is already a lack of suitable office space for airline representatives, handling agents etc. This problem will become (much) worse after the entrance to the check-in area (incl. security checks) will be relocated to one side of the building and the exit from the check-in area to the immigrations to the other side of the building. Just for your info, in the areas designated for entrance / exit of the check-in area in the present plans, you currently find offices for British Airways, Regional Air, Emirates, Kenya Airways, KLM, Saudi Arabian Airlines etc. Would there be any possibility to create a floor on top of the check-in area, where offices could be created? Other suggestions? Airline and

baggage. The current 'cages' in the arrival hall are extremely ugly. All (customs) **offices** that do not necessarily need to be in the arrivals hall from an operational point of view **should** be removed to other office space in the arrivals building.

- 8) It is not clear at what point arriving passengers with destination Nairobi **will be** separated from arriving passengers transferring to connecting **flights**. In the current plans, the departure lounge at level 1 will be a sterile area, with security checks for local departing passengers provided straight after check-in. In my view, arriving passengers transferring to connecting flights should first go through a security check before they mix with passengers who checked-in locally. If this is not done, there is a potential security risk since the security standards at other airports, where transferring passengers arrive from, are not necessarily equal to those applied in Nairobi. Therefore, all arriving passengers should go to level 2 and only at the point that passengers with destination Nairobi are going towards the **arrival** hall, connecting passengers should be allowed into level 1, after passing through a security check.

Other issues:

- 1) Even in the current set-up of JKIA, the parking space for ground services equipment (highloaders, tractors, conveyor belts, push back tractors, passenger steps, ground power units, water carts, toilet carts, pallet and container dollies etc. etc.) belonging to KQ and the handling agents is rather limited. If the shared ramps for arriving passengers between **the** gates are going to be built, the parking space for this equipment is going to diminish further. Moreover, a part of the equipment (mainly baggage carts and pallet / container dollies) is currently parked where the future car park and unit 4 are planned. **It** is the responsibility of the airport authority to provide suitable parking space for **the equipment** used by the operators and this space should be in close proximity of the place Where the actual work is being carried out. In a more detailed design, different locations should be designated for this purpose as well as for storage of baggage containers.

- 2) Option **3a**, with shared / split gates in my view **Is** not practical. **It** does improve the use of your apron but **it** will definitely lead to operational clashes with the use of **1** passenger gate by **2** different aircraft.

- 3) The finger of option 3 seems highly unpractical to me. Apart from the whole swing-gate issue (**ifs** that proven technology at other airports?), which **I** fear will lead to operational chaos, **I** foresee practical problems with immigrations, customs etc. **If** the relocation of the presidential pavilion would be approved, there would be no objection to plan an international **finger** on that side of the terminal for the long term. As far as **I** understand, the international gates planned in the unit 4 finger are not required in the very near future. This would allow for the **construction** of a much smaller domestic

#### A. GENERAL COMMENTS

- 1) There appears to be little difference between the plans for 2014 and 2024.
- 2) ~~The Kenya~~ Association of Air Operators is not in favour of the relocation of the Domestic Terminal to the north side of Runway 06 at Embakasi. It is the contention of the KAOAO that such a move would be detrimental to the smooth ground transfer of passengers from domestic to international flights and vice versa. The pick-up and drop off of international passengers at JKIA with General Aviation charter aircraft would also be exceedingly cumbersome. Moreover, fuelling of passenger jets at a Domestic Embakasi Terminal would be difficult and the towing of aircraft between the domestic and international terminals would result in substantial expenses and problems in crossing Runway 06/24.
- 3) In view of Point 2 above, Option 3, with a Domestic Terminal 4 within the existing 'Ring Building', is preferred. The construction of this Domestic Terminal should be 'fast tracked' as much as possible.
- 4) It is understood that the present capacity of the JKIA is limited and that the existing Domestic Terminal 3 is urgently required to meet increasing demand by international arrivals and departures. This proposal is, of course, attractive because it can be implemented relatively quickly and a modest cost. However, the relocation of domestic arrivals and departures to Embakasi entails several disqualifying drawbacks. It is therefore suggested that, in the first instance, a "temporary domestic terminal" be constructed immediately on the large parking area to the east of the existing access promenade, near the Presidential Pavilion. Meanwhile, construction could begin immediately and simultaneously on Terminal 4 and on the Parking Garage, as proposed in Option 3. This would minimise the time span within which the 'temporary domestic terminal' near the Presidential Pavilion would have to be in use. If apron space for domestic and international flights is insufficient, such aircraft could be parked in remote locations and served by busses. Construction of additional apron space should be commenced in the early stages of developments the issue of the congestion of the Domestic Terminal the lack of apron space, more so than the building facility. Additional building at this stage will not solve the problem. Terminal 4 and expanded apron gets built first, Domestic moves in, Terminal 3 gets renovated thereby increasing the International capacity.

Pedestrian and trolley traffic circulation within the 'ring' perhaps merits further study, considering the distances involved (several hundred metres) and the necessity to cross the busy 'ring road'.

- 7) It is not clear how the pick-up of passengers with taxis and private vehicles would function at the proposed Domestic Terminal? The drop-off zone will have to be split into departures and arrivals.

Whilst these are our initial comments, the Association looks forward to continued involvement in the planning process. We would be pleased to discuss the above and other issues pertaining to this project, at your convenience.

**January 17, 2005**

**Mr. Titus Naikuni, CEO & MD, Kenya Airways**

In response to your report submitted on 10<sup>th</sup> December 2004, we have now reviewed the set of *drawings with* the explanation notes and come up with the following comments:

In both the short-term and medium-term, we are in favour of Option 3 with the domestic terminal integrated in the plan.

Our comments are as follows:

#### **Parking Spaces**

- 1) Cargo Apron Space - currently, the Cargo Apron space is not sufficient and overflow cargo aircraft are forced to park adjacent to the passenger main terminal. The Cargo Apron can only accommodate three 747 freighters or 4 DC8s. Our recommendation is to extend the current Cargo Apron southward to be within our boundary area.
- 2) Passenger Aircraft Gates around the terminals - although the number of gates (connecting to aircraft) has increased, the 2014 plans have not produced any additional parking positions. On the contrary, the number of aircraft parking positions around the terminal building in 2014 has reduced from the current 22 to 21 Gates (which includes Terminal 4). Our recommendation is two-fold for Apron Parking space:
  - Complete the new apron as soon as possible (refer to as K in A1a as marked on the attachment)
  - Extend the other Remote Parking area by 2004 (marked as Z on attachment) to include the zone with the shaded area. This would decongest the gates for aircraft requiring longer layovers or night-stops.

#### **Lounges**

- 2) On the proposed lounge relocation, KQ has just invested considerably in a new premium lounge. It is crucial to know the time-lines of the planned lounge relocation (i.e. when do we need to relocate our lounge before the terminal completion).
- 3) **It** is mentioned **that** the existing Gates from 4 to 13 would be maintained. How can shared ramps be introduced every 2 Gates. How will the new **walkway** be introduced?
- 4) **Check-in** Counters - as IATA is moving towards common user **self-service** check-in, the need for the introduction of common user self-service (CUSS) **facilities** in the future becomes a necessity, how is this addressed in the renovation plans?
- 5) The Health facility that meets **ICAO's** requirements has not been addressed in the current setting. Where will this be located?

We would **appreciate** if the issues outlined above could be critically discussed in a forum of stakeholders.

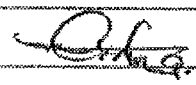
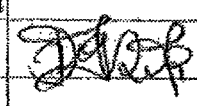
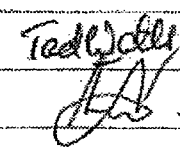
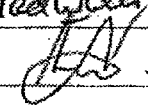


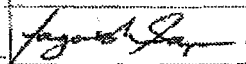

**RE-ORGANIZATION AND UPGRADING OF FACILITIES AT JKIA****STAKEHOLDERS & STEERING COMMITTEE PRESENTATION MEETING  
ON 3RD DECEMBER 2004 AT 9.00AM, JKIA BOARD ROOM, 3RD FLOOR****BEST OPTION - SURVEY**

NO	ORGANIZATION	NOMINATED OFFICER	TITLE	Option 1	Option 2	Option 3	Option 3a	Phased YES/NO
1	AFRAA	Mr. Christian Folly-Kossi	Secretary General					
2	Airline Operators Committee	Ms. S. Wamae (Kenya Aerotech)	Operations Manager					
3	Board of Airlines Representatives	Charles Kutwa	Chairman				✓	NO
4	IATA	Dr. Peter S. Chikumba	Regional Director Africa					
5	JKIA Tour and Travel Operators Association	Joel Ngetich	Secretary				✓	NO
6	Kenya Airports Authority	Mr. George Muhoho	Managing Director					
7	Kenya Airports Authority	Engineer Mukwana	Project Director					
8	Kenya Airports Authority	Engineer Chamwada	Project Manager					
9	Kenya Airports Police Unit	Mr. D.K. Kibenei	Commandant					
10	Kenya Airways	Mr. Titus Naikuni	General Managing Director / CEO					
11	Kenya Association of Air Operators	Captian T.A.D. Watts	Z. Boskovic Air Charters				✓	NO
12	Kenya Association of Air Operators (KAAO)	Col. (Rtd) E. K. Waitthaka	Chief Executive				✓	NO
13	Kenya Association of Tour Operators (KATO)	Fred Kaigua - CEO	CEO					
14	Kenya Association of Travel Agents (KATA)	Roger Silvester	Chairman					
15	Kenya Civil Aviation Authority (KCAA)	Kuto C.A., Anna	Director General					
16	Kenya Duty Free	Mr. Ajay Khotari	General Manager Operations				✓	NO
17	Kenya Pipeline Co. Ltd	Mr. Peter Mecha	Operations					
18	Kenya Railways Corporation	Mr. Andrew Wenyandeh	Managing Director					
19	Kenya Revenue Authority	Mr. J.K. Mailutha	Deputy Commissioner					
20	Kenya Tourist Board	Mr. Raymond Maliba	Chairman					
		Mr. Yogaish					✓	NO
	Maya Duty Free	Sapra	Managing Director				✓	NO
22	Ministry of Health	Ms. Jesica Omai	Port Health Officer				✓	NO





**RE-ORGANIZATION AND UPGRADING OF FACILITIES AT JKIA****STAKEHOLDERS & STEERING COMMITTEE PRESENTATION MEETING  
ON 3RD DECEMBER 2004 AT 9.00AM, JKIA BOARD ROOM, 3RD FLOOR****ATTENDANCE RECORD**

NO	ORGANIZATION	NOMINATED OFFICER	TITLE	SIGNATURE
1	AFRAA	Mr. Christian Folly-Kossi	Secretary General	
2	Airline Operators Committee	Ms. S. Wamae (Kenya Aerotech)	Operations Manager	
3	Board of Airlines Representatives	Charles Kutwa	Chairman	
4	IATA	Dr. Peter S. Chikumba	Regional Director Africa	
5	JKIA Tour and Travel Operators Association	Joel Ngetich	Secretary	
6	Kenya Airports Authority	Mr. George Muhoho	Managing Director	
7	Kenya Airports Authority	Engineer Mukwana	Project Director	✓
8	Kenya Airports Authority	Engineer Chamwada	Project Manager	
9	Kenya Airports Police Unit	Mr. D.K. Kibenei	Commandant	
10	Kenya Airways	Mr. Titus Naikuni	General Managing Director / CEO	
11	Kenya Association of Air Operators	Captian T.A.D. Watts	Z. Boskovic Air Charters	
12	Kenya Association of Air Operators (KAAO)	Col. (Rtd) E. K. Waithaka	Chief Executive	
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17	Kenya Pipeline Co. Ltd	Mr. Peter Mecha for	Operations Manager	
18	Kenya Railways Corporation	Mr. Andrew Wanyandeh	Managing Director	
19	Kenya Revenue Authority	Mr. J.K. Mailutha	Deputy Commissioner (Customs)	
20	Kenya Tourist Board	Mr. Raymond Matiba	Chairman	
21	Maya Duty Free	Mr. Yogalish Sapra	Managing Director	
22	Ministry of Health	Ms. Jesica Omai	Port Health Officer	

**RE-ORGANIZATION AND UPGRADING OF FACILITIES AT JKIA**

**STAKEHOLDERS & STEERING COMMITTEE PRESENTATION MEETING  
ON 3RD DECEMBER 2004 AT 9.00AM, JKIA BOARD ROOM, 3RD FLOOR**

**ATTENDANCE RECORD**

23	Ministry of Transport	Mr. Charles N. Kimemia	Chief Air Transport Office	
24	Mrutu Salmann Associates - Architects	Issac Mrutu	Partner	
25	MSC Inc. - Project Managers	Mohan Chal	CEO	
26	Muambi Associates - Quantity Surveyors	Harrison Muambi	Partner	HCM
27	Office of the President	Mr. Gilbert M. Siang'a	Under Secretary	
28	Office of Vice-President - Immigration	Mr. E.G. Rintaugu	Immigration Officer	
29	Swissport Kenya	Jeroen L. de Clerq	General Manager	
30	Kenya Airways	Mr. Jimmy Kibathi	HEAD OF NETWORK AND STRATEGY	
31	SOUTH AFRICAN Airways	JANOS NAR	REGIONAL Manager	
32	BRITISH AIRWAYS	SIMON HAWKER	SERVICE DELIVERY MANAGER EA	
33	AERO CLUB OF EA	H. TREMPENAU	CHAIRMAN	
34	KCAA	Eng. Mwangela	Chief Engineer	
35	KCAA	ABRAHAM J. OKONGO	Representing MANAGER - ANS, TWA, KQA.	
36	KCAA / TWA	S.M. GICHTUKI	MANAGER	
37	KCAA	KUSHTA OMUTA	OPERATIONS	
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**DOCUMENT CONTROL SHEET**



**FORM MP180 / B**

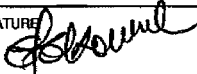

**CLIENT: QUEENS QUAY ARCHITECTS INTERNATIONAL**

**PROJECT: EIA Project Report for the expansion of JKIA**

**JOB NO: JK 1304.**

**TITLE: DRAFT REPORT**

	Prepared by	Reviewed by	Approved by
<b>ORIGINAL</b>	NAME <b>George Goro Owuor</b>	NAME <b>Elizabeth Ndinya</b>	NAME <b>Sean T Avery</b>
DATE <b>15/06/2006</b>	SIGNATURE 	SIGNATURE 	SIGNATURE

<b>REVISION</b>	NAME <b>GEORGE GORO OWUOR</b>	NAME	NAME <b>S.T. AVERY</b>
DATE <b>22/07/2006</b>	SIGNATURE 	SIGNATURE 	SIGNATURE <b>STA</b>

<b>REVISION</b>	NAME	NAME	NAME
DATE	SIGNATURE	SIGNATURE	SIGNATURE

<b>REVISION</b>	NAME	NAME	NAME
DATE	SIGNATURE	SIGNATURE	SIGNATURE

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- (a) GIBB Africa written agreement is obtained prior to such release, and
- (b) By release of the report to the Third Party, that Third Party does not acquire any rights, contractual or otherwise, whatsoever against GIBB Africa and GIBB Africa accordingly, assume no duties, liabilities or obligations to that Third Party, and
- (c) GIBB Africa accepts no responsibility for any loss or damage incurred by the Client or for any conflict of GIBB Africa interests arising out of the Client's release of this report to the Third Party.

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