THE REPUBLIC OF KENYA

LAKE VICTORIA SOUTH WATER WORKS DEVELOPMENT AGENCY (LVSWWDA)

WATER AND SANITATION SECTOR DEVELOPMENT PROGRAM – LAKE VICTORIA SOUTH

ADDITIONAL FEASIBILITY STUDIES, FINAL DESIGN, TENDERING AND SUPERVISION OF PROJECT IMPLEMENTATION FOR

KERICHO, KISII, NYAMIRA AND LITEIN TOWNS

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY REPORT FOR EXPANSION OF THE ITARE WATER SUPPLY SYSTEM AND ESTABLISHMENT OF FAECAL SLUDGE TREATMENT FACILITY FOR LITEIN & KAPKATET TOWNS

Client / Employer:

CHIEF EXECUTIVE OFFICER
Lake Victoria South Water Works
Development Agency
P.O. Box 3325 - 40100
KISUMU, KENYA

Consulting Engineers:

CES
Consulting Engineers
Salzgitter GmbH
Nordstrasse 23
38106 Braunschweig, GERMANY
e-mail: gek@ces.de

Mangat I.B. Patel (MIBP) Ltd.
Consulting Engineers
P. O. Box 48674 - 00100
NAIROBI, KENYA
e-mail: mibp.nairobi@mibp.co.ke

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WATER AND SANITATION SECTOR DEVELOPMENT PROGRAM – LAKE VICTORIA SOUTH

EMPLOYER:

Lake Victoria South Water Works Development Agency (LVSWWDA)

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CERTIFICATION

Compiled By:

Signed …… Date…….

Godwin Lidahuli Sakwa
NEMA Registered Lead Expert NEMA Reg No. 2492

Checked By:

Authorized Representative:

Signed …… Date…….

Eng Ranjit S. Rupra

CES Consulting Engineers Salzgitter GmbH Nordstrasse 23 38106 Braunschweig,
GERMANY e-mail: gek@ces.de

MANGAT, I.B.PATEL LIMITED – Consulting Engineers
P.O. Box 48674, 00100 - GPO - Nairobi, KENYA – TEL : +254 20 2710500

Proponent

Signed …… Date…….

Chief Executive Officer (CEO)
Lake Victoria South Water Works Development Agency (LVSWWDA)
P.O. Box 3325 - 40100
KISUMU, KENYA

WATER AND SANITATION SECTOR DEVELOPMENT PROGRAM – LAKE VICTORIA SOUTH

Additional Feasibility Studies, Final Design, Tendering and Supervision of Project Implementation for Kericho, Kisii, Nyamira and Litein Towns

ENVIRONMENT IMPACT ASSESSMENT AND SOCIAL ASSESSMENT (ESIA) STUDY REPORT FOR EXPANSION OF THE ITARE WATER SUPPLY SYSTEM AND ESTABLISHMENT OF FAECAL SLUDGE TREATMENT FACILITY LITEIN & KAPKATET TOWNS

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LIST OF ABBREVIATIONS

AoI	-	Area of Influence
BoD	-	Biological Oxygen Demand
BOMWASCO	-	Bomet Water and Sanitation Company
C-ESMP	-	Construction – Environment and Social management Plan
CoC	-	Code of Conduct
DMP	-	Dust Management Plan
ESAAP	-	Environment and Social Audit Action Plan
EHS	-	Environment Health and Safety
EA	-	Environmental Assessment
EIA	-	Environment Impact Assessment
EMCA	-	Environment Management & Coordination Act
ESMP	-	Environment and Social Management Plan
IFC	-	International Finance Cooperation
ILO	-	International Labour Organization
IUCN	-	International Union for Conservation of Nature
KEWASCO	-	Kericho Water and Sanitation Company
H&S	-	Health and Safety
KfW	-	German Development Cooperation
KPHC	-	Kenya Population and Housing Census
LVSWWDA	-	Lake Victoria Water Works Development Agency
NEMA	-	National Environmental Management Authority
NOx	-	Sulphur Oxides
SOx	-	Nitrogen Oxides
OSHA	-	Occupational Health & Safety Act
Pm	-	Particulate Matter
PSEA	-	Project Sexual Exploitation and Abuse
PPE	-	Personal Protective Equipment
PDR	-	Design Report
TMP	-	Traffic Management Plan
RWGM	-	Raw Water Gravity Main
VOC	-	Volatile Organic Compounds
WBG	-	World Bank Group
WWTP	-	Waste Water Treatment Plant
WRA	-	Water Resources Authority

E. EXECUTIVE SUMMARY

E.1 Project Information

The Government of Kenya (GoK) through the Ministry of Water, Sanitation and Irrigation (MWSI) received a loan from the Government of Germany, through KfW Development Bank (KfW), to undertake the Water Supply and Sanitation Development Program – Lake Victoria South (WSDP-LVS) for the Towns of Kericho, Kisii, Nyamira, and - if financially viable - Litein and Sotik.

The Program Objective is to ensure the provision of sufficient, hygienic, economically viable and affordable Water and Sanitation Services for the population of the selected Towns, thus contributing to the overall development goal of improving the health of the urban population by reducing waterborne diseases and favouring economic development. The Program also supports enhancement of water supply and sanitation service delivery and sustainability through improved commercialization, pro-poor orientation, and clustering of schemes.

The Project Components discussed in this report are summarized below

i. **Expansion of the existing Itare Water Supply System** from current production capacity of 8,000 m^3/d to 15,500 m^3/d to meet Year 2040 water demands of Litein and Kapkatet Towns including surrounding Market/Trading Centres in addition to the areas within Bomet County that are currently served by the System.

ii. **Proposed Faecal Sludge Treatment Facility in Litein Town** – Sludge Treatment Facility with a design capacity of 20 m^3/d has been proposed in Litein Town to treat faecal sludge generated in Litein and Kapkatet Towns as well as adjacent Five (5) Nr. Trading/ Market Centres (Chemosit, Roret, Kabartegan, Kaplong and Mogogosiek), which are within a radius of approximately 20km from Litein Town.

E.2 Proposed Project Scope of works

Sanitation Measures

The following Sanitation Improvement Measures are proposed for Litein, Kapkatet and adjacent Trading/ Market Centres (Chemosit, Roret, Kabartegan, Kaplong and Mogogosiek):

i. **Faecal Sludge Emptying and Transport:** Under the Contract, 1Nr Exhauster Tankers, of capacity 10,000 litres, will be procured and handed over to KEWASCO for improved and more affordable faecal sludge transport services in the Project Towns and other areas within proximity.

ii. **Faecal Sludge Treatment Facilities:** The Sludge Treatment Facilities have been proposed for Litein Town at the site identified by Kericho County Government, though not yet acquired. Their design is based on the average ultimate flow of 3.0 m^3/d and peak flow of 20.0 m^3/d. The previous design of Sludge Treatment Facilities has been improved to ensure environmental sustainability by introduction of Anaerobic Baffled Reactor (ABR), which is an improved Septic Tank, and provision of Constructed Wetland instead of Soak Pits for liquid effluent polishing. A Soak Pit has been provided for disposal of excess final effluent.

iii. **Resource Recovery/ Safe End-Use and Disposal:** Considering the quantities of the by-products and final products of faecal sludge treatment, the recommended products for resource recovery include.

a. Soil Conditioner and agricultural manure from stabilized and dried sludge.

b. Fodder and weaving plants from Constructed Wetlands.

Water Supply

The Proposed Water Supply Expansion Measures include:

i. Rehabilitation of Existing Water Supply System comprising of the following components

- Intake Works and Raw Water Pumping Station
- Itare Water Treatment Works
- Water Storage Tanks and Distribution Pipelines

ii. New DN 350mm Ferrous Raw Water Pumping Main and its Appurtenances, length 250m

iii. Augmentation of Existing Itare Water Treatment Works from current production capacity of 8,000 m^3/d to 15,500 m^3/d

iv. Proposed Treated Water Pumping Main, ND 300mm pipeline, 2.5km long to convey water from Itare Water Treatment Works to Existing Saseta Tank

v. Proposed Treated Water Transmission Pipeline from Existing Saseta Tank to Existing Chemoiben Tank, OD 315mm Main, 10.3km long

E.3 Approach and Methodology

A reconnaissance site visit was conducted along the proposed Raw Water Pipeline, existing Itare Water Treatment Plant, and Treated Water Pipeline on the 2nd of June 2022. The aim of the visit was to collect primary data through field observation of flora and fauna, water resources, soils resources, land use, landscape and sensitive receptors that could be impacted by the Project. Further, secondary data was collected through literature review of reports and documents including the Design Report (DR).

An effective impact assessment requires engagement with relevant stakeholder throughout the key stages of ESIA assessment. The process of engaging stakeholders assisted in understanding stakeholder views with regards to the Project and in identifying issues that should be taken into account in the prediction and evaluation of impacts. The schedule of public barazas undertaken within the *Kiowa, Mogogoseik and Simoti* locations is summarized in **Table E.1**.

Table E.1: Schedule of Public Participation

LOCATION	VENUE	DATE	ATTENDEES
Koiwa Location	Sergone Village Koiwa Brigde	9th June 2022	62
Mogogoseik Location	Mogogosiek Location Chief's Office	10th June 2022	23
Simoti Location	Simoti Location Chief's Office	9th June 2022	31

E.4 Assessing Environmental and Social Risk associated proposed Project Components

Table E.2 below presents a summary of preliminary Environmental and Social Assessment of risks associated with the proposed Project components.

Table E.2: Assessment of Environmental and Social Impacts associated with Proposed Project Components

Project Component	Criteria	Yes	Description
Koiwa Bridge Site and Raw Water Gravity Main (RWGM)	Impact on Natural Habitat, artifacts and monuments	Yes	The site is located within riparian land along Itare River, and the raw water gravity main will be laid along the river within riparian land
	Impacts on Soils Resources	Yes	Construction of the intake works will result to minimal destruction of soils structure leading to cases of soil erosion, appropriate mitigation measures will be applied
	Impacts on Water Resources	Yes	The site is located within riparian land along Itare River, minimal pollution of river is likely to occur during construction of the intake works as a result of fuel and oil leaks from plant and equipment.
	Social Impacts	Yes	The intake Works will trigger land acquisition and therefore RAP will be prepared. For construction of the intake works will be acquired through wiling buyer willing seller arrangement.
Kiptingting Bridge Site and Raw Water Gravity Main	Impact on Natural Habitat, artifacts and monuments	Yes	The site is located within riparian land along Itare River, and the raw water gravity main will be laid along the river within riparian land
	Impacts on Soils Resources	Yes	During construction of the intake works, minimal destruction of soils will be experienced, appropriate mitigation measures will be applied
	Impacts on Water Resources	Yes	The site is located within riparian land along Itare River, minimal pollution of river is likely during construction of the intake works
	Social Impacts	Yes	The intake Works will trigger land acquisition and therefore RAP will be prepared
Itare Bridge Site and Raw Water Gravity Main	Impact on Natural Habitat, artifacts and monuments	Yes	• The site is located within riparian land along Itare River. • This site is also located off Embomos Forest, easement permits for raw water pipeline will be required from Kenya Forest Services (KFS)
	Impacts on Soils Resources	Yes	During construction of the Intake, works minimal destruction of soils will be experienced, appropriate mitigation measures will be applied

Project Component	Criteria	Yes	Description
	Impacts on Water Resources	Yes	The site is located within riparian land of Itare River, minimal pollution of river is likely during construction of the intake works
	Social Impacts	Yes	The intake Works will trigger land acquisition and therefore RAP will be prepared.
Water Treatment Plant Site (WTP) and Treated Water Rising Main	Impact on Natural Habitat, artifacts and monuments	Yes	The works are proposed within existing WTP and also the clear Water rising main alignment exists
	Impacts on Soils Resources	Yes	During construction of the intake works, minimal destruction of soils will be experienced, appropriate mitigation measures will be applied
	Impacts on Water Resources	No	This impact is assessed negligible
	Social Impacts	No	No land acquisition will be triggered because the WTP and Clear Water Rising main exist, proposed works will restricted within existing alignment.
Sludge Treatment Site in Litein Town	Impact on Natural Habitat, artifacts and monuments	Yes	• The facility is proposed to be constructed within low lying ground Parcel/818 belonging to 2Nr private individuals – RAP is triggered • The lower section of the parcel is traversed by a permanent stream • However, risks of water resources and soil resources pollution will be triggered, mitigation measures will be applied.
	Impacts on Soils Resources	Yes	
	Impacts on Water Resources	Yes	
	Social Impacts	yes	Additional land will be required, 2Nr families living around the site will require relocation

E.5 Environmental and Social Risk Management Plan at Construction Stage

Table E.3 below presents a summary of Environmental and Social Risks Management Plan at Construction Stage.

Table E.3: Environment and Social Risks Management Plan at Construction Stage

Risk	Mitigation
Impacts on Water Resource	● All waste water which may be contaminated with oily substances must be managed in accordance with an appropriate Waste Management Plan (WMP). ● No hydrocarbon-contaminated water may be discharged to the environment or into Itare River. ● At construction stage, the contractor will prepare Specific Construction Environment and Social Management Plan (C-ESMP) which included among other; Soil and Sedimentation Control Plan, Spoil Management Control Plan and Waste Management Plan.
Impacts on Soil Resource	● Vegetation clearing and topsoil disturbance will be minimized. ● Contour temporary and permanent access roads / laydown areas so as to minimize surface water runoff and erosion. ● Sheet and rill erosion of soil shall be prevented where necessary through the use of sand bags, diversion berms, culverts, or other physical means. ● Topsoil shall be stockpiled separate from subsoil. Stockpiles shall not exceed 2 m height, shall be located away from drainage lines, shall be protected from rain and wind erosion, and shall not be contaminated. ● Wherever possible construction work will take place during the dry season. ● Topsoil shall be evenly spread across the cleared areas when reinstated.

Risk	Mitigation
	● Accelerated erosion from storm events during construction shall be minimized through managing storm water runoff (e.g., velocity control measures). ● Soil backfilled into excavations shall be replaced in the order of removal in order to preserve the soil profile. ● Spread mulch generated from indigenous cleared vegetation across exposed soils after construction ● At construction stage, the contractor will prepare Specific Construction Environment and Social Management Plan (C-ESMP) which included among other; Soil and Sedimentation Control Plan, Spoil Management Control Plan and Waste Management Plan.
Impacts on Air Quality	**As general measures for all locations:** ● Develop a Dust Management Plan (DMP); ● Record all dust and air quality complaints, identify cause(s), take appropriate measures; ● Liaise with local communities to forewarn of potentially dusty activities; ● Undertake monitoring close to dusty activities, noting that this may be daily visual inspections, or passive/active monitoring as parameter ● Undertake inspections to ensure compliance with the Dust Management Plan; ● Plan potentially dusty activities so that these are located as far from receptors as feasible; ● Erect solid screens if feasible around stockpiles and concrete batching; ● Avoid run off of mud and water and maintain drains in a clean state; ● Remove dusty materials form site as soon as possible if not being re-used. If being re-used, cover or vegetate if possible; ● Impose speed limits on haul routes and in construction compounds to reduce dust generation; ● Minimize drop heights when loading stockpiles or transferring materials; and ● Avoid waste or vegetation burning. **For traffic on unpaved roads:** ● Undertake watering to attenuate dust near sensitive receptors. The duration and frequency of this should be set out in the Dust Management Plan and will consider water availability and any stakeholder grievances; and ● On unpaved roads in use for more than 1 month, consider use of surface and sealants to reduce the use of water and water trucks. Use of lignin-based sealants recommended due to low environmental toxicity. **For excavations and levelling** ● Revegetate exposed areas as soon as feasible; ● Revegetate or cover stockpiles if feasible; ● Expose the minimum area required for the works, and undertake; and exposure on a staged basis to minimize dust blow.
Noise and Vibrations Impacts	● Siting noisy plant and equipment as far away as possible from human settlement, and use of barriers (e.g., site huts, acoustic sheds or partitions) to reduce the level of construction noise at receptors wherever practicable; ● Where practicable noisy equipment will be orientated to face away from the nearest Human settlement and other receptors; ● Working hours for significant noise generating construction work (including works required to upgrade existing access roads or create new ones), will be daytime only; ● Alternatives to diesel and petrol engines and pneumatic units, such as hydraulic or electric-controlled units, will be used, where practicable; ● Where practicable, stationary equipment will be located in an acoustically treated enclosure; ● For machines with fitted enclosures, doors and door seals will be checked to ensure they are in good working order; also, that the doors close properly against the seals;

Risk	Mitigation
	● Throttle settings will be reduced and equipment and plant turned off, when not being used; ● Equipment will be regularly inspected and maintained to ensure it is in good working order. The condition of mufflers will also be checked; and fitting of mufflers or silencers of the type recommended by manufacturers.
Impacts on vegetation cover	● Avoidance of impacts should be prioritized. However, if not possible then compensatory planting of trees that will be cut by the contractor during works will be undertaken. ● Vegetation shall only be within the well field's only if the vegetation and will interfere with Project construction and/or present a hazard. ● Areas to be cleared shall be agreed and demarcated before the start of the clearing operations to minimize exposure. ● The use of existing cleared or disturbed areas for the Contractor's office, stockpiling of materials etc. shall be encouraged. ● Whenever possible, all damaged areas shall be reinstated and rehabilitated upon completion of the contract to as near pre-construction conditions as possible. ● Rehabilitation of temporary construction sites and pioneer camps (if needed) should be done as swiftly as possible and always with suitable native grasses and other plants
Community Health Safety and Security Impacts	● Contractor will develop and monitor the implementation of a Community Health and Safety Management Plan (CHSMP) ● Contractor will develop Emergency Response Plans (ERPs) in cooperation with local emergency authorities and hospitals. ● Contractor will extend the Worker Code of Conduct to include guidelines on worker – community interactions and will provide training on the worker code of conduct to all employees including drivers as part of the induction process. ● Contractor will provide primary health care and first aid at construction office sites to avoid pressure on local healthcare infrastructures. ● Contractor will implement a Community Grievance Mechanism. ● Contractor will develop and implement a Traffic Management Plan covering aspects such as vehicle safety, driver and passenger behaviour, use of drugs and alcohol, operating hours, rest periods, community education on traffic safety and accident reporting and investigations.
Worker Health and Safety and Workers Management impacts	● Contractor and self-employed contractors will assess the H&S risks related with the tasks to be performed during the construction phase. ● Contractor will ensure that training on health and safety measures is provided to all construction workers prior to starting to work on the Project and that supervisors have adequate experience to deliver on their responsibilities. ● Contractor will implement regular health and safety checks and audits of workers, and subcontractors and implementing sanctions in case of breaches of national standards and the Project's specific standards. Such audits to include workplace H&S; worker contracts, working hours, pay and conditions; housing and food standards. ● Contractor will establish a procedure for the recording and analysis of incidents and lessons learned such that additional actions can be implemented to avoid or minimize occupational health and safety risks. ● Contractor will ensure that facilities and work sites are designed and maintained such that robust barriers are in place to prevent accidents. ● Contractor will ensure that adequate clean water, adequate food and access to medical care is provided to all workers on the worksite and at accommodation. ● Contractor will develop and implement a Traffic Management Plan covering aspects such as vehicle safety, driver and passenger behaviour, use of drugs and alcohol, operating hours, rest periods, community education on traffic safety and accident reporting and investigations.

Risk	Mitigation
Gender-based violence and Sexual Harassment	● Ensure clear human resources policy against sexual harassment that is aligned with national law ● Integrate provisions related to sexual harassment in the employee Code of Conduct (CoC) ● Ensure appointed human resources personnel to manage reports of sexual harassment according to policy ● The Contractor shall require his employees, sub-contractors, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse ● The contractor will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: - effective and on-going community engagement and consultation, particularly with women and girls; - Review of specific project components that are known to heighten GBV risk at the community level, e.g., compensation schemes; employment schemes for women; etc. ● the contractor shall develop specific plan for mitigating these known risks, e.g., sensitization around gender-equitable approaches to compensation and employment; etc. ● The contractor will ensure adequate referral mechanisms are in place if a case of GBV at the community level
Sexual Exploitation and Abuse by project workers against community members	● Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). ● The SEA action plan will include how the project will ensure necessary steps are in place for: - Prevention of SEA: including CoCs and ongoing sensitization of staff on responsibilities related to the CoC and consequences of non-compliance; project-level IEC materials; - Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management; - Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level Information Education and Communication (IEC) materials; regular community outreach to women and girls about social risks and their PSEA-related rights; ● Management and Coordination: including integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.
Spread of communicable diseases and HIV/AIDS	● Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and sexual health and rights through staff training, awareness campaigns, multimedia and workshops or during community Barazas. ● Use existing clinics to provide VCT services to construction crew and provision of ARVs for vulnerable community members

Risk	Mitigation
	● Ensure safety of women and girls in provision of VCT services. ● Work to minimize or altogether eliminate mosquito-breeding sites.
Spread of COVID -19 amongst workers	● The Contractors will develop a SOPs for managing the spread of Covid-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilization. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions; ● Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including ● Avoid concentrating of more than 100 workers at one location. Where there are two or more people gathered, maintain social distancing at least 2 meters. All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs; ● Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used; ● Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc;

E.6 Statutory Requirements for Water Treatment Plant and Sludge Treatment Facility

The Occupational Health and Safety Act (OSHA 2007) provides below detailed statutory provisions to be complied with before commission and operation of a Water Treatment Plant (WTP) and Sludge Handling Facility.

Table E.4: Statutory Requirements for Water Treatment Plant and Sludge Treatment Facility

Activity	Requirement	Conformity Measure
Registration of the Water Treatment Plant as Works Place with DOSH	OSHA 2007 requires that any workplace with more than 7 employees should be registered as a workplace	*Register the Proposed Augmented Itare Water Treatment Plant and Litein Sludge Handling Facility as Workplace with DOSH*
Duties Of Occupiers (Legal Requirements)	• Risk Assessment • Safety and Health Audit • Fire Safety Audit • Initial Environment Audit	*Undertake Risk Assessment, Safety and Health Audit and Fire Safety Audit for Augmented Itare Water Treatment Plant and Litein Sludge Handling Facility.*
Management of Polices required at the Water Works	Policies Required: • Safety & Health Policy • Fire Safety Policy • Environment Policy	*Prepare Safety & Health Policy, Fire Safety Policy and Environment Policy Augmented Itare Water Treatment Plant and Litein Sludge Handling Facility.*
Water Works Personnel Trainings Required	Training required: • Statutory: Fire marshal training Training required: • Statutory: First Aid Training Training required: • Statutory: Safety and Health Committee	*Establish of Health and Safety Committee for Augmented Itare Water Treatment Plant and Litein Sludge Handling Facility and train them on;* • *Statutory Fire marshal training* • *Statutory First Aid Training* • *Statutory Safety and Health Committee training on Occupational Health and Safety (OSH)* • *Regular provision of personnel at the T/Works with Appropriate (PPEs)*

E.7 Operation Stage Environment and Social Management Plant for Water Treatment Plant

At operation stage, the WTP Operator will ensure the following measures are implemented during operation of the WTP.

Table E.5: Operation Stage Environment and Social Management Plant for Water Treatment Plant

Activity Fields	Requirement
Approval, Authorization And Permits	WTP Operator should apply and renew water Abstraction permit for Augmented Itare Water Treatment Plant from WRA, activities under in are listed under the Six Schedule of the Rules.
Control of Pollution and Water Quality Requirements	**Management of Reagents** For Augmented Itare Water Treatment Plant, PDR has provided for a well ventilated and proper lighting chemical storage house. Further, personnel handling the reagents will be provided with appropriate PPEs such as gloves, nose masks and googles to protect them from the chemical. Also procurement of reagent will be done in batches with enough doses to eliminate the risk of some of the reagent expiring therefore requiring disposal.
	Management of Sludge PDR provides for sludge drying beds, the beds provide allow for sludge dewatering and allow for easy handling and evacuation
Water Use Charges	A master meter has been installed at the raw water inlet chamber to measure the water abstraction volume for the purpose of calculating amount due for payment of water services to Water Resources Authority (WRA)
Conservation of Riparian	The Water Rules 2007, Part ix on Conservation of Riparian and Catchment Areas regulation 120.(1) provides that for the purposes of conserving the catchments and riparian areas, the authority may by order or state as a condition on an authorization or permit, require a person to prepare and conform to a Soil and Water Conservation Plan (SWCP). In compliance with this regulation, a forestation program in liaison with Kenya Forest Services (KFS) will be initiated within the WTP and dam peripheries. WTP Operator will upscale this initiative after commissioning of the Plant.

E.8 Operation Stage Environment and Social Management Plant for the Sludge Handling Facility

The Environmental and Social Management Plan during operation of the sludge handling facility is presented below.

Table E.6: Operation Stage Environment and Social Management Plant for Sludge Handling Facility

Issue	Action required
Odour Menace from Wastewater Treatment Works	• Maintain appropriate covering/ventilation of the pre-treatment unit, appropriate handling and removal of grit/grease • Ensure scum is appropriately disposed-off or properly stabilized and adequate water flow and aeration to reduce the potential of odour formation • The perimeter of the proposed site should be vegetated with trees and plants of varying heights thereby forming windbreaker and reduce dispersion of odour • Repairing of dilapidated the roofs of the sludge drying beds to ensure quick drying of sludge and appropriate disposal to reduce odour emanating from wet sludge.
Risks Associated with handling of Sludge at the facility	• Dried sludge could be used to make briquettes as a charcoal substitute or be sold to farmers as fertilizers • Excess sludge can be disposed in a designated landfill which shall only be for disposing dry odourless sludge. • Preparation and enforcement of operational guidelines for sludge management by Kericho County Government

Issue	Action required
Solid Wastes Impacts at WWTP Screens	• Develop a comprehensive Waste Management Plan (WMP) for management of solid wastes from screen chambers • Employ personnel who will be in charge of maintaining hygiene and cleanliness of the WWTP including removal of solid wastes from screen chambers • Properly labelled and strategically placed waste disposal containers shall be provided at all places within the WWTP • Solid wastes once removed from screens shall be collected and disposed-off appropriately as required by waste Management Regulations of (2006) and Kericho County Government by laws.
Inversion of Birds and Reptiles to the sludge treatment site	• The sludge treatment facility should be protected from livestock encroachments by providing secure barriers to keep off the animals from interfering with the plant operations and safety • The quality of effluent discharged into the river will be an important parameter on the regional control of the river eutrophication that attracts insects that reptiles feed on

E.9 Findings

A summary of Preliminary ESIA findings is detailed below.

- The Government of Kenya (GoK) through the Ministry of Water, Sanitation and Irrigation (MWSI) received a loan from the Government of Germany, through KfW Development Bank (KfW), to undertake the Water Supply and Sanitation Development Program – Lake Victoria South (WSDP-LVS) for the Towns of Kericho, Kisii, Nyamira, and - if financially viable - Litein and Sotik.
- The proposed Project sanitation component include; Faecal Sludge Treatment Facilities - To serve Litein, Kapkatet Towns and adjacent Five (5) Nr. Trading/ Market Centres (Chemosit, Roret, Kabartegan, Kaplong and Mogogosiek), which are within a radius of approximately 15km to 20km from Litein Town.
- The proposed Project water supply component include Expansion of the Itare Water Supply System to meet Year 2030 water demands for Litein and Kapkatet Towns.
- The project area of influence for raw water pipeline, water treatment plant, storage tanks is Bomet County in the locations of Simoti, Koiwa, Sotit, Mogogosiek. The clear water pipeline location is Kericho County Bureti Sub County for Boito and Litein Locations
- The proposed raw water pipeline is proposed to be laid along Itare River from Kiptingting village off Embomos Forest a distance of approximately 10km to the existing Itare Water Treatment Plant
- The river basin comprised a dense, diverse mosaic of wetland plants dominated by *Cyperus spp. (C.immensus, C. triandra) with some Typha spp. (T. domingensis and T. capensis) and Polygonum spp. (P. senegalense, P. pulchrum). Potamogeton schweinfurthi.* The proposed Raw Water Pipeline (RWP) does not directly interact with Embomos Forest which is Protected Ecosystem.

- The rivers flowing from Mau Forest Ecosystem have various species of fish which include the brown and rainbow trout fish, Barbus, Snake Catfish, Rainbow Trout, others include *Oncorhyncus mykiss (Rainbow trout), Clarius theodare (Snake catfish), Barbus amphigramma (Barbus) and Poecilla reticulata (Guppy)*
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- The assessment identified below listed Biological social receptors that might be impacted by project activities at construction stage including; Embomos forest (part of Mau Forest), Itare River representing biological receptors while Itare, Chemosoren, Mogogoseik and Boito tea buying center representing social receptors
- Koiwa and Kiptingting Bridge Site is located is located within riparian land of Itare River, and the raw water gravity main will be laid along the river within riparian land. However, Itare Bridge site is located within riparian land of Itare River, this site is also located off Embomos Forest, easement permits will be required from Kenya Forest Services (KFS)
- Itare Water Treatment Plant and clear water rising main exists and, therefore no land acquisition will be triggered. However, additional land will be required for existing Saseta Tank, this land can be acquired through willing buyer willing seller arrangement
- The sludge handling facility is proposed to be constructed within low lying ground Parcel/818 belonging to 2Nr private individuals – RAP is triggered. The lower section of the parcel is traversed by a permanent stream. However, risks of water resources and soil resources pollution will be triggered, mitigation measures will be applied. Additional land will be required, 2Nr families living around the site will require relocation

E.10 Provisions

The Preliminary ESIA makes below listed provisions:

- The Environment and Social Management Plan (ESMP) prepared under this ESIA assessment recommends provision of a budget of Kenya Shillings Two Million, Eight Hundred and Fifty Thousand (Kshs 2,850,000) for mitigation of environment and social impacts identified in this Report. The Bid Documents to be prepared for the project should incorporates the Environment, Social provisions discussed herein (Environment and Social Impact Assessment and Mitigation Measures).
- Project Contract Document to include provisions for the Contractor for preparing and implementing Construction Environment and Social Management Plan (C-EMSP), annexes to the C-EMSP will include but not limited to: Soil and Sedimentation Control Plan, Spoil Management Control Plan, Dust Management Plan, Health, Hygiene and Safety Plan, Labour Management Plan, Child Protection Strategy, Gender-based Violence Action Plan, Waste Management Plan, Contractors Code of Conduct, Gender Inclusivity Strategy , HIV/Aid Prevention Strategy. The contractors will be required to engage

services of a qualified Environment, Health and Safety Officers and Social Safeguards Officer at the time of Project implementation.

- At Project implementation stage, the contractor with approval of the supervising engineer will prepare periodic Environmental and Social Implementation Report. The reports will provide status of implementation of risks & impacts management measures to date from the project start to the end of the reporting period. From an occupational Health and Safety approach, the contractors will ensure they undergo the following; (OSH) risk assessment, Registration of workplaces, Safety and Health (OSH) Audit, Fitness to work assessment of employees, Training of all workers or workers' representatives in basic Occupational Safety and Health, Accident and incident reporting, Compensation of injured workers who die or get injured and disabled and Examination of Safety Plants and Equipment.
- At Project completion stage, within the Defects Liability Period, Bomet and Kericho Water Companies will initiate an Initial Environment and Social Audit for the Project as required by EIA/EA Audit Regulations of the year 2003 and subsequent annual self-audits. The Audit will develop an Environment and Social Audit Action Plan (ESAAP) that will be used to track Project Environment and Social Compliance during Project implementation stage.

CHAPTER 1: BACKGROUND INFORMATION

1.1 General

The Government of Kenya (GoK) through the Ministry of Water, Sanitation and Irrigation (MWSI) received a loan from the Government of Germany, through KfW Development Bank (KfW), to undertake the Water Supply and Sanitation Development Program – Lake Victoria South (WSDP-LVS) for the Towns of Kericho, Kisii, Nyamira, and - if financially viable - Litein and Sotik.

The Program Objective is to ensure the provision of sufficient, hygienic, economically viable and affordable Water and Sanitation Services for the population of the selected Towns, thus contributing to the overall development goal of improving the health of the urban population by reducing waterborne diseases and favouring economic development. The Program also supports enhancement of water supply and sanitation service delivery and sustainability through improved commercialization, pro-poor orientation, and clustering of schemes.

The targeted Towns include:

- Kericho County - Kericho, Litein and Kapkatet Towns
- Kisii County - Kisii Town

The beneficiaries of the program will be mainly:

i. The Urban populations within the Project Towns, estimated to be 80,327 in Kericho, 69,293 in Kisii based on projected year 2030 populations and 34,821 in both Litein and Kapkatet based on projected year 2040 populations.

ii. The Water Services Providers (WSPs), Kericho Water and Sanitation Co. Ltd. (KEWASCO) and Gusii Water and Sanitation Co. Ltd. (GWASCO) in their roles as the Water Services Providers for the Project Towns.

The Program Executing Agency (PEA) is Lake Victoria South Water Works Development Agency (LVSWWDA). LVSWWDA is a state corporation, under the Ministry of Water, Sanitation and Irrigation, responsible for development, maintenance and management of Water and Sanitation Infrastructure in its area of jurisdiction. It was established under the Water Act 2016 through Gazette Notice of 20th September 2016 with the mandate of ensuring efficient and economic provision of Water and Sanitation Services in its area of jurisdiction.

This report presents an Environment Impact Assessment and Social Assessment (ESIA) Report for Litein & Kapkatet Towns. The ESIA covers scope of Water and Sanitation Works detailed in the '*Design Report (DR)*.

1.2 Project Components

The major components as detailed in the Design Report based on the previous Feasibility Study Reports are:

iii. **Faecal Sludge Treatment Facilities** - To serve Litein, Kapkatet Towns and adjacent Five (5) Nr. Trading/ Market Centres (Chemosit, Roret, Kabartegan, Kaplong and Mogogosiek), which are within a radius of approximately 15km to 20km from Litein Town.

iv. **Expansion of the existing Itare Water Supply System** from current production capacity of 8,000 m^3/d to 15,500 m^3/d to meet Year 2040 water demands of Litein and Kapkatet Towns including surrounding Market/Trading Centres in addition to the areas within Bomet County that are currently served by the System.

1.3 Location and Size

Kericho County is one of the 14 Counties in the Rift Valley region. It lies between longitude 35^0 02' and 35^0 40' East and between the Equator and latitude 0^0 23' South. The County is bordered by Uasin Gishu County to the North, Baringo County to the Northeast, Nandi County to the Northwest, Nakuru County to the East and Bomet County to the South. It is also bordered to the Southwest by Nyamira and Homa Bay Counties and to the West by Kisumu County. The County covers a total area of approximately 2,479 km^2.

The Location Plan of Kericho County is given in **Figure 1.1** on **Page 1-3.**

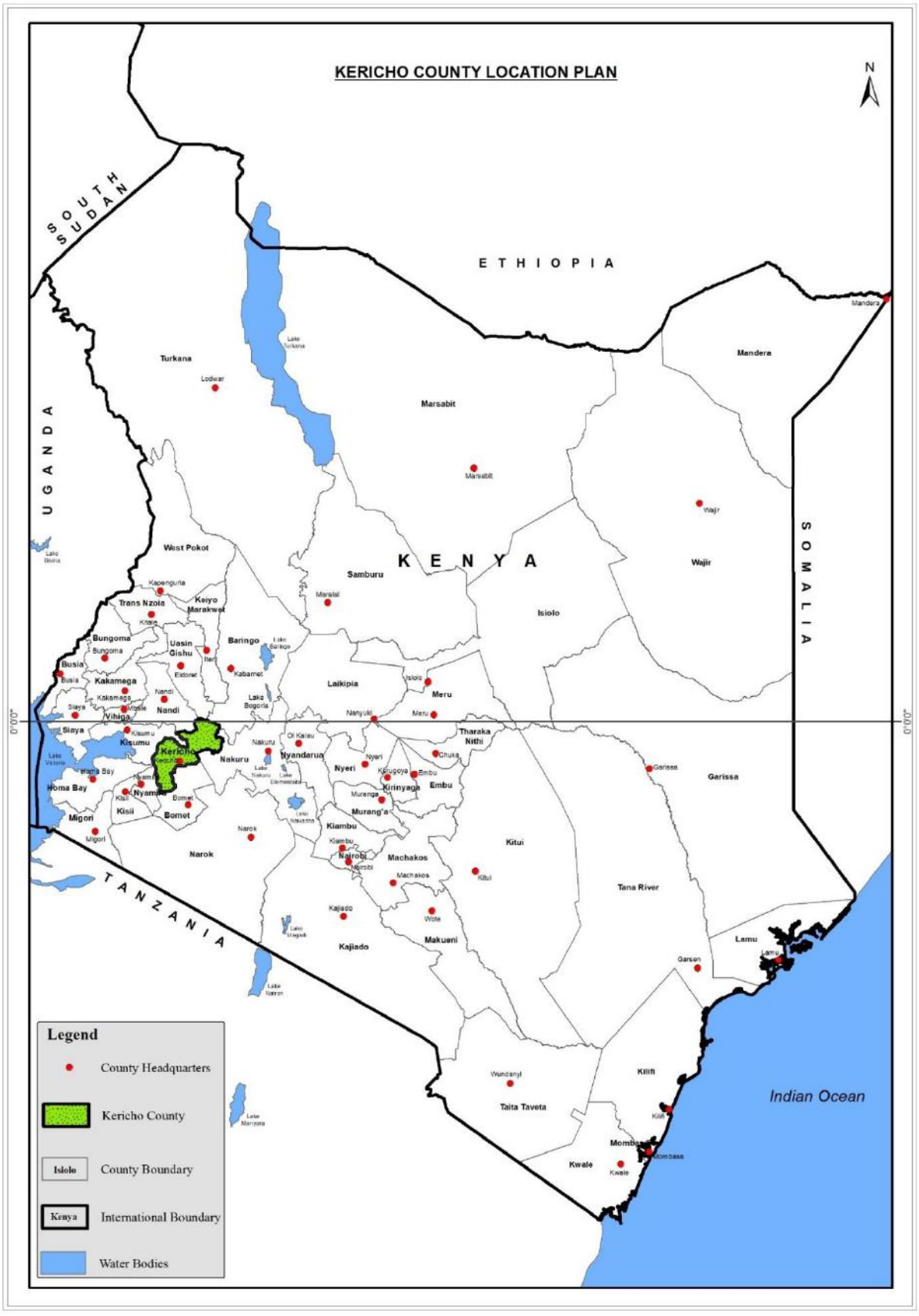


Figure 1.1: Kericho County Location Plan

1.4 Existing Water Supply System in Litein and Kapkatet Towns

1.4.1 Institutional Set-up

In the Constitution of Kenya (2010), provision of water and sanitation services was reviewed and assigned to the County Governments. The Water Act 2002 has been realigned with the New Constitution through Water Act 2016.

Under the New Water Act 2016, the Cabinet Secretary responsible for Water, Sanitation, and Irrigation Services, is empowered, in consultation with County Governments to provide a National Water Sector Investment and Financing Plan, aggregated from County Government Plans, which shall provide details such as the time frames and the investment programs for the Plans. The Water Service Providers (WSPs) are fully owned by the County Governments.

1.4.2 Management of Water Supply and Sanitation Systems

Kericho Water and Sanitation Company Limited (KEWASCO) is a Private Limited Company established under the Company's Act Cap 486, Laws of Kenya and it is wholly owned by the County Government of Kericho. KEWASCO was clustered with former Tililbei Water and Sanitation Company Limited (TILWASCO) on **2nd November 2018**. Tililbei was a rural based Utility that covered nine schemes namely Kapkatet / Litein, Sosiot, Kipkelion, Chesinende, Londiani, Fort Ternan, Kipsitet, Bargeiywet and Sigowet whilst KEWASCO was mandated to provide water and sanitation services within the urban and Peri urban areas of Kericho Town.

The core mandate of the merged KEWASCO is to provide Water and Sanitation Services to the whole of Kericho County. KEWASCO's joint mandated area of coverage is over 644 km^2 while the area currently supplied with water is estimated to be 291 km^2. Formerly, KEWASCO was contracted by Lake Victoria South Water Service Board (LVSWSB), now known as Lake Victoria South Water Works Development Agency (LVSWWDA), to provide Water and Sanitation Services within the urban and Peri urban areas of Kericho Town. However, following the enactment of the Water Act 2016, the licensing mandate was transferred to the Water Services Regulatory Board (WASREB).

The Company operates under the Direction and Guidance of Eight (8) Board of Directors who are drawn from a wide spectrum of the Shareholder (County Government of Kericho) and Stakeholders. This is the Policy Making Organ of the Company which operates on Committee basis. The Management is headed by the Managing Director who reports to the Board of Directors.

Although Litein and Kapkatet Towns are located within Kericho County and under jurisdiction of KEWASCO, their existing Intake and Water Treatment Works are located within Bomet County.

KEWASCO purchases water in bulk from Bomet Water and Sewerage Company (BOMAWASCO) and sells it to the customers in Litein, Kapkatet and rural areas within Kericho County. The County Government of Kericho contributes significantly towards settling of recurrent cost billed by BOMAWASCO for the bulk water supply. These payments are however erratic and infrequent resulting to frequent water supply disconnections and interruptions to regular supply.

The quantity of bulk water supplied by BOMWASCO to Litein and Kapkatet Towns is recorded by DN 300 mm dia Bulk Meter installed at Boito. At present, BOMWASCO levies KEWASCO Kshs. 30 per m^3 of bulk water supplied. Based on available records, approximately 3,200 m^3 is supplied to Litein and Kapkatet Towns as well as adjacent Market Centres and Rural Areas daily to satisfy their water demand.

1.4.3 Existing Litein Water Supply System

The Existing Litein Water Supply Scheme traverses Kericho and Bomet Counties. The Scheme was constructed in 1979/80 and has now been in operation for approximately 42 years. The Scheme was designed to meet the 1988 water demand of 7,940 m^3/d, serving a population of 140,700 persons.

The Litein Water Supply Scheme is a pumping scheme based on abstraction of raw water from a run-of-the-river Intake on Itare River at Elevation 1920m. The scheme covers a total area of approximately 249 km² most of which is rural in nature and traverses Kericho and Bomet Counties.

Raw water is pumped to Itare Water Treatment Works, where full conventional treatment involving coagulation, sedimentation, filtration, and disinfection is carried out. Treated water is pumped to Existing Saseta Storage Tank using high lift pumps. From Existing Saseta Tank, treated water flows by gravity into the Distribution Network covering an area of approximate 357km^2.

Brief details of the Existing Litein Water Supply System components are summarised in **Table 1.1**.

Table 1.1: Components of the Existing Litein Water Supply System

Component	Description
Source	• River Itare
Intake Works	• Run-of-River Reinforced Concrete Weir
Raw Water Pumps	• 3 Nr Submersible Pumps • Operation: 2 Nr Duty + 1 Nr Standby • Pump Discharge: Q = 250 m^3/h & H = 21m for each pump
Raw Water Transmission Main	Type : Pumping Main Size : 350mm diameter Length : 232m Material : Cast Iron – 20m uPVC – 212m
Water Treatment Works	• Full Conventional Treatment Works involving coagulation, sedimentation, filtration, and disinfection • Reported Design Capacity:- 12,000 m^3/d (*However hydraulic assessments of Key Components indicate that the installed capacity is 8,000 m^3/d*) • Operation – 20 hours per day
Treated Water Pumping Station	Equipped with: • 5 Nr Treated Water Pumps, each with discharge, Q = 250 m^3/h & 160m Pumping Head • 2 Nr Backwash Pumps, each with discharge Q = 50 m^3/h
Treated Water Transmission Main	Type : Pumping Main Size : 300mm diameter Length : 2,465m Material : Cast Iron – 740 m uPVC – 1725 m
Storage Tanks	• Storage Tanks – 12 Nr Tanks, capacities varying from 50 m^3 to 1300 m^3, total capacity 3,455 m^3
Distribution Network	• Primary Mains : - Diameters vary 150mm to 450mm - Total length approx. 76.2km - Mostly uPVC pipes • Secondary / Tertiary Mains : - Diameters vary 25mm to 150mm - Total length approx. 125.2km - Mostly uPVC pipes

A Schematic Layout Plan of the Existing Litein and Kapkatet Water Supply System is given in **Figure 1.1** on **Page 1.6**.

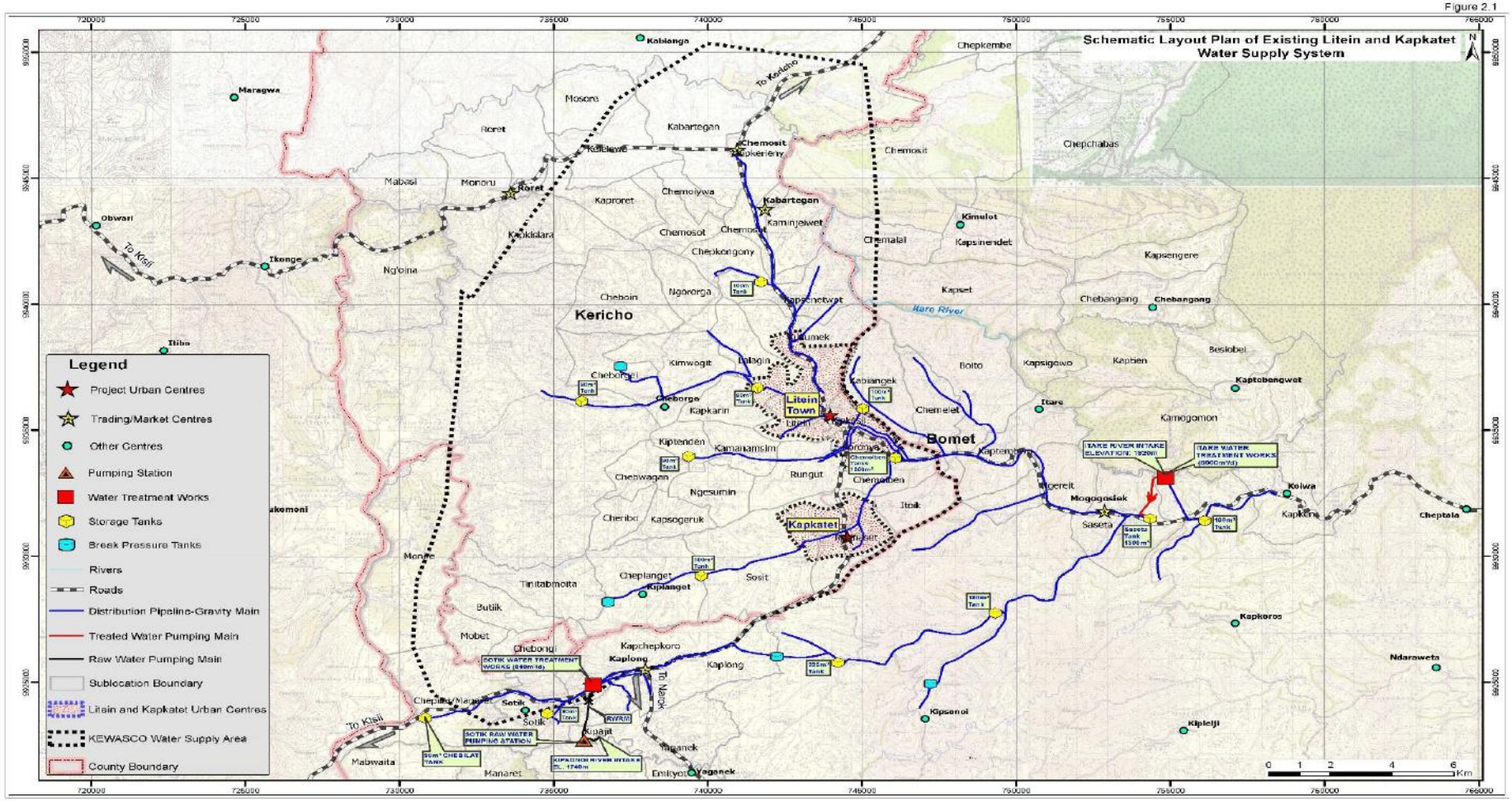


Figure 1.2: Schematic Layout Plan of the Litein Water Supply System

1.5 Existing Sanitation Systems in Litein and Kapkatet

1.5.1 General

Litein and Kapkatet Towns lack public Water-Borne Sewerage Systems. Based on Local Physical Development Plan for Litein Town (2017 – 2037), **86%** of the Town inhabitants owned or shared traditional pit latrines and **14%** flushed toilets connected to septic tanks.

It is reported that communal or individual Pit Latrines are common in the low-income households and areas with intermittent water supply while Flushed Toilets with Septic Tanks are common in the high income, medium income households and institutions with regular water supply.

There are three public Ablution Blocks in Litein and Kapkatet Towns. One Ablution Block was demolished due to unknown reasons. The other two Ablution Blocks are in poor condition and only one is currently in use.

Status of the communal Ablution Blocks is summarised in **Table 1.2**.

Table 1.2: Ablution Blocks

Nr	Component	Status / Evaluation	Remarks
1	Litein Ablution Block near Patnas Hotel. • Ablution block is operated and maintained by Community groups • *Ablution Block constructed by Water Sector Trust and GIZ*	• Dilapidated Plumbing system i.e., cisterns and taps • Surfaces are soiled with mud and dirt and Paint is peeling off in some sections • Ceramic Floor tiles are worn out • Latches and locks are defective • The roof is perforated due to hail stones prevalent in the area.	• Replace defective cisterns and taps including pipework • Prepare surfaces and Repaint • Prepare the floor and replace tiles • Provide and install new latches and locks • Remove and replace roofing sheets with heavy gauge sheets
2	Litein Ablution Block near market stalls.	• Ablution Block is demolished and non-existent	
3	Kapkatet Ablution Block • Ablution Block is neglected, abandoned, and unmanned • *Ablution Block constructed by KCB as part of CSR exercise*	• Plumbing system is dilapidated i.e., cisterns and taps • Surfaces are soiled with mud and dirt • Paint is peeling off in some sections • Floor screed is worn out • Latches and locks are defective • Doors are old and worn out	• Ablution block requires major overhaul of the entire finishes to restore it to its original state

1.5.2 Faecal Sludge Emptying and Transport

The predominant Faecal Sludge Evacuation and Transport in Litein and Kapkatet Towns is by **Mechanized Emptying and Transport via Vacuum Exhaust Discharge Tankers. There is no practice of manual emptying of the containment units.**

The emptying vehicles are equipped with a motorized pump and holding tank for storage and transportation of faecal sludge. Local trucks are commonly adapted for sludge transport by equipping them with holding tanks and pumps.

Emptying operations are conducted by manoeuvring the hose pipe and switching the pump on and off. Consequently, there is minimum risk of physical contact with the faecal sludge.

Faecal sludge transport services within the Project Towns are provided by private operators licensed by Kericho County Government and KEWASCO.

Details of Sewage Exhausters that collect sludge/ wastewater from Septic Tanks and transport the sludge to the existing Kericho Wastewater Treatment Plant are shown in **Table 1-3**.

Table 1-3: Details of KEWASCO Sewage Exhausters

S/Nr	Description	Details
1.	No of KEWASCO Sewage Exhausters	• 1Nr. 8m^3 Capacity • 4Nr. 7m^3 Capacity each • 1Nr. 5m^3 on a Tractor Trailer • 4 Nr. defective inclusive of 5m^3 tractor trailer
2.	No of Private Sewage Exhausters	• 2Nr. 8m^3 capacity each owned by James Finlay's Ltd, Kericho
3.	Cost of Sewage Exhausting / disposal per trip	• KES 5,000 within 10km radius • KES 100 per extra km beyond 10km • Charges are exclusive of 35% administrative costs
4.	No of trips made by KEWASCO's sewage exhausters per day	• 4 to10 Trips
5.	No of trips made by Private sewage exhausters per month	• 2

1.5.3 Faecal Sludge Treatment

Most sludge trucks are reported to transport their sludge to existing Kericho Wastewater Treatment Plant in Kericho Town for treatment that is located approximately 32km from Litein Town. However, because of the long distance involved, there is high possibility of illegal discharge of the untreated sludge into the environment.

1.5.4 Shit Flow Diagram

To gauge the extent to which faecal sludge is safely or unsafely managed in Litein Town, a Shit Flow Diagram (SFD) has been prepared using the available containment, emptying and transportation and sludge treatment data and is illustrated in **Figure 1.2** on **Page 1-10**.

In the preparation of the SFD, the following assumptions have been made:

a) Septic Tanks provide safe containment for faecal sludge (14% of population). 80% of Septic Tanks are safely emptied for transport to treatment facilities. However, only 50% of emptied Septic Tanks are transported safely to the Treatment Facilities.

b) Lined pit latrines (40%) are well constructed and have little interference from high ground water levels and therefore their sludge is safely contained. Only 50% are safely emptied when full. However, 50% of sludge from emptied Lined Pit Latrines are safely transported to the designated Treatment Facilities

c) Sludge in all unlined pit latrines (46%) were considered not to be safely contained due to lack of adequate protection against high groundwater level. None of the Unlined Pit Latrines are emptied when full but are covered / abandoned and new ones constructed

The SFD shows that only 18% of the faecal sludge is being safely managed while 82% is unsafely managed and pose serious risk to the environment. The main challenges encountered in safe management of faecal sludge in the Project Towns of Litein and Kapkatet include.

- Low uptake of Septic Tanks which are easy to empty when full
- High uptake of Unlined Pit Latrines which are difficult to empty when full
- Access to and affordability of sludge emptying and transporting services
- Distant location of Sludge Treatment Facilities / Sewage Treatment Works

Consequently, for improved sanitation situation, there is need to provide New Sludge Management Facilities in the proximity to Litein and Kapkatet Towns within a radius of 15km and for KEWASCO to encourage residents to upgrade their pit latrines to lined pits / Septic Tanks.

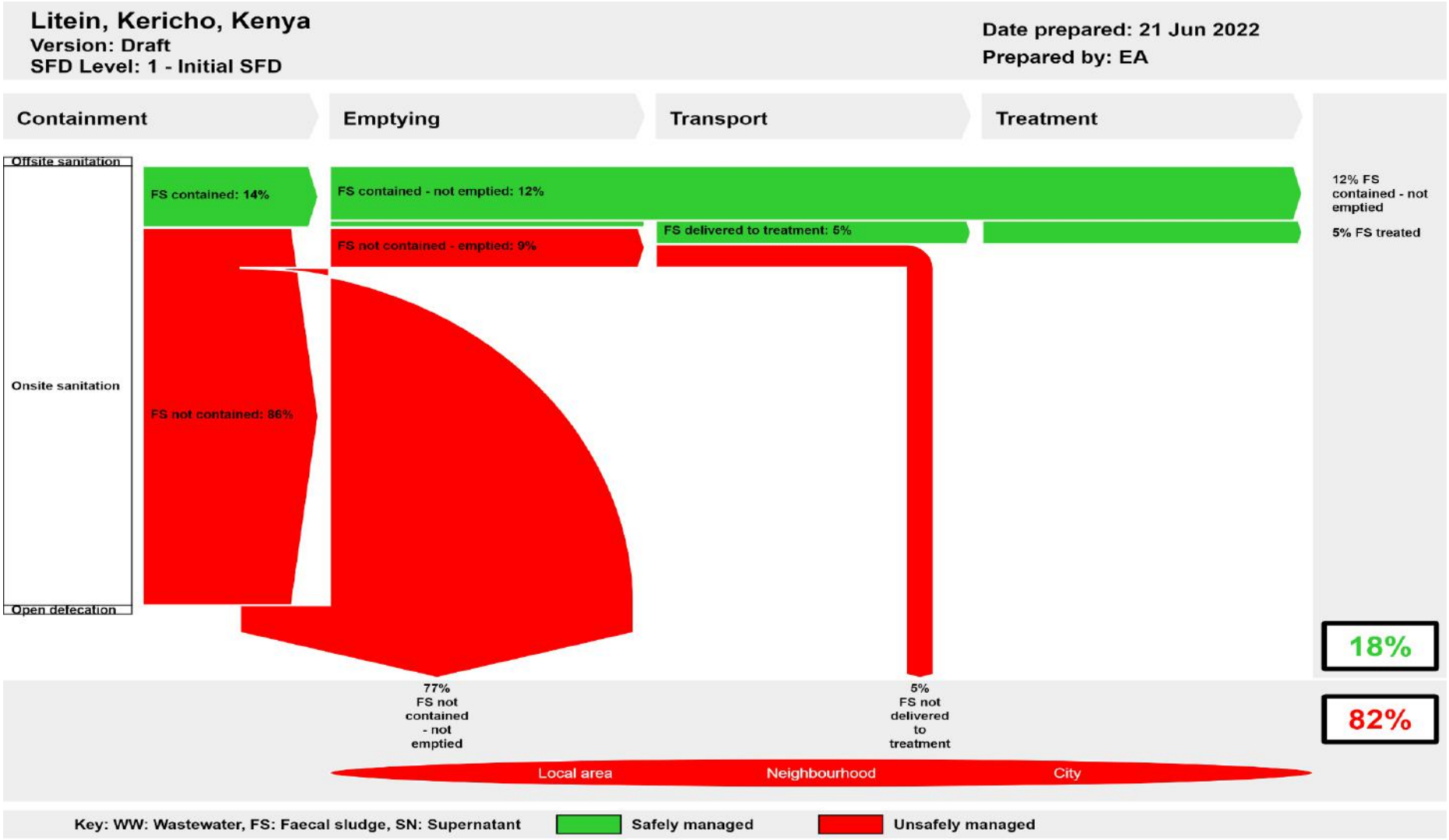


Figure 1.3: Shit Flow Diagram for Litein Town

CHAPTER 2: SITE BASELINE INFORMATION

2.1 Rainfall and Temperature

The geographical location of Kericho County at relatively high altitudes strongly affects the climatic conditions of the Town. Rainfall and temperature averages from 1990 to 2009 for Kericho County. On average, total annual precipitations was approximately 1223 mm, relatively evenly distributed throughout the year, though with higher precipitations during the winter months between April and September as indicated in **Table 2-2** below.

Table 2-1: Rainfall and Temperature Averages

Temperature - Precipitation				**°C| °F**		
	Jan	**Feb**	**Mar**	**Apr**	**May**	**June**
Average high in °C	26	27	27	26	25	24
Average low in °C	9	9	9	9	8	8
Av. precipitation - mm	81	104	175	257	218	149
	July	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Average high in °C	24	24	25	25	25	25
Average low in °C	8	8	8	8	8	8
Av. precipitation - mm	134	170	144	127	133	99

Source EU Climate data – Rainfall and Temperature for Kericho

The climatic data above apply to the Project specific areas for both raw water pipeline, water treatment plant, storage tanks and clear water pipeline. The specific administrative areas include; Konoin Sub County of Bomet County in the locations of Simoti, Koiwa, Sotit, Mogogosiek and Bureti Sub County for Boito and Litein Locations.

2.2 Physical and Topographic Conditions

The Project area *(Konoin and Litein Sub Counties)* is characterized by undulating topography which drains in a westerly direction towards the Itare and Sondu River. The physiography of the project area which is along Itare River (*Simoti, Koiwa, Sotit, Mogogosiek*) is influenced by Mau Escarpment specifically the Embomos Forest.

Further, at the County Level, Kericho County is surrounded by Tinderet Hills to the North and to the North-East is the Mau Escarpment and between them is the gently rolling land which forms Londiani hills (Tuluap-sigis). The central part of the county rises eastward towards 3,000m above sea level. The county is well drained with a good number of rivers that include Chemosit, Kiptaret, Kipsonoi, Timbilil, Maramara, Itare which is the within the Project area of Influence, Nyando, Kipchorian and Malaget. Some of these rivers are characterized by rapids and falls which could be harnessed for hydroelectric power generation. Some of the rivers with the waterfalls include Maramara, Itare and Kiptaret.

Section of Embomos Forest within Itare River Basin

2.3 Geological Conditions

Kericho County lies in the Lake Victoria Basin. Its geology is characterized by volcanic rocks as well as igneous and metamorphic complexes. The County is predominantly underlain by tertiary lavas (phonolites) and intermediate igneous rocks. A small part of the County is dominated by undifferentiated basement system rock (granites), volcanic ash admixture and other prolific rocks.

The hilly nature in some parts of the County encourages soil erosion. This problem is however minimized by the presence of a dense vegetation cover, except in a few areas like Sigowet in Soin-Sigowet Sub- County, Chilchila in Kipkelion and partly the lower zones covering Koitaburot in Soin Sigowet Sub- County. Geologically, volcanic deposits of granite and phonolite dominate the town as evidenced by the formation of red clay soils in the region. The area is compose of tertiary volcanic namely Kericho plateau (phonolites) which is an extension of volcanic eruptions from Mau Escarpments that were formed before down warping of the Rift Valley

The area is an agro-climatic zone; the soils are primary dark reddish, brown to dark red clay, classified as dark humid nitisols and humid cambisols. The soils in the area are classified into; soils of foot of the ridges which are well drained and extremely deep dark reddish valley they are high in organic contents and moderately acidic and soils of the minor valleys are moderately deep to deep red to dark reddish brown, friable silt loam to clay

2.4 Drainage and Hydrology

The proposed raw water pipeline is proposed to be laid along Itare River from *Kiptingting* village off *Embomos* Forest a distance of approximately 10km to the existing Itare Water Treatment Plant. The Itare River forms wetland and marshlands as it flows downstream towards Sondu River. The river traverses through and urban setting and therefore is used by the local community in Mogogosiek for a variety of purposes such as bathing, laundry, water supply, car washing and recreational activities. With this urban setting and other constraining factors including the poor soils present and the flood risk inherent in using the site, there are few potential land uses.

Photographs of proposed Itare and Koiwa Bidge Site potential Water Intake Sites

2.5 Flora

2.5.1 Riverine Vegetation

The river basin comprised a dense, diverse mosaic of wetland plants dominated by *Cyperus spp. (C.immensus, C. triandra) with some Typha spp. (T. domingensis and T. capensis) and Polygonum spp. (P. senegalense, P. pulchrum). Potamogeton schweinfurthii* grows in areas where emergent vegetation was absent, such as near the inflow streams at the head of the river and in small areas near the outflow monitoring point.

Further, the region is characterized by deep incised ridges and valleys with other additional rivers including rivers *Cheptabes, Chemosi, Changana, Saosa, and Dimboli* all the rivers flow from Mau escapements to the lake basin region. The catchment region of the rivers is under intensive tea farming on the highlands and therefore the rivers exhibits slightly high percentage of potassium, phosphors and Zinc which less than 1.5mg/litre as a result of dilution from other streams inflowing to the river and consistent rainfall in the area.

The surrounding land use consists largely of small-holder agricultural land and commercial tea (*Camellia sinensis*) plantations but with significant urban and peri urban components. Subsistence agricultural crops include maize (*Zea Mays*), potato (*Solanum tuberosum*) and various market vegetables.

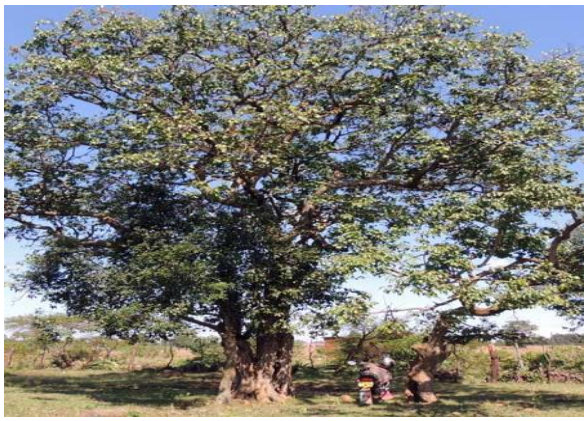
A full list of vegetation known to be present in the within Itare River Basin is presented in **Table 2-2 on Page 2.3** below. Itare River is known to be used as habitat by a few species of wetland birds, most notably grey crested cranes (*Balearica reulorum*). The local community considers that the river also harboured snakes and small nocturnal omnivorous mammals (*ratel Mellivora* capensis and common genet Genetta genetta).

Table 2-2: Flora Species along Itare River

Plant species	Plant species
Polygonum saicifolium	*Cyperus rotundus*
Polygonum senegalense	*Cyperus laevigatus*
Polygonum pulchrum	*Cyperus latifolius*
Potamogeton schweinfurthii	*Eragrostis tuneifolia*
Typha domingensis	*Mimosa pigra*
Typha capensis	*Ludwigia stolonifera*
Eragrostris barteri	*Eragrostis sp.*
Eragrostris lappula	*Ipomoea sp.*
Eragrostris milbraedi	*Achyranthes aspera*
Eragrostris stapfii	*Hibiscus sp*
Amaranthus hybridus	*Echinochloa sp.*

2.5.2 Flora listed under the IUCN Red list

Flora of conservation importance are species that are listed in the Wildlife Conservation and Management Act 2013, CITES and IUCN Red List as protected species. Such species are endangered, threatened or vulnerable to extinction with continuous exploitation. The proposed Raw Water Pipeline (RWP) does not directly interact with *Embomos Forest* which is Protected Ecosystem. However, the assessment established that apart from *Prunus africana and Vitex keniensis* which is listed as vulnerable tree under the sixth schedule of the Wildlife Conservation and Management Act of 2013, no other flora of conservation importance was noted along the pipeline route. *Prunus africana and Vitex keniensis (Meru Aok)* in the Project area is however mainly planted within farmlands, tea and coffee plantation and residential areas.



Endangered Prunus Africana Tree

Endangered Vitex Keniensis (Meru Oak Tree)

2.5.3 Farmland Vegetation

Land cover within the 6nr drainage areas comprises mainly of exotic tree species, commonly the Eucalyptus ssp. (Blue Gum) and *Grivellia robusta* within the households. Predominant land cover include agricultural crops among them being tea bushes, maize, beans, potatoes, sugar cane, cassava, millet, horticultural crops and coffee among others.

Photographs of Vegetation Cover along Itare River at Kiptingting Bridge and Kilometer 5 Potential Water Intake Sites

2.6 Fauna

The Project area is dominated by anthropogenic activities which have modified natural environment, there are few terrestrial wild fauna in the project area of influence which is predominantly settled areas. Fauna in the proposed project area is mainly comprised of various bird species, domestic animals and aquatic fresh water fish species within the Irati River.

2.6.1 Fish Diversity

The rivers flowing from Mau Forest Ecosystem have various species of fish which include the brown and rainbow trout fish, Barbus, Snake Catfish, Rainbow Trout, others include *Oncorhyncus mykiss* (Rainbow trout), *Clarius theodare* (Snake catfish), *Barbus amphigramma (Barbus)* and *Poecilla reticulata (Guppy*). None of these species is listed as of conservation concern in the IUCN red data list and the Kenya wildlife conservation and management Act of 2013.

Clarius theodare **(Snake catfish)**

Barbus amphigramma **(Barbus)**

2.6.2 Avian Diversity with the Project area

The mau forest ecosystem boost of over 500 species of birds, these include Black river ducks, forest and moorland francolins, white napped ravens, streaky seed eaters, hill chats, alpine swifts and four species of sunbirds including the scarlet – tufted malachite sunbird which is found in the moorlands. Birds of prey are common which include the mountain augur buzzard, crowned eagle, hawk eagle and African goshawk. Globally threatened bird species found in the mountain range are Sharpe's Longclaw, Abbott's Starling. Regionally threatened bird species

are African green Ibis, Ayre's Hawk Eagle, African Crowned Eagle, Stripped Flufftail, Bailon's Crake, African Grass owl, Cape Eagle Owl and Long-tailed Widowbird.

However, the project will not directly interact with the forest ecosystem. Therefore no important bird of conservation observed in the project area as listed in the Wildlife and Conservation Act and IUCN Red List. This is attributed to the numerous exotic trees in the area that are planted for commercial purposes. Exotic trees are not preferred habitat for avifauna. However, caution should be taken where indigenous trees like, Podocarpus and Ficus trees exist because such trees form habitat for the birds where they form nests. Some of the avifauna species observed in the project area are listed in **Table 2.3** below.

Table 2.3: Avian Species within the Project Area

Weavers	Ploceus spp
African black duck	Anas sparsa leucostigma
Greenbul	Andropadus
Eagles	Polemaetus bellicosus
Speckled mouse birds	Colius striatus
Blue-naped mousebird	Urocolius macrourus
Blue-naped mousebird	Streptopelia spp
Doves	Streptopelia spp
Speckled pigeon	Columba guinea
Golden breasted bunting	
Camaroptera	Camaroptera
Slate coloured boubou	Laniarius funebris
Common fiscal	Lanius collaris humeralis
Fire finch	Lagonosticta senegala
Bee-eater	Merops spp.
Sunbird	Nectarinia
Red bishop	Euplectes franciscanus
White-browned scrub robin	Cercotrichas leucophyrs
Cattle egret	Bubulcus ibis
Red fronted tinkerbird	Pogoniulus pusillus affinis
Barbet	Trocholaema
Superb starling	Lamprotonis superbus

Source: Mau Forest Management Plan 2014-2019

Photograph of Weavers Birds Ploceus spp and Sun Bird Spp within *Embomos

2.7 Socio Economic Baseline Information

2.7.1 Location, Administration Population and Size

The project area of influence for raw water pipeline, water treatment plant, storage tanks is Bomet County in the locations of Simoti, Koiwa, Sotit, Mogogosiek. The clear water pipeline location is Kericho County Bureti Sub County for Boito and Litein Locations as indicated in **Table 2-4 below.**

Table 2.4: Location, Administration Population and Size

County	Sub-County	Wards	Area in Km^2	No. of Locations	Projected population
Bomet	Konoin	Kimulot, Mogogosiek, Boito Embomos and Chepchabas	445.1	16	232,609
Kericho	Bureti	Kisiara, Tebesonik, Cheboin, Chemosot, Litein, Cheplanget and Kapkatet.	321.1	**85**	251,264

2.8 Land Ownership and Settlements Patterns

There are two major land tenure systems in Konoin and Bureti Sub Counties namely the Leasehold Tenure and the Freehold Tenure. The Freehold Tenure is governed under the Land Registration Act of 2012 and is mainly utilized for farming. On the other hand, Leasehold Land Tenure system is an interest in land for a definite term of years usually 99 years renewable upon request by the proprietor. All urban areas exist under leasehold tenure in the project locations of *Kimulot, Mogogosiek, Boito Embomos and Chepchabas in Bomet and Kisiara, Tebesonik, Cheboin, Chemosot, Litein, Cheplanget and Kapkatet in Kericho* County.

2.9 Education

In Kericho County, Early Childhood Development Education, pupils enrolment as at 2017 comprised 23,094 boys and 22,526 girls giving a total of 45,620 pupils thus boys representing 50.6% while girls represent 49.4%.There are over 1800 teachers teaching in these centers, 935 of these are employed by the county government on contract.

The county has a total enrolment of 242,034 from both public and private schools. According to 2009 census, there were 169,093 primary school pupils. Since then there has been tremendous increase in enrollment. The percentage increase is 43% and this requires urgent investment in infrastructural and human development to accommodate the increasing number of pupils. **Table 2-5 on Page 2-8**.

Table 2-5: Kericho County Education Institutions

SUB - COUNTY	NO. OF PRIMARY SCHOOL			NUMBER OF PUPILS
	PUBLIC	PRIVATE	TOTAL	
Bureti	114	92	206	53,896
Belgut	78	40	118	41,174
Ainamoi(kericho)	80	53	133	42,217
Soin//sigowet	91	25	116	35,461
Kipkelion west	81	33	114	33,127
Kipkelion east	82	34	116	36,159
Total	**526**	**277**		**242,034**

County Director of Education, Kericho 2018

2.10 Health

The number of facilities in the county has been increasing over the years. Total number of CGOK facilities is currently at 136. More are yet to be opened up over the next five years. Surgical services are currently available in four hospitals, namely Kericho district hospital, Kapkatet sub-county hospital, Londiani sub-county hospital and Sigowet sub-county hospital with two more to be opened up soon at Roret and Fort- Tenan hospitals. There is a six bed HDU/ICU in Kericho County Referral Hospital and a CT scan at Kapkatet County Hospital. Dialysis is currently being offered at the County Referral Hospital. Imaging services are now available in five hospitals.

HIV prevalence in Kericho is lower than the national prevalence at 3.5% (Kenya HIV Estimates 2015). The HIV prevalence among women in the County is higher (4.9%) than that of men (2.9%), indicating that women are more vulnerable to HIV infection than men in the County.

Kericho County contributes to 1.1% of the total number of people living with HIV in Kenya and is ranked the twenty seventh nationally. By the end of 2015, a total of 16,382 people were living with HIV in the County, with 15% being young people aged 15-24 years and 9% being children under the age of 15 years

2.11 Road Infrastructure

The infrastructural development is mainly carried out by the Department of Public Works, Roads and Transport. Public Works sub sector is involved in the provision of planning, maintenance and supervision services of public buildings and structures. The goal is therefore to ensure standards are followed during construction of the public projects and safety concerns are adhered to as per the building and construction codes.

The roads subsector is mandated to open up county road networks countywide, build drainage structures, and maintain urban and rural county roads. The sub sector is set to achieve opening up of specific lengths of priority road networks identified in the Annual Development Plan. The transport subsector also implements the transport policy and is set to achieve specific road safety initiatives in specific roads identified, issue licenses to public transport with aim of management of the transport services and increase the targeted value of revenue that is also expanded through enforcement of axle load controls at toll stations.

2.12 Biological and Social Receptors

The assessment identified below listed in **Table 2-6** Biological social receptors that might be impacted by Project activities at construction stage

Table 2-6: Social Receptors

Category of Receptor	Name of receptor	GPS coordinate
Biological receptors along the raw water line	• Embomos forest (part of Mau Forest) • Itare River	36 M 0754619 UTM 9932929 36 M 0754287 UTM 9932111
Social Receptors along the Raising main and clean water line	• Itare tea buying center • Chemosoren tea buying center • Mogogosiek shopping center • Boito Shopping center.	36 M 0756712 UTM 9956418 36 M 0748450 UTM 9933740

Photographs of Mogogosiek and Boito Shopping Centers identified as Social Receptors

CHAPTER 3: PROJECT COMPONENTS PROPOSED IN THE DESIGN REPORT (DR)

3.1 Proposed Measures Sanitation Measures

The following Sanitation Improvement Measures are proposed for Litein, Kapkatet and adjacent Trading/ Market Centres (Chemosit, Roret, Kabartegan, Kaplong and Mogogosiek):

i. **Faecal Sludge Emptying and Transport:** Under the Contract, 1Nr Exhauster Tankers, of capacity 10,000 litres, will be procured and handed over to KEWASCO for improved and more affordable faecal sludge transport services in the Project Towns and other areas within proximity.

ii. **Faecal Sludge Treatment Facilities:** The Sludge Treatment Facilities have been proposed for Litein Town at the site identified by Kericho County Government, though not yet acquired. Their design is based on the average ultimate flow of 3.0 m^3/d and peak flow of 20.0 m^3/d. The previous design of Sludge Treatment Facilities has been improved to ensure environmental sustainability by introduction of Anaerobic Baffled Reactor (ABR), which is an improved Septic Tank, and provision of Constructed Wetland instead of Soak Pits for liquid effluent polishing. A Soak Pit has been provided for disposal of excess final effluent.

iii. **Resource Recovery/ Safe End-Use and Disposal:** Considering the quantities of the by-products and final products of faecal sludge treatment, the recommended products for resource recovery include.

   a. Soil Conditioner and agricultural manure from stabilized and dried sludge.

   b. Fodder and weaving plants from Constructed Wetlands.

Schematic Layout Plan of the proposed Sludge Treatment Facilities is given in **Figure 3.1** on **Page 3.2**.

The Engineer's Estimate for the Proposed Sanitation Works is **KES. 165,164,843 (Euro 1,321,319)** as presented in **Table 3.1** below.

Table 3-1: Preliminary Costs of Proposed Sanitation Works

S/No	Works Component		Amount, KES	Amount, Euro
1	Exhauster Discharge Bay		4,170,350	33,363
2	Equalization Tank (32 m^3 Capacity)		5,114,400	40,915
3	Anaerobic Baffled Reactor		9,773,600	78,189
4	Facultative Pond (1Nr)		11,785,000	94,280
5	Constructed Wetlands (2Nr)		5,465,750	43,726
6	Sludge Drying Beds (6Nr)		31,672,000	253,376
7	Site and Ancillary Works		36,965,250	295,722
8	Operation and Maintenance Tools & Equipment		19,942,000	159,536
	Sub-Total 1	**[A]**	**124,888,350**	**999,107**
9	Preliminaries & General Items (Add 15% of [A])	[B]	18,733,253	149,866
	Sub-Total 2 ([A] + [B])	[C]	**143,621,603**	**1,148,973**
10	Physical and Price Contingencies (Add 15% of [C])	[D]	21,543,240	172,346
	Grand Total for Sanitation Works ([C] + [D])		**165,164,843**	**1,321,319**

** 1 EUR = 125 KES (September. 2022)*

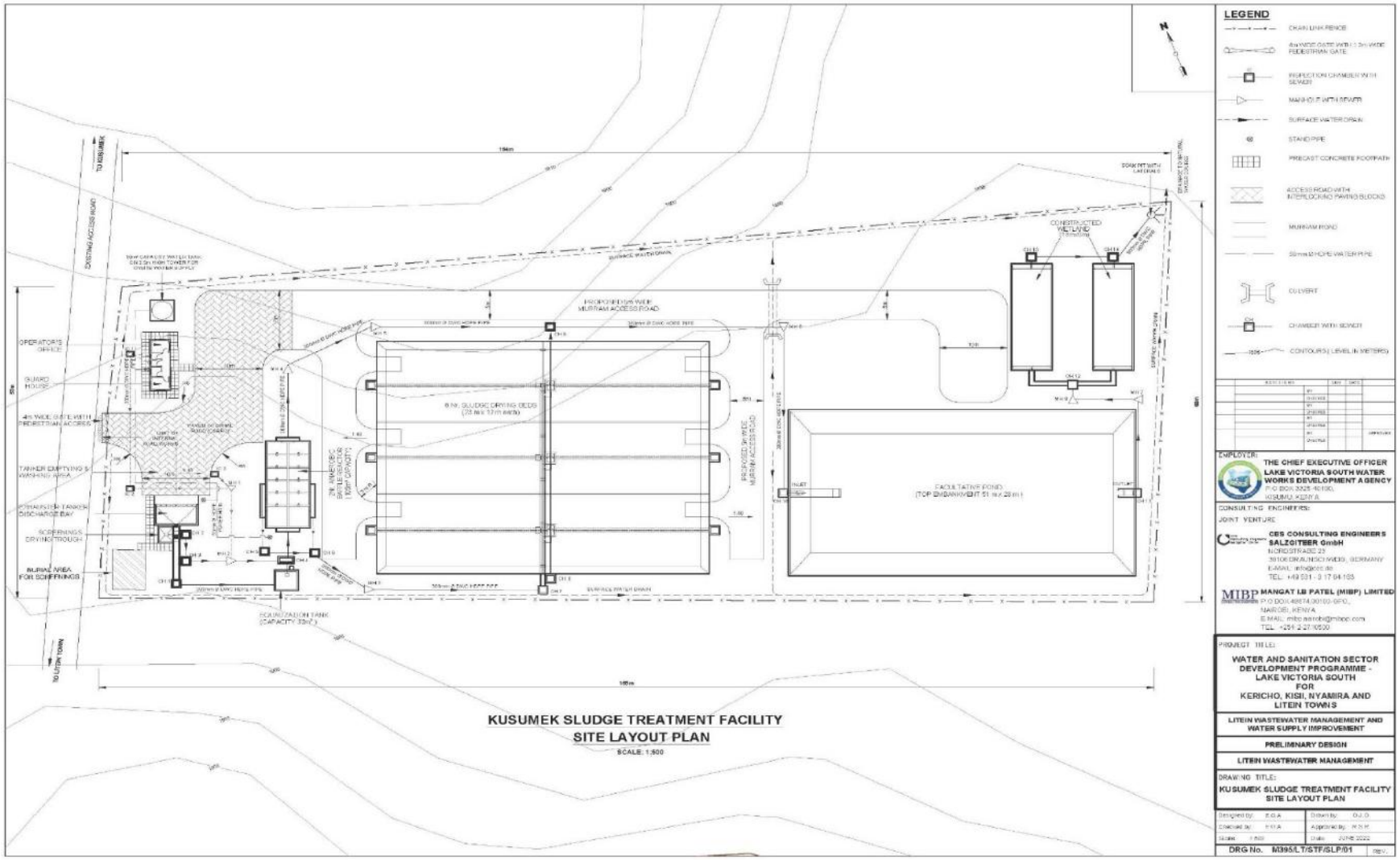


Figure 3.1: Layout Plan of Proposed Sludge Treatment Facility

3.2 Proposed Water Supply Expansion Measures

The Proposed Water Supply Expansion Measures include:

i. Rehabilitation of Existing Water Supply System comprising of the following components
   - Intake Works and Raw Water Pumping Station
   - Itare Water Treatment Works
   - Water Storage Tanks and Distribution Pipelines

ii. New DN 350mm Ferrous Raw Water Pumping Main and its Appurtenances, length 250m

iii. Augmentation of Existing Itare Water Treatment Works from current production capacity of 8,000 m^3/d to 15,500 m^3/d

iv. Proposed Treated Water Pumping Main, ND 300mm pipeline, 2.5km long to convey water from Itare Water Treatment Works to Existing Saseta Tank

v. Proposed Treated Water Transmission Pipeline from Existing Saseta Tank to Existing Chemoiben Tank, OD 315mm Main, 10.3km long

The Engineer's Estimate for the Proposed Water Supply Expansion Works is **Kshs. KES 512,958,438 (Euro 4,103,668** as presented in **Table 3.2**.

Table 3-2: Preliminary Costs of Proposed Water Supply Expansion Works

S/No	Works Component	Amount, KES	Amount, Euro
1	**Electro-Mechanical Works**		
a	4Nr Submersible Raw Water Pump Sets & Control Panels (Q =431m^3/h, H = 34m & Motor Power = 58kw)	34,000,000	272,000
b	5Nr Multi-stage Centrifugal Treated Water Pump Sets & Control Panels (Q = 269m^3/h, H = 133m & Motor Power = 140kw)	36,000,000	288,000
c	2Nr Centrifugal Backwash Pump Sets & Control Panels and associated E&M modifications (Q = 225m^3/h, H = 30m & Motor Power = 26kw)	6,360,000	50,880
	Sub-Total - A	**76,360,000**	**610,880**
2	**Water Treatment Works – 3Nr Streams**		
a	Stilling Well, Chemical Dosing Channel & Flocculation Basin	15,993,326	127,947
b	Chemical Storage, Mixing & Dosing Building	19,681,919	157,455
c	Sedimentation Tanks (3Nr)	40,781,413	326,251
d	Filters (3Nr), Filter Gallery and Filter Control Room	55,002,845	440,023
e	RC Backwash Tank (225m^3 Capacity)	10,166,773	81,334
f	Backwash Water & Sludge Lagoon	11,436,891	91,495
g	Sludge Drying Beds (2Nr)	10,778,893	86,231
h	Site & Ancillary Works	12,000,000	96,000
	Sub-Total - B	**175,842,060**	**1,406,736**
3	**Transmission Pipelines**		
a	Raw Water Pumping Main from Intake Works to Existing Itare WTP, DN 350mm Ferrous (PN 16) 250m long	9,922,033	79,376
b	Treated Water Pumping Main to Existing Saseta Tank, DN 300mm dia Ferrous (PN16), 2.5km long	65,057,431	520,459

S/No	Works Component	Amount, KES	Amount, Euro
c	Treated Water Transmission Main from Existing Saseta Tank to Existing Chemoiben Tank, OD315mm dia HDPE PN12.5, 10.3km long	185,776,914	1,486,215
	Sub-Total - C	**260,756,378**	**2,086,051**
	Total [A+B+C]	**512,958,438**	**4,103,668**

** 1 EUR = 125 KES (Jun. 2022)*

3.3 Summary of Investment Requirements

A summary of the Estimated Investment Costs incorporating the Proposed Sanitation measures and Water Supply Expansion Measures is given in **Table 3.3** below.

3.3.1 Overall Investment Cost for Sanitation Works and Augmentation of Litein Water Supply System

Table 3-3: Total Estimated Investment Requirements for Litein and Kapkatet Towns

Bill Description		Amount (Kshs)	Amount (Euro)
Faecal Sludge Treatment Facilities		165,164,843	1,321,319
Expansion of the Water Supply Systems to meet Year 2030 demands		512,958,438	4,103,668
Bills Total Exclusive of VAT	**(A)**	**678,123,281**	**5,424,987**
Value Added Tax (VAT) - 16% of (A)	(B)	82,073,350	867,998
Grand Total [(A)+(B)]		**760,196,631**	**6,292,985**

The above Costs include allowance for Preliminary and General Items (estimated as 15% of Cost of Works) and Contingencies (estimated as 10% of cost of Works). **However, it should be noted that the above Costs do not include Costs of any Land Acquisition or compensation that may be required.**

CHAPTER 4: APPROACH AND METHOD OLOGY

4.1 Site Visits

To provide a context within which the impacts of the Project can be assessed, a site visit was conducted along the proposed Raw Water Pipeline, existing Itare Water Treatment Plant, Saseta Tank and Clear Water Pipeline on the **2nd of June 2022**. The aim of the visit was to collect data was through field observation of flora and fauna, water resources, soils, land use and landscape. Further, secondary data was collected through literature review. A description of the physical, biological, and social conditions is detailed in **Chapter 3** of this report.

4.2 Stakeholder Engagement

An effective impact assessment requires engagement with relevant stakeholder throughout the key stages. This was undertaken during the ESIA stage. This process assisted in understanding stakeholder views on the Project and in identifying issues that should be taken into account in the prediction and evaluation of impacts. The schedule of public barazas within the *Kiowa, Mogogoseik and Simoti* locations is summarized in **Table 4.1**.

Table 4.1: Schedule of Public Participation

LOCATION	VENUE	DATE	ATTENDEES
Koiwa Location	Sergone Village Koiwa Brigde	9th June 2022	62
Mogogoseik Location	Mogogosiek Location Chief's Office	10th June 2022	23
Simoti Location	Simoti Location Chief's Office	9th June 2022	31

Minutes and the attendance list of the public baraza are presented as **Appendix 1** to this report.

4.3 Impact Assessment Methodology

Impact identification and assessment starts with scoping and continues through a structured impact assessment process. The principal steps comprise the following steps.

- Impact prediction - to determine what could potentially happen to resources and receptors as a consequence of the Project and its associated activities;
- Impact evaluation - to evaluate the significance of the predicted impacts by considering the magnitude of the effect and the sensitivity, value, and importance of the affected resource or receptor;
- Mitigation and enhancement - to identify appropriate and justified measures to mitigate negative impacts and enhance positive impacts; and
- Residual impact evaluation - to evaluate the significance of impacts assuming effective implementation of mitigation and enhancement measures.

The terminologies used to describe impact characteristics is shown in **Table 4.2.**

Table 4.2: Impact characteristics

CHARACTERISTIC	DEFINITION	DESIGNATION
Type	A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect)	Direct, Indirect, Induced
Extent	The 'reach' of the impact (e.g., confined to a small area around the Project Footprint, Projected for several km etc.)	Local, Regional, International
Duration	The time period over which a resource/ receptor is affected	Temporary, Short term, long term Permanent
Scale	The size of the impact (e.g., the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc.)	No fixed designation, intended to be a numerical value or a qualitative description of intensity
Frequency	A measure of the constancy or periodicity of the impact	No fixed designation, intended to be a numerical value or a qualitative description

The definitions for the type designations are shown in **Table 4.3**.

Table 4.3: Impact characteristics

DEFINITION	DESIGNATION
Direct	Impacts that result from a direct interaction between the Project and a resource/receptor (e.g., between occupation of a plot of land and the habitats which are affected
Indirect	Impacts that follow on from the direct interactions between the Project and its environment as a result of subsequent interactions within the environment (e.g., viability of a species population resulting from loss of part of a habitat as a result of the Project occupying a plot of land).
Induced	Impacts that result from other activities (which are not part of the Project) that happen as a consequence of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).

The above characteristics and definitions apply to planned and unplanned events. An additional characteristic that pertains unplanned events is likelihood. The likelihood of an unplanned event occurring is designated using a qualitative scale, as described in **Table 4.4**.

Table 4-4: Definition of Likelihood

LIKELIHOOD	DEFINITION
Unlikely	The event is unlikely but may occur at some time during normal operating conditions
Possible	The event is likely to occur at some time during normal operating conditions.
Induced	Impacts that result from other activities (which are not part of the Project) that happen as a consequence of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).
Likely	The event will occur at normal operating conditions (i.e., it is essentially inevitable).

Once an impact's characteristics are defined, the next step in the impact assessment phase was to assign each impact a 'magnitude'. Magnitude is a function of some combination of the following impact characteristics:

- Extent
- Duration
- Scale
- Frequency

Magnitude essentially describes the intensity of the change that is predicted to occur in the resource/receptor as a result of the impact. As discussed above, the magnitude designations themselves are universally consistent, but the descriptions for these designations vary on a resource/receptor-by resource/receptor basis. The universal magnitude designations are:

- Positive
- Negligible
- Small
- Medium
- Large

In the case of a positive impact, no magnitude designation (aside from 'positive') is assigned. It is considered sufficient for the purpose of the area of influence to indicate that the Project is expected to result in a positive impact, without characterizing the exact degree of positive change likely to occur.
In the case of impacts resulting from unplanned events, the same resource/receptor-specific approach to concluding a magnitude designation is utilized, but the 'likelihood' factor is considered, together with the other impact characteristics, when assigning a magnitude designation.

In addition to characterizing the magnitude of impact, the other principal impact evaluation step is definition of the sensitivity, vulnerability and importance of the impacted resource/receptor. There are a range of factors to be taken into account when defining the sensitivity/vulnerability/importance of the resource/receptor, which may be physical, biological, cultural or human. Other factors may also be considered when characterizing sensitivity/vulnerability/importance, such as legal protection, government policy, stakeholder views and economic value.

As in the case of magnitude, the sensitivity/vulnerability/importance designations themselves are universally consistent, but the definitions for these designations vary on a resource/receptor basis.

The sensitivity/vulnerability/importance designations used herein for all resources/receptors are:

- Low
- Medium
- High

Significance

Once magnitude of impact and sensitivity/vulnerability/importance of resource/receptor were characterized, the significance was assigned for each impact. Impact significance was designated using the matrix shown in **Table 4.5 on Page 4.4**.

Table 4-5: Impact Significance

		SENSITIVITY / VULNERABILITY / IMPORTANCE OF RESOURCE / RECEPTOR		
Magnitude of Impact		Low	Medium	High
	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

The matrix applies universally to all resources/receptors, and all impacts to these resources/receptors, as the resource/receptor-specific considerations were factored into the assignment of magnitude and sensitivity, vulnerability and importance designations that enter into the matrix.

4.4 Mitigation and Enhancement Measures

Further, once the significance of an impact was characterized, the next step was to evaluate what mitigation and enhancement measures are warranted. For the purposes of this assessment, the following order or hierarchy was applied for development of mitigation:

- Avoid at Source, Reduce at Source: avoiding or reducing at source through the design of the Project (e.g., avoiding by siting or re-routing activity away from sensitive areas or reducing by restricting the working area or changing the time of the activity).
- Abate on Site: add something to the design to abate the impact (e.g., pollution control equipment, traffic controls, perimeter screening and landscaping).
- Abate at Receptor: if an impact cannot be abated on-site then control measures can be implemented off-site (e.g., noise barriers to reduce noise impact at a nearby residence or fencing to prevent animals straying onto the site).
- Repair or Remedy: some impacts involve unavoidable damage to a resource (e.g., agricultural land and forestry due to creating access, work camps or materials storage areas) and these impacts can be addressed through repair, restoration or reinstatement measures.
- Compensate in Kind, Compensate Through Other Means: where other mitigation approaches are not possible or fully effective, then compensation for loss, damage and disturbance might be appropriate (e.g., planting to replace damaged vegetation, financial compensation for damaged crops or providing community facilities for loss of fisheries access, recreation and amenity space).

The priority in mitigation for the Project was to first apply mitigation measures to the source of the impact (i.e., to avoid or reduce the magnitude of the impact from the associated Project activity), and then to address the resultant effect to the resource/receptor via abatement or compensatory measures or offsets (i.e., to reduce the significance of the effect once all reasonably practicable mitigations have been applied to reduce the impact magnitude

4.5 Residual Impact

In addition, once mitigation and enhancement measures were specified the next step in the Impact Assessment Process was to assign residual impact significance. This is essentially a repeat of the impact assessment steps discussed above, considering the implementation of the proposed mitigation and enhancement measures.

4.6 Management and Monitoring and Audit

The final stage in the impact assessment process was the development of a management plan for implementing controls and mitigation and also monitoring the effectiveness. Monitoring is done to verify that: a) impacts or their associated project components remain in conformance with applicable standards; and b) mitigation measures are effectively addressing impacts and compensatory measures and offsets are reducing effects to the extent predicted.

An Environmental and Social Management Plan (ESMP), which is a compilation of all actions identified in the impact assessment, is provided in **Chapter 8**. This includes mitigation measures, compensatory measures and offsets and management and monitoring activities

CHAPTER 5: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

5.1 Policy Framework

The water sector in Kenya is guided by the Kenya Vision 2030, Water Act 2016, the Water Policy 1999 and the water strategic plan 2013-2017, among other instruments. **Table 5.1 below** presents a summary relevant policy provisions and legal statutes that were analyzed.

Table 5.1: Policy Framework Relevant to Water and Sanitation Infrastructure

No	Policy	Applicability
1	Constitution of Kenya (CoK) 2010	Article 43 (1) provides that every person has the right – (b) to accessible and adequate housing, to reasonable standards or sanitation; and, (d) to clean and safe water in adequate quantities. These provisions cover oblige state organs and bind them to provide not just high quality or clean and safe water but also adequate quantities to all people that they will serve. Litein & Kapkatet Towns Water and Sanitation Project will ensure this goal is achieved through adequate treatment of raw sewage before it is released into the environment Also, the Constitution of Kenya provides for sound management and sustainable development of all Projects, both public and private investments. It also calls for the duty given to the Project proponent to co-operate with State organs and other persons to protect and conserve the environment as mentioned in Part II.
2	National Environment Policy (NEP):	The revised draft of the National Environmental Policy, dated April 2012, sets out important provisions relating to the management of ecosystems and the sustainable use of natural resources. The Project area is ecological zone V and VI. Ecosystems under these zones are sensitive to any activity out of character with the ecosystem. Therefore, during implementation of the Project Components proper environment assessment will be undertaken in order to ensure that the ecosystems are not destabilized.
3	The National Environmental Sanitation and Hygiene Policy-July 2007:	The Policy is devoted to environmental sanitation and hygiene in Kenya as a major contribution to the dignity, health, welfare, social well-being and prosperity of all Kenyan residents. The Policy recognizes that healthy and hygienic behavior and practices begin with the individual. The implementation of the Policy will greatly increase the demand for sanitation, hygiene, food safety, improved housing, use of safe drinking water, waste management, vector control at the household level and encourage communities to take responsibility for improving the sanitary conditions of their immediate environment.

No	Policy	Applicability
4	National Policy on Water Resources Management and Development (Sessional Paper No.1 of 1999)	The management of water resources in Kenya is guided by four specific policy objectives, namely: • Preserve, conserve, and protect available water resources and allocate it in a sustainable rational and economic way; • Supply water of good quality in sufficient quantities to meet the various water needs, including poverty alleviation, while ensuring the safe disposal of wastewater and environmental protection; • Establish an efficient and effective institutional framework to achieve a systematic development and management of the water sector; and • Develop a sound and sustainable financing system for effective water resources management, water supply and sanitation development.
5	The National Water Policy 2012 (Draft)	The Policy is built on the achievements of the sector reform commenced with the Water Act and based on the sector principles lined out in the National Water Policy 1999. On water resources management, the policy seeks the management of water resources along natural catchment/basin boundaries following the Integrated Water Resource Management approach. It aims to ensure a comprehensive framework for promoting optimal, sustainable, and equitable development and use of water resources for livelihoods of Kenyans through: • Progressive restoration and protection of ecological systems and biodiversity in strategic water catchments; • increasing per capita water availability above the international benchmark of 1000 m. by 2030; • Maximizing use of trans-boundary water resources in coordination with other riparian countries; • Enhancing storm water management and rainwater harvesting; • Enhancing inter-basin water transfer in Kenya as a strategic intervention for optimized used of water resources; • Improving effluent waters treatment and recycling for use; • Ensuring sustainable groundwater resources for present and future generations; and • Developing a water management system which contributes to the protection of the environment.
6	Kenya Vision 2030	The Kenya Vision 2030 is the current National Development blueprint for period 2008 to 2030. The vision has three pillars; economic, social and political. It is recognized that Kenya is a water scarce Country but stated (Kenya, 2007: 115) that the Vision for the water and sanitation sector is "to ensure water and improved sanitation services availability. The Project will directly contribute towards achievement of objectives of vision under the environment and social pillar through provision of the planned dam projects.
7	National Climate Change Response Strategy, 2010	The strategy paper recognizes that Kenya is a water scarce country and offers a variety of strategies for ensuring that the resource is utilized in ways that recognize that it is a finite resource. The paper also argues that interventions in the water sector should take a participatory approach involving different water users including gender groups, socioeconomic groups, planners and policy makers in water resource management (Kenya, 2010: 53).

No	Policy	Applicability
8	The National Land Policy (Sessional Paper No. 3 of 2009)	The policy regulates rights over land and provides for sustainable growth, investment and the reduction of poverty in line with the Government s overall development objectives. Specifically, "the policy offers a framework of policies and laws designed to ensure the maintenance of a system of land administration and management. The overall objective of the National Land Policy is to secure land rights and provide for sustainable growth, investment, and the reduction of poverty in line with the governments overall development objectives.
9	Economic Recovery for Wealth and Employment Creation Strategy 2006	The overall goal of the strategy is to ensure clear improvement in the social and economic wellbeing of all Kenyans; thereby giving Kenyans a better deal in their lives, and in their struggle to build a modern and prosperous nation. The key areas covered in the strategy are: • Expanding and improving infrastructure; • Reforms in trade and industry; • Reforms in forestry; • Affordable shelter and housing; • Developing arid and semi-arid lands, and • Safeguarding environment and natural resources.

5.2 Legal Framework

Applicable Acts of Parliament as summarized in **Table 5.2** below were reviewed

Table 5.2: Legal Framework Relevant to Water and Sanitation Infrastructure

Policy	Applicability
EMCA 1999 Cap 397	The Environmental Management and Coordination Act of 1999 (EMCA) Cap 387 was enacted to provide an appropriate legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto. EMCA does not repeal the sectoral legislation but seeks to coordinate the activities of the various institutions tasked to regulate the various sectors. These institutions are referred to as Lead Agencies in EMCA. Lead Agencies are defined in Section 2 as any Government ministry, department, parastatal, and State Corporation or local authority in which any law vests functions of control or management of any element of the environment or natural resource. EMCA addresses itself primarily to Environmental Impact Assessment (Section 58). The Environmental (Impact Assessment and Audit) Regulations of 2003, however, recognizes SEAs as a measure of environmental impact assessment at strategic level such as policy, plans and programmes. Waste Management Regulations, 2006: Regulation 4 (1) states that "no person shall dispose of any waste on a public highway, street, road, recreational area or in any place except in a designated receptacle". Regulation 4 (2) further states that "a waste generator shall collect, segregate and dispose such waste in the manner provided for under these regulations". The proponent will use provisions of this regulation to ensure that waste is handled, stored, transported and disposed as per this regulation.
Land Act, 2012	It is the substantive law governing land in Kenya and provides legal regime over administration of public and private lands. It also provides for the acquisition of land for public benefit. The government has the powers under this Act to acquire land for projects, which are intended to benefit the general public.

Policy	Applicability
	This Act provides for the procedure to be followed during compulsory acquisition of land by the Government and the just compensation which should be paid promptly and in full to all persons whose interest in land has been affected. This Act will be applied during land acquisition if required.
Water Act, 2016	Article 43 of the Constitution stipulates that every person in Kenya has the right to clean and safe water in adequate quantities and to reasonable standards of sanitation. In conformity to this constitutional requirement, the Water Act, 2016 was enacted. It is "AN ACT of Parliament to provide for the regulation, management and development of water resources, water and sewerage services; and for other connected purposes". The law provides for national public water works (Article 8(2)) that include water storage, water works for bulk distribution and provision of water services, inter-basin water transfer facilities, and reservoirs for impounding surface run-off and for regulating stream flows to synchronize them with water demand patterns which are of strategic or national importance. It vests the administration of water resources to the National Government (Article 9) and calls for public participation in the formulation of a National Water Resource Strategy (Article 10 (1)) on five-year cycles. The Strategy shall provide the Government's plans and programs for the protection, conservation, control and management of water resources (2). Article 10(3) gives the details of the contents of the National Water Resource Strategy, i.e.: (a) existing water resources and their defined riparian areas; (b) measures for the protection, conservation, control and management of water resources and approved land use for the riparian area; (c) minimum water reserve levels at national and county levels; (d) institutional capacity for water research and technological development; (e) functional responsibility for national and county governments in relation to water resources management; and (f) any other matters the Cabinet Secretary considers necessary. The new law aligned national water management and water services provision with the requirements of the Constitution of Kenya 2010 particularly on the clauses devolving water and sanitation services to the county governments. Service provision is devolved to the Counties who are the owners of Water Service Providers (WSPs). The Sanitation Works once implemented will be handed to Kericho and Bomet Water and Sanitation Companies Water Service Provider (WSP) for operation and maintenance as provided by Water Act 2016
County Government Act No. 17 of 2012	The preamble to the Act gives overriding object and purpose of the Act. It states that, 'An Act of Parliament to give effect to Chapter Eleven of the Constitution; to provide for county governments' powers, functions and responsibilities to deliver services and for connected purposes. Part II elaborate on the functions and powers of the county government, emphasizing its constitutional authority to enter into contracts, acquire and hold and dispose of assets, and delegate functions, such as through sub-contracts and partnerships. Part VI considers the foci and administration of decentralization to the sub-county level, including to urban areas and cities.

Policy	Applicability
	The County Government Act, 2012, provides the basis for spatial plans as statutory requirements in the county. The Act stipulates a 10-year spatial plan be developed by each county to provide for: (a) spatial depiction of the social and economic development programme of the county as articulated in the integrated county development plan; (b) a clear statement of how the spatial plan is linked to the regional, national and other county plans; and (c) a clear clarification on the anticipated sustainable development outcomes of the spatial plan.
Physical and Land Use Development Plan Act 2019	Section 16 of the Physical Planning Act (Chapter 286) provides that the Director may prepare a regional physical development plan. The plan shall consist of inter alia, a statement of policies and proposals with regard to the allocation of resources and the locations for development within the area. The Act requires the Director to invite any person interested to make representations to do so within sixty days of the publication of the plan. On approval of the regional physical development plan no development shall take place on any land unless it is in conformity with the plan. Section 24 provides for the Director to prepare also a local physical development plan whose purpose is to guide and coordinate development and for the control of the use and development of land. The proposed sanitation works will be implemented in line with the approved Local Physical Development Plans (LPDPs) for Kericho and Bomet. Particular interest will be site for WWTP and alignment of trunk and secondary sewers along road reserves and river riparian
The Urban Areas and Cities Act 2011	This Law passed in 2011 provides legal basis for classification of urban areas (City) when the population exceeds 500,000; a municipality when it exceeds 250,000; and a town when it exceeds 10,000) and requires the city and municipality to formulate County Integrated Development Plan (Article 36 of the Act).
Occupational Health and Safety Act (OSHA 2007)	The Act provides Environment Health and Safety (EHS) Guidelines which shall be followed by both the Contractor and Supervising Consultant during implementation of the Project to avoid injuries and even loss of life to workers and neighboring community.
The Public Health Act (Cap.242)	This is an Act of Parliament that makes provision for securing and maintaining health. Part IX contains provision regarding sanitation and housing. Section 115 of the Act states that no person shall cause nuisance or cause to exist on any land or premises any condition liable to be injurious or dangerous to human health. Section 116 requires that Local Authorities take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable to be injurious or dangerous to human health. The Act also contains provisions on discharges of pollutants into water sources. On responsibility of the Local Authorities Part XI, section 129, of the Act states in part "It shall be the duty of every local authority to take all lawful, necessary and reasonably practicable measures for preventing any pollution dangerous to health of any supply of water which the public within its district has a right to use and does use for drinking or domestic purposes. Part XII, Section 136, states that all collections of water, sewage, rubbish, refuse and other fluids which permit or facilitate the breeding or multiplication of pests shall be deemed nuisances under this Act.

Policy	Applicability
HIV and AIDS Prevention and Control Act 2011	The objective and purpose of this Act is to (a) promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS; (b) extend to every person suspected or known to be infected with HIV and AIDS full protection of his human rights and civil liberties. The Act provisions will be applied during Project implementation phase where the contractor will be required to create awareness among workers and community at large.
Sexual Offences Act 2006	An Act of Parliament that makes provision about sexual offences aims at prevention and the protection of all persons from harm from unlawful sexual acts and for connected purposes. Section 15, 17 and 18 focuses mainly on sexual offenses on minor (children).
Child Rights Act (Amendment Bill) 2014	This Act of Parliament makes provision for parental responsibility, fostering, adoption, custody, maintenance, guardianship, care and protection of children. It also makes provision for the administration of children's institutions, gives effect to the principles of the Convention on the Rights of the Child and the African Charter on the Rights and Welfare of the Child. Contractors implementing the various Project components envisaged under the Master Plan Study will be required to comply to provisions of the Act during Project implementation.
Labour Relations Act 2012	An Act of Parliament to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratization of trade unions and employers organizations or federations, to promote sound labour relations through the protection and promotion of freedom of association. This act will be applied by labour force on site in addressing disputes related to working conditions.
National Gender and Equality Commission Act 2011	The over-arching goal for NGEC is to contribute to the reduction of gender inequalities and the discrimination against all; women, men, persons with disabilities, the youth, children, the elderly, minorities and marginalized communities. This Act will be applied during hiring of workforce on site.
The National Museums and Heritage Act 2006	An Act of Parliament to consolidate the law relating to national museums and heritage; to provide for the establishment, control, management and development of national museums and the identification, protection, conservation and transmission of the cultural and natural heritage of Kenya; to repeal the Antiquities and Monuments Act (Cap. 215) and the National Museums Act; and for connected purposes. This act together with world bank policy OP 4.11 on Physical Cultural Resources will be quoted in the event that the project will encounter such materials, chance find procedures will be provided to specific ESIAs that will be prepared.

5.3 Regulations and Rules

Applicable Regulations and Rules are summarized in **Table 5.3** below were reviewed.

Table 5.3: Regulations and Polices

REGULATION	RELEVANCE	APPLICABILITY TO THE PROJECT
The Environmental (Impact Assessment and Audit) Regulations, 2003	The regulation provides a framework under which Environment Impact Assessment for the Factory is prepared, Regulation 4(1) further states that: (a)''…no Proponent shall implement a project: likely to have a negative environmental impact. (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…''	Provisions of the regulations apply during preparation of this preliminary ESIA.

REGULATION	RELEVANCE	APPLICABILITY TO THE PROJECT
Environmental Management and Coordination (Water Quality) Regulations, 2006	Regulation 9 of these regulations provides for water quality monitoring. It states that the "Authority in consultation with the relevant lead agency, shall maintain water quality monitoring for sources of domestic water at least twice every calendar year and such monitoring records shall be in the prescribed form as set out in the second schedule to these regulations". The regulations provides for sustainable management of water resources including prevention of water pollution and protection of water sources (lakes, rivers, streams,' springs, wells and other water sources). Construction of the dam provides for sustainable management of such water resources.	Provisions of the regulations apply during preparation of this this preliminary ESIA.
(Waste Management Regulations, 2006	Regulation 4 (1) states that "no person shall dispose of any waste on a public highway, street, road, recreational area or in any place except in a designated receptacle". Regulation 4 (2) further states that "a waste generator shall collect, segregate and dispose such waste in the manner provided for under these regulations".	Contractor will use provisions of this regulation to ensure that waste is handled, stored, transported and disposed as per this regulation.
Noise and Excessive Vibration Pollution (Control) Regulations, 2009	The Contractor will be required to ensure compliance with the above regulations in order to promote a healthy and safe working environment throughout the Construction Phase. This shall include regular inspection and maintenance of equipment and prohibition of unnecessary hooting by vehicles. The regulations provides for a maximum of 60 dBA during the day and 35 dBA during the night for a construction site.	Provisions of the regulations apply during preparation of this this preliminary ESIA.
The Environmental Management and Coordination (Air Quality Regulations 2014)	These regulations provide a framework for management of plant and equipment emissions of hydrocarbons on site. The regulations require that all plant and equipment on site should be well serviced to manufacturers specifications to avoid air pollution, the regulation also require monitoring of baseline air quality within construction site and implementation of correction action where the standards are not complied to.	Water spray will be used at all times when working in dry areas to avoid risks associated with dust menace. Particulate matter (PM_{10}), equipment's will be operated as provided by manufacturers specification to eliminate cases of Oxides (SOx), Nitrogen Oxides (NOx)) and Volatile Organic Compounds (VOC).
Fire Risk Reduction Rules, 2007	The rules require electrical equipment be installed in accordance with the respective hazardous area classification system, flammable materials are stored in appropriately designed receptacles, electrical equipment is inspected after six months by a competent person and the Proponent is required to keep records of such inspections, installation and maintenance of firefighting systems in workplaces, fire drills at least once a year, assembly points be marked, undertake annual fire safety audits etc.	The contractor will be required to store all flammable materials and liquids safely to avoid risk of fire.

REGULATION	RELEVANCE	APPLICABILITY TO THE PROJECT
Medical Examination Rules, 2005	It requires workers on site to undergo regular medical examination to identify the symptoms of hazardous exposures on the body, especially those who handle food or food products. This is with a sole purpose of monitoring exposure for remedial action.	The contractor will institute and implement regular medical examinations for its staff at the facility. These will include COVID 19 temperature checkup and drug abuse (at least alcohol on daily basis).
Safety and Health Committee Rules of 2004	These rules require the proponent and contractor (once they employ a more than twenty persons) to establish a committee to address the health, safety and welfare of workers. The Proponent and by extension the contractor, are required to provide space for meetings for the committee, training of the S&H Committee, appoint a S&H management representative, as well as allowing all staff to attend these meetings with no risk of loss of earnings, opportunities for promotion or advancement. They should also make legislation on occupational safety and health available to the Committee.	The contractor will develop a clearly defined safety and health policy, bring it to the notice of all employees at the workplace. They are also required to implement and review the policy when need arises. If construction workers exceed 20, the contractor will facilitate the formation of a S&H Committee and its operations.
First-Aid Rules, 1977	Rule 7 of First-Aid Rules, 1977 require that (No person shall be placed in charge of a first aid unless he has received adequate training and holds a certificate of competence	The contractor will conduct first aiders' training for the first time and a refresher training Bi- annually.

5.4 National Water Quality Standards

The PDR report provides that the WTP will conform to provisions of national regulatory drinking water quality standards and WHO water quality guidelines, whichever is stringent. Regular monitoring to determine compliance will be done by Bomet and Kericho Water Companies and corrective/ mitigation measures applied where necessary. The standards are provided in **Table 5.4** below.

Table 5.4: National Drinking Water Quality Standards

PARAMETER	UNITS	GUIDELINE VALUE
Aluminium	mg/L	0.05 - 0.2
Chloride	mg/L	<250
Color	Hazen	<15
Copper	mg/L	<1.0
Corrosivity	-	Non – corrosive
Fluoride	mg/L	<2.0
Foaming Agents	mg/L	<0.5
Iron	mg/L	<0.3
Manganese	mg/L	<0.05
Odour	Odour threshold level	<3
Ph	Sorensen scale	6.5-8.5
Silver	mg/L	<0.10
Sulphate	mg/L	<250
Total Dissolved Solids	mg/L	<500
Zinc	mg/L	<5
Sodium	mg/L	<200
Chlorine	mg/L	0.2+ -0.5
Magnesium	mg/L	<100
Ammonia	mg/L	<0.5
Mercury	mg/L	<0.001
Nitrate	mg/L	<10
Fluoride	mg/L	<1.5
Arsenic	mg/L	<0.05
Cadmium	mg/L	<0.05

Source-NEMA

Table 5.5: Microbiological Limits for Drinking Water

TYPE OF MICROBES	PRESENT/ABSENT
Total viable counts at 37^0C per ml, Max	100% Present
Coliforms in 250 ml	Absent
E. Coli in 250 ml	Absent
Staphylococcus aureus in 250 ml	Absent
Sulphite reducing anaerobes in 50 ml	Absent
Pseudomonas aeruginosa Fluorescence in 250 ml	Absent
Steptococuus faecalis	Absent
Shingella in 250 ml	Absent
Salmonella in 250 ml	Absent

****Source-NEMA***

5.5 KfW Sustainability Principles

The assessment was prepared in conformity with the provisions of KfW Sustainability Guideline Assessment and management of Environmental, Social, and Climate Aspects: Principles and Procedures of 2019. Applicable KfW Sustainability Principles as defined in clause (3.2) of the guidelines are listed in **Table 5.6 below**.

Table 5.6: Kfw Sustainability Principles

Principle	Description
Principle 1	to avoid, reduce or limit environmental pollution and environmental damage including climate-damaging emissions and pollution;
Principle 2	To preserve and protect biodiversity and tropical rainforests and to sustainably manage natural resources;
Principle 3	To consider probable and foreseeable impacts of climate change including utilising the potential to adapt to climate change. In this context climate change is understood as climate variability and long-term climate change;
Principle 4	To avoid adverse impacts upon the living conditions of communities, in particular indigenous people and other vulnerable groups, as well as to ensure the rights, living conditions and values of indigenous people;
Principle 5	To avoid and minimise involuntary resettlement and forced eviction of people and their living space as well as to mitigate adverse social and economic impacts through changes in land use by reinstating the previous living conditions of the affected population;
Principle 6	to ensure and support occupational health and safety as well as health protection in the workplace
Principle 7	To condemn forced labour and child labour, ban discrimination in respect of employment as well as occupation and support the freedom of association and the right to collective bargaining;
Principle 8	To protect and preserve cultural heritage;
Principle 9	to avoid all forms of discrimination
Principle 10	to avoid negatively influencing existing conflict dynamics;
Principle 11	to protect and preserve cultural heritage;
Principle 12	To support the executing agency in the management and monitoring of possible adverse environmental, social and climate impacts as well as risks within the framework of the implement FC measure.

5.6 Permits and Licences

The below listed permits and licenses will be required before the Project is rated compliant to statutory county and national government regulations. The Contractor shall ensure that all pertinent permits, certificates and licenses have been obtained prior to any activities commencing on site and are strictly enforced/ adhered to;

- Environment License issued by NEMA and per the provisions of the EMCA 1999 Cap 387
- Effluent Discharge Permit issued by NEMA and WRA
- The license in Department of Occupational Health and Safety Registration (DOSH).
- Approval of Plans by Bomet and Kericho County Government Physical Planning Department of any structures on site.
- Permits from Public Health Department (Bomet and Kericho County) of sanitation facilities installed on site

The Contractor shall maintain a database of all pertinent permits and licenses required for the contract as a whole and for pertinent activities for the duration of the contract.

CHAPTER 6: STAKEHOLDER CONSULTATION

6.1 Stakeholder Consultations

Project stakeholders are defined as individuals, groups or other entities who: (i) are impacted or likely to be impacted directly or indirectly, positively or adversely, by the Project (also known as 'affected parties'); and (ii) may have an interest in the Project ('interested parties'). They include individuals or groups whose interests may be affected by the Project and who have the potential to influence the Project outcomes in any way.

The objectives of stakeholder consultations were as follows;

- To identify and map all relevant stakeholders, their context, interests and concerns;
- To establish a two-way dialogue to understand concerns, management options and external perspectives;
- To manage stakeholders' expectations;
- To facilitate the collection of quality primary and secondary information relevant; to the project processes including monitoring;
- To triangulate data collected and analysis done to inform decision making;
- To document information disclosed and public consultation efforts;
- To comply with regulations and requirements on disclosure and consultation;
- To provide information about the project and its potential impacts to those interested in or affected by the project, and solicit their opinion in this regard;
- To identify additional impacts/issues and possible mitigation measures;
- To inform the process of developing appropriate mitigation measures and facilitate consideration of alternatives and trade-offs (if any);
- To reduce chances of conflict through early identification of contentious issues;
- To ensure transparency and accountability of decision-making; and
- To increase public confidence in the project.

6.2 Stakeholder Mapping and Identification

An effective impact assessment requires engagement with relevant stakeholder throughout the key stages. This was undertaken during the ESIA stage. This process assisted in understanding stakeholder views on the Project and in identifying issues that should be taken into account in the prediction and evaluation of impacts. The schedule of public barazas within the *Kiowa, Mogogoseik and Simoti* locations is summarized in **Table 6.1**.

Table 6.1: Schedule of Public Participation

LOCATION	VENUE	DATE	ATTENDEES
Koiwa Location	Sergone Village Koiwa Brigde	9th June 2022	62
Mogogoseik Location	Mogogosiek Location Chief's Office	10th June 2022	23
Simoti Location	Simoti Location Chief's Office	9th June 2022	31

Minutes and the attendance list of the public baraza are presented as **Appendix 1** to this report.

The Project designs and Environment Impact Assessment (EIA) in-cooperated issues discussed and resolved in the consultative meeting as summarized in **Table 6.2 to 6.4** below.

Table 6-2 below presents summary of issues discussed during Koiwa Meeting

Table 6.2: Stakeholder Concerns

Concerns	Response
Respondent 1 wanted to know what are plans are in place to ensure residents of Koiwa Which the water source of the project get sufficient water supply. They proposed a tank to be constructed at Seanin Hills so that they can be served.	Residents were informed that since the Project still under design stage, the technical team was looking at the best options to ensure water is available for residents. It was agreed that after the meeting the team will visit seanin hills for preliminary observation.
Respondent 2 Raised concerns that it was better to treat water at the intake point pump it to Seanin hills instead of constructing a long Expensive pipeline to sagem Project	Residents were informed that Construction of a new treatment plant is expensive and that's why rehabilitation of the existing Itare water treatment plant was picked as the most feasible option. Treating water at the intake point will still involve double pumping which the design team is trying to eliminate due to its cost implication. They were further informed that the initial cost of construction of the raw water pipeline might be higher however running costs of the project will be lower in the long run which will translate into lower bills for the final consumer.
Respondent 3 wanted to be informed if indigenous trees likely to be cut down during project implementation will be compensated before project commencement.	Residents were informed that trees that will be cut down will be compensated before commencement of the project. Owners will be given sufficient time to cut down the trees and collect salvage. They were further informed that if private land is affected compensation for easement will be done. The same will be done for any structures that might be affected, owners will be compensated at full replacement costs of the structure and still allowed sufficient time to collect salvage.
Respondent 4 wanted to know if WRUA and WRA will be consulted so that they can issue abstraction permit for the project.	The residents were informed that the consultant will ensure all the prerequisite permits are issued from relevant authorities before project commencement. WRUA and WRA will be consulted to issue the abstraction permit and also compute the annual charge for the water consumed. Additionally, they were informed that ESIA report will be submitted to NEMA so that they can issue a license to the project.
Residents inquired on when the water project will begin	Residents were informed that the current assignment was for feasibility studies and design, after this is done, they will be informed on the next steps through public participation forums.

Photograph of Koiwa Meeting

Table 6-3 below presents summary of issues discussed during Mogogoseik Meeting

Table 6.3: Stakeholder Concerns Mogogoseik Location

Respondent 1 wanted to know when was the tank at Saseta last cleaned He felt that typhoid cases have been on that rise in the area	Residents were informed that water treatment tanks are supposed to undergo routine cleaning every 6 months the consultant will inquire to find out if that is being done by the water service provider. They were also encouraged to be careful with post handling of water by ensuring containers used to fetch water are clean.
Respondent 2wanted to know if the existing line will be removed before or after construction of a new line Since he felt that supply maybe interrupted. He also wanted to be informed on how residents along the raw water line will get water since they were not considered during the initial project.	Residents were informed that the during construction it is a requirement for the contractor to ensure continuous water supply to residents. When rehabilitating dilapidated sections of the line, temporary pipelines will be provided. Concerning water supply for people along the raw water transmission line, residents were informed that the technical team was looking at options of constructing additional water storage tanks on higher elevated areas to ensure treated water gravitates to wider geographical areas.
Respondent 3 wanted to know if damage to private property will be compensated. He said that during construction of the initial project property was damaged and never paid.	Residents were informed that compensation will be done in three aspects that include payment for easement where private land is affected, payment for crops and trees and compensation for structures affected. They were informed that the compensation will be done before commencement of the project, adequate time given to the affected to collect salvage.

He also wanted to know if this was the only meeting or others will be organized.	The meeting was reliably informed that there will be many more public participation forums organized before project implantation and even during construction phase. A grievance redress committee will be established to timely handle any grievances.
Respondent 4 wanted to be informed if there will be any other mega water projects in the area or this was the final one.	Residents were informed that water infrastructure improvement was a continuous process aimed at achieving vision 2030. There will be more water projects as time progresses. At the moment focus is on expansion and rehabilitation of Itare water supply project.
Respondent 5 wanted to be informed on why residents along Kimori – Sotik road were never connected back to the line after road.	Those in attendance were informed that the disruption was occasioned by the road construction works. The county Government will work in conjunction with BOMWASCO to ensure residents are connected back to the line.
Respondent 6 wanted to know why he does not receive water yet he lives near the tank. He also wanted to know what will be done to control water overflow from the tank at Saseta that destroys their crops and land.	Residents were informed that since the current water production at the treatment plant is below half, that is the reason for the unreliable water supply this will be corrected once the rehabilitation is done. The tank will be installed with automatic control switch that will eliminate the issue of overflows.

Photograph of Mogogoseik Meeting

Table 6-4 below presents summary of issues discussed during Simoti Meeting.

Table 6.4: Stakeholder Concerns Simoti Location

Respondent 1 wanted to know when project implementation will commence	Residents were informed that the current assignment was to do feasibility studies and design which includes ESIA and RAP. Once this stage is concluded, they will be informed about the subsequent steps.
Respondent 2 wanted to know if the contractor will look for workforce within the community where the project was based.	Residents were informed that the top priority of the contractor's workforce is the youths and women in the project area. They were also informed that both unskilled and skilled labor will be sourced from the local community. The youths however, were told to look for the opportunities, organize and avail themselves. They were also encouraged to work diligently and responsibly to avoid termination before completion of the project.
Respondent 3 wanted to know if land and any other property affected during project implementation will be compensated.	Residents were informed that in the primary objective will be to utilize the riparian land and road reserves however, if any private property is affected compensation will be done on land and any developments on the affected section. They were further informed that sufficient time will be allocated for collection of salvage After laying of the pipeline, residents are expected not to plant trees and other long-term crop on the wayleave, they will also not be allowed to put up any structures on the sections.
Respondent 4 wanted to be informed of the measures that have been put in place to ensure residents get water. Currently he said water supply in the area is very unreliable. He also wanted to know if the water bill will be reduced.	Residents were informed that the unreliable water supply has been occasioned by the depreciation of Itare water treatment plant that is functioning at half the design capacity. High cost of power and regular power outages is also a contributing factor towards the unreliability. They were further informed that the proposed rehabilitation and upgrade of the of the system will ensure production capacity is improved to 15000 cubic meters per day. Electricity cost will also be reduced by more than half through elimination of raw water pumping and introduction of hydro power, this will translate into reduction of water bills.
Respondent 5wanted to know if the intake will involve construction of a dam and how will they ensure water is available for downstream user. He also expressed concerns about dam safety siting an example of Solai Dam in Nakuru County that collapsed and led to a catastrophe.	Those in attendance were informed that there was no construction of a dam instead a weir will be used to tap the water into the raw water transmission line. This will ensure sufficient water is available for downstream users. Because there is no construction of a dam residents were told not to be warried about dam collapse.

Respondent 6 wanted to know if there will be additional storage tanks that will be constructed in order to act as reservoirs for the water	Residents were informed that since the project was still under feasibility and design stage, project engineers will look for possible storage tank sites that are elevated to ensure water is pumped to them and gravitas back naturally to cover a wider geographical area.

Photograph of Simoti Meeting

CHAPTER 7: ASSESSMENT OF ENVIRONMENT AND SOCIAL IMPACTS

7.1 Assessing Environment and Social Impacts

The Design stage, screening assessment was undertaken to determine the potential risks of the proposed Project sites on the human and natural environment as summarized in sub section below.

7.2 Intake Works Proposed Sites and Raw Water Gravity Main

7.2.1 Koiwa Bridge Site and Raw Water Gravity Main

Table 7.1: Environment and Social Risks Screening for Koiwa Bridge Site and Raw Water Gravity Main

Criteria	Yes	Description
Cluster 1: Impact on Natural Habitat, artifacts and monuments • Is the site or proposed investment a protected or reserved site including national park, reserve or local sanctuary etc.)? • Is it an environmentally sensitive area or critical habitat – wetland, woodlot, natural forest, and river • Are there vulnerable or endangered species (terrestrial or aquatic) in the area? • Are there natural habitats in the site? Or in its proximity. If there are natural habitats, are they fragile, unique, and limited in size? Are these world heritage / Ramsar sites • Are there wetlands, areas of saturated soils (permanent or temporary), or evidence of ponding (cracks, high clay content in soils, dead vegetation, water marks)?	Yes	The site is located within riparian land of Itare River, and the raw water gravity main will be laid along the river within riparian land.
Cluster 2: Impacts on Soils Resources • Is the site already degraded (low groundwater, poor soil quality)? • Are there steep slopes in the proximity of the investment site? • Is the site vulnerable to natural hazards (in floodplain, near volcano, on seismic fault, near coastline in hurricane zone)? • Create a risk of increased soil erosion/degradation? • Create waste that could affect local soils, vegetation, rivers and streams or groundwater? • Affect soil salinity and alkalinity?	Yes	During construction of the intake works minimal destruction of soils will be experienced, appropriate mitigation measures will be applied
Cluster 3: Impacts on Water Resources • Affect the aesthetic quality of the landscape? • Result in incompatibility of land uses? • Divert the water resource from its natural course/location? • Involve drainage of wetlands or other permanently flooded areas? • Result in a modification of groundwater levels by altering flows, paving surfaces or increasing water extraction? • Affect groundwater quality? • Affect quality (through sediment, wastewater, storm discharge or solid waste) of nearby surface waters (lake, rivers, streams)? • Affect water quantity in nearby water bodies (lake, river, stream)? • Affect any watershed?	Yes	The site is located within riparian land of Itare River, minimal pollution of river is likely during construction of the intake works.

Criteria	Yes	Description
Cluster 4: Social Impacts • Are there known archaeological, historical or other cultural property e.g. graves? Are any of these world heritage/ UNESCO designated etc • Entail resettlement of population? and lead to destruction of private property and assets and loss of Livelihoods • Affect indigenous/marginalized/vulnerable people? • Result in involuntary restriction of access by people to legally designated parks and protected areas and pasture land • Result in construction workers or other people moving into or having access to the area (for a long period and in large numbers compared to permanent residents)?	Yes	The intake Works will trigger land acquisition and therefore RAP will be prepared

Photograph of proposed Koiwa Bridge Intake Site

7.2.2 Kiptingting Bridge Site and Raw Water Gravity Main

Table 7.2: Environment and Social Risks Screening for Kiptingting Bridge Site and Raw Water Gravity Main

Criteria	Yes	Description
Cluster 1: Impact on Natural Habitat, artifacts and monuments • Is the site or proposed investment a protected or reserved site including national park, reserve or local sanctuary etc.)? • Is it an environmentally sensitive area or critical habitat – wetland, woodlot, natural forest, and river • Are there vulnerable or endangered species (terrestrial or aquatic) in the area? • Are there natural habitats in the site? Or in its proximity. If there are natural habitats, are they fragile, unique, and limited in size? Are these world heritage / Ramsar sites • Are there wetlands, areas of saturated soils (permanent or temporary), or evidence of ponding (cracks, high clay content in soils, dead vegetation, water marks)?	Yes	The site is located within riparian land of Itare River, and the raw water gravity main will be laid along the river within riparian land.
Cluster 2: Impacts on Soils Resources • Is the site already degraded (low groundwater, poor soil quality)? • Are there steep slopes in the proximity of the investment site? • Is the site vulnerable to natural hazards (in floodplain, near volcano, on seismic fault, near coastline in hurricane zone)? • Create a risk of increased soil erosion/degradation? • Create waste that could affect local soils, vegetation, rivers and streams or groundwater? • Affect soil salinity and alkalinity?	Yes	During construction of the intake works minimal destruction of soils will be experienced, however, appropriate mitigation measures will be applied
Cluster 3: Impacts on Water Resources • Affect the aesthetic quality of the landscape? • Result in incompatibility of land uses? • Divert the water resource from its natural course/location? • Involve drainage of wetlands or other permanently flooded areas? • Result in a modification of groundwater levels by altering flows, paving surfaces or increasing water extraction? • Affect groundwater quality? • Affect quality (through sediment, wastewater, storm discharge or solid waste) of nearby surface waters (lake, rivers, streams)? • Affect water quantity in nearby water bodies (lake, river, stream)? • Affect any watershed?	Yes	The site is located within riparian land of Itare River, minimal pollution of river is likely during construction of the intake works

Cluster 4: Social Impacts • Are there known archaeological, historical or other cultural property e.g. graves? Are any of these world heritage/ UNESCO designated etc • Entail resettlement of population? and lead to destruction of private property and assets and loss of Livelihoods • Affect indigenous/marginalized/vulnerable people? • Result in involuntary restriction of access by people to legally designated parks and protected areas and pasture land • Result in construction workers or other people moving into or having access to the area (for a long period and in large numbers compared to permanent residents)?	Yes	The intake Works will trigger land acquisition and therefore RAP will be prepared

Photograph of proposed Kiptingting Bridge Intake Site

7.2.3 Itare Bridge Site and Raw Water Gravity Main

Table 7.3: Environment and Social Risks Screening for Itare Bridge Site and Raw Water Gravity Main

Criteria	Yes	Description
Cluster 1: Impact on Natural Habitat, artifacts and monuments • Is the site or proposed investment a protected or reserved site including national park, reserve or local sanctuary etc.)? • Is it an environmentally sensitive area or critical habitat – wetland, woodlot, natural forest, and river • Are there vulnerable or endangered species (terrestrial or aquatic) in the area? • Are there natural habitats in the site? Or in its proximity. If there are natural habitats, are they fragile, unique, and limited in size? Are these world heritage / Ramsar sites • Are there wetlands, areas of saturated soils (permanent or temporary), or evidence of ponding (cracks, high clay content in soils, dead vegetation, water marks)?	Yes	The site is located within riparian land of Itare River, This site is also located off Embombos Forest, easement permits will be required from Kenya Forest Services (KFS)
Cluster 2: Impacts on Soils Resources • Is the site already degraded (low groundwater, poor soil quality)? • Are there steep slopes in the proximity of the investment site? • Is the site vulnerable to natural hazards (in floodplain, near volcano, on seismic fault, near coastline in hurricane zone)? • Create a risk of increased soil erosion/degradation? • Create waste that could affect local soils, vegetation, rivers and streams or groundwater? • Affect soil salinity and alkalinity?	Yes	During construction of the intake works minimal destruction of soils will be experienced, appropriate mitigation measures will be applied
Cluster 3: Impacts on Water Resources • Affect the aesthetic quality of the landscape? • Result in incompatibility of land uses? • Divert the water resource from its natural course/location? • Involve drainage of wetlands or other permanently flooded areas? • Result in a modification of groundwater levels by altering flows, paving surfaces or increasing water extraction? • Affect groundwater quality? • Affect quality (through sediment, wastewater, storm discharge or solid waste) of nearby surface waters (lake, rivers, streams)? • Affect water quantity in nearby water bodies (lake, river, stream)? • Affect any watershed?	Yes	The site is located within riparian land of Itare River, minimal pollution of river is likely during construction of the intake works

Cluster 4: Social Impacts • Are there known archaeological, historical or other cultural property e.g. graves? Are any of these world heritage/ UNESCO designated etc • Entail resettlement of population? and lead to destruction of private property and assets and loss of Livelihoods • Affect indigenous/marginalized/vulnerable people? • Result in involuntary restriction of access by people to legally designated parks and protected areas and pasture land • Result in construction workers or other people moving into or having access to the area (for a long period and in large numbers compared to permanent residents)?	Yes	The intake Works will trigger land acquisition and therefore RAP will be prepared

Photograph of proposed Itare Bridge Intake Site off gazetted Embomos Forest

7.3 Water Treatment Plant Site (WTP) and Clear Water Rising Main

Table 7.4: Environment and Social Risks Screening for Water Treatment Site and Clear Water Rising main

Criteria	Yes	Description
Cluster 1: Impact on Natural Habitat, artifacts and monuments • Is the site or proposed investment a protected or reserved site including national park, reserve or local sanctuary etc.)? • Is it an environmentally sensitive area or critical habitat – wetland, woodlot, natural forest, and river • Are there vulnerable or endangered species (terrestrial or aquatic) in the area? • Are there natural habitats in the site? Or in its proximity. If there are natural habitats, are they fragile, unique, and limited in size? Are these world heritage / Ramsar sites • Are there wetlands, areas of saturated soils (permanent or temporary), or evidence of ponding (cracks, high clay content in soils, dead vegetation, water marks)?	No	The works are proposed within existing WTP and also the clear Water rising main alignment exists
Cluster 2: Impacts on Soils Resources • Is the site already degraded (low groundwater, poor soil quality)? • Are there steep slopes in the proximity of the investment site? • Is the site vulnerable to natural hazards (in floodplain, near volcano, on seismic fault, near coastline in hurricane zone)? • Create a risk of increased soil erosion/degradation? • Create waste that could affect local soils, vegetation, rivers and streams or groundwater? • Affect soil salinity and alkalinity?	Yes	During construction of the intake works minimal destruction of soils will be experienced, appropriate mitigation measures will be applied
Cluster 3: Impacts on Water Resources • Affect the aesthetic quality of the landscape? • Result in incompatibility of land uses? • Divert the water resource from its natural course/location? • Involve drainage of wetlands or other permanently flooded areas? • Result in a modification of groundwater levels by altering flows, paving surfaces or increasing water extraction? • Affect groundwater quality? • Affect quality (through sediment, wastewater, storm discharge or solid waste) of nearby surface waters (lake, rivers, streams)? • Affect water quantity in nearby water bodies (lake, river, stream)? • Affect any watershed?	No	This impact is assessed negligible

Cluster 4: Social Impacts • Are there known archaeological, historical or other cultural property e.g. graves? Are any of these world heritage/ UNESCO designated etc • Entail resettlement of population? and lead to destruction of private property and assets and loss of Livelihoods • Affect indigenous/marginalized/vulnerable people? • Result in involuntary restriction of access by people to legally designated parks and protected areas and pasture land • Result in construction workers or other people moving into or having access to the area (for a long period and in large numbers compared to permanent residents)?	No	No land acquisition will be triggered because the WTP and Clear Water Rising main exist

Photograph of existing Itare Water Treatment Plant

7.4 Treated Water Transmission Main

Table 7.5: Environment and Social Risks Screening for Water Treatment Site and Clear Water Rising main

Criteria	Yes	Description
Cluster 1: Impact on Natural Habitat, artifacts and monuments • Is the site or proposed investment a protected or reserved site including national park, reserve or local sanctuary etc.)? • Is it an environmentally sensitive area or critical habitat – wetland, woodlot, natural forest, and river • Are there vulnerable or endangered species (terrestrial or aquatic) in the area? • Are there natural habitats in the site? Or in its proximity. If there are natural habitats, are they fragile, unique, and limited in size? Are these world heritage / Ramsar sites • Are there wetlands, areas of saturated soils (permanent or temporary), or evidence of ponding (cracks, high clay content in soils, dead vegetation, water marks)?	No	The Treated Water Transmission Main will be laid along road reserves
Cluster 2: Impacts on Soils Resources • Is the site already degraded (low groundwater, poor soil quality)? • Are there steep slopes in the proximity of the investment site? • Is the site vulnerable to natural hazards (in floodplain, near volcano, on seismic fault, near coastline in hurricane zone)? • Create a risk of increased soil erosion/degradation? • Create waste that could affect local soils, vegetation, rivers and streams or groundwater? • Affect soil salinity and alkalinity?	Yes	During construction of the intake works minimal destruction of soils will be experienced, appropriate mitigation measures will be applied
Cluster 3: Impacts on Water Resources • Affect the aesthetic quality of the landscape? • Result in incompatibility of land uses? • Divert the water resource from its natural course/location? • Involve drainage of wetlands or other permanently flooded areas? • Result in a modification of groundwater levels by altering flows, paving surfaces or increasing water extraction? • Affect groundwater quality? • Affect quality (through sediment, wastewater, storm discharge or solid waste) of nearby surface waters (lake, rivers, streams)? • Affect water quantity in nearby water bodies (lake, river, stream)? • Affect any watershed?	No	This impact is assessed negligible

Cluster 4: Social Impacts • Are there known archaeological, historical or other cultural property e.g. graves? Are any of these world heritage/ UNESCO designated etc • Entail resettlement of population? and lead to destruction of private property and assets and loss of Livelihoods • Affect indigenous/marginalized/vulnerable people? • Result in involuntary restriction of access by people to legally designated parks and protected areas and pasture land • Result in construction workers or other people moving into or having access to the area (for a long period and in large numbers compared to permanent residents)?	Yes	No extral land will be required under the Project

Photograph of existing Saseta Water Storage Tank

7.5 Sludge Treatment Site in Litein Town

Table 7.6: Environment and Social Risks Screening for Sludge Treatment Site in Litein

Criteria	Yes	Description
Cluster 1: Impact on Natural Habitat, artifacts and monuments • Is the site or proposed investment a protected or reserved site including national park, reserve or local sanctuary etc.)? • Is it an environmentally sensitive area or critical habitat – wetland, woodlot, natural forest, and river • Are there vulnerable or endangered species (terrestrial or aquatic) in the area? • Are there natural habitats in the site? Or in its proximity. If there are natural habitats, are they fragile, unique, and limited in size? Are these world heritage / Ramsar sites • Are there wetlands, areas of saturated soils (permanent or temporary), or evidence of ponding (cracks, high clay content in soils, dead vegetation, water marks)?	Yes	The facility is proposed to be located within low lying ground on Parcel/818 belonging to a 2nr private individual, to the lower side the parcel is traversed by a permanent stream that forms the main receptor. However, risks of water resources and soil resources pollution will be triggered, mitigation measures will be applied
Cluster 2: Impacts on Soils Resources • Is the site already degraded (low groundwater, poor soil quality)? • Are there steep slopes in the proximity of the investment site? • Is the site vulnerable to natural hazards (in floodplain, near volcano, on seismic fault, near coastline in hurricane zone)? • Create a risk of increased soil erosion/degradation? • Create waste that could affect local soils, vegetation, rivers and streams or groundwater? • Affect soil salinity and alkalinity?	Yes	
Cluster 3: Impacts on Water Resources • Affect the aesthetic quality of the landscape? • Result in incompatibility of land uses? • Divert the water resource from its natural course/location? • Involve drainage of wetlands or other permanently flooded areas? • Result in a modification of groundwater levels by altering flows, paving surfaces or increasing water extraction? • Affect groundwater quality? • Affect quality (through sediment, wastewater, storm discharge or solid waste) of nearby surface waters (lake, rivers, streams)? • Affect water quantity in nearby water bodies (lake, river, stream)? • Affect any watershed?	Yes	

Cluster 4: Social Impacts • Are there known archaeological, historical or other cultural property e.g. graves? Are any of these world heritage/ UNESCO designated etc • Entail resettlement of population? and lead to destruction of private property and assets and loss of Livelihoods • Affect indigenous/marginalized/vulnerable people? • Result in involuntary restriction of access by people to legally designated parks and protected areas and pasture land • Result in construction workers or other people moving into or having access to the area (for a long period and in large numbers compared to permanent residents)?	Yes	Additional land will be required, 2Nr families living around the site will require relocation

Photograph of Proposed Site for Sludge Treatment in Litein Town

CHAPTER 8: ENVIRONMENTAL and Social MANAGEMENT AND MONITORING PLAN (ESMP)

8.1 Purpose and Objectives of ESMP

The specific objectives of the ESMP are to:

- Serve as a commitment and reference for the contractor to implement the ESMP including conditions of approval from NEMA.
- Serve as a guiding document for the environmental, health and safety monitoring activities during construction and operation of the sewer lines.
- Provide detailed specifications for the management and mitigation of activities that have the potential to impact negatively on the environment, health and safety of workers and community.
- Provide instructions to relevant personnel regarding procedures for protecting the environment and minimizing environmental effects, thereby supporting the operator's goal of minimal or zero incidents.

8.2 ESMP at Construction Stage

The Environmental, Social Management and Monitoring Plan (ESMP) prepared for preliminary ESIA for Litein and Kapkatet Water and Sanitation Project is summarized In **Table 8-1 on Page 8.2.**

Table 8.1: Environment and Social Management Monitoring Plan during Construction Stage

RISK	ANTICIPATED IMPACT	MITIGATION	RESPONSIBILITY	MONITORING PARAMETER	BUDGET (Kshs.)
Impacts on Water Resource	● Site activities such as excavations and levelling could result to loosening of soils that could result increased sedimentation and siltation of Itare River ● Un-serviced plant and equipment on site could result to oils and fuels leaks that could contaminate Itare River rising the BoD and adversely affecting aquatic organism in seasonal Streams.	● All waste water which may be contaminated with oily substances must be managed in accordance with an appropriate Waste Management Plan (WMP). ● No hydrocarbon-contaminated water may be discharged to the environment. ● At construction stage, the contractor will prepare Specific Construction Environment and Social Management Plan (C-ESMP) which included among other; Soil and Sedimentation Control Plan, Spoil Management Control Plan and Waste Management Plan.	Contractor	● State of natural storm water drainage channels draining into Itare River ● Quality of water flowing within Itare River	Preliminary Sum of Ksh 500,000 to be allowed for water pollution control
Impacts on Soil Resource	● Soil include erosion resulting from activities such as excavation and levelling, clearing of vegetation for infrastructure such as access roads, laydown areas and construction zones ● Soil contamination as a result of possible oil and fuel leaks from un services plant and equipment on site.	● Vegetation clearing and topsoil disturbance will be minimized. ● Contour temporary and permanent access roads / laydown areas so as to minimize surface water runoff and erosion. ● Sheet and rill erosion of soil shall be prevented where necessary through the use of sand bags, diversion berms, culverts, or other physical means. ● Topsoil shall be stockpiled separate from subsoil. Stockpiles shall not exceed 2 m height, shall be located away from drainage lines, shall be protected from rain and wind erosion, and shall not be contaminated. ● Wherever possible construction work will take place during the dry season. ● Topsoil shall be evenly spread across the cleared areas when reinstated. ● Accelerated erosion from storm events during construction shall be minimized through managing storm water runoff (e.g., velocity control measures). ● Soil backfilled into excavations shall be replaced in the order of removal in order to preserve the soil profile.	Contractor	● State of top soil within active work site ● Level of turbidity of water within Itare River triggered by Project Activities	Preliminary Sum of Ksh 500,000 to be allowed for soil erosion control

RISK	ANTICIPATED IMPACT	MITIGATION	RESPONSIBILITY	MONITORING PARAMETER	BUDGET (Kshs.)
		● Spread mulch generated from indigenous cleared vegetation across exposed soils after construction ● At construction stage, the contractor will prepare Specific Construction Environment and Social Management Plan (C-ESMP) which included among other; Soil and Sedimentation Control Plan, Spoil Management Control Plan and Waste Management Plan.			
Impacts on Air Quality	● Emissions of oxides of nitrogen (NO2 in particular) mainly from construction-related vehicles (and to a lesser degree from construction generators and other hydrocarbon powered equipment); and ● Dust and particulate matter (as PM10) created by construction-related vehicle traffic on unpaved roads.	**As general measures for all locations:** ● Develop a Dust Management Plan (DMP); ● Record all dust and air quality complaints, identify cause(s), take appropriate measures; ● Liaise with local communities to forewarn of potentially dusty activities; ● Undertake monitoring close to dusty activities, noting that this may be daily visual inspections, or passive/active monitoring as parameter ● Undertake inspections to ensure compliance with the Dust Management Plan; ● Plan potentially dusty activities so that these are located as far from receptors as feasible; ● Erect solid screens if feasible around stockpiles and concrete batching; ● Avoid run off of mud and water and maintain drains in a clean state; ● Remove dusty materials form site as soon as possible if not being re-used. If being re-used, cover or vegetate if possible; ● Impose speed limits on haul routes and in construction compounds to reduce dust generation; ● Minimize drop heights when loading stockpiles or transferring materials; and ● Avoid waste or vegetation burning.	Contractor	● Compliance level Dust Management Plan ● Services and inspection reports of plant and equipment ● Air quality monitoring report findings ● Number of complaints from community related to dust menace	Preliminary Sum of Ksh 500,000 to be allowed for air pollution control

RISK	ANTICIPATED IMPACT	MITIGATION	RESPONSIBILITY	MONITORING PARAMETER	BUDGET (Kshs.)
		For traffic on unpaved roads: ● Undertake watering to attenuate dust near sensitive receptors. The duration and frequency of this should be set out in the Dust Management Plan and will consider water availability and any stakeholder grievances; and ● On unpaved roads in use for more than 1 month, consider use of surface and sealants to reduce the use of water and water trucks. Use of lignin-based sealants recommended due to low environmental toxicity. **For excavations and levelling** ● Revegetate exposed areas as soon as feasible; ● Revegetate or cover stockpiles if feasible; ● Expose the minimum area required for the works, and undertake; and exposure on a staged basis to minimize dust blow.			
Noise and Vibrations Impacts	Construction activities and equipment are not expected to result in significant levels of vibration. Equipment that might high levels of vibration (such as impact piling or vibratory compaction) will not be used	● Siting noisy plant and equipment as far away as possible from human settlement, and use of barriers (e.g., site huts, acoustic sheds or partitions) to reduce the level of construction noise at receptors wherever practicable; ● Where practicable noisy equipment will be orientated to face away from the nearest Human settlement and other receptors; ● Working hours for significant noise generating construction work (including works required to upgrade existing access roads or create new ones), will be daytime only; ● Alternatives to diesel and petrol engines and pneumatic units, such as hydraulic or electric-controlled units, will be used, where practicable; ● Where practicable, stationary equipment will be located in an acoustically treated enclosure; ● For machines with fitted enclosures, doors and door seals will be checked to ensure they are in good working	Contractor	Serviced plant and equipment to manufacturers specification	Preliminary Sum of Ksh 250,000 to be allowed for air pollution control

RISK	ANTICIPATED IMPACT	MITIGATION	RESPONSIBILITY	MONITORING PARAMETER	BUDGET (Kshs.)
		order; also, that the doors close properly against the seals; ● Throttle settings will be reduced and equipment and plant turned off, when not being used; ● Equipment will be regularly inspected and maintained to ensure it is in good working order. The condition of mufflers will also be checked; and fitting of mufflers or silencers of the type recommended by manufacturers.			
Impacts on vegetation cover	Stripping of vegetation cover will be on isolated cases only limited the trees and will have minimal impact to soil structure.	● Avoidance of impacts should be prioritized. However, if not possible then compensatory planting of trees that will be cut by the contractor during works will be undertaken. ● Vegetation shall only be within the well field's only if the vegetation and will interfere with Project construction and/or present a hazard. ● Areas to be cleared shall be agreed and demarcated before the start of the clearing operations to minimize exposure. ● The use of existing cleared or disturbed areas for the Contractor's office, stockpiling of materials etc. shall be encouraged. ● Whenever possible, all damaged areas shall be reinstated and rehabilitated upon completion of the contract to as near pre-construction conditions as possible. ● Rehabilitation of temporary construction sites and pioneer camps (if needed) should be done as swiftly as possible and always with suitable native grasses and other plants	Contractor in liaison with KFS	● Number of trees replanted as compensatory trees ● Status of reinstatement of completed sites	Preliminary Sum of Ksh 200,000 to allowed for procurement and planting of compensatory tree seedling
Community Health Safety and Security Impacts	Increased Project-related traffic, civil works for site preparation including site clearance and excavation and levelling, change to the environment due to	● Contractor will develop and monitor the implementation of a Community Health and Safety Management Plan (CHSMP) ● Contractor will develop Emergency Response Plans	Contractor	● Number of incidences recorded on site and within communities ● Community	Preliminary Sum of Ksh 250,000 to allowed for

RISK	ANTICIPATED IMPACT	MITIGATION	RESPONSIBILITY	MONITORING PARAMETER	BUDGET (Kshs.)
	increased noise, decreased air quality, inappropriate waste handling or disposal, and accidental leaks and spills, and the presence of the Project workforce all present potential hazards for the health and safety of local communities	(ERPs) in cooperation with local emergency authorities and hospitals. ● Contractor will extend the Worker Code of Conduct to include guidelines on worker –community interactions and will provide training on the worker code of conduct to all employees including drivers as part of the induction process. ● Contractor will provide primary health care and first aid at construction office sites to avoid pressure on local healthcare infrastructures. ● Contractor will implement a Community Grievance Mechanism. ● Contractor will develop and implement a Traffic Management Plan covering aspects such as vehicle safety, driver and passenger behaviour, use of drugs and alcohol, operating hours, rest periods, community education on traffic safety and accident reporting and investigations.		satisfactory reports with regards to health and safety ● Reported and addressed grievances on site and from communities	addressing Community health and security impacts
Worker Health and Safety and Workers Management impacts	Workers' rights including occupational health and safety need to be considered to avoid accidents and injuries, loss of man-hours, labour abuses and to ensure fair treatment, remuneration and working conditions. These issues should be considered not only for those who are directly employed on the Project. The Project could potentially lead to workforce-related social and health issues throughout the life cycle of the Project if worker management and rights do not meet Kenyan law or international best practice.	● Contractor and self-employed contractors will assess the H&S risks related with the tasks to be performed during the construction phase. ● Contractor will ensure that training on health and safety measures is provided to all construction workers prior to starting to work on the Project and that supervisors have adequate experience to deliver on their responsibilities. ● Contractor will implement regular health and safety checks and audits of workers, and subcontractors and implementing sanctions in case of breaches of national standards and the Project's specific standards. Such audits to include workplace H&S; worker contracts, working hours, pay and conditions; housing and food standards. ● Contractor will establish a procedure for the recording	Contractor	● Number of incidences recorded on site and within workers ● Workers satisfactory reports with regards to health and safety ● Reported and addressed grievances on site and from workers ● Signed code of conduct	Preliminary Sum of Ksh 250,000 to allowed for addressing Worker's health and security impacts

RISK	ANTICIPATED IMPACT	MITIGATION	RESPONSIBILITY	MONITORING PARAMETER	BUDGET (Kshs.)
		and analysis of incidents and lessons learned such that additional actions can be implemented to avoid or minimize occupational health and safety risks. ● Contractor will ensure that facilities and work sites are designed and maintained such that robust barriers are in place to prevent accidents. ● Contractor will ensure that adequate clean water, adequate food and access to medical care is provided to all workers on the worksite and at accommodation. ● Contractor will develop and implement a Traffic Management Plan covering aspects such as vehicle safety, driver and passenger behaviour, use of drugs and alcohol, operating hours, rest periods, community education on traffic safety and accident reporting and investigations.			
	Gender-based violence and Sexual Harassment	● Ensure clear human resources policy against sexual harassment that is aligned with national law ● Integrate provisions related to sexual harassment in the employee COC ● Ensure appointed human resources personnel to manage reports of sexual harassment according to policy ● The Contractor shall require his employees, sub-contractors, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse ● The contractor will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: - effective and on-going community engagement and consultation, particularly with women and girls; - Review of specific project components that are	Contractor	● Mitigation plan for GBV occurring at the community level as a result of project implementation ● Number of GBV cases happening at the community level that receive survivor-centered referral and care	Budget as presented above

RISK	ANTICIPATED IMPACT	MITIGATION	RESPONSIBILITY	MONITORING PARAMETER	BUDGET (Kshs.)
		known to heighten GBV risk at the community level, e.g., compensation schemes; employment schemes for women; etc. ● the contractor shall develop specific plan for mitigating these known risks, e.g., sensitization around gender-equitable approaches to compensation and employment; etc. ● The contractor will ensure adequate referral mechanisms are in place if a case of GBV at the community level			
	Sexual Exploitation and Abuse by project workers against community members	● Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). ● The SEA action plan will include how the project will ensure necessary steps are in place for: - Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials; - Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management; - Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all		● SEA Action Plan ● Code of Conduct ● Number of staff trainings ● SEA FP ● Community Liaison trained in PSEA ● IEC materials for workers sites and community ● Discrete SEA reporting pathway ● Relevant policies, e.g., investigations and discipline and whistle blower protection ● Monthly minutes from SEA coordination meetings	Budget as presented above

RISK	ANTICIPATED IMPACT	MITIGATION	RESPONSIBILITY	MONITORING PARAMETER	BUDGET (Kshs.)
		community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights; ● Management and Coordination: including integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.			
HIV/AIDs	Spread of communicable diseases and HIV/AIDS	● Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and sexual health and rights through staff training, awareness campaigns, multimedia and workshops or during community Barazas. ● Use existing clinics to provide VCT services to construction crew and provision of ARVs for vulnerable community members ● Ensure safety of women and girls in provision of VCT services. ● Work to minimize or altogether eliminate mosquito-breeding sites.	Contractor and LVSWWDA	● Number of cases of diseases reported ● Rate of absenteeism due to diseases ● No of workers trained on HIV/ AIDS ● Number of gender-disaggregated toilets constructed	Preliminary and General Sum of Ksh 200,000 for awareness and purchase of condoms
COVID 19	Spread of COVID -19 amongst workers	● The Contractors will develop a SOPs for managing the spread of Covid-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilization. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions; ● Mandatory provision and use of appropriate Personal	Contractor and LVSWWDA	● Availability of SOP(s), Training material, PPE, sanitizing facilities ● No of workers sensitized on COVID-19 ● No of hand-washing	Preliminary and General Sum of Ksh 200,000 for awareness and purchase of soap, sanitizers, temperature

RISK	ANTICIPATED IMPACT	MITIGATION	RESPONSIBILITY	MONITORING PARAMETER	BUDGET (Kshs.)
		Protective Equipment (PPE) shall be required for all project personnel including ● Avoid concentrating of more than 100 workers at one location. Where there are two or more people gathered, maintain social distancing at least 2 meters. All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs; ● Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used; ● Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc;		facilities installed; facemasks and temperature monitors secured, etc.	screening gadgets and face masks for workers.
				Sub Total ESMP	**2,850,000.00**

8.3 Statutory Requirements Pre-Commissioning of the WTP

The Occupational health and Safety Act (OSHA 2007) provides below detailed statutory provisions before commission operation of the Water Treatment Plant (WTP).

The measures are listed below.

(i) Register the Augmented Itare Water Treatment Plant (WTP) as Workplace with DOSH as required by OSHA 2007
(ii) Undertake risk assessment, safety and health audit and fire safety audit for the WTP
(iii) Prepare safety & health policy, fire safety policy and environment policy for the WTP
(iv) Establish Health and Safety Committee (HSC) for WTP and train members of the committee on;
- *Statutory fire marshal training*
- *Statutory first aid training*
- *Statutory safety and health committee training on Occupational Health and Safety (OSH)*
- *Regular provision of personnel at the Treatment Works with Appropriate Personal Protective Equipment's (PPEs)*

The plan presented under **Table 8.2 on Page 8-12** will guide the Plant Operator to conform to the provisions of OSHA pre- commissioning of the WTP.

Table 8.2: OSHA 2007 Statutory Provisions Pre-Commissioning of the WTP and Sludge Treatment Facility.

Activity	Requirement	Conformity Measure	Monitoring Indicator	Responsibility	Timelines	Budget (Ksh)
Registration of the Water Treatment Plant as Works Place with DOSH	OSHA 2007 requires that any workplace with more than 7 employees should be registered as a workplace	*Register the Proposed Augmented Itare Water Treatment Plant and Sludge Treatment Facility as Workplace with DOSH*	Availability of Valid Registration Certificate from DOSH	*WTP Operator*	Immediate	*50,000*
Duties Of Occupiers (Legal Requirements)	• Risk Assessment • Safety and Health Audit • Fire Safety Audit • Initial Environment Audit	*Undertake Risk Assessment, Safety and Health Audit and Fire Safety Audit for Augmented Itare Water Treatment Plant and Sludge Treatment Facility.*	*Risk assessment, Health and Safety and Fire Safety Reports*	*WTP Operator Management*	Immediate	*100,000*
Management of Polices required at the Water Works	Policies Required: • Safety & Health Policy • Fire Safety Policy • Environment Policy	*Prepare Safety & Health Policy, Fire Safety Policy and Environment Policy Augmented Itare Water Treatment Plant and Sludge Treatment Facility.*	*Safety & Health Policy, Fire Safety Policy and Environment Policy displayed at the T/Works*	*WTP Operator Management*	Immediate	*Can be done internally*
Water Works Personnel Trainings Required	Training required: • Statutory: Fire marshal training Training required: • Statutory: First Aid Training Training required: • Statutory: Safety and Health Committee	*Establish of Health and Safety Committee for Augmented Itare Water Treatment Plant and Sludge Treatment Facility and train them on;* • *Statutory Fire marshal training* • *Statutory First Aid Training* • *Statutory Safety and Health Committee training on Occupational Health and Safety (OSH)* • *Regular provision of personnel at the T/Works with Appropriate (PPEs)*	*Existing and Trained Health and Safety Committee*	*WTP Operator Management*	Immediate	*100,000*
						250,000.00

8.4 ESMP during operation of the WTP

At operation stage, the WTP Operator will ensure the following measures are implemented during operation of the WTP.

(i) Ensure at any given time that the Water Use Rights Permits required by Water Resources Authority (WRA) for such facilities are annually renewed and valid.
(ii) The Water Treatment Operators will continuously maintain the sludge drying beds and back wash water system and ensure no blockages
(iii) The Water Treatment Operators will ensure the master meter is functioning and flow measurements are collected on a daily basis.
(iv) WTP Operator Management will continuously promote reforestation programs with company operations
(v) WTP Operator Management will regular inspection of the Water Pipeline wayleave, WTP and Dam peripheries and ensure the way leave is free from encroachment at market centres.

Table 8 .3 on Page 8-14 presents the ESMP proposed during operation phase of the WTP.

Table 8.3: Environment and Social Management Monitoring Plan during Operation of the WTP

Activity Fields	Requirement	Relevant Act (Clauses)	Continuous Improvement Measure	Responsibility	Timelines	Budget (Ksh)
Approval, Authorization And Permits	WTP Operator should apply and renew water Abstraction permit for Augmented Itare Water Treatment Plant from WRA, activities under in are listed under the Six Schedule of the Rules.	Water Rules 2007: Part II - Approval, Authorization And Permits	Ensure at any given time that the Water Use Rights Permits from WRA are valid	*WTP Operator* Management	Annually	Operation funds
Control of Pollution and Water Quality Requirements	**Management of Reagents** For Augmented Itare Water Treatment Plant, PDR has provided for a well ventilated and proper lighting chemical storage house. Further, personnel handling the reagents will be provided with appropriate PPEs such as gloves, nose masks and googles to protect them from the chemical. Also procurement of reagent will be done in batches with enough doses to eliminate the risk of some of the reagent expiring therefore requiring disposal.	Water Rules 2007: Part V Water Quality Monitoring And Effluent Discharge	Continuously maintain the sludge drying beds and back was lagoons / continuously unblock blockages	*WTP Operator* Management	Weekly	Operation funds
	Management of Sludge PDR provides for sludge drying beds, the beds provide allow for sludge dewatering and allow for easy handling and evacuation	Water Rules 2007: Part V Water Quality Monitoring And Effluent Discharge	Continuously maintain the sludge drying beds and back was lagoons / continuously unblock blockages	*WTP Operator* Management	Weekly	Operation funds
Water Use Charges	A master meter has been installed at the raw water inlet chamber to measure the water abstraction volume for the purpose of calculating amount due for payment of water services to Water Resources Authority (WRA)	PART VIII - Water Use Charges	Ensure the master meter is functioning and flow measurements are collected	*WTP Operator* Management	Daily	Operation funds
Conservation of Riparian	The Water Rules 2007, Part ix on Conservation of Riparian and Catchment Areas regulation 120.(1) provides that for the purposes of conserving the catchments and riparian areas, the authority may by order or state as a condition on an authorization or permit, require a person to prepare and conform to a Soil and Water Conservation Plan (SWCP). In compliance with this regulation, a forestation program in liaison with Kenya Forest Services (KFS) will be initiated within the WTP and dam peripheries. WTP Operator will upscale this initiative after commissioning of the Plant.	PART IX - Conservation Of Riparian And Catchment Areas	Continuously promote reforestation programs with company operations	*WTP Operator* Management	Annually	Operation funds

8.5 ESMP during Operation of the Sludge Handling Facility

The Environmental and Social Management Plan during operation of the sludge handling facility is presented in **Table 8-5 on Page 8-16**

Table 8.4: Environmental and Social Management Plan during Operation of Sludge Management Facility

Issue	Action required	Responsibility	Provisional Budget
Odour Menace from Wastewater Treatment Works	• Maintain appropriate covering/ventilation of the pre-treatment unit, appropriate handling and removal of grit/grease • Ensure scum is appropriately disposed-off or properly stabilized and adequate water flow and aeration to reduce the potential of odour formation • The perimeter of the proposed site should be vegetated with trees and plants of varying heights thereby forming windbreaker and reduce dispersion of odour • Repairing of dilapidated the roofs of the sludge drying beds to ensure quick drying of sludge and appropriate disposal to reduce odour emanating from wet sludge.	KEWASCO	To be established at Operation Phase and included in the operation of the Project
Risks Associated with handling of Sludge at the facility	• Dried sludge could be used to make briquettes as a charcoal substitute or be sold to farmers as fertilizers • Excess sludge can be disposed in a designated landfill which shall only be for disposing dry odourless sludge. • Preparation and enforcement of operational guidelines for sludge management by Kericho County Government	KEWASCO	To be established at Operation Phase and included in the operation of the Project
Solid Wastes Impacts at WWTP Screens	• Develop a comprehensive Waste Management Plan (WMP) for management of solid wastes from screen chambers • Employ personnel who will be in charge of maintaining hygiene and cleanliness of the WWTP including removal of solid wastes from screen chambers • Properly labelled and strategically placed waste disposal containers shall be provided at all places within the WWTP • Solid wastes once removed from screens shall be collected and disposed-off appropriately as required by waste Management Regulations of (2006) and Kericho County Government by laws.	KEWASCO	To be established at Operation Phase and included in the operation of the Project
Inversion of Birds and Reptiles to the WWTP	• The sludge treatment facility should be protected from livestock encroachments by providing secure barriers to keep off the animals from interfering with the plant operations and safety • The quality of effluent discharged into the river will be an important parameter on the regional control of the river eutrophication that attracts insects that reptiles feed on	KEWASCO	To be established at Operation Phase and included in the operation of the Project

CHAPTER 9: FINDINGS AND PROVISIONS

9.1 Findings

A summary of findings from the assessment is detailed below.

- The Government of Kenya (GoK) through the Ministry of Water, Sanitation and Irrigation (MWSI) received a loan from the Government of Germany, through KfW Development Bank (KfW), to undertake the Water Supply and Sanitation Development Program – Lake Victoria South (WSDP-LVS) for the Towns of Kericho, Kisii, Nyamira, and - if financially viable - Litein and Sotik.
- The proposed Project sanitation component include; Faecal Sludge Treatment Facilities - To serve Litein, Kapkatet Towns and adjacent Five (5) Nr. Trading/ Market Centres (Chemosit, Roret, Kabartegan, Kaplong and Mogogosiek), which are within a radius of approximately 15km to 20km from Litein Town.
- The proposed Project water supply component include Expansion of the Itare Water Supply System to meet Year 2030 water demands for Litein and Kapkatet Towns.
- The project area of influence for raw water pipeline, water treatment plant, storage tanks is Bomet County in the locations of Simoti, Koiwa, Sotit, Mogogosiek. The clear water pipeline location is Kericho County Bureti Sub County for Boito and Litein Locations
- The proposed raw water pipeline is proposed to be laid along Itare River from Kiptingting village off Embomos Forest a distance of approximately 10km to the existing Itare Water Treatment Plant
- The river basin comprised a dense, diverse mosaic of wetland plants dominated by *Cyperus spp. (C.immensus, C. triandra) with some Typha spp. (T. domingensis and T. capensis) and Polygonum spp. (P. senegalense, P. pulchrum). Potamogeton schweinfurthi.* The proposed Raw Water Pipeline (RWP) does not directly interact with Embomos Forest which is Protected Ecosystem.
- The rivers flowing from Mau Forest Ecosystem have various species of fish which include the brown and rainbow trout fish, Barbus, Snake Catfish, Rainbow Trout, others include *Oncorhyncus mykiss (Rainbow trout), Clarius theodare (Snake catfish), Barbus amphigramma (Barbus) and Poecilla reticulata (Guppy)*
- The rivers flowing from Mau Forest Ecosystem have various species of fish which include the brown and rainbow trout fish, Barbus, Snake Catfish, Rainbow Trout, others include *Oncorhyncus mykiss (Rainbow trout), Clarius theodare (Snake catfish), Barbus amphigramma (Barbus) and Poecilla reticulata (Guppy)*
- The assessment identified below listed Biological social receptors that might be impacted by project activities at construction stage including; Embomos forest (part of Mau Forest), Itare River representing biological receptors while Itare, Chemosoren, Mogogoseik and Boito tea buying center representing social receptors
- Koiwa and Kiptingting Bridge Site is located is located within riparian land of Itare River, and the raw water gravity main will be laid along the river within riparian land. However, Itare Bridge site is located within riparian land of Itare River, this site is also located off Embomos Forest, easement permits will be required from Kenya Forest Services (KFS)

- Itare Water Treatment Plant and clear water rising main exists and, therefore no land acquisition will be triggered. However, additional land will be required for existing Saseta Tank, this land can be acquired through willing buyer willing seller arrangement
- The sludge handling facility is proposed to be constructed within low lying ground Parcel/818 belonging to 2Nr private individuals – RAP is triggered. The lower section of the parcel is traversed by a permanent stream. However, risks of water resources and soil resources pollution will be triggered, mitigation measures will be applied. Additional land will be required, 2Nr families living around the site will require relocation

9.2 Provisions

The preliminary ESIA makes below listed provisions:

- The Environment and Social Management Plan (ESMP) prepared under this ESIA assessment recommends provision of a budget of Kenya Shillings Two Million, Eight Hundred and Fifty Thousand (Kshs 2,850,000) for mitigation of environment and social impacts identified in this Report. The Bid Documents to be prepared for the project should incorporates the Environment, Social provisions discussed herein (Environment and Social Impact Assessment and Mitigation Measures).
- Project Contract Document to include provisions for the Contractor for preparing and implementing Construction Environment and Social Management Plan (C-EMSP), annexes to the C-EMSP will include but not limited to: Soil and Sedimentation Control Plan, Spoil Management Control Plan, Dust Management Plan, Health, Hygiene and Safety Plan, Labour Management Plan, Child Protection Strategy, Gender-based Violence Action Plan, Waste Management Plan, Contractors Code of Conduct, Gender Inclusivity Strategy , HIV/Aid Prevention Strategy. The contractors will be required to engage services of a qualified Environment, Health and Safety Officers and Social Safeguards Officer at the time of Project implementation.
- At Project implementation stage, the contractor with approval of the supervising engineer will prepare periodic Environmental and Social Implementation Report. The reports will provide status of implementation of risks & impacts management measures to date from the project start to the end of the reporting period. From an occupational Health and Safety approach, the contractors will ensure they undergo the following; OSH risk assessment, Registration of workplaces, Safety and Health (OSH) Audit, Fitness to work assessment of employees, Training of all workers or workers' representatives in basic Occupational Safety and Health, Accident and incident reporting, Compensation of injured workers who die or get injured and disabled and Examination of Safety Plants and Equipment.
- At Project completion stage, within the Defects Liability Period, Bomet and Kericho Water Companies will initiate an Initial Environment and Social Audit for the Project as required by EIA/EA Audit Regulations of the year 2003 and subsequent annual self-audits. The Audit will develop an Environment and Social Audit Action Plan (ESAAP) that will be used to track Project Environment and Social Compliance during Project implementation stage.

APPENDIXES

Appendix 1: Public Participation Minutes

Appendix 2: Lead Expert's Year 2022 Practicing License

Appendix 1: Public Participation Minutes

MINUTES OF PUBLIC PARTICIPATION FORUM HELD ON 9TH JUNE 2022 AT SERGONE VILLAGE KOIWA BRIGDE KAPKEN SUB LOCATION KOIWA LOCATION

PRESENT:

Local Administration

Emily Chepng'eno	Chief Koiwa Location
Evans Rono	Assistant Chief

Bomet Water and Sanitation Company Representative

Erick Towett	Corporate Affairs Officer

Consultant Representative

Justin Mabele	Engineer
Obra Mmaitsi	Environmentalist

Residents of Koiwa Location and WRUA Representatives. – see the attached attendance list

KEY PROJECT DATA

Client/ Employer	Lake Victoria South Water Works Development Agency (LVSWWDA).
Financing Agency	KFW

MINUTES

ITEM	MINUTES	Action By
	Introduction The meeting started at 11:15 A.M, called to order by Geoffrey Chepkoen, one of the village elders. Opening prayers were conducted by Hellen Koech, a village member. The village elder later welcomed chairman of Itare Water Resources User Associates (WRUA), Mr. John Cheruiyot. The WRUA chairman appreciated residents who made time to attend the meeting. He gave Koiwa residents the opportunity to do self-introduction. Residents were encouraged to be attentive and contribute as much as possible since the meeting was a participatory forum. He invited the consultant representative to proceed with the remaining agenda of the meeting.	Geoffrey Chepkoen – Village elder Sergone WRUA Chairman

ITEM	MINUTES	Action By
1.	**<u>Project Information</u>** Mr. Erick Towett Corporate affairs Officer BOMWASCO introduced the proposed project to residents in to vernacular for better understanding. He informed them that currently Itare Water Treatment Plant produces between 4,000-7,000 cubic meters of water against the design capacity of 8,000 cubic meters of water per day. This he said is attributed to depreciation of the system and high operation cost brought about by low and high lift pumping for raw and treated water respectively. He also informed residents that BOMWASCO was the Water Service Provider under Bomet County Government. He welcomed the Consultant Representative Mr. Justin Mabele to share the proposed project scope with residents. Mr. Justin Mabele informed residents that the proposal was to construct a new intake weir on Itare river about 11 kilometers upstream of the existing Itare Water Treatment Plant at Mau Forest, construction of a raw water gravity transmission line that will majorly be laid along the river riparian to the existing Itare Water Treatment plant, rehabilitation and expansion of the existing water treatment plant to produce 15000 cubic meters of water per day, rehabilitation of the raising main to Saseta Tank site, capacity build Saseta Tank to accommodate the additional water volume, extent the main distribution lines to cover larger areas and to identify new storage tank sites for the treated water. He informed residents that the reasons for tapping water further upstream was to ensure sufficient gravitation force is achieved to transmit raw water to the treatment plant without pumping, this will cut down electricity costs by almost 40%. The other reason is water from the forest site is less polluted which is good for achieving the required water quality. He also informed residents that the design team was exploring the option of setting up a mini hydro power generator that will be used to pump treated water, this will reduce electricity cost even further. Upon conclusion of his Agenda, he invited Mr. Obra Mmaitsi to talk about Environmental and Social Safeguards.	BOMWASCO Representative Consultant Representative-MIBP
2	**<u>Environment and Social Safeguard Report</u>** The consultant environmentalist Mr. Obra Mmaitsi informed the residents that the project was funded KFW and it will be executed as guided by the bank's safeguards guidelines.	

ITEM	MINUTES	Action By
	An Environmental and Social Impact Assessment will be done as guided by EMCA 1999 where the public will be informed about the project, their views gathered and incorporated in the project design, project impacts to the environment identified and mitigation measures provided. All this is done in order to achieve sustainable development. He also informed residents in attendance that the project design team will try as much as possible to utilize riparian land and the road reserves in order to minimize impact to private property however, in the event where the pipeline is laid in private land, a Resettlement Action Plan (RAP) report will be prepared. The RAP report will capture affected land size for easement computation to be done as per the area's land value, developments including crops, trees and structures will be captured and valued for compensation purposes.	Obra Mmaitsi Environmentalist
3.	**<u>Project Positive Impacts</u>** Mr. Obra Mmaitsi informed residents that the water supply project would have benefits such as: a) Reduced time taken for residents to fetch water from the nearby river. This time will be used in farming activities and other important activities. b) Sanitation improvement within the area through provision of clean reliable water for domestic uses. Through this water borne diseases like cholera and typhoid will be reduced. c) Employment opportunities will be provided to both skilled and unskilled residents of the area during operation stage. d) Value of land will increase due to provision of sanitation infrastructure, leading to better housing development in the area. e) Operation costs of the water treatment will be reduced through power cuts, this will translate to reduced water bill to the consumer.	Obra Mmaitsi Environmentalist
4.	**<u>Impacts to the Environment (Natural and Social</u>**) Mr. Obra Mmaitsi pointed out to the meeting that the water project would have minimal negative impacts as listed below: - Noise and excessive vibrations produced by the equipment during the construction phase.	

ITEM	MINUTES	Action By
	- Some private lands would be interfered with due to laying of pipes which would further change the land use activities and the type of crops to be grown in the specific area. - Some trees will be cut down during project construction phase especially along the raw water transmission line - Generation of solid wastes like plastic bags, metal offcuts and spoil that can lead to environmental pollution - Liquid waste generation like grease and oil spillage from construction machinery which can lead to water pollution. - Health and safety issues like injuries to construction workers on site might occur. He added that all the impacts would be sited comprehensively by the ESIA study report and mitigation measures be provided.	Obra Mmaitsi Environmentalist
5.	**<u>Question and Answer Session</u>** The residents were given a chance to as their questions as given below: **Philip Langat** wanted to know what are plans are in place to ensure residents of Koiwa Which the water source of the project get sufficient water supply. They proposed a tank to be constructed at Seanin Hills so that they can be served. — Residents were informed that since the project still under design stage, the technical team was looking at the best options to ensure water is available for residents. It was agreed that after the meeting the team will visit seanin hills for preliminary observation. **Helen Koech** Raised concerns that it was better to treat water at the intake point pump it to Seanin hills instead of constructing a long Expensive pipeline to sagem Project — Residents were informed that Construction of a new treatment plant is very expensive and that's why rehabilitation of the existing Itare water treatment plant was picked as the most feasible option. Treating water at the intake point will still involve double pumping which the design team is trying to eliminate due to its cost implication. They were further informed that the initial cost of construction of the raw water pipeline might be higher however running costs of	

ITEM	MINUTES		Action By
		the project will be lower in the long run which will translate into lower bills for the final consumer.	
	Elisha Lang'at wanted to be informed if indigenous trees likely to be cut down during project implementation will be compensated before project commencement.	Residents were informed that trees that will be cut down will be compensated before commencement of the project. Owners will be given sufficient time to cut down the trees and collect salvage. They were further informed that if private land is affected compensation for easement will be done. The same will be done for any structures that might be affected, owners will be compensated at full replacement costs of the structure and still allowed sufficient time to collect salvage.	
	Philip Lanag'at wanted to know if WRUA and WRA will be consulted so that they can issue abstraction permit for the project.	The residents were informed that the consultant will ensure all the prerequisite permits are issued from relevant authorities before project commencement. WRUA and WRA will be consulted to issue the abstraction permit and also compute the annual charge for the water consumed. Additionally, they were informed that ESIA report will be submitted to NEMA so that they can issue a license to the project.	
	Residents inquired on when the water project will begin	Residents were informed that the current assignment was for feasibility studies and design, after this is done, they will be informed on the next steps through public participation forums.	
6.	**<u>Closing Remarks and AOB</u>** **Mr. John Cheruiyot** gave a vote of thanks. **Emily Chepng'eno** Koiwa chief thanked residents for their participation and urged them to be positive ambassadors of the project. In the event of grievance, they were advised to air it through proper channels so that timely resolutions can be achieved. She also encouraged residents to be peaceful during this campaign period welcome all aspirants and make informed decision during election **day 9th August 2022.** There being no Any Other Business the meeting Adjourned at 1:30 P.M. A closing prayer were conducted by **Stephen Kenduywo**.		

Sample photographs

Koiwa Location Chief Addressing the meeting

BOMWASCO representative addressing residents.

Consultant's representative responding to residents' questions

A resident sharing her concerns.

Attendance list

MIBP CONSULTING ENGINEERS

ITARE WATER SUPPLY REHABILITATION PROJECT

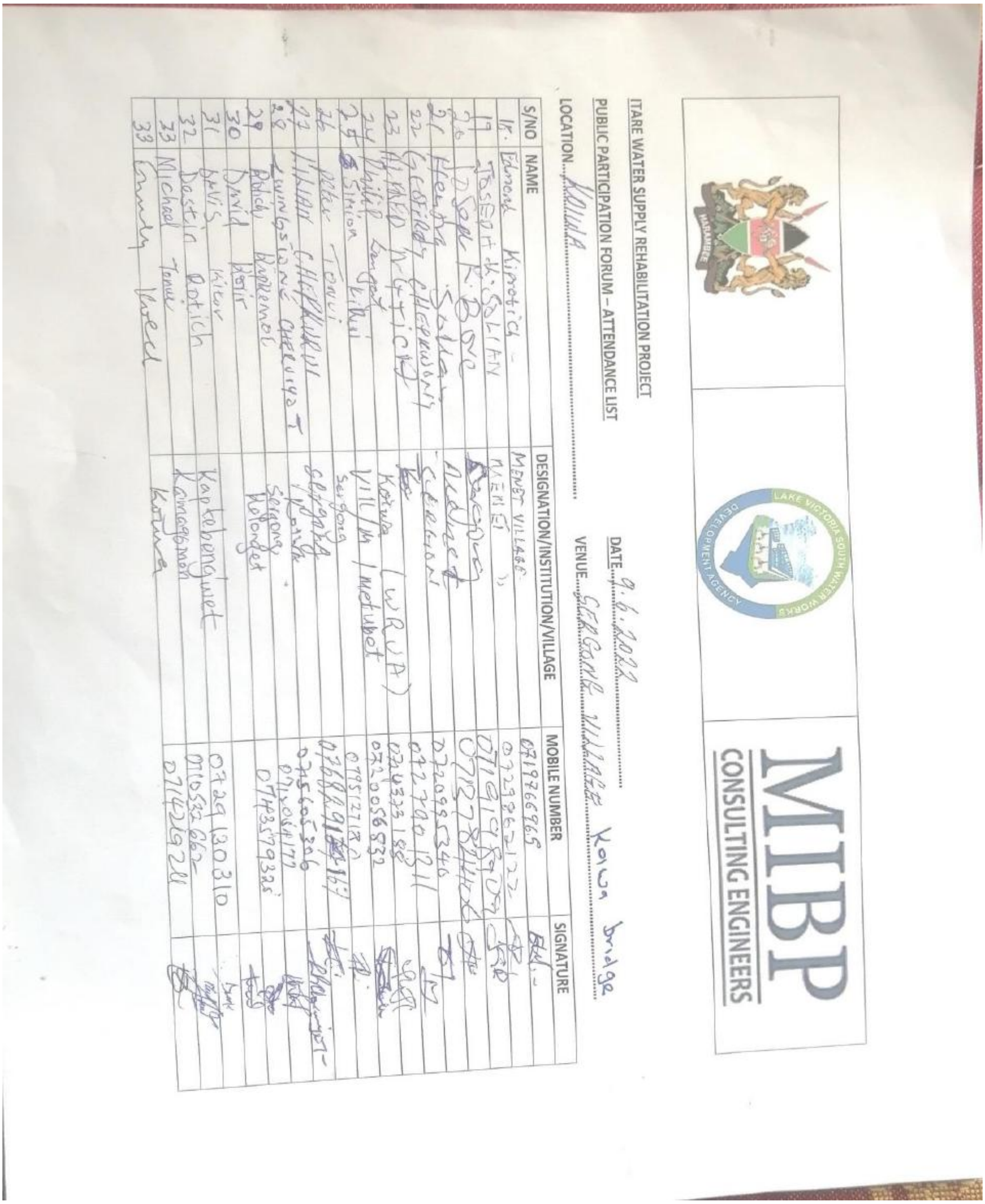
PUBLIC PARTICIPATION FORUM – ATTENDANCE LIST

LOCATION: Koiwa

DATE: 9/6/2022

VENUE: GERGONG Koiwa bridge.

S/NO	NAME	DESIGNATION/INSTITUTION/VILLAGE	MOBILE NUMBER	SIGNATURE
1.	Erick Towett	C.A Bomwasco	0723147240?	
2.	John Cheruiyot	V. Manager	0711072282	
3.	Geoffrey K Korir	V. Manager (Host)	0711126274	
4.	Kiprotich Enock	institution	0710948033	
5	Geoffery Kirui	villager	0702023715	
6	Dennis Sang	villager	0710816882	
7	Vincent Bett	institution	0742500991	
8	Kevin Kigen	institution	0769627726	
9	Asan Kiptoo	institution	0717628854	
10	Gilbert Ngeno.	institution	0717552761	
11	Peter Laboso	WRUA	0723978492	
12	Stephen Kerofuiwo	WRUA V. Chairman	0719744285	
13	Hellen Koech	C.F.A & WRUA.	0711244593	
14	Elisha Langat	Chairman C.F.A	0719453820	
15	Agnes Sigira	C F A WRUA	0713117147	
16	Emmy Kendiwa		0713700411	
17	Beatrice Korir		0799135321	



MIBP CONSULTING ENGINEERS

ITARE WATER SUPPLY REHABILITATION PROJECT

PUBLIC PARTICIPATION FORUM – ATTENDANCE LIST

DATE: 9.6.2022

LOCATION: KOIWA

VENUE: SERGONG VILLAGE Koiwa bridge

S/NO	NAME	DESIGNATION/INSTITUTION/VILLAGE	MOBILE NUMBER	SIGNATURE
18.	Edmond Kiprotich	MENET VILLAGE	0719766965	
19	JOSEPH K. SOLIAN	MENET "	0729862122	
20	Joseph K. Bore	Sergong	0719198909	
21	Henry Sollan	Aldinet	0712782440	
22	GEOFFREY CHEPKWONY	SERGON	0720995340	
23	ALFRED NGETICH	Ko	0727901311	
24	Philip Langat	Koiwa (WRUA)	0724373188	
25	Simion Kirui	Vill/m / metubot	0720056832	
26	peter Tonui	Sergong	0795127180	
27	LILIAN CHEPKURUI	sergong	0768291167	
28	LIVINGSTONE CHERUIYOT	Koiwa	0715605306	
29	Rotich Kipkemoi	Sergong	0712084177	
30	David Koir	Kolonget	0743579325	
31	DAVIS Kitur		0729130310	
32	Destin Rotich	Kaptebenguet	0710532662	
33	Michael Tonui	Kamagomon	0714219211	
33	Emily Kweed	Koiwa		

MIBP CONSULTING ENGINEERS

ITARE WATER SUPPLY REHABILITATION PROJECT

PUBLIC PARTICIPATION FORUM – ATTENDANCE LIST

DATE: 9/6/2022

LOCATION: KOIWA

VENUE: CERGONG Koiwa Bridge

S/NO	NAME	DESIGNATION/INSTITUTION/VILLAGE	MOBILE NUMBER	SIGNATURE
34	DANGAN NGETICH	KAMOGOMON	0716820981	
35	Timothy Kipyegon	Kamagimon	0720424645	
36	CORNELIUS K BETT	KAMAGOMON	0726552515	
37	Ronald Ronon	Kamagomon	0710 711514	
38	EVANS RONOH	ASS-CHIEF	0724531 384	
39	Edward Koris	Kaptebengwet	0726043618	
40	Samuel Kapkelwony	Besiobei	0726800766	
41	Cosmas Kipngetich Teror	Kamagomon	0711890220	
42	LILIAN KORIR	Kelonget	0728247860	
43	Weldon Sang	Kamagomon	0704943951	
44	Eunice Chepkemoi Rose	Kelonget 0714363652	0799458567	
45	Fredrick K Rotich	Kamagomon	0720 043 540	
46	Teror Mike	Kelonget	0705 886579	
47	Wesly Koris	Kelonget	0724114292	
48	Geoffrey Sode	Kelonget	0724116292	
49	Raymond Ronoh	Metubet	0724488677	

HARAMBEE

LAKE VICTORIA SOUTH WATER WORKS DEVELOPMENT AGENCY

MIBP CONSULTING ENGINEERS

ITARE WATER SUPPLY REHABILITATION PROJECT

PUBLIC PARTICIPATION FORUM – ATTENDANCE LIST

DATE: 9-06-2022

LOCATION: Koiwa

VENUE: SERGON Kawa Bridge.

S/NO	NAME	DESIGNATION/INSTITUTION/VILLAGE	MOBILE NUMBER	SIGNATURE
50	LEONARD KIPKIRUI KORIR	SERGON	0111502595	
51	SAMWEL LANGAT	C.B.O Chair	0716760897	
52	George Biir	CBO member.	0722669201	
53	Mary Cherop	C.BOO	0703252506	
54	Pauline Mesonik	C.BO member	0716194167	
60	Joan Kirui	Metukbet	0704172980	
61	Gilbert K Rotich	Meret	0725768476	
62	ROBERT MARITIM	C.B.O member	0715119057	

MINUTES OF PUBLIC PARTICIPATION FORUM HELD ON 9TH JUNE 2022 AT MOGOGOSIEK LOCATION CHIEF'S OFFICE

PRESENT

Local Administration

Emmy Ngetich	Chief Mogogosiek Location

Bomet Water and Sanitation Company Representative

Erick Towett	Corporate Affairs

Consultant Representative

Justin Mabele	Engineer
Obra Mmaitsi	Environmentalist

Residents of Simoti Location- See attached attendance list

KEY PROJECT DATA

Client/ Employer	Lake Victoria South Water Works Development Agency (LVSWWDA)
Financing Agency	KFW

MINUTES

Item	Minutes	Action By
	Introduction The meeting was called to order by Emmy Ngetich Chief Mogogosiek Location at 10.30 A.M, she invited David Bii, a Mogogosiek resident, to lead in opening prayer. The chief in her opening remarks congratulated residents who had created time to attend the meeting. She informed those in attendance that the meeting was about water supply improvement project that is geared towards provision of sufficient reliable and safe water for domestic use. She called upon those in attendance to do self-introduction. She later invited Mr. Erick Towett Corporate Affairs Officer BOMWASCO to proceed with the remaining agenda.	Chief Mogogosiek location
1.	**Project Information** Mr. Erick Towett Corporate affairs Officer BOMWASCO introduced the proposed project to residents in to vernacular for better understanding. He informed them that currently Itare Water treatment plant produces between 4000-7000 cubic meters of water against the design capacity of 12000 cubic meters of water per day. This he said is attributed to depreciation of the system and high operation cost brought about by low and high lift pumping for raw and treated water respectively. He also informed residents that BOMWASCO was the Water Service Provider under Bomet County Government. He welcomed the	BOMWASCO Representative

Item	Minutes	Action By
	Consultant Representative Mr. Justin Mabele to share the proposed project scope with residents. Mr. Justin Mabele informed residents that the proposal was to construct a new intake weir on Itare river about 11 kilometers upstream of the existing Itare Water Treatment Plant at Mau Forest, construction of a raw water gravity transmission line that will majorly be laid along the river riparian to the existing Itare Water Treatment plant, rehabilitation and expansion of the existing water treatment plant to produce 15000 cubic meters of water per day, rehabilitation of the raising main to Saseta Tank site, capacity build Saseta Tank to accommodate the additional water volume, extent the main distribution lines to cover larger areas and to identify new storage tank sites for the treated water. He informed residents that the reasons for tapping water further upstream was to ensure sufficient gravitation force is achieved to transmit raw water to the treatment plant without pumping, this will cut down electricity costs by almost 40%. The other reason is water from the forest site is less polluted which is good for achieving the required water quality. He also informed residents that the design team was exploring the option of setting up a mini hydro power generator that will be used to pump treated water, this will reduce electricity cost even further. Upon conclusion of his Agenda, he invited Mr. Obra Mmaitsi to talk about Environmental and Social Safeguards.	Consultant Representative-MIBP
2.	**<u>Environment and Social Safeguard Report</u>** The consultant environmentalist Mr. Obra Mmaitsi informed the residents that the project was funded KFW and it will be executed as guided by the bank's safeguards guidelines. An Environmental and Social Impact Assessment will be done as guided by EMCA 1999 where the public will be informed about the project, their views gathered and incorporated in the project design, project impacts to the environment identified and mitigation measures provided. All this is done in order to achieve sustainable development. He also informed residents in attendance that the project design team will try as much as possible to utilize riparian land and the road reserves in order to minimize impact to private property however, in the event where the pipeline is laid in private land, a Resettlement Action Plan (RAP) report will be prepared.	Obra Mmaitsi Environmentalist

Item	Minutes	Action By
	The RAP report will capture affected land size for easement computation to be done as per the area's land value, developments including crops, trees and structures will be captured and valued for compensation purposes.	
3.	**<u>Project Positive Impacts</u>** Mr. Obra Mmaitsi informed residents that the water supply project would have benefits such as: f) Reduced time taken for residents to fetch water from the nearby river. This time will be used in farming activities and other important activities. g) Sanitation improvement within the area through provision of clean reliable water for domestic uses. Through this water borne diseases like cholera and typhoid will be reduced. h) Employment opportunities will be provided to both skilled and unskilled residents of the area during operation stage. i) Value of land will increase due to provision of sanitation infrastructure, leading to better housing development in the area. j) Operation costs of the water treatment will be reduced through power cuts, this will translate to reduced water bill to the consumer.	Obra Mmaitsi Environmentalist
4.	**<u>Impacts to Environment (Natural and Social)</u>** Mr. Obra Mmaitsi pointed out to the meeting that the water project would have minimal negative impacts as listed below: - Noise and excessive vibrations produced by the equipment during the construction phase. - Some private lands would be interfered with due to laying of pipes which would further change the land use activities and the type of crops to be grown in the specific area. - Some trees will be cut down during project construction phase especially along the raw water transmission line - Generation of solid wastes like plastic bags, metal offcuts and spoil that can lead to environmental pollution - Liquid waste generation like grease and oil spillage from construction machinery which can lead to water pollution. - Health and safety issues like injuries to construction workers on site might occur.	Obra Mmaitsi Environmentalist

Item	Minutes	Action By
	He added that all the impacts would be sited comprehensively by the ESIA study report and mitigation measures be provided.	
5.	**<u>Question and Answer Session</u>** The following issues and concerns were raised by residents and were answered by the relevant personnel in attendance. **Mr. Joseph Mutai** wanted to know when was the tank at Saseta last cleaned He felt that typhoid cases have been on that rise in the area Residents were informed that water treatment tanks are supposed to undergo routine cleaning every 6 months the consultant will inquire to find out if that is being done by the water service provider. They were also encouraged to be careful with post handling of water by ensuring containers used to fetch water are clean. **Mr. David Bii** wanted to know if the existing line will be removed before or after construction of a new line Since he felt that supply maybe interrupted. He also wanted to be informed on how residents along the raw water line will get water since they were not considered during the initial project. Residents were informed that the during construction it is a requirement for the contractor to ensure continuous water supply to residents. When rehabilitating dilapidated sections of the line, temporary pipelines will be provided. Concerning water supply for people along the raw water transmission line, residents were informed that the technical team was looking at options of constructing additional water storage tanks on higher elevated areas to ensure treated water gravitates to wider geographical areas. **David Bii** wanted to know if damage to private property will be compensated. He said that during construction of the initial project property was damaged and never paid. He also wanted to know if this was the only meeting or others will be organized. Residents were informed that compensation will be done in three aspects that include payment for easement where private land is affected, payment for crops and trees and compensation for structures affected. They were informed that the compensation will be done before commencement of the project, adequate time given to the affected to collect salvage. The meeting was reliably informed that there will be many more public	

Item	Minutes		Action By
		participation forums organized before project implantation and even during construction phase. A grievance redress committee will be established to timely handle any grievances.	
	Charles Langat wanted to be informed if there will be any other mega water projects in the area or this was the final one.	Residents were informed that water infrastructure improvement was a continuous process aimed at achieving vision 2030. There will be more water projects as time progresses. At the moment focus is on expansion and rehabilitation of Itare water supply project.	
	Emmy Ngetich wanted to be informed on why residents along Kimori – Sotik road were never connected back to the line after road.	Those in attendance were informed that the disruption was occasioned by the road construction works. The county Government will work in conjunction with BOMWASCO to ensure residents are connected back to the line.	
	Mathew Koech wanted to know why he does not receive water yet he lives near the tank. He also wanted to know what will be done to control water overflow from the tank at Saseta that destroys their crops and land.	Residents were informed that since the current water production at the treatment plant is below half, that is the reason for the unreliable water supply this will be corrected once the rehabilitation is done. The tank will be installed with automatic control switch that will eliminate the issue of overflows.	
6.	**<u>Closing Remarks and adjournment.</u>** The area chief thanked all those who had created time to attend the meeting. She requested the consultant to organize more public forums at different stages of the project and venues including near the water treatment plant so that the information can disseminate further. She urged residents to embrace the project and air their views and concerns through the right channels for amicable solutions to be arrived at. There being no any other business, the meeting adjourned at 12:30 P.M A closing prayer were Conducted by David Bii a resident of Mogogosiek Location.		Chief Mogogosiek Location

Sample Photographs

Mogogosiek Chief addressing Residents

BOMWASCO representative addressing residents

Consultant's representative discussing proposed project scope.

A resident sharing his views.

Attendance list

MIBP CONSULTING ENGINEERS

ITARE WATER SUPPLY REHABILITATION PROJECT

PUBLIC PARTICIPATION FORUM – ATTENDANCE LIST

DATE 10/06/2022

LOCATION MOGOGOSIEK

VENUE MOGOGOSIEK CHIEF'S CAMP

S/NO	NAME	DESIGNATION/INSTITUTION/VILLAGE	MOBILE NUMBER	SIGNATURE
1	Erick Towett	CA [illegible]	0723422447	
2	Emmy Ngetich	Chief - Mogogosiek	0715697646	
3	Charles Langat	Mogogosiek market	0722254703	
4	Joseph Kirui	Chemosoren	0728159147	
5	Joseph Koech	Paragubin	0726336590	
6	[illegible]	[illegible]	0725803070/0725040047	
7	Joseph K. [illegible]	Baraguin	0714466467	
8	Joseph K. Ngetich	Chemosoren	0702144035	
9	Jonathan Ngeno	[illegible]	0759000614	
10	Erick Korir	Mikimani	0728623977	
11	Daniel Koske	[illegible]	0724745762	
12	Samwel Tanui	Mosoriot	0712136716	
13	Julius Koech	Barbay, Union	0717164718	
14	David Kirui	Baraguin	0702682046	
15	David K Biri	Chemosoren	0727201533	

MIBP
CONSULTING ENGINEERS

ITARE WATER SUPPLY REHABILITATION PROJECT

PUBLIC PARTICIPATION FORUM – ATTENDANCE LIST

DATE: 10/06/2022

LOCATION: Mogogosiek

VENUE: Mogogosiek Chief's Office

S/NO	NAME	DESIGNATION/INSTITUTION/VILLAGE	MOBILE NUMBER	SIGNATURE
16	[illegible] Koech	Baragamin	0726296711	[signature]
17	Mathew Kibet Koech	Baragamin	0723790408	[signature]
18	Joseph Mutai	Mogogo Town Chair	0726143897	[signature]
19	Charles Roro	Kimori	0720097982-	[signature]
20	Johnstone Beti	Chemosoren	0710534659	
21	Joshua Ruto	Sosetra	0715828400	[signature]
22	John Kiptoo	Baragamin	0724419816	[signature]
23	Philip Koech	Baragamin	0720324800	[signature]

Appendix 2: Lead Expert's Year 2022 Practicing License

FORM 7 (r.15(2))

nema

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/16936

Application Reference No: NEMA/EIA/EL/21830

M/S **Godwin Lidahuli Sakwa**
(individual or firm) of address

P.O. Box 18075-00500 NAIROBI

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **2492**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **3/25/2022**

Expiry Date: **12/31/2022**

Signature…..

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001:2015 Certified