Republic of Kenya

Coast Water Works Development Agency
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Project Name: Water and Sanitation Development Project (WSDP)

Credit No.: IDA – 6030 KE

Contract Name: Consultancy Services for Preparation of Detailed Designs, Tender Documents, Environmental and Social Impact Assessment Report (ESIA) and Construction Supervision of the Baricho Well-Field Protection Works

Contract No.: KE-CWWDA-87234-CS-QCBS

PHASE I: PREPARATION OF DETAILED DESIGNS, TENDER DOCUMENTS, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT (ESIA)

FINAL ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) COMPREHENSIVE PROJECT REPORT

December 2021

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WATER AND SANITATION DEVELOPMENT PROJECT (WSDP)

EMPLOYER:

COAST WATER WORKS DEVELOPMENT AGENCY (CWWDA)

CONSULTANT:

G. KARAVORYIS & PARTNERS CONSULTING ENGINEERS S.A JV STRUCTURAL REINFORCEMENT COMPONENTS LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA), FOR BARICHO WELL-FIELD PROTECTION WORKS COMPREHENSIVE PROJECT REPORT

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CERTIFICATION

G. KARAVORYIS & PARTNERS CONSULTING ENGINEERS S.A JV STRUCTURAL REINFORCEMENT COMPONENTS LTD

Signed ……..……Date……

GODWIN LIDAHULI SAKWA
LEAD EXPERT NEMA REG NO. 2492

PROPONENT

Signed ……Date…….

NAME……..
COAST WATER WORKS DEVELOPMENT AGENCY
Chief executive officer

E. EXECUTIVE SUMMARY

E.1 Project Information

The Baricho well field is situated in the alluvial flood plain of the Sabaki River, about 3 km northwest of the Baricho waterworks in Malindi Sub County, Kilifi County. Water production can be achieved by fifteen (15) vertical boreholes in two wellfields (Upstream and Downstream), which are located on the southern bank of the Sabaki River. Five (5) boreholes are in the upstream wellfield, and ten (10) boreholes are in the downstream. The boreholes are situated at distances of around 50 m or less from the river, thus the abstracted water is mostly bank filtrate from the river.

The Coast Water Works Development Agency (CWWDA) through the Water and Sanitation Development Project (WSDP) has commissioned M/S G Karavokyris Consulting Engineers and Partners S A in Joint Venture with Structural Reinforcement Components Ltd to undertake Consultancy Services for Preparation of Detailed Designs, Tender Documents, Environmental and Social Impact Assessment Report (ESIA), Resettlement Action Plan (RAP) and Construction Supervision of the Baricho Well-field Protection Works.

E.2 Proposed Project Scope of works

The upstream well field includes, at present five wells (Boreholes – BH). These are BH1, BH2, BH2A, BH3 and BH3A. The first three are situated upstream of the new bridge and the last two are situated downstream of the new bridge. Protective islands, consisting of gabion boxes, are being constructed already around BH1, BH3 and BH3A under a different design and construction contract. In the present design and subsequent construction contract, the following are included:

- Construction of two circular concrete towers, approximately 8.00 m in diameter and 8.00 m high, each surrounding each one of BH2 and BH2A. The towers are founded on concrete piles. Immediately surrounding each tower is a concrete pavement, 4.00m in width that provides vehicle access to the tower.
- Construction of a raised concrete platform, 8.00m by 8.00m in plan for placing the transformer and electrical switch-board house for the wells.
- Protection of the river bank between all five wells and the low-water river-course with the use of gabions. This protection has a total length along the riverbank of approximately 230m.
- Protection of the floodplain to a width of approximately 90m from the wells, with approximately 50m closer to the river being protected by gabions and the rest 40m by light rip-rap stone.
- Protection of the surface of access roads in the flood-plain against erosion with concrete paving. A total length of approx. 420m of access roads to the individual wells are to be paved.
- Protection of a river bed zone parallel to the new bridge and 10m upstream and downstream of its piers using gabions. This was considered necessary because hydraulic modelling indicated that the new bridge piers will induce very heavy scouring of the river bed unless this is protected.

- All current pipelines will be disconnected and reconnected from the individual wells before and after construction of the respective protection works surrounding each well. Mitigation measures for environment and social impacts likely to be triggered will be undertaken as detailed in chapter (7) of this report.

The downstream wellfield includes, at present, ten wells (Boreholes – BH). These are BH4, BH4A, BH5, BH6 and BH6A, BH7, BH8, BH9, BH10, BH11. In the present design and subsequent construction contract, the following are included:

- Construction of one circular concrete tower, approximately 8.00 m in diameter and 8.00 m high, surrounding BH4. The tower is founded on concrete piles. Immediately surrounding the tower is protective embankment, approximately 4.00m high.
- Construction of five rectangular concrete towers, approximately 4.00 m by 4.00m in plan and between 5.00 and 6.00 m high, each surrounding each one of BH5, BH6 and BH6A, BH7, and BH8. The towers are founded on concrete piles. Immediately surrounding each tower is a concrete pavement, 4.00m in width that provides vehicle access to the tower.
- Protection of the river bank at the low-water river-course along all ten wells using gabions. This protection has a total length along the riverbank of approximately 865m. The protection zone width will vary somewhat, depending on river-bank slope but will be of the order of 12m. Of these, 4m will be placed on the river bed next to the bank. In comparison, the total river-bed width in the location varies between 100m and 110m.
- Protection of the surfaces of access roads in the flood-plain against erosion with concrete paving. A total length of approx. 950m of access roads to the individual wells are to be paved.
- Construction of a low road embankment (maximum height 1.50m) along the axis of the current main access road. Where the road crosses the lowest point of the flood-plain, a series of 10 concrete box-culverts, 1.50m in height will be constructed to allow drainage of the floodplain, during lesser floods, without affecting access to the wells.
- Protection of the existing corridors of pipelines from scour by laying a gabion mattress on the surface above them. Protection of the electricity pylons that lie within the flood-plain by surrounding their bases with a rip-rap layer.
- All current pipelines will be disconnected and reconnected from the individual wells before and after construction of the respective protection works surrounding each well.

E.3 Objectives of the ESIA Assessment

The assessment was undertaken as required by Environmental Management and Coordination Act (EMCA) 1999 cap 387 section (58) and World Bank OP 4.01 on Environment Assessment as well as World Bank OP 4.12 on Involuntary Resettlement. The main objective of the assessment was to identify and assess impacts resulting from the Baricho Well Fields Protection and construction Works. The focus was on impacts to biophysical social and economic environment. Also, the assessment provides appropriate mitigation measures to be implemented at Project construction and operation stages.

E.4 Legal and Policy Regulatory Instruments

E.4.1 Kenyan Policy and Legal Statutes

Table E-1 below presents a summary relevant policy provisions and legal statutes that were analyzed in this assessment.

Table E.1: Applicable Policy and Legal Statutes

Scope	Description
Applicable Policy provisions	Constitution of Kenya (CoK) 2010
	National Environment Policy (NEP):
	The National Environmental Sanitation and Hygiene Policy-July 2007:
	National Policy on Water Resources Management and Development (Sessional Paper No.1 of 1999)
	The National Water Policy 2012 (Draft)
	Kenya Vision 2030
	National Climate Change Response Strategy, 2010
	National Gender and Development Policy, 2019
	National policy for prevention and response to gender-based violence, 2014
	Kenya National Youth Policy 2006
Applicable legal statutes	EMCA 1999 Cap 387
	Land Act, 2012
	Water Act, 2016
	County Government Act No. 17 of 2012
	Physical & Land use planning Act, 2019
	The Urban Areas and Cities Act 2011
	Occupational Health and Safety Act (OSHA 2007)
	The Public Health Act (Cap.242)
	HIV and AIDS Prevention and Control Act 2011
	Sexual Offences Act 2006
	Child Rights Act (Amendment Bill) 2014
	Labour Relations Act 2012
	National Gender and Equality Commission Act 2011
	Public Participation Bill of 2016
	The National Museums and Heritage Act 2006
	Fisheries Development and Management Act 2016
	Environment and Land Court Act, 2011
	Energy Act 2019
	Traffic Act 2015

E.4.2 World Bank Safeguard Policies

Table E.2: Applicable World Bank Safeguards Policy

Safeguards Policies	Relevance to the Project
World Bank OP 4.01 on Environmental Assessment	An Environmental and Social Impact Assessment of Proposed Project Components will be required
World Bank OP 4.12 on Involuntary Resettlement	Resettlement Action Plan (RAP) has been prepared for Project components that require land or / causes displacement of populations. 12 PAPs have been identified
World Bank OP 4.11 on Physical Cultural Resources	Requires assessment for any physical cultural resources or requires preparation of chance find procedures be prepared during implementations of Projects. Chance find Procedures provided as **Appendix 2** to this report

E.5 Public Participation

The World Bank OP 4.01 provides that the borrower consults project-affected groups and local Non-governmental organizations (NGOs) about the project's environmental aspects and takes their views into account. Also, Kenya's Environmental Impact Assessment / Audit Regulations of 2003 require that in the process of Environmental Impact Assessment (EIA) the proponent shall in consultation with the National Environment Management Authority (NEMA); seek the views of persons who may be affected by the Project. The stakeholder consultation was done on **30th March 2021** at Lango Baya Chiefs Offices grounds. The invitation for this baraza was done through the chiefs and 'Nyumba Kumi' leaders (village elders) who went through the village inviting community members a week prior to the date of the meeting. **Table E.3** below presents summary of issues that were discussed during the meeting that was attended by 21No participants who included 6No females and 15No males. (See Appendix 1 for Minutes and List of Attendance).

Table E.3: Stakeholder Concerns

Suggestion / Question	Response
Mrs. Mwanakombo wanted to know what will happen in a scenario where the affected land has tenants farming on it will they be compensated for their crops.	The meeting was informed that compensation is normally done for land, crop, trees and structures. If tenants are farming on the affected parcel of land they will be compensated separately from the land owner, compensation for the tenant will include; net monthly income from land rent or income from sell of crops / trees (Multiplied by/ for 3 Months). Further, the farmers were informed that they will be given sufficient time to harvest their crops before works commence within their farms.
Mr. Franklin wanted to know if the contractor will source for workforce within the community where the works will be implemented.	Residents were informed that all unskilled labour and any available semi-skilled and skilled labour will be sourced from the local community. In addition, youths who will be interested to secure supply of construction contracts, organizing themselves into registered groups provide them with capacity in terms of manpower and capital that would enable them successfully deliver such assignments. Therefore, youth present in the meeting were encouraged to organize themselves into groups and avail themselves for consideration.
Samson Siri wanted to know what will happen to people who were pumping water from the river to irrigate their farms. He wanted clarification if the pipes will be damage or blocked by the proposed project.	Residents were informed that Project will not destroy sources of livelihood of the community. Therefore, those doing farming using pumped water from the river will be assigned designated corridors where they will lay their pipes and continue farming, The cost of re-laying such pipes will, is always as a common practice included in the contract under an Preliminary and General Item on relocation of services, Therefore, no farmer will incur such cost. The cost will include; provision for replacement / purchase of pipes, cost of labor for replacement of the pipes and cost for incidentals under the same item that will include for lost income to farmers during replacement of such pipes. . .
Mr. Mwalimu Siri wanted to know if there will be any Cooperate Social Responsibility (CSR) that will be implemented under the project	Residents were informed that they were the ones to suggest what they would like to be done for them as part of CSR. It was agreed that they can suggest three projects so that the client can take the issue up and implement the most feasible one if possible. However, the community members were informed that the project cannot be held to account for it as it

	is the implementing agency's prerogative to implement CSR activities as per their customer charter.
Mr. Gilbert Mwaringa wanted to know how compensation for land will be done and yet most of the residents did not have title deeds.	Residents were informed that before payments are done there will be consultations that will include the chief's office to identify the rightful owner of the property. Further, they were informed that an Abbreviated Resettlement Action Plan (RAP) will be prepared for the 12 PAPs who have been preliminary identified as the ones whose land will be acquired.
Mrs. Rehema Said wanted to know how disputes related to resettlement will be avoided.	Residents were informed that the consultant will form a Grievance Redress Committee (GRC) comprising of a Project Affected Person (PAP), youth, women, Vulnerable groups and People living with disability representatives that will work with the local administration to ensure real time resolution of emerging issues during the entire period of project implementation. The committee will include 2 Elders, 1 youth 1 woman and Local Leader rep including Vulnerable PAP rep. the members will be elected by the PAPs and trained by the project on grievance resolution mechanism.

E.6 Project Impacts

E.6.1 Sensitive Receptors

The assessment identified several receptors located within close proximity of 5km radius from the proposed Baricho Well Fields Protection Works site. The receptors might suffer damage associated with the Project activities, for instance, if the receptor is a school or a market the impact could be related to Health and Safety of pupils or general public.

Tables E-4 below summarizes social and biophysical receptors identified with the Project area.

Table E.4: Biophysical and Social Receptors

Name of Receptor	Nature of risk
Lango Baya Primary School Lango Baya Secondary School	Accidents to students and general public within Lango Baya associated with plant and equipment, vehicular movement. The risk is associated with plant and equipment movement within the market or open un barricaded trenches or without warning tapes among other risks
Lango Baya Market	
Lango Baya Mosque	
Lango Baya bridge	The project will not be associated with deep excavation or rock breaking that result to excessive vibrations resulting from equipment's such as rock drillers. Therefore, risk related to the bridge will be limited to health and safety scope.
Aquatic fauna within the river at the Project Location	From secondary data, field observation and information from local community members, there are no specific / protected fish breeding sites along the river within Baricho Well Fields Section. However, as a cumulative impact associated with risk of pollution of river water from incidences such as oil / fuel spills from plant and equipment fish kills[1] could occur. In such cases, the kill will be associated with increased levels of COD or BOD beyond recommended levels.

[1] Applicable fish species dominant in lower Sabaki River have been detailed in Section 4.6 of this report

E.6.2 Assessment of Impacts

The assessment characterized magnitude of impact and sensitivity/vulnerability/importance of resource/receptors as detailed in sub section (3.3) of this report. A summary of significance of each impact is designated using the matrix shown in **Table E.5** below.

Table E.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 are factored into the assignment of magnitude and sensitivity, vulnerability and importance designations that enter into the matrix.

A summary of impact significance discussed in this report is presented in **Table E.6** below.

Table E.6: Impact Significance Assessment

Environmental / Social Variable	**Phase**	**Impact Type**	**Severity Rating**	
			Before Mitigation	**After Mitigation**
Impact on Water Resources (River Sabaki)	Construction & Operation	Direct	Minor	Negligible
Impacts on Soil Resources within Baricho Well Fields	Construction	Direct	Minor	Negligible
Impact on Air Quality within the Project area	Construction	Direct	Moderate	Negligible
Noise and Vibration Impacts within the project area	Construction	Direct	Minor	Negligible
Impacts on Flora and Vegetation Cover	Construction	Direct	Minor	Negligible
Community Health and Safety	Construction	Direct	Moderate	Minor
Workers Health and Safety	Construction and Operation	Direct	Moderate	Minor
Temporary Disruption of Water Supply during construction works	Construction	Direct	Moderate	Minor
Impacts related to Gender Based violence (GBV) and Sexual Harassment (SH), Children Protection, Sexual Exploitation and Abuse (SEA)	Construction	Direct	Moderate	Minor
Health Impact- spread of COVID19 among construction workers and social risk - Spread	Construction	Direct	Moderate	Minor

of COVID-19 amongst community members during consultations				
Land Acquisition and Resettlement Impacts	Operation	Direct	Moderate	Minor

A summary of Environment and Social Impacts discussed in this report summarized in **Table E.7 on Page** I**X**

Table E.7: Environment and Social Impacts and Mitigation Measures

Anticipated Risk and Impact	Mitigation
Impacts on Water Resource ● There will be direct interaction during clearing and construction near to or in surface water resources. There will be indirect interaction in the case of erosion of soils into water resources. ● Site activities such as excavations during site levelling could result to loosening of soils that could result to sedimentation and siltation of storm water drainage channels and eventually flowing into Sabaki River. ● There will be direct interaction from the abstraction of water from Sabaki River for construction (e.g. for dust control). ● Un-serviced plant and equipment on site could result to oils and fuels leaks that could contaminate Sabaki river affecting aquatic organism at the point of discharge	● Activities shall be conducted to extend possible away from water bodies, except where crossings are required. ● All waste water which may be contaminated with oily substances must be managed in accordance with an appropriate Waste Management Plan (WMP). The measure include containment before collection by NEMA licensed waste handlers for safe disposal. ● No hydrocarbon-contaminated water may be discharged into river Sabaki. ● 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 ● Project activities will have direct physical impacts to soil within well fields, possible direct physical impacts to soil include erosion resulting from activities such as excavation and leveling works, clearing of vegetation for infrastructure such as access roads, laydown areas and construction zones among others. ● The excavation of soil for the construction of protection works will disrupt the soil cohesion and also may result in surplus soil due to the installation of the gabions within the same excavated areas. If not properly restored or managed, such soils may erode and wash into nearby Sabaki River thereby increasing the sediment load. Temporary soil stockpiles established during construction of infrastructure will be at risk of erosion from wind and rainfall.	● Vegetation clearing and topsoil disturbance will be minimized. ● Contour temporary and permanent access roads / laydown areas so as to minimise 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. ● 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	**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;

from construction generators and other hydrocarbon powered equipment); and ● Dust and particulate matter (as PM10) created by construction-related vehicle traffic on unpaved roads.	● 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; ● Minimise 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 minimise dust blow.
Noise and Vibrations Impacts Construction activities and equipment are not expected to result in significant levels of vibration. Equipment that might have 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 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 There is no protected vegetation cover within the Baricho Well Fields that is considered a fragile ecosystem, sensitive to changes to its components. However, stripping of vegetation cover will be on isolated cases only limited coconut and casuarina trees spotted on site.	● 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. ● 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 Camp, 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 Increased Project-related traffic, civil works for site preparation including site clearance and excavation work for protection works, change to the environment due to 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	● 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 contractors and subcontractors and truck drivers as part of the induction process. ● Contractor will provide primary health care and first aid at construction camp 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 behavior, 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 Workers' rights including occupational health and safety need to be considered to avoid accidents and injuries, loss of man-hours, labor 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	● Contractor will develop a Human Resources Policy, which will outline worker rights to be included in all contracts including restrictions on working hours in line with applicable ILO and Kenyan labor standards, compensation including consideration of overtime, holidays etc. contractor will require its contractors and subcontractors to put in place policies in line with national legislation and applicable international legislation and contractor Code of Conduct and Policies. ● Contractor will establish contractual clauses to be embedded in the contracts of the all sub-contractors that require adherence to Kenyan law and international standards to be upheld related to worker rights. ● Contractor will prohibit the use of alcohol or drugs, which could adversely affect the

worker management and rights do not meet Kenyan law or international best practice.	ability of the employee to perform the work safely or adversely affect the health and safety of other employees, community members or the environment. ● Contractor and self-employed contractors will assess the H&S risks related with the tasks to be performed during the construction phase and provide corresponding prevention and management measures. ● Contractor will Provide first Aid kits and ensure availability of trained first aiders within the construction site. The ratio of trained first aiders to workers on site at any particular time should meet the threshold defined by the First Aid Rules under OSHA 2007 ● Pre-employment medical assessments will be put in place as a workforce risk management tool to screen individuals for risk factors that may limit their ability to perform a job safely and effectively. Expected benefits of conducting pre-employment medical assessments include a safer working environment, reduction in workplace injuries, minimized downtime, matching the capacity of the employee with the role, and overall recruitment cost and risk reduction. ● 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. The training will be in line with provisions of Health and Safety Management Plan (HSMP) that will be prepared by the contractor prior to commencement of project civil works. ● Contractor will implement regular health and safety checks and audits of workers, contractors 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 develop and implement a Workers Grievance Mechanism for the Project workforce including contractors and subcontractors. ● 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. The contractor will promptly report major incidents/accidents to the employer, statutory bodies and subsequently to the Bank. ● Contractor will ensure that facilities and work sites are designed and maintained such that robust barriers are in place to prevent accidents. For works on/near water, such will also include availing of emergency rescue equipment like personal floating devices and having designated rescue personnel among the workers available at any time works are in progress ● Contractor will ensure that its Code of Conduct is followed to regulate the performance and behavior of all workers, including provision for disciplinary action for anti-social behavior and non-compliance with health and safety regulations such as lack of use of PPE.

	● Contractor will ensure that IFC/World Bank Group Environmental, Health and Safety guidelines regarding the construction and management of worker accommodation and the provisions of medical facilities at worker accommodation are followed. ● 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 behavior, use of drugs and alcohol, operating hours, rest periods, community education on traffic safety and accident reporting and investigations. ● Contractor will develop a Waste Management Plan for the construction phase with clear guidelines for the safe storage and disposal of hazardous waste and handling of hazardous materials.
Sexual Harassment (SH) at the workplace	● The contractor will prepare a SEA/SH management plan that is complete with code of conduct to be signed by all employees, in a language that is understandable to them. ● The contractor SEA/SH management plan will be binding to the subcontractors and their employees as well. ● The contractor will develop and implement a clear human resources policy against sexual harassment that is aligned with national law ● The contractor will integrate provisions related to sexual harassment in the employees Code of Conduct (CoC) ● The contractor will ensure appointed human resources personnel to manage reports of sexual harassment according to policy. ● A grievance redress committee will be formed and will act as the first point of call for those aggrieved on GBV related problems.
Labor Influx and gender exclusion risks	● The contractor will mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 Gender Rule. ● The existing community structures headed by location chiefs should be involved in local labour hire, emphasize the requirement of hiring women, youth and people with disability and VMGs ● Protecting Human Risk Areas Associated with, Disadvantaged Groups, Interfering with Participation Rights and interfering with Labour Rights: ● Recruit locals workers on locally available unskilled, semi-skilled and skilled labour as much as possible to reduce labour influx ● Contractor to formulate and implement a labour management plan for his workforce; ● Contractor will be required to have a transparent external communication plan covering among others, how available opportunities will be advertised ● Consultations with the local council of elders to ensure that available opportunities are fairly distributed across different clan members ● Maintain a grievance register to log any complaints from workers and local community.

	● As part of the C-ESMP that contractor to prepare a Labour Management Plan (LMP) that included mandatory requirement to procure all unskilled (and as much as possible, semi-skilled) labor as well as locally available materials from the local community while ensuring equal pay for equal work for men, women and people with disability
Child Protection	● The contractor will develop and implement a Children Protection Strategy that will ensure minors are protected against negative impacts associated by the Project including SEA. ● All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behaviour ● Children under the age of 18years should not be hired on site as provided by Child Rights Act (Amendment Bill) 2014 ● Wherever possible, ensure that another adult is present when working in the proximity of children. ● Not invite unaccompanied children to workers' home, unless they are at immediate risk of injury or in physical danger. ● Refrain from physical punishment or discipline of children ● Refrain from hiring children for domestic or other labor, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury. ● Comply with all relevant local legislation, including labor laws in relation to child labor specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation
Sexual Exploitation and Abuse (SEA) of community members by project workers (employees of the proponent, contractor, subcontractor and project engineer)	● 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). SEA/SH management plan will have a Code of Conduct (CoC) which includes these mitigation measures as summarized below. ✓ Do not use language or behavior towards women or children that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate. ✓ Sexual activity with children under 18—including through digital media is prohibited. Mistaken belief regarding the age of a child and consent from the child is not a defense. ✓ Exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading or exploitative behavior is prohibited. Sexual interactions between contractor's and consultant's employees at any level on one hand, and adult (above 18 years) member of the communities surrounding the workplace on the other hand, that are not agreed to with full consent by all parties involved in the sexual act are prohibited, especially with persons one

	reason or another, is unable to make decisions or sound judgements concerning the agreement, e.g. persons with mental disability. This includes relationships involving the withholding, promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex – such sexual activity is considered "non-consensual" within the scope of this Code. ✓ Where an employee develops concerns or suspicions regarding acts of GBV by a fellow worker, whether in the same contracting firm or not, he or she must report such concerns in accordance with Standard Reporting Procedures. ✓ All employees are required to attend an induction-training course prior to commencing work on site to ensure they are familiar with the GBV Code of Conduct. ✓ All employees must attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce the understanding of the institutional GBV Code of Conduct. ● The SEA action plan will include how the project will ensure necessary steps are in place for: o 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; o 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; o Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of Sexual Exploitation and Abuse (SEA) awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their SEA-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
Health Impact- spread of COVID19 among construction workers at construction sites	● The Contractors will develop 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 mobilizing to site. 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 workers and visitors; ● Avoid concentration of more than 15 workers at one location. Where there are two or more people gathered, maintain social distancing of 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; ● The project shall put in place means to support rapid testing of suspected workers for covid-19; ● 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;
Social risk - Spread of COVID-19 amongst community members during consultations	● Electronic means of consulting stakeholders and holding meetings shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced; ● Avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters; ● The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet; ● Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Allow participants to provide feedback and suggestions (iv) Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration. (v) In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chart groups. ● Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants.
Land Acquisition and Resettlement Impacts	An abbreviated Resettlement Action Plan (ARAP) has been prepared separately, the ARAP

The proposed protection works will be undertaken within the existing Sabaki River riparian within existing Baricho Well fields. However, a total of 2.82 acres of land belonging to 12 PAPs at the proposed 6m wide water pipeline route and 10m wide access road corridor and pipeline route will be impacted. The PAPs include 6 female PAPs and 6 male PAPs	provides compensation measures to the PAPs as required by OP 4.12 on Involuntary Resettlement. The compensation measures in the ARAP will be implemented before civil works can commence

E.7 Findings

A summary of ESIA findings is detailed below.

- Site activities such as excavations during site levelling clearing of vegetation for infrastructure such as access roads, laydown areas and construction zones and other related works could result to loosening of soils and ultimately result to sedimentation and siltation of natural storm water drainage channels that flow into Sabaki River.
- Un-serviced plant and equipment on site could result to oils and fuels leaks that could contaminate Sabaki River affecting aquatic organism at the sites of possible leaks.
- Project activities that have potential to impact air quality would be associated with construction from emissions of air pollutants from temporary power generators, construction equipment, and vehicles that trigger dust and particulate matter.
- Potential noise impacts may arise as a result of the construction activities associated with the construction of the protection works. However, construction activities and equipment are not expected to result in significant levels of vibration.
- There are no protected vegetation cover within the well fields that are considered fragile ecosystem, sensitive to changes to its components. However, stripping of vegetation cover will be on isolated cases to existing coconut and casuarina trees scattered within the river bank
- Increased project-related traffic, civil works for site preparation including site clearance and excavation and levelling, change to the environment due to 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 to both workers and community members.
- The proposed protection works will be undertaken within existing Sabaki River riparian within existing Baricho Well fields. However, a total of 2.82 acres of land belonging to 12 PAPs at the proposed 6m water pipeline route and 25m access road will be impacted. An abbreviated Resettlement Action Plan (ARAP) has been prepared separately, the ARAP provides compensation measures to the PAPs as required by OP 4.12 on Involuntary Resettlement, to be undertaken prior to commencement of civil works. The ARAP budget is provided as **KShs 3,425,484.80** (Three million, Four hundred and Twenty-five thousands and four hundred and eighty-four and eighty cents Only). .
- Sexual Exploitation and Abuse (SEA) of community members by project workers (employees of the proponent, contractor, subcontractor and project engineer) and Sexual Harassment (SH) at the workplace will appropriately be mitigated as provided in this assessment.
- Further, to manage Labor Influx and gender exclusion risks, the contractor will prepare a Construction Specific Environment and Social Management Plan (C-ESMP) that includes a Labour Management Plan (LMP), the plan will require that the contractor procures all unskilled (and as much as possible, semi-skilled) labor as well as locally available materials from the local community while ensuring equal pay for equal work for men, women and people with disability

E.8 Provisions

The Environment and Social Management Plan (ESMP) prepared under this ESIA provides a

budget of Kenya Shilling Nine Million Three Hundred Thousand (Ksh 9,300,000.00) for mitigation of environment and social impacts identified in this report.

The **Bid Documents** to be prepared for the well fields protection works will incorporates the Environment, Social provisions discussed under Chapter 7 (Environment and Social Impact Assessment and Mitigation Measures). The Project contract document should include provisions for the contractor 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 that included mandatory requirement to procure all unskilled (and as much as possible, semi-skilled) labor as well as locally available materials from the local community while ensuring equal pay for equal work for men, women and people with disability*
- ✓ *Child Protection Strategy*
- ✓ *SEA/SH risk management plan*
- ✓ *Waste Management Plan*
- ✓ *Codes of Conduct (CoC) in languages that are understandable to all workers, to be signed by each worker, and sensitization of both workers and communities against SEA/SH Gender Inclusivity Strategy*
- ✓ *HIV/Aid Prevention Strategy*
- ✓ *Covid -19 Prevention and Control Protocols*

The project implementation team will prepare monthly reports on the progress of the C-ESMP implementation while ensure prompt reporting of serious accidents/incidents.

The Coast Water Works Development Agency (CWWDA) safeguards department will oversee Environment and Social Management plan (ESMP) implementation by contractor during construction phase and to implement operation phase ESMP. Further, at Project implementation phase the contractor and supervising engineer will hire a safeguards expert to oversee implementation of the plans as listed above.

In addition to regular reporting on safeguards implementation status, prompt incident reporting will be required of the implementation team as applicable. In line with the requirement of the Occupational Health and Safety Act (OSHA) 2007, EMCA 1999 and its 2015 revisions, as well as the World Bank EHS guidelines, all ESHS incidents, accidents, dangerous occurrences including occupational diseases shall be promptly reported to the respective regulatory institutions in the prescribed manner and template outlined in DOSH ML/DOSH/FORM 1 and further to the World Bank. Records of all incidents shall also be maintained and made available for inspection on site throughout the project implementation phase. Investigation shall be conducted, and a corrective action plan developed for every reportable incident to prevent recurrence.

At Project completion stage, within the defects liability Period, Coast Water Works Development Agency (CWWDA) should initiate and an Initial Environment and Social Audit for the Project as required by EIA/EA Audit regulation 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

E.9 Covid – 19 Infection Prevention and Control Measures

The review of this ESIA is undertaken during the Coronavirus disease (COVID-19) pandemic outbreak. The preparation of the ESIA including the relevant consultations have been undertaken in strict compliance with guidelines for infection prevention and control in the country. Additionally, specific mitigation measures have been introduced to prevent the spread of the pandemic during the construction period. Moreover, consultations required as part of the mitigation measures, such as during training on E&S issues, also pose a risk of infection to communities. For this reason, the risk of contracting the virus during consultations will be avoided, minimized and mitigated with specific measures (wearing of face masks, use of hand sanitizers/ hand washing with soap, keeping a social distance of 1.5-2m in meetings and gathering not more than 15 people for meetings) to ensure national requirements on social distancing and recommendations on how to minimize contact are adhered to.

TABLE OF CONTENTS

E. EXECUTIVE SUMMARY iii
E.1 Project Information iii
E.2 Proposed Project Scope of works iii
E.3 Objectives of the ESIA Assessment iv
E.4 Legal and Policy Regulatory Instruments v
E.5 Public Participation vi
E.6 Project Impacts vii
E.6.1 Sensitive Receptors vii
E.6.2 Assessment of Impacts viii
E.7 Findings xix
E.8 Provisions xix
E.9 Covid – 19 Infection Prevention and Control Measures xxi
TABLE OF CONTENTS i
LIST OF ABBREVIATIONS vii
CHAPTER 1: BACKGROUND INFORMATION 1
1.1 Back Ground Information 1
1.2 Project Information 1
CHAPTER 2: PROJECT DESCRIPTION 3
2.1 Coast Water Works Development Agency 3
2.2 Flood effects on the Baricho Wellfield 3
2.3 Alternative designs considered 4
2.4 Design Components of Upstream Wellfield 5
2.5 Design Components of Downstream Wellfield 6
CHAPTER 3: APPROACH AND METHODOLOGY 8
3.1 Introduction 8
3.2 Impact Assessment Steps 8
3.2.1 Scoping 8
3.2.2 Baseline Conditions 9
3.2.3 Stakeholder Engagement 10
3.3 Impact Assessment Methodology 10
3.4 Mitigation and Enhancement Measures 13
3.5 Residual Impact 13
3.6 Management and Monitoring and Audit 14
CHAPTER 4: PROJECT SITE BASELINE INFORMATION 15
4.1 Introduction 15
4.2 Climate 16

4.3 Topography and Geology 16
4.4 Soils 16
4.5 Hydrology 17
4.6 Biological Environment 23
4.7 Social Economic Setting 26
4.7.1 Land Ownership 26
4.7.2 Educational Facilities 28
4.7.3 Health Facilities 28
4.7.4 Bulk Water Supply System 29
4.7.5 Existing Sanitation System 30
4.8 Sensitive Receptors Likely to be impacted 31
4.9 Livelihood Sources for Community 32
4.10 Gender Based Violence (Situational Analysis) 32
CHAPTER 5: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK 34
5.1 Policy Framework 34
5.2 Legal Framework 36
The Environmental (Impact Assessment and Audit) Regulations, 2003 36
5.3 World Bank Policy Provisions 41
5.4 Institutional Responsibility 41
CHAPTER 6: STAKEHOLDER CONSULTATION 44
6.1 Stakeholder Consultations 44
6.2 Stakeholder Mapping and Identification 44
6.3 Consultations with Water Resources Authority (WRA) 44
6.4 Consultations with the Kenya Rural Roads Authority 45
6.5 Consultations with Local Community (Lango Baya Residents) 45
CHAPTER 7: ASSESSMENT OF ENVIRONMENT AND SOCIAL IMPACTS 47
7.1 Introduction 47
7.2 Screening and Scoping Assessment 47
7.3 Impact on Physical Resources and Receptors 51
7.3.1 Water Resources 51
7.3.2 Soil Resources 53
7.3.3 Air quality 55
7.3.4 Noise and Vibration 59
7.4 Biological Resources and Receptors 62
7.4.1 Flora and Fauna 62
7.5 Social Resources and Receptors 65
7.5.1 Community Health Safety and Security 65

7.5.2 Worker Health and Safety and Workers Management 68
7.5.3 Labour Influx and Gender Exclusion Risks 72
7.5.4 Sexual Harassment (SH) at the workplace 73
7.5.5 Child Protection 73
7.5.6 Sexual Exploitation and Abuse (SEA) 74
7.5.7 Land Acquisition and Resettlement 75
7.6 Cumulative Impacts and Mitigation Measures 75
7.7 Health Impact- spread of COVID19 among construction workers at work sites 76
7.8 Social risk - Spread of COVID-19 amongst community members during consultations 77
CHAPTER 8: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMP) 80
8.1 Purpose and Objectives of ESMP 80
8.2 Institutional Capacity to Implement the ESMMP 80
8.3 Grievance Redress Mechanism 81
CHAPTER 9: FINDINGS AND PROVISIONS 99
9.1 Findings 99
9.2 Provisions 99
CHAPTER 10: REFERENCES 101
APPENDIXES 102

List of Tables

Table 3-1: Resources and Receptors and Impacts Considered in Scoping9
Table 3-2: Impact characteristics11
Table 3-3: Impact Type Definitions11
Table 4-4: Definition of Likelihood11
Table 3-5: Impact Significance13
Table 4-1: frequency analysis of the local gauge (Gauge 3HA13)20
Table 4-2: The flood discharge peaks for different return period21
Table 4-3: Physicochemical parameters22
Table 4-4: Dissolved oxygen and biological oxygen demand levels at Galana River23
Table 4-5:Lower Sabaki River Fish Species25
Table 4-6: Birds listed Under IUCN Red List within Sabaki River Esturay26
Table 4-7: Sensitive Receptors in around the Well Fields31
Table 5-1: Policy Framework Relevant to the Project34
Table 5-2: Legal Framework Relevant to the Project36
Table 5-3: World Bank Safeguards41
Table 5.4: Institutional Roles and Responsibilities42
Table 6-1: Stakeholder Concerns45
Table 7-1: Potential Interactions Matrix at Screening and Scoping49
Table 7-2: Pre-Mitigation Impact Assessment52
Table 7-3: Residual Impact Significance53
Table 7-4: Mitigation Impact Assessment54
Table 7-5: Residual Impact Significance55
Table 7-6: Pre-Mitigation Impact Assessment57
Table 7-7: Residual Impact Significance59
Table 7-8: World Bank Group Noise Level Guidelines60
Table 7-9: NEMA Noise Level Guidelines60
Table 7-10: Pre-Mitigation Impact Assessment60
Table 7-11: Residual Impact Significance61
Table 7-12: Pre-Mitigation Impact Assessment63
Table 7-13: Pre-Mitigation Impact Assessment64
Table 7-14: Residual Impact Significance65
Table 7-15: Social Receptors65
Table 7-16: Pre-Mitigation Impact Assessment66
Table 7-17: Residual Impact Significance68
Table 7-18: Potential Impacts on Occupational Health and Safety and Worker Management69

Table 7-19: Pre-Mitigation Impact Assessment70
Table 7-20: Residual Impact Significance72
Table 7-21. Summary of Resettlement Impacts75
Table 8-1: Environment and Social Management Monitoring Plan83

List of Figures

Figure 1-1: Layout Plan of Existing Baricho Well field2
Figure 2-1: River Bank Protection Works6
Figure 2-2: River bank protection with gabions (artistic impression)7
Figure 3-1: Impact Assessment Process8
Figure 4-1: Location Map of Baricho Well Fields15
Figure 4-2: Image of Soils within Baricho Well Fields (Ongoing Rehabilitation Works)17
Figure 4-3: Athi-Galana/Sabaki river catchment and location of project (Source: Athi River Basin Modelling Report, 2020, Thwake Dam Project, Ministry of Water)19
Figure 4-4: Images of Sabaki River at Baricho Well Fields21
Figure 4-5: Location Map of Baricho Well Fields on Image22
Figure 4-6: Vegetation Cover within Baricho Well Fields24
Figure 4-7: School Infrastructure28
Figure 4-8: Health Infrastructure within Malindi Sub County29
Figure 4-9: Existing Bulk Water Supply in Malindi30
Figure 4-10: Image of Lango Baya Market32

LIST OF ABBREVIATIONS

AoI		Area of Influence
BoD	-	Biological Oxygen Demand
B/H		Borehole
C-ESMP		Construction – Environment and Social Management Plan
CoC		Code of Conduct
CHSMP		Construction Health and Safety Management Plan
COVID -19		Corona Virus Disease
COD		Chemical Oxygen Demand
CWWDA		Coast Water Works Development Agency
DOSHS		Department of Occupational Health and Safety
DMP		Dust Management Plan
EA	-	Environmental Assessment
EIA		Environment Impact Assessment
ERP		Emergency Response Plan
EHS		Environment Health and Safety
EMCA	-	Environment Management & Coordination Act
ESAAP		Environment and Social Audit Action Plan
ESMP		Environment and Social Management Plan
GBV		Gender Based Violence
GBVRC		Gender Based Violence Recovery Centre
H&S		Health and Safety
IBA		Important Bird Area
IUCN		International Union for Conservation of Nature
JICA		Japan International Cooperation Agency
MAWASCO		Malindi Water and Sanitation Company
NEMA	-	National Environmental Management Authority
NOx		Nitrogen Oxides
NRW		Non Revenue Water
OSHA	-	Occupational Health & Safety Act
PAP		Project Affected Persons
PDR		Preliminary Design Report
Pm		Particulate Matter
PPE		Personal Protective Equipment
SEA		Sexual Exploitation and Abuse
SGBV		Sexual Gender Based Violence
SOx		Sulphur Oxides
TMP		Traffic Management Plan
VOC		Volatile Organic Compounds
WTP		Water Treatment Plant
WBG		World Bank Group
WHO		World Health Organization
WRA		Water Resources Authority
WSDP		Water and Sanitation Development Project
WMP		Waste Management Plan
WSP		Water Services Provider
WWTP		Waste Water Treatment Plant

CHAPTER 1: BACKGROUND INFORMATION

1.1 Back Ground Information

Water and Sanitation Development Project (WSDP) is being implemented with funding from the World Bank (WB) and Government of Kenya. The development objective of the project is to improve water supply and sanitation services in selected coastal and north eastern regions in the Republic of Kenya. This objective will be achieved by investing in water supply and sanitation infrastructure in urban centers in coastal counties and two counties in Kenya's arid north-eastern region. The Project will also improve services by strengthening institutional capacity in areas, such as reducing non-revenue water (NRW), improving billing and revenue collection systems, and developing medium-term business plans. In addition, the Project will establish a results-based financing mechanism at the national level to provide incentives to the Water Service Providers (WSPs) to accelerate access to water supply and sanitation services and improve operational and financial performance.

1.2 Project Information

The project is being implemented by the Coast Water Works Development Agency (CWWDA) which is a parastatal (Government Owned and Autonomous) created under the Water Act, 2016 and established through a Gazette Notice No. 28 of 26th April 2019. The CWWDA area covers the following six (6) counties in the region: Mombasa, Kwale, Kilifi, Taita-Taveta, Lamu and Tana River.

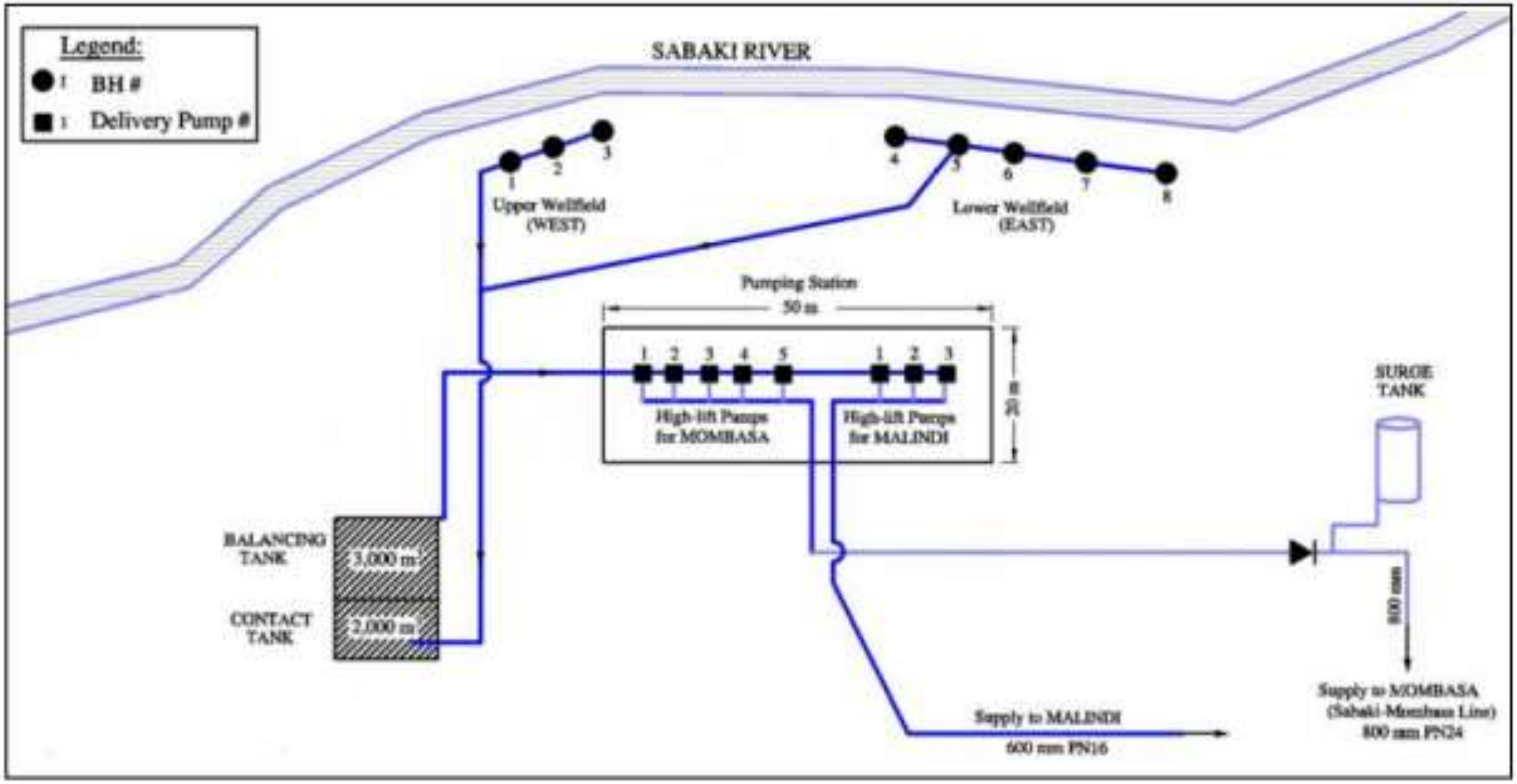
The Coast region covers 83,040 km² out of which 28,450 km² is occupied by Indian Ocean, rivers, lakes, and the national park, while the rest is used for agriculture, settlement and other human activities. In line with the Water Act 2016, the Agency does not provide services directly, but through contracted agents or Water Service Providers (WSPs). The Agency has contracted seven (7) WSPs to provide water and sewerage services in different areas of the coast zone (Mombasa, Malindi, Kilifi, Kwale, Taita, Lamu and Tana).

The Baricho well field is situated in the alluvial flood plain of the Sabaki River, about 3 km northwest of the Baricho waterworks (Malindi Sub County in Kilifi County, Coastal Region). Water production can be achieved by fifteen (15) vertical boreholes in two wellfields (Upstream and Downstream), which are located on the southern bank of the Sabaki River. Five (5) boreholes are in the upstream wellfield, and ten (10) boreholes are in the downstream. The boreholes are situated at distances of around 50 m or less from the river, thus the abstracted water is mostly bank filtrate from the river.

The raw water is pumped from the boreholes to Baricho WTP, where it is disinfected with Calcium hypochlorite (chlorine) via a gravity dosing system, stored, and then pumped to Mombasa, Kilifi, Malindi and other small towns en-route

A Layout Plan of the existing Baricho Well Fields is given in **Figure 1-1** on **Page 2**

Figure 1-1: Layout Plan of Existing Baricho Well field



CHAPTER 2: PROJECT DESCRIPTION

2.1 Coast Water Works Development Agency

CWWDA operates the Bulk water supply system as a unit within the organization. The Bulk water supply system comprises of the following:

- Baricho Wellfield with, currently with fifteen boreholes (BHs) serving Mombasa (North Mainland and Island) and Kilifi (Malindi, Watamu, Kilifi, Mtwapa, Gongoni and other towns enroute). When fully operational these boreholes may produce more than 112,000 m^3/day, thus representing the major potable water source of the system.
- Mzima Springs – Capacity 40,000 m^3/day serving Mombasa (West Mainland & Island), Taita Taveta (Voi, Maungu, Samburu, Makinon), Kwale (Vigurungani), Kilifi (Mariakani, Mazeras, Kaloleni) and enroute population.
- Marere Springs – Capacity 12,000 m^3/day Mombasa (South and West Mainland), Kwale (Kwale, Ukunda, Diani, Kinango) and enroute population.
- Tiwi Boreholes – Capacity 10,000 m^3/day serving Mombasa (South Mainland -Likoni Area), Kwale (Kwale, Ukunda, Diani) and enroute population.

The proposed works (Emergency localized protection works have been designed and are being constructed for boreholes 1,3A, 3B and 4B) (CWWDA 87234-CS-QCBS) concerns rehabilitation works on the Baricho Wellfield supply system. The proposed project aims at protecting the entirewater wells located at 3 º 07'22.06S,39º46'21.21"E

2.2 Flood effects on the Baricho Wellfield

In January 1998, a major flood occurred on the Sabaki River during the El Nino weather phenomena. The river scoured its banks and damaged the entire upstream wellfield and a number of wells in the downstream wellfield.

Following the flood damage, a design of protective measures for the upstream wellfield and for borehole no. 4 in the downstream wellfield was commissioned and prepared by Gauff Ingenieure and CAS Consultants and was subsequently implemented in 2005.

In April 2018, another major flood occurred on the Sabaki River and, despite the earlier protection works, both borehole fields were adversely affected leading to closure of the whole Baricho plant. Borehole 1 was completely washed away, borehole 4 was also adversely affected as the river course changed and, as a result, the borehole after the event was inside the river. Power supply and pipelines were also washed away. Other Boreholes were overtopped by the flood water and the respective electrical components destroyed.

The damages to boreholes 1, 3 and 4 were extensive. Nevertheless, the Agency proceeded so that the boreholes were re-drilled. The targeted eventual production is 110,000 m3/day. Emergency localized protection works have been designed and are being constructed for boreholes 1,3A, 3B and 4B. However, long term major protection works are necessary for the

whole wellfield to safeguard it from future floods, these works are the focus under this report as presented in the design report.

2.3 Alternative designs considered

The “Zero Option” of not constructing any protection works is rejected because of the great importance of the wellfields in meeting potable water demand and the certainty of future damage and lengthy interruption of service, in addition to the recurring costs of regular reconstruction of wells and associated infrastructure after large flood events.

Concerning design options, the following were considered:

a) A heavy engineering intervention option with a high water-tight concrete dam-wall along the river bank which would close-off the flood-plain next to the permanent river.
b) Similar to option (a) but with a high water-tight embankment closing-off the flood-plain.
c) A medium intervention option with a permeable high-embankment (levee) along the river bank, which would allow expansion of the river into the flood-plain. To avoid inundation of the wells these would be raised to maximum flood-water level.
d) A low intervention option with construction of low gabion scour protection at the river-bank level and protection of individual wells, independently by surrounding them with individual concrete enclosures founded on piles and protecting the immediate surrounding area of each well with gabion mattresses and a concrete pavement for vehicular access. In addition, the individual pipeline and access corridors, as well as the electricity supplies are protected from erosion scour. This option also presented least environment impacts on the river bank with regards to sedimentation and also minimized land acquisition requirements.

Option (d) was selected following a multi-criteria comparison.

The main construction material is concrete and rock for gabion works. It is estimated that the work shall take about 1,500m^3 of concrete and 3000m^3 of rock for gabions (all locally available). It shall employ about 80 members of staff for a period of 8 months.

However, this option came with a disadvantage of not being able to clean the boreholes as previously using a drilling rig mounted on top of the well head. Three options were explored as follows:

1. Carry out erosion protection works along the river bank, improve the well head against flotation and provide water tight covers to the well heads,

2. Construct ramps to wells 5 to 8 and protect wells 2, 2A and 4 as in option 1,

3. Maintain the well heads with the design as in option d above and explored different methods of cleaning.

Reducing borehole protection even in one well was considered not prudent and hence option 3 was adopted. Among the cleaning alternatives agreed to be explored were as follows:

a) Acquire a lighter rig that can be mounted on the proposed elevated well heads, or

b) Change the cleaning system to adopt one that uses chemicals and pressurized air surging with a brushing system mounted on a crane, or

c) Acquiring a high water jet system that does not use chemicals with ability to clean the well screens and material behind it.

All the three options are possible but CWWDA shall have to employ and train a team for cleaning purposes among other duties.

2.4 Design Components of Upstream Wellfield

The Upstream Wellfield measures concern chiefly the individual wells and the area under the original protective structure of 2005, that was destroyed by the 2018 flood. The geometry of protection is complicated somewhat by the construction of a new bridge through and over the upstream wellfield.

The upstream wellfield includes, at present five wells (Boreholes – BH). These are BH1, BH2, BH2A, BH3 and BH3A. The first three are situated upstream of the new bridge and the last two are situated downstream of the new bridge. Protective islands, consisting of gabion boxes, are being constructed already around BH1, BH3 and BH3A under a different design and construction contract.

In the present design (proposed scope of works) and subsequent construction contract, the following are included:

- Construction of two circular concrete towers, approximately 8.00 m in diameter and 8.00 m high, each surrounding each one of BH2 and BH2A. The towers are founded on concrete piles. Immediately surrounding each tower is a concrete pavement, 4.00m in width that provides vehicle access to the tower.
- Construction of a raised concrete platform, 8.00m by 8.00m in plan for placing the transformer and electrical switch-board house for the wells.
- Protection of the river bank between all five wells and the low-water river-course with the use of gabions. This protection has a total length along the riverbank of approximately 230m.
- Protection of the floodplain to a width of approximately 90m from the wells, with the approximately 50m closer to the river being protected by gabions and the rest 40m by light rip-rap stone.
- Protection of the surface of access roads in the flood-plain against erosion with concrete paving. A total length of approx. 420m of access roads to the individual wells are to be paved.
- Protection of a river bed zone parallel to the new bridge and 10m upstream and downstream of its piers using gabions. This was considered necessary because hydraulic modelling indicated that the new bridge piers will induce very heavy scouring of the river bed unless this is protected.
- All current pipelines will be disconnected and reconnected from the individual wells before and after construction of the respective protection works surrounding each well.

2.5 Design Components of Downstream Wellfield

The downstream wellfield includes, at present, ten wells (Boreholes – BH). These are BH4, BH4A, BH5, BH6 and BH6A, BH7, BH8, BH9, BH10, BH11. A protective island, consisting of gabion boxes, OS being constructed already around BH4 under a different design and construction contract. In the present design and subsequent construction contract, the following are included:

- Construction of one circular concrete tower, approximately 8.00 m in diameter and 8.00 m high, surrounding BH4. The tower is founded on concrete piles. Immediately surrounding the tower is protective embankment, approximately 4.00m high.
- Construction of five rectangular concrete towers, approximately 4.00 m by 4.00m in plan and between 5.00 and 6.00 m high, each surrounding each one of BH5, BH6 and BH6A, BH7, and BH8. The towers are founded on concrete piles. Immediately surrounding each tower is a concrete pavement, 4.00m in width that provides vehicle access to the tower.
- Protection of the river bank at the low-water river-course along all ten wells using gabions. This protection has a total length along the riverbank of approximately 865m. The protection zone width will vary somewhat, depending on river-bank slope but will be of the order of 12m. Of these, 4m will be placed on the river bed next to the bank. In comparison, the total river-bed width in the location varies between 100m and 110m.
- Protection of the surface of access roads in the flood-plain against erosion with concrete paving. A total length of approx. 950m of access roads to the individual wells are to be paved.
- Construction of a low road embankment (maximum height 1.50m) along the axis of the current main access road. Where the road crosses the lowest point of the flood-plain, a series of 10 concrete box-culverts, 1.50m in height will be constructed to allow drainage of the floodplain, during lesser floods, without affecting access to the wells.
- Protection of the existing corridors of pipelines from scour by laying gabion mattress on the surface above them. Protection of the electricity pylons that lie within the flood-plain by surrounding their bases with a rip-rap layer.
- All current pipelines will be disconnected and reconnected from the individual wells before and after construction of the respective protection works surrounding each well.

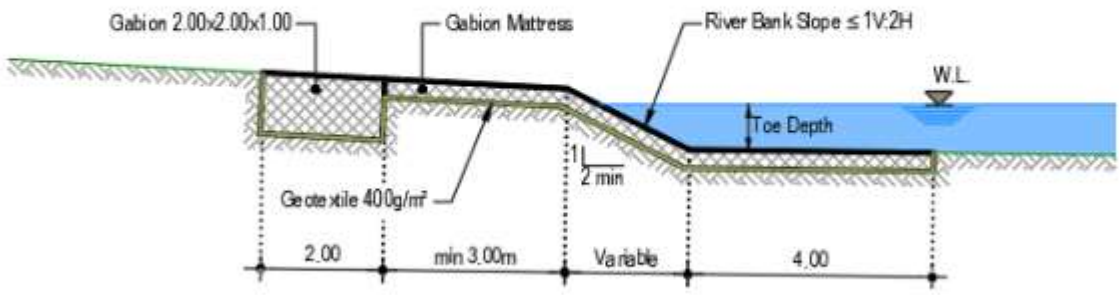


Figure 2-2: River Bank Protection Works

Figure 2-3: River bank protection with gabions (artistic impression)

CHAPTER 3: APPROACH AND METHODOLOGY

3.1 Introduction

This chapter describes the methodology used to conduct the Environment and Social Impact Assessment for the proposed Baricho Well-Field Protection Works. The methodology follows the overall approach illustrated in **Figure 3.1**. The assessment has been undertaken following a systematic process that predicts and evaluates the impacts the Project to physical, biological, or social environment. Further, the assessment provides measures that the Project will take to avoid, reduce, mitigate, or offset for adverse impacts and to enhance positive impacts.

The steps in the assessment process are described in the following sections.

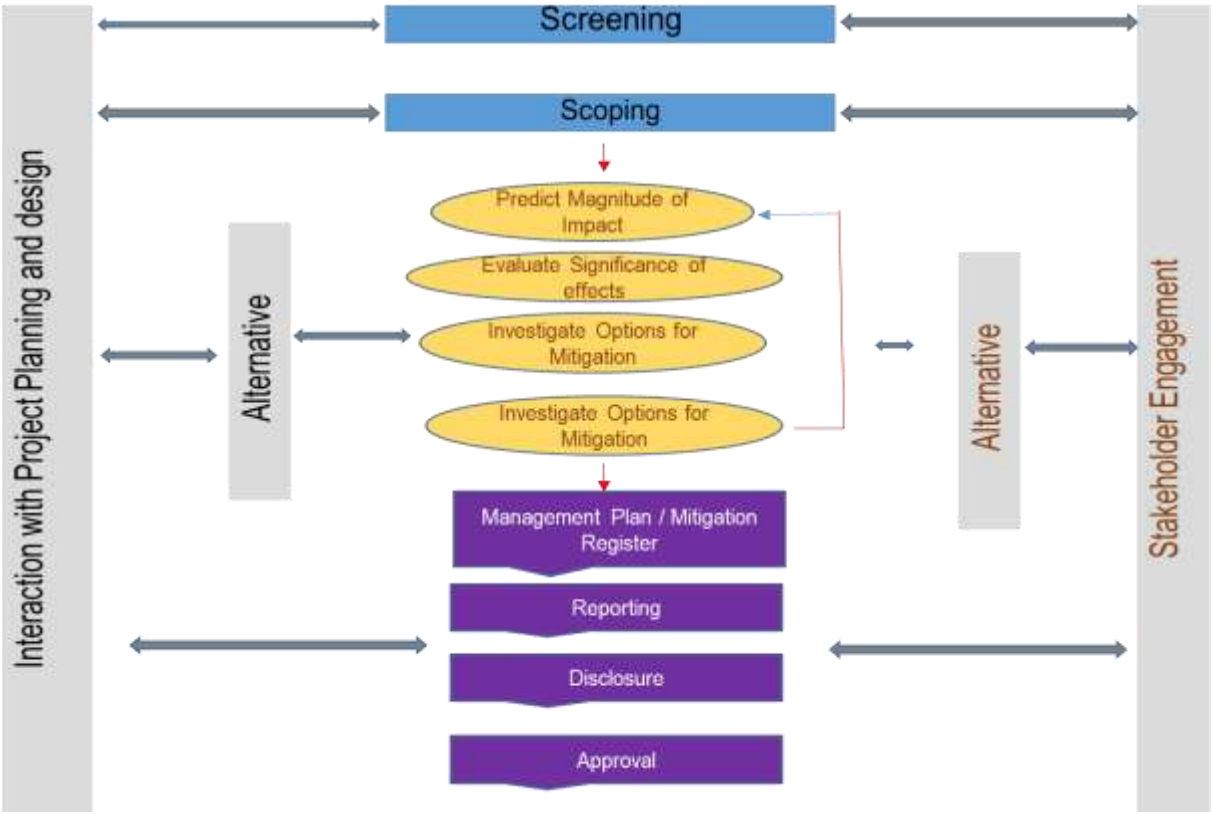


Figure 3-4: Impact Assessment Process

3.2 Impact Assessment Steps

3.2.1 Scoping

The process of scoping was undertaken in the Month of March 2021 with the following objectives:

- Identify the Project's Area of Influence (and thus an appropriate Study Area);
- Identify where there are interactions between the Project activities result in effects to environmental and social resources and receptors.

- Make a tentative evaluation of the impact of such effect and identify which should be included in the scope of the impact assessment; and
- Develop a terms of reference or plan for a detailed assessment of impacts.

This stage is intended to ensure that the impact assessment focuses on those issues that are most important for design, decision-making and stakeholder interest. **Table 3-1** presents the resources/receptors considered in the scoping together with the changes that might indicate a Project-related impact.

Table 3-1: Resources and Receptors and Impacts Considered in Scoping

Recourse / Receptor	Impact /risk
soil erosion sedimentation of water course	Increased soil erosion/degradation/ sedimentation of water course as result of excavation and backfilling activities in addition to trampling of soils by plant and equipment on site.
Air Quality	Air quality pollution caused by emissions from construction plant and equipment which include dust and gaseous emissions. Impacts relate to the receptors such as schools, market centers and places of worship within Lango Baya
Noise and excessive vibration	Noise from construction activities affecting nearby dwellings and workers, this will be related to movement of plant and equipment to and from the Project Sites
Water Quality and Resources	Water will be required during construction activities (cement mixing and potable water for the workers). There is the potential to impact on Sabaki River. Further, accidental events (such as spills and uncontrolled releases) have the potential to lead to groundwater contamination of the Baricho aquifer.
Community Health and Safety	Community health and safety impacts (including spread of communicable diseases such as HIV/AIDS and COVID 19) during construction, excavation activities and the increased traffic on the road from worker and equipment transportation has the potential to create more road accidents and fatalities during the construction phase especially within Lango Baya Market
Occupational Health and Safety	There is the potential for occupational health and safety incidents throughout the life cycle of the project; the risk is particularly high during construction and decommissioning phases.
Gender Based violence (GBV) and Sexual Harassment (SH), Children Protection, Sexual Exploitation and Abuse (SEA)	Impacts related to Gender Based violence (GBV) and Sexual Harassment (SH), Children Protection, Sexual Exploitation and Abuse (SEA) as a result of the project
HIV/AIDS and COVID - 19 spread to among workers and community members	Health Impact- spread of HIV/AIDS, COVID19 among construction workers and Social risk - Spread of COVID-19 amongst community members during consultations
Land Acquisition and Resettlement	Land Acquisition will be triggered to 8PAPs who own land parcels that will be required for the access road and pipeline route.

3.2.2 Baseline Conditions

To provide a context within which the impacts of the Project can be assessed, a description of physical, biological, and social conditions that would be expected to prevail in the absence of the Project are characterized. The following describes the approach for determining the baseline conditions for physical, biological, and social resources and receptors

To inform the description of the baseline, field surveys were conducted within the Month of March and April 2021. The survey was undertaken by a combined physical, biological, and social study team which collected and categorized both primary and secondary data.

To plan the survey, maps of the Project area of influence were created and the key environmental and social resources were located and analyzed. This analysis was used to develop the survey plan and target locations.

Bio physical data collection was through field observation for flora and fauna, water resources, soils, land use and landscape as well as secondary literature review.

Social surveys were also performed and included the following tasks:

- Stakeholder Mapping, identification and analysis;
- Social demographics and other characteristics (secondary data review); and
- Identification and geolocation (potential) of problematic locations information

3.2.3 Stakeholder Engagement

An effective impact assessment requires engagement with relevant stakeholders throughout the key stages 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. A public baraza (meeting) was organized on site on the **30th March 2021** at Lango Baya Chiefs Offices. The invitation for this baraza was done through the chiefs and 'Nyumba Kumi' leaders (village elders) who went through the village inviting community members a week prior to the date of the meeting.

3.3 Impact Assessment Methodology

Impact identification and assessment starts with scoping and continues through a structured impact assessment process. The principal steps are summarized in **Figure 3-1 on Page 8** and comprise the below listed 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 terminology used to describe impact characteristics is shown in Table 3-2**.**

Table 3-2: 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 3-3 below.

Table 3-3: Impact Type Definitions

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 3-4** below**.**

Table 3-4: 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 is 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 have been characterized, the significance can be assigned for each impact. Impact significance is designated using the matrix shown in **Table 3-5** below.

Table 3-5: 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 are factored into the assignment of magnitude and sensitivity, vulnerability and importance designations that enter into the matrix.

3.4 Mitigation and Enhancement Measures

Further, once the significance of an impact has been characterized, the next step is 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 is 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

3.5 Residual Impact

In addition, once mitigation and enhancement measures are specified the next step in the IA Process is 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.

3.6 Management and Monitoring and Audit

The final stage in the impact assessment process is 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 4: PROJECT SITE BASELINE INFORMATION

4.1 Introduction

Malindi Sub County lies within Kilifi County, in the South-Eastern part of Kenya along the Indian Ocean. It lies approximately 120 km northeast of Mombasa, at the mouth of Sabaki River and between Longitudes 39° and 40° 14' East and Latitudes 2° 20' and 4° 0' South of the Equator. The average altitude in Malindi is 10 m above sea level.

Malindi Sub-County covers an area of 627 km^2 and borders the following Sub-Counties of Kilifi County: Magarini Sub-County to the North, Ganze Sub-County to the West and Kilifi North Sub-County to the South. Malindi and Watamu areas have a higher population compared to adjacent Peri-Urban and rural areas because of improved infrastructure and availability of employment opportunities.

Water supply and sanitation systems are managed by Malindi Water and Sewerage Company Ltd. (MAWASCO).

Baricho well field which is the Geographical Area of Influence (AoI) in this assessment falls within Lango baya Sub Location Malindi Sub County of Kilifi County. Therefore, this chapter provides a description of the current baseline conditions around the existing well fields and further within Lango baya Sub location. **Figure 4.1** below illustrates location of Baricho Well Fields

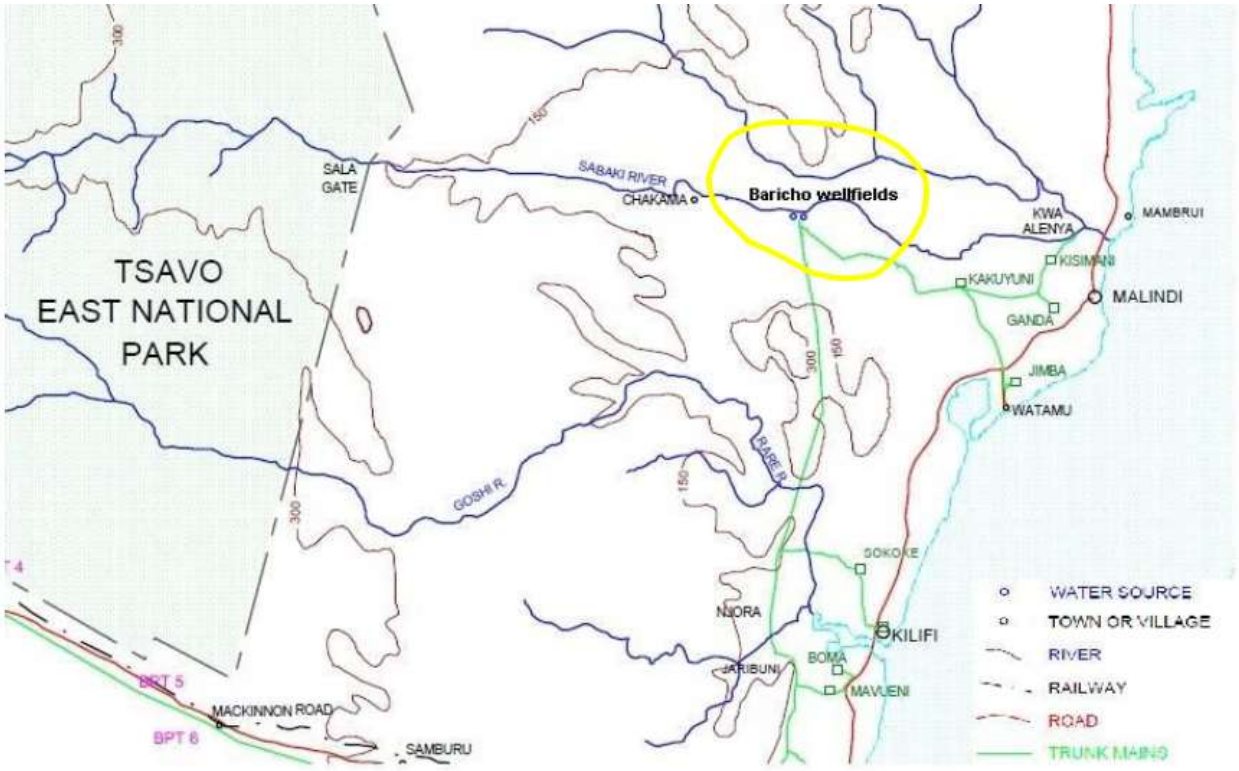


Figure 4-5: Location Map of Baricho Well Fields

4.2 Climate

Malindi Sub-County, including Lango Baya Sub location, is marginally semi-arid with two rainy seasons in a year. The long rains fall between April and July while the short rains occur between October and November. Due to topography and the effects of the monsoon winds, Malindi experiences varying annual rainfall of between 900 mm to 1,100 mm. There is a marked decrease in rainfall intensity to the hinterland.

It is generally hot and humid in Malindi throughout the year. The annual temperature ranges between 21° C and 30° C. The lowest temperature is experienced during the long rainy seasons (April – July). The average relative humidity along the coastal belt is 65% but with a decrease towards the hinterland.

4.3 Topography and Geology

Malindi Sub-County lies within the Coastal Plains which is a narrow belt, varying in width between 3 km and 20 km. It lies below 30 m above sea level. The Coastal plain is composed of Marine sediments, including coral, limestone, marble, clay stones and alluvial deposits that support agriculture.

To the West of the Coastal plain where Baricho wells fields are located lies the foot plateau characterized by slightly undulating terrain. The Plateau falls between 60 m and 150 m altitude and slopes towards the ocean. Several dry water courses traverse the surface with underlying Jurassic sediments consisting of shells, sandstones and clays. In this zone, grassland and stunted vegetation prevails.

Malindi sub-County comprises of three broad landscape units: (i) the "beach", The “beach” is characterized by coral cliff, sandy soil and is an unstable new dune formation. (ii) the "coral landscape" The "coral landscape" consists of higher situated old reefs and lagoons. It is characterized by depressions with clayish soils and areas susceptible to water logging. (iii) the "plateau" Baricho wells fields. The "plateau" is a prominent area of shallow sandy clay soils underlain by coral limestone Rock. It is located above the 4.5 m contour.

4.4 Soils

Generally, the soils of Malindi represent a wide range of profile characteristics. Differences in e.g. parent material, age or drainage condition have delivered an array of soils from high to low agricultural potential. Some of the characteristics that are generally recognizable are:

- Coral rag, that is developed from coral limestone with sand mixtures (reef complex)
- Red and yellow sands of the coastal strip (Kilindini formation)
- Dark red loamy sands (latosolic soils), mostly covering the soils of the Magarini formation.
- Brown clays (Grumosolic soils) covering the soils of the Mto Mkuu formation.
- Complex of dark red loamy sands (latosolic soils), dark red brown loams, brownish yellow loamy sand 9with laterite horizon brown clays (grumosolic) and shallow stony soils with rock outcrops. Part of this complex covers the soils of the Mariakani Formation.

The soils in the Malindi Sub County differ widely in depth, texture, physical and chemical

properties, mainly because of the underlying geology. The soils are poor in fertility, except where indigenous vegetation remains and a layer of fertile loam soil have developed.

Malindi is made up of sedimentary rocks of Jurassic to Recent age. The geological structure of sedimentary rocks promotes rapid infiltration and percolation of rainwater to recharge groundwater aquifers.

Sabaki River (precise location of Baricho Well Fields) is characterized by poor soils, shallow depressions and a gently undulating terrain characterized by sandy, sandy loam soils with very high infiltration rates. In some areas, the soils are dry with drainage and salinity. In some places, the soils are covered with thick top soils, which are loamy sand to sandy loam.

Figure 4-6: Image of Soils within Baricho Well Fields (Ongoing Rehabilitation Works)

4.5 Hydrology

The Sabaki River has its origin as Athi River in the central highlands around Nairobi. When joined by Tsavo river in its lower basin the river is known as Galana. The river is known as Sabaki when it drains into the Indian Ocean, a few kilometers north of Malindi Town. The entire Athi – Galana - Sabaki system extends for 390km and drains a catchment area of 70,000 km^2.

The river rises at 1° 42' S. as Athi River and enters the Indian Ocean as Galana River (also known as Sabaki River). Athi River flows across the Kapiti and Athi plains, through the Athi River town, takes a northeast direction and is met by the Nairobi River. Near Thika it forms the Fourteen Falls

and turns south-south-east under the wooded slopes of the Yatta ridge, which shuts in its basin on the east. Apart from the numerous small feeders of the upper river, the only tributary is the Tsavo River, from the east side of Kilimanjaro, which enters in about 3° S. It turns east, and in its lower course, known as the Sabaki (or Galana), traverses the sterile quartz-land of the outer plateau. The valley is in parts low and flat, covered with forest and scrub, and containing small lakes and backwaters connected with the river in the rains.

River Sabaki (Galana) is formed by the confluence of Athi River, which is the main watercourse, with Tsavo River, which is a major tributary. Athi River flows from the southeast of Nairobi, north-eastward in its upstream reaches where it receives flows from the Aberdare Mountains. It then turns its flow direction to the southeast and flows along the catchment area boundary with the Tana Catchment Area, thus receiving tributaries from its West Bank only. Downstream of Tsavo Park and the confluence with River Tsavo, the river-course runs towards the East, outflowing into the Indian Ocean North of Malindi. A common convention is for the stretch between the confluence and the downstream end of Tsavo Park to use the name Galana, and to use the name Sabaki further downstream all the way to the coast.

Sabaki Estuary at Malindi (3.20S 40.150E) is estimated to be about 0.5 km^2 (Kitheka et al., 2005). The tidal range during spring tide is of the order 3.0 m while that during neap tide is of the order 1.5 m. The tide penetrates about 2-3km into the estuary. Saltwater intrudes into the estuary a distance of 1km during spring tide. The estuary is a bird foot type of delta characterized by heavy sediment deposition and transport, both along the coast and within the estuary (see Abuodha, 1998). The estuary is narrow, with width ranging 250-300m in the upper riverine region and 750-1000m in the lower region fronting the Indian Ocean. Its total length is 2.5 km

Important catchment areas are as follows:

- The area of the entire Athi-Sabaki-(Galana) basin is 38,063 km2.
- At the site of the Baricho well fields, the entire catchment area of the river is 34,490 km2. Following the symbology of National Water masterplan (JICA, 2013b) the Baricho wellfield lies on sub-basin 3HB of Athi Catchment Area (ACA) with an area of 2,317 km2
- At the confluence of Athi and Tsavo rivers, the total catchment area is 31,072 km2.
- The Athi River catchment at the Tsavo confluence is 24,802 km2
- The Tsavo River catchment at the confluence is 6,270 km2
- The Athi River catchment at Thwake Dam is 10,272 km2.

The Athi-Tsavo-Sabaki river system encompasses a variety of meteorological and hydrological regimes. In general, it is classified as a semi-arid land except in the upstream area of the Athi River which is classified as a humid land. The mean annual rainfall ranges between 600 mm in the central part of the area from the lower Athi, Tsavo and Sabaki to within about 50 km from the coast, up to 1,200 mm in the upstream area of the Athi River. The catchment area average mean annual rainfall comes to 810 mm (JICA, 2013b). The renewable water resources, which is defined by precipitation minus evapotranspiration is estimated at 4.5 BCM/year in 2010 for ACA and the per capita renewable water resources is calculated at 464 m3/year/capita. Major cities and towns of Kenya found in Athi River Basin are Nairobi (the capital city), Thika, Machakos, Kajiado and Malindi.

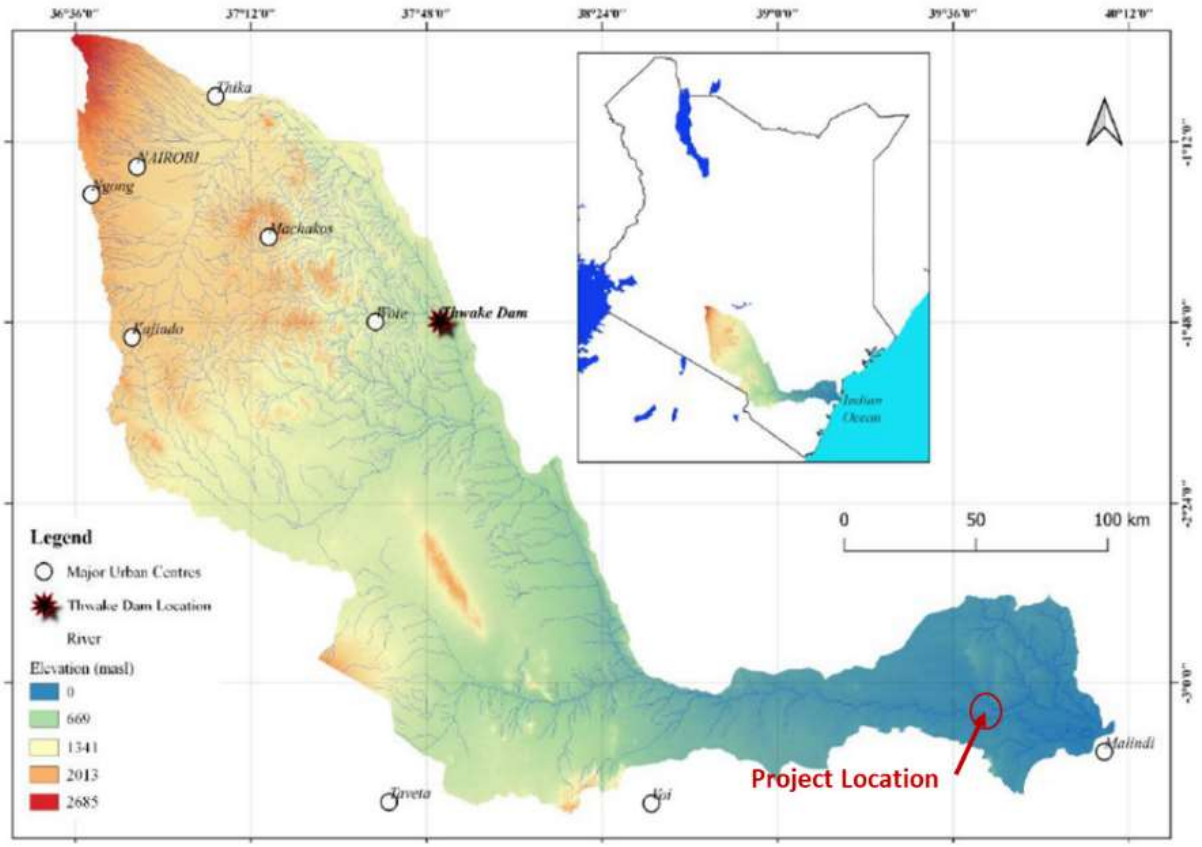


Figure 4-7*:* Athi-Galana/Sabaki river catchment and location of project (Source: Athi River Basin Modelling Report, 2020, Thwake Dam Project, Ministry of Water)

The main scope of the hydrology report was to provide input to the design study of the wellfield protection works, by determining the magnitude of the design floods. For this reason, a review of all the previous reports on the hydrology of the Sabaki river/or the Baricho well field was carried out. A flood frequency analysis is implemented considering all the available discharge data. Effects of climate change on future floods in combination with a thorough understanding of the past major floods of 1961, 1998, 2018 and also most recent floods of 2019-2020 are extensively discussed for the selection of design discharges for the works.

The Hydrology Study was executed through the following subtasks which are described in detail in the Hydrology Report:

- Review of previous hydrology studies
- Collection of hydrometric data, quality check, comparison of older and recent rating curves for a check on gauge stationarity. Compilation of a set of annual maxima of river discharges. Once years with significant data gaps were discharged this led to only 20 years of maxima between 1960 and 2020.
- Frequency analysis of the 20-year data-set.
- Modification of the frequency analysis with the addition of knowledge that the floods of 1960, 1998 and 2018 were the three largest events in the 60-year period 1960-2020 and assignment of probabilities with two alternative formulas; Weibull and Gringorten.
- Alternative estimation method by transferring the flood frequency analysis results at the upstream sub-basin of Thwake Dam to the Baricho wellfield basin.
- Alternative estimation method of applying the regression equations of the National Water Masterplan.

- Comparison of the different flood estimation methods and adoption of that of bullet (iv) with the Weibull probability assignment formula.
- Identification of the key meteorological drivers of large flood events in the Basin. These were identified primarily as the Indian Ocean Dipole (IOD), the Madden-Julian Oscillation (MJO) and, as a contributing driver, the effect of tropical cyclones at the coasts to the south and north of Kenya on air movement patterns. Of these three, the most important driver has been identified as the strongly positive phase of the IOD.
- Review of recent scientific literature on the predicted effects of Climate Change (Global Warming) on the key drivers of large flood events. Qualitatively, scientific opinion agrees overwhelmingly that Climate Change will lead to an increased frequency of the above key drivers acting so as to increase flood magnitudes. There is as yet a dearth of quantitative predictions, the exception being research work on the predicted increase in the frequency of occurrence of a strongly positive IOD under the assumption of 1.5 degrees Celsius global atmospheric warming by 2050.

In so far, the average discharge and the flow-duration characteristics of Sabaki River at the location of the Baricho Wellfield, these were estimated by frequency analysis of the local gauge (Gauge 3HA13) and are summarized in the following **Table 4-1** below:

Table 4-1: frequency analysis of the local gauge (Gauge 3HA13)

Frequency (Qxx refers to the discharge that is exceeded xx% of time)	**Discharge** (m^3/s)
Q Average	51.95
Q10	115.35
Q20	57.84
Q30	30.12
Q40	19.45
Q50	10.90
Q60	6.79
Q70	4.47
Q80	2.50
Q90	0.86

The flood discharge peaks for different return period were estimated on the basis of the historic record and for mid-century (circa 2050) under the scenario of 1.5 degrees Celsius global atmospheric warming. They are summarized in the following **Table 4-2. Below**. The 1.5 degree warming scenario covers IPCC RCPs (Representative Concentration Pathways) 4.5 and 6 which correspond to the assumptions of “slowly declining emissions” and “stabilizing but not declining emissions” for greenhouse gases. The more optimistic RCPs as per the international Paris Agreement are, of course, covered with an even greater margin.

Table 4-2: The flood discharge peaks for different return period

Return Period (years)	Peak Discharge from Frequency Curve Fitted to Available Data (m^3/s)	Peak Discharge from Frequency Curve Modified for Climate Change Impacts (m^3/s)
10	2,985	3,635
20	3,960	4,858
50	5,222	6,441
100	6,167	7,627
200	7,109	8,809
500	8,352	10,368
1000	9,291	11,547

Figure 4-8: Images of Sabaki River at Baricho Well Fields

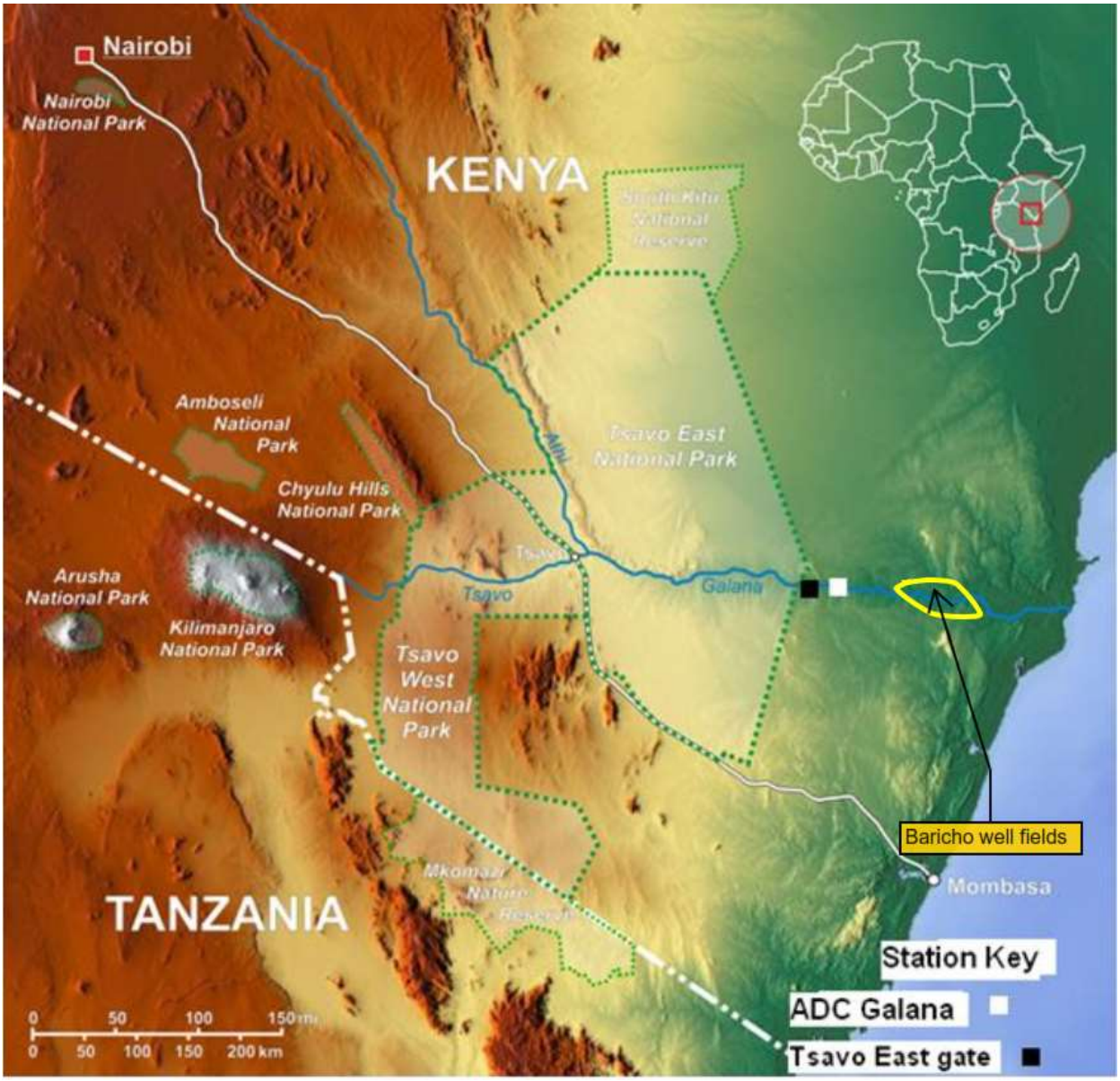


Figure 4-9: Location Map of Baricho Well Fields on Image

Technical Report on the pollution status of River Galana/Sabaki/Athi KMFRI-OH Natural Resource Management (NRM)-Management Report, May 2015 presents the rivers physiochemical parameters as summarized in **Table 4-3 and 4-4** below.

Table 4-3: Physicochemical parameters

Time	Location	Water pH	Water Temp	Sediment Temp	Air Temp
9:00 am	Galana	10.08	25.5	26.1	27.5
1:45 pm	Tsavo East	10.38	30.9	31.2	
4:30 pm	Galana	10.54	31.4	31.3	33.4

Source: KMFRI-OH Natural Resource Management (NRM)-Management Report, May 2015

Table 4-4: Dissolved oxygen and biological oxygen demand levels at Galana River

TIME	STATION	DISOLVED OXYGEN	DISOLVED OXYGEN AFTER FIVE DAYS (BOD5)	BIOLOGICAL OXYGEN DEMAND
1615hrs	Galana ADC	6.5	0.65	6.786
1615hrs	Galana ADC	7.2	0.4	7.888
9.00AM	Galana ADC	6.9	0.25	7.714
9.00AM	Galana ADC	7.35	0.25	8.236
1340hrs	Sala gate	7.95	0.02	9.1988
1340hrs	Sala gate / Tsavo East National Park	8.95	0.25	10.092

Source: KMFRI-OH Natural Resource Management (NRM)-Management Report, May 2015

4.6 Biological Environment

Flora

Vegetation and Flora -The Malindi Sub County falls within Kilifi County i.e. Three Agro - Ecological Zones (AEZ), which define areas that have similar characteristics such as annual mean temperatures, vegetation and humidity. These zones are as follows:

I. **Mangrove Swamps Zone:** covers only a small portion of Malindi area mainly on the sides of the Mida Creek in Watamu, this area is not within the project geographical scope. There are only a few species, which form dense forest. Mainly three different vegetation zones cover the hinterland of Malindi, namely Manilkara-Acacia Savannah, Tropical monsoon forest and the Acacia Euphorbia bush land.

II. **Lowland Ranching:** It varies in altitude of 90-300m with mean annual temperature of $27.^0$ C and annual precipitation of 350-700mm. Major activities within this zone include ranching and wildlife.

III. **Coconut-Cassava Zone:** This zone has the highest potential for crop production in the county spreading along the coastal uplands and low-level coastal plains. Major farming activities include tree cropping (mango, citrus, cashew nuts, and coconuts), vegetables (chilli, brinjals, okra etc.), food crops (maize, bananas, cowpeas, green grams etc.) and upland rice. Dairy farming also does well in this zone. It has an average precipitation of 1,300mm per annum and mean annual temperature of 24^{o}C. Baricho Well Fields are Located in this zone, notable vegetation at the site include; scattered coconut and casuarina trees

The **natural vegetation** of the area is varied and is dependent on both proximity to fresh and marine water as well as the soil that range from sand dunes to river bed sediments. On the sand dunes scrub vegetation exists consisting of 103 plant species of 43 families. Seasonal grasslands on the recent silt deposit form an expansive flat on the northern shores where invasive *Prosopis juliflora* thicket with scattered stands of Casuarinas has developed.

Figure 4-10: Vegetation Cover within Baricho Well Fields

Fauna

Human habitation and agricultural activities have significantly interfered with both terrestrial and aquatic habitats in along Sabaki River at the Baricho Well Fields Site. Further the well fields are not located within Sabaki Estuary that provides habitat for birds and fish species as discussed below. The well fields are located approximately 30km upstream from the estuary.

From, literature there is limited riverine fishery along river Sabaki which are caught by local fishermen using drift nets. Different species are reported to be present in the river including Bagamoyo goby, *Mkizi Mtonzi,* Shortfin eel (English), Mkunga (Pokomo), Redfin robber (English), Nkwakwa (Pokomo) as summarized in **Table 4.5** below (KEMFRI 2015). From secondary data, field observation and information from local community members, there are no specific / protected fish breeding sites along the river within Baricho Well Fields Section.

Table 4-5:Lower Sabaki River Fish Species[2]

Bagamoyo goby (English): Reported to occur in the lower reaches of the Athi-Galana-Sabaki river system (Ref. 30558). 	Redfin robber (English), Nkwakwa (Pokomo): Known from Tana River (Ref. 52331) and Athi-Galana-Sabaki River (Ref. 30558). Possibly also occuring in other eastward flowing rivers (Ref. 52331). Also Ref. 3971, 79840.  
Pointed head gudgeon (English) Reported to enter the lower reaches of the Athi-Galana-Sabaki river system (Ref. 30558) 	Milkfish (English) Known from the lower part of the Sabaki River (Ref. 52331). Also Ref. 3388, 12484. 
Grass carp (English): Introduced in 1969 from Japan into Kenya for aquaculture and weed control; uncertain if this species is established in the wild in Tana River and Athi River (Ref. 30558, Ref. 52331). Also Ref. 1739. 	Dusky sleeper (English), Vumbika (Digo), Brown gudgeon (English): Known from the coast of Kenya (Ref. 52331). It enters brackish and fresh water of eastward flowing rivers (Ref. 52331), including Tana River (Ref. 52331), lower reaches of Galana-Sabaki River (Ref. 30558, 52331) and Ramisi River (Ref. 52331 
Freshwater goby (English) Known from Tana River (Ref. 52331) and Athi-Galana-Sabaki River (Ref. 30558). Possibly also occuring in other eastward flowing rivers (Ref. 52331). Also Ref. 3971, 79840. 	Tana squeaker (English), Kikorokoro (Giryama), Ningo wa yuvu (Pokomo):Known from the Lower Athi/Galana-Sabaki River system (Ref. 30558, 52331, 78218, 82238, 96595) and from the Lower Tana River (Ref. 39831, 52331, 78218, 82238, 96595).

[2] www.fishbase.in/country/CountryChecklist.php?what=list&trpp=50&c_code=404&csub_code=&
Date and Time of retrieval?

There is no terrestrial wildlife observed specifically at the well fields except for limited rodents such as squirrels, moles and different bird and insect species. The community around the well fields keep Livestock including; cattle, goats, sheep, bees, poultry, rabbit and pigs.

However, for information, the Sabaki River as it approaches the estuary is one of the Important Bird Areas (IBAs) in Kenya (Bennun and Njoroge, 1999). It hosts large visiting stocks of the Madagascar Pranticole and is also an important nesting, roosting and feeding ground for gulls and terns. A total of 68 species have been recorded and a maximum count of 11,753 birds. Peak numbers appear to be in the northern spring, notably April. Counts of tern and gull roosts have also been carried out at peak times when birds were most abundant. High numbers of terns have been recorded in January/February with a night-time roost of Sundowners in the region of 80,000 birds, day time counts occasionally reach 25,000 birds.

The Collard Pratincole bird has a limited breeding distribution within Kenya and this is the only known breeding location for this species on the Kenyan coast. Numbers of palaeratic waders and broad billed sand pipers also occur. The globally threatened and range restricted Malindi Pipit is also resident in and around the dune grasses. Some of the species which have recorded sufficient numbers in Sabaki estuary include; pelicans, cormorants, herons, flamingoes, ducks, geese, waders, gulls, terns and kingfishers. **Table 4.6** below presents list of Threatened Birds that are listed under the Redlist by IUCN.

Table 4-6: Birds listed Under IUCN Red List within Sabaki River Estuary

Species	Current IUCN Red List Category
Madagascar Pratincole *Glareola ocularis*	VU
Sooty Gull *Larus hemprichii*	LC
Saunders's Tern *Sternula saundersi*	LC
Lesser Crested Tern *Thalasseus bengalensis*	LC

Source: IBA Assessment Criteria 2001*

4.7 Social Economic Setting

4.7.1 Land Ownership

Issues of land ownership cut across the whole of Coast region. Kilifi County is one of the Counties within the Coast region and Malindi is one of its Sub Counties.

Land tenure is a major development challenge in the County with more than 60 percent of the residents lacking title deeds. This has led to incidences of landlessness which in turn contributes to high poverty levels in the County.

It is estimated that 11.3 % of the households in the county are landless according to the data available in the County Lands offices. Many of these people are squatters on private land. In an

effort to address the situation, the Government has put in place several schemes, although the number of people settled in these schemes are below target. This has led to an emergence of informal and unorganized settlements in Malindi.

Land ownership around Baricho Well Fields is currently under the Weru Ranch Group, a local group owned and run by the farmers within the project area, with farmers owning their own parcels of land within the ranch. Over time however some of the members have sold their parcels to other individuals without transferring the title from the original Weru Ranch Group title to individual titles. However, the existing Baricho Well fields are established on public land registered under National Water Conservation and Pipeline Corporation. Further, additional land (2.82 acres) belonging to private landowners/farmers within the Weru ranch will be acquired by CWWDA through implementation of the ARAP prepared for the Project.

Two options of land acquisition process for the 2.82 acres required by the project were considered by CWWDA as presented in **Table 4.7** below. After negotiations with the landowners and Weru Group Ranch, option 2 was settled on and CWWDA has finalized the preparation of a tripartite legal agreement (between the individual PAPs, Weru Group Ranch and CWWDA) to be used as the basis of compensating PAPs in the absence of title deeds, prior to embarking on any works. The tripartite legal agreement that was prepared by CWWDA and reviewed by the Bank, mandates the affected landowners and Weru ranch to transfer the legal title of the affected parcels to CWWDA once the title deeds – currently being processed by the concerned land authority – are issued.

Table 4-7: Land Acquisition Step / Road Map

Acquisition Process	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
Option 1 Through National Lands Commission (NLC)	Publish intention to acquire gazette (6 PAPs)	Complete NLC inspection process (6 PAPs)	Publish inquiry gazette (6 PAPs)	Complete inquiry process	Prepare and issue compensation awards	Complete compensation payments	Undertake Vesting of the 7.01H to CWWDA Ministry of Lands
Option 2 Direct PAPs compensation by CWWDA	N/A	N/A	N/A	N/A	Prepare compensation Agreements	Complete compensation payments to the 6 PAPs	Undertake Vesting of the 2.82 acres to CWWDA Ministry of Lands

History on Baricho Well Fields Land Ownership

Baricho water supply system was developed with River Sabaki as the surface water source in 1975 by the then Ministry of Water Development who also operated it up to 1990 when National Water Conservation and Pipeline Corporation took over its management and development. However, the operation was very expensive and with discovery of good quality and sufficient ground water along the River Sabaki flood plain upstream and downstream of the Surface Water Intake, it was natural that the system was to be changed from surface water to ground water

supply system. Between 1990 and 1994, the upstream water wells fields (BH 1-3) were developed and replaced most of the surface water supply system. The downstream well field (BH 4-BH8) were developed between 1994 and 1998 and between 2016 and 2018, BH 9-BH11 were development. Currently Baricho Water supply is purely a ground water supply system.

In 1992 all the assets (Land and infrastructure) developed by Ministry of Water Development were transferred to National Water conservation and Pipeline Cooperation. With enactment of Water Act 2002, water supply infrastructure development was transferred to Water Services Boards based on the 7 drainage systems in Kenya. Coast Water Service Board took over the management and development of water works infrastructure in the Coast Region with Baricho water well field system being one of them. With the enactment of the Water Act 2016 the Water Services Boards were transformed to Water Works Development Agencies and Coast Water Service Boards transformed to Coast Water Works Development Agency.

An asset transfer plan was developed to have all the water sector assets formerly held by National Conservation Water and Pipeline Corporation transferred to the relevant Water Works Development Agencies. The Baricho Well field is among the assets in the Coast Region to be transferred to Coast Water Works Development Agency, whose process is presently ongoing.

4.7.2 Educational Facilities

From Kilifi County Integrated Development Plan (CIDP 2017), the enrolment rate for class (1) was at an average of 90% annually with a gender enrolment bias towards boys at 67% compared to girl's enrolment at 33%, this could be an indication that some families are still not keen on educating girls. On average the school population was at 300 to 400 pupils varying from school to school.

The Secondary and Primary Schools that were identified included Airport, Lango Baya Primary and Secondary School within Baricho well fields Lango Baya Sub Location.

Figure 4-11: School Infrastructure

4.7.3 Health Facilities

The main health facility is the Malindi General Hospital located in Malindi town. The area also has private health facilities, for example Danrose, Ganda, Catholic Mission, and Meridian which

are all privately owned. Malindi General Hospital located within Malindi Town records on average 50 to 100 in patients and out patients on a daily basis. Common ailment include water borne related diseases, snake bites, respiratory complications and maternity.

Figure 4-12: Health Infrastructure within Malindi Sub County

4.7.4 Bulk Water Supply System

The Existing Water Supply System for MAWASCO consists of the Bulk Water Supply System and local Storage and Distribution Networks as detailed in the following sub-sections;

At present, the Bulk Water Supply Source for MAWASCO Service Area is Baricho Wellfield. Besides Malindi and Watamu Towns (MAWASCO Service Area), the Wellfield supplies water to Mombasa and Kilifi Towns. The year 2016 capacity of the Baricho Wellfield and its potential production are 96,000 m^3/d and 180,000 m^3/d respectively.

MAWASCO supplies water from the well fields to Lango Baya residents as well as Lango Baya Primary and Secondary Schools. Details of the existing Water Supply System are summarized in **Figure 4-9** below.

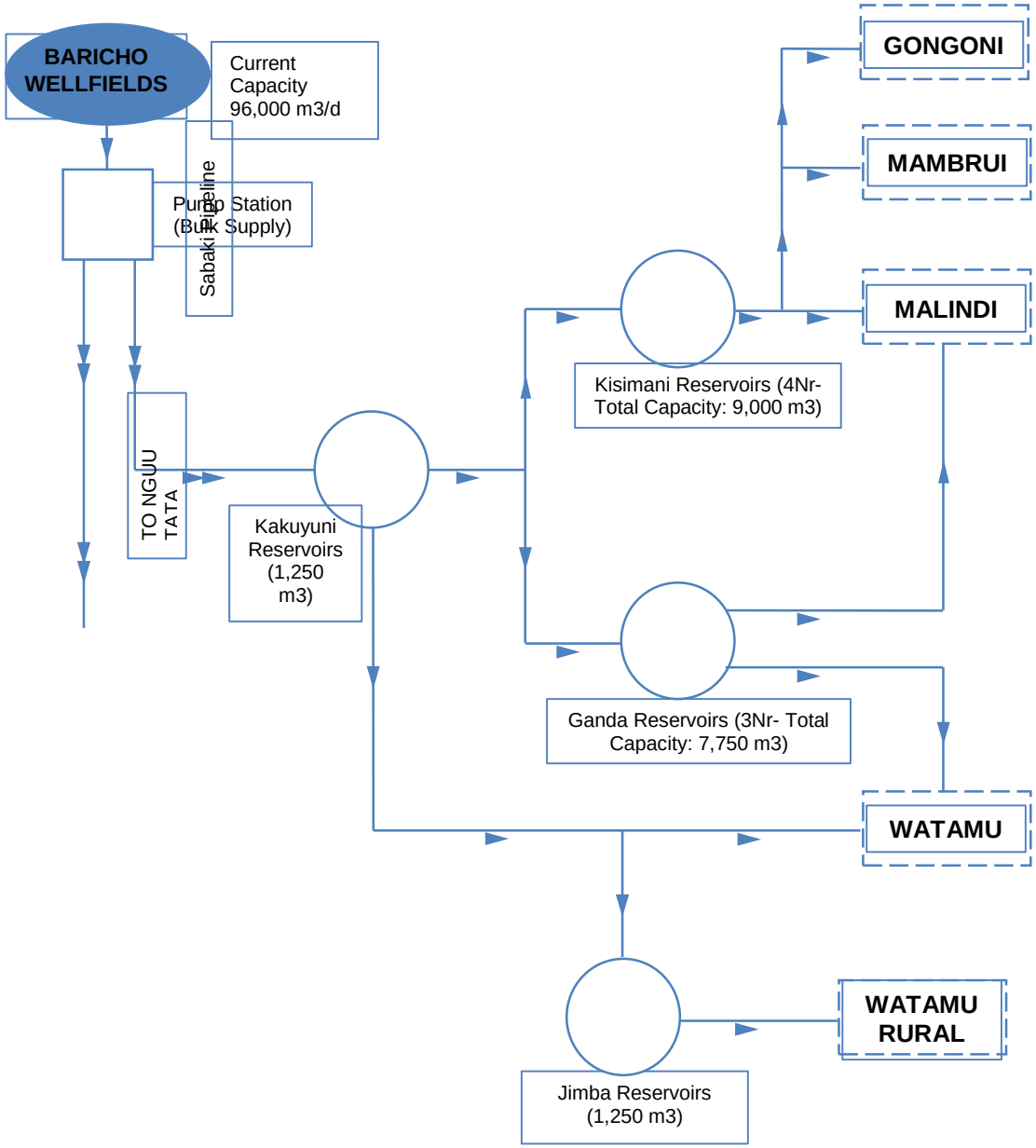


Figure 4-13: Existing Bulk **Water Supply in Malindi**

4.7.5 Existing Sanitation System

At present, Malindi Town and Malindi Sub County in general has no sewerage system. The use of on-plot sanitation systems such as pit latrines and septic tanks for disposal of effluent is prevalent. The major problem faced is the lack of a proper sludge management system such as a Sludge Handling Facility for the discharge of septage by the exhaust vacuum tankers. Thus, septage from septic tanks is discharged directly to the environment including unrestricted public utility sites such as near the solid waste disposal site at Mayungu.

In situations of suppressed water supply, such as in Malindi Town, the use of on-plot sanitation systems though unsustainable environmentally is manageable. If the water supply situation is improved through the development of additional water resources and expansion of water distribution networks, as planned for Malindi Town, the use of on-plot sanitation systems will not suffice and thus health and environmental hazards are bound to occur.

In summary, the current sanitation infrastructure in Malindi Town is insufficient to meet the sanitation needs of the growing population and there is need for the development of a sustainable water-borne sanitation system. At Lango Baya (Baricho Well Fields) residents depend on pit latrine for disposal of human waste.

4.8 Sensitive Receptors Likely to be impacted

The assessment identified several sensitive receptors located within close proximity of upto 5km around the well fields.

The receptors might suffer damage associated with the Project activities, for instance, if the receptor is a school the impact could be related to Health and Safety of pupils or if the receptor is a market associated impacts could be disruption of business and demolition of structure[3]. If the receptor is a communal water body, the associated impact could be pollution of the water resource. Likely impacts that the Project can pose to the receptors are summarized below.

- Health and Safety risks associated with accidents involving contractor's equipment and plant transporting material to site.
- Dust pollution triggered by movement of plant and equipment on dusty roads pose health risks (respiratory illness)
- Noise and excessive vibrations beyond 60 decibels during the day pose health risk (ear related illness)

Table 4-7 below presents the receptors identified in within 5km from the existing Baricho Wells fields.

Table 4-8: Sensitive Receptors in around the Well Fields

Type of Receptor	Number of Receptor	Name of Receptor
Schools	2	Lango Baya Primary School Lango Baya Secondary School
Markets	1	Lango Baya Market
Mosque	1	Lango Baya Mosque
Fish Resources	-	Fish resources within Sabaki river at Baricho well fields site

[3] This information is presented for illustration purpose only and does not imply that the indicated assets / livelihoods are impacted

Figure 4-14: Image of Lango Baya Market

4.9 Livelihood Sources for Community

The communities living in the Project area include the Giriama (the largest ethnic group in the area), the Watha, the Sanya and the Orma. The predominant livelihood for the male population of the Giriama is farming (mainly of maize and vegetables). Some of the more fortunate men in the community do manage to gain employment – either formally, such as in the surrounding tourist camps and hotels, or through informal or casual jobs. The Watha are originally a hunting (poaching) and gathering community but have presently turned to farming as their main livelihood. The Orma community are mainly Pastoralists. All communities living in the area rely primarily on the Galana River as their source of water, for both domestic, farming and livestock needs

4.10 Gender Based Violence (Situational Analysis)[4]

In Kenya, it is estimated that almost half (45 percent) of women aged 15-49 have experienced either physical or sexual violence. The National Crime Research Centre data on SGBV provides a situational analysis of instances of SGBV in Kenya. The Centre has so far supported over 21,341 survivors of SGBV, of whom 56% were women, 36% girls, 3% men and 5% boys. A study conducted by Dimovitz, Kirsten (2015) on GBV management in Nairobi revealed that male victims of SGBV were a smaller compared to women which ratio stood at 14:86.

The study further revealed that medical facilities are not accessible to victims and in most instances are at least 40-90 minutes from near bus stations. Police were also indicated to be a puzzle in the long line of bureaucratic processes and which is compounded by outside of legal services which have their own barriers in seeking services and help. These factors are said to create high attrition rates in access to justice, because survivors do not have the time, resources, or willpower to navigate the system

[4] Statistics provided in this sub section was borrowed from the Policy of Sexual and Gender Based Violence of 2017

At the Coastal Kenya in 2019, the Gender-Based Violence and Recovery Centre (GBVRC) at Coast Provincial General Hospital, Mombasa, Kenya has development an integrated care model for survivors of sexual violence. Statistics from the Center indicate that since 2007, the GBVRC has attended to 6,575 individual Sexual Violence survivors. Most survivors were female (5,837 or 88%), and over half were below 16 years of age (3,670 or 56%). Male survivors were often younger median age, 9 years, interquartile range (IQR), 6–13 years, compared with a median age of 14 years for females, with an IQR of 9–17 years.

Further, an organization known as *'Sauti ya Mwanamke'* have been on the forefront in addressing SGBV within the Coastal region. With support from the Peace Initiative Kenya, the group has engaged with coastal region counties resulting into passing of a policy to establish a GBV kitty to support victims and survivors of GBV. Essentially therefore, Counties are seen as a great actor in aiding the fight against SGBV. Despite the existing data on SGBV in Kenya, reporting has been a challenge due to underlying infrastructural impediments and lack of one national SGBV monitoring and evaluation framework that can consistently collate and present data on SGBV for analysis.

The assessment has provided under sub section **7.6.3, 7.6.4 and 7.6.5** Gender Based violence and Sexual Harassment, Children Protection and Sexual Exploitation and Abuse (SEA)

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 of relevant policy provisions and legal statutes that were analyzed.

Table 5-1: Policy Framework Relevant to the Project

No	Policy	Applicability
1	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 IV. 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.
2	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.
3	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. Protection of Baricho well fields is an initiative towards Water Resources conservation.
4	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. Protection of Baricho well fields is an initiative towards Water Resources conservation.
5	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 protection of Baricho Well fields from Sedimentation and erosion.
6	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).
7	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. Under protection of Baricho well fields Project 12 PAPs will be affected and part of their land will acquired for the Project.
8	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.
9	Big 4 Agenda	President Uhuru Kenyatta's development blueprint, The Big 4 Agenda, comprises of Food Security; Affordable Housing; Manufacturing and Affordable Healthcare. Water system as an enabler for this and driver of economic growth.
10	Kenya National Youth Policy 2006	This Policy aims at ensuring that the youth play their role alongside adults in the development of the Country. The National Youth Policy visualizes a society where youth have an equal opportunity as other citizens to realize their fullest potential. Proposed wells protection Project will provide direct employment to the youth as required by the Policy.
11	National Gender	The goal of the policy is to "achieve gender equality and women's

	and Development Policy, 2019	empowerment in national development so as to enhance participation of women and men, boys and girls, vulnerable and marginalized groups for the attainment of sustainable development". The policy sets, legislative and administrative measures to address the existing gaps in the realization of gender equality and women's empowerment. This Policy aims at achieving equality of opportunity and outcomes with respect to access to and control of national and county resources and services; and equality of treatment that meets the specific and distinct needs of different categories of women and men. The policy will be important at the time of recruiting workers at the time of Project implementation.
12	National policy for prevention and response to gender-based violence, 2014	The overall Goal of this National Policy is to accelerate efforts towards the elimination of all forms of GBV in Kenya. The Policy Goal is to be realized as laid out in the key objectives which seek to ensure; a coordinated approach in addressing GBV and effective programming; enhanced enforcement of laws and policies towards GBV prevention and response; increase in access to quality and comprehensive support services across sectors; and improved sustainability of GBV prevention and response interventions. Provisions of this policy will be adhered to during project implementation phase

5.2 Legal Framework

Applicable Acts of Parliament as summarized in **Table 5-2** below were reviewed

Table 5-2: Legal Framework Relevant to the Project

Policy	Applicability
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 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. Protection of Baricho Well Fields will ensure this goal is achieved through protection of the well fields from sedimentation and erosion ultimately guaranteed sustained safeguard of Baricho Aquifers. 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.
EMCA 1999 Cap 387	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 and its subsidiary legislations are enforced by the National Environment Management Authority (NEMA)
The Environmental (Impact	The regulation provides a framework under which Environment Impact Assessment for the works is prepared, Regulation 4(1) further states that: (a)"…no Proponent shall implement a project: likely to have a negative

Assessment and Audit) Regulations, 2003	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…''
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". As part of baseline water quality assurance at EIA stage, surface water quality of Sabaki river has been included in the baseline table 3.1 and 3.2, the table presents physiochemical characteristic of the river including BoD and CoD that are necessary for monitoring of the rivers water quality during project implementation phase.
(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 (CWWDA) 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 provide for a maximum of 60 dBA during the day and 35 dBA during the night for a construction site.
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}), equipments will be operated as provided by manufacturers specification to eliminate cases of Oxides (SOx), Nitrogen Oxides (NOx)) and Volatile Organic Compounds (VOC).
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. 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 for the identified 8 PAP in Baricho.
Environment and Land Court Act, 2011	Article 162 of the constitution provides for the creation of specialized courts to handle all matters on land and the environment. Such a court will have the status and powers of a High Court in every respect. Article 159 on the principles of judicial authority, indicates that courts will endeavour to encourage application of alternative dispute resolution mechanisms, including traditional ones, so long as they are consistent with the constitution. Section 20, of the Environment and Land Court Act, 2011 empowers the Environment and Land Court, on its own motion, or on application of the parties to a dispute, to direct the application of alternative dispute resolution (ADR), including traditional dispute resolution mechanisms.
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).
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. 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. PART VIII of the Act provided for Citizen Participation principles which include timely access to information, data, documents, and other information relevant or related to policy formulation and implementation among others.
Physical and Land Use Development Plan Act 2019	Part IV of the Act provides objectives of development control which are to ensure orderly physical and land use development, to ensure the proper execution and implementation of approved physical and land use development plan and to protect and conserve the environment

	Further section 56 provides that Subject to the provisions of this Act, the Urban Areas and Cities Act, 2011, and the County Governments Act, 2012, the county governments shall have the power within their areas of jurisdiction to consider and approve all development applications and grant all development permissions among other roles. As guided by this Act CWWDA will seek requisite approvals from the County Director of Physical Planning prior to commencement of the works discussed in this report.
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. OSHA is enforced by the directorate of occupational safety and health services (DOSHS).the project contractor will be expected to register the site as a work place with DOSHS and also engaged the directorate in handling work related accidents.
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.
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 as well as other measures such as provision of condoms among others.
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). In an effort to comply to provisions of this Act, the contractor will integrate 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 SEA focal points in the project and trained community liaison officers among other measures.
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 Project will be required to comply to provisions of the Act during Project implementation. The contractor will undertake below listed measures among others; ● The contractor will develop and implement a Children Protection Strategy that will ensures minors are protected against negative impacts associated by the Project including SEA. ● All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behaviour
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 National gender and equality commission (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 especially during hiring of workers, the aim will be to ensure adequate representation of women in the Project.
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 have been provided in this report as an **Appendix 2. The provisions of the Act are mainly enforced by the National Museums of Kenya (NMK)**
Energy Act 2019	PART VIII provided for energy efficiency and Conservation of energy resources, the Act provides that factories and buildings and energy appliances by types, quantities of energy use, or methods of energy utilization for purposes of energy efficiency and conservation, as provided by the act safe handling of petroleum used by plant and equipment on site will be emphasized. Requirements for dealing in energy handling including safety are enforced by the Energy and Petroleum Regulatory authority (EPRA). EPRA will be instrumental in licensing the bulk storage of petroleum on site where necessary.
Traffic Act 2015	PART V of the Act provides driving and other offences relating to the use of vehicles on roads. The act provides explicit measures related to; Speed of motor vehicles, Penalties in relation to speed, driving under influence of drink, Driving on pavement, pedestrian walkway, Causing death by driving or obstruction, Reckless driving, Signals and signs to be obeyed, Condition of vehicles, Limitation of loads. This Act will be cited in relation to operation of plant and equipment on site. This act is enforced by the Traffic Police Department and the National Transport and Safety Authority (NTSA)

5.3 World Bank Policy Provisions

Applicable World Bank Operational Safeguard Polices are listed in **Table 5-3** below

Table 5-3: World Bank Safeguards

Safeguards Policies	Provision	Relevance to the Project
World Bank OP 4.01 on Environmental Assessment	Provides framework for WB environmental safeguard policies and describes project screening and categorization to determine level of environmental assessment required. For category A and B projects the policy requires public consultation and disclosure to be undertaken as part of the EA process. If indigenous people are found to be affected, in addition to consultation, it is necessary to prepare a plan to avoid or mitigate adverse impacts on such groups and ensure that they have access to project benefits to the extent that they wish to.	An Environmental and Social Impact Assessment of Proposed Project Components will be required
World Bank OP 4.12 on Involuntary Resettlement	The World Bank Involuntary Resettlement Policy OP 4.12 covers direct economic and social impacts that result from Bank-assisted investment projects.	Resettlement Action Plan (RAP) will be prepared for Project components that require land or / causes displacement of populations. 12 PAPs have been identified
World Bank OP 4.11 on Physical Cultural Resources	Provides for measures to protect cultural heritage from the adverse impacts of project activities and support its preservation;	Requires assessment for any physical cultural resources or requires preparation of chance find procedures be prepared during implementations of Projects. Chance find Procedures provided as **Appendix 2** to this report

5.4 Institutional Responsibility

Implementation responsibility of mitigation measures highlighted in the Environmental and Social Management and Monitoring Plan (ESMMP) is multi agency and require intervention of various government institutions and World Bank as listed below.

Table 5-4: Institutional Roles and Responsibilities

Institution	Responsibility
World Bank	The World Bank Group will provide financial support / finance the Project and provide technical support including support in safeguards compliance. The world bank will also share experiences in innovative knowledge and solutions to the challenges that might be faced by the Project.
Ministry of Water and Sanitation	The ministry is responsible for and contributes to national development by promoting and supporting integrated water resource management to enhance water availability and accessibility. The ministry will be responsibility in offering guidance in policy direction with regards to the proposed Baricho Well Fields Protection Project
Coast Water Works Development Agency (CWWDA)	CWWDA is an agency formed under Water Act 2016 to undertake Water and Sanitation infrastructure development in the coastal region of Kenya. CWWDA has engaged services of technical personnel who are mandated to provide technical assistance to the Project. They include; Civil Engineers, Surveyors, Sociologists, environmentalists and communication experts among others. The safeguards consultants provide oversight of the implementation of the ESMMP and overall ESHS performance.\ **Operation of Baricho Well Fields** Under the water sector reforms which were brought about by the enactment of the Water Act 2002 the then water service provide/operator of major water supplies in Kenya among them the Baricho Water Works was National Water Conservation and Pipeline Corporation which was transformed into the National Water Harvesting Authority and the Water Services Boards were established among them Coast Water Services Board to operate and manage the water supply systems. An Asset Transfer Plan was developed to have the water assets transferred to the relevant water services boards which were the water sector asset holders as per the Water Act 2002. The Baricho wellfield was being operated by the NWC&PC and was the Asset holder. The implementation of the Asset Transfer Plan will thus transfer these assets which were under the NWC&PC in the Coast Region to the Coast Water Services Board. Under the Water Act 2016 it was transformed to Coast Water Works Development Agencies.
Water Resources Authority	State corporation established under Section 11 of the Water Act, 2016. it is mandated through delegated Authority on behalf of the National government to safeguard the right to clean water by ensuring that there is proper regulation of the management and use of water resources, in order to ensure sufficient water for everyone- now and in the future. The authority is mandated among other roles to formulate and enforce standards, procedures and regulations for the management and use of water resources and flood mitigation. Also, the authority regulates the management and use of water resources. The Authority will regulate all works related to protection works by the virtue of the fact that the works will be done within river riparian.
National Environment Management Authority NEMA	The National Environment Management Authority (NEMA), is established under the Environmental Management and Co-ordination Act No. 8 of 1999 (EMCA) as the principal instrument of Government for the implementation of all policies relating to environment. EMCA 1999 was enacted against a backdrop of 78 sectoral laws dealing with various components of the environment, the deteriorating state of Kenya's environment, as well as increasing social and economic inequalities, the combined effect of which negatively impacted on the environment. The responsibility of NEMA is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government of Kenya in the implementation of all policies relating to the environment. Specific NEMA roles are listed

	below. • Reviewing and provide approval or issuance of improvement comments on the project ESIA report. • Issue ESIA license and the associated conditions • Routinely monitor the ESMP, ESIA license conditions compliance and issuance of compliance note or stoppage or improvement orders to the project. NEMA will coordinate, supervise and manage all matters relating to the environment including approval of the EIA report prepared for The Project
Department of Occupational Health and safety (DOSH)	Directorate of Occupational Safety & Health Services (DOSHS) is an Institution established under OSHA Act 2007 with a mandate of ensuring compliance with the provisions of the Occupational safety and health Act 2007 and promote safety and health of workers. OSHA is enforced by the directorate of occupational safety and health services (DOSHS).the project contractor will be expected to register the site as a work place with DOSHS and also engaged the directorate in handling work related accidents
Malindi Water and Sanitation Company (MAWASCO)	MAWASCO is a registered private limited liability company wholly owned by the County Government of Kilifi as the majority shareholder, with mandate of providing water and sanitation services in Malindi Sub-County and its environs on self-sustaining basis. MAWASCO receives water from Baricho well fields and distributes to consumers in Marereni, Gogoni, Mamburui, Malindi, Gede and Watamu Towns.
Kenya Marine and Fisheries Research Institute (KMFRI)	Kenya Marine and Fisheries Research Institute (KMFRI) is a State Corporation established in 1979 by the Science and Technology Act, Cap 250 of the Laws of Kenya, which has since been repealed by the Science, Technology and Innovation Act No. 28 of 2013 which has recognized KMFRI as a national research institution under section 56, fourth schedule. KMFRI's mandate is to undertake research in "marine and freshwater fisheries, aquaculture, environmental and ecological studies, and marine research including chemical and physical oceanography", in order to provide scientific data and information for sustainable exploitation, management and conservation of Kenya's fisheries and other aquatic resources, and contribute to National strategies of food security, poverty alleviation, clean environment and creation of employment as provided for under Vision 2030 KMFRI will be responsible for conducting any research required with regards to fish species with river Sabaki as part of ecological assessments.
Kilifi County Government	Devolution under Kenya's new 2010 Constitution has wide-ranging implications for the water sector. The Constitution recognizes that access to safe and sufficient water is a basic human right. It also assigns responsibility for water supply and sanitation provision to 47 newly established counties. Therefore, through the Water Services Providers which are now wholly owned by the County Government in this case MAWASCO. The County Governments will be responsible for operation and maintenance of the water supply infrastructure within their area of jurisdiction.

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

Kenya's Environmental Impact Assessment / Audit Regulations of 2003 require that in the process of Environmental Impact Assessment (EIA) the proponent shall in consultation with the National Environment Management Authority (NEMA); seek the views of persons who may be affected by the Project. The stakeholders considered for Consultation were the local community (Lango Baya Village), Water Resources Authority, and Kenya Rural Roads Authority

6.3 Consultations with Water Resources Authority (WRA)

The Water Resource Authority were the first to be consulted to provide the River gauging stations' locations and their flow records over the time a long river Sabaki, Galana and Athi river. They were also informed of the CWWDA intention to protect the wells along the river line and the river embankment itself.

They were supportive to the project by providing all the necessary data required however, they demanded that CWWDA acquire a construction permit to work along the river by providing the design report and drawings which should meet their requirements.

6.4 Consultations with the Kenya Rural Roads Authority

The project team consulted Kenya rural roads Authority head office who referred them to the Consulting Engineers supervising construction of the road and the Bridge Project, the following issues were discussed:

The work program to ensure that there shall be no conflict particularly at the upstream wellfield where the road over River Bridge is located,
The level of the road and the bridge beams to ensure that the wells protection works shall not interfere with the Road structures,
The direction and location of the piles onto which the bridge foundations are carried on.

The consulting Engineer provided all the necessary drawings to allow design of the upstream wellfield protection work and they informed the consultant that they had provided a new pipeline to replace the one that was buried by the road embankment.

6.5 Consultations with Local Community (Lango Baya Residents)

The stakeholder consultation was done on **30th March 2021** at Lango Baya Chiefs Offices grounds.

Table 6-1 below presents summary of issues that were discussed during the meeting

Table 6-1: Stakeholder Concerns

Suggestion / Question	Response
Mrs. Mwanakombo wanted to know what will happen in a scenario where the affected land has tenants farming on it will they be compensated for their crops.	The meeting was informed that compensation is normally done for land, crop, trees and structures. If tenants are farming on the affected parcel of land they will be compensated separately from the land owner, compensation for the tenant will include; net monthly income from land rent or income from sell of crops / trees (Multiplied by/ for 3 Months). Further, the farmers were informed that they will be given sufficient time to harvest their crops before works commence within their farms.
Mr. Franklin wanted to know if the contractor will source for workforce within the community where the works will be implemented.	Residents were informed that all unskilled labour and any available semi-skilled and skilled labour will be sourced from the local community. In addition, youths who will be interested to secure supply of construction contracts, organizing themselves into registered groups provide them with capacity in terms of manpower and capital that would enable them successfully deliver such assignments. Therefore, youth present in the meeting were encouraged to organize themselves into groups and avail themselves for consideration.
Samson Siri wanted to know what will happen to people who were pumping water from the river to irrigate their farms. He wanted clarification if the pipes will be damage or blocked by the proposed project.	Residents were informed that Project will not destroy sources of livelihood of the community. Therefore, those doing farming using pumped water from the river will be assigned designated corridors where they will lay their pipes and continue farming, The cost of re-laying such pipes will, is always as a common practice included in the contract under an Preliminary and

	General Item on relocation of services, Therefore, no farmer will incur such cost. The cost will include; provision for replacement / purchase of pipes, cost of labor for replacement of the pipes and cost for incidentals under the same item that will include compensation for lost income to farmers during replacement of such pipes. . .
Mr. Mwalimu Siri wanted to know if there will be any Cooperate Social Responsibility (CSR) that will be implemented under the project	Residents were informed that they were the ones to suggest what they would like to be done for them as part of CSR. It was agreed that they can suggest three projects so that the client can take the issue up and implement the most feasible one if possible. However, the community members were informed that the project cannot be held to account for it as it is the implementing agency's prerogative to implement CSR activities as per their customer charter.
Mr. Gilbert Mwaringa wanted to know how compensation for land will be done and yet most of the residents did not have title deeds.	Residents were informed that before payments are done there will be consultations that will include the chief's office to identify the rightful owner of the property. Further, they were informed that an Abbreviated Resettlement Action Plan (RAP) will be prepared for the 12 PAPs who have been preliminary identified as the ones whose land will be acquired.
Mrs. Rehema Said wanted to know how disputes related to resettlement will be avoided.	Residents were informed that the consultant will form a Grievance Redress Committee (GRC) comprising of a Project Affected Person (PAP), youth, women, Vulnerable groups and People living with disability representatives that will work with the local administration to ensure real time resolution of emerging issues during the entire period of project implementation. The committee will include 2 Elders, 1 youth 1 woman and Local Leader rep including Vulnerable PAP rep. the members will be elected by the PAPs and trained by the project on grievance resolution mechanism.

CHAPTER 7: ASSESSMENT OF ENVIRONMENT AND SOCIAL IMPACTS

7.1 Introduction

This chapter presents the assessment of potential environmental (physical, biological), community health and safety and social impacts associated with protection of Baricho Wells Fields Works. The chapter is organized by resources and receptors baseline information, potential impact, Impact basement, mitigation measure and assessment of residual impact following implementation of mitigation measures. Based on the impact assessment, mitigation for both construction and operation phases are specified with the goal to either *avoid the impact*, *abate the impact at the source, minimize the impact at receptor and, if necessary to offset the impact through compensation* or other means.

Regarding the physical resources or receptors, the impacts are assessed in four areas: soils, water resources, air quality, and noise and vibration. For biological resources and receptors, impacts are assessed for flora and fauna. The social impacts are assessed for three areas: community health and safety, worker health and safety and land and livelihoods.

7.2 Screening and Scoping Assessment

The screening and scoping assessment for the proposed Baricho Well Fields Protection Works was undertaken on site on **29th and 30th March 2021**. Potential impacts of the Project have been identified through a process whereby the features and activities (both planned and unplanned) associated with the pre-construction, construction and operation of the Project have been considered with respect to their potential impact on resources/receptors. Potential impacts have been classified in one of three categories:

- No interaction: where the Project is unlikely to interact with the resource/receptor;
- Interaction likely, but not likely to be significant: where there is likely to be an interaction, but the resultant impact is unlikely to change baseline conditions in an appreciable/detectable way; and
- Significant interaction: where there is likely to be an interaction, and the resultant impact has a reasonable potential to cause a significant effect on the resource/receptor.

As a tool for conducting scoping, the various project features and activities that could reasonably act as a source of impact were identified, and these have been listed on the vertical axis of a Potential Interactions Matrix. The resources/receptors relevant to the Baseline environment have been listed across the horizontal axis of the matrix.

Each resulting cell on the Potential Interactions Matrix thus represents a potential interaction between a Project feature/activity and a resource/ receptor. The completed Potential Interactions Matrix is presented in **Table 7-1** with the following noted:

- The interactions that are coloured white have been ‘scoped out’ for further consideration in the impact assessment process.

The interactions that are coloured grey have also been 'scoped out', and the justification for scoping out these interactions (e.g. past experience, documented data) has been included in the present Environmental and Social Impact Assessment Report.

- The interactions that are shaded black have been retained for further consideration in the impact assessment process.

Table 7-1: Potential Interactions Matrix at Screening and Scoping

Project Activities / Hazards	**Environment / Social/ Economic Resources / Receptors**									
	Loss of Biodiversity (Fauna and Flora)	Air Quality and emission of hydrocarbons	Water quality and Resource (Surface and Ground)	Land and Soil Contamination	Soil erosion and sedimentation of river Sabaki	Wastes from Project Activities	Noise and Excessive vibrations	Land Acquisition and livelihoods Impacts	Community health and Safety	Occupational Health and safety
Construction Stage[5]										
Right of Way clearance and Setting Out	Minor	N/A	N/A	N/A	N/A	N/A	N/A	Moderate	Minor	Minor
Excavation works and backfilling	Minor	Minor	Minor	N/A	Minor	Minor	Minor	N/A	Moderate	Moderate
Equipment / material / workers transport	Minor	Minor	Minor	N/A	Minor	Minor	Minor	N/A	Moderate	Moderate
Accidental events / spills	N/A	N/A	Minor	Minor	N/A	Minor	N/A	N/A	Moderate	Moderate
Waste storage / disposal	N/A	N/A	Minor	Minor	N/A	Minor	N/A	N/A	Moderate	Moderate
Impacts related to Gender Based violence (GBV) and Sexual Harassment	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Moderate	Moderate

[5]color codes illustrate the nature of impact with green showing minor impact to Red showing high Impact

(SH), Child Protection, Sexual Exploitation and Abuse (SEA)										
Health Impact- spread of COVID19 among construction workers and Social risk - Spread of COVID-19 amongst community members during consultations	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Moderate	Moderate
Social risk - Spread of COVID-19 amongst community members during consultations										
Operation stage										
Operation and maintenance (siltation Control)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Minor	Minor

7.3 Impact on Physical Resources and Receptors

7.3.1 Water Resources

Potential Impacts

Project activities will interact with water resources within Baricho Well Fields in the following ways.

- There will be direct interaction during clearing and construction near to or in surface water resources. There will be indirect interaction in the case of erosion of soils into water resources.
- Site activities such as excavations during site levelling could result to loosening of soils that could result to sedimentation and siltation of storm water drainage channels and eventually flowing into Sabaki River.
- There will be direct interaction from the abstraction of water from Sabaki River for construction (e.g., for dust control).
- Un-serviced plant and equipment on site could result to oils and fuels leaks that could contaminate Sabaki river rising the BoD and adversely affecting aquatic organism in the rivers/ streams from the baseline presented in Table 3.2 (chapter 3)

Baseline Conditions

The Project area site is located within the banks of River Sabaki, the river has its origin as Athi River in the central highlands around Nairobi. When joined by Tsavo river in its lower basin the river is known as Galana. The river is known as Sabaki when it drains into the Indian Ocean, a few kilometres north of Malindi Town. The entire Athi – Galana - Sabaki system extends for 390km and drains a catchment area of 70,000 km^2. The location of Baricho Well Fields is located approximately 30km from Sabaki Estuary as it drains into the Indian Ocean.

The volume of soil likely to be disturbed by proposed well field's protection works is likely to be **minor** and therefore the extent of the impacts from sediment addition to Sabaki River as a result of the works is considered to be **local** at site within the well fields and **short term** only active during site physical works.

The small magnitude of this impact on surface water quality flowing in Sabaki River and the low sensitivity of the rivers to increased turbidity means the significance of this impact is assessed as **mino**r. Pre- Mitigation Impact Assessment is presented in **Table 7-2** on **Page 52**

Table 7-2: Pre-Mitigation Impact Assessment

Impact	**Siltation and pollution of Surface Waters Resources**				
Nature of Impact	Negative		Positive		Neutral
	Eroded soil and leaked oils and fuels entering surface water bodies (*River Sabaki*				
Type of Impact	Direct		Indirect		Induced
	Impact is a result as a direct interaction between Project activities and the environment along the footprint of the well fields				
Duration of Impact	Temporary	Short term	Long term		Permanent
	The impact is expected to be short term, however in the case of serious erosion the impacts of siltation of surface water may be experienced long term (into the operational phase).				
Impact Extent	Local		Regional		International
	The impact will be limited to the footprint of the well fields and immediate surrounds. The dilution of sediments in the river will render this impact negligible at the regional scale				
Impact scale	The impact is considered as small (local) scale. Limited at Well fields Environs				
Frequency	Continuous				
Likelihood	Possible				
Impact magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered small.				
Resource / receptor sensitivity	Low		Medium		High
	The sensitivity of the river along the proposed areas for well fields protection works to Siltation and pollution is considered to be medium to low.				
Impact significance	Negligible	Minor	Moderate		Major
	Considering the impact magnitude is small and the sensitivity is medium to low, the overall significance is considered to be minor				

Operation Phase

No impact anticipated

Mitigation

The following mitigation measures will be implemented to minimize the potential for siltation and sedimentation of Sabaki River by soils eroded from construction sites. The measures will also apply for pollution control from hydro-carbons from plant and equipment.

- 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 into river Sabaki.
- 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.*

Residual Impact

The implementation of the proposed mitigation measures reduces the significance of the residual impact to negligible from minor within Sabaki River. **Table 7-3** below presents residual

impact significance following mitigation measures

Table 7-3: Residual Impact Significance

Impact	Project Phase	Significance (Pre-mitigation)	Residual Impact Significance (Post-mitigation)
Availability and Quality of Water Resources *(Sabaki River)*	Construction	Minor	Negligible

7.3.2 Soil Resources

Potential Impacts

Project activities will have direct physical impacts to soil within well fields, possible direct physical impacts to soil include erosion resulting from activities such as excavation and leveling works, clearing of vegetation for infrastructure such as access roads, laydown areas and construction zones among others.

The excavation of soil for the construction of protection works will disrupt the soil cohesion and also may result in surplus soil due to the installation of the gabions within the same excavated areas. If not properly restored or managed, such soils may erode and wash into nearby Sabaki River thereby increasing the sediment load. Temporary soil stockpiles established during construction of infrastructure will be at risk of erosion from wind and rainfall.

Soil contamination as a result of possible oil and fuel leaks from un-serviced plant and equipment on site.

Baseline Conditions

Sabaki River (precise location of Baricho Well Fields) is characterized by poor soils, shallow depressions and a gently undulating terrain characterized by sandy, sandy loam soils with very high infiltration rates. In some areas, the soils are dry with drainage and salinity. In some places, the soils are covered with thick top soils, which are loamy sand to sandy loam.

Impact Assessment

The risk of erosion is likely to occur but the extent of the impact is likely to be limited to the footprint of the activities, particularly the construction and use of access roads, laydown areas (i.e. **local** extent).

The impacts of construction activities on soil erosion are anticipated to last for the duration of the construction phase only (i.e**. short term**). Given the subtropical location (Agro Ecological IV) areas cleared areas will revegetate naturally and relatively quickly (assuming rainfall patterns similar to the current averages persist), minimizing the risk of erosion. **Table 7-4** below presents Pre- mitigation Impact Assessment.

Table 7-4: Mitigation Impact Assessment

Impact	**Soil Erosion during Construction**				
Nature of Impact	Negative	Positive	Neutral		
	Loss of soil cohesion contributing to erosion.				
Type of Impact	Direct	Indirect	Induced		
	Impact is a result as a direct interaction between project activities and the environment along the footprint of the project.				
Duration of Impact	Temporary	Short term	Long term	Permanent	
	The impact is expected to be short term, however in the case of serious erosion the impacts may be experienced long term.				
Impact Extend	Local	Regional	International		
	The impact will be limited to the footprint of the project and immediate surrounds.				
Impact scale	The impact is considered as small (local) scale.				
Frequency	Continuous				
Likelihood	Possible				
Impact magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered small.				
Resource / receptor sensitivity	Low	Medium	High		
	The sensitivity Sabaki River to erosion is considered to be medium to low.				
Impact significance	Negligible	Minor	Moderate	Major	
	Considering the impact magnitude is small and the sensitivity is medium to low, the overall significance is considered to be minor				

Operation Stage

No significant soil erosion is anticipated.

Mitigation

The following mitigation measures will be implemented to minimize the potential for soil erosion:

- Vegetation clearing and topsoil disturbance will be confined and minimised.
- Contour temporary and permanent access roads / laydown areas so as to minimise 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 minimised 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.

Residual Impact

The implementation of the proposed mitigation measures reduces the significance of the residual impact to negligible from minor within the well fields. **Table 7-5** below presents residual impact significance following mitigation measures

Table 7-5: Residual Impact Significance

Impact	Project Phase	Significance (Pre-mitigation)	Residual Impact Significance (Post-mitigation)
Loss of soil resources due to erosion	Construction	Minor	Negligible

7.3.3 Air quality

Potential Impacts

Project activities that have potential to impact air quality would be associated with construction from emissions of air pollutants from temporary power generators, construction equipment, and vehicles. Construction activities will also create dust.

The following would be expected during construction.

- Emissions of oxides of nitrogen (NO_2 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 PM_{10}) created by construction-related vehicle traffic on unpaved roads.

Once the protection works are built and operational and the site is reinstated, no significant effects on air quality are anticipated.

Baseline Conditions

Pollution Level

Based upon the potential impacts, the pollutants of interest are oxides of nitrogen dust, and particulate matter.

Baseline dust and PM_{10} is influenced by a wide range of emissions, including man-made and natural sources. Along the well fields, it is anticipated that there will be several locations where the dust and PM_{10} baseline is elevated and close to and frequently above air quality standards due to existing levels of human activities including vehicle traffic. This includes in the urban areas within the Lango Baya shopping centre where there are unpaved roads. On this basis, the baseline dust and PM_{10} air shed is considered to be degraded but only on a localised basis. NO_2 is emitted from combustion sources and these are almost exclusively man-made. In the absence of significant local sources, NO_2 concentrations are not expected to approach or exceed air quality standards. On this basis, existing levels of NO_2 will be below air quality standards throughout the project areas.

Receptor Sensitivity

The sensitivity of receptors in the Area of Influence are defined as follows:

For sensitive human receptors.

- High – locations where there are particularly vulnerable receptors, including hospitals with high dependency and intensive care wards;
- Medium – locations where people are generally present permanently, including dwellings, schools and settlements; and
- Low – where people are only present for short periods, such as agricultural areas and fishing areas[6].

For sensitive ecological and agricultural receptors:

- High – habitat sites with international designations, such as Ramsar sites;
- Medium – habitat sites with statutory national protection, and sites where agricultural activities are producing particularly sensitive crops, such as fruit or green vegetables; and
- Low – local or national habitats sites with no statutory protection, and other agricultural areas

Based on a review of the proposed site for the protection works and the access roads, sensitive human receptors are defined as **Medium** where there are permanent settlements of dwellings within Lango Baya Shopping centre, and low at the actual site of the well fields.

[6] From, literature there is limited riverine fishery along river Sabaki which are caught by local fishermen using drift nets, such kind of subsistence fishing happens upstream and downstream of the well fields

Impact Assessment

Exhaust Emissions

No detailed traffic data is available at this stage. However, the numbers of Heavy Duty Vehicles (HDV) and Light Duty Vehicles (LDVs) are expected to be well below the thresholds for potentially significant impacts. On this basis, the magnitude of impacts associated road traffic exhaust emissions are predicted to be Negligible.

Combined with the Medium and Low receptor sensitivities identified, the overall significance of impacts is **Negligible** at all locations.

Dust and PM_{10}

These are the potential for impacts expected to arise from; plant and equipment traffic on unpaved roads, trench excavation works and general construction activities. The Project will generate traffic on unpaved roads close to dwellings. As this is expected to be less than five HDVs/day, and at some locations for more than four weeks, the magnitude is medium.

The Project works will include stripping vegetation from the route, construction of access roads and the route haul track and the construction of construction compounds. Due to the scale of these activities, the Magnitude is **medium**.

Combined with the Medium and Low receptor sensitivities identified, the significance of unmitigated impacts are:

- Traffic on unpaved roads are **Major** where there are receptors within 50m of unpaved roads used by construction plant and equipment traffic, or the haul route within Lango Baya Shopping Centre.

On this basis there is a need for mitigation to be implemented to reduce dust emissions/ impacts as presented in Pre- Mitigation Impact Assessment in **Table 7-6** below**.**

Table 7-6: Pre-Mitigation Impact Assessment

Impact	**Degradation of the Air-shed during Construction**				
Nature of Impact	Negative		Positive		Neutral
	Increase in airborne pollution.				
Type of Impact	Direct		Indirect		Induced
	Impact is a result as a direct interaction between project activities and the environment along the proposed works .				
Duration of Impact	Temporary	Short term	Long term		Permanent
	The impact is expected to be temporary as emissions arise throughout the construction phase.				
Impact Extend	Local		Regional		International
	The impact will be limited to the footprint of the project and immediate surrounds.				
Impact scale	The impact is considered as small (local) scale.				
Frequency	Intermittent – impacts will typically only arise during working hours				
Likelihood	Inevitable				
Impact magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered medium.				
Resource / receptor	Low		Medium		High

sensitivity	The sensitivity of human receptors is Medium in dwellings and settlements			
Impact significance	Negligible	Minor	Moderate	Major
	Dust emissions have the potentially to have Moderate significant impacts at nearby sensitive human receptors.			

Mitigation

Exhaust Emissions

No mitigation is required. We assume that the project will use only vehicles that are operated and maintained according to manufacturer specifications as provided in the ESMP.

Dust and PM_{10}

The impact assessment identified Major impacts associated with plant and equipment traffic on unpaved roads and earthworks. The following mitigation are therefore recommended to manage these impacts. Mitigation measures should be implemented in locations where there are receptors within the relevant distance.

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;
- Minimise 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 leveling works

- 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 minimise dust blow.

Residual Impact

The residual impacts associated with road traffic exhaust emissions are **Negligible.**

With the implementation of suitable mitigation and with adequate monitoring, residual impacts associated with dust and PM_{10} from construction activities are **Negligible** as presented in **Table 7-7 below.**

Table 7-7: Residual Impact Significance

Impact	Project Phase	Significance (Pre-mitigation)	Residual Impact Significance (Post-mitigation)
Road Traffic Exhaust Emissions	Construction	Negligible	Negligible
Dust and PM from construction activities	Construction	Moderate	Negligible

7.3.4 Noise and Vibration

Potential Impact

Potential noise impacts may arise as a result of the construction activities associated with the construction of the protection works.

Construction activities and equipment are not expected to result in significant levels of vibration. Therefore, equipment that might high levels of vibration (such as impact piling or vibratory compaction) will not be used. Therefore, vibration effects have been scoped out of further assessment.

Baseline Conditions

The project will not be associated with deep excavation or rock breaking that result to excessive vibrations resulting from equipment's such rock drillers. Therefore, risk related to the adjacent bridge will be limited to occupational health and safety scope.

The ambient noise environment within Baricho is influenced by activities within human settlements including people activities, animals (such as birds), occasional cars, vegetation blowing in the wind, and weather (wind, rain). World Bank Group General EHS Guidelines provide guidance on acceptable noise levels based on WHO standards and these are set out in **Table 7-8** below.

Table 7-8: World Bank Group Noise Level Guidelines

	Maximum Allowable Ambient Noise Levels, LAeq,1hr, dBA Free field	
	Daytime	**Night-time**
	07:00 – 22:00	22:00 – 07:00
Residential, institutional, educational	55	45
Industrial, commercial	70	70

National Environment Management Authority (NEMA) noise levels, maximum permissible noise levels for construction sites (Measurement taken within the facility) are shown **Table 7-9** below.

Table 7-9: NEMA Noise Level Guidelines

Site	Day	Night
Health facilities, educational institutions, homes for disabled	60dBA	35dBA
Residential	60dBA	35dBA
Other areas	75dBA	65dBA

The equipment and plant used during construction will generate noise during construction activities that might affect communities living and working near to the works. However, this impact will not be significant as the nearest village is approximate 500m from the project site Pre mitigation Impact Assessment is presented in **Table 7-10** below.

Table 7-10: Pre-Mitigation Impact Assessment

Impact	**Noise during Construction**				
Nature of Impact	Negative	Positive	Neutral		
	Elevated noise levels from operation of construction equipment.				
Type of Impact	Direct	Indirect	Induced		
	Impact is a result of noise generated by construction activities.				
Duration of Impact	Temporary	Short term	Long term	Permanent	
	Impacts are expected to be short term				
Impact Extend	Local	Regional	International		
	The impact will be limited to the footprint of the project and immediate surrounds.				
Impact scale	The impact is considered as small (local) scale.				
Frequency	Impacts may occur during daytime periods over a short term.				
Likelihood	Inevitable				
Impact magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered negligible to small.				
Resource / receptor sensitivity	Low	Medium	High		
	Dwellings are considered to have a high sensitivity to noise				
Impact significance	Negligible	Minor	Moderate	Major	
	Considering the impact magnitude is small to negligible and the sensitivity is high, the overall significance is considered to be minor				

Mitigation

Mitigation measures are set out below, which have been assumed for the base case assessment. They are assumed to result in a 5 dB (A) reduction in the overall noise from construction plant teams.

The following standard mitigation measures will be employed

- 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;
- 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.

Residual Impact

Standard mitigation measures listed above have been assumed for the base case noise assessment. No impacts above small are predicted and therefore no further mitigation is required. Consequently, the residual impacts are the same as those presented above. Residual Impact Significance is presented in **Table 7-11** below.

Table 7-11: Residual Impact Significance

Impact	Project Phase	Significance (Pre-mitigation)	Residual Impact Significance (Post-mitigation)
Noise from construction activities affecting nearby dwellings	Construction	Minor	Negligible

7.4 Biological Resources and Receptors

7.4.1 Flora and Fauna

Potential Impact

There are **no** protected vegetation covers within the drainage area that is considered a fragile ecosystem, sensitive to changes to its components. However, stripping of vegetation cover will be on isolated cases only limited to isolated cases on coconut and casuarina trees.

This will **not** cause impacts, such as loss of biodiversity, fragmentation of habitat, changes in light conditions and possible invasion by invasive alien species. However, it could lead to minimal disruption of soil structure which leads to susceptibility of the soils to agents of erosion

Baseline Conditions

The natural vegetation of the area is varied and is dependent on both proximity to fresh and marine water as well as the soil that range from sand dunes to river bed sediments Baricho Well Fields are Located Agro Economic Zone IV, notable vegetation at the site include; scattered coconut and casuarina trees

Human habitation and agricultural activities have significantly interfered with both terrestrial and aquatic habitats in along Sabaki River at the Baricho Well Fields Site. Further the well fields are not located with Sabaki Estuary that provides habitat for birds and fish species. The well fields are located approximately 30km upstream from the estuary. However, the general river provides habit for fresh water fish species such as the; Bagamoyo goby, Redfin robber, Pointed head gudgeon Milkfish, Grass carp, Dusky sleeper or Vumbika in Digo languge, Freshwater goby, Tana squeaker and Kikorokoro (Giryama) among others. Further, from secondary data, field observation and information from local community members, there are no specific / protected fish breeding sites along the river within Baricho Well Fields Section.

There is no terrestrial wildlife observed specifically at the well fields except for limited rodents such as squirrels, moles and different bird and insect species. The community around the well fields keep Livestock including; cattle, goats, sheep, bees, poultry, rabbit and pigs.

Impact Assessment Flora

The impact is related to removal of vegetation cover at the sites identified for establishment of protection works. However, as discussed before, the magnitude of the impact is considered to be medium, this is because the site is sparsely vegetated. Pre-mitigation Impact Assessment is presented in Table 7-12.

Table 7-12: Pre-Mitigation Impact Assessment

Impact	**Flora and Vegetation during Construction**				
Nature of Impact	Negative	Positive	Neutral		
	Disturbance to vegetation cover within the protection works sites.				
Type of Impact	Direct	Indirect	Induced		
	Impact is as a result of a direct interaction between the project (i.e. Construction activities) and the existing vegetation at the protection sites.				
Duration of Impact	Temporary	Short term	Long term	Permanent	
	The effect is considered permanent as the areas where vegetation will be removed for the construction of the protection works will have to be permanently kept with vegetation for maintenance purposes				
Impact Extend	Local	Regional	International		
	The impact will be limited to the footprint of the project and immediate surrounds.				
Impact scale	The impact is considered as small (local) scale.				
Frequency	Once off				
Likelihood	Inevitable				
Impact magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered small				
Resource / receptor sensitivity	Low	Medium	High		
	The protection works will be constructed within disturbed or modified environment therefore the sensitivity is considered low.				
Impact significance	Negligible	Minor	Moderate	Major	
	Considering the impact magnitude is small and the sensitivity is low, the overall significance is considered to be minor				

Mitigation

The following standard mitigation measures will be employed

- Avoidance of impacts should be prioritised. 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 Camp, 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

Impact Assessment Fauna

The impact will be cumulative in nature related to risk of pollution of river water from incidences such as oil / fuel spills from plant and equipment or increased sedimentation due to soil erosion could result to fish kills[7]. In such cases, the kill will be associated with increased levels of COD or BOD beyond recommended levels. The magnitude of the impact is considered to be medium due to the fact that no significant sedimentation or pollution is anticipated from the Project

[7] Applicable fish species dominant in lower Sabaki River have been detailed in Section 4.6 of this report

activities. Pre mitigation Impact Assessment is presented in **Table 7-13.**

Table 7-13: Pre-Mitigation Impact Assessment

Impact	**Flora and Vegetation during Construction**				
Nature of Impact	Negative	Positive	Neutral		
	Disturbance to vegetation cover within the protection works sites.				
Type of Impact	Direct	Indirect	Cumulative		
	The impact will be cumulative in nature related to risk of pollution of river water from incidences such as oil / fuel spills from plant and equipment or increased sedimentation due to soil erosion could result to fish kills				
Duration of Impact	Temporary	Short term	Long term	Permanent	
	The impact is considered long term, this is because replenishing fish stocks and other aquatic fauna once destroyed will require considerable time to re-establish.				
Impact Extend	Local	Regional	International		
	The impact will be limited to the river stretch at the well field section and 1-5km downstream of the Project.				
Impact scale	The impact is considered as small (local) scale.				
Frequency	Could re-occur often if mitigation measures are not implemented				
Likelihood	Possibly likely				
Impact magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered **medium**				
Resource / receptor sensitivity	Low	Medium	High		
	Sabaki River is a significantly big river with high volume of water which can neutralize such pollutants and wash down silt from the works site, therefore the sensitivity is considered **medium**				
Impact significance	Negligible	Minor	Moderate	Major	
	Considering the impact magnitude is medium and the sensitivity is **low,** the overall significance is considered to be **minor**				

Mitigation

The following standard mitigation measures will be employed

- All forms of soil erosion such as sheet and rill erosion of soil shall be prevented where necessary through the use of sand bags, diversion berms, culverts, or other physical means.
- Activities shall be conducted to extend possible away from the river and natural storm water drains.
- All waste water which may be contaminated with oily substances must be managed in accordance with an appropriate Waste Management Plan (WMP). The measure include containment before collection by NEMA licensed waste handlers for safe disposal. Such water contaminated by hydro-carbons will not be discharged into Sabaki 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.

Residual Impact

The impact significance on both flora and Fauna is **minor** after mitigation measures during construction and **negligible** post mitigation for operations. With the proposed mitigation measures, the residual negative impacts on flora are assessed to be of **a low magnitude**.

Residual Impact Significance is presented in **Table 7-14** below.

Table 7-14: Residual Impact Significance

Impact	Project Phase	Significance (Pre-mitigation)	Residual Impact Significance (Post-mitigation)
Disturbance to vegetation cover	Construction	Negligible to Minor	Negligible

7.5 Social Resources and Receptors

7.5.1 Community Health Safety and Security

Potential Impact

Increased project-related traffic, civil works for site preparation including site clearance and excavation and leveling, change to the environment due to 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

Baseline Conditions

Relevant baseline conditions that may potentially influence impacts are summarized in **Table7-15** below.

Table 7-15: Social Receptors

Name of Receptor	Nature of risk
Lango Baya Primary School Lango Baya Secondary School	Accidents to students and general public within Lango Baya associated with plant and equipment, vehicular movement. The risk is associated with plant and equipment movement within the market or open un barricaded trenches or without warning tapes among other risks
Lango Baya Market	
Lango Baya Mosque	
Lango Baya bridge	The project will not be associated with deep excavation or rock breaking the result to excessive vibrations resulting from equipment's such rock drillers. Therefore, risk related to the bridge will be limited to health and safety scope.

Impact Assessment

Construction

During construction there will be an increase in traffic movements of heavy machinery and light vehicles in the road within the project during a period of 8months. This will include, cement trucks, transport of construction material, excavation machinery, etc. which is expected to increase the risk of road traffic accidents and potential injuries or fatalities to other road users or pedestrians within Lango Baya Shopping centre. The increase in movement of vehicles during the construction phase may result in greater disturbance and decreased wellbeing for those communities adjacent to Baricho well fields. Also, open un-barricaded trenches or without warning tapes could fill up with water during rainy seasons and expose the community to the risk of drowning as well as trip and fall.

During the construction phase activities will result in changes to the physical environment, with the potential to affect the health and welfare, of communities. There will be temporary increases in dust during the duration of the construction phase, which will be mostly localized to the active sites working areas and access roads. There are no impacts on local air quality over the long term and therefore unlikely to result in a recordable increase in respiratory diseases in the population.

Similarly, the construction of well protection works is likely to result in temporary increased noise levels for residents close to the working areas. The increase in noise is likely to result in disturbance and decreased wellbeing for those closest to the construction activities. However, this will be limited to construction hours and sleep disturbance is unlikely assuming construction work will be undertaken during daytime hours.

Project construction will also entail some temporary, localized, ground works that will generate vibrations. Depending on the soil characteristics and on the distance to the nearest building, these activities could produce vibrations for houses in the vicinity. Impacts could range from the level of temporary nuisance and disturbance, up to actual damage to buildings.

Waste production as a result of the construction activities is unlikely to impact on the health of communities since most of the waste will be placed in the appropriate covered waste containers, and transported periodically to licensed landfills, and therefore opportunities for communities to come into contact with waste will be minimal.

The Project workforce will be housed in open accommodation camps allowing free movements of workers. Interaction with nearby communities is therefore very likely and could potentially lead to an increased transmission of communicable diseases and sexually transmitted diseases within these communities such as HIV and Aids, Hepatitis B and now COVID -19 among others. Pre mitigation Impact Assessment is presented in **Table 7-16** below.

Table 7-16: Pre-Mitigation Impact Assessment

Impact	**Community Safety and Environment Health**			
Nature of Impact	Negative	Positive	Neutral	
	Increased traffic during the construction period may result in increased risk to road traffic accidents from plant and equipment and exposure to open un-barricaded trenches or without warning tapes. Impacts that result from a direct interaction between the Project (i.e. and noise emissions, vibrations, and generation of waste) and the population new the active sites. The presence of Project Workforce will lead to interaction with the local communities which will potentially result in increased transmission of communicable diseases and sexually transmitted diseases			
Type of Impact	Direct	Indirect	Induced	
	Impact that result from a direct interaction between the Project (i.e. increased plant and equipment traffic) and the local population within Baricho.			
Duration of Impact	Temporary	Short term	Long term	Permanent
	The increased traffic effect and risks to injuries is temporary, as construction activities will take place in a sequential manner during the length of the construction period			
Impact Extend	Local	Regional	International	
	The impact will be limited to the footprint of the project and immediate surrounds.			

Impact scale	The impact is considered as small (local) scale.				
Frequency	The frequency is considered to be occasional or one time at each temporary over the duration of the construction phase.				
Likelihood	Inevitable				
Impact magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered negligible to small.				
Resource / receptor sensitivity	Low		Medium		High
	The sensitivity of the receptors (local population and road users including vehicle users, pedestrians and cyclists) is considered medium.				
Impact significance	Negligible	Minor	Moderate	Major	
	Considering the magnitude and sensitivity are medium, the impact on the community safety during construction activities is considered to be of moderate significance.				

Mitigation

The following mitigation measures will be implemented during the construction phase to reduce any impacts on community health and safety.

- Contractor will develop and monitor implementation of a Community Health and Safety Management Plan (CHSMP) which will include the following measures:
    - Ensure all workers including contractors and subcontractors undergo pre-employment screening and regular health screening including voluntary screening for STDs.
    - Ensure any trucking companies employed to work on the Project will have policies around health screening of their workers in line with Project requirements.
    - Ensure all workers including contractors and subcontractors receive education around transmission and symptoms of communicable diseases of concern and STDs.
    - Provide access to health care for those injured by its activities.
    - Ensure that work sites are fenced and that signs are put up around work fronts and construction sites advising people of the risks associated with trespass. When work fronts are less than 10 metres from a community or house, employ security guards from the local community to prevent trespass.
    - Undertake a programme of stakeholder engagement and consultation to educate local communities of the risks of trespassing onto sites, the meaning of signs, and the dangers of playing on or near equipment or entering fenced areas. Special attention to be paid on residential areas, primary and secondary schools.
    - 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
    - Contractor will put in place measures geared towards prevention of spread on Covid 19 between community members and the project workers. Such measures will be aligned to prevention protocol as per the prevailing ministry of health directives including (i) Ensuring social distance among workers, (ii) provision of face masks to workers and (iii) provision of hand washing dispensers and soap or alcohol based sanitizers at work places.
- 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 contractors and subcontractors and truck drivers as part of the induction process.
- Contractor will provide primary health care and first aid at construction camp sites to avoid pressure on local healthcare infrastructures.
- Contractor will implement a *Community Grievance Mechanism.*
- At construction stage, the contractor will prepare Specific Construction Environment and Social Management Plan (C-ESMP) which included among other; *Health, Hygiene and Safety Plan, Labour Management Plan and* Gender-based Violence Action Plan

Residual Impact

The significance of the residual impacts on community health and safety after the implementation of mitigation measures is presented in **Table 7-17** below.

Table 7-17: Residual Impact Significance

Impact	Project Phase	Significance (Pre-mitigation)	Residual Impact Significance (Post-mitigation)
Community Safety (Road Accidents, Site Trespass,	Construction	Moderate	Minor
Environmental Health (Noise and Air)	Construction	Moderate	Minor
Interaction with Project Workforce	Construction	Moderate	Minor

7.5.2 Worker Health and Safety and Workers Management

Potential 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.

Table 7-18 presents the potentially significant impacts associated with occupational health and safety and worker management during the construction and operation phases. The potential for occupational health and safety incidents throughout the life cycle of the project is higher during construction phase.

Table 7-18: Potential Impacts on Occupational Health and Safety and Worker Management

Construction Phase	Operation Phase
Impacts on workers' health and safety, in particular from road accidents, slip, and trip and falls, drowning hazards during trench excavations/gabion laying at the river bank and inconsistent use of PPEs.	N/A
Impacts on workers' rights from violations of labour laws in particular with respect to enforcement of health and safety measures by the employer such as the use of appropriate PPEs during construction of the proposed works.	N/A

Baseline Conditions

The main health facility is the Malindi General Hospital located in Malindi town. The area also has private health facilities, for example Danrose, Ganda, Catholic Mission, and Meridian which are all privately owned. Malindi General Hospital located within Malindi Town records on average 50 to 100 in patients and out patients on a daily basis. Common ailment include water borne related diseases, snake bites, respiratory complications and maternity.

Impact Assessment

Construction

Worker's Health and Safety and Labour Rights

Considering that construction was identified as one of the sectors of employment (formal and informal), the locally hired workforce may have some experience in traditional / basic construction activities. However, work practices and consideration for health and safety may fall short of international standards and best practice, such as the use of personal protective equipment (PPE), which will increase the severity of hazards to which the workforce are exposed.

Equipment and worker transport along the access roads may also result in road accidents in the absence of a proper traffic management plan or if traffic safety rules are not enforced. The often poor conditions of the existing roads may also increase the risk of accidents. Pre mitigation Impact Assessment is presented in **Table 7-19 below**.

Table 7-19: Pre-Mitigation Impact Assessment

Impact	**Workers Health and Safety and Rights during Construction**				
Nature of Impact	Negative		Positive		Neutral
	Poor planning, non-compliance with health and safety best practice and labour rights can result in injuries or fatalities				
Type of Impact	Direct		Indirect		Induced
	Impact that result from a direct interaction between the Project activities which include clearance of the RoW in vegetated areas, excavation work, laying of gabions				
Duration of Impact	Temporary	Short term	Long term		Permanent
	Injuries and fatalities could have permanent impacts on workers and their families.				
Impact Extend	Local		Regional		International
	The workforce will be primarily contracted from Malindi town and Lango Baya Shopping Centre				
Impact scale	As mentioned above the workers will be working on different sections of the wellfields at different times. The impact scale is therefore medium.				
Frequency	The frequency is considered to be infrequent as the workforce and drivers are expected to be trained and the employer is expected to enforce the use of PPEs and health and safety measures.				
Likelihood	Inevitable				
Impact magnitude	Positive	Negligible	Small	Medium	Large
	Based on the parameters above, and considering the embedded measures in place the magnitude is considered to be medium				
Resource / receptor sensitivity	Low		Medium		High
	The sensitivity of the receptors) is considered medium as some workers may not be aware of their rights.				
Impact significance	Negligible	Minor	Moderate		Major
	Since the magnitude is considered medium and sensitivity is medium, the impact on workers' health and safety during construction activities is considered to be of moderate significance				

Occupational safety risks associated with the operations of well fields'

The main risk anticipated during operation of the well fields will be flooding of the entire well fields in the event of exceptional high rainfall (El-nino). Flooding of the well fields could lead to numerous impacts ranging from destruction of access road, washing away of river bank protections works (gabions) and water pipeline protection works. Further, flooding risk could destroy the electrical control room. Therefore, the design has provided emergency roof-top exist in the electrical/control room.

Environmental pollution that is associated with wells cleaning. These are mainly sludge and cleaning chemicals. Standards Operating Procedures, including actions to be taken in case of unprecedent rise in water levels, will be adopted for the routing operation and maintenance works to prevent workplace accidents.

Mitigation Measures

The following mitigation measures will be implemented during the construction phase to reduce any impacts on workers' health and safety and labour rights.

Contractor will develop and implement a Workers' Health and Safety Management System covering all contractors and subcontractors including the following measures:

- Contractor will develop a Human Resources Policy, which will outline worker rights to be included in all contracts including restrictions on working hours in line with applicable ILO standards, compensation including consideration of overtime, holidays etc. contractor will require its contractors and subcontractors to put in place policies in line with national legislation and applicable international legislation and contractor Code of Conduct and Policies.
- Contractor will establish contractual clauses to be embedded in the contracts of the all sub-contractors that require adherence to Kenyan law and international standards to be upheld related to worker rights.
- Contractor will prohibit the use of alcohol or drugs, which could adversely affect the ability the employee to perform the work safely or adversely affect the health and safety of other employees, community members or the environment.
- Contractor and self-employed contractors will assess the H&S risks related with the tasks to be performed during the construction phase and provide corresponding prevention and management measures.
- Contractor will Provide first Aid kits and ensure availability of trained first aiders within the construction site. The ratio of trained first aiders to worker on site at any particular time should meet the threshold defined by the First Aid Rules under OSHA 2007
- Pre-employment medical assessments will be put in place as a workforce risk management tool to screen individuals for risk factors that may limit their ability to perform a job safely and effectively. Expected benefits of conducting a pre-employment medical assessments include a safer working environment, reduction in workplace injuries, minimised downtime, matching the capacity of the employee with the role, and overall recruitment cost and risk reduction.
- 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, contractors 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 develop and implement a Workers Grievance Mechanism for the Project workforce including contractors and subcontractors.
- 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. For works on/near water, such will also include availing of emergency rescue equipment like personal floating devices and having some designated rescue personnel among the workers available at any time works are in progress
- Contractor will ensure that its *Code of Conduct* is followed to regulate the performance and behavior of all workers, including provision for disciplinary action for anti-social behavior and non-compliance with health and safety regulations such as lack of use of PPE.
- Contractor will ensure that IFC/World Bank Group Environment, Health and Safety guidelines regarding the construction and management of worker accommodation and

the provisions of medical facilities at worker accommodation are followed.
- 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 behavior, use of drugs and alcohol, operating hours, rest periods, community education on traffic safety and accident reporting and investigations.
- Contractor will develop a *Waste Management Plan* for the construction phase with clear guidelines for the safe storage and disposal of hazardous waste and handling of hazardous materials.
- Containment of the cleaning water in a pool to allow it drying naturally and the chemical break down by UV rays and making sure it does not flow into the river.

Residual Impacts

The implementation of mitigation measures will contribute to reducing occupational health and safety risks and the risk of labour rights abuses significantly. However, the risk of potential accidents still exists and may potentially lead to injuries or fatalities for the workforce during construction. This risk will be short-term during the construction phase (12months) and long-term during operations.

With the implementation of mitigation measures the remaining impact significance is considered minor significance during construction and negligible during operation. Residual Impact Significance is presented in **Table 7-20** below.

Table 7-20: Residual Impact Significance

Impact	Project Phase	Significance (Pre-mitigation)	Residual Impact Significance (Post-mitigation)
Worker health and safety	Construction	Moderate	Minor
Worker labour rights	Construction	Moderate	Minor

7.5.3 Labour Influx and Gender Exclusion Risks

Large construction projects often require labour force and associated goods and services cannot be fully supplied locally for reasons such as worker unavailability and lack of technical skills and capacity. In such cases, the labour force (total or partial) needs to be brought in from outside the project area. This influx is compounded by an influx of other people who follow the incoming workforce with the aim of selling them goods and services, or in pursuit of job or business opportunities. The influx of workers can have adverse social and environmental impacts on local communities, particularly if the communities are rural, remote or small. The contractor will implement below listed measures to eliminate conflicts related to labour related disputes between local communities and contractor in relation to hiring of labour force.

Mitigation Measures
- The contractor will mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 Gender Rule.
- The existing community structures headed by location chiefs should be involved in local labour hire, emphasize the requirement of hiring women, youth and people with disability and VMGs

- Protecting Human Risk Areas Associated with, Disadvantaged Groups, Interfering with Participation Rights and interfering with Labour Rights:
- Recruit locals workers on locally available unskilled, semi-skilled and skilled labour as much as possible to reduce labour influx
- Contractor to formulate and implement a labour management plan for his workforce;
- Contractor will be required to have a transparent external communication plan covering among others, how available opportunities will be advertised
- Consultations with the local council of elders to ensure that available opportunities are fairly distributed across different clan members
- Maintain a grievance register to log any complaints from workers and local community.
- As part of the C-ESMP that contractor to prepare a Labour Management Plan (LMP) that included mandatory requirement to procure all unskilled (and as much as possible, semi-skilled) labor as well as locally available materials from the local community while ensuring equal pay for equal work for men, women and people with disability

7.5.4 Sexual Harassment (SH) at the workplace

Sexual Harassment at work place might be associated be between a project worker against another project worker. Therefore, below listed provisions are provided in order to mitigate against sexual harassment in relation to the project.

Mitigation Measures

- The contractor will prepare a SEA/SH management plan that is complete with code of conduct to be signed by all employees, in a language that is understandable to them.
- The contractor SEA/SH management plan will be binding to the subcontractors and their employees as well.
- The contractor will develop and implement a clear human resources policy against sexual harassment that is aligned with national law
- The contractor will integrate provisions related to sexual harassment in the employees Code of Conduct (CoC)
- The contractor will ensure appointed human resources personnel to manage reports of sexual harassment according to policy

7.5.5 Child Protection

The possibility of contractor children abuse is through hiring of child labour, also labour force on site might abuse children within the Project area through sexual advance that could lead to early pregnancies and school dropout including exposure to communicable diseases such as HIV and AIDS. The contractor will undertake the below listed mitigation measures.

Mitigation Measures

- The contractor will develop and implement a Child Protection Strategy that will ensure minors are protected against negative impacts associated by the Project including SEA.
- All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behaviour

- Children under the age of 18years should not be hired on site as provided by Child Rights Act (Amendment Bill) 2014
- Wherever possible, ensure that another adult is present when working in the proximity of children.
- Not invite unaccompanied children to workers home, unless they are at immediate risk of injury or in physical danger.
- Refrain from physical punishment or discipline of children
- Refrain from hiring children for domestic or other labor, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.
- Comply with all relevant local legislation, including labor laws in relation to child labor specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation

7.5.6 Sexual Exploitation and Abuse (SEA)

This impact refers to sexual exploitation and abuse committed by Project staff against communities and represents a risk at all stages of the Project, especially when employees and community members are not clear about prohibitions against SEA in the Project.

Mitigation Measures

- 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). SEA/SH management plan will have a Code of Conduct (CoC) which includes these mitigation measures as summarized below.
    - ✓ Do not use language or behavior towards women or children that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
    - ✓ Sexual activity with children under 18—including through digital media is prohibited. Mistaken belief regarding the age of a child and consent from the child is not a defense.
    - ✓ Exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading or exploitative behavior is prohibited.
      Sexual interactions between contractor's and consultant's employees at any level on one hand, and adult (above 18 years) member of the communities surrounding the workplace on the other hand, that are not agreed to with full consent by all parties involved in the sexual act are prohibited, especially with persons one reason or another, is unable to make decisions or sound judgements concerning the agreement, e.g. persons with mental disability. This includes relationships involving the withholding, promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex – such sexual activity is considered "non-consensual" within the scope of this Code.
    - ✓ Where an employee develops concerns or suspicions regarding acts of GBV by a fellow worker, whether in the same contracting firm or not, he or she must report such concerns in accordance with Standard Reporting Procedures.
    - ✓ All employees are required to attend an induction-training course prior to commencing work on site to ensure they are familiar with the GBV Code of Conduct.
    - ✓ All employees must attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce the understanding of the institutional GBV Code of Conduct.
-
- 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 Sexual Exploitation and Abuse (SEA) awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their SEA-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.

7.5.7 Land Acquisition and Resettlement

The proposed protection works will be undertaken within the existing Sabaki River riparian within existing Baricho Well fields. However, a total of 2.82 acres of land belonging to 6 PAPs at the proposed 6m wide water pipeline route and 25m wide corridor and pipeline route will be impacted. The PAPs include 6 female PAPs and 6 male PAPs**. Table 7.21** below summarizes category of losses under this ARAP

Table 7-21. Summary of Resettlement Impacts

Type of loss	No.
PAPs losing less than 20% of Land	12
PAPs losing trees and crops on their land	12

An abbreviated Resettlement Action Plan (ARAP) has been prepared separately, the ARAP provides compensation measures to the PAPs as required by World Bank OP 4.12 on Involuntary Resettlement.

7.6 Cumulative Impacts and Mitigation Measures

The assessment identified cumulative impacts associated with the works as discussed in this report as summarized below.

- Downstream increased flooding as a result of increased siltation resulting from both well protection works and bridge construction works.
- Increased sedimentation resulting from both well protection works and bridge construction works could result to sedimentation of river bank that provide habitat to fish and other aquatic fauna.
- Increased sedimentation resulting from both well protection works and bridge construction works could result to clogging of existing downstream water abstraction

points that belong to subsistence farmers.

Mitigation Measure

- Synergize sedimentation control measures between the well protection works contractor and bridge construction contractor. *Sedimentation Control Plan, Spoil Management Control Plan and Waste Management Plans* to be prepared by well protection works contractor will be harmonized with the one belonging to the bridge contractor. Some of sedimentation prevention measures will include;

    - 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.
    - 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

- Disruption of water supply to Marereni, Gogoni, Mambrui, Sabaki, Malindi, Gede and Watamu Towns due to Disconnection and re-connection of current pipelines from the individual wells before and after construction will be mitigated by MAWASCO through a robust water rationing program that will be communicated in advance to community members to allow them sufficient time to conserve and store water.

7.7 Health Impact- spread of COVID19 among construction workers at work sites

The World Health Organization declared COVID-19 a global pandemic after assessing both its alarming levels of spread and severity, and the alarming levels of inaction. Consequentially, WHO issued various guidance and measures to prevent the spread of the virus. The measures have been adopted worldwide. Similarly, the Kenyan government has since then issued several guidance and directives after the first case was registered on March 13th 2020. These included complete cessation of movement to and from areas considered hot spots and night curfew, social distancing guidelines, closure on non – critical and essential enterprises, closure of places of worship and public gatherings, mandatory use of masks in public places, among others.

During project execution (civil works), large numbers of workers will be required to assemble together in meetings, toolbox talks and even at work sites; varied number of workforce including suppliers of material and services are also expected to come in from various places in the country which may be COVID-19 hot spots; and interaction of workers with the project host community will happen as workers find accommodation close to work sites, and/or return to their homes after works. The potential for the spread of any infectious disease like COVID-19 by projects is high. There is also the risk that the project may experience large numbers of its workforce becoming ill and will need to consider how they will receive treatment, and whether

this will impact on local healthcare services including the project host community. The presence of international workers, especially if they come from countries with high infection rates, may also cause social tension between the foreign workers and the local populations.

Recently, the WHO has warned that the virus is here to stay for a long time and might persist and become our new way. The Government of Kenya has also lifted some of the initial movement controls and allowed the resumption of business, with certain industry specific guidelines being enforced. The duty of care has now been transferred to individual citizens and enterprises. Recognizing the potent risk this may present, it is difficult to clearly outline exhaustive mitigation measures under the mitigation impacts. As such, there is need for the client and the contractor to develop and adopt COVID-19 Standard Operating Procedure (SOPs) in line with the World Bank guidance, Ministry of Health Directives and site-specific project conditions. These SOPs need to be communicated to all workers and enforced to the latter without fail. In addition to the requirement of the SOPs, the following mitigation measure shall also be adopted:

COVID-19 – Mitigation Measures against spread of COVID-19 amongst workers:

- The Contractors will develop 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 mobilizing to site. 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 workers and visitors;
- Avoid concentration of more than 15 workers at one location. Where there are two or more people gathered, maintain social distancing of 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;
- The project shall put in place means to support rapid testing of suspected workers for covid-19;
- 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;

7.8 Social risk - Spread of COVID-19 amongst community members during consultations

Efficient and meaningful engagement, a wide range of individual participants, groups in the local community and other stakeholders will be involved. The types of consultations to be used to pass information shall be through public Baraza's, electronic means shall be used where possible and one-on-one basis meetings while observing the COVID-19 mitigation measures to ensure safety stakeholders involved, the community at large and the client. The consultations will involve verification of PAPs covering the occupants of the affected area and vulnerable persons and groups; awareness raising, sensitization of PAPs and gauging attitude to the

project; training and capacity building for livelihoods restoration, grievance redress, and execution of site - specific surveys among others. If carried out conventionally, these activities would lead to close interaction between the proponent and the community members leading to a high risk of spreading COVID-19 amongst community members during the consultation process.

To minimize the risk of spread of COVID-19 amongst community members, alternative means of consultation will be required as mitigation measures to ensure social distancing and appropriate communication measures. The mitigation measures will be supervised by a communications/ stakeholder engagement / social safeguards experts in the project proponent's team.

Mitigation measures against spread of COVID-19 amongst community members

- Electronic means of consulting stakeholders and holding meetings shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced;
- Avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters;
- The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;
- Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Allow participants to provide feedback and suggestions (iv) Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration. (v) In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chart groups.
- Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants.

7.9 Operation and Maintenance Activities

This covers a range of tasks which can be done periodically by the operator during project operation phases. The following maintenance items will be completed as soon as possible after identification (at least annually):

- Remove bushes and trees from the wells
- Repair erosion gullies.
- Repair deteriorated concrete or metal components.
- Maintain riprap or other erosion protection.
- Remove debris from wells

7.10 Project Decommission Impacts

Demobilization of the wells will include activities such, construction of diversion weirs, removal of plant and equipment, demolition of auxiliary services among others. The assessment identified that such activities might present environmental risks such as the ones listed below among others;

- Soil erosion and sedimentation as a result of trampling of top soils
- Air pollution from associated activities such as trucks ferrying used construction material away from the site.
- Solid and liquid wastes pollution such as spoil or leakages
- Community and workers' health and safety risks such as accidents

Mitigation Measures

- Development of a decommissioning plan
- Development of and Emergency Response Plan for decommissioning
- The site is to be cleared of all construction materials, including litter prior to hand over
- Fences, barriers and demarcations associated with the construction phase must be removed from the site
- Fences, barriers and demarcations associated with the construction phase must be removed from the site
- Rehabilitation Activities of Environmental Cases identified must continue throughout the defect liability period
- Undertake a completion Environment, Health and Safety Audit

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 project.
- 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.

The Environmental, Social Management and Monitoring Plan (ESMP) prepared for Baricho well fields protection works presented in **Table 8-1 on pages 81 to 95** below.

8.2 Institutional Capacity to Implement the ESMMP

The Water and Sanitation Development Project (WSDP) at CWWDA is organized as summarized below.

- The Project Manager (PM) is the overall technical coordinator in the implementation of the overall Project. The Project Manager is employed by CWWDA and he/she is assisted by the Water and Environment Engineer, recruited by the Agency. Other officers include the Asset Manager in case of any land acquisition and resettlement and other social issues related to this Program.
- The Project Manager will supervise and coordinate the Project Team and ensure that Project implementation activities and reports are on schedule and in compliance with the financing agreement. The coordinator will report to the Chief Executive Officer (CEO) of CWWDA and from time to time draw the attention of the CEO to all emerging policy issues for decision at that level or at a higher level.

The overall coordination of the environment and social safeguards, from development to implementation and monitoring, is provided by the CWWDA safeguards team. The team is headed by an Environment officer and includes others personnel such as sociologists, surveyors and water engineers. The role of the safeguards team is a summarized below.

- Coordinate the effective implementation of the RAP and ensure compliance with agreed implementation procedures and guidelines.
- Prepare Progress Reports on the implementation of the environmental and social safeguards.
- Ensure integration of ESMPs into Contract and Bid Documents.
- Ensure adequate community participation.
- The team will be responsible for routine implementation and technical austerity of the Project.

- Ensure that the environmental and social safeguards are implemented.
- The team will carry out quality checks and review the RAP reports before forwarding them to the World Bank Safeguards Specialist. The team will also be in charge of actual implementation of the RAP with assistance from a Resettlement Implementation Committee constituted for the Project.

Further, the contractor will prepare and implement a Construction Environment and Social Management Plan (C-EMSP) annexes to the C-EMSP as detailed in Sub section 9.2 and E.8. Also, the contractor and supervising engineer will hire a safeguards expert to oversee implementation of C-ESMP. Table 5-4 in chapter 5 presents other institutions that will be relevant in implementing the ESMP.

Incident Reporting: Further to regular safeguards status reporting, prompt incident reporting will be required of the implementation team as applicable. In line with the requirement of the Occupational Health and Safety Act (OSHA) 2007, EMCA 1999 and its 2015 revisions, as well as the World Bank EHS guidelines, all ESHS incidents, accidents, dangerous occurrences including occupational diseases shall be promptly reported to the respective regulatory institutions in the prescribed manner and template outlined in DOSH ML/DOSH/FORM 1 and further to the World Bank.

Records of all incidents shall also be maintained and made available for inspection on site throughout the project implementation phase. Investigation shall be conducted, and a corrective action plan developed for every reportable incident to prevent recurrence.

8.3 Grievance Redress Mechanism

The contractor will employ a Community Liaison Officer who will be responsible for collating written complaints and co-coordinating responses to all complaints. Both verbal and written complaints are to be entered into a Grievance Complaint Log as addressed

When receiving a complaint all employees shall refer the complainant to the Community Liaison Officer (CLO) or the resident engineer. The person receiving a complaint shall ensure that the Grievance Complaint Log is completed. The form shall then be forwarded to the Community Liaison Officer who will assign it a number. The Community Liaison Officer shall ensure that all actions are made to close out the complaint.

Information on proposed corrective action sent to complainant (if appropriate); the date the complaint was closed out; and Date response sent to complainant. All complaints shall be responded to in writing, though a verbal response will be provided as well if this is more appropriate in the circumstances (e.g., where the complainant cannot read). All complaints must be responded to within two weeks of being received, even if the response is just a summary of what is planned and when it is likely to be implemented. Further correspondence should be given once the complaint is closed out.

The CLO through the contractor will be responsible for providing CWWDA with a Monthly report detailing the level of complaints and any outstanding issues to be addressed. Monthly reports will include analysis of the type of complaints, levels of complaints and

action taken to reduce complaints. The CLO shall file all documentation related to complaints in a file in his office.

Detailed Grievance Redress Mechanism (GRM) is presented as **Appendix 3**.

Table 8-1: Environment and Social Management Monitoring Plan

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
Loss of land, crops and trees and livelihoods	• Land acquisition and resettlement	• Implement the ARAP before commencement of civil works for well field protection	CWWDA	• Number of PAPs promptly paid disaggregated by gender • Size of land acquired by the Project after compensation • Number and amounts of payments made to PAPs • Number of people with improved livelihoods	KShs 4,717,525
Impacts on Water Resource	• Site activities such as excavations and levelling could result to loosening of soils that could result to sedimentation and siltation of storm water drainage channels and eventually into Sabaki River. • Un-serviced plant and equipment on site could result to oils and fuels leaks that could contaminate water resources rising the BoD and adversely affecting aquatic organism in Sabaki River.	• 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* • *Quality of water flowing within Sabaki River at Baricho well fields, the monitoring frequency shall be quarterly while 2Nr monitoring point will be selected. 1Nr point will be upstream while the other 1nr point will be downstream*	Preliminary Sum of Ksh 1 Million to be allowed for water pollution control

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
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 minimised. ● Contour temporary and permanent access roads / laydown areas so as to minimise 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 minimised 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.	Contractor	● *State of natural storm water drainage channels* ● *Quality of water flowing within Sabaki River at Baricho well fields, the monitoring frequency shall be quarterly while 2Nr monitoring point will be selected. 1Nr point will be upstream while the other 1nr point will be downstream*	Preliminary Sum of Ksh 1 Million to be allowed for soil erosion control
Impacts on Air Quality	● Emissions of oxides of nitrogen (NO2 in particular) mainly from	**As general measures for all locations:** ● Develop a Dust Management Plan (DMP);	Contractor	● *Compliance level Dust Management*	Preliminary Sum of Ksh 1

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
	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.	● 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; ● Minimise 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		*Plan* ● *Services and inspection reports of plant and equipment* ● *Air quality monitoring report findings* ● *Number of complaints from community related to dust menace*	Million to be allowed for air pollution control

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
		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 minimise 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 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	Contractor	*Serviced plant and equipment to manufacturers specification*	Best Management practices with no direct cost

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
		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	According to data from the survey carried out for the ESIA, the vegetation cover within the well fields is limited to casuarina and coconut trees. 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 prioritised. 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 Camp, 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	● *Number of trees replanted as compensatory trees* ● *Status of reinstatement of completed sites*	Preliminary Sum of Ksh 500,000 to allowed for procurement and planting of compensatory tree seedling
Impacts on aquatic fauna	The impact will be cumulative in nature related to risk of pollution of river water from incidences such as oil / fuel spills from plant and equipment or increased sedimentation due to soil erosion could result to fish kill. In such cases, the kill will be associated with increased levels of COD or BOD beyond recommended levels. The magnitude of the impact is considered to be medium due to the fact that no significant sedimentation or pollution	● All forms of soil erosion such as sheet and rill erosion of soil shall be prevented where necessary through the use of sand bags, diversion berms, culverts, or other physical means. ● Activities shall be conducted to extend possible away from the river and natural storm water drains. ● All waste water which may be contaminated with oily substances must be managed in accordance with an appropriate Waste Management Plan (WMP). The measure	Contractor	● *Reports on cases of fish and other aquatic fauna reported.* ● *Waste management measures on site.* ● *Soil erosion prevention measures on site.*	Preliminary Sum of Ksh 100,000 to allowed water analysis and other related measures

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
	is anticipated from the Project	include containment before collection by NEMA licensed waste handlers for safe disposal. Such water contaminated by hydro-carbons will not be discharged into Sabaki 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.		● *BoD and CoD levels of Water in Sabaki River at the Project area of influence*	
Impact on private / community water pipes owned by community member	Risk triggering grievances from community members	● Mapping of all community water pipelines that travers through the Project area ● Issuance of adequate notice to owners of community water pipelines on intention to use the site ● Adequate reinstatement of community water pipelines after completion of works	Contractor	● *Number of complaints reported associated with community water pipeline destroyed* ● *Number of community water pipelines reinstated*	Preliminary sum of Ksh 500,000 for repair and reinstatement of such pipes
Disruption of Water Supply during construction of the works	Disconnection and re-connection of current pipelines from the individual wells before and after construction of the respective protection works surrounding each well will result to disruption of water supply to households depending on the water supply in Marereni, Gogoni, Mambrui, Sabaki, Malindi, Gede and Watamu Towns.	● Disruption of water supply to Marereni, Gogoni, Mambrui, Sabaki, Malindi, Gede and Watamu Towns due to Disconnection and re-connection of current pipelines from the individual wells before and after construction will be mitigated by MAWASCO through a robust water rationing program that will be communicated in advance to community members to allow them sufficient time to conserve and store water.	MAWASCO	● *Number of complaints from water users in the listed towns* ● *General situation of water availability in the listed town*	MAWASCO water rationing program – no cost implication

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
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 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	● 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 contractors and subcontractors and truck drivers as part of the induction process. ● Contractor will provide primary health care and first aid at construction camp 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.	Contractor	● *Number of incidences recorded on site and within communities* ● *Community satisfactory reports with regards to health and safety* ● *Reported and addressed grievances on site and from communities*	Preliminary Sum of Ksh 1 million to allowed for 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	● Contractor will develop a Human Resources Policy, which will outline worker rights to be included in all contracts including restrictions on working hours in line with applicable ILO standards, compensation including consideration of overtime, holidays etc. contractor will require its contractors and subcontractors to put in place policies in line with national legislation and applicable international legislation and contractor Code of Conduct and Policies.	Contractor	● *Number of incidences recorded on site and within workers* ● *Workers satisfactory reports with regards to health*	Preliminary Sum of Ksh 2 million to allowed for addressing Workers health and security impacts

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
	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 will establish contractual clauses (signed code of conduct) to be embedded in the contracts of the all sub-contractors that require adherence to Kenyan law and international standards to be upheld related to worker rights. ● Contractor will prohibit the use of alcohol or drugs, which could adversely affect the ability the employee to perform the work safely or adversely affect the health and safety of other employees, community members or the environment. ● Contractor and self-employed contractors will assess the H&S risks related with the tasks to be performed during the construction phase and provide corresponding prevention and management measures. ● Contractor will Provide first Aid kits and ensure availability of trained first aiders within the construction site. The ratio of trained first aiders to worker on site at any particular time should meet the threshold defined by the First Aid Rules under OSHA 2007 ● Pre-employment medical assessments will be put in place as a workforce risk management tool to screen individuals for risk factors that may limit their ability to perform a job safely and effectively. Expected benefits of conducting pre-employment medical assessments include a safer working environment, reduction in workplace injuries, minimized downtime, matching the capacity of the employee with the role, and overall recruitment cost and risk reduction. ● Contractor will ensure that training on health and safety measures is provided to all		*and safety* ● *Reported and addressed grievances on site and from workers* ● *Signed code of conduct*	

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
		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, contractors 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 develop and implement a Workers Grievance Mechanism for the Project workforce including contractors and subcontractors. ● 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. For works on/near water, such will also include availing of emergency rescue equipment like personal floating devices and having some designated rescue personnel among the workers available at any time works are in progress. ● Contractor will ensure that its Code of Conduct is followed to regulate the performance and behavior of all workers, including provision for disciplinary action for anti-social behavior and non-compliance with health and safety regulations such as lack of			

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
		use of PPE. ● Contractor will ensure that IFC/World Bank Health and Safety guidelines regarding the construction and management of worker accommodation and the provisions of medical facilities at worker accommodation are followed. ● 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 behavior, use of drugs and alcohol, operating hours, rest periods, community education on traffic safety and accident reporting and investigations. ● Contractor will develop a Waste Management Plan for the construction phase with clear guidelines for the safe storage and disposal of hazardous waste and handling of hazardous materials.			
	Labor Influx and gender exclusion risks	● The contractor will mainstream Gender Exclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 Gender Rule. ● The existing community structures headed by location chiefs should be involved in local labour hire, emphasize the requirement of hiring women, youth and people with disability and VMGs ● Protecting Human Risk Areas Associated with, Disadvantaged Groups, interfering with Participation Rights and interfering with Labour Rights: ● Recruit locals workers on locally available	Contractor	● *Numbers of locals hired to work for the project* ● *Cases of community complaints associated with labour*	Preliminary Sum of Ksh 2 million to allowed for addressing project social related issues

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
		unskilled, semi-skilled and skilled labour as much as possible to reduce labour influx ● Contractor to formulate and implement a labour management plan for his workforce; ● Contractor will be required to have a transparent external communication plan covering among others, how available opportunities will be advertised ● Consultations with the local council of elders to ensure that available opportunities are fairly distributed across different clan members ● Maintain a grievance register to log any complaints from workers and local community. ● As part of the C-ESMP that contractor to prepare a Labour Management Plan (LMP)that included mandatory requirement to procure all unskilled (and as much as possible, semi-skilled) labor as well as locally available materials from the local community while ensuring equal pay for equal work for men, women and people with disability			
	Sexual Harassment (SH) at the workplace	● The contractor will prepare a SEA/SH management plan that is complete with code of conduct to be signed by all employees, in a language that is understandable to them. ● The contractor SEA/SH management plan will be binding to the subcontractors and their employees as well. ● The contractor will develop and implement a clear human resources policy against sexual harassment that is aligned with national law	Contractor	Number of Sexual Harassment cases reported	Preliminary Sum of Ksh 2 million to allowed for addressing project social related issues

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
		● The contractor will integrate provisions related to sexual harassment in the employees Code of Conduct CoC ● The contractor will ensure appointed human resources personnel to manage reports of sexual harassment according to policy			
	Protection of Children	● The contractor will develop and implement a Children Protection Strategy that will ensures minors are protected against negative impacts associated by the Project including SEA. ● All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior ● Children under the age of 18years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014 ● Wherever possible, ensure that another adult is present when working in the proximity of children. ● Not invite unaccompanied children to workers home, unless they are at immediate risk of injury or in physical danger. ● Refrain from physical punishment or discipline of children ● Refrain from hiring children for domestic or other labor, which is inappropriate given their age, or developmental stage, which interferes with their time available for	Contractor Supervising Engineer	Number of cases reported involving abuse of children	Budget of Ksh 2million presented above

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
		education and recreational activities, or which places them at significant risk of injury. ● Comply with all relevant local legislation, including labor laws in relation to child labor specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation			
		●		●	
	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: o 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; o 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;	- Contractor - GBV Expert	● 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 whistlblower protection ● Monthly minutes from SEA coordination meetings	Budget of Ksh 2million presented above

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
		○ 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 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 whistleblower 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	Contractor and CWWDA	● 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 300,000 for awareness and purchase of condoms

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
		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 15 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;	Contractor and CWWDA	● Availability of SOP(s), Training material, PPE, sanitizing facilities ● No of workers sensitized on COVID-19 ● No of hand-washing facilities installed; facemasks and temperature monitors secured, etc.	Preliminary and General Sum of Ksh 300,000 for awareness and purchase of soap, sanitizers, temperature screening gadgets and face masks for workers.
	Spread of COVID-19 amongst community members during consultations processes	● Electronic means of consulting stakeholders and, holding meetings, whenever possible, shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced;	Contractor and CWWDA Stakeholder engagement Expert	● Number of participants invited for meetings ● Availability of SOP(s), Training material, PPE, sanitizing facilities ● No of workers sensitized on	Preliminary and General Sum of Ksh 500,000 to support communit

Risk	Anticipated Impact	Mitigation	Responsibility	Monitoring parameter	Budget
		● Avoid concentrating of more than 15 community members at one location. Where there are two or more people gathered, maintain social distancing at least 2 meters ● The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet; ● Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Ensure to provide and allow participants to provide feedback and suggestions; ● Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration. ● In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chat groups. ● Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants.		COVID-19 ● No of hand-washing facilities installed; facemasks and temperature monitors secured, etc.	COVID 19 prevention measure and purchase of soap, sanitizers, temperature screening gadgets and face masks for community members
		●		●	
Total Budget for Implementing the ESMP					Kshs 9.3 million
ARAP Budget					KShs 4,717,525

CHAPTER 9: FINDINGS AND PROVISIONS

9.1 Findings

The environment and social impacts assessment detailed specific baseline information of the Baricho well fields with specific focus on biophysical and socioeconomic conditions. The information was used as the basis of prediction of possible effects and also to monitor changes during construction and operation of the proposed additional works.

As summary of the findings is detailed below.

- Site activities such as excavations during site levelling clearing of vegetation for infrastructure such as access roads, laydown areas and construction zones and other related works could result to loosening of soils and ultimately result to sedimentation and siltation of natural storm water drainage channels that flow into Sabaki River.
- Un-serviced plant and equipment on site could result to oils and fuels leaks that could contaminate Sabaki River affecting aquatic organism at the sites of possible leaks.
- Project activities that have potential to impact air quality would be associated with construction from emissions of air pollutants from temporary power generators, construction equipment, and vehicles that trigger dust and particulate matter.
- Potential noise impacts may arise as a result of the construction activities associated with the construction of the protection works. However, construction activities and equipment are not expected to result in significant levels of vibration.
- There is no protected vegetation cover within the well fields that are considered fragile ecosystem, sensitive to changes to its components. However, stripping of vegetation cover will be on isolated cases to existing coconut and casuarina trees scattered within the river bank
- Increased project-related traffic, civil works for site preparation including site clearance and excavation and levelling, change to the environment due to 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 to both workers and community members.
- The proposed protection works will be undertaken within existing Sabaki River riparian within existing Baricho Well fields. However, a total of 2.82acres of land belonging to 12PAPs at the proposed 6m water pipeline route and 10m wide access road and pipeline route will be impacted. An abbreviated Resettlement Action Plan (ARAP) has been prepared separately, the ARAP provides compensation measures to the PAPs as required by OP 4.12 on Involuntary Resettlement. Additionally, the ARAP budget is provided as of **KShs3,425,484.80** (Three million, Four hundred and Twenty-five thousands and four hundred and eighty-four and eighty cents Only).

9.2 Provisions

The Environment and Social Management Plan (ESMP) prepared under this ESIA provides a budget of Kenya Shilling Nine Million Three Hundred Thousand (Ksh 9,300,000.00) for mitigation of environment and social impacts identified in this report.

The **Bid Documents** to be prepared for the proposed well protection works will incorporate the Environment, Social provisions discussed under Chapter 7 (Environment and Social Impact Assessment and Mitigation Measures). The Project contract document should include provisions for the contractor 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*
- ✓ *COVID -19 Protocols*

The project implementation team will prepare monthly reports on the progress of the C-ESMP implementation while ensure prompt reporting of serious accidents/incidents.

At Project completion stage, within the defects' liability Period, CWWDA should initiate an Initial Environment and Social Audit for the Project as required by EIA/EA Audit regulation 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 10: REFERENCES

Republic of Kenya, Environmental Management and Coordination Act (EMCA, Cap 387), and Subsequent Legislations including other legal statutes and detailed in chapter 5.

Water Distribution Master Plans for Water Service Providers (5 WSPs) in Mombasa, Kilifi, Taita Taveta and Kwale Counties (Mangat IB Patel 2017)

Kilifi County Integrated Development Plan (CIDP) 2018-2022

World Bank Operational Policies including OP 4.01, OP 4.11, OP 4.12 and WSDP EMSF and RPF

Effects Of Shoreline Change On Sandy Beach Environments Of Malindi - Mambrui area, northern Kenyan Coast, Abuodha, 1998-

The effect of rainfall variability and landuse/land cover change in a small tropical river basin in Kenya. Kitheka et al-2005

Technical Report on the pollution status of River Galana/Sabaki/Athi KMFRI-OH Natural Resource Management (NRM)-Management Report, May 2015

The birds of Gongoni Forest Reserve, South Coast, Kenya Maurice O. Ogoma, Broder Breckling, Hauke Reuter, Muchai Muchane and Mwangi Githiru

APPENDIXES

Appendix 1 Public Participation Minutes

Appendix 2 Chance Find Procedure

Appendix 3 Grievance Redress Mechanism (GRM)

Appendix 4: Incidence Reporting Log

Appendix 5: Lead Expert's Year 2021 Practicing License

Appendix 1 Public Participation Minutes

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) REPORT FOR BARICHO WELL FIELD PROTECTION WORKS.

MINUTES OF PUBLIC PARTICIPATION FORUM HELD ON THE 30TH MARCH 2021 AT LANGO BAYA ASSISTANT CHIEF'S OFFICE.

PRESENT:

Local Administration

Emmanuel Karisa Baya	Chief Lango Baya Location
Fredrick Chembe Charo	Assistant Chief Lango Baya Sub Location

Coast Water Works Development Authority Representative.

Patrick Syengo Kaluva	CWWDA

Consultant

Eng Patrick Wambuki	Engineer
Obra Mmaitsi	Environmentalist

Residents, Village Elders and Nyumba Kumi Representatives of Lango Baya Location - see attached list

KEY PROJECT DATA

Client/Employer	Coast Water Works Development Agency (CWWDA)
Financing Agency	World Bank

MINUTES

Item	Minutes	Action By
1.	**Introduction** The meeting was called to order by the Assistant Chief Lango Baya sub Location at 10.00 AM and a word of prayer done by a Village elder who was in attendance. The Assistant Chief welcomed the Chief Lango Baya Location to address the meeting. The Chief thanked residents who had created time to attend the meeting despite their busy schedules and short notice. He informed residents that Public *Barazas* were not yet open due to the Covid 19 Pandemic however, meetings touching on development could still be conducted under strict adherence to guidelines put in place by the Ministry of Health (MOH). The Chief reiterated the fact that Corona was still around and it was deadly. Residents were encouraged to avoid crowded places including entertainment joints where social distance is hard to be attained. He also discouraged residents who were still organizing funeral night vigils to stop it immediately, owners of music system used in such vigils were warned that if found the equipment will be confiscated and destroyed. The chief then welcomed CWWDA representative to give his remarks. CWWDA representatives thanked residents in attendance. He	Assistant Chief Lango Baya Sub location Chief Lango Baya Location CWWDA

	informed them that the proposed project was to do protection works around the boreholes within Baricho well field in order to prevent soil erosion in the event of heavy rains like the ones experienced in the year 2018. He later invited Eng. Patrick Wambuki to share more information about the proposed project.	Representative.
2.	**<u>Project Information</u>** Eng. Patrick Wambuki informed residents that the proposed project is world bank funded, the project client is Coast Water Works Development Authority that is under the ministry of Water and Sanitation. He further Informed them that the proposal was to do protection works around the boreholes within Baricho well field both up and downstream. The protection works entails raising of the borehole chamber wall this will prevent water ponding in the chambers in the event a flood occurs, there will also be extension of the gabions around the boreholes to reduce soil erosion that might lead to destruction of the boreholes and finally there will be raising of the access road leading to downstream boreholes. He welcomed the Environmentalist Mr. Obra Mmaitsi to address residents regarding environmental impacts and mitigation.	Eng. Patrick Wambuki – Consultant Representative.
3.	**<u>Environment and Social Safeguard Report</u>** The consultant environmentalist representative Mr Obra Mmaitsi informed the meeting that they were going to prepare *Environmental and Social Impact Assessment Report* (ESIA) that will capture all the environmental and social impacts of the project and provide mitigation measures. They were assured that all their opinions and concerns will be captured in the report so as to ensure the Project is acceptable by the community and also sustainable development is achieved.	Obra Mmaitsi Environmentalist
4.	**<u>Resettlement Action Plan (RAP)</u>** Residents were also informed that the project is planned to majorly be within the well field land however minor land extension might be necessary in order to fully protect the boreholes. Residents whose land will be affected will be identified all their assets including crops, trees captured and valued for compensation purposes. Loss of livelihoods by the PAPs will also be considered.	Obra Mmaitsi Environmentalist
5.	**<u>Question and Answer Session</u>** After discussion summarized above, the community were invited to a question and answer session under the guidance of the Assistant chief. Detailed questions and suggestion of the plenary session are presented in **Table 1** below **Table 1: Plenary Session**	

Suggestion / Question	Response
Mrs. Mwanakombo wanted to know what will happen in	The meeting was informed that compensation is normally done in terms of

	a scenario where the affected land has tenants farming on it will they be compensated for their crops.	land, crop, trees and structures. If tenants are farming on the affected parcel of land they will be compensated separately from the land owner.	Obra Mmaitsi Environmentalist
	Mr. Franklin wanted to know if the contractor will source for workforce within the community where the works will be implemented.	Residents were informed that all unskilled labour and some skilled labour will be sourced from the local community. Youths were encouraged to organize themselves into groups and avail themselves for consideration.	
	Samson Siri wanted to know what will happen to people who were pumping water from the river to irrigate their farms. He wanted clarification if the pipes will be damage or blocked by the proposed project.	Residents were informed that projects are not supposed to destroy sources of livelihood of the community therefore those doing farming using pumped water from the river will be given an allowance to pass their pipes and continue farming. If some pipelines are destroyed during construction, the contractor will reinstate.	Obra Mmaitsi Environmentalist
	Mr. Mwalimu Siri wanted to know if there will be any Cooperate Social Responsibility (CSR) that will be implemented under the project	Residents were informed that they were the ones to suggest what they would like to be done for them as part of CSR. It was agreed that they can suggest three projects so that the client can take the issue up and implement the most feasible one if possible.	Engineer Patrick Wambuki
	Mr. Gilbert Mwaringa wanted to know how compensation for land will be done and yet most of the residents did not have title deeds.	Residents were informed that before payments are done there will be consultations that will include the chief's office to identify the rightful owner of the property.	
	Mrs. Rehema Said wanted to know what will be done to ensure errors that occurred during the previous compensation process of people around the well field are avoided.	Residents were informed that the consultant will form a Grievance Redress Committee (GRC) comprising of youth, women, Vulnerable groups and People living with disability representatives that will work with the local administration to ensure real time resolution of emerging issues during the entire period of project implementation.	Obra Mmaitsi Environmentalist
6.	**<u>Closing Remarks</u>** The area assist chief assured the consultant that the youth within his area will avail themselves during project implementation period. He requested that renumeration for the employed youth should be revised upwards since the cost of living currently is high. He further assured the consultant that they welcome the project and that they will offer all the necessary support. There being no Any Other Business, the meeting adjourned at 12 noon by a word of prayer.		Assistant Chief Lango Baya Sub Location.

MINUTES CERTIFICATION

for **Chief Langa Baya Location**

Name..... E. K. BAYA .....

Date ..... 15.04.2021 .....

Signature..... .....

CHIEF
LANGOBAYA LOCATION
P. O. Box 1-80800, MALINDI
Date

Assistant Chief Lango Baya Sub Location

Name..... FREDRICK CHEMBE CHARO .....

Date ..... 15/04/2021 .....

Signature..... .....

ASST. CHIEF
LANGOBAYA SUB-LOCATION
LANGOBAYA LOCATION
DATE 15/04/2021

Consultant's Representative

Name.....

Date .....

Signature.....

SAMPLE PHOTOS OF THE MEETING

Chief Lango Baya Location Addressing residents.

Lango Baya Assistant Chief addressing residents.

CWWDA representative addressing residents

Engineer Patrick Wambuki Explaining Scope of works to residents.

***Residents following the meeting proceedings*.**

A resident asking questions.

ATTENDANCE LIST- LANGO BAYA LOCATION

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR PROPOSED PROTECTION OF BARICHO WELL FIELD

PUBLIC CONSULTATIVE FORUM

ATTENDANCE LIST

Date: 30/3/2021 Venue: Assistant Chief's office Lango Baya

S/No	Name	Village/Designation	Telephone	Sign
01.	EMMANUEL KARISA BAYA.	CHIEF- LANGOBAYA LOC.	0714356600	
02.	FREDRICK CHEMBE CHARO	ASST. CHIEF LANGOBAYA	0705951316	
03.	PATRICK SYENGO KALUVA	COAST WATER WORKS STAFF	0797898767	
4	JOSEPH YAA YERI	Resident – Langobaya	0729164540	
5	REHEMA KITSAO SAA	"	0714831615	
6	KANGOMBE CHANGAWA BOKOLE	"	0769743040	
7	OHESMUS L MWSHO	"	0717487156	
8	FRANKLIN F KAINGU	"	0711527146	
9	JANET D. GEORGE	"	0743591670	
10	SAFARI NOTI	"	0724050099	
11	JAPHET CHANGA	"	0705871791	
12	MWANAKOMBO A BAMBAULO	"	0725893429	
13	Ewan Mapesi Thoya	"	0722458383	
14	WILLIAM S. BAYA	Resident – Langobaya	0726162172	
15	Charo Yeri	"	0700191411	
16	EVALINE K CHENGO	"	0715771949	
17	NICODEMUS CHARO KENGA	"	0726687565	
18	Joseph Kalama	"	0729909708	
19	Anderson Kitha Thoya	"	0700694151	
20	KAHINDI MITSANZE MWAMURE	"	0704976512	
21	HANNINGTON MWALUGHA	"	0746518124	
22	SAMSON SIRYA THOYA	"	0713472152	
23	LOICE DZENDERE GUNGA	"	0746646412	
24	JOSPHINE DZENDERE KITSAO	"	0111758375	
25	KAVUMBI KARISA GARAMA	"	0727293462	
26	TABU BAHATI KITSAO	"	0708433325	
27	Oscar Maneitsi	Environmental St.	0729766004	

Records of Key Informant Interviews

Key informant interviews were carried out with the Kenya Rural Roads Authority (KERRA) and Water Resources Authorities (WRA) to gain more information on the road bridge under construction and available flow data along the River Sabaki.

Kenya Rural Roads Authority
The consultant was introduced to Kenya Rural Roads authority vide CWWD letter reference CWSB/BARICHOBH/433/VOL.1/61 (a copy attached for reference). They sort to know the following regarding the bridge under construction after explaining the CWWDA intention of protection its well along River Sabaki where 4 of the well are close to the bridge:

- The extent of the bridge components (foundations and embankments) relative to the wells
- The foundation extent,
- The final road level when complete,
- The interaction of the bridge with the existing boreholes as well as the pipeline, and
- The period of the contract

We were directed to get all information on the bridge from the Constant Engineer supervising the Road and bridge construction from the **Resident Engineer, Eng. S. K. Tangus of Otieno and Ondongo Consulting Engineers** by the Regional manager at Mombasa.

The Resident Engineer informed us as follows:

1. The foundation piles extended up to 40m below ground level and hence were not interfering with the boreholes since they were far and the screens are below 40m
2. A pipeline from Borehole one fell under the bridge embankment and this was replaced with one that was routed under the bridge and when CWWDA shall be ready they shall just connect into the new pipeline
3. The Road level at the bridge shall be level 59.600masl when finished, and
4. The Road and bridge construction was reported to extend to April 2022 but he was sure the Beams under construction would have already been removed.

REF: CWSB/BARICHO BH/433/VOL. [#1]

22nd October 2020

DIRECTOR GENERAL,
Kenya Rural Roads Authority - KeRRA,
Barabara Plaza-JKIA, Block B
Off Airport South Road, Opp. KCAA
Along Mazao Road Opposite Aviation House
P.O BOX 48151-00100
NAIROBI.
Email: info@kerra.go.ke / dgkerra@kerra.go.ke

Dear Sir,

RE: CONSTRUCTION OF BARICHO BRIDGE AND THE APPROACH ROADS – CONTRACT No: KeRRA/011/39/21/2017/2018

Request for Detailed Design Drawings

Reference is made the above subject matter.

Coast Water Works Development Agency (CWWDA) has engaged G. Karavokyris & Partners Consulting Engineers in joint venture with Structural Reinforcement Components Ltd to offer consultancy services for detailed design and construction supervision of the Baricho well-field protection works.

To enable them carry out hydraulic modelling of Baricho river, we request you to provide us with details of the bridge foundations and abutments including the superstructures. We also take this opportunity to introduce the consultant's team to you for any other information that they may require from your office concerning the bridge works.

The consultant's team shall be represented locally by Eng. Patrick Wambuki of Structural Reinforcement Components Ltd.

Yours faithfully,

Jacob K. Tonui
Chief Executive Officer

Copy to:

P.O. Box 90417-80100
Mombasa Kenya

Tel: No. 041 - 2315230

Email: info@cwwda.go.ke
Website: www.cwwda.go.ke

Introduction letter to KERRA from CWWDA

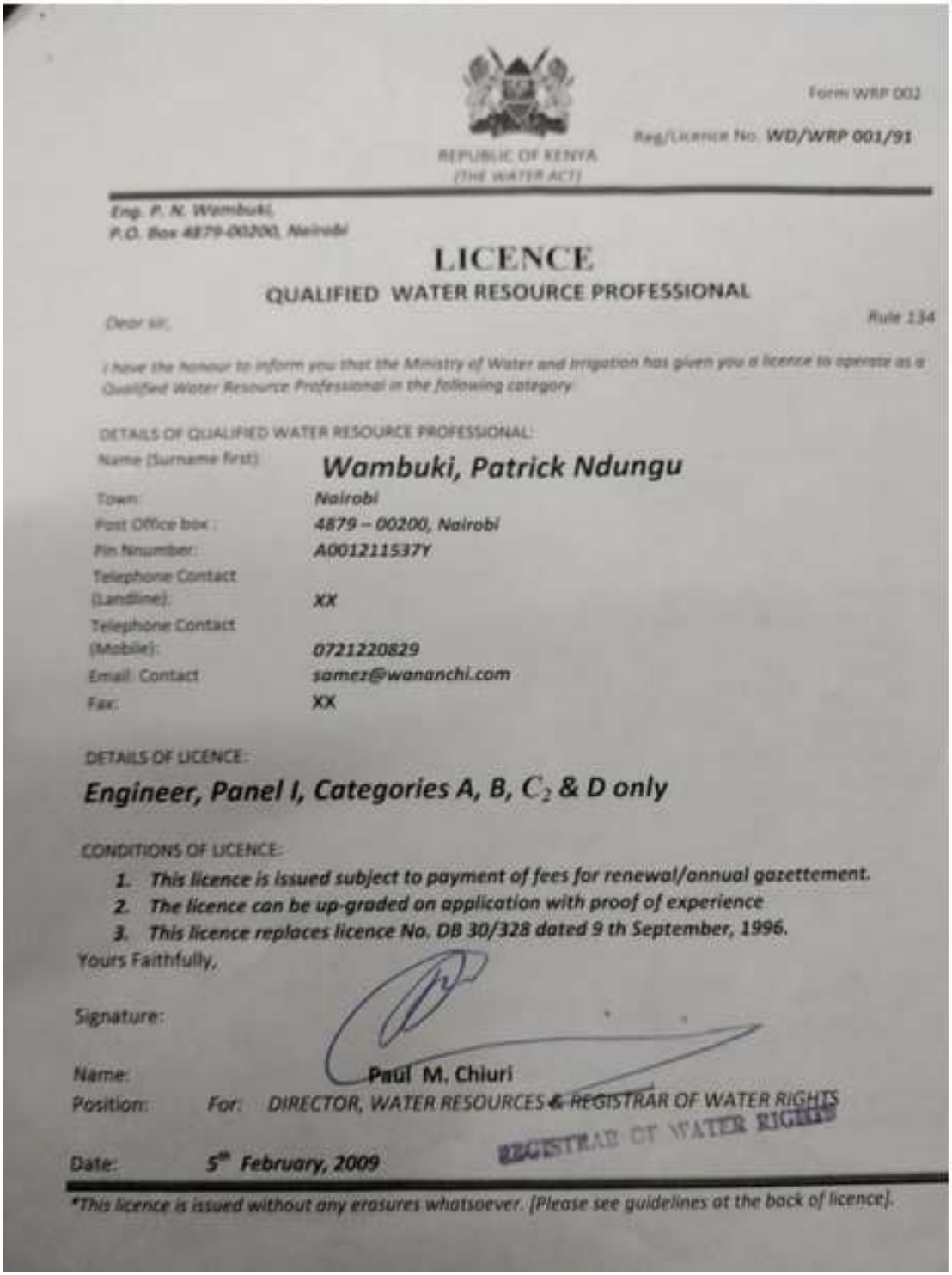
Water Resources Authority

Through Mr, Patrick Wambuki a Qualified Water Resources Authorized Profession Reg license no. WD/WRP001/91 (a copy attached for reference) explained the objectives of the project to the **Sub-Regional Manager Mr Ahmed Mobarak** and sort to know from Water resource Authority the following:

1. Their requirement authorisation such for work to be done along River Sabaki
2. The Sabaki flow data they may have in their archives that can assist as in establishing the river flow regime,

Mr Mobarak reported the following:

- The work we intending to do was mainly on land reclamation and they require the design report and drawings to assess the extent and if it meets their requirement they shall have no problem to authorise its construction
- They reported that they had data from various River flow station and we identified data from three stations that we acquired.



Form WRP 002

Reg/Licence No. WD/WRP 001/91

REPUBLIC OF KENYA
(THE WATER ACT)

Eng. P. N. Wambuki,
P.O. Box 4879-00200, Nairobi

LICENCE

QUALIFIED WATER RESOURCE PROFESSIONAL

Dear sir,

Rule 134

I have the honour to inform you that the Ministry of Water and Irrigation has given you a licence to operate as a Qualified Water Resource Professional in the following category

DETAILS OF QUALIFIED WATER RESOURCE PROFESSIONAL:

Name (Surname first):	**Wambuki, Patrick Ndungu**
Town:	Nairobi
Post Office box :	4879 – 00200, Nairobi
Pin Nnumber:	A001211537Y
Telephone Contact (Landline):	XX
Telephone Contact (Mobile):	0721220829
Email Contact	samez@wananchi.com
Fax:	XX

DETAILS OF LICENCE:

Engineer, Panel I, Categories A, B, C_2 & D only

CONDITIONS OF LICENCE:

1. **This licence is issued subject to payment of fees for renewal/annual gazettement.**
2. **The licence can be up-graded on application with proof of experience**
3. **This licence replaces licence No. DB 30/328 dated 9 th September, 1996.**

Yours Faithfully,

Signature:

Name: Paul M. Chiuri

Position: For: DIRECTOR, WATER RESOURCES & REGISTRAR OF WATER RIGHTS

REGISTRAR OF WATER RIGHTS

Date: 5th February, 2009

*This licence is issued without any erasures whatsoever. [Please see guidelines at the back of licence].

APPENDIX 2: CHANCE FIND PROCEDURE

CHANCE FIND PROCEDURES

Policy and Legal Provision

World Bank OP 4.11 on Physical Cultural Resource and National Museums and Heritage Act 2006 laws of Kenya provides for; *'if you believe that you may have encountered any archaeological materials or any material national importance stop work in the area and follow the procedure in the box below'*

Chance Find Procedure

(i) All construction activity in the vicinity of the remains is to cease immediately.
(ii) The Supervising engineer or Environment Officer shall contact Kenya National Museums Immediately

Public relations:
E-mail: publicrelations@museums.or.ke
Director General:-
Email: dg@museums.or.ke
Fax: +254 -20-3741424
Tel:+254-20-8164134/35/36

(iii) The find location will be recorded and all remains will be left in place.
(iv) Potential significance of the remains will be assessed and mitigative options will be identified.
(v) If the significance of the remains is judged to be sufficient to warrant further action and they cannot be avoided, then the Director of Kenya National Museums will determine the appropriate course of action
(vi) In the case of human remains, if the remains are assessed to be archaeological, then Director of Kenya National Museums will determine how to handle them.
(vii) Options could include avoidance or respectful removal and reburial.
(viii) If human remains are encountered and they are not archaeological, then Malindi County Government will be contacted immediately for appropriate reburial.

Appendix 3: Grievance Redress Mechanism (GRM)

Grievance Redress Mechanism

During the implementation of the project activities, it is likely that disputes or disagreements between the project implementers and the affected persons or general stakeholders may occur. Such disputes may come about in terms of boundary complaints, dispute over water abstraction, pollution related disputes, ownership of crops or land, the use of land and properties, compensation values, delay in disbursement of the compensation packages and so on.

Because disputes are inevitable despite these efforts, it is necessary to establish channels through which aggrieved people could file their complaints so as to ensure successful project development and implementation. The grievance redress procedures will provide opportunity for stakeholders to settle their complaints and grievances amicably.

Anticipated types of grievances

In the context of this project, grievances could arise from: (list is illustrative only) Disputes over water abstraction Pollution related disputes Misidentification of owner/occupier of eligible property and assets; Errors in asset assessments; Disputes over plot limits, either between the affected person and the Project, or between two neighbors; Complaints about entitlement policy of the project; Disagreement of asset valuation; Disagreement on entitlement and ownership; Disagreement of time and manner of compensation

General principles and key aspects

The Project will put in place an extra-judicial mechanism for the management of grievances and disputes based on mediation by third parties. Each of the affected persons and stakeholders will be able to trigger this mechanism, while still being able to resort to the judicial system in the event of failure.

Key aspects of the grievance mechanism are:

The public need to be informed about the grievance mechanism and how they can make use of this process. The public will be informed via safeguards documents disclosure process and through community meetings conducted by the PIU in cooperation with the local resettlement committees:

Grievances will be recorded by using a Grievance Form (in local language, also available in English). Forms will contain details regarding the grievance as well as the name and address of the applicant, application date, type of application and the name of the persons receiving the grievance. The forms will be logged in a register where they will be tracked through to a suitable resolution.

The CWWDA PIU will maintain a digital grievance database, containing the logs and records of all grievances received, with an indication of the respective status of a grievance (i.e., resolved, not resolved, pending etc.)

After registration of the complaint, the committee members will carry out an investigation to verify its authenticity. Thereafter a resolution approach will be selected based on the findings. The decisions of the action to be taken or taken will be communicated to all involved parties mainly in written form.

All measures will be undertaken to ensure that the grievance is solved amicably and privately between the concerned parties and the courts will be the last resort. Efficiency in solving of the grievances will be of paramount importance

Resolution options will be developed through unilateral proposal, bilateral discussion and/or third-party mediation. If a complaint is not legitimate the case will be closed without agreement with the complainant. Any response will be communicated clearly either orally or in writing, and a legitimate grievance case will only be closed when an agreement with the complainant is reached.

Affected people will be offered access to third party legal advice, through a qualified lawyer; this lawyer will be available at the PIU on site office on a regular base; legal advice will be at no costs; information on the possibility of access to legal advice will be communicated to the affected people;

Project Grievance Redress Tenets

The following tenets underlie the grievance redress mechanism:

- Stakeholders will be fully informed of their rights and of the procedures for addressing complaints whether verbally or in writing during consultation, survey, and at the time of compensation;
- Each grievance will be registered, its receipt acknowledged, and tracked until closure;
- All grievances will be processed and responded to within a reasonable period of time;
- The overall objective is to avoid resorting to judicial action for as many grievances as possible.
- Language, literacy and gender will not be an impediment for complainants.
- Presentation of complaints will not incur undue costs to the complainant.

The contractor will employ a Community Liaison Officer who will be responsible for collating written complaints and co-coordinating responses to all complaints. Both verbal and written complaints are to be entered into a Grievance Complaint Log

When receiving a complaint all employees shall refer the complainant to the Community Liaison Officer (CLO) or the resident engineer. The person receiving a complaint shall ensure that the Grievance Complaint Log is completed. The form shall then be forwarded to the Community Liaison Officer who will assign it a number. The Community Liaison Officer shall ensure that all actions are made to close out the complaint.

Information on proposed corrective action sent to complainant (if appropriate); the date the complaint was closed out; and Date response sent to complainant. All complaints shall be responded to in writing, though a verbal response will be provided as well if this is more appropriate in the circumstances (e.g., where the complainant cannot read). All complaints must be responded to within two weeks of being received, even if the response is just a summary of what is planned and when it is likely to be implemented. Further correspondence should be given once the complaint is closed out.

The CLO through the contractor will be responsible for providing CWWDA with a Monthly report detailing the level of complaints and any outstanding issues to be addressed. Monthly reports will include analysis of the type of complaints, levels of complaints and action taken

to reduce complaints. The CLO shall file all documentation related to complaints in a file in his office.

Grievance Management Roles and Levels
A five-tier system for reviewing and settling grievances will be used. The specific roles of the GRMs in each level is highlighted below, however, in summary among the roles they will take up include[8]: -

Ensure that all conflicts and grievances are resolved through facilitation
Play a crucial role in documenting, reporting, and following up, referring and resolving stakeholder grievances

Specifically handle issues and grievances of vulnerable groups as identified in this stakeholders
Promptly address the grievances raised by stakeholders with regards to resettlement and compensation

First Level: Village Grievance Redress Committees (VGRC)
The project affected area VGRC will be established. All the matters not resolved in the first level, will be escalated by the SLGRC to the VGRCs. The composition of the VGRCs will include: 2 Elders, 1 youth 1 woman and 1 Local Leader rep including 1 Vulnerable PAP rep

Second Level: Sub Location Grievance Redress Committees (SLGRC)
The project affected area has 1 sub location, a SLGRC will be established. All the matters not resolved in the first level, will be escalated to the SLGRCs by the VGRC.

The composition of the SLGRCs will include: -

- The area Assistant chief
- Village Administrator
- One Village Elder
- One project affected youth,
- One project affected woman,
- One project affected male
- A representative of vulnerable PAHs
- CWWDA Social Specialist
- Contractor's Social Expert
- Supervising Engineer's Social Expert
- Project affected representative from a religious institution

Third Level: Sub County Grievance Redress Committee (SCGRC)
The project area falls under 1 sub County and there will be established a Sub County Grievance Redress Committee at Sub county Level.

Composition of members is as follows: -

- Deputy County Commissioner

[8] The committees will convene only when representation to the meeting is by all the offices listed under each of the committees.

- Assistant County Commissioner
- Sub-County Administrator – (political representation)
- County Surveyor
- County Land Adjudication Officer
- One project affected Vulnerable PAH
- Representative from a CBO
- Representative from an NGO
- Representative from a Religious Institution
- CWWDA Social Specialist
- Social Development Expert

Fourth Level – County Grievance Redress Committee (CGRC)
All cases that are unresolvable by the SCGRC will be handled by the County Grievance Redress Committee (s). The project falls in one County (Kilifi) and as. Composition of members is as follows: -

- County representative
- National Government representative
- County Legal Officer
- CWWDA Social Specialist
- NLC County Co-ordinator
- PIU Social Safeguard Specialist

Fifth Level – Resort To Justice
The Environment and Land Court Act 2012 provides a legal redress mechanism for all land related disputes through the Environment and Land Courts established in each County. Any PAH will have the right to register complaints/grievances to ELCs at any time without pursuing the alternative grievance redress process proposed in this GRM if they so wish without prejudice.

Grievance Redress Committee Members Appointment
The GRMC members will be appointed through an electioneering process where the members will be appointed through elections to be organized by the CWWDA with the support of the local and county government.

Grievance Redress Disclosure, Registration and Monitoring
The community members need to be informed about the GRM and how to submit a grievance in advance. Disclosure will inform people about availability of the Grievance Redress Mechanism, its purpose and how a grievance can be submitted. In addition, a brief description of the Grievance Mechanism procedure can be provided and contact persons publicized to the community. This may be done through the following methods:

- Display of posters in public and accessible locations in villages;
- Announcements in social gatherings such as churches, community meetings, barazas etc.
- Preparation and dissemination of a brief leaflet in local languages

Steps in Grievance Redress

The steps hereunder are proposed for this GRM.

Step 1. Grievance Submission
The secretary of each committee will be nominated to act as the 'Grievance Officer' at each level. When a grievance is received (either verbally or in written form) it is recorded in the Grievance Form by the Grievance Officer If a grievance does not relate to the land acquisition and compensation process, the Grievance Officer will contact the complainant and provide the details of the appropriate person or organization to address the grievance. This type of grievance will be marked as ineligible and closed out. Eligible grievances will be escalated to Step 2.

Step 2. Registration and Categorization
The Grievance Officer will record all eligible grievances received in the Grievance Database – the database may be maintained in 'soft 'or 'hard' versions - by means of the Grievance Tracking and Close-Out Form The Grievance Officer will assess the significance of the grievance and allocate it to one of the following categories:

- Critical Priority: potential for significant breach of national legislation or World Bank policies and/or negative media attention or a local, isolated or 'one-off' grievance that may affect the interests of a community to the extent that livelihoods of a considerable number of its inhabitants are jeopardized in the near term;
- Medium Priority: widespread and/or ongoing repeated grievance, for example, relating to 'unfair valuations' or a local, isolated or 'one-off' grievance that may affect the interests of an individual, or household to the extent that livelihoods are jeopardized in the near term; and
- Low Priority: a local, isolated or 'one-off' grievance with no significant reputational or livelihood implications.

The Grievance Officer will forward the grievance to the right GRM level but he remains responsible for tracking the grievance and ensuring that all parties are informed about all matters affecting their case at their level from beginning to end.

Step 3. Investigations
An investigation will be conducted into the grievance. The project will aim to resolve any grievances within 30 days from the date of receipt. This timeframe can be extended to 90 days for more complex grievances, if required. The grievance investigators may adopt the following steps;

- Hold initial consultations with the complainant to gain a first-hand understanding of the grievance
- Undertake a site visit to clarify the parties and issues involved.
- Gather the views of other stakeholders, if necessary and identify initial options for settlement that parties have considered.
- Inform the complainant of the expected timeframe for resolution of the grievance.
- Enter the findings of the investigation in the Grievance Database

Step 4. Decision on Grievances
All grievances must be responded to within 5 working days of being received, even if the response is only a summary of what action is planned and when it is likely to be implemented, or an explanation of why action is not required (essentially, this is a decision stating that the

grievance is not valid). The response must be in writing, though a verbal response will also be provided where appropriate. If a grievance was submitted anonymously (for example, through a grievance box), the Grievance Officer will make public, via public barazas, the results of the investigation and the proposed action. Details of a proposed or already implemented action to resolve a grievance must be conveyed to the complainant within 14 calendar days of receipt of the grievance. Complainants will be asked to give their response to the proposed/implemented action and confirm their acceptance – or not (a decision must be made within 5 working days).

Step 5. Appeal
If a resolution cannot be obtained, the Grievance Officer will, after receiving full and unequivocal consent from the complainant, refer the unresolved grievance to the next level GRC.

Step 6. Grievance Resolution and Close-Out
When specific actions are agreed upon, the Grievance Officer will be responsible for ensuring that proposed actions are implemented.

If no further action is required or can be taken, then the grievance will be closed. Closure of a grievance does not automatically mean that the complainant is satisfied with the action taken. It means that the complainant agrees that action has been taken by the project to address the grievance. When closing out, it is important to ensure full proof of close out based on fully documented evidence of the resolution process including:

- Written internal record internally, with the date and time it took place, and sign off by responsible staff;
- Photographs documenting the resolution if relevant; and
- Written confirmation of the complainants' agreement with the resolution.

Step 7: Monitoring evaluation and reporting
Good record keeping of complaints raised throughout Project implementation is fundamental in grievance monitoring. The Grievance Officer will be the focal point for all data touching on grievances.

On receipt of grievances, electronic notification to management must be distributed. Grievance records must be made available to management at all times. Monthly internal reports will be compiled by the Grievance Officer and distributed to the management team.

As part of the grievance monitoring the project will implement a process to analyse grievances. This will ensure wider actions are taken where required to solve root problems causing grievances rather than just individual grievances. PIU will also develop performance indicators to evaluate the grievance management process.

Grievance Redress Hierarchy

Figure below shows the grievance redress hierarchy.

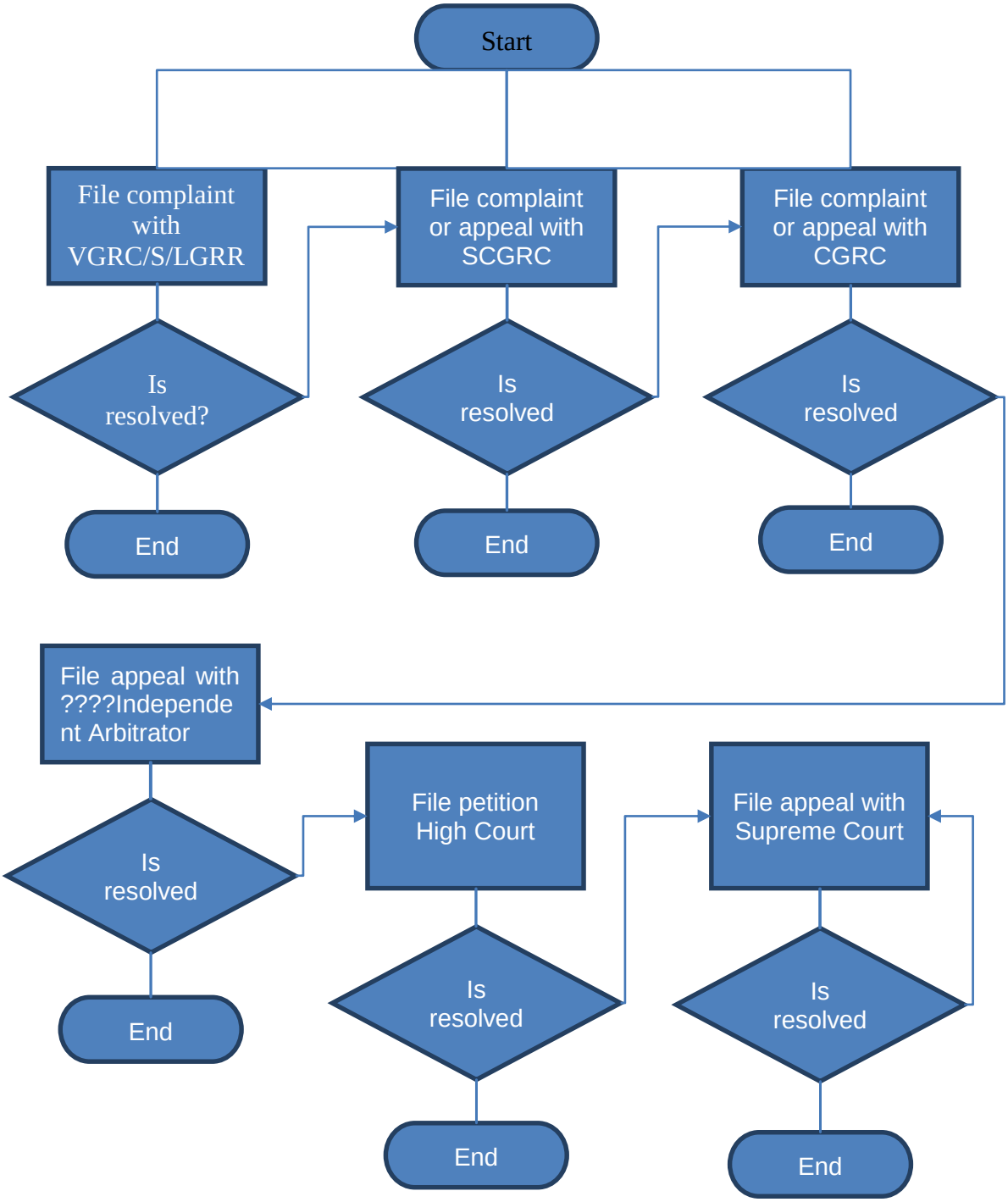


Figure shows the grievance redress hierarchy

Appendix 4: Incidence and Near Misses Log

	DATE
	NAME OF THE PERSON/EQUIPMENT
	LOCATION (CH)
	ACCIDENT DETAILS/NEARMISS DETAILS
	NEAR MISS
	MINOR ACCIDENT
	MAJOR ACCIDENT
	FATALITY
	COMMENTS /PROPOSED CORRECTIVE ACTIONS

Appendix 5: Lead Expert's Year 2021 Practicing License

FORM 7 (r.15(2))

nema
mazingira yetu | uhai wetu | wajibu wetu

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/13777

Application Reference No: NEMA/EIA/EL/18256

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: **1/20/2021** Expiry Date: **12/31/2021**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001: 2008 Certified