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REQUEST FOR EXPRESSION OF INTEREST (REOI)
(Consulting Services – Selection of Firm)

Country: Republic of Rwanda

Project Title: Rwanda - Kigali Climate Smart Wastewater Management Project (Project Preparation Special Fund – PPSF).

Client: WASAC Development Limited, Government of Republic of Rwanda

Grant No.: AIIB Grant No S0942A

Contract No and Title: KMP-PPSF-Firm-1 - Consultancy Services for the preparation of Feasibility Studies, Environmental & Social Impact Assessment (ESIA) and detailed engineering designs (DED) for Kigali Climate Smart Wastewater Management Project (KCSWMP).

REOI Reference: KMP-PPSF-Firm-1-REOI

1. The Government of Republic of Rwanda has received financing from the Asian Infrastructure Investment Bank (AIIB) toward the cost of preparation of the proposed Rwanda Kigali Climate Smart Wastewater Management Project (PPSF project) and intends to apply part of the proceeds for consulting services (Services). The PPSF project shall be prepared by Ministry of Infrastructure as the Project Implementation Agency and WASAC Development Ltd (WASAC) as the Project Execution Agency.

2. WASAC now invites qualified and experienced Consulting Firms to express their interest in providing the Services (EoI). The detailed Terms of Reference (TOR) for the assignment can be found at the following websites: www.wasac.rw ; www.aiib.org or can be obtained at the address given below. The Consulting Firm shall be selected in accordance with the AIIB's Procurement Policy (June 26, 2024, as amended from time to time) and AIIB's Directive on Procurement Instructions for Recipients (July 26, 2024, as amended from time to time).

3. Interested Consulting Firm shall provide specific information in the Expression of Interest (EoI) demonstrating that it has the required qualifications and relevant experience to perform the Services, as defined in this REOI. The EoI shall include a covering letter from the Consulting Firm expressing interest in providing the Services, either as a sole applicant or as the Lead Firm in a Joint Venture (JV) and summarising the Firms (or Joint Ventures) EoI. The EoI shall be evaluated for its compliance with the qualification criteria defined in this REOI.

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4. The Consulting Firm shall meet the following minimum qualification criteria:

Criteria	Qualification
Eligibility (EoIs not meeting this criterion will be rejected)	Consulting Firm or any Firm in case of JV shall not be debarred by AIIB / No Conflict of Interest.
Firm's Capacity	(a) Consulting Firm or Lead Firm in case of JV shall be in continuous operations for last Twenty (20) years minimum in the core business of providing consulting engineering services for infrastructure projects.
	(b) Consulting Firm or Lead Firm in case of JV shall provide at least 3 (three) documented relevant references of consulting assignments with similar scope of services over the last 10 (ten) years of operations.
Firm's Specific Experience	(a) Consulting Firm or Lead Firm in a JV has experience of providing engineering consulting services in water or wastewater or equivalent sectors in last 10 (ten) years.
	(b) Consulting Firm or any firm in case of JV shall have completed with Client's acceptance of deliverables, at least 3 (three) assignments, with similar tasks as defined in the ToR for this assignment such as preparation of Feasibility Study Report (FSR) or detailed project reports, ESIA and/or developing detailed engineering designs & drawings for wastewater or water reuse or equivalent projects in the last 10 (ten) years. At least one of the above three assignments shall have a minimum consulting contract value of USD 1.25 Million (USD One Million and Two Hundred and Fifty Thousand) or equivalent.
	(c) Consulting Firm or any firm in case of JV shall have experience of completing work on at least 1 (one) project in the wastewater or water reuse sector with similar scope of work, which was financed by multilateral development banks or by international development partners in the last 10 (ten) years.
	(d) Firm or Lead Firm in case of JV shall have completed at least one assignment with similar scope of work in Rwanda or in any country in Africa in last 10 (ten) years.

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5. A Consulting Firm may associate with other firms to enhance their qualifications but should indicate clearly whether the association is in the form of a joint venture and/or a sub-consultancy. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected.

6. A Consulting Firm or JV will be selected in accordance with the Quality and Cost Based Selection (QCBS) method.

7. Duration of the contract shall be 12 (Twelve) Months from date of signing of the Contract.

8. Further information can be obtained by writing at the address below during office hours from 9:00AM to 5:00PM Rwanda time or by email at the address below.

9. Expressions of Interest shall be submitted in writing at the address below or electronic copy to the email address below before 30/09/2025 at 5:00PM Rwanda time.

Attention: WASAC Development Ltd
Procurement Management Office:
Procurement Manager
3rd Floor
P.O Box 2331 KN4 Av 8, Centenary House, HQ, Nyarugenge District, Kigali City, Rwanda
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Dr Asaph KABAASHA
Chief Executive Officer
WASAC GROUP

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GOVERNMENT OF REPUBLIC OF RWANDA

WASAC DEVELOPMENT LIMITED
(Subsidiary of Water and Sanitation Corporation Group Limited (WASAC), Ministry of Infrastructure, Government of Rwanda)

KIGALI CLIMATE SMART WASTEWATER MANAGEMENT PROJECT (KCSWMP)

Grant No.:	S0942A (Project Preparation Special Fund)
Assignment/Project Title:	Consultancy Services for preparation of Feasibility Study, Environmental & Social Impact Assessment (ESIA) with required E&S management instruments, and detailed engineering design (DED) for Kigali Climate Smart Wastewater Management Project (KCSWMP).
Locations:	Kigali City and Gasabo District, with travel to other locations in Rwanda as necessary to meet the objectives of the Assignment.
Assignment Duration:	12 Months
Assignment Type:	Firm
Selection Method:	International Open Competitive Selection (IOCS) - Quality and Cost Based Selection (QCBS)

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Terms of Reference for Feasibility Study, Environmental & Social Assessment (ESIA) and Detailed Engineering Designs (DED) Services

I. PROJECT BACKGROUND

1) The Republic of Rwanda (Rwanda) is a sovereign state in Central and East Africa. Rwanda is divided into five provinces - Northern Province, Western Province, Kigali City, Eastern Province, and Southern Province. Kigali is the capital city of Rwanda and is an economic, cultural and transport hub with an administrative area of about 730 sq. km and a population of approximately 1.7 million as per 2022 census. Kigali is divided into three Districts - Gasabo, Nyarugenge and Kicukiro.

2) Rwanda has committed to achieve 100% sanitation service coverage by year 2030 according to Sustainable Development Goals. The National Water and Sanitation Policy establishes a framework for sustainable management and cost-effective provision of safe sanitation services to all. The policy provides a strategic direction to address challenges faced by the sanitation sector, which include insufficient sanitation infrastructure, especially waste treatment facilities for both solid and liquid waste, increased negative impact of climate change on water resources, water supply and sanitation, limited financial resources and lack of well-trained human resources to strategically plan, invest in and operate Centralized Sewerage System.

3) The Government of Rwanda (GoR), through the Ministry of Infrastructure and WASAC Development Limited (WASAC), has planned to implement several projects in all five provinces of Rwanda to achieve universal access to improved sanitation and to promote good health of communities through adoption of climate smart wastewater treatment technologies. GoR, with support of the African Development Bank, had prepared the Rwanda Transformative and Sustainable Water and Sanitation Program in 2023. One of the key planned projects under the Program was the Kigali Climate Smart Wastewater Management Project (KCSWP).

4) One of the key objectives of KCSWP was to provide an effective and sustainable wastewater treatment solution for Kigali. KCSWP would also minimize pollution of the water bodies within its project area and water pollution of all the rivers located downstream of the project area such as Nyabugogo River, Nyabarongo River, Akagera River and Lake Victoria. KCSWP included climate mitigation measures to reduce greenhouse gas emissions, improve public health and environmental quality and support Kigali's ambition to become a green and resilient city by limiting the carbon footprint of the city.

5) Wastewater generation in Gasabo district of Kigali is increasing every year mainly due to rapid urban population growth. Most people in Gasabo district rely on pit latrines and septic tanks. WASAC has, therefore, proposed to prioritize preparation and implementation of KCSWP as relevant for Gasabo district of Kigali.

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6) GoR has approached Asian Infrastructure Investment Bank (AIIB) for project preparation and financing support of KCSWP. KCSWP shall have the following components:

a) **Component 1 – Design and Construction of Wastewater Conveyance System or Sewerage System using Climate Smart, Climate Resilient Designs:** This component entails full design and installation of new wastewater conveyance (sewerage) system and connection of existing semi-centralized sewerage system and includes provision of house service connections from the new wastewater conveyance system in the Gasabo district of Kigali. The design of this component will maximize utilization of natural drainage to allow wastewater flows by gravity, with minimum pumping and shall include nature-based solutions that enhance or expand existing Kigali wetlands.

b) **Component 2 – Wastewater Treatment and Re-use of Treated Wastewater:** This component includes construction of wastewater treatment plant connected to the new wastewater conveyance system in Component 1, treatment and safe disposal of septage sludge in an environmentally sustainable manner and water supply system for re-use of treated wastewater, thereby reducing demand for freshwater.

c) **Component 3 - Project management and capacity building:** This component supports strengthening of institutional capacity of relevant central and local agencies, including WASAC Development Ltd, this include purchase of license of software to be used the during the design for key project team of WASAC, for project implementation and operation & maintenance of infrastructure assets. It shall also support project management, construction supervision and monitoring & evaluation of infrastructure investments in the Investment Project. Under this component, the consultant will identify the required materials and equipment including but limited to jetting equipment, spare parts, etc., provide their specifications in addition to the list of chemicals.

Infrastructure interventions included in Component 1 and Component 2 shall hereinafter be referred to as the Investment Project.

II. OBJECTIVES OF THE ASSIGNMENT

1) WASAC seeks to engage a qualified Consulting Firm to carry out Feasibility Studies, prepare an Investment Project Proposal, Project Implementation Manual (PIM), detailed engineering designs, Resettlement Action Plan (RAP), conduct an Environmental and Social Impact Assessment (ESIA) and prepare the corresponding E&S management instruments (ESMP, RP, IPP, as applicable) including carrying out the required procurement tasks as specified in the ToR and undertake climate assessments including Climate Risk and Adaptation Assessment (CRA) and GHG calculation.

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2) The Consulting Firm (hereinafter referred to as the Consultant) shall support WASAC to prepare the Investment Project with sufficient readiness for the purpose of obtaining GoR's approval for project implementation and for processing AIIB's Project Loan application.

3) AIIB has extended a Project Preparation Special Fund (PPSF)[1] in the form of a grant to WASAC. WASAC shall utilize PPSF to make eligible payments to the Consultant for providing services, as described in these Terms of Reference (ToR).

III. SCOPE OF SERVICE

1) The Scope of Services, as described below, is organized as follows:

   a) Part A describes the tasks related to preparation of FS for the Investment Project.

   b) Part B describes the tasks related to conducting the ESIA and preparing the required E&S management instruments for the Investment Project.

   c) Part C describes the tasks related to the development of detailed engineering designs and Resettlement Action Plan for the Investment Project.

2) For avoidance of doubt, this ToR does not include any services related to Component 3 unless specifically indicated in the ToR. Services related to Component 3 would be financed through the Project Loan and not through PPSF.

Part A - Feasibility Study (FS) for the Investment Project

1) The Consultant shall conduct FS for the Investment Project in the Gasabo District of Kigali. The Feasibility Study Report (FSR) shall include an Executive Summary, which shall capture and summarise key information on project description, Project options, project costs, investment program, implementation plan, recommendations, conclusions etc. The FS shall include a summary of all alternative options considered and the rationale for selection / rejection including where relevant details of changes made to avoid / minimize E&S risks and impacts, and for all options a justification of E&S acceptability (that is the ability to comply with AIIB's ESF and national requirements). Where E&S' compliance of any option with AIIB's ESF and national requirements relies on the undertaking of future actions these shall be specified, including responsibilities, costs and timeframes.

2) The Consultant shall prepare the FSR by undertaking, but not limited to, the following tasks:

Task 1 - Mobilization, Reconnaissance Visits, Data Collection and Review of data & reports

1) Mobilize all team members and establish its project offices, in accordance with its Work Plan and complete mobilization activities by the date stated in the Consultancy Contract or as agreed in writing with WASAC.

[1] Please refer to www.aiib.org for more information on PPSF.

2) Undertake reconnaissance visits to the Project Area[2] and collect available maps (geography, topography, geology, ethnography, etc.), technical reports of water supply and wastewater (or sewage) system and infrastructure projects (historical, ongoing & planned), rainfall, data, drawings, environment & social assessments and baseline data, potential likelihood of disaster risks and flooding etc., as relevant & necessary, from WASAC, Kigali's administrative government and other relevant departments of GoR. The Investment Project is expected to cover Gasabo District of Kigali, specifically areas in the Kinyinya and Kibagabaga catchments located in seven sectors of the Gasabo District namely: Kinyinya, Kimironko, Remera, Gisozi, Bumbogo, Jabana and Nduba. The Consultant shall assess the possibility of connecting other adjacent sectors (such as Jali and Gastata sectors) according to their current socio-economic development.

3) Review classification of the water bodies in the Project Area to determine the specific effluent standards to be adopted and monitored. Collect data on water quality of the water bodies and the groundwater, with sampling stations upstream and downstream where the Wastewater is currently being discharged to serve as baseline data for design, monitoring and other purposes. If water quality data is not available, or the quality, location, duration etc. of the monitoring data or method used to obtain the data is considered by the Consultant to be insufficiently robust, prepare a water quality testing program covering all seasons over the year and support WASAC to implement the program or agree with WASAC on a contract variation to enable the Consultant to implement the same.

4) Review & assess each report or document for data adequacy, relevance, quality and completeness.

5) Review of progress of ongoing water supply and wastewater projects and the users of the water bodies in and around the Project Area, which may have relevance for the AIIB financed Investment Project, if any.

6) Prepare a list of relevant data and information for each Project Area. WASAC shall provide the data which is available with WASAC. WASAC shall coordinate with other Ministries or Agencies of GOR and shall arrange meetings in this regard. It shall be the Consultant's responsibility to collect the required data, if available, from such sources. This list shall not include any data or information to be collected through direct surveys by the Consultant. Where data is not currently available with WASAC or with other Government Ministries or agencies or other secondary data sources, the Consultant shall advise and implement a strategy for collecting the same or for finding proxies for such data. The Consultant shall discuss with WASAC and finalize a proposal for the purchase of data from secondary sources, if necessary.

7) Review the sanitation sector in Rwanda in its entirety, including national policy, programs, design and effluent discharge standards, implementation strategies, GoR's support to the sector etc. Also, report the status of sanitation in the Project Area within the overall sector context. Thereafter, position the Investment Project, as currently formulated within the overall national policy and governance or regulatory framework, after identification of infrastructure gaps, institutional frameworks etc. to meet objectives of sector policies & strategies. Recommend

[2] Project Area shall mean Kigali, especially Gasabo District and any other adjoining areas of influence which are included in the Investment Project. Project Area shall be agreed with WASAC prior to undertaking reconnaissance visits and shall be finalized at the appropriate stage during preparation of FSR. More information on Kigali is presented at Annexure B.

strategy and project related interventions to prepare the Investment Project considering all the above. All identified project-related interventions shall be included in the scope of work of the Consultant and shall be addressed appropriately in the FSR and downstream work.

Task 2 – Preparation of Socio-Economic Profile of Project Area

1) Develop a socio-economic profile of the Project Area, including location characteristics, density of development (overall and sector level), economic profile, population by gender and age categories and number of households including women-headed households, household size, occupation and income, number of poor and vulnerable households and their characteristics, access to water supply and sanitation facility, distribution of ethnic and indigenous people, solid waste collection, nature and number of commercial and industrial units, industrial or commercial waste collection and other relevant aspects. While developing the socio-economic profile, the Consultant shall assess, in consultation with GoR and WASAC, the impact of proposed changes in the land use over the Projects' design horizon and future town development scenarios for short (priority) (5 years), medium (5-15 years) and long term (>15 years) plans as a basis for infrastructure planning.

2) The Consultant shall discuss its planned approach and methodology for collecting necessary data to generate the socio-economic profile with WASAC and agree on the same, before starting this task.

3) Assess current modes of wastewater (grey water and septage) collection, treatment and disposal and access for households & other consumers to the sewerage system, if any, through a sample survey of households in the Project Area. The sample size, survey method and survey questionnaire are to be recommended by the Consultant and finalized in discussion with WASAC to ensure a fair representation of consumers in the Project Area.

Task 3 - Demographic Studies

1) Review of master plan, development plan, above socio-economic study and/or any other economic report, which projects future development in the Project Area and assess/project growth in terms of spatial increase in current area boundaries, the number of residential/commercial/institutional properties or any other relevant unit which may be required to compute future water demand. This task may also require the Consultant to assess potential economic development of the province/town, based on consultation with GOR/WASAC/Municipality and which shall clearly be stated in the FSR.

2) Utilize published census data of base year 2022, for the projection of population for short term (5 years), medium term (5-15 years) and long term (>15 years), beyond the envisaged date of commissioning of the Investment Project, for the purposes of defining the Investment Project, ease of execution, immediate priority and feasibility of provision of sewerage system in the Project Area. Future population shall be projected using appropriate methodology, after providing adequate reasoning & justification.

3) If census data for the base year is not available, then the Consultant & WASAC shall discuss and agree an alternative base year for which census data or other reliable population data that GoR normally uses for planning purposes is available. The population estimation for the design horizon shall be arrived at by considering growth as assessed above, with suitable correction based on the recent migration pattern. The Consultant shall prepare a simple demographic

model for the areas for which the available development plans are either obsolete or not available or where no reliable historical population data is available.

Task 4 - Wastewater Quality & Flow Assessment and Projections

1) Review wastewater quality and quantity computation criteria for grey water and septage that are currently being used by GOR or as per international best practices to compute the quantity of wastewater that would be generated by households and other consumers in the Project Area, considering present and planned future water supply projects.

2) Plan and conduct necessary surveys and investigations to assess the current characteristics of wastewater generated in the Project area through sampling or other data collection methods. Sampling shall be done in the following premises: residential areas, public markets, health facilities, offices, commercial centers, schools, prisons, households (high, medium, and low income), slaughterhouses and any others location. The Consultant shall prepare a sampling program and finalize the same with WASAC. The sampling program shall include one sample at each specific wastewater generation points (at least 12 samples) based on a survey of the points of sampling as indicated by WASAC and shall include description of the proposed method of sampling, analyses and equipment to be used for sampling. The testing of wastewater shall be undertaken by a certified laboratory. The parameters in consideration are: pH, temperature, color, BOD5, COD, Dissolved solids (DS), Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Total Organic Carbon (TOC), Total Nitrogen (TN), Nitrate, Nitrite, Total Phosphorous (TP), microbiological activity including F. COLI, E.COLI, T. COLI, Oil and grease, Sulphate and Chlorine. Other parameters may be also analyzed depending on the activity of the chosen industry or other than domestic use (Heavy metals, Hydrocarbons etc.).

3) Prepare design criteria for computing quality and quantity of grey water, solid wastes (for the combined sewage and stormwater scenario) and septage to be used in the Investment Project and agree the same with WASAC and AIIB. Grey water and septage quality standards may be derived based on existing data used for design of other sewage treatment plants in Rwanda or based on national or international best practices, duly considering socio-economic profile of the Project Area.

4) Develop wastewater quality and quantity projections for the intermediate design year 2043 and final design horizon Year 2058.

5) If WASAC opts for a combined wastewater management system for wastewater and storm water (see Task 7 below) then the Consultant shall review past hydrology data & analyses and project future stormwater flows for the intermediate design year and final design horizon year and add the same to wastewater quantity projections determined above.

Task 5 - Condition Assessment of Existing Sewerage System in Kigali and Related Infrastructure

1) Identify the infrastructure facilities in the existing sewerage system of Kigali, if any, which can be connected to the proposed sewerage system in the Project Area or which is critical for Kigali to improve environment in the sectors of Kigali that are adjoining the Project Area.

2) Conduct field survey & inventory of existing sewerage system, as identified above. The following indicators shall be considered in conducting the survey:

a) Population growth and changes in population distribution.
b) Number of households, institutions and commercial establishments in the survey area.
c) Average water consumption of households, institutions and commercial establishments in the coverage area.
d) Average size of septic tanks used.
e) Percentage of establishments that have approved septic tanks.
f) Percentage of establishments that have accessible septic tanks.
g) Percentage of households that are willing to have their septic tanks desludged.

3) Undertake condition assessment of all components of the existing sewerage system (collection, treatment and disposal, including septage management facilities, if any, and roadside drains if they are being used to convey grey water), based on O&M records, local experience, non-destructive testing and international best practices.

4) Support WASAC to undertake physical inspections and non-destructive testing of existing sewerage infrastructure such as Wastewater pipes, roadside drains, civil structures, wastewater treatment plant equipment, appurtenances, wastewater & sludge disposal facilities, house service connections etc., where necessary, to determine its residual useful life and ability to convey & treat wastewater of the Project Area over the thirty years design horizon i.e. up to the year 2058.

5) Prepare a Repair & Rehabilitation plan for those assets that have a useful residual life and can be utilized in the future sewerage system in the Project Area and include the cost of the same in the project cost estimate.

Task 6 - Climate Risk and Adaptation Assessment and GHG Calculation

1) Define the scope and methodology for the Climate Risk and Adaptation Assessment (CRA) for the Investment Project. This includes: establishing the scope and time horizon of the assessment; identifying relevant climate variables for risk analysis; and selecting an appropriate assessment methodology, taking into account international best practices and the availability of local data

2) Review existing Climate Risk Assessment Reports for the Project Area, if available, for adequacy & completeness and adopt relevant assessments & recommendations for impact management of climate related events on the existing and proposed investment components in the sewerage system, for further development in the FSR.

3) Analyze hydrology data, extreme weather events and climate risk data, and their future trends under climate change conditions, to determine their possible impact in the Project Area and on Project objectives/outcomes, if any, including in relation to the demographic study. Assess the potential impacts of extended drought or increasing frequency & intensity of rainfall-induced flooding, or due to climate events like tropical cyclones on the project area using downscaled climate data and models to generate climate scenarios based on high and medium emission pathways.

4) Review and map current morphology (covering river channel, banks, and flood plain) of all river basins with their respective tributaries which impact Kigali, identify recent and past

changes and trends, and potential causes of flooding, if any. Review status of flood risk management in vulnerable reaches and expected events. Short-list license-free and public domain mathematical models for understanding and forecasting morphological changes including from episodic events such as very heavy rainfall, cloudburst, and landslides and to predict impact of proposed river management solutions.

5) Determine possible frequency of occurrence of similar events in the future, based on collected data, existing reports or studies or by climate and morphological modeling. Where adequate hydrologic data is not available for modeling purposes, Consultant shall adopt an alternate strategy for data collection in consultation with WASAC and implement the same.

6) Determine the level of risk and possible mitigation or flood management plan to minimize impact of climate related events in the Project Area. This assessment shall consider possible catchment scale risk management plans that include, for example, the effects of upstream land use change and the viability of nature-based solutions, such as reforestation etc., to reduce risks.

7) Develop an adaptation program that allows flexible responses to changing climate conditions and evolving risks, including nature-based sustainable solutions if relevant, to manage or mitigate the impact of climate events and identified risks on the wastewater system, in consultation with WASAC and Project beneficiaries.

8) Develop, design and include appropriate measures and facilities to improve resilience of each Investment Project sub-component and assets to recover from direct and indirect shocks due to climate related events, including flooding, drought and water scarcity, rising temperature and heatwaves, and landslides. Resilience measures may include providing power back up from different power sources, building flood protection infrastructure such as levees/dykes/pumping stations/water channels/identifying temporary storage areas or adding capacity in project sub-components to store wastewater during system downtimes etc. Ensure that all sewerage system sub-components and assets in the Investment Project have recommended climate resilience measures integrated into their design. For avoidance of doubt, flood protection infrastructure, if required to protect the sectors adjoining the investment assets, in addition to the investment assets, are deemed to be included in the Scope of Work of the Consultant.

9) Summarize the findings and recommendations of climate risk adaptation & mitigation measures in the FSR.

10) Establish monitoring and evaluation frameworks to track the effectiveness of climate resilience measures.

11) Determine the costs of implementing adaptation measures and resilience improvement interventions in the Project area and include them in Project Capital and O&M Cost.

12) Assess the alignment of the Investment Project with the national and sectoral climate resilience policies and strategies: assess that the proposed project is not inconsistent with the national or sectoral policies and strategies on climate resilience.

13) GHG calculation: Calculate emissions of greenhouse gases (GHGs) as a result of the project including baseline emissions (emissions before project), project emissions (emissions after project), and net emissions (the 'delta' or difference between the baseline and the project

emissions). The calculation must show the breakdown between scope 1, 2 and 3 emissions and must include the emissions during construction.

14) Inception report describing the results of the preliminary assessment studies and consultations and a description of the proposed CRA methodology for prior approval by AIIB.

15) The assessment process and results shall be documented as a dedicated CRA chapter of the Feasibility Study Report and submitted to AIIB for review. The CRA chapter should include the following key elements: (1) Background and Scope – A description of the purpose, objectives, and boundaries of the assessment, (2) Methodology, Data, and Assumptions – An overview of the approach used, sources of data, and key assumptions, (3) Climate risk assessment - Identification and analysis of climate hazards and risks, evaluation of their potential impacts on the Project, and proposed adaptation measures to be integrated into the technical design to address the identified risks, (4) Policy Alignment – Assessment of the Project's alignment with relevant national and sectoral climate resilience strategies and policies, (5) Cost Estimates – Estimation of the costs associated with the identified adaptation measures and resilience-enhancing interventions, (6) Greenhouse Gas (GHG) Calculation for AIIB's review, and (7) Conclusions – Summary of key findings and recommendations from the CRA.

Task 7 - Proposed Climate Smart Wastewater Management System (Sewerage), Flood Protection Works and Water and Septage Reuse System

1) The Consultant shall discuss options to provide combined or separate collection systems for wastewater and stormwater with WASAC and finalize one option. Accordingly, the Consultant shall determine feasibility and then design, and detail engineer the Wastewater or Sewerage System under the Investment Project. WASAC or concerned department of GoR shall prepare a separate project to implement a future stormwater management system in the Project Area if it opts for a separate stormwater management system.

2) Update existing road maps and sewerage system infrastructure maps with current data and by considering future spatial expansion in the Project Area, if relevant, in consultation with staff of WASAC and/or local citizens. The Consultant shall adopt an optimal approach such as using GIS, drones etc. to perform this task that is time efficient & cost effective, as this task is an important mandatory task for the Project Area.

3) Discuss with WASAC and AIIB and agree in writing all assumptions, planning and design criteria, relevant design codes and standards etc. In developing criteria, the consultant shall provide due consideration to the feasibility of nature-based and soft engineering solutions. The selection of relevant design codes and standards shall reflect the need to achieve Good International Practice for equipment and facility safety, including in relation to natural hazards and life and fire safety risks. All relevant design codes and standards selected shall include the factoring in climate change (such as in sizing of sewerage infrastructure, selection of materials etc.) to a globally acceptable standard. The Consultant shall recommend the Flood Storm return period to be adopted for designing the flood protection works and agree the same with WASAC, before proceeding with determination of adaptation, climate protection and resilience improvement plans.

4) Compare different wastewater treatment technologies and technologies for reuse of treated wastewater, septage and sludge (including technologies for purposes of generating renewable energy onsite and agricultural purposes offsite, using nature-based solutions and the surrounding natural wetlands), considering wastewater quality, treated wastewater quality, expected sludge characteristics, land area availability, experience in Rwanda or other African Countries with similar conditions. The comparison shall include a comparison of reduction of GHG emissions from all direct and indirect sources and consider power consumption, life cycle costs, treatability of phenols/hazardous chemicals/Per and polyfluoroalkyl substances (PFAS), capacity/availability/accessibility of facilities for the safe transport, storage, handling and disposal of hazardous waste, treated effluent & sludge etc. The Consultant shall formally contact relevant wastewater treatment technology owners, suppliers, vendors, other utilities etc., in addition to its own resources/databases & experience, to prepare the comparison and retain records of such meetings & discussions. Based on the foregoing, the Consultant shall recommend appropriate wastewater treatment technology for use in the Investment Project and finalize the same in consultation with WASAC and AIIB.

5) Compare different water supply (for Water reuse) and sewerage pipe material based on hydraulic carrying capacity, aging experience, procurement & delivery experience in Rwanda or other African countries with similar conditions, life cycle costs etc. and select appropriate pipe material for use in the sewerage system, in consultation with WASAC and AIIB.

6) Identify project sites & Right of Way (RoW), in close consultation with WASAC and local authority at the sector level, for all sub-components of the sewerage system, based on land availability & ownership and with the objective of avoiding and minimizing acquisition of additional land and RoW, and avoiding areas protected for their biodiversity or cultural value and areas assessed as 'critical habitat' as defined in AIIB's ESS 1 or natural habitats that possess economic, cultural and religious values to the community in the project site. If land is required to be acquired then the Consultant shall advise WASAC of different options for additional land required, in compliance with AIIB's ESF.

7) Plan the future climate smart sewerage system to meet the ultimate wastewater demand of year 2058, duly integrating identified useful existing sewerage system assets (after repair/rehabilitation) and relevant future assets that are under implementation through other projects, if any. The Consultant shall identify investment components which may be required up to design year 2058 to ensure that there is complete coverage in terms of scope and services, from wastewater sources to disposal points of treated wastewater & treated septage sludge as well as for climate impact management. Investment components may include new public sanitation facilities, house connections to sewer system, removal of septic tanks when connection to sewerage system is provided, all sewers, Wastewater pumping stations, wastewater treatment facilities for treating grey & black water, system, provision of septage evacuation system, offsite septage treatment facilities, sludge treatment plants, safe disposal of treated grey and black wastewater & treated sludge or biogas plant as relevant, renewable energy based power supply systems, flood protection works like early warning systems / intermediate storages for retaining flood waters / flood water channels / cross sewerage structures / dykes or levees etc., other adaptation and resilience improvement measures etc., as relevant and shall be designed up to a level to estimate project capital and O&M costs at the FSR Stage.

8) Discuss and finalize with WASAC the purpose and use of treated wastewater (whether treated wastewater water can be reused for non-potable purposes such as flushing/landscaping/road-washing or for industrial use or for irrigation or for groundwater recharge or wetland restoration etc.), as per the national policy/strategy of GoR. Based on the selected water reuse purpose, the Consultant shall prepare various system configuration options for water reuse, including additional treatment units to comply with water quality standards, water supply through water tankers or through a separate water distribution piped network in areas adjoining the wastewater treatment plant or to provide piped bulk water to industry etc. The treated wastewater reuse system shall be planned from the treated wastewater reservoir at the wastewater treatment plant to the ultimate water supply point at the consumer premises or up to the point of disposal in the natural environment.

9) The Consultants shall discuss and finalise with WASAC options for reuse of treated septage sludge, including using it for soil conditioning or as fertilizer or to generate biogas. Based on the selected options, the Consultant shall prepare preliminary engineering designs of sub-components of the reuse systems.

10) Electrical and Electromechanical Assessment: The Consultant shall assess the power requirement of the wastewater management system including treated wastewater reuse system and treated sludge reuse facilities, if any and develop the power supply system and electromechanical equipment upto the preliminary engineering stage. The Consultant shall:

a) verify the existence of electrical lines / power supply points and availability of surplus electrical power next to the facilities to be built (The Consultant shall consult the local REG and check the availability of power at the sites).

b) assess the need to build new transmission/distribution lines (LV/MV) to supply the new facilities (The Consultant shall consult the local REG and check the availability of power at the sites).

c) assess the need to build new transformer stations to supply the new facilities.

d) study the possibility of providing power to the consumers in the areas adjacent or enroute to the project facilities through the new power transmission or distribution lines / transformer stations, if applicable and agree with WASAC if the same shall be included in the scope of this project.

e) verify the reliability of the power network and the need for alternate back-up power sources such as solar powered or diesel based electric generator etc. to power the proposed new facilities in the absence of regular power from the local REG network. The Consultant shall consider various options of power supply and agree with WASAC on the final option for power backup. In case diesel-powered electricity generator is selected, Consultant shall select the generator of adequate capacity and include design of fuel tank of adequate capacity to supply power to the facility during the desired power down time.

f) Assess lightning protection and the type of system to be installed.

The Consultant shall provide a general description of the system with an indication of the main equipment and instrumentation to be installed, description of the system's operating mode, including the existence of SCADA and cost estimation of electrical and electromechanical installations and equipment's.

11) The Consultant may consider options to build phased capacity or any longer design horizon beyond Year 2058. The proposed sewerage system and treated wastewater reuse system and various implementation options shall be discussed with WASAC and AIIB and then finalized for further consideration.

12) Prepare a preliminary hydraulic and engineering design of the proposed wastewater management system from consumer service connection up to treated effluent & sludge disposal locations to meet Year 2058 wastewater quantity, using standard & calibrated analysis software. Similarly, the Consultant shall prepare a preliminary hydraulic and engineering design of the proposed treated wastewater reuse system.

13) Designs shall be developed to a preliminary engineering level for each sub-component of the sewerage system, treated wastewater reuse system and treated septage sludge reuse system such as house service connection, sewerage system, pumping stations, wastewater treatment plant/septage treatment plant, additional treatment of treated waste water if required, treated reuse water storages, reuse water distribution system, water tanker filling points if required, biogas plant if opted for, renewable energy based power supply systems or otherwise, control & data acquisition system (SCADA) etc.

a) All elevation data required to screen and design the various options listed above shall be taken from Google Earth or equivalent trusted sources. Topographical survey shall not be required or expected at the FSR stage, except if specifically stated in the ToR.

b) The Consultant shall identify each sub-component to be constructed or repaired/rehabilitated in each phase, if phased implementation is recommended, along with associated capital and O&M costs.

c) Summarize project sub-components (with a table of capacity, sizes, material, type, quantity & other relevant specification parameters) and superimpose on topography maps or GIS, along with an implementation plan (i.e., whether phased implementation or single-phase implementation).

d) There should be a presumption in favor of nature-based solutions, GHG emission reduction and soft engineering design solutions where equivalent results and technical and commercial feasibility vs hard engineering solutions can be achieved. Climate Smart designs shall include low energy Wastewater conveyance, treatment & disposal systems that maximize gravity flow & use renewable energy sources, use of green or low carbon footprint material such as recycled steel/other sustainable materials/locally available material, permeable pavements to manage stormwater, enhance urban green spaces, nature-based materials for preserving and enhancing wetlands, elevated structures above potential flood levels, green buffers and wetlands around the treatment plant to manage stormwater and reduce flood risk, provide shading structures and thermal insulation to reduce cooling demands, nature-based sewerage system that enhances or expands existing Kigali wetlands etc.

e) The Consultant shall quantify extent of the benefits (reduction in GHG emissions) due to the climate smart design of Investment Project and considering the reuse of by-products (treated water, energy, fertilizers) as well as the potential for urban agriculture and forestry. This quantification is a mandatory task of the assignment.

14) Prepare a preliminary engineering design of flood protection structures, channels, drains etc. as identified in Task 6 above.

15) Assess the implementation period for procurement, construction, testing and handover of the project and prepare an implementation schedule for the Investment Project in the FSR.

Task 8 - E&S Optioneering, Assessments and Management Plans

1) The Consultant shall fully integrate the identification, assessment and management of E&S risks and impacts into the feasibility, preliminary and detailed design processes set out in this ToR in accordance with the steps, process and deliverables set out under Part B as required to comply with AIIB's ESF, for the Investment Project.

2) The proposed investment components and various implementation options that are selected to be discussed with WASAC and AIIB prior to finalization (as per Task 7 above) shall be accompanied by an appropriately detailed E&S risk assessment of the available options. This shall identify any options that have potential for elevated cost and schedule risks to achieve compliance with AIIB's standards. All options that are fundamentally non-compliant with the Bank's ESF shall be removed from consideration prior to sharing with WASAC and the AIIB (but details of measures taken to avoid such impacts – including dropping of options from consideration – shall be recorded and shared).

Task 9 - Institutional Studies, Stakeholder Engagement and Capacity Building Plans

1) Undertake a comprehensive stakeholder mapping and analysis for the project, identifying project -affected communities and other interested parties such as the academe, CSOs including those working on environmental issues or conflict-prevention or peace promotion, community-based associations or networks of IP organization. The stakeholder analysis should cover analysis of the different interests/agenda of the different groups in relation to the project and the relationship and dynamics among the groups.

2) Based on stakeholder mapping and analysis, conduct timely and inclusive public consultations with WASAC, Kigali Government, other concerned government agencies, village officials, potential beneficiaries, project-affected communities, and other relevant/interested stakeholders such as CSOs and IP organizations, to disclose project information, including E&S risks and impacts and project-level grievance redress mechanism (GRM) to manage complaints from PAPs; gather additional baseline information and identify and confirm key areas for improvement in the wastewater management services and flood management facilities, including public interface, operation and maintenance, billing & collection (if any), grievance redressal etc. and to identify topics for capacity-building activities.

3) Conduct public consultations with relevant stakeholders to disseminate WASAC's plan to reuse treated wastewater for non-potable purposes such as toilet flushing, landscaping, irrigation, industrial use, recharge of groundwater, wetland restoration etc. and for use of treated wastewater sludge for agriculture etc. The consultations shall assist in identification of community education & confidence building programs as well as to ensure that necessary project information on E&S risks and impacts are discussed and communicated in a timely and inclusive manner.

4) Describe the existing institutional arrangements in WASAC/Kigali Government for management, implementation, operation and maintenance (O&M), billing & collection (if

any), accounts etc. related to wastewater management and flood management services and document the experiences and challenges encountered in the past during implementation and/or O&M of previous projects.

5) Determine the optimal organization structure including number, qualifications and experience of staff which shall be required for management, O&M, billing & collection (if any) accounts, environmental & social safeguards compliance of the proposed investment components, after completion of the Investment Project.

6) Recommend appropriate capacity building measures, including formal training of WASAC/Kigali staff, which shall be necessary to provide efficient and reliable wastewater management services and for management and O&M of investment components, including for effective environmental & social safeguard compliances, upon completion of the Investment Project. The Consultant shall include consumers and civil society, especially women, in the capacity building programs to improve community participation in management and O&M of investment components.

7) Review adequacy of available equipment and tools and its condition to O&M investment components and recommend procurement of equipment, tools, material, vehicles, consumables, spares etc., which shall be required for efficient O&M in the first year of operation, after completion of the Investment Project.

8) Review and undertake a gap analysis and capacity needs assessment of the institutional and O&M management system/s of stakeholders responsible for the procurement, ES risk management, project management and delivery of O&M activities. The gap analysis shall be carried out against the O&M phase mitigations to be specified in the ESMP and other relevant instruments following the AIIB ESP, and applicable World Bank Group (WBG) EHS General Guidelines[3] and sector specific WBG EHS Guidelines for Water and Sanitation[4], and other Environmental, Health and Safety (EHS) Good International Practice (GIP) for the sector, as the Consultant may advise. The gap analysis report shall identify timebound actions with responsible parties identified, for bringing the Project's O&M E&S management system/s into conformance.

9) Identify institutional bottlenecks and risks, including E&S risks, that are likely to be encountered during Investment Project implementation, which may result in delays and increase in Investment Project cost and recommend possible mitigation strategies.

10) Recommend suitable institutional arrangements for Investment Project implementation, including distribution of responsibilities among the stakeholders and cost sharing amongst themselves, if any, for the Investment Project.

11) Recommend and undertake necessary training programs in Kigali including on-the-job training; and recommend overseas training for WASAC & relevant water utility staff who shall be involved in the management and O&M of investment components constructed under the Investment Project.

[3] Available at: https://www.ifc.org/content/dam/ifc/doc/2000/2007-general-ehs-guidelines-en.pdf
[4] Available at: https://www.ifc.org/content/dam/ifc/doc/2000/2007-water-and-sanitation-ehs-guidelines-en.pdf

12) Recommend appropriate strategies, organization and training requirement to enhance consumer connectivity to the sewerage system in each sector in the Project Area, including increasing the number of house service connections.

13) Propose and develop scenario-based training programs for stakeholders to anticipate and address potential climate impacts on Investment Components.

14) Estimate costs involved in implementing the above recommendations and include them in the Investment Project capital and/or O&M cost estimates.

Task 10 - Capital Cost Estimate and annual O&M expenditure for Investment Project

1) Collect & analyze price data of recently completed and/or awarded projects (preferably projects which were financed by MDBs), which have similar sub-components as in the Investment Project and which were procured through competitive bidding processes.

2) Prepare a database of unit rates for material, services, works etc. at current prices for each Project Sub-component, based on such a review, and after adjusting price data for inflation during project preparation & construction, utilize the same for preparing Investment Project cost estimates.

3) Identify and estimate the cost of activities that shall be undertaken at the detailed engineering stage to put in place the preferred option including but not limited to geotechnical investigation for proposed sub-components, topographical survey, SCADA system integration, etc.

4) Prepare an Investment Project sub-component wise capital cost estimate (base year and on project completion date as per project implementation schedule) for each project sub-component. The capital cost estimate shall also include provision for costs of project preparation, detailed engineering, project management, construction supervision, E&S management plans, adaptation & resilience interventions, owner's establishment during implementation, physical & cost contingency, material & spares for first year of O&M etc., amongst other costs. The capital cost estimate shall not include the cost of land acquisition and taxes, which shall be indicated separately.

5) Identify and justify a technically, economically/financially, and environmentally/socially viable investment program. The program shall capture capital investments, operating costs, and revenues to show the sustainability of the investments. The Consultant shall identify the most critical priority investments to achieve the Investment Project objectives as all financing for the Investment Project may not become available at once. The Consultant shall identify and discuss with WASAC if any Project sub-component (For example: Treated wastewater reuse or septage reuse or biogas subcomponent etc) can be implemented through public private partnership (PPP) option and agree with WASAC on inclusion or exclusion of such sub-component from the Investment Project. In such a case, the Consultant shall support WASAC in preparation of a Concept proposal to obtain necessary approvals of GoR for separately preparing the PPP project proposal.

6) The FSR shall detail any pre-conditions necessary for the start of the project activities and organization necessary and shall provide corresponding cost estimates.

7) Prepare a cost estimate of the annual O&M cost for Investment Project in each sector in the Project Area for the first five years of operations after completion of the Investment Project, based on WASAC's database or based on best international practices. O&M cost estimate shall

include fixed costs (manpower including salary of additional staff recommended by the Institutional Study above, establishment costs etc.) and variable costs such as power, chemicals, insurance, consumables, spares, travel etc.).

8) Present capital cost and annual O&M cost estimates for Investment Project in USD and Rwandan Franc (Rwf). Capital Cost and annual O&M cost shall be presented for each Phase if project implementation has been recommended in Phases.

Task 11 - Financial Viability Analysis

1) Conduct a preliminary financial viability analysis of the proposed infrastructure investments, including affordability analysis, financial sustainability (FIRR) analysis, O&M sustainability analysis, cost-benefit quantitative framework (EIRR), sensitivity analysis, poverty impact assessment and tariff setting framework.

2) Develop different scenarios of tariff for wastewater management services and treated wastewater reuse services for different consumer categories in the Project Area, up to year 2058 following the principle that every service shall be chargeable to make the service financially viable. Recommend an appropriate tariff based on the above analyses for each category of consumer in the Project Area. Recommend inflation linked formula or alternative basis and approach for periodic tariff revisions. While doing so, the Consultant shall consider consumer participation in the tariff revision process.

3) Recommend basic cost of providing consumer connection to the sewerage system with a breakdown of cost heads (material, labour, taxes etc.).

4) Recommend basic cost of providing consumer connection to the Reuse Water Supply system with a breakdown of cost heads (material, labour, taxes etc.).

Task 12 - Results Framework and Monitoring Indicators

1) Develop a results framework to evaluate the progress towards achieving the objectives of the Investment Project, including indicators for intermediate outputs and ultimate objectives, with proper targets breakdown by year, clear definition, and data collection methods for each indicator.

2) Make recommendations on data collection and reporting responsibilities, frequency, and formats. Develop the structure of an information management system for the Investment Project in consultation with WASAC.

Task 13 – Implementation Manual for Investment Project

1) The primary purpose of the Implementation Manual shall be to serve as a ready reference to the implementing agencies for all aspects of Investment Project implementation. The Manual shall define guidelines and procedures (in terms of what, whom, how and when) for effective Investment Project implementation. It shall be a dynamic document and shall be reviewed for any amendment periodically by the implementing agency in consultation with AIIB.

2) The Manual shall cover the following:

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a) Background: Existing situation, Rationale, Project description and activities therein,

b) Institutional Arrangements and Roles: Roles and responsibilities of each agency for various components, project organization structure, key persons involved in implementation, and organizational structure for newly created agencies, if any.

c) Implementation Arrangements: Overall and detailed implementation arrangements (in terms of what, whom, how and when) for each activity identified under the Project, project readiness activities

d) Financial Arrangements: Cost estimates, key assumptions, allocation and withdrawal of municipality proceeds, funds flow, contract, disbursement, accounting, auditing, and public disclosure.

e) Procurement Arrangements: applicable procurement policy, details of procurement arrangements, responsibility of various stakeholders including risk mitigation, procurement plan.

f) Environmental and Social Risk and Impact Management: covering key ES risks and impacts assessment and management instruments in compliance with AIIB's ESP and national E&S legislation, including in relation to environment (pollution prevention and control, resource and energy efficiency and biodiversity), health and safety, labor and working conditions, land use, involuntary resettlement, indigenous people, social and gender (including action plan and implementation monitoring). This section should include clear institutional arrangement as well as references to ES instruments.

PART B – Environmental and Social Impact Assessment (ESIA) and Risk Management Activities

1) As soon as the FSR and Preliminary Engineering Designs are available, the consultant will undertake an Environment and Social Impact Assessment (ESIA) including site specific studies and gender analysis to determine the environment and social baseline conditions of the project site, assess E&S risks and impacts and accordingly prepare the applicable management instruments, such as Environmental and Social Management Plan (ESMP), Resettlement Action Plan (RAP), Indigenous Peoples Plan (IPP), Labor Management Plan (LMP), Stakeholder Engagement plan (SEP), Grievance Redress Mechanism (GRM) and Gender Action Plan (GAP). These instruments shall be updated as soon as the detailed engineering designs become available.

2) The Consultant shall prepare these required E&S instruments in a manner that meets the requirements of AIIB's ESF[5], international standards and guidelines listed below, as well as the Rwandan legislation and national requirements. The Consultant shall work with the Ministry of Economy and Finance's Department of Resettlement for preparation of relevant

5 https://www.aiib.org/en/policies-strategies/framework-agreements/environmental-social-framework.html

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land acquisition and resettlement documents and cooperate with local consultants who are registered with the MOE to prepare ESIA reports to meet the national requirements and approval processes.

3) This section of the ToR is further supplemented by additional detailed information in Annex A.

NATIONAL AND INTERNATIONAL STANDARDS AND GUIDELINES

4) The standards and guidelines include but are not limited to:

a) Applicable country policies, laws, regulations and standards environment, health, safety and social aspects.[6]

b) Relevant international treaties and conventions to which Rwanda is a signatory.

c) AIIB Environmental and Social Framework (2024) including the Environmental and Social Policy (ESP), and Environmental and Social Standards (ESS) and the Environmental and Social Exclusion List (ESEL).

d) World Bank Group (WBG) Environmental, Health, and Safety (EHS) General Guidelines (2007).

e) WBG EHS Guidelines for Water and Sanitation (2007).

f) WBG EHS Guidelines for Construction Materials Extraction (2007).

g) IFC Performance Standard 6: Biodiversity Conservation and the Sustainable Management of Living Natural Resources including Guidance Note 6.

h) All ILO conventions signed and ratified by the country, all ILO conventions covering core labor standards and all ILO conventions covering the basic terms and conditions of employment.

i) Other relevant Good International Practices (GIP)[7].

RESPONSIBILITIES OF THE CONSULTANT FOR E&S ACTIVITIES

5) The scope of work outlined in this ToR shall be regarded as essential, though not exhaustive. The Consultant is expected to exercise professional judgment and proactively identify areas of engagement and additional E&S assessments as needed. The aim is to ensure that the analytical output is comprehensive and compliant with relevant national laws and regulations and AIIB's ESF.

6) The Consultant is responsible for performing all necessary services to fulfill the objectives of this ToR, even if not explicitly stated. These services shall be deemed reasonable and necessary by competent professionals in the field. Throughout the Project's duration, other consultants shall be providing services to AIIB or WASAC. The Consultant is expected to refer to the work product of these parties where relevant, ensuring cooperation and coordination without hindering the overall progress of the Project.

6 The E&S Consultant is not expected to develop documents for regulatory submissions and approvals. The Consultant shall, however, support WASAC in this regard, when requested by it, based on the work done under the ToR.

7 GIP is defined as the exercise of professional skill, diligence, prudence and foresight that would reasonably be expected from skilled and experienced professionals engaged in the same type of undertaking under the same or similar circumstances globally or regionally. The outcome of such exercise should be that the Project employs the most appropriate technologies in the Project-specific circumstances.

7) The Consultant shall be accountable for completing the E&S tasks outlined in this ToR, including collecting and analyzing secondary and primary data, and supporting stakeholder engagement and consultation activities for the E&S Studies. Consultations shall be conducted inclusively and meaningfully, in a culturally and gender-sensitive manner, held in accessible places and using the language that target stakeholders, especially the vulnerable and marginalized groups, speak and understand[8], with consideration of any health measures, guidance and / or requirements as may be in force from time to time.

8) GoR/WASAC shall provide reasonable support as needed to facilitate the smooth execution of the assignment. Project records, such as the Feasibility Study, design reports, permits and approvals, consultation records, and land acquisition documents, etc., shall be made available for review and, if necessary, copying. In instances where WASAC does not have the required documents or information to fulfill the objectives and scope of work in this ToR, the Consultant shall assume responsibility for collecting the same.

In undertaking activities under this ToR, ensure compliance with AIIB's ESF. As a minimum, an iterative design process should be adopted such that E&S risks and impacts are reflected in the project, following the ES mitigation hierarchy, i.e., to anticipate and avoid ES risks and impacts, and if avoidance is not possible (where acceptable under the ESF), to minimize to the extent feasible, and where significant residual impacts remains, compensate for or offset them, where feasible.

In early FSR stage / FSR review stage, the Consultant shall identify potential environmental and social (E&S) risks and impacts[9], perform a desktop review to determine the availability of E&S baseline information and identify gaps that shall be required to characterize the E&S baseline[10], undertake E&S baseline studies and surveys required for FSR stage, characterize an appropriately detailed baseline, and select and apply relevant E&S criteria to inform feasibility stage optioneering and selection of projects and subprojects taken forward for detailed engineering design. All project alternatives considered in the analysis shall be recorded in the FSR along with the findings of the appraisal against the E&S criteria for each.

Alongside Preliminary and Detailed Engineering Design, the consultant shall prepare the ESIA and specific management plans and procedures etc., in accordance with Annex A to this ToR. ESIA shall be conducted in parallel with design such that ESIA findings can inform the configuration or design of components of the proposed water supply system as necessary as part of an iterative design process. ESIA shall be accompanied by a non-technical summary (NTS) to support stakeholder engagement. **Refer to detailed ESIA requirements in Annexure A.**

To the extent that any E&S compliance actions / mitigations (as shall be identified through steps above) shall be passed down to contractors and sub-contractors, the Consultant shall

[8] It shall be the responsibility of the Consultant to translate relevant documents and/or information provided by AIIB or WASAC and stakeholders into the local language and/or English, as relevant.

[9] The identification of risks and impacts at feasibility, preliminary and detailed design stages must include not only the direct impacts of the project infrastructure, but also the effect of intakes and discharges on water bodies including their ecology in impacted reaches, the availability and quality of water downstream, and impacts on downstream water users.

[10] For informing (A) meaningful E&S appraisal of options, and (B) for completing ESIA of detailed designs.

ensure that these are captured in the Detailed Engineering Design and contracting agreements and shall prepare ToRs / scopes of work / contract specifications as necessary to achieve this. Standard contract conditions to adopt and comply with AIIB's ESP 2024 shall also be included.

PART C – Detailed Engineering Design (DED), Resettlement Action Plan (RAP) and Procurement Documents

1) The Consultant shall perform tasks described in this Part after the FSR for the Investment Project has been approved by WASAC.

2) Output shall be prepared separately for the Wastewater Management System and Treated Wastewater Reuse System in the Project Area. During the detailed engineering design, the Consultant shall coordinate with WASAC for uniformity and comprehensiveness in the preparation of related documents, compliance with the latest edition of Rwanda design guidelines, criteria and standards and applicable provisions of existing laws, codes and department orders/regulations to be applied for detailed design and construction drawings. In case other foreign standards are applied, it is necessary to obtain prior approval from WASAC. For avoidance of any doubt, compliance with Rwanda Codes is mandatory in case of contradictory/conflicting requirements in other codes & standards.

3) The Consultant shall utilize his experience and professional judgment to adapt and perform the respective tasks, as relevant to meet the objectives of the assignment and Investment Project. In case of any doubt, the Consultant shall seek written clarification from WASAC before proceeding further in performing the task.

Task 1 - Topography Surveys

1) Collect primary data and review existing data, topographic maps, land use maps, and other maps, drawings, reports etc., for each site and right of way (RoW) for project sub-components in respective Project Areas from the point of view of availability, relevance & utility for use on the Project. The Consultant shall utilize existing data, including data available from national agencies or satellite data, only after verification of its accuracy through primary data collection, sample measurements or by correlating the same with recently verified maps from secondary sources. The land use masterplan under enforcement will be considered.

2) Prepare comprehensive base maps of the Project Area by using appropriate satellite images (not older than two years; including orthorectification) and standard CAD and GIS technology.

3) Work closely with WASAC to confirm availability of sites, as identified during the FS stage. If any site is unavailable then the Consultant shall identify an alternative site or route on public land, to the maximum extent possible, to minimize the need for land acquisition from private landowners. The Consultant shall advise the Client on ways of minimizing these impacts and costs.

4) Using the confirmed dimensions of the Wastewater pipelines in various zones as ascertained by the hydraulic modeling, the Consultant shall work with WASAC or relevant local GoR agencies to confirm the pipelines' routings and RoW. Obstructions/Constraints in RoW, requirements for resettlement of households and / or businesses shall be considered during these deliberations and decisions. Temporary dislocation of small businesses would also need to be considered.

5) Undertake fresh topographic surveys, if required, at each project sub-component site or right of way by means of a Total Station or Geodetic GPS, using permanent benchmarks to the extent possible. For RoW, the Consultant shall survey a corridor with appropriate buffer zones on either side along the line of the proposed pipeline routes. The survey corridor shall be reduced appropriately depending on the width of the road or access corridor for Wastewater pipelines.

6) Produce general plans and profiles for each site showing project sub-components and for ROW showing alignment of the proposed pipelines. These shall be prepared in AutoCAD format as well as superimposed on standard GIS software or Google Earth. Plans and profiles shall be prepared at a scale of 1H:1V and shall show important features such as roads, property boundaries, waterlogged or marshy areas, rock (if visible) etc. The plans and maps shall be drawn on appropriate scale so that the provided information are accurate and clear.

7) Provide a soft copy of data of actual survey points in a format readable by AutoCAD and standard GIS software or Google Earth.

8) **Task 2 - Geotechnical Investigations**

1) Undertake fresh geotechnical investigations, if existing data & maps are not adequate or accurate, to establish regional geology in the Project area and to collect data on geologic structure, geologic history, seismicity, hydrogeology etc., at each Project Sub-component site and at critical locations along the RoW of each Wastewater pipeline route. Investigations shall reveal critical data, which shall be required for design of excavation works, civil works, foundations, pipeline supports etc. such as soil/rock characteristics, rock fractures, soil moisture content, bearing capacity, hydraulic properties of subsurface material, presence of salinity, sulfates etc. For flood protection and climate mitigation structures, geotechnical investigations as necessary to establish riverbank stability and stability of hill slopes, flood protection report, etc. shall be performed.

2) Prepare a Geotechnical Investigation Report, which shall include data of all investigations, samples collected, test procedures, codes followed, test reports, geological & hydrogeological maps of the Project area & Sub-component sites, cautions & recommendations for safe & stable design of Sub-components etc.

Task 3 - Detailed Engineering Designs and Drawings

1) Hydraulic Design

a) Prepare detailed hydraulic designs of the sub-components of the wastewater management system and treated wastewater reuse system, using standard modelling software. Hydraulic design of pipelines to be carried out considering ultimate design period of 30years and design criteria which shall be agreed upon with WASAC.

b) Revalidate evaluation of different pipe materials done during the FSR stage and make recommendations of appropriate pipe materials for the required applications. Consult with and agree with WASAC on the pipe materials to be used.

c) Identify pipe sizes, pipe material, treatment plant unit sizes for the selected option, pumps & motors, Control panels, valves, fittings, other appurtenances, locations for measurement of flow (or velocities) etc.,

d) Identify invert levels and gradients for all sewers and laterals,

e) Mark locations for inspection chambers, valve chambers, flow measurement device chambers, manholes etc., as relevant to the respective systems and prepare detailed working drawings with pipes and fittings details and technical specifications,

f) Mark locations for water body, natural drainage or road/river crossings and design appropriate type of crossing with pipe and fittings details and specifications,

g) Utilize actual site & RoW data & maps, while preparing hydraulic designs. Where necessary due to local site conditions or due to circumstances which may delay the Project or significantly impact Project cost, Consultant may change pipeline routes, sizes & material (which were identified while preparing the FSR) in consultation with WASAC.

h) Prepare detailed technical specifications and bill of quantities for the above.

i) Calculations notes for all designs shall be provided

2) Design of Civil Works

a) Prepare detailed plans & structural designs including identifying & detailing reinforcement, formwork and construction material, detail technical & material specifications and compute bills of quantities for all civil works of sub-components, including sewers, manholes,Wastewater pumping stations, wastewater (or septage) treatment plant and its associated works as required, wastewater outfalls and at facilities for managing risks from climate change events such as flood protection works etc.

b) Prepare detailed plans & structural designs for all civil works of sub-components treated wastewater reuse system, including treated water storage reservoir, tanker filling station, tertiary water treatment plant and its associated works, water storage, pump house etc., as required and at facilities for managing risks from climate change events such as flood protection works etc.

c) Prepare detailed technical specifications for Material & Works and corresponding bill of quantities for the above.

d) Calculations notes for all designs shall be provided

3) Design of Power Supply & Control Systems

a) Prepare a detailed plan for power supply for each sub-component site of the respective Wastewater management and treated wastewater reuse systems. The detailed plan shall show locations of power offtake points from the transmission grid, locations of central control rooms, all substations, transformers & standby generators, distribution network at each Sub-component site, backup power arrangements etc.

b) Prepare detailed design for each sub-component of the power supply system, including instrumentation, system control panels, safety devices, transformer, switchgear, cables etc., as required and prepare detailed specifications and bill of quantities.

c) Prepare a plan for a Supervisory Control and Data Acquisition system (SCADA) for each Sub-component. The plan shall be sufficiently detailed and shall be based on actual maps of the Project area & sites of Sub-components. Plan shall include design criteria,

system logic & methodology, type of control, communication technology, power system, safety and power back up (conventional or renewable or mix of both) etc., which has been adopted, location of towers, control room, sensors, chambers etc., type of software, ancillary equipment (such as servers, computers, printers, data storage etc.) power backup etc., which shall be required.

d) Prepare detailed technical specifications and bill of quantities for the power supply components, instrumentation and the SCADA system.

4) Preparation of Detailed Estimates of Project Capital Cost and Annual O&M Cost

a) Prepare a detailed Project Subcomponent wise capital cost estimate at current year prices for wastewater management system and for treated wastewater reuse system of the Investment Project, based on the above stated bills of quantities & specifications (as computed from detailed designs). The capital cost estimate shall include provision for costs of project preparation, detailed engineering, project management, owner's establishment during implementation, physical & cost contingency, material & spares for first year of O&M etc. The cost estimate shall not include cost of land acquisition and taxes, which may be indicated separately.

b) Prepare a detailed cost estimate of annual O&M cost of wastewater management system and for treated wastewater reuse system of the Investment Project, duly considering detailed design and future staffing, equipment & material requirement. Adopted unit rates shall be based on inflation adjusted market rates, GoR's policies or best international practices.

c) Present Capital Cost and annual O&M cost estimates separately for each town in each Project, in USD and Rwandan Franc (Rwf). Capital Cost and annual O&M cost shall be presented for each Phase, if project implementation has been recommended in Phases.

5) Design Drawings & Design Engineering Report

a) Prepare engineering drawings, which shall be Good for Construction (GFC) and for release to a Contractor. Drawings shall be prepared and submitted separately for the wastewater management system and for treated wastewater reuse system of the Investment Project. The scale of drawings shall be agreed with WASAC. Drawings shall include, but may not be limited to:

i) Map of Project Area and each sector or sub-catchment, if relevant,

ii) Index Plan showing overall layout of Project Components & all related Sub-components, including wastewater pipeline routes and sites for wastewater (or septage) treatment plants, pumping stations, treated effluent and sludge disposal facilities, power substations, flood protection infrastructure, facilities to manage climate change event risks, quarries, borrow pits, construction equipment storage, construction roads, construction debris disposal, Owner's offices, workshops, vehicle depots, stores etc. and all major sewer pipeline and treated wastewater distribution pipeline routes, as applicable.

iii) General Arrangement Drawings, Plans & Sections at each sub-component site to appropriate scale, depending on details & size of Sub-components,

iv) Plan & longitudinal section profile of sewer pipeline routes/treated wastewater distribution pipeline routes, to appropriate horizontal & vertical scale, depending on details & length of route. All piping designs shall provide connection details, as per the associated piping materials and diameters for all connections,

v) Detailed structural plans & sections for all structures in sub-components, to an appropriate scale,

vi) Detailed drawings of power supply, electrical system, instrumentation and SCADA system,

vii) Schematic diagrams showing all Project Sub-components,

viii) Other drawings for miscellaneous sub-components and as required for Construction and O&M purposes.

b) Prepare individual design report for the wastewater management system and for treated wastewater reuse system. The Design Report shall be complete in all respects with necessary detailed sewer or treated wastewater distribution pipeline plans, longitudinal profiles of pipelines, as needed, detailed drawings of all civil works in different sections and scales (1:50 and/or 1:25), geotechnical and soil investigation reports (if it was required and was done), structural design (for major civil works such as all buildings, plants, pumping stations, Wastewater outfalls, storage tanks, flood protection infrastructure, etc.), detailed reinforcement and shuttering plans for all civil works in scales 1:50 and/or 1:25, technical specifications for works, equipment and materials and bills of quantities as well as confidential cost estimation (at latest available price) of supplies and construction works, and procurement plan for supplies and construction works. All individual design reports should include necessary documents (e.g. drawings, hydraulic designs, structural designs, summary cost estimate, etc.) attached as Annexures to the Design Report.

c) Prepare a summary of Design Engineering Report (DER)for wastewater management system and for treated wastewater reuse system of the Investment Project. The DER shall include the adopted design philosophy & approach, design criteria, list of assumptions, list of design and Standards Codes, design performance standards, summary bill of quantities, key technical & material specifications, GFC engineering drawings and summary estimates of Project capital cost and annual O&M cost, as worked out above. The DER shall also include a consolidated summary of capital cost and annual O&M cost for the Investment Project.

Task 4 - Project Delivery Strategy, Procurement Plan and Bid Documents for Investment Project

1) Prepare a Project Delivery Strategy (PDS), which shall describe the Investment Project's strategic assessment with respect to national policies, sector plans or priorities, contract strategy and specific procurement approaches that aims to better fit the main procurement principles of Value for Money (VfM) and Fit for Purpose (FfP). The PDS shall also set out principles of the procurement arrangements. Contracts, for goods, works, non-consulting services and consulting services funded in part or in whole by AIIB shall be conducted in accordance with the requirements of AIIB's Procurement Policy (June 2024, as amended from

time to time), Policy on Prohibited Practices, and Directive on Procurement Instructions for Recipients (July 2024, as amended from time to time). The PDS shall also describe project implementation structure & timelines, procurement strategies, assessment of operational factors affecting procurement such as governance, laws & regulation, economic conditions, sustainability, technology etc. and market demand supply and competition analyses.

2) Prepare a detailed consolidated procurement plan for the wastewater management system and treated wastewater reuse system of the Investment Project.

3) Prepare bid documents including a draft contract agreement for procurement of Contractors to implement the Investment Project, as per the respective project procurement plan. Contracts below thresholds for International Open Competitive Tendering/Selection (IOCT/s) shall apply the GoR procurement procedures with associated national bidding documents while AIIB procedures and documents will be used for IOCT/S contracts.

4) Prepare the Request for Proposal including the Terms of Reference and a draft contract agreement for procurement of supervisor to oversee the implementation of the Investment Project,

Task 5 - Project Proposal for Investment Project:

1) Prepare a project investment proposal in the appropriate format for the Investment Project after completion of the feasibility study and again after finalization and approval of detailed engineering design, and official cost estimate. The proposal shall include a business plan for operation & maintenance of the wastewater management system and treated wastewater reuse system in a financially viable and sustainable manner. The business plan shall be prepared for the immediate (first 5 years of O&M), medium (6-15 years) and long term (>15 years) and shall include periodic infusion of capital investment for repairs/rehabilitation/replacement of assets or equipment. The business plan shall include an assessment of the level of capital and revenue subsidy, if any, required from GoR or WASAC.

2) Finalize the project proposal, incorporating all such relevant comments and suggestions as expressed by the WASAC and other stakeholders.

3) The Project Proposal and related documents for the Project shall conform to the requirements of the guidelines and procedures of GoR, WASAC and AIIB.

IV DELIVERABLES & PAYMENT SCHEDULE

1) The Consultant shall prepare the following reports and submit one original and Two copies to WASAC, along with a soft copy of the same in standard software format. The soft copies (MS Word, PDF, CAD, Shapefiles, MS Excel and other possible format) shall be submitted on Flash disc/CD for each deliverable. All deliverables shall be in English language, neatly bound, with an attractive outlay and shall contain the main text and annexure, with figures/frameworks, illustrations and/or logical flow diagrams. The executive summary shall be in English. The copyright of all documents prepared by the Consultant in connection with this assignment rests with the WASAC. The Consultant may keep/make copies of these documents but shall not use the content thereof for any purposes unrelated to the services without prior written approval of the WASAC.

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Sr No	Report	Due Date (To be filled up as per WASAC's project preparation schedule)	Payment Terms (% of Contract Value)
	Inception phase		
1	Inception Report • Methodology, Data collection tools, Mobilization Status, Work Plan, Activity Schedule, Resources and Progress of Assignment and other related information	1 months—after signing the contact	**10**
Part A	**Feasibility Study Report**		
4	Draft FSR with Draft Preliminary Engineering Designs	8 weeks after signing the contract	**5**
5	Final FSR with Final Preliminary Engineering Designs	10 weeks after signing the contract	**5**
6	Draft Investment Project Implementation Manual	14 weeks after signing the contract	**-**
7	Final Investment Project Implementation Manual	18 weeks after signing the contract	**5**
Part B	**ESIAs and E&S Management Plans after approval of FSR**		
8	Draft ESIA Reports and Draft ESMPs including draft RAPs and other applicable Action Plans	20 weeks after signing the contract	**5**
9	Gender Assessment Report and Gender Action Plan	21 weeks after signing the Contract	**2.5**
10	Report on Public Consultation & Public Hearing including documentation	21 weeks after signing the Contract	**2.5**
11	Final ESIA Reports and final ESMPs including RAPs and other applicable Action Plans	26 weeks after signing the contact	**5**
Part C	**Detailed Engineering Design & Drawings**		
12	Draft Individual Design & Drawings for Wastewater Management System	24 weeks after signing the contact	**5**
	Draft Individual Design & Drawings for Treated Wastewater Reuse System	24 weeks after signing the contact	
	Draft DER for Wastewater Management System	26 weeks after signing the contact	
	Draft DER for Treated Wastewater Reuse System	26 weeks after signing the contract	

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14	Final DER for Wastewater Management System including wastewater treatment plant, sewer network, auxiliary treatment facilities	35 weeks after signing the contract	**15**
	Final DER for Treated Wastewater Reuse System	35 weeks after signing the contract	
15	Draft Project Delivery Strategy, Procurement Plan, draft ToR for the Project Management Consultant Firm	30 weeks after signing the contract	**2.5**
16	Draft Bid Document for Works	37 weeks after signing the contract	**2.5**
17	Final Project Delivery Strategy, Procurement Plan	40 weeks after signing the contract	**10**
	Draft Investment Project Proposal	40 weeks after signing the contract	
18	Final Investment Project Proposal	42 weeks after signing the contract	**5**
Part D	**Report**		**20**
1	Final Completion Report	50 weeks after signing the contract	

Note:

The Total assignment duration will be 12 months.

1. WASAC shall provide comments or Non-Objection Certificate (NOC) within 15 days of the date of submission of a deliverable.
2. Consultant shall submit a delivery schedule for periodic submission of draft Detailed Engineering Designs and Drawings for review of WASAC within 15 days of commencement of services for Part C.
3. Payment for the deliverable shall be eligible based on the payment schedule agreed at the time of negotiation of the contract.
4. Monthly Progress Report: The consultant shall also submit the monthly progress report composed by Updated Activity Schedule, Work Progress for each activity, constraints and issues with way forward, resource mobilization, cumulative progress. It shall be submitted within the first week of following month
5. Quarterly Progress Report: The consultant shall also submit the monthly progress report composed by Updated Activity Schedule, Work Progress for each activity, constraints and issues with way forward, resource mobilization, cumulative progress and plan for the succeeding quarter. Every quarterly report shall be submitted within two weeks of the following month after quarter end.

V CONSULTANT'S QUALIFICATION AND TEAM COMPOSITION

1) Qualification of the Consultant

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Criteria	Qualification
Eligibility (EoIs not meeting this criterion will be rejected)	Consulting Firm or any Firm in case of JV shall not be debarred by AIIB / No Conflict of Interest.
Firm's Capacity	(a) Consulting Firm or Lead Firm in case of JV shall be in continuous operations for last Twenty (20) years minimum in the core business of providing consulting engineering services for infrastructure projects.
Firm's Specific Experience	(b) Consulting Firm or Lead Firm in case of JV shall provide at least 3 (three) documented relevant references of consulting assignments with similar scope of services over the last 10 (ten) years of operations.
	(a) Consulting Firm or Lead Firm in a JV has experience of providing engineering consulting services in water or wastewater or equivalent sectors in last 10 (ten) years.
	(b) Consulting Firm or any firm in case of JV shall have completed with Client's acceptance of deliverables, at least 3 (three) assignments, with similar tasks as defined in the ToR for this assignment such as preparation of Feasibility Study Report (FSR) or detailed project reports, ESIA and/or developing detailed engineering designs & drawings for wastewater or water reuse or equivalent projects in the last 10 (ten) years. At least one of the above three assignments shall have a minimum consulting contract value of USD 1.25 Million (USD One Million and Two Hundred and Fifty Thousand) or equivalent.
	(c) Consulting Firm or any firm in case of JV shall have experience of completing work on at least 1 (one) project in the wastewater or water reuse sector with similar scope of work, which was financed by multilateral development banks or by international development partners in the last 10 (ten) years.
	(d) Firm or Lead Firm in case of JV shall have completed at least one assignment with similar scope of work in Rwanda or in any country in Africa in last 10 (ten) years.

Team Composition

a) **Key Experts:** Key Experts are defined positions who have a crucial role in implementing the contract. CVs of key experts shall be evaluated and shall score points during evaluation of bids.

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b) **Non-Key Experts and Support Staff:** The Consultant shall hire the non key experts and support staff at their own charge. The cost of non-key experts and support staff shall not be included in financial proposal.

c) WASAC has estimated a total of **96 person-months** of consulting services to perform all required tasks as defined in the ToR and to meet the objectives of the assignment. The Consultant shall, however, be free to prepare his own work plan and manning schedule to achieve the objectives of the ToR. For avoidance of any doubt, the Consultant is free to propose either International or National Key Experts for each Key Expert position, who meet the required qualification criteria, without any restriction.

d) The indicative team composition of the key and non-key Experts along with their estimated person-months is provided in Table 1 below:

Table 1: Team Composition and Input

I	Key Expert	Months
K1	Project Manager/Team Leader	12
K2	Wastewater Treatment Expert/Process Design Expert	12
K3	Sewer Network Design Engineer/Sewer network Hydraulic Modeler	12
K4	Hydrologist Specialist/Stormwater and Flood Management Specialist	6
K5	Climate Change Specialist	4
K6	Financial and Economic Expert	4
K7	Environmental Safeguards Expert	6
K8	Resettlement Expert/Social Safeguard	6
K9	Property Valuation Expert	6
K10	Structural Design Engineer/Civil Engineer	6
K11	Electromechanical Engineer	4
K12	Automation and SCADA Specialist	4
K13	Geo-Technical Expert	4
K14	Topographical Surveyor	6
K15	Quantity Surveyor	4
	Total Mon-Months	**96**

e) The Consultant shall provide his team composition, work plan and manning schedule in his Proposal. The Consultant shall be free to allocate tasks and responsibility to each member of his team.

f) **Minimum Qualification Requirement for Key Experts**

i) **K1 - Project Manager/Team Leader-** The Expert shall have at least a Master's degree in civil engineering/Construction management /Sanitary engineering. The Expert shall have at least 15 years of total work experience in the infrastructure sector. The Expert shall have completed work as a Project Manager or Team Leader on at least three projects with similar scope of work (involving preparation of FSR for wastewater project, detailed engineering design of wastewater or sewer network projects including technical, environment and social experts). The Expert shall have also successfully completed at least three assignments as Project Manager or Team Leader on similar sewerage projects, the proof of having completed these three similar projects must be submitted. Excellent communication (written and oral) skills in English shall be required.

ii) **K2 - Wastewater Treatment Expert/Process Design Expert**: The Expert shall have at least a master's degree in Sanitary Engineering or environmental

engineering with at least 10 years of total work experience in the infrastructure sector. Of these 10 years of total experience, the Expert shall have experience of at least 7 years in the sanitation sector, as a wastewater treatment specialist or as a wastewater process design engineer. The Expert shall have completed similar work as Wastewater Treatment Expert/Process Design Expert (preparing FSR and detailed design of sewerage system, Wastewater treatment plant and ancillary facilities) on at least three wastewater projects. The Expert's CV shall demonstrate experience of working on different wastewater treatment technologies, including tertiary treatment technologies for complying with treated wastewater quality standards for industrial or other non-potable reuse as well as the Sludge Reuse. Excellent communication (written and oral) skills in English shall be required. the proof of having completed these three similar projects must be submitted

iii) **K3 – Sewer Network Design Expert/ Sewer Network Hydraulic Modeler**: The Expert shall have at least a master's degree in Sanitary Engineering hydraulic engineering, environmental engineering, with at least 10 years of total work experience in the infrastructure sector. Of these 10 years of total experience, the Expert shall have experience of at least 7 years in the sewer network design projects and have worked at least for three (3) similar projects as a sewer hydraulic modeler. The Expert's CV shall demonstrate experience of working in difficult terrain such as hilly areas, poor geotechnical stability etc. and with standard wastewater network analyses and modelling software. Excellent communication (written and oral) skills in English shall be required. The proof of having completed these three similar projects must be submitted

iv) **K4 - Hydrogeologist Specialist/Stormwater and Flood Management Specialist**: The Expert shall have at least a master's degree in Hydrology, Hydrogeology engineering, with at least 10 years of total work experience of which at least 7 years' experience shall be in hydrology, hydrogeology, stormwater management or flood management. The Expert shall have completed similar works as hydrologist or hydrogeologist on at least three infrastructure projects.. The proof of having completed these three similar projects must be submitted. Excellent communication (written and oral) skills in English shall be required.

v) **K5 – Climate Change Specialist:** The Expert shall have at least a master's degree in climate change and sustainable development, Environmental Engineering, Meteorology science, Environmental sciences. The Expert shall have experience of 10 years as a Climate Change Specialist or related position working on climate-related risk assessment, planning of adaptation programs and design of climate/disaster-resilient infrastructure, amongst other experiences. The Expert's CV shall demonstrate experience in at least three areas – climate change risk assessment, planning of adaptation programs or design of climate/disaster-resilient infrastructure. The Expert shall have completed work on at least three projects as climate change specialist... Excellent communication (written and oral) skills in English shall be required. The proof of having completed these projects must be submitted.

vi) **K6 - Financial and Economic Expert**: The Expert shall have at least a master's degree in Finance, Economics , project management with at least 10 years of total work experience of which at least 5 years of experience shall be in municipal/city accounting, auditing, financial management, economic and financial analysis. The Expert shall have completed similar work on at least three similar projects. Good communication (written and oral) skills in English shall be required. The proof of having completed these three similar projects must be submitted.

vii) **K7- Environmental Safeguards Specialist**: The Expert shall have at least a master's degree in environmental engineering, environmental science, environmental management with total experience of at least 10 years as an Environmental Safeguard Specialist. The Expert's CV shall demonstrate experience in conducting environmental and social impact studies, environmental due diligence, data collection and analysis for infrastructure project in line with GIIP such as AIIB's ESS, IFC's PS, WB's ESS or African Development Banks's Safeguards Policy Statement. The Expert shall have completed work on at least three projects as Environmental Safeguard Specialist and have experience of working on projects financed by international donor agencies or MDBs. Good communication (written and oral) skills in English shall be required. The proof of having completed these three similar projects must be submitted.

viii) **K8 - Resettlement Specialist/ Social Safeguards:** The Expert shall have at least a master's degree in social science, Economics, development studies, sociology, urban studies, anthropology, and environmental studies with total experience of at least 10 years as a resettlement Specialist. The Expert's CV shall demonstrate experience of working on social development issues and Social Impact Assessments and Management Plans as well as on involuntary resettlement issues, conflict issues, indigenous peoples and stakeholder engagement. The Expert shall have completed work on at least three projects as a resettlementSpecialist.and have experience of working on projects financed by international donor agencies or MDBs. Good communication (written and oral) skills in English shall be required. The proof of having completed these three similar projects must be submitted.

ix) **K9 - Property valuation Expert:** The Expert shall have at least a bachelor's degree in Civil engineering, Quantity surveying, estate management with 10 years of relevant experience in property valuation and having worked on 3 projects as property valuation expert. Good communication (written and oral) skills in English shall be required. The proof of having completed these three similar projects must be submitted.

x) **K10 – Structural Design Engineer/Civil Engineer**: The Expert shall have at least a master's degree in civil engineering or structural engineering with at least 10 years of total work experience of which at least 7 years of experience shall be in structural design projects. The Expert shall have

completed work as a structural design engineer on at least three projects for wastewater and sewer network projects with similar scope of work. The Expert's CV shall demonstrate the expert's familiarity and experience with international design & material specification codes, Good communication (written and oral) skills in English shall be required. The proof of having completed these three similar projects must be submitted.

xi) **K11 – Electro-Mechanical Engineer**: The Expert shall have at least a master's degree in electro-mechanical engineering industrial engineering with at least 10 years of total work experience of which at least 7 years of experience shall be in design of wastewater engineering projects. The Expert shall have completed work as a project electro-mechanical engineer on at least three projects in wastewater sector, with similar scope of work. The Expert's CV shall demonstrate the expert's experience in at least three similar projects as electromechanical engineer. The Expert's CV shall also demonstrate experience of work by applying international design & material specification codes and standards. Good communication (written and oral) skills in English shall be required. The proof of having completed these three similar projects must be submitted

xii) **K12 - Automation and SCADA Specialist**: The Expert shall possess at least a master's degree in Automation and Control Engineering, Industrial automation, Electronical engineering, with minimum of 10 years of related design and engineering experience on SCADA (Supervisory Control and Data Acquisition) systems or on process control & automation systems. The Expert shall have completed work on at least three similar assignments in the water or wastewater treatment plant projects Good communication (written and oral) skills in English shall be required. The proof of having completed these three similar projects must be submitted.

xiii) **K13 - Geotechnical Expert:** The Expert shall have a master's degree in geotechnical engineering, with at least10 years of total work experience as geotechnical engineer. The Expert shall have completed work as a geotechnical engineer on at least three projects as geotechnical engineer. Good communication (written and oral) skills in English shall be required. The proof of having completed these three similar projects must be submitted.

xiv) **K14 - Topographical Surveyor:** The Expert shall possess at least a bachelor's degree in Topographical Surveying, Geomatics, Land survey with at least 10 years of total work experience as Topographic surveyor. The Expert shall have completed work as a Topographical surveyor on at least three projects for water supply, sewerage. Good communication (written and oral) skills in English shall be required. The proof of having completed these three similar projects must be submitted.

xv) **K15 - Quantity surveyor:** The Expert shall possess at least a bachelor's degree in Quantity Surveying, Civil Engineering, construction management and technology, building economic with at least 10 years of total work experience as

Quantity surveyor. The Expert shall have completed work as a Quantity surveyor on at least three projects as quantity surveyor Good communication (written and oral) skills in English shall be required. The proof of having completed these three similar projects must be submitted.

g) The curriculum vitae of the Key Experts shall contain information on the assignments they have completed, with complete names and addresses of the clients and the name and contact information of the client's supervisors. WASAC may, at its sole discretion, contact any of those clients of the first-ranked firm, for verification of the information provided by the firm, before signing the contract.

VI REPORTING

1) The Consultant shall work very closely with WASAC's PMU project team and shall report to the Project Director.

2) The Consultant shall be based in Kigali City and shall travel to the Project Area as per their work plan and as required by WASAC for purposes of attending meetings related to the assignment. The Consultant shall also work collaboratively with the Gasabo District Authorities, Kigali city Authorities and other relevant GoR agencies.

3) The Consultant shall exercise all due skills and diligence in the provision of the services, in accordance with recognized professional standards.

4) The Consultant shall consider relevant comments from the Client and other statutory agencies and shall be responsible for the accuracy of all generated data and analysis, references, observations, proposals, conclusions, and recommendations.

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ANNEXURE A

DETAILED ESIA REQUIREMENTS

Based on the preliminary ES works (risk identification, baseline collection, project alternative analysis, etc.) and conceptual engineering design from the Feasibility Study, the ESIA Report shall be prepared and to include topic detailed below.

1) Description of the Project

a) The Consultant is responsible for gathering additional information on Project activities and clearly identifying Project's development, with a focus on potentially high-risk aspects. The E&S Consultant shall summarize the activities expected to occur during each Project phase, including planning, pre-construction/construction (including necessary site preparation), operations, and, to the extent possible, decommissioning, including Associated Facilities (AF), in accordance with the requirements outlined in paragraph 35 of AIIB ESP.

b) A detailed description of the existing site topography shall be provided, and the land required for the Project shall be clearly demarcated and presented using graphical or aerial maps. The Project Description shall include a site layout with specific details about the functions and operations.

c) The Consultant shall also include the following details in the Project Description:

- Information on facilities and activities by third parties that could impact or be impacted by the Project or which effects could accumulate to those from the Project (e.g., synergies or antagonistic effects). Administrative setup, land use and planned developments within the vicinity of the Project location, detailed maps / photos showing the Project site/footprint and Project Area of Influence (AoI);
- Summary of activities likely to take place by Project phase, including future Project development planned. This includes specifying any classified as either AF or Project components for which third parties shall have responsibility for assessment and management of E&S risks and impacts.
- Labor and Workforce: Total labor requirement during all Project phases, a summary of workforce management, accommodation strategy, and human resources policies and procedures. Workforce requirements of various categories such as skilled, semi-skilled, unskilled workers, technicians, engineers, managers and other professionals for both construction and operational phases shall be discussed here. Also, details on contractual staff and employed staff shall be presented with men and women ratio here. Targets for local hiring, hiring of women, or on the basis of vulnerabilities/impacts/social categories shall also be proposed. For the operations phase, the number of workers required for technical operations, module cleaning, security, housekeeping, and other miscellaneous jobs shall also be presented here, along with targets, as described above, as agreed and committed.
- Power: Power requirement for construction and operation phase from local power sources (village power lines) of the project to be assessed here. Also, use of DG sets

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along with any other identified auxiliary power source shall be identified and discussed here;
- Accurate plans showing the layout of Project infrastructure, structures, offices, roads, waste management and disposal location, fuel storage areas, accommodation camps (if any), workshops, power generation, drainage and Wastewater treatment as applicable;
- Water quantity and quality required both for construction and operations phase of the project. In addition, potential source of water for construction and operation phase, along with potential alternatives considered, if any. The requirement of water treatment to make water usable, if any proposed, shall be included in this section of the report.
- Details of expected emissions and discharges (to air, water, and soil) including greenhouse gases (GHG), noise and waste, as well as any anticipated measures for reduction of the same that are incorporated within the Project design. Provide information on expected types and amounts of waste to be generated during each Project phase and potential disposal options and associated quality requirements. Particularly, the E&S Consultant shall determine the presence of treatment, storage, and disposal facilities (TSDFs) in the province/region for handling hazardous waste (if any);
- Details of location of additional land required, if any, for storage of materials during the construction phase; and
- Updated schedule of execution of main project development phases.

d) Deliverable: The Consultant shall deliver the Project Description. This document shall be included in the ESIA Report as a standalone section.

2) Project Alternatives

a) The Consultant shall compare reasonable alternatives in terms of their technical, economic as well as social, environmental, and safety impacts, especially in relation to use of resources and Project footprint. The alternatives assessment can be qualitative or semi-quantitative, including assigning relevant "weights" to various E&S characteristics, based on sensitivity to the Project context.

b) The E&S Consultant shall provide justification(s) as to why the proposed Project design is considered the optimal solution, considering the following:
- Project site selection.
- Project technology.
- Project layout and design.
- Project interface with Associated Facilities.
- Project and contextual E&S risks; and
- No Project alternative (what happens if the Project is not developed).

c) Deliverable: The Consultant shall deliver the Analysis of Alternatives report. This document shall be included in the ESIA Report as a standalone section.

3) Project Area of Influence (AoI)

a) The Consultant shall provide a description and justification of the E&S Project Area of Influence (AoI) in accordance with the requirements specified in paragraph 8 of AIIB ESS 1. This shall involve clearly indicating the Project's footprint and the extent of direct and indirect impacts within the Project AoI, which may have broader social implications. The determination of the Project AoI shall be based on the following:
   - Project activities and facilities that are directly owned, operated, or managed (for example by contractors) and are components of the Project.
   - Impacts from unplanned but predictable developments caused by the Project that may occur later or at a different location; and
   - Indirect Project impacts on biodiversity of ecosystems services upon which affected communities' livelihoods are dependent.

b) Additionally, AF, as per AIIB requirements, shall be considered when defining the AoI. The Project AoI shall be presented using graphical or aerial maps, utilizing Geographic Information System (GIS) or similar mapping technologies. E&S Consultant to provide clear rationale for the AoI.

c) Using this above definition of AoI, this may include but not limited to the following:
   - The area for the sewerage conveyance system, including consumer connections to the new wastewater conveyance system in Component 1,
   - The area for the wastewater treatment plant, water reuse system, treated septage & sludge reuse system, material warehouse, vehicle garages etc,
   - The area for treatment and safe disposal of unused treated septage sludge & wastewater,
   - The area for temporary storage of construction material & equipment, borrow pits, disposal of construction debris etc,

d) Deliverable: The Consultant shall deliver the Project Area of Influence report. This document shall be included into the ESIA Report as a standalone section.

4) Review of Country's Legal Framework and AIIB Environmental and Social Framework (ESF)

a) The Consultant shall define the legal framework under which the ESIA is being completed, including applicable laws and regulations, AIIB ESS, WBG EHS, norms and requirements set forth at the international, national, regional and/or local levels. The most stringent requirement to prevail. The review shall comprise the following:
   - Detailed review of the environment, health, safety and social regulatory framework that governs the development of the Project from concept to operations.
   - Detailed review of laws, regulations, national guidelines, standards, international treaties and conventions of which Rwanda is a signatory to, and which is relevant to the Project directly or indirectly. A clear requirement from the Project shall be enumerated for each relevant piece of legislation.
   - Detailed review of the relevant country regulations, environmental permit process and relevant institutional set-up (entities involved in environmental management in country); and

- Detailed review of the AIIB ESS E&S requirements as identified in the scoping process including the ones that would be triggered for the Project and necessary requirements that shall be taken care of during Project development.

b) Deliverable: The Consultant shall deliver the Legal and Regulatory Framework report. This document shall be included in the ESIA Report as a standalone section.

5) Methodology

a) The Consultant shall incorporate in the ESIA a comprehensive description of the methodology employed for collecting additional baseline data and conducting updated impact assessments. The methodology section shall provide a clear explanation of how the Project is expected to impact each of the identified E&S parameters. It shall include details on the methods utilized to assess these impacts, such as model studies, empirical approaches, referencing existing similar situations, or drawing from previous studies.

b) Furthermore, the methodology section shall specify the tools used for both the baseline data collection and impact assessment. When applicable, these tools shall be provided as an annex to the ESIA, ensuring transparency and enabling further examination of the methodology's application.

Baseline Methodology

a) The Consultant is expected to collect and analyze relevant data for the aspects detailed in the *E&S Baseline Collection* section of this ToR. The following shall be considered by the Consultant:
- Secondary data shall be used where relevant (e.g., trustworthy statistical records, census records, government reports, non-governmental organization (NGO) publications, academic studies and articles, topographic maps, aerial photos, satellite imagery, international databases, E&S Studies carried out for the Project, GIS data etc.); and
- Primary data collection through site visit. A field planning exercise shall be undertaken to facilitate collection of primary data. This shall include scheduling of activities, logistics planning, and development of field tools.

b) Data collection shall be undertaken to enable an assessment that is appropriate to the nature and scale of the Project and is able to meet requirements of both prevailing laws and regulations within the country and the AIIB ESS. The spatial and temporal extent of the baseline surveys shall be determined through professional judgment and good practice. Data shall be gender disaggregated, relevant to inform decisions about design, construction, operation, and mitigation measures. This section shall indicate the accuracy, reliability, and data sources, and shows that the necessary investigations to gather, review and compile all relevant data, and/or to consult with stakeholders have been undertaken by the E&S Consultant.

Impact Assessment Methodology

a) The Consultant is expected to incorporate the following:
- Impacts characterization (negative, positive, mixed).
- Impacts nature and duration (direct, secondary, indirect, cumulative; short-term, long term, permanent, reversible).
- Impact significance/magnitude (negligible, minor, moderate, major).
- Impacts likelihood (unlikely, possible, likely).
- Spatial scale (national, regional, local).
- Measures to mitigate (adverse) or enhance (positive) impacts.
- Significance/magnitude of residual impacts (negligible, minor, moderate, major) and
- Where relevant receptor sensitivity/vulnerability (negligible, low, medium, high).

b) The mitigation hierarchy, avoidance or minimization, mitigation, and as last resort compensation, with clear indication of the impact before mitigation and the residual impact after mitigation, shall be captured in the ESIA. Impact assessment shall also consider the views and concerns of Project Affected People (PAP) and other stakeholders (where relevant).

c) Deliverable: The Consultant shall deliver the Methodology report. This document shall be included in the ESIA Report as a standalone section.

6) Environmental and Socio-Economic Baseline

a) E&S conditions shall be described for the Project AoI, with clear indication of the Project footprint. The collection of data shall cover the range of physical, biological/ecological, socioeconomic, and cultural heritage aspects that are likely to be affected (directly or indirectly) by the Project pre-construction, construction (including any relocation of utilities, resettlement, trees, and any earth work activity), and operation and maintenance (O&M) phases (decommissioning when possible and applicable).

b) Baseline information shall be supported with figures, site visit photos and maps.

c) The Consultant is expected to (a) collect and analyze all the baseline information needed to assess the potential Project impact and then to be used as benchmark for monitoring purposes, and (b) present in the baseline section of the ESIA the existing E&S condition and related context in an objective manner and with clear reference to the primary and/or validated secondary data that substantiate the description.

d) Baseline data shall be compared against AIIB ESS requirements and relevant GIIP including WBG EHS Guidelines.

e) The proposed list of items/aspects to be addressed in the baseline section of the ESIA, presented in Table 1 is not to be considered exhaustive and the E&S Consultant is expected to use its professional judgment to complete this list following the International Standards and Guidelines (section D).

f) This task involves collecting necessary environmental and socioeconomic information from secondary and primary sources to establish an environmental and socioeconomic baseline for

the project area. Any changes anticipated in the baseline conditions before the project commencement shall also be identified and determined. The current and proposed development activities within the project area but not directly connected to the project shall also be reviewed. The trends in the key environmental and social parameters of the area shall also be analyzed. Data shall be relevant to decisions about project location, design, and operation. For this purpose, secondary data shall be collected while primary data shall also be needed, through techniques such as instrument monitoring and reconnaissance surveys.

g) The baseline analysis shall cover the following:

- Physical environment (baseline survey needed conducted twice, both for wet and dry season): land use, topography, geology and soils, climate and weather, seismic, water resources, water quality, floods, ambient air quality, noise, and vehicular traffic on the existing roads.

Table 1. Baseline Data – Environmental

Topic	Indicative Scope
Landscape and Visual	Based on the site visit, identify general landscape and topography conditions within the area of influence. In addition, based on site assessment and consultations with relevant entities, identify any key visual receptors which could be impacted (touristic sites, villages, key archaeological/cultural sites, etc.).
Climate Change	Capture data considered necessary to conduct a Climate Risk E&S Assessment per the steps outlined in the *Climate Risk E&S Assessment below*.
Flooding	Gather available data on historical flood events in the Project area. This includes records of past floods, flood levels, flood durations, and flood frequency. Obtain data from local authorities, meteorological departments, hydrological agencies, and any existing flood monitoring systems. Engage with local communities, experts, and stakeholders to gain insights into past flood events, flood impacts, and local flood risk perception.
Biodiversity	Review the habitat types contained within the Project area and classify the habitat as either natural, critical, or modified (as per IFC Performance Standards (PS) 6, Guidance Note (GN) paragraph 39). Review the data available from online data sources (such as the Integrated Biodiversity Assessment Tool) and from interviews/consultation to screen for any critical habitat values that may be present within an appropriate area of assessment for the Project. Reference shall be made to IFC PS6 GN paragraph 66. The E&S Consultant is to provide a clear statement as to any selected biodiversity values that are identified. Map the extent and condition of Natural and Modified Habitats, as defined in IFC PS6. Consultation with local experts to assess potential for the presence of sensitive species identified from IBAT screening to occur on-site.

Topic	Indicative Scope
	Through survey results and consultation with relevant local and international NGOs if relevant, assess potential impacts to sensitive/protected areas identified from IBAT and other screening, including potential impacts from the Project's Associated Facilities. Provide a list of potential selected biodiversity values associated with the project according to the principles of vulnerability and irreplaceability per IFC PS 6 Guidance Note 6. Confirm Habitat designation based on selected biodiversity values, and if Critical Habitat is confirmed a Critical Habitat Assessment as per IFC PS6 requirements shall be conducted – but only with prior approval of WASAC and AIIB.
Air Quality	Comprehensive air quality monitoring baseline shall be undertaken, also related to any sensitive off-site receptors which may be affected by the Project. The E&S Consultant is expected to provide a classification of site environment (e.g., degraded, or non-degraded airshed), establish present background air pollutants, applicable ambient air quality limits for the area, local dimensioning practice, and assessment of future expected air quality based on available contextual information. This shall consider any implications for the Project design.
Noise & Vibration	Noise monitoring baseline shall be undertaken, also related to any sensitive off-site receptors which may be affected by the Project. The E&S Consultant is expected to provide a classification of the site environment, establish present background noise level, and identify applicable noise limits and location of boundary to a level sufficient for the development of mitigation measures envisaged and to assess the future expected levels of noise, and, if applicable vibration, during operations.
Water	Assess the nature of and characterize surface water and groundwater within the Project AoI, with particular attention to the Project footprint. As possible assess current water sourcing & permitting requirements as well as quality. This shall include the assessment of the sustainability of groundwater and/or surface resources, and aspects such as ecological flow requirements in any surface water resources the Project might exploit. If groundwater resources are potentially limited and/or there is an indication of potential impacts on other users, including ecological aspects, a groundwater model shall be developed. The ESIA report shall have the drainage maps to capture and analyze the drainage pattern in the area. A Digital Elevation Model (DEM) map shall also be included to identify the flow of water in the Project area. The ESIA study shall also cover surface water resources in the area and through water quality assessment, identify if there is any contamination of water.
Geology, soil, and land cover	The geological and geotechnical/ hydrogeological features shall be described in the baseline report and to cover Geo-hazards and analysis of land cover, soil types, quality, and distribution over the interested area.

Topic	Indicative Scope
Waste (Hazardous and non-hazardous) generation and management	Assess the city sewerage treatment system capacity. Provide details on solid and waste management including storage, treatment and disposal with details of the EPC Contractors' practices (if applicable); availability of companies with required permits if engaged in the treatment and disposal of waste. Determine expected types and amounts of waste stream. Map local disposal options and associated quality requirements, including the permitting status of local landfills and their compliance with international standards and guidelines. Assess local recycling capacity for waste generated by the Project (including the potential for waste to energy), and any needs, longer term, for building local capacity.

- Socioeconomic baseline: Demographic profile of the region shall be developed using data from secondary sources and sample surveys within the project footprint. The sample survey shall also present household level data on income, education, ethnicity, marital status, occupation, expenditures, and access to basic facilities. The income of the commercial units shall also be captured in the survey. In addition, the socioeconomic baseline data, gender-segregated where applicable, shall be collected through a combination of secondary literature review and appropriate primary data collection techniques such as surveys and interviews, on the following parameters/aspects, as appropriate and relevant:
  - population and demography,
  - vulnerable groups and poverty profile,
  - local government institutions; community organizations and patterns of social interaction, such as social networks and support systems, civil society organizations and key programs, and existing complaints resolution systems and practices;

- Gender: A gender survey shall also be carried out to determine the gender issues and trends in the project area. The baseline shall include but not limited to the project affected persons (PAPs). Gender baseline data shall include (but may not be limited to) indicators of women's mobility; gender differences in constraints faced in accessing facilities and utilities; gender equality; gender-based violence (GBV); gender responsive infrastructure facility; and gender differences in preferences/concerns.

- Cultural Resources: a list of cultural heritage, archaeology, objects and places of special interest in the project area (e.g., World Heritage Sites/Buildings listed by UNESCO, masjid and monuments; and others) shall be developed. Any cultural resources in the immediate vicinity of the project area (e.g., road corridor, construction camps, borrow areas, any other project-related facility) shall be described in greater detail.

h) Deliverable: The Consultant shall deliver the E&S Baseline Collection report. This document shall be included into the ESIA Report as a standalone section.

7) Environmental and Social Impact Assessment:

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a) This task builds upon the initial scoping and analyses carried out during Feasibility Study. Develop a methodology/grading system for impacts to record severity in a matrix (long vs. short-term, reversible vs. irreversible etc.); This task aims to assess all potential environmental risks and impacts, both positive and adverse, associated with the Project. This includes direct and indirect impacts on the physical and biological environment, recognizing they are closely linked with social and economic conditions. These include risks in both the short-term and the long-term resulting from pre-construction, construction and operation phases of the Project. Tools such as the Leopold Matrix may be used to determine the interaction of the project activities with various environmental and social aspects. Based on its nature and likelihood of occurrence, significance of each potential impact shall be assessed as severe, moderate, mild, or negligible. Qualitative approaches and where necessary/appropriate, quantitative techniques shall be used to assess the potential impacts, and significant positive and negative impacts, direct and indirect impacts, and short-term and long-term impacts shall be distinguished, particularly those adverse impacts which are likely to be unavoidable or irreversible. The assessment shall cover generic as well as project- and site-specific impacts. In addition, sensitive receptors shall be identified in the project area with respect to environment, biodiversity, and socioeconomic aspects. Direct and indirect impacts on biodiversity shall also be assessed. The ecological impact assessment shall particularly specify disturbance to the protected area and wildlife due to the construction and operation and provide recommendations for synergizing the positive effects and minimizing short-term and long-term adverse impacts and possible integration with socio-economic development.

b) Scope and Coverage. Refer to AIIB ESP. The Consultant is required to address the identified environmental and social risks and impacts of the Project in accordance with Sections D through L of the AIIB ESP. Section A of ESS 1 sets out general requirements for assessing and managing environmental and social risks under the Project; Sections B, C and D of ESS 1 set out more detailed requirements for, respectively: environmental aspects, social aspects, and working conditions and community health and safety aspects of such assessment and management.

c) Environmental Coverage: The following environmental aspects are to be assessed:

- Biodiversity - habitat loss, degradation and fragmentation, invasive species, overexploitation, hydrological changes, nutrient loading, pollution and incidental take, as well as projected climate change impacts.
- Impacts on Critical habitats, Natural habitats, Protected areas
- Sustainability of Land and Water Use
- Pollution Prevention
- Resource Efficiency
- Climate Change and Greenhouse Gases.
- Occupational Health and Safety. Includes Traffic Road and Safety

d) Social Coverage: Undertake a broad assessment of potential social and economic risks and impacts, both positive and adverse, associated with the Project, not limited to Involuntary Resettlement or impacts on Indigenous Peoples. This includes direct and indirect impacts at the community and household level, recognizing they are closely linked with physical and biological conditions. To address the potential land acquisition and resettlement issues, a Resettlement Action Plan (for Project Areas) shall be prepared, as an annexure to the ESIA.

- The following areas are to be covered:
  - Vulnerable Groups (economic, geography, social, occupation, disability) and discrimination
  - Gender and social inclusion
  - Ethnic minority group and indigenous community
  - Availability of social safety nets
  - Land and Natural Resource Access
  - Loss of Access to Assets or Resources or Restrictions on Land Use
  - Cultural Resource
  - Safe Working Conditions and Community Health and Safety
  - Child Labor and Forced Labor
  - Labor Management Relationships in Private Sector Projects
  - Use of Security Personnel

- The social impact assessment shall include, but not be limited to, the following topics:
  - Analyze and address issues of land acquisition, including land title, nature of displacements (physical, economic, commercial), total numbers of Project Affected People (census survey), any other impacts due to land acquisition, such as livelihood restoration etc. Provide gender disaggregated data on PAPs.
  - Analyze and address social development issues, and ensure accomplishing the outcomes in terms of inclusion, cohesion, equity, safety, security, and accountability.
  - Assess impacts on individuals, groups and communities, e.g., temporary access restrictions, disturbance to traffic and other public utilities due to construction. Impact on both residential and commercial units (linked to item #a) shall be studied to understand the short- and medium-term disruptions due to construction.
  - Analyze labor health and safety as well as impacts of labor influx on the community.
  - Analyze risks on community health and safety during construction and operation phases.
  - Analyze the risk of human trafficking and STIs/HIV/AIDS associated with the Project
  - Identify stakeholders at different levels, mapping key expectations, analyze impacts, issues and concerns as related to each stakeholder subgroups thereof.
  - Identify potentially adverse gender-specific risks and impacts of the Project and develop mitigation measures to reduce these. Use gender/sex disaggregated data and analysis and consider enhancing the design of the Project to promote equality of opportunity and women's socioeconomic empowerment, particularly with respect to provision of services and employment.
  - Identify risks to and impacts on vulnerable groups and develop measures for their mitigation.
  - Develop measures for the management of interactions between the communities and workers.
- Issues related to Labor and Working Conditions: Provide guidance for use of a labor management system for Project workers, consistent with relevant national law, which provides for:

- Clear and understandable terms of employment made available to Project workers in an accessible manner.
- Timely payment for Project work and those working hours are in conformity with national regulations.
- Employment on the basis of the principle of equal opportunity, fair treatment and non-discrimination.
- Compliance with national law relating to workers' organizations and collective bargaining.
- An accessible, understandable, and transparent Grievance Redress Mechanism for raising Project workplace concerns that:
  - i. Does not impede access to other judicial or administrative remedies that might be available under law or through existing arbitration or mediation procedures, or substitute for grievance mechanisms provided through workers unions or collective agreements.
  - ii. Involves an appropriate level of management and addresses concerns promptly, using an understandable and transparent process that provides timely feedback to those concerned, without any retribution; and
  - iii. Allows for confidential complaints to be raised and addressed; and
- A suitable system designed to inform Project workers of the grievance mechanism at the time of hiring and make it easily accessible to them.

- In addition, close coordination shall be maintained with the engineering design team to assess the climate risks and to analyze climate adaptation/ mitigation measures incorporated in the project design. For the former, an internationally recognized methodology shall be applied to estimate the Gross Emissions of Greenhouse Gases (GHGs) as a result of the Project and to predict the net GHG emissions compared to baseline emissions.
- Subsequently, avoidance, mitigation, and/or compensatory measures, in this order of preference, shall be identified to address each potential impact, in the context of the Project. The proposed mitigation measures shall be project- and site-specific, practical, and cost effective. After determining the mitigation measures, residual impacts (i.e., impacts after implementing the mitigation measures) shall also be identified and their significance assessed based upon their severity and likelihood of occurrence.

8) Rapid Cumulative Impacts Assessment

a) Assess whether the project development may contribute to cumulative impacts.

b) The Consultant shall undertake an assessment of other existing or planned/permitted projects which along with the Project could have cumulative impacts on Valued Environmental and Social Components (VECs). This shall recognize that Cumulative Impacts are contextual and encompass a broad spectrum of impacts at different spatial and temporal scales. Then information shall be used in the development of the management plans to avoid and/or minimize these impacts to the greatest extent possible. A map shall be included which illustrates the proximity of these features to the Project and, as appropriate, the VECs.

9) Stakeholder Engagement Plan (for Project Areas):

a) The Consultant shall develop a Stakeholder Engagement Plan ("SEP") in line with the AIIB's requirements. For purposes of this Project, the SEP will be embedded in the ESMP. The SEP shall recognize that stakeholder engagement is an ongoing process that involves stakeholder analysis & planning, disclosure and dissemination of information, consultation & participation, grievance mechanism and on-going reporting to affected communities. In line with the requirements of AIIB, the SEP shall be developed and scaled to the Project risks and impacts and be tailored to the characteristics and interests of the Affected Communities and key stakeholders.

b) The Consultant shall build the SEP based on the E&S assessment outcomes considering local settings. The SEP shall be developed to include the following:

- Identify all Project related direct and indirect, primary and secondary stakeholders influenced by the Project to include central governmental entities, local governmental entities, NGOs, local communities and CBOs; academic and research institutions; private sector companies; media organizations; and most important any vulnerable groups if applicable.
- Evaluate Project related stakeholders to understand their priorities and relevance to the Project.
- Define the Project's approach to stakeholder engagement (post ESIA study, during construction and operations). Preference shall be given to identification of engagement mechanisms that are: (i) culturally appropriate, (ii) scaled to the project risks and impacts, (iii) tailored to the characteristics and interests of the stakeholder groups language preferences, and decision-making process, and (iv) capture the needs of vulnerable groups and gender considerations.
- Identify the objective of undertaking such consultation activities for each stakeholder group.
- Identify the phase of involvement of stakeholders. This shall include: (i) summary of stakeholder consultations and engagement undertaken as part of the ESIA (scoping process, baseline, impact assessment, mitigation, etc.) and (ii) future engagement post-ESIA phase to be implemented through the project duration to include four distinct phases – planning, construction, operation, and decommissioning and
- A detailed grievance/project complaints mechanism that is responsive and facilitates establishing and facilitating the resolution of stakeholders' concerns and grievances.

c) This SEP shall describe the process undertaken for disclosing Project information, consulting key stakeholders and, where appropriate, incorporating responses into Project design and mitigation. It shall also list all key issues raised to date, who raised them (unless anonymous/confidential), and responses provided, as well as the dates and times of meetings held, details of how meetings were advertised, methods of info dissemination etc. (e.g., radio, TV, newspaper adverts, public meetings, small meetings / focus groups, key informant discussions). It shall establish a Grievance Mechanism to record, evaluate, and address complaints or issues raised by stakeholders.

10) **Grievance Redress Mechanism (GRM)**

a) A Project level Grievance Redress Mechanism (GRM) shall be included in the ESMP. It shall be outlined with clear roles, timelines, procedures and responsibilities. It shall also describe the options available to PAPs for grievance redress regarding environmental, social and resettlement issues.

b) The ESMP and SEP shall indicate how the information of GRM would be disseminated and accessible clearly and comprehensible to the PAPs.

c) The GRM shall include provisions to protect complainants from retaliation and to remain anonymous, if requested. Reference shall be made to the Project-affected People's Mechanism Policy of the AIIB. It is important to constitute field level GRCs (Grievance Redress Committees) which can be easily accessed by the community members.

d) Deliverables: The Consultant shall submit the SEP, along with the Grievance Mechanism in compliance with the applicable requirements.

11) Preparing Detailed Environmental and Social Management Plan (for Project Areas):

Environmental and Social Management Plan (ESMP)

a) The Consultant shall develop an Environmental and Social Management Plan ("ESMP") as part of the ESIA. This is to identify for each impact the mitigation, monitoring and management measures to be taken during the various phases of the Project (construction, operations and maintenance) to avoid, reduce, mitigate, or compensate for adverse environmental, social, and health and safety impacts. This is to be provided in a consolidated table form (Table 2), with the measures required for pre-constructing, construction, and operation to be described. Measures shall be developed based on the mitigation hierarchy, commencing with avoiding risks/impacts, followed by minimizing them, and finally compensating/offsetting remaining impacts.

Table 2 – Proposed Mitigation Measures

Issue	Potential Environmental Impacts	Proposed Mitigation Measures	Responsible Institutions	
			Implementation	Supervision
Pre-Construction Stage				
Design of project facilities				
Utility				
Lack of environmental specifications				
Tree cutting				

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Issue	Potential Environmental Impacts	Proposed Mitigation Measures	Responsible Institutions	
			Implementation	Supervision
Pre-Construction Stage				
Construction Stage				
Air pollution				
Noise pollution				
Wastewater Pollution/Sanitation Hazard				
Drainage Congestion				
Solid Waste Pollution				
Landscape				
Access Road/Traffic Congestion				
Liquid/hazardous waste				
Construction Camp Management				
Worker Health and Safety				

b) For each identified impact, the Consultant shall establish:

- A set of mitigation measures that shall include feasible measures to prevent significant adverse impacts or reduce them to acceptable levels. Such measures shall involve technical requirements, guidelines or procedures and practices to be implemented during design, construction, and operation phases of the Project; and
- A set of monitoring requirements that ensure that the identified mitigation measures are considered, implemented properly and are sufficient measures for protecting the environment and environment resources, local communities, and workers.

c) As part of the ESMP, the Consultant shall also identify the proposed management structure and roles and responsibilities, as applicable, that shall be followed for the project. This to capture Sponsor, EPC Contractors, and O&M contractors (if any).

d) An ESMP (Table 3) shall be prepared including the following:

- A summary of the anticipated significant adverse environmental impacts together with the mitigation measures for each anticipated significant/non-significant adverse

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environmental and social impact throughout the project cycle (i.e., Detailed design and planning phase, Pre-Construction Phase – Site Preparation, Construction Phase, and Operation and Maintenance phase) and residual impact if any. Mitigation measures shall be specific as much as possible.

- Monitoring plan including:
  - Parameters to be monitored.
  - Proposed locations of sampling points.
  - Methodology for monitoring.
  - Frequency of monitoring and
  - Responsible agency / agencies.
- Availability of funds, expertise and facilities including budget/cost considerations.
- Implementation arrangement including:
  - Implementation schedule of the impact mitigation plan showing phasing and coordination with overall project implementation.
  - Institutional framework, indicating who is responsible for carrying out the mitigation and monitoring; and
  - Capital and recurrent costs to implement mitigation and monitoring measures described above. Identify the availability and source of funds to implement the measures including for capacity development activities.

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Table 3. Environmental and Social Management Plan

Project Activity	**Potential Impacts**	**Proposed Mitigation Measures**	**Institutional Responsibilities** (Implementation and Supervision)	**Estimated Quantities and Material Specifications Required Recommended**	**Cost Estimates**	**Comments** (e.g., secondary impacts)
Detailed Design and Planning Phase						
Site Preparation						
Construction Phase						
Operation and Maintenance Phase						

e) The ESMP shall be prepared based on the impact assessment and collate all recommended mitigation measures and compliance conditions of different permits. The institutional mechanism shall also provide details on training and capacity building, internal and external reporting on E&S, budgetary allocation etc.

f) Subject to the status of project definition, the following management plans shall be developed, or their content outlined in detail to allow its full development by the responsible party (only indicative list provided). The management plans which may include but not limited to:

- Pollution Prevention and Control Plan;
- Transportation Management Plan;
- Air Quality Management Plan;
- Water Conservation / Minimization Plan;
- Wastewater Management Plan;
- Hazardous Material Management Plan;
- Waste Minimization and Resource Efficiency and Conservation Management Plan;
- ESHS Training Management Plan;
- Labor Influx Management Plan and Working Conditions (including Gender, GBV, and Harassment),
- Local Recruitment and Training Plan;
- Occupation Health and Safety Management Plan and procedures (includes management of climate risk);
- Community Health and Safety Management Plan (includes management of Climate risk);

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- Mitigation measures for Impact on private and communal property including loss of access;
- Security Risk Assessment and Management Plan;
- Gender/Gender Based Violence (GBV) Assessment and Action Plan;
- Biodiversity Management Plan (if applicable depending on the finding of the ESIA);
- Emergency Preparedness and Management Program (includes management of Climate risk for safety of workers and community);
- E&S Contractor Management Plan (including GBV); and
- Cumulative Impact Assessment and Management Program,
- Policy, legal and administrative framework, social related act

g) Deliverable: The Consultant shall develop the ESMP in compliance with the applicable requirements as part of the ESIA. This document shall be included into the ESIA Report as a standalone section.

12) ESIA Standalone Non-Technical Summary (NTS)

a) The E&S Consultant shall prepare a Non-Technical Summary ("NTS") report that concisely presents meaningful information on the subproject, its E&S footprint and impacts, significant findings, and recommended actions in easily understandable (non-technical) language.

b) The section shall include a summary of the ESIA (Project description, baselines, impact analysis and mitigation measures for the environmental, social and health and safety negative and positive impacts) and a summary of the stakeholder engagement process. NTS is required in English and local language.

c) Deliverable: The Consultant shall develop the NTS. This document shall be a standalone document, as an annex to the ESIA Report.

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Annexure B

Kigali Outline

I City of Kigali

1) The City of Kigali with population of approximately 3 million as per 2022 census is the capital and largest city of Rwanda with an administrative area of about 730 sq. km. It is the economic, cultural and transport hub of Rwanda. The city is surrounded by hills with highest peak Mt. Kigali with an elevation of 1850m.

2) Kigali is divided in to three districts - Gasabo, Nyarugenge and Kicukiro. Gasabo district occupies the northern half of Kigali province. It covers about 430.30 sq.km area with a population of 879,505 as per 2022 census. The district is divided into 15 sectors which are Bumbogo, Gatsata, Jali, Gikomero, Gisozi, Jabana, Kinyinya, Ndera, Nduba, Rusororo, Rutunga, Kacyiru, Kimihurura, Kimironko and Remera, 73 cells and 501 settlements commonly known as Imidugudu. The urban population is mainly formed of the seven sectors; Kimihurara, Kacyiru, Kimironko, Remera, Gisozi, Kinyinya and Gatsata and the urban population is about 72% of population of Gasabo district.

3) According to the existing feasibility study, it is expected that proposed project will cover some areas of Gasabo District of Kigali, specifically in the area comprised in the Kinyinya and Kibagabaga catchments located in the seven sectors of the Gasabo District namely: Kinyinya, Kimironko, Remera, Gisozi, Bumbogo, Jabana and Nduba.

4) Gasabo District has two major climatic seasons in a year, namely, the dry and rain seasons. The two major climatic seasons alternate within the year, hence, the district experiencing two dry seasons and rain seasons. However, it is important to note that duration for these seasons is irregular, the average temperatures are about 22^0C and rains received range between 900 and 1,500mm annually.

5) There is considerable agriculture carried out in Gasabo district and the main crops cultivated are maize (14.9 %), sorghum (4.7 %) and rice (1.2 %). Similarly, 25.9 % households do manage any farm animal. Also noted is that 61.0 % of agriculture is done on land size of less than 0.1 hectare which reflects the 5 % farm employment.

6) Gasabo district is characterized by the mixture of high mountains with average altitude of 1,800m mainly located in the rural zone, sloping basins, and valleys. The district has over 30 wetlands and small rivers traversing through the valleys. The main unique long river of about 50Km long and 1,000M wide is the one that originates from Lake Muhazi and traverses through marshy and boggy valleys before emptying into the Nyabugogo River and thereafter

connects to the Nyabarongo River. Also, Lake Muhazi in the North and part in the East borders Gasabo district.

Figure 1. Location map of Gasabo district

II Expected Project Beneficiaries in Kigali.

1) The project is expected to benefit 756,106 residents directly and 6 million residents indirectly, as follows:

- 652,334 people directly benefit (estimated from household connections) and from estates with pretreatment facilities with access to safe Wastewater collection and environmentally sound discharge.
- 103,772 people directly benefit from safe disposal of fecal sludge from collection and disposal from septic tanks and pit latrines.
- 1.3 million people in Kigali indirectly benefit from higher quality surface and groundwater for their water supply.
- 6 million people indirectly benefit downstream in the LVC (total LVC population 40 million) with better surface water quality.

- The above beneficiaries were identified in the earlier prepared FSR and are likely to change because of the Investment Project.