ESIA Scoping Study
Project La Côtière (Lot 3), Substations, Guinea

On behalf of:
Construction Management Services

Project Reference:
023-1951

Revision:
REV00

Date:
March 2024

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Document Control Record				
Revision	**Date**	**Author(s)**	**Authorised by**	**Reason for Change**
00	31/03/24	MS	SPR	First issue to Client

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Abbreviations

AoI	Area of Influence
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
E&S	Environmental and Social
EAME	Earth & Marine Environmental Consultants
ELV	Emission Limit Value
EMP	Environmental Management Plan
EMS	Environmental Management Systems
ERP	Emergency Preparedness Plan
EU	European Union
GIS	Gas Insulated Switchgear
GIS*	Geographical Information System
GPS	Global Positioning System
HSEQ	Health, Safety, Environment and Quality
HSSE	Health, Safety, Security and Environment
IBC	Intermediate Bulk Container
IFC	International Finance Corporation
IFI	International Finance Institution
IUCN	International Union for Conservation of Nature
OECD	Organization for Economic Cooperation and Development
PM	Particulate Matter
QHSSE	Quality, Health, Safety, Security and Environmental
SDS	Safety Data Sheets
TDS	Total Dissolved Solids
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds
WWTP	Wastewater Treatment Plant
WHO	World Health Organisation

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Executive Summary

Earth & Marine Environmental Consultants Ltd (EAME) is a multi-disciplinary ESG consulting firm specialising in Environmental and Social appraisals of internationally funded infrastructure projects (especially energy infrastructure). EAME was instructed by **Construction Management Services** *SARL* of Morocco (the "Client" or "CMS") to undertake an Environmental and Social Impact Assessment (ESIA) and produce a Scoping Report and ESIA Report in relation to the Project La Côtière (Lot 3), Substations, Guinea (the "site" or the "project"). Following local requirements, EAME has partnered with a locally registered and authorised consulting firm (Cabinet d'Expertise Multi-conseils en Environnement - CEMED) to assist with the ESIA programme.

The Lot 3 Project involves the construction of five new substations with Gas Insulated Switchgear (GIS) as part of Project La Côtière which involves several power distribution developments including sub-stations and overhead transmission lines. Lot 3, the subject of this ESIA, involves the construction of new substations at the following sites:

- Dubréka;
- Kobaya;
- Kipé;
- Kaloum; and
- Matoto.

It has been determined by the funders that the Project is sufficient in scale and potential impacts to warrant a full Environmental and Social Impact Assessment (ESIA) as would be expected by any International Finance Institution (IFI) following the Equator Principles, IFC Performance Standards and World Bank EHS Guidelines (as a minimum scope). However, these standards and the required scope of coverage apply to all Projects of any size and sector, but clearly, some issues will not be relevant on a Project-by-Project basis. This report, the so-called ESIA Scoping Report, sets out the anticipated E&S aspects that could be relevant to this specific Project, and how these will be assessed and communicated throughout the ESIA process.

The Scoping Report is a stakeholder consultation document that is issued to relevant stakeholders and made available to the public and which sets out (in basic terms) the Project proposals, the potential impacts that could be envisaged and how these will be estimated and assessed through the ESIA process. The approach is not intended to be a definitive statement of intent and stakeholders and the public are encouraged to respond and raise any other

environmental and social (E&S) impacts that they think should be assessed that may not have been included. The ESIA team will then review these and incorporate them (where relevant) in the overall ESIA process.

The Project, in simple terms, involves:

- the clearance of existing site infrastructure or surface features;
- geotechnical preparation of the ground before construction;
- installation of foundations and surface infrastructure;
- erection and installation of the main GIS Substation equipment and ancillary structures; and
- commissioning and operation of the substations.

Although there will be Overhead Transmission Lines (OHTLs) that will connect the sub-stations to the electrical grid, these are the subject of a separate construction contract (not with CMS) and are being assessed separately in an unrelated ESIA. As such consideration of the E&S issues associated with these OHTLs is outside the scope of this ESIA. Furthermore, it is understood that all of the construction activities will take place within the curtilage of the designated sites and that no other temporary sites or associated facilities need to be considered in the execution of this ESIA.

The potential E&S impacts that have been considered (Scoped In) for the ESIA and also those that could be expected for any given project but which are not considered to be relevant in the specific case of this project (Scoped Out) are outlined in **Table ES1**.

Table ES1: *E&S topics scoped into and out of the ESIA process*

Topic	Scoped	Construction	Operation	Decommissioning
Environmental Impacts				
Soils and Geology	IN	Y	Y	Y
Surface water	IN	Y	Y	Y
Groundwater	IN	Y	Y	Y

Topic	Scoped	Construction	Operation	Decommissioning
Climate change risks	IN	Y	Y	Y
Green House Gas (GHG) emissions	IN	Y	Y	Y
Air quality – human receptors	IN	Y	Y	Y
Air quality – biodiversity receptors	IN	Y	Y	Y
Noise and vibration	IN	Y	Y	Y
Biodiversity and ecological disturbance	IN	Y	Y	Y
Waste management	IN	Y	Y	Y
Traffic	IN	Y	Y	Y
Landscape and visual impact	IN	Y	Y	-
Social Impacts				
Cultural heritage	IN	Y	-	-
Demographics	OUT	-	-	-
Indigenous Peoples	IN	Y	-	-
Land Use (including take and loss)	IN	Y	-	-
Health	OUT	-	-	-
Economy and livelihoods	IN	Y	Y	Y
Infrastructure and services	IN	Y	Y	Y
Community health, safety, and security	IN	Y	Y	Y
Worker health, safety, and security	IN	Y	Y	Y
Labour issues	IN	Y	Y	Y
Human rights	IN	Y	Y	Y

The reason that Demographics and Health impacts have been scoped out (require no further consideration) is that the project is effectively 5 relatively small construction projects happening simultaneously and the construction labour requirement and operational labour requirement for any given site is very small. The number of persons that will be added to the local population as a result of the construction activities is insignificant and will not have any

influence over the prevailing demographic baseline. Similarly, the demand for health services and the potential for the introduction of health impacts (e.g. communicable disease spread, overloading of health services, etc) is insignificant.

It should be noted for those elements that remain Scoped In, the Project can involve positive as well as negative impacts and these too shall also be considered.

This report sets the terms of reference for the full ESIA which will assess these potential impact scenarios in more detail and define measures to reduce or eliminate these impacts where they are deemed to be significant.

The remainder of this document sets out these issues in more detail. All responses and queries related to this document, the Project and associated studies should be directed to guinea@eame.co.uk.

It is important to remember that the conclusions on the scope of the ESIA only remain valid if the current proposals are implemented as stated on the identified site. Any significant changes to the proposed scope of works or site locations would invalidate the presented assessment.

1 Introduction

1.1 Background

Earth & Marine Environmental Consultants Ltd (EAME) is a multi-disciplinary ESG consulting firm specialising in Environmental and Social appraisals of internationally funded infrastructure projects (especially energy infrastructure). EAME was instructed by Construction Management Services SARL of Morocco (the "Client" or "CMS") to undertake an Environmental and Social Impact Assessment (ESIA) and produce a Scoping Report and ESIA Report in relation to the Project La Côtière (Lot 3), Substations, Guinea (the "site" or the "project").

The Project involves the construction of five new substations with Gas Insulated Switchgear (GIS) as part of Project La Côtière (Lot 3). The sites involved in the study are:

- Dubréka (41km from Conakry – 1.1.ha);
- Kobaya (21km from Conakry – 1.3ha);
- Matoto (18km from Conakry – 1.5ha);
- Kipé (13km from Conakry – 1.1ha); and
- Kaloum (3km from Conakry – 1.3ha).

This scoping report provided an early indication of the environmental and social conditions in the Project area (site locations) and enabled an initial high-level assessment of how the implementation of the Project might change these conditions.

Associated with Lot 3 and the development of these sub-station sites is the development of Overhead Transmission Lines (OHTLs), but these are being developed as a separate contract to the sub-stations and are the subject of a separate ESIA. The OHTLs do not form part of the ESIA scope that is part of this study.

Following local requirements, EAME has partnered with a locally registered and authorised consulting firm (Cabinet d'Expertise Multi-conseils en Environnement - CEMED) to assist with the ESIA programme.

1.2 Scoping Report Purpose

The purpose of this Scoping Report is to introduce the project to stakeholders and the public and set the terms of reference (define the scope) for the ESIA. In particular, the potential E&S impacts that will be scoped in and out and the methodologies that will be used to assess those that have been scoped in and the justification for those that haver been scoped out.

The ESIA is required to evaluate the environmental and social impacts of Project-related activities during the construction and operational phases of the development and the subsequent demolition and decommissioning. EAME will undertake the ESIA following the requirements of the Equator Principles (EPIV), which set minimum expectations for matters to be considered in an ESIA study.

The following are the main objectives of the Scoping stage of the ESIA:

- To inform potentially affected persons, relevant stakeholders and the public about the project and its features openly and transparently;
- To make a preliminary identification and high-level assessment of potential environmental and social impacts that could be associated with the project;
- To assess and “Scope Out” (exclude) issues that are required considerations under EPIV and the IFC Performance Standards, but which might not be relevant to this particular study (and explain why they have been Scoped Out);
- To provide a mechanism for additional issues and concerns raised by stakeholders to be considered in the development of the ESIA study; and
- To provide a record of the state of knowledge about the project and its potential impacts at the time of commencement of the ESIA study.

The scoping process is an iterative one, informed by increasing knowledge acquired through the ESIA process. **Figure *1-1*** highlights some of the key inputs to the scoping process.

Figure 1-1: *Scoping process inputs*

The Scoping Report is based on the available information about the project design and the host sites and their Environmental and Social contexts as known at the time of the preparation of the Scoping Report. If any of these features change during the subsequent ESIA process, such changes would be dealt with through the ESIA process and associated reporting. The Scoping Report would not be re-issued to address such changes.

1.3 Need for the Development

1.3.1 General Power Infrastructure

The national grid, managed by Electricité de Guinée (EDG), serves greater Conakry, with several isolated grid networks providing service elsewhere. Although Guinea is endowed with significant hydropower potential (especially since commissioning the 240-megawatt (MW) Kaleta hydropower plant in May 2015), there is still a general lack of power availability in the country.

Based on 2016 World Bank information (Sustainable Energy for All database), only 33.5% of Guinea's population can access electrical infrastructure (6.9 per cent in rural areas, 82.2 per cent in urban areas). Despite strong resource potential and long-term opportunities to export low-cost electricity throughout West Africa, Guinea's power sector faces significant challenges including dilapidated infrastructure, high technical and commercial losses, and poor overall financial performance. For example, even though power is available to most of Conakry, it is only available for limited periods, with long periods of blackout or reliance on multiple diesel generators to fill the gap (which is often not a resource available to the public and lower-income households). The cost and availability of this private power purchase has been greatly impacted by a recent major incident (catastrophic explosion) at the national fuel storage facility in Conakry in December 2023.

The improvement of the electrical distribution network through the installation of new modern sub-stations in strategic locations (and associated Overhead Transmission Lines) is an essential requirement for improved distribution and reliability of the power generation resource that is available. This project (Lot 3) is a key component of that improved power distribution network as it will provide 5 new state-of-the-art 225kV GIS substations across the Conakry region. There is no alternative way of enabling power distribution over long-distances.

1.3.2 Industrial Activities

Worldwide demand for bauxite, the primary source of aluminium oxide ore, is surging to meet the needs of the construction, energy, and vehicle sectors as they strive to cut carbon emissions. According to Reuters bauxite production is forecast to grow by 80 percent by 2050[1].

Guinea is a small country with a population of only 13.5 million, but in possession of massive (and high-quality) bauxite reserves: 7.4 billion metric tons, or 23 per cent of the world total[2]. In 2020, Guinea accounted for 55 per cent of global aluminium ore exports, primarily to China[3].

The Guinean government is now pressing multinational mining companies to develop more in-country downstream processing capacity to refine bauxite into aluminium oxide (alumina), which trades for six to seven times the price of bauxite itself. At present, Guinea's only aluminium oxide refinery is capable of refining less than 3 per cent of its annual bauxite production

1 https://www.reuters.com/world/china/world-aluminium-industry-must-cut-emissions-by-77-by-2050-iai-2021-03-16/#:~:text=Demand%20for%20aluminium%20is%20due,and%20power%20cabling%2C%20Bayliss%20added.

2 https://www.imf.org/en/Publications/CR/Issues/2021/07/06/Guinea-Selected-Issues-461723

3 https://oec.world/en/profile/hs/aluminium-ore

According to the Peterson Institute for International Economics (PIIE) expanding refining capacity in Guinea (a highly energy-intensive process) will be challenging, in part because Guinea's power grid is inadequate. Despite Guinea's substantial hydropower potential (at the headwaters of the Gambia, Niger, and Senegal Rivers) the mining sector still depends on diesel and heavy fuel oil-powered generators and is looking to natural gas-fed power development to meet anticipated demand[4].

The development of the sub-stations associated with this project will enhance the ability of the mining sector to harness the available power resources within Guinea and improve industrial output which has a direct effect on employment, foreign investment, export earnings and ultimately GDP.

1.4 Project Screening

Equator Principles 4 (EP4) categorisation is based on the International Finance Corporation's (IFC's) environmental and social categorisation process as outlined in the IFC Environmental and Social Review Procedures Manual (Version 8, May 31, 2012).

The IFC uses "Project categories" as a concise way of indicating the level of environmental and social concern posed by a proposed investment. In accordance with the OECD "*Common Approaches*", projects are assigned a category of A, B, or C, in descending order of environmental and social sensitivity.

These categories are:

- **Category A:** Business activities with potential significant adverse environmental or social risks and/or impacts that are diverse, irreversible, or unprecedented.
- **Category B:** Business activities with potential limited adverse environmental or social risks and/or impacts that are few, generally site-specific, largely reversible, and readily addressed through mitigation measures.
- **Category C:** Business activities with minimal or no adverse environmental or social risks and/or impacts.

EAME understands that the Project has (provisionally) been categorized as a **Category B** Project with United Kingdom Export Finance (UKEF), which is the Export Credit Agency (ECA) providing export credit guarantees for this project. EAME's initial appraisal of the project and the sites leads us to concur with this Categorisation.

4 https://www.piie.com/blogs/realtime-economics/guinea-faces-challenges-building-capacity-around-critical-mineral-energy

As a Category B project, it is anticipated by the international finance community that the project would be subjected to a robust ESIA by a suitably qualified ESIA practitioner. Unlike Category A projects, however, it is not normally necessary for that project and the ESIA to also be subjected to an Environmental and Social Due Diligence (ESDD) Audit by an Independent Environmental and Social Consultant (IESC).

Category C projects require no formal environmental and social appraisal beyond screening.

It should be noted that Guinea also has its own Screening and categorisation process for projects, the competent authority for which is L'Agence Guinéenne d'Evaluations Environnementales (AGEE). The AGEE categorisation system comprises 4 categories as follows:

Category A – Projects or activities that are high risk and likely to have very negative impacts and/or risks, generally irreversible, most often felt in a larger area than the sites covered by these projects. These projects are subject to a detailed Environmental and Social Impact Study

Category B: Projects or activities with significant risk and whose negative effects on the environment are less serious than those of the projects of category A. These are projects that can have easily identifiable impacts and are limited and the means of their mitigation are generally known. These projects are subject to a Simplified Environmental and Social Impact Study or Environmental and Social Impact Notice (NIES).

Category C: Projects or activities with moderate or even low risk and whose negative impacts are minor, on the biophysical and human environment. These projects are subject to environmental and social requirements.

Category D: Projects or activities whose negative impacts are insignificant, on the biophysical and human environment. These projects are implemented without specific measures.

The project notice has been submitted to AGEE, as long as the ToR is included in this scoping report, EAME propose that the ESIA is being undertaken in response to the UKEF/IFI classification of **Category B** which is in compliance with the requirements.

2 Project Description

2.1 Project Locations

Four of the five allocated sites (Kaloum, Kipé, Matoto and Kobaya) are located on the Conakry Peninsula whilst the final site is located north of the town of Dubréka, Guinea.

Figure 2-1: *Site locations*

The sites that have been put forward for the project have been provided by the Government of Guinee and have been selected on the basis of them both being in government ownership and not being encumbered by active land users or other activities. The sites have been identified and confirmed to the funding institutions, including the Export Credit Agency and have had perimeter fencing installed to prevent unauthorised access. There is a possibility that the Khaloum site will be changed for an alternative site, but this will still be an un-used industrial site in the port authority area.

2.2 Poste de Kaloum

From an administrative perspective, the site is in Conakry which is a special city with a single region and prefecture government. The site is partially within the Dixinn and Kaloum communes (***Figure 2-2***).

Figure 2-2: *Poste de Kaloum site outline*

The site was visited by EAME and CEMED on 08/03/2024. The northern part of the site area is currently occupied by a vehicle repair/dismantling/maintenance business with a security guard living on site (accommodation in the northeast corner of the site). The southern part of the site is walled and unused, but overgrown with low-level scrub vegetation. The site is currently composed of unsurfaced ground which was reclaimed from the inshore waters circa 2021 (**Annex C**). The nature of the infilled material is currently unknown.

There will be a need to understand the tenure and use of the land as a vehicle maintenance yard. These issues will be clarified and picked up through the ongoing ESIA process.

2.3 Poste de Kipé

The proposed site is located within a largely industrial/commercial area with the Kipé power plant (Centrale thermique de Kipé - 50 MW heavy fuel oil) to the south and the retail Prima Center to the north (***Figure 2-3***).

From an administrative perspective, the site is in Conakry which is a special city with a single region and prefecture government. The site is located within the Ratoma commune.

CMS reports that the local area surrounding the site has been designated for residential use since approximately 2014 but no development has yet been implemented.

The site was visited by EAME on 21/02/2024. The Site is currently unused and unfenced and there are no current site users or occupiers. The site was observed to be partially vegetated, and the remains of historic industrial activities (concrete pads and tank bases) are visible.

The historical data shows that the Site operated as an oil-fired power station between circa 2009 and 2019 (**Annex C**).

Figure 2-3: *Poste de Kipé site outline*

Only around 50% of the area identified above will likely be required for the sub-station development. The northern half of the site is generally undeveloped bare ground, but the southern half has numerous concrete ground structures and slabs and overgrown vegetation that would need to be removed to make the site developable. According to information provided by CMS, the below-ground concrete structures will be removed before the official site handover to CMS.

Photograph 2-1: *View across Poste de Kipé*

2.4 Poste de Matoto

From an administrative perspective, the site is in Conakry which is a special city with a single region and prefecture government. The site is located within the Ratoma commune (***Figure 2-4***).

Figure 2-4: *Poste de Matoto site outline*

The site was visited by EAME on 21/02/2024. The Site is currently unused and there are no current site users or occupiers. The site is partially fenced along the northern boundary with the railway line where a 15-metre buffer zone is required between the train line and the development area (***Photograph 2-2***). The Site was observed to be partially vegetated and there is evidence of localised waste disposal (construction materials). An unknown fibrous material was identified, this is a possible Asbestos Containing Material (PACM). The soils were observed to be composed of hard, compacted ironstone.

Photograph 2-2: *View across Poste de Matoto*

CMS reports that, as of 27th March 2024 the site is now fully fenced.

2.5 Poste de Kobaya

The proposed site is located within a largely rural area with interspersed farmsteads (***Figure 2-5***). The aerial photograph shows the site under rice production (and the site visit confirmed recent rice farming activity on the site). According to the US Department of Agriculture, the nearby Kindia region (in 2017) produced around 16% of the national rice production[5]. Rice production is an important crop for the local and wider area.

From an administrative perspective, the site is in Conakry which is a special city with a single region and prefecture government. The site is located within the Ratoma commune.

The site was visited by EAME on 21/02/2024. The site was observed to be well vegetated with previous rice crop remnants. Shallow drainage/irrigation channels (containing residual water) were observed around the proposed development area.

5 https://ipad.fas.usda.gov/rssiws/al/crop_production_maps/wafrica/Guinea_Rice.png

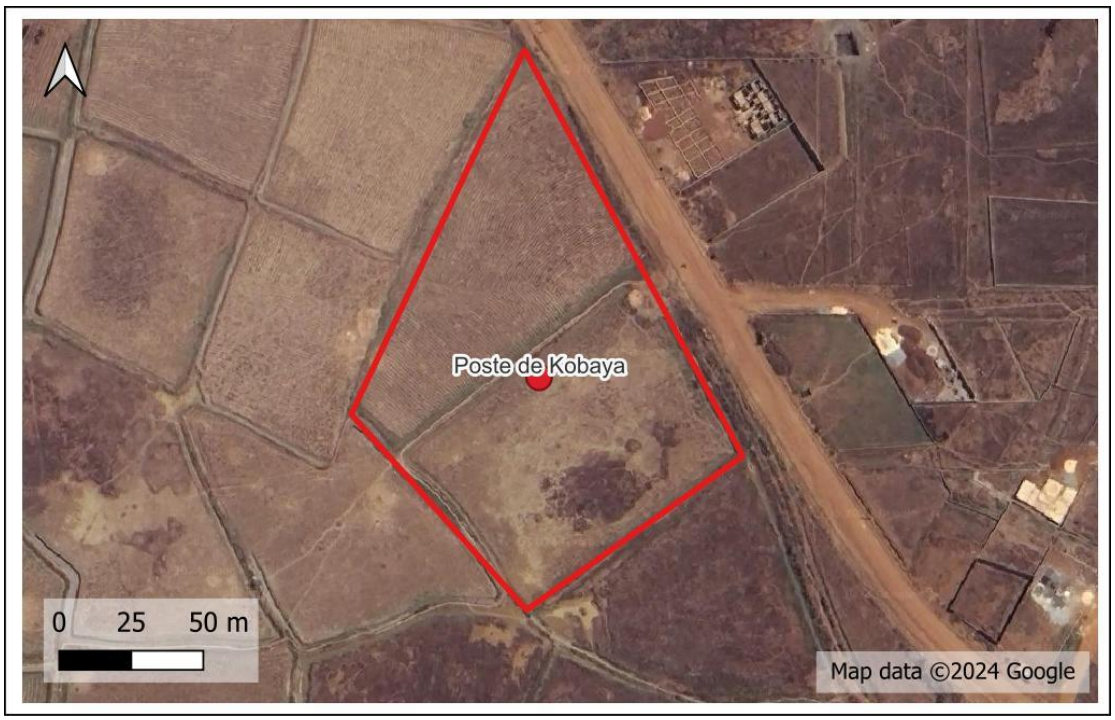


Figure 2-5: *Poste de Kobaya site outline*

Photograph 2-3*: View across Poste de Kobaya*

CMS reports that the local area surrounding the site has been designated for residential use but no development has yet been implemented.

2.6 Poste de Dubréka

The proposed site is located within a largely rural area with interspersed farmsteads (***Figure 2-6***). The aerial photograph shows the site under, according to CMS-provided information, decorative palm rather than commercial oil palm (*Elaeis guineensis*). According to the US Department of Agriculture, the Kindia region (in 2017) produced around 31% of the national palm oil production[6].

Figure 2-6: *Poste de Dubréka*

From an administrative perspective, the site is located within the Kindia administrative region, Dubréka Prefecture and Khoria sub-prefecture.

The site was visited by EAME on 21/02/2024. The site was fenced and cleared of all vegetation. The vegetation from the clearance activity was still located onsite in spoil heaps and a solitary tree had been left in place for shade.

6 https://ipad.fas.usda.gov/rssiws/al/crop_production_maps/wafrica/Guinea_Oil_Palm.png

Photograph 2-4: View across Poste de Dubréka

CMS reports that the local area surrounding the site has been designated for residential use but no development has yet been implemented.

2.7 Development Proposals

All five sites will follow the same design and layout provisions as outlined in ***Figure 2-7***.

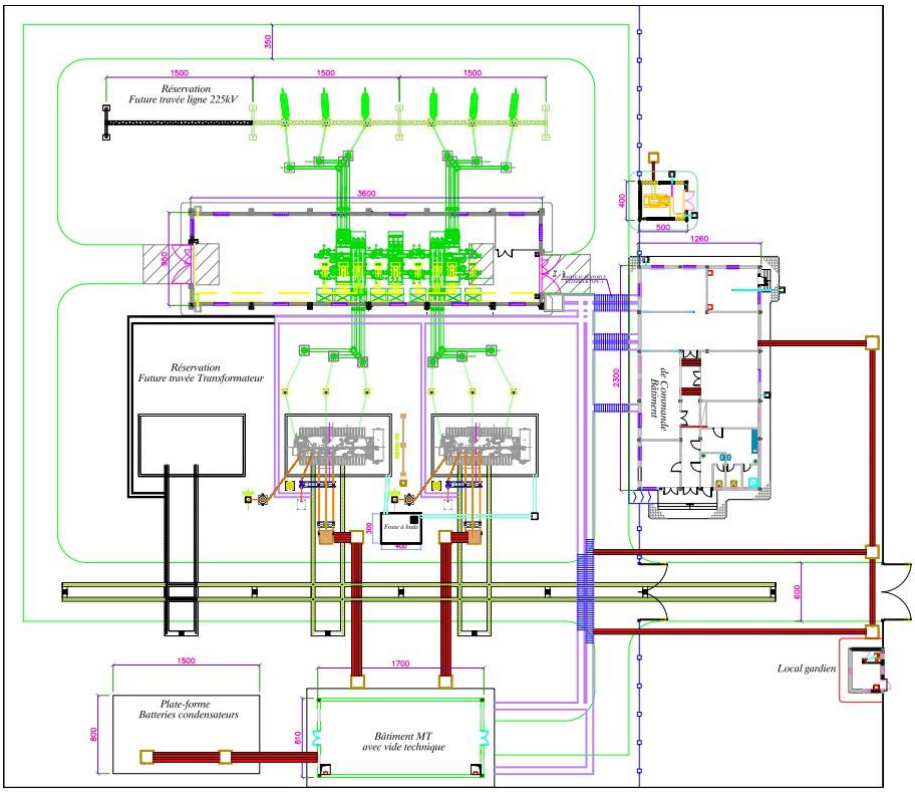


Figure 2-7: *Generalised substation layout*

The infrastructure elements will include:

- security guard station at the main site entrance;
- main control building;
- conductors (225k kV) entering the site (note external Overhead transmission lines (OHTL) are excluded from this E&S assessment process);
- gas-insulated switchgear containing Sulphur hexafluoride (SF6). Depending on the number of bays the initial fill volume could be between 1380 kg (5 bays) and 2703 kg (8 bays).
- distribution transformers (two with space for a third future unit)
- battery capacitor storage

- small 100 kV backup diesel generator

The key characteristics of the Proposed Development are summarised in **Table *2-1***. It is important to note that these are currently 'assumptions' based on the previous developments (i.e. full design details are not currently available).

Table 2-1: *Proposed Development – Key Characteristics (assumptions)*

Area	Description
Site Levels	To protect against the risk of flooding the existing site levels will need to be raised (levels to be provided). This will be achieved through the importation and deposition of material.
Surface water	It has been assumed that surface water will be collected and removed from the site. The discharge will be either via point source release or via infiltration (where possible). Where equipment containing oil is present (i.e. the transformers) these shall be contained within suitably sized secondary containment. Discharges from secondary containment systems shall be checked before off-site release.
Sewage Treatment	This is unlikely to be required given the likely low staff numbers required to operate and maintain the sites. It would be typical to include a cesspit (a sealed, fully enclosed tank that collects and stores sewerage) which is then removed for off-site treatment and disposal.
External Surfacing	External surfacing would be largely composed of hardstanding. The site would be fully fenced and secured.
Energy Generation	A single backup generator (maximum of 100 kV) with a self-contained day tank is to be installed at each of the sites.
Above Ground Tanks (ASTs)	No standalone ASTs are to be installed.
Water Supply	Standard water supply will be provided to the control room building and associated rest rooms. A deluge system is to be installed on all transformers (in the event of a fire).
Waste Storage	Localised waste storage only. Minimal volumes are expected although this would increase during outages and maintenance activities.
Waste Treatment	None.

2.8 Alternatives Considered

An outline of the main alternatives examined will be included in the ESIA Report, considering environmental and social impacts. It will include proposed site selection, Project design and layout and the 'do nothing/no action' approach. In general, there is no viable alternative.

Gas insulated switchgear (GIS) substation is a high voltage substation in which the major conducting structures are contained within a sealed environment with a dielectric gas known as SF6, or sulphur hexafluoride gas as the insulating medium.

In comparison, a conventional Air-Insulated Switchgear (AIS) substation, uses atmospheric air as the dielectric gas medium, as these types of substations primarily consist of outdoor facilities.

The benefits of the GIS substation are:

- **Amount of space required** – The total space required for a GIS substation is roughly a tenth of that needed for a conventional AIS facility. While the conventional, AIS requires several feet of air insulation to isolate a conductor, SF6 gas insulation only needs centimetres, allowing a GIS facility to fit into areas far smaller than that of an AIS facility.

- **Environmental protection** – GIS technology is a good choice to use in hot or cold locations, as it can be enclosed in a building which is environmentally protected from extreme conditions. In addition to protecting the system components from extreme heat and cold, GIS technology encloses the electrical components within a Faraday cage which shields the system from potential lightning strikes. AIS is also less stable, with reduced safety of operation compared to GIS, in seismic regions.

- **Urban installations** – GIS technology can be used for installations in areas where the cost of real estate or the aesthetic appeal and safety is a significant consideration. When acquiring land for a conventional AIS station in some densely populated areas, can be cost-prohibitive and/or politically sensitive.

The disadvantages of a GIS system are:

- **Costs** – The total system cost is higher compared to that of a conventional AIS although installation and development costs are lower.

- **Management of SF6** – Delivery of SF6 gas to the site can be problematic.

- **Maintenance** – System cleaning and maintenance are critical to reduce conductive particle contamination. Particle or moisture contamination inside the compartment causes flash overs. Access to live parts for maintenance is more problematic and harder

to diagnose without gas reclamation and disassembly of the modules. Outages can be longer, and the damage to the system will normally be severe following a fault condition.

2.8.1 Use of SF6

Sulphur hexafluoride is a nontoxic, inert and non-flammable gas consisting of a sulphur atom surrounded by and tightly bonded to six fluorine atoms. Sulphur hexafluoride (SF6) is the most common insulation gas in high-voltage technology because of the electron attachment (electron affinity.)

SF6 is around five times the density of atmospheric air at mean sea level and has no colour, odour, or taste. SF6 is almost purely water-insoluble, and as with all other gases, its solubility decreases as the temperature of the water increases.

SF6 is a strong greenhouse gas (GHG) that has the potential to contribute to the effects of global warming. At an international treaty conference in Kyoto, Japan in 1997, SF6 was listed as one of the six greenhouse gases whose emissions should be reduced.

Even though SF6 is a relatively minor contributor to the total amount of greenhouse gases, it has a very long life in the atmosphere, with a half-life which is estimated at 3,200 years. So the effect of even small quantities of SF6 being released into the atmosphere is cumulative and permanent, unlike some other greenhouse pollutants, which are quicker to dissipate.

To control gas leakage from a GIS system, the SF6 is completely contained within the sealed enclosures, allowing for full reclamation and recycling. By following the present international guidelines for the use of SF6 in electrical equipment, the contribution of SF6 to global warming can be minimised, when guidelines are stringently followed by GIS maintenance personnel.

3 Legislative, Regulatory and Policy Frameworks

3.1 Introduction

The ESIA for the Project will conform to international guidelines including the Equator Principles, World Bank, IFC Performance Standards etc. Reference to other international guidance may be made during the ESIA process. The ESIA will also account for local legislative requirements.

3.2 International Conventions

Guinea has signed and/or ratified various International conventions and treaties. The Secretary-General of the United Nations is the depositary of more than 560 multilateral treaties which cover a broad range of subject matters such as human rights, disarmament, and protection of the environment. The status regarding relevant E&S International conventions will be outlined within the ESIA.

3.3 National Legislation and Requirements

In addition to international requirements and the expectations of the international finance community, as a minimum, the project must also comply with local environmental legislative requirements concerning permitting, pollution prevention, air quality standards, water quality standards, permissible noise levels and waste management.

In addition, the project must also comply with social legislative requirements which would include employment rights, labour conditions, health and safety management, human rights and grievance procedures.

A full analysis of prevailing and relevant national environmental and social legislation and the project's compliance with such will be undertaken and reported within the ESIA process. This will also include a Human Rights Risk Assessment.

3.4 Primary E&S Project Standards

In addition to the national environmental legislation, the objective of the assessment is to determine the Project's compliance with the relevant international standards and assess the likelihood of the proposed Project giving rise to environmental and social impacts so significant that the Project would warrant a full ESIA.

According to the Terms of Reference (ToR), the required hierarchy of E&S standards to be applied to the Project are outlined below.

3.4.1 Equator Principles

The Equator Principles (EPs) is a risk management framework, adopted by financial institutions, for determining, assessing, and managing environmental and social risk in Projects and is primarily intended to provide a minimum standard for due diligence and monitoring to support responsible risk decision-making. The ten principles set out within the July 2020 guidelines (EP4) state:

- **Principle 1:** Review and Categorisation
- **Principle 2:** Environmental and Social Assessment
- **Principle 3:** Applicable Environmental and Social Standards
- **Principle 4:** Environmental and Social Management System and Equator Principles Action Plan (as amended and re-issued)
- **Principle 5:** Stakeholder Engagement
- **Principle 6:** Grievance Mechanism
- **Principle 7:** Independent Review
- **Principle 8:** Covenants
- **Principle 9:** Independent Monitoring and Reporting
- **Principle 10:** Reporting and Transparency

Equator Principles Financial Institutions (EPFIs), encourage their clients to address potential or actual adverse risks and impacts identified during the Project Development Lifecycle. The EPFIs, have adopted the Equator Principles to ensure that the Projects they finance and advise on are developed in a manner that is socially responsible and reflects sound environmental management practices.

3.5 Secondary E&S Project Standards

The applicable World Bank Group Internal Finance Corporation (IFC) standards are outlined in **Figure *3-1***.

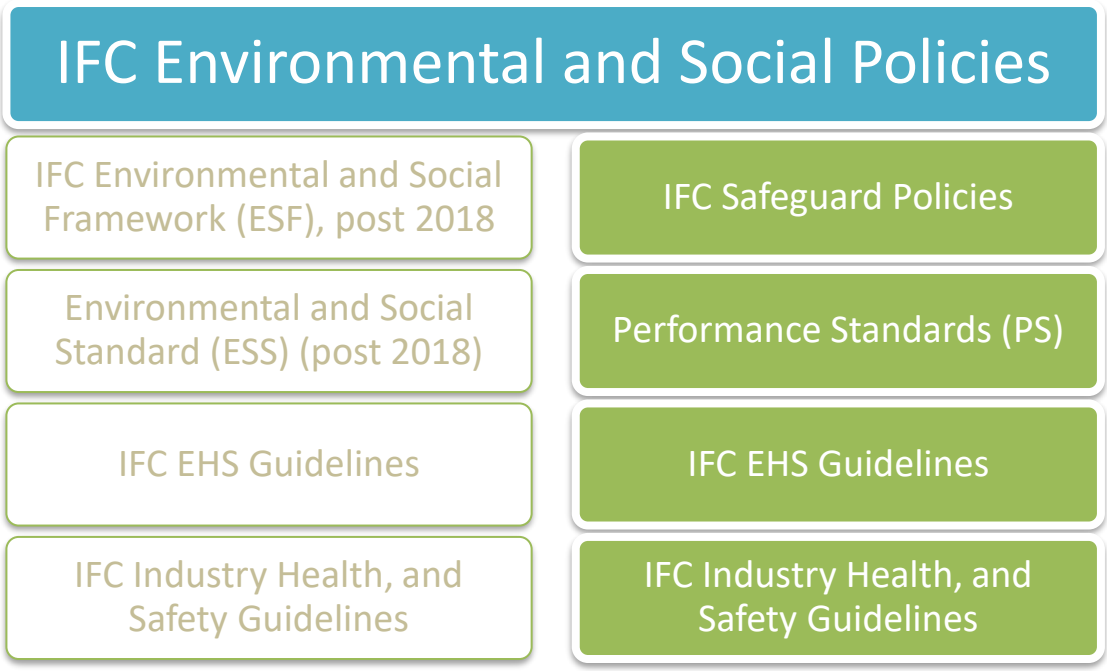


Figure 3-1: *IFC Environmental and Social Policy Structures*

3.5.1 IFC Environmental and Social Framework (ESF)

In August 2016, the World Bank adopted a new set of environmental and social policies called the Environmental and Social Framework (ESF). As of October 1, 2018, the ESF applies to all new World Bank investment Project financing. With existing Projects continuing to apply the Safeguard Policies (including 2012 Performance Standards), the two systems will run in parallel for an estimated seven years. The ESF consists of ten standards:

- **Environmental and Social Standard 1:** Assessment and Management of Environmental and Social Risks and Impacts;
- **Environmental and Social Standard 2:** Labour and Working Conditions;
- **Environmental and Social Standard 3:** Resource Efficiency and Pollution Prevention and Management;
- **Environmental and Social Standard 4:** Community Health and Safety;
- **Environmental and Social Standard 5:** Land Acquisition, Restrictions on Land Use and Involuntary Resettlement;
- **Environmental and Social Standard 6:** Biodiversity Conservation and Sustainable Management of Living Natural Resources;

- **Environmental and Social Standard 7:** Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities;
- **Environmental and Social Standard 8:** Cultural Heritage;
- **Environmental and Social Standard 9:** Financial Intermediaries; and
- **Environmental and Social Standard 10:** Stakeholder Engagement and Information Disclosure.

3.5.2 IFC Performance Standards

IFC's Environmental and Social Performance Standards define IFC clients' responsibilities for managing their environmental and social risks. The 2012 edition of IFC's Sustainability Framework, which includes the Performance Standards, applies to all investment and advisory clients whose Projects go through IFC's initial credit review process after January 1, 2012. The sustainability framework consists of eight standards:

- **Performance Standard 1:** Assessment and Management of Environmental and Social Risks and Impacts (Jan 1, 2012);
- **Performance Standard 2:** Labour and Working Conditions (Jan 1, 2012);
- **Performance Standard 3:** Resource Efficiency and Pollution Prevention (Jan 1, 2012);
- **Performance Standard 4:** Community Health, Safety, and Security (Jan 1, 2012);
- **Performance Standard 5:** Land Acquisition and Involuntary Resettlement (Jan 1, 2012);
- **Performance Standard 6:** Biodiversity Conservation and Sustainable Management of Living Natural Resources (Jan 1, 2012);
- **Performance Standard 7:** Indigenous Peoples (Jan 1, 2012); and
- **Performance Standard 8:** Cultural Heritage (Jan 1, 2012).

3.5.3 World Bank Group Environmental, Health, and Safety Guidelines

The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP) and are referred to in the World Bank's Environmental and Social Framework and IFC's Performance Standards.

The General EHS Guidelines contain information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors. They include environmental,

occupational health and safety, community health and safety and construction and decommissioning.

In the case of this Project, the following would be considered applicable:

- Environmental, Health, and Safety General Guidelines (2007)
- Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution (2007)

3.5.4 UN Guiding Principles for Business and Human Rights

The UN Guiding Principles (2011) contain three chapters, or pillars: protect, respect and remedy. Each defines concrete, actionable steps for governments and companies to meet their respective duties and responsibilities to prevent human rights abuses in company operations and provide remedies if such abuses take place.

4 Stakeholder Engagement

4.1 Background

The purpose of the stakeholder identification and analysis is to understand potential impacts on stakeholders and to clarify who should be involved in the ESIA process and how. This is done by listing all relevant stakeholders (based on any existing stakeholder analysis developed during the Project design process) and on general knowledge about the Project context and its main stakeholders and examining the following:

- stakeholders' interests in and expectations of the Project;
- how they might influence the Project (positively or negatively);
- a first appraisal or estimation of how their livelihoods could be impacted by the Project (positively or negatively); and
- how they should be involved in the ESIA based on the information in the three items above.

The detailed approach to stakeholder engagement is set out in the Stakeholder Engagement Plan (SEP), the current draft of which is provided as an annexe to the Scoping Report.

4.2 Stakeholder Identification

The potential stakeholders are outlined in **Table *4-1***

Table 4-1: *Potential stakeholders*

Stakeholder	Dubréka	Kobaya	Kipé	Kaloum	Matoto
National					
Ministry of Environment and Sustainable Development (MEDD)	Yes	Yes	Yes	Yes	Yes
National Directorate of Pollution, Nuisances and Climate Change	Yes	Yes	Yes	Yes	Yes
Guinean Environmental Assessment Agency (AGEE)	Yes	Yes	Yes	Yes	Yes
Centre for the Protection of the Marine Environment and Coastal Zones	Yes	Yes	Yes	Yes	Yes

Stakeholder	Dubréka	Kobaya	Kipé	Kaloum	Matoto
Ministry of Territorial Administration and Decentralization	Yes	Yes	Yes	Yes	Yes
Ministry of Urban Planning and Housing	Yes	Yes	Yes	Yes	Yes
Electricité de Guinée (EDG) - Project Coordination	Yes	Yes	Yes	Yes	Yes
Local					
The Prefectural Directorate of Environment and Sustainable Development of Dubereka	Yes	-			-
The Prefectural Directorate of Urban Planning and Housing of Dubereka	Yes	-			-
The Kobayah Municipal Urban Planning and Housing Service	-	Yes			-
The Municipal Department of Urban Planning and Housing of Matoto	-	-			Yes
The Prefectural Directorate of Agriculture of Dubereka	Yes	-			-
The Communal Agency of the EDG of Dubereka	Yes	-			-
The Municipal Council (for the area)	Yes	Yes			Yes
The Neighborhood Council (for the area)	Yes	Yes			Yes
The Kobayah Housing Gendarmerie	-	Yes			-
The Kobayah Municipal Environment Service	-	Yes			-
The Municipal Environment Service of Matoto	-	-			Yes
Coordination of the Social Housing Project	-	Yes			-
Local population	Yes	Yes	Yes	Yes	Yes

Stakeholder consultation and engagement is an ongoing process and other stakeholders and potential project-affected parties, not identified above, may come to light as the ESIA develops and beyond the ESIA into the construction and operational phases of the project.

The Stakeholder Engagement Plan is a live document that will remain with the project throughout its lifetime and will be updated when new stakeholders come into the project environment or process.

4.3 Grievance Mechanisms

Grievance mechanisms are an important part of the EPIV requirements for community engagement by project developers. Where it is anticipated that a new Project or existing company operations will involve ongoing risk of adverse impacts on surrounding communities, the client will be required to establish a formal documented grievance mechanism to receive and facilitate resolution of the affected communities' concerns and complaints about the client's environmental and social performance. This also includes employees and contractors working on the site as well as the wider community around the sites.

The appropriateness and suitability of the grievance mechanism will be assessed as part of the ESIA process.

5 ESIA Approach and Methodology

5.1 Introduction

The proposed ESIA methodology is set out in this section and is based on a well-recognised generic method commonly employed in ESIA work.

Potential impacts arising from planned Project activities, cumulative impacts with other developments (e.g. OHTL routes) and unplanned events (e.g. accidents, natural disasters, etc.) will also be assessed using this methodology. In the case of planned activities, impact magnitude and receptor sensitivity are the two key considerations. The concept of likelihood (or probability) is also relevant in the consideration of unplanned events.

5.2 Impact Assessment

The purpose of the ESIA process is to determine a baseline (pre-Project) environmental and social conditions; assess the significance of potential changes to these environmental and social conditions as a result of the project implementation (the Impacts); and identify mitigation measures that are designed to avoid, minimise, or mitigate the identified significant impacts to an acceptable level.

The ESIA will be conducted following local environmental legislation as a minimum requirement but as international development financing is to be provided to fund the Proposed Development, the ESIA is required to meet the Primary and Secondary Project-related E&S Standards of the international finance community (as espoused in EPIV and IFC Performance Standards).

The ESIA will also identify and estimate the extent and quality of available data and uncertainties associated with predictions and specify topics that do not require further attention. The ESIA process will include:

- initial scoping of the assessment process (this report);
- proposed Project description;
- examination of alternatives;
- identification of the Proposed Project Area of Influence;
- stakeholder identification and gathering of environmental and social data;
- impact identification, prediction, analysis and assessment of effects;

- development of mitigation and management measures and actions;
- evaluation of residual impacts;
- assessment of Cumulative impacts; and
- development of Environmental and Social Management Plans.

The ESIA is required to be proportionate to the nature and scale of the Proposed Project's potential impacts and must comply with the host country's laws and regulations, including the relevant disclosure of information and public consultation requirements.

5.3 ESIA Process

The ESIA process is a systematic approach to identifying, describing, and evaluating the potential environmental and social impacts of the Proposed Development, and formulating measures that will be implemented to manage these impacts, for example, so that adverse impacts can be avoided or reduced to an acceptable level and beneficial impacts can be enhanced. In this document, all references to 'impact mitigation' or to 'mitigation measures' imply both avoiding/minimising adverse impacts and enhancing beneficial impacts.

Concerning potential adverse impacts, and as part of the Project design process, certain measures to avoid or minimise impacts will be identified and incorporated into the Proposed Project design. These are referred to as "design controls" and include both physical design features (such as location of structures/activities) and management measures (such as timing of activities). These design controls are based on Good International Industry Practice (GIIP) and best or good practice guidance such as the IFC mitigation hierarchy presented in IFC's (2012) Performance Standard 1 *'Assessment and Management of Environmental and Social Risks and Impacts'* and, as applicable. Where the outcome of the ESIA indicates that design controls are insufficient to manage certain impacts to acceptable levels, further mitigation measures will need to be identified and implemented.

To ensure a robust and comprehensive impact assessment, the ESIA process will be structured around a series of progressive and iterative stages (**Figure *5-1***). Stakeholders, the Proposed Project Planning team and the ESIA team will provide inputs to these stages.

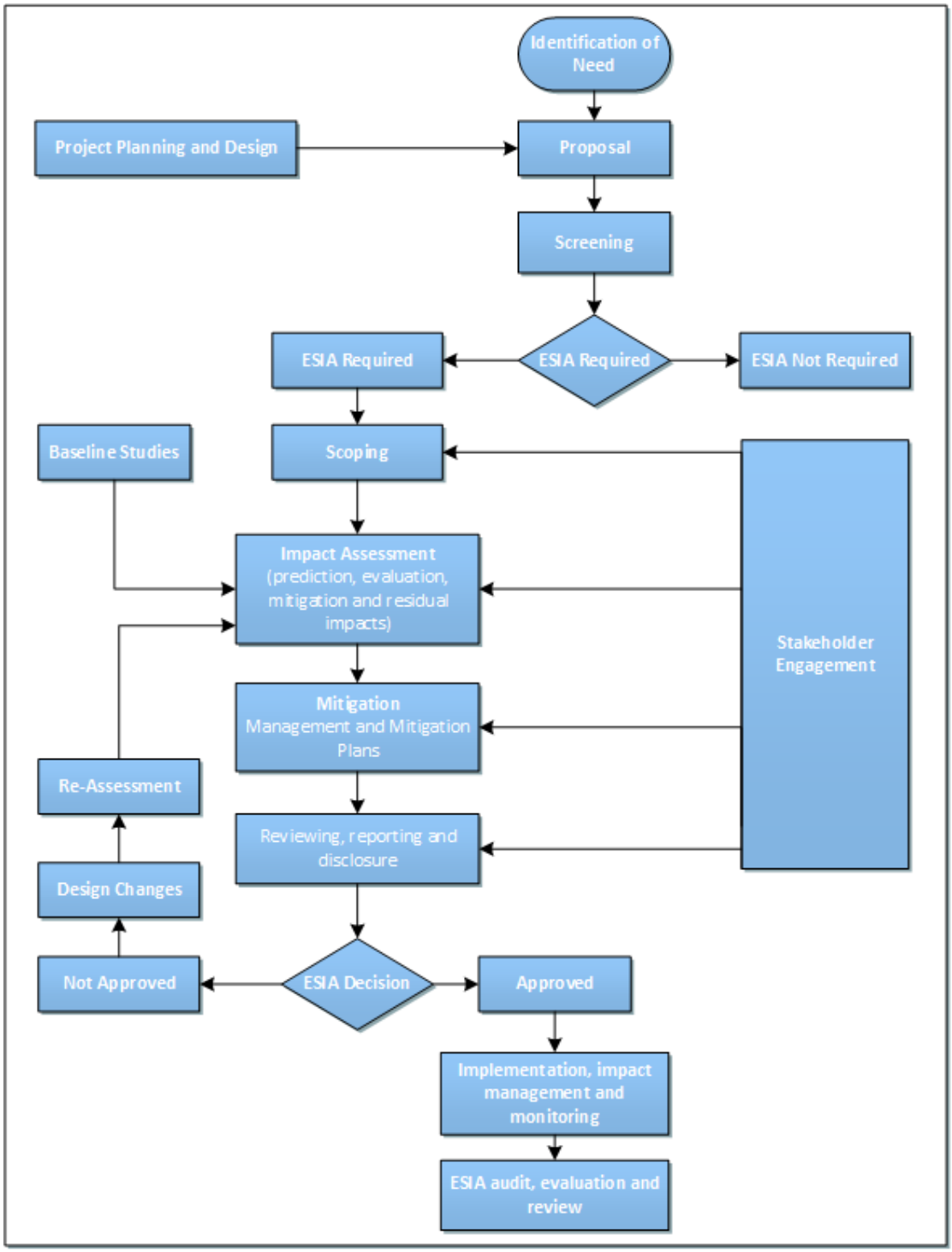


Figure 5-1: *ESIA Process Stages*

5.3.1 STAGE 1 - ESIA Scoping

During this stage, the initial proposed Project Area of Influence (AOI) is identified, according to the IFC criteria included in PS 1, which entails consideration of areas affected by:

a) direct and indirect impacts (in terms of indirect impacts, the focus is specifically on impacts affecting biodiversity and ecosystem services upon which Affected Communities' livelihoods are dependent);

b) impacts from unplanned, but predictable developments caused by the Proposed Project that may occur later or at different locations;

c) Associated Facilities (in this case there are believed to be none); and

d) cumulative impacts arising from a Project and other existing, planned or reasonably defined developments at the time the ESIA process is conducted in the same area of influence.

5.3.2 STAGE 2 - Baseline Studies

Baseline studies are undertaken initially at a relatively 'high level' (desk-based only) during the Scoping exercise to broadly characterise the environmental and social context of each site. Thereafter a more detailed Environmental and Social Baseline Survey is required involving desk-based research, consultation and stakeholder engagement and direct field surveys and measurements.

The definition of the baseline conditions is essential to the impact assessment process as this sets out what the short and long-term environmental and social conditions will be if the development does not go ahead. It is against this baseline scenario that the significance of the potential impacts of the development are measured. In other words, how will those predicted impacts change the baseline conditions and to what extent and how significantly.

Due to the short-time frame on this project and the relative simplicity of the sites in terms of potential impact scenarios, the opportunity was taken during the early site reconnaissance stages to begin some of the baseline surveys. In particular, at all 5 sites, air, noise and traffic surveys have been undertaken and at 4 of the sites (excluding Khaloum), soil sampling was also completed and the samples submitted to the laboratory for analysis. The results of these surveys will be reported in the ESIA report.

Identification of Receptors

Receptors are environmental and social components that may be affected, adversely or beneficially, by a Project and are key to the baseline characterisation. Potential receptors are identified, and their sensitivity is determined in scoping work and baseline studies. Four high-level categories of Project receptors can be identified:

- **Environmental** (such as air quality, waterbodies, landscapes, terrestrial soils and geology);
- **Biodiversity** (such as habitats, species etc.);
- **Humans** (such as residents of local communities, business owners, employees, etc); and
- **Built Environment** (such as buildings, utilities, archaeological sites, transport infrastructure, etc).

5.3.3 STAGE 3 – Impact Assessment

The actions undertaken to determine the significance of potential Project impacts involve the following four key steps:

- **Prediction:** What will happen to the baseline status of specific receptors as a consequence of the Project being implemented (primarily; what is the magnitude of the impact?);
- **Evaluation of significance:** How significant is the impact? What is its relative significance when compared to the baseline conditions, other impacts or reference standards?
- **Mitigation:** If there are impacts of concern (adverse), can anything be done to avoid, minimise, or offset the impacts? Or to enhance potential beneficial impacts?
- **Residual Impacts:** After mitigation, are the impacts still of concern? If yes, the process needs to be repeated at least once before the 'final' determination of residual impact significance occurs.

5.3.4 Impact Prediction

Impact prediction involves determining the magnitude or extent of a change or changes in the baseline conditions or linked receptors resulting from project activities. To the extent possible these status changes should be described and quantified. Impact prediction is at the core of the ESIA process.

5.3.5 Impact Types and Characteristics

Impacts can be divided into types and described via several characteristics. The degree to which an impact may be managed or modified by the mitigation measures is dependent upon the impact type and its characteristics (**Table *5-1***).

Table 5-1: *Impact types and magnitude descriptors*

Impact	Description
Direct Impact	An impact that results from a direct interaction between a Project activity and the receiving environment.
Indirect Impact	An impact that follows from the primary interactions between the Project and its environment because of subsequent interactions within the environment.
Induced Impact	An impact that results from other activities that occur or are encouraged to occur because of the Project.
Cumulative Impact	A 'combined' impact results from the interaction of two or more impacts, arising from a Project and one or more other Projects.
Nature	**Adverse –** negative effect on, or change in, the environment resulting in an action. **Beneficial** – positive effect on, or change in, the environment resulting in an action.
Change	**Reversible** – Restoration of the preimpact status of a receptor because of mitigation and/or natural recovery. The periods over which impacts may reverse link to the duration over which an impact is experienced. **Irreversible** – Impacts that cause a permanent change in the affected receptor.
Extent	**Local** – Impacts that affect receptors in areas close to the source of impact. **District** – Impacts that affect receptors beyond the defined local level but are not experienced at the regional level. **Regional** – Impacts that affect receptors beyond the defined district level but are not experienced at the Country level. **National** – Impacts that affect receptors at a national scale. **International/Transfrontier** – Impacts that affect receptors, beyond the boundaries of the Country.
Duration	Period over which an impact will interact with a receptor: **Short-term** – Impacts that are predicted to last only for a limited period but will cease either on completion of the activity or soon afterwards. **Medium-term** – Impacts that are predicted to last for a longer period (e.g. construction phase). **Long-term** – Impacts that are predicted to continue over an extended period (e.g. construction and operational phases). Can include impacts that may be intermittent or repeated rather than continuous if they occur over an extended period.

Impact	Description
Frequency	**Infrequent** – rare in nature over a certain period. **Periodic** – recurring over a certain period. **Constant** – permanent during a certain period.

5.3.6 Receptor Sensitivity

Receptor sensitivity is based on two components: the degree to which a particular receptor is resilient to a change (vulnerable to damage) and the value attributed to the receptor by stakeholders or applicable regulations/policies.

Receptor resilience takes into consideration not only the mechanism by which the receptor could suffer impact but also the characteristics of a receptor that might make it more or less resilient to change. As such, a receptor can be considered as existing within a spectrum of 'vulnerable' to 'resilient'.

Receptor value takes into consideration its importance in terms of, for example, its conservation status, its socio-cultural importance and/or its economic value. Certain receptors are deemed to be of greater importance than other receptors (**Table *5-2***).

Table 5-2: *Receptor sensitivity*

Sensitivity	Criteria
Low	A receptor with a low quality and rarity, local scale, and limited potential for substitution. Receptor is not generally vulnerable to impacts that may arise from the Project and/or has high recoverability. The anticipated change is minimal, or the receptor(s) are tolerant to changes from the Project.
Medium	The receptor has a medium quality and rarity, local scale and limited potential for substitution/replacement or receptor with a low quality and rarity, regional or national scale and limited potential for substitution. Receptor is somewhat vulnerable to impacts that may arise from the Project and/or has moderate to high recoverability.
High	The receptor has a high quality and rarity on a national or regional scale and limited potential for substitution. Receptor is highly vulnerable to impacts that may arise from the Project and recoverability is long-term or not possible. Receptors might be particularly susceptible to Project-derived changes e.g. residential areas, schools, hospitals, care homes, ecologically sensitive areas.

Sensitivity	Criteria

For each impact, the receptor sensitivity must be determined. Sensitivity is specific to the biophysical or socio-economic environment identified during the baseline study. In cases where receptor sensitivity varies for an impact, the worst-case receptor sensitivity is chosen, *e.g.*, if some of the individuals affected by an impact are of low sensitivity and others are of medium sensitivity, then the impact will be evaluated for the medium sensitivity individuals.

5.3.7 Evaluation of Significance (Normal)

Impact significance needs to be assessed with and without mitigation measures in place (in both cases it is assumed that the design controls are in place). A residual impact is the impact that remains following the application of additional mitigation measures and is thus the final 'level' of impact. Residual impacts are the focus of management and monitoring activities during Project implementation, which are set out in the Environmental and Social Management Plan(s).

For each impact, it needs to be characterised in terms of its extent, duration, frequency, and reversibility. The next step is to determine the impact magnitude itself. **Table *5-3*** provides generic criteria to be used to determine the impact magnitude. Taking the results derived from the previous step a decision can be made on impact magnitude.

Table 5-3: *Impact Significance and Descriptors*

Impact Magnitude	Typical Criteria or Impact Characteristics
Very Low	No discernible impact. Receptor change is essentially indistinguishable from natural background variation.
Low	Limited impacts are: **Extent:** local **Duration:** short term **Frequency:** infrequent to periodic **Reversibility:** reversible.
Medium	Noticeable impacts are: **Extent:** regional **Duration:** medium term **Frequency:** periodic to constant **Reversibility:** reversible

Impact Magnitude	Typical Criteria or Impact Characteristics
High	Prominent impacts are: **Extent:** national or transboundary **Duration:** long term **Frequency:** constant **Reversibility:** irreversible

Once the respective magnitudes of each impact have been allocated, the next step is to determine receptor sensitivity. The final step is to combine the impact magnitude and receptor sensitivity results to determine impact significance. This is done by using an impact significance matrix (**Table *5-4***), whereby impact significance is determined by finding the cell where the impact magnitude and sensitivity results intersect.

Table 5-4: *Impact Significant Matrix (Normal Conditions)*

		Receptor Sensitivity		
		Low	Medium	High
Magnitude	Very Low	Low	Low	Minor
	Low	Low	Minor	Moderate
	Medium	Minor	Moderate	Major
	High	Moderate	Major	Major

The impact definitions are outlined in **Table *5-7***. Note that beneficial effects are not ranked.

5.3.8 Evaluation of Significance (Unplanned Events)

For unplanned events (e.g. emergencies, accidents, incidents, etc.), it is necessary to add the likelihood of an event occurring to the methodology as outlined in **Table *5-5***.

Table 5-5: *Likelihood Categories for Unplanned Events*

Likelihood	Criteria
Certain	Events that will occur during normal operating conditions (*i.e.* they are inevitable).
Possible	Events that are likely to occur at some time during normal operating conditions.
Unlikely	Events that are unlikely but may occur at some time during normal operating conditions.
Improbable	Events that are extremely unlikely to occur during normal operating conditions.

Unplanned events will often result in a major impact significance, even with mitigation/ remedial measures in place *e.g.* major oil spills. In such cases, not only must measures be in place to manage an unplanned event, but the probability must be minimised to levels seen to represent good industry practice. In this table, unplanned events with a High residual impact significance would need to be categorised as 'Improbable'. In some cases, a quantified risk assessment will be required to quantify the probability of an event, and this should be compared with industry good practice. Where quantification is possible, the likelihood criteria should include quantified probabilities. For example, *improbable* equates to less than a $1x10^{-6}$ event.

The final step is to combine the likelihood and receptor sensitivity results to determine impact significance. This is done by using an impact significance matrix (**Table *5-6***), whereby impact significance is determined by finding the cell where the likelihood and sensitivity results intersect.

Table 5-6: *Impact Significant Matrix (Abnormal and Emergency Conditions)*

		Receptor Sensitivity		
		Low	Medium	High
Likelihood	Improbable	Low	Low	Minor
	Possible	Low	Minor	Moderate
	Unlikely	Minor	Moderate	Major
	Certain	Moderate	Major	Major

5.3.9 Impact Significance Definitions

The impact definitions are outlined in **Table *5-7***.

Table 5-7: *Impact Significance Definitions (adverse impacts)*

Impact Magnitude	Criteria
Major	Impacts with a "Major" significance are likely to disrupt the function and value of a receptor and may have broader systemic consequences. These impacts are a priority for mitigation to avoid or reduce the significance of the impact.
Moderate	Impacts with a "Moderate" significance are likely to be noticeable and result in lasting changes to baseline conditions, which may cause hardship to or degradation of a receptor, although the overall function and value of a receptor are not disrupted. These impacts are a priority for mitigation to avoid or reduce the significance of the impact.
Minor	Impacts with a "Minor" significance are expected to be noticeable changes to baseline conditions, beyond natural variation, but are not expected to cause hardship, degradation, or impair the function and value of the receptor. However, these impacts warrant the attention of decision-makers and should be avoided or mitigated where practicable.
Low	Any impacts are expected to be indistinguishable from the baseline or within the natural level of variation. These impacts do not require mitigation and are not a concern of the decision-making process.

This method is applied twice to both pre- and post-mitigation scenarios for all impacts identified *i.e.* for the Proposed Project including design controls and with additional mitigation to identify the residual effects.

In general, residual impacts classed as "Low" or "Minor" are not considered to be of concern for the Project. A more stringent approach may apply for the assessment of ecological receptors of high sensitivity, such as critical habitat, or species classified as having vulnerable or above conservation status. In this case, residual impact significance of Low and above is very likely to be a concern to the further development of the Proposed Project. For adverse impacts of "Moderate" and "Major" significance, an iterative process is undertaken to further investigate opportunities for mitigation, according to the hierarchy above. Where the significance cannot be further reduced, an explanation is provided of why further reduction is

not practicable. Monitoring may be required to confirm the measures used to mitigate adverse impacts are working properly and that the impact is not worse than predicted.

During the impact assessment phase, Environmental and Social Management Plans (ESMPs) are prepared to guide environmental and social management issues during the construction and operational phases of the Project. The ESMPs are to include a Construction Environmental Social Management (CESMP) and an Operational Environmental and Social Management Plan (OESMP). These plans set out the detailed procedures, protocols and monitoring requirements to ensure that impacts are mitigated adequately.

5.3.10 STAGE 4 - Impact Mitigation

As part of the ESIA process, when adverse impacts are identified (which cannot be mitigated or managed via design controls), mitigation measures are developed (including avoiding the impact, management and monitoring actions). The process of identifying design controls and mitigation measures must follow the sequence of the mitigation hierarchy, as specified in IFC PS 1.

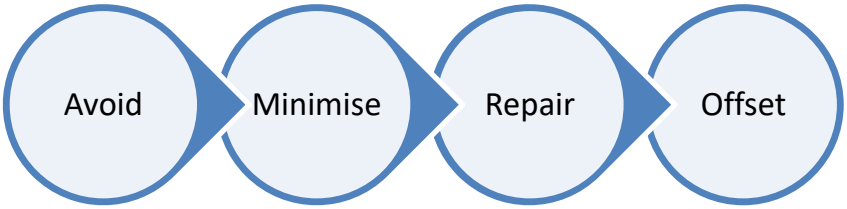


Figure 5-2: *Mitigation Hierarchy*

First, efforts are made to avoid or prevent, then minimise or reduce adverse impacts. Through the application of design controls. Subsequently, these design controls are supplemented by additional design controls plus mitigation measures to be applied through the effective management of Project-related activities during construction, operation, and decommissioning. Any remaining significant residual impacts are then addressed via consideration of compensatory mitigation measures such as offsetting and compensation.

Identifying, assessing, and then selecting mitigation measures is a process involving the ESIA team, working with the Project engineers, to identify practicable and cost-effective approaches to mitigate the impacts. These measures are agreed and integrated into the Project CESMP and OESMP.

5.3.11 Cumulative Impacts

The IFC released a Guidance Note on cumulative Impact Assessment in August 2013 (IFC, 2013). The guidance note introduces a framework for identifying and assessing potentially significant cumulative impacts. IFC PS1 (2012) requires that the Proposed Project encompass "cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the Project, from other existing, planned, or reasonably defined developments at the time the risks and impact identification process is conducted."

IFC PS1 (2012) offers some context to limit the cumulative impacts to be addressed to "those impacts generally recognised as important based on scientific concerns and/or concerns from Affected Communities" and provides examples such as "incremental contribution of gaseous emissions to an airshed; reduction of water flows in a watershed due to multiple withdrawals; increases in sediment loads to a watershed; interference with migratory routes or wildlife movement; or more traffic congestion and accidents due to increases in vehicular traffic on community roadways."

The IFC Performance Standards recommend that this assessment should (a) "be commensurate with the incremental contribution, source, extent, and severity of the cumulative impacts anticipated," and (b) "determine if the Project is incrementally responsible for adversely affecting an ecosystem component or specific characteristic beyond an acceptable predetermined threshold (carrying capacity) by the relevant government entity, in consultation with other relevant stakeholders".

Cumulative impacts may result from incremental changes caused by other past, present, or reasonably foreseeable activities or Projects in the local area, in combination with the Proposed Development. Cumulative effects can be split into:

- **Type 1 - Combination effects** *i.e.* combined effects of individual impacts resultant from the development upon a set of defined sensitive receptors *e.g.* noise, dust and visual impacts; or

- **Type 2 - Cumulative effects** *i.e.* combined effects arising from another development site or sites, which individually might be insignificant, but when considered together, could create a significant cumulative impact.

Information will be gathered to the extent possible in the context of Guinea on planned or reasonably foreseen or predicted third-party projects that could have the potential for cumulative impacts with the Project. Most notable in this regard is the OHTL project that will run alongside and connect with the Lot 3 sub-station project.

6 Scoping Assessment

6.1 Introduction

The Area of Influence (AOI) is defined based on the definitions given in the IFC PS1 and represents the geographical area expected to be affected by:

- (i) the Project and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the Project; (ii) impacts from unplanned but predictable developments caused by the Project that may occur later or at a different location; or (iii) indirect Project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.

- associated facilities, which are facilities that are not funded as part of the Project and that would not have been constructed or expanded if the Project did not exist and without which the Project would not be viable.

- cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the Project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.

Physical environmental conditions (e.g. air quality, noise, soil, groundwater, and surface water), and biological environmental and social considerations (such as community health and safety, employment and land use) may be affected at different distances from the source. These will be identified and assessed during the ESIA. In-line with usual ESIA impact assessment procedures descriptive criteria will include the extent (local, district, regional, national, or International), duration (short, medium, long term) and nature (direct, indirect, reversible or irreversible).

The environmental and social conditions associated with each site (identified during scoping) are outlined in the following sections.

6.2 Land

Impacts on geology and soils are assessed concerning the potential to encounter existing soil contamination associated with past and current land use or for new contamination to occur through accidental leaks or spills (especially during construction), which could result in impact on soils and mobilisation of the soil contamination towards several environmental receptors. In addition, any cut-and-fill exercise to be undertaken along with subsequent re-profiling will result in a change to the soil structure within the Proposed Project Area.

It is evident from the historical satellite imagery review (see Annex C) that there have been former activities on all of the sites, some of which may have the potential to cause land contamination. Notably:

- **Dubreka** was formerly a palm oil plantation where pesticides and herbicides might have been used which could leave residual contamination on the soils;
- **Koubayah** was formerly a rice cultivation field where herbicides and pesticides might have been used and which could have left residual contamination on the soils;
- **Matoto** has been used for unauthorised waste disposal (mainly construction materials) that could contain chemical contaminants and asbestos-containing materials;
- **Kipe** was formerly a fully developed oil-fired power plant that could have had oil and other chemical spillages to the ground or asbestos-containing materials from demolition activities; and
- **Khaloum** – the site has been used for vehicle maintenance which could have led to oil and chemical pollution of the ground and the original site was only recently infilled with material from an unknown source that could be contaminated.

These matters will be investigated through the ESIA process.

6.2.1 Topography

Guinea is divided into four main regions:

- the Basse-Côte lowlands in the west, which run along the coast;
- the cooler, mountainous Fouta Djalon that runs roughly Nouth–South through the middle of the country;
- the Sahelian Haute-Guinea to the north-east; and
- the forested jungle regions in the south-east.

All of the Project sites are located within the Basse-Côte lowlands. Each site has relatively small elevation changes (less than a few metres) and can fundamentally be regarded as flat sites requiring only limited cut and fill operations.

6.2.2 Soil Classification

The Soil Atlas of Africa (Jones, 2013) shows:

- Poste de Dubréka – Haplic Ferralsols, strongly weathered soil with low nutrient levels showing no major characteristics.
- Poste de Kipé, Poste de Matoto and Post de Kobaya – Petric Plinthosols, soil with an accumulation of iron that hardens irreversibly when exposed to air and sunlight, having a strongly cemented or indurated layer.
- Poste de Kaloum – Thionic Fluvisols, soil in floodplains, lakes, deltas or marine deposits with acid horizon rich in sulphur.

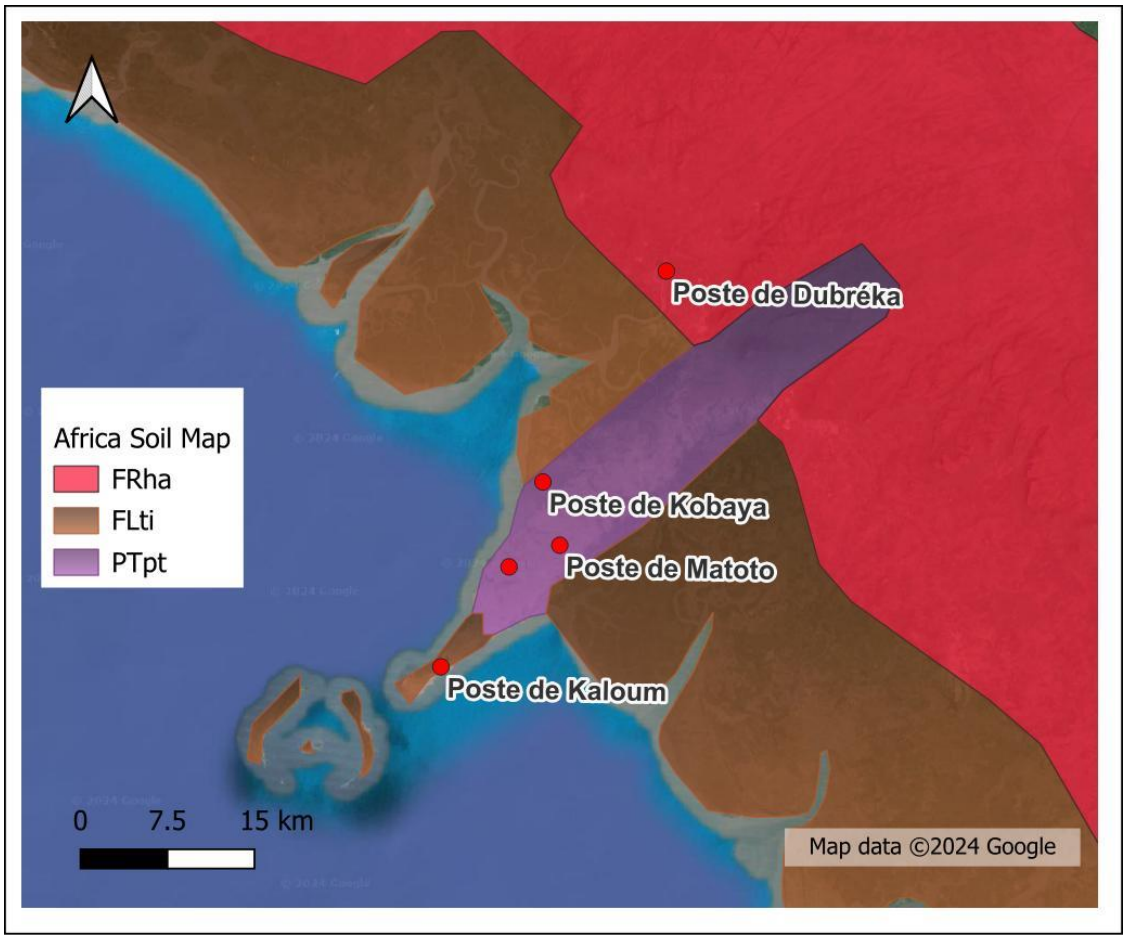


Figure 6-1: *Soil Atas of Africa – Guinea*

6.2.3 Superficial Deposits

According to the USGS mapping (USGS, 2002) the sites are underlain by the following superficial deposits:

- Poste de Dubréka – Ordovician (O).

- Poste de Kipé, Poste de Matoto and Poste de Kaloum – Mesozoic Igneous (Mi).
- Post de Kobaya – Not identified at the scale of the mapping. Likely to be Holocene (Qe).

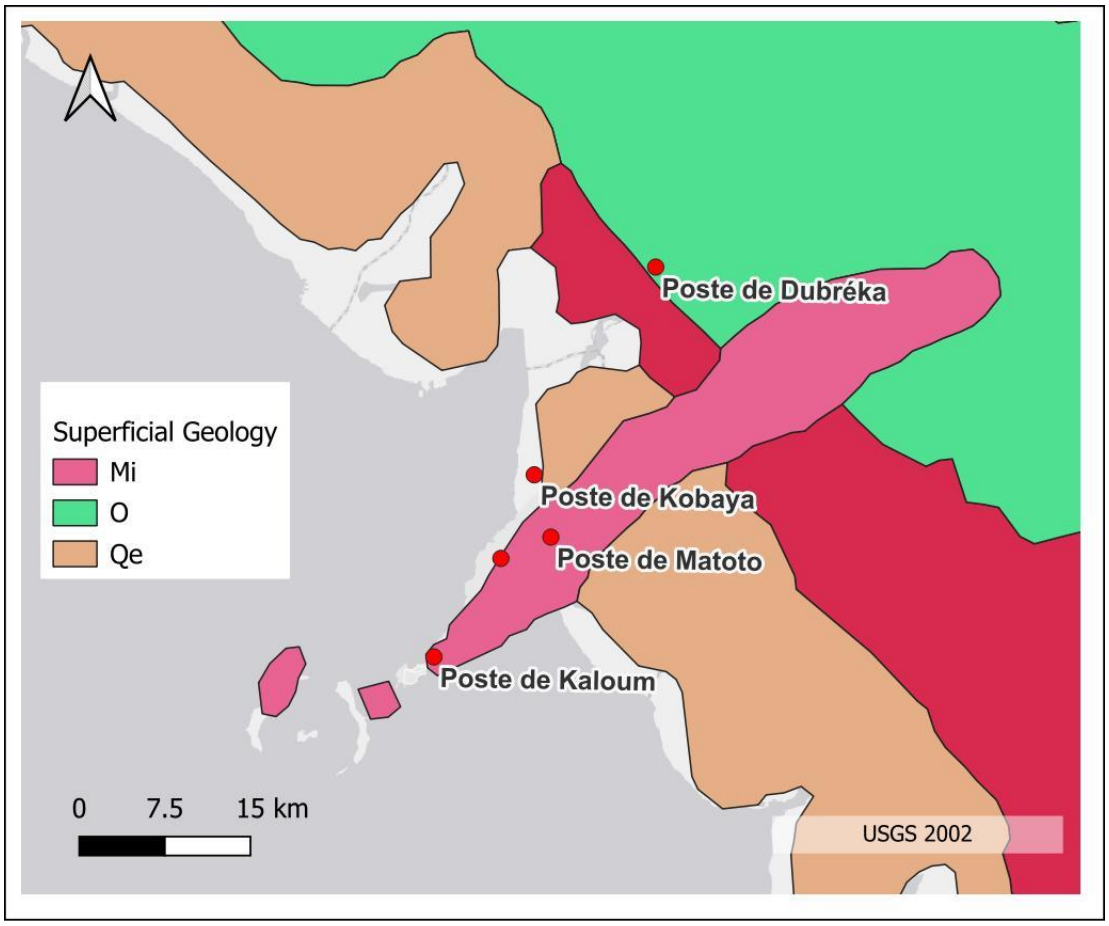


Figure 6-2: USGS Superficial Deposits, Guinea

6.2.4 Bedrock Deposits

The coastal plains are formed mainly of Quaternary marine and alluvial unconsolidated sediments, with small areas of Tertiary and Upper Cretaceous sedimentary rocks, which overlie older Palaeozoic rocks. The 1:10M scale digital map of Africa is provided by the French Geological Survey (BRGM). All sites are located on Quaternary age sedimentary bedrock (**Figure *6-3***). These are typically composed of alluvial sediments in river valleys: sands, sandy loams, silts and gravels. Along the coast, marine loams, clays, clayey sands and sands.

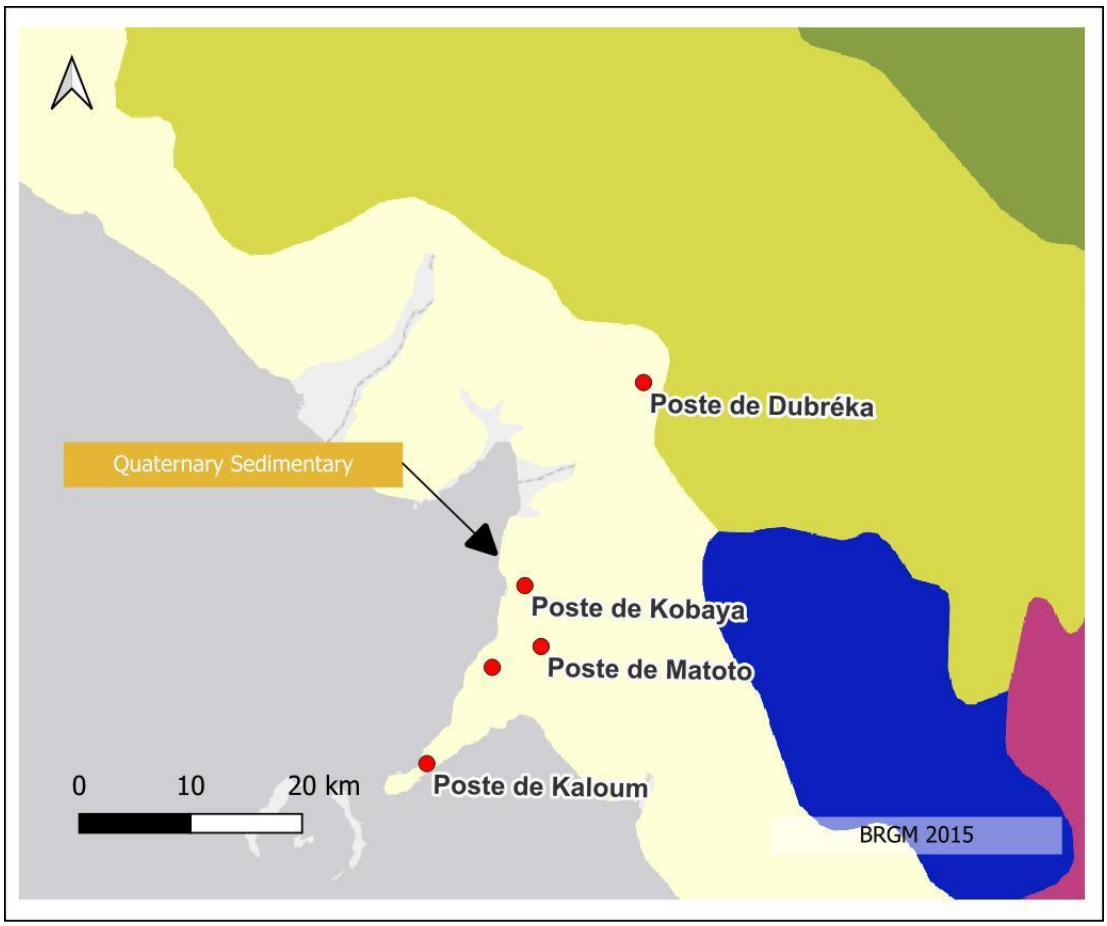


Figure 6-3: *BRGM SIGAfrique Bedrock Age*

6.2.5 Seismic Conditions

Guinea is far away from any known active plate boundary. Guinea is not known to be seismically active, and available records suggest that the occurrence of moderate to large earthquakes is infrequent (Irinyemi, 2022).

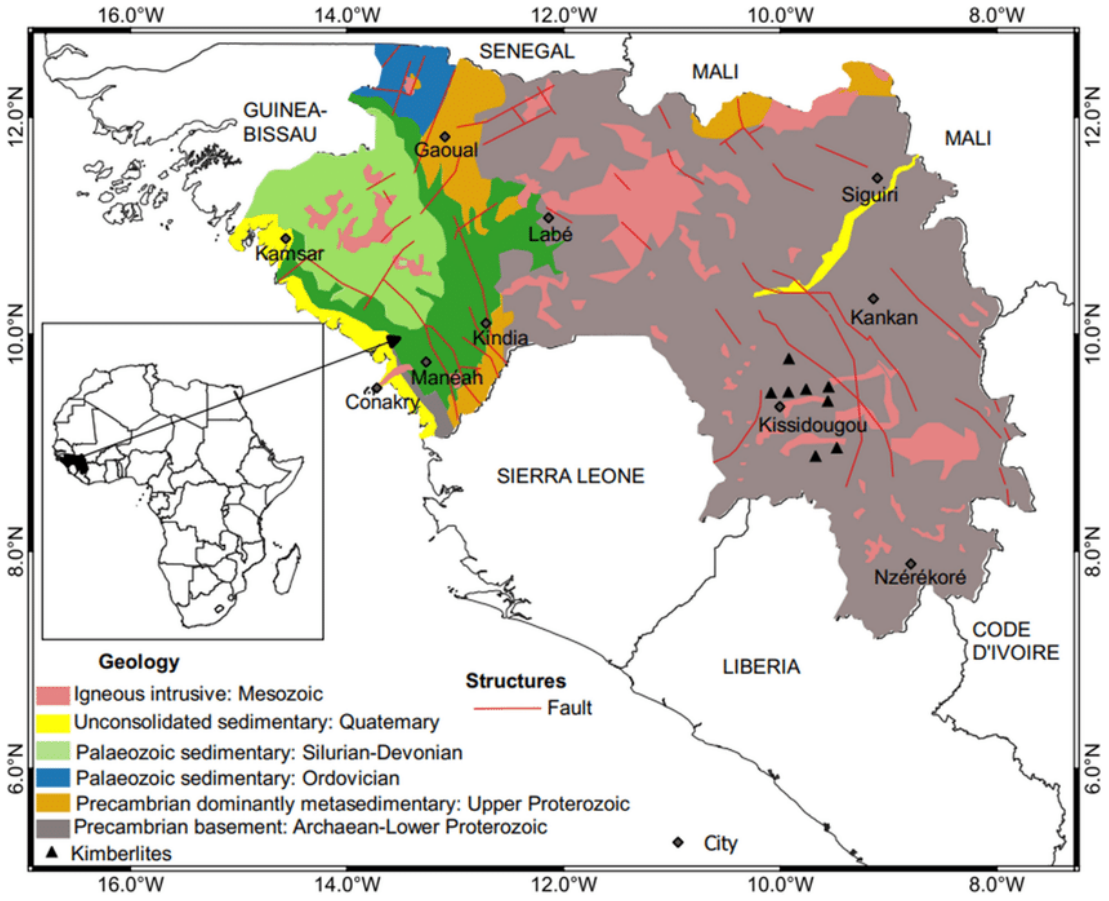


Figure 6-4: *Geology and tectonic map of Guinea*

According to the Seismic Hazard Assessment for Guinea (Irinyemi, 2022) the first reported earthquake in Guinea occurred in 1795, with an estimated surface magnitude of 5.2, causing considerable damage in the city of Labé1. In 1818 an earthquake of surface magnitude, 5.9 occurred in the Futa Djallon massif in northern Guinea. Another earthquake, with a surface magnitude of 4.0, caused panic in the Kakulima region but no damage was reported. In 1928 an earthquake with a surface magnitude of 4.8 struck the western part of Guinea, leading to the collapse of dwellings along the Konkouré River. Aftershocks followed this event triggering a landslide1. More earthquakes were reported between 1935 and 1939. On 22nd December 1983, north-western Guinea experienced a strong earthquake of moment magnitude, Mw, 6.3. The epicentre of the event was located in Gaoual, close to the border of Guinea-Bissau. It resulted in approximately 10 km of surface rupture, which extensively damaged buildings, killing over 300 people and destroying more than 4,000 houses.

6.3 Land Use

The land use associated with the proposed development sites and the surrounding areas has been assessed using publicly available Land Use Land Cover (LULC) mapping (Sentinel-2 10m Land Use/Land Cover data for 2020).

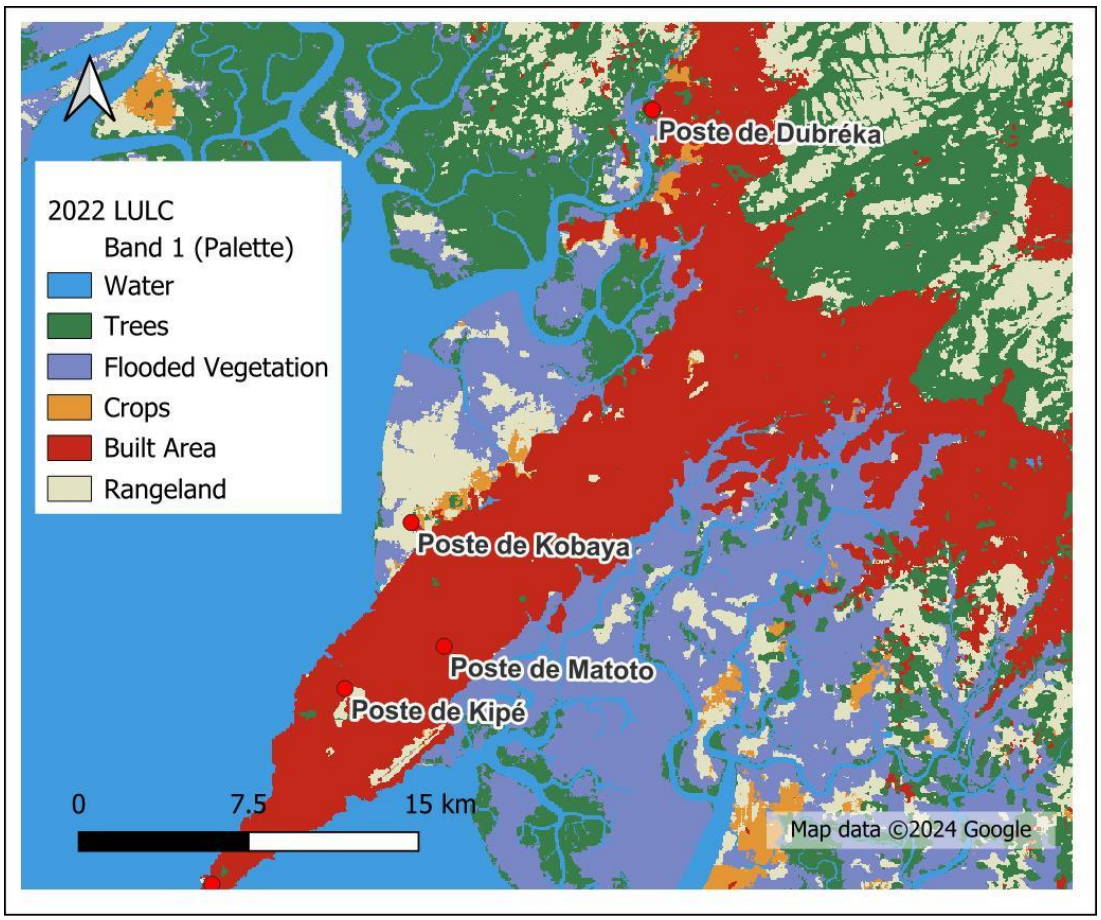


Figure 6-5: *Land Use Land Cover (2020)*

This dataset was produced by Impact Observatory for Esri. © 2024 Esri. This dataset is available under a Creative Commons BY-4.0 license and any copy of or work based on this dataset requires the following attribution: This dataset is based on the dataset produced for the Dynamic World Project by the National Geographic Society in partnership with Google and the World Resources Institute.

6.4 Cultural Heritage

At the time of preparation of this Scoping Report, there was no publicly available information to suggest that any of the sites have any cultural or archaeological significance and all sites have been the subject of recent anthropolical disturbance.

6.5 Air Quality

The US Embassy in Guinea, which is located approximately 780 metres south of the Poste de Kipe site measures airborne fine particulate matter ($PM_{2.5}$) and reports the data via the www.airnow.gov website. In 2023, 6841 valid data points were recorded (over a 1 hour averaging period). The results are summarised below:

- $PM_{2.5}$ average concentration – 19.16 µg/m^3
- $PM_{2.5}$ maximum concentration – 219 µg/m^3
- Air Quality Index (AQI) rated 'Good' (i.e. air quality is satisfactory, and air pollution poses little or no risk) – 3,216 hours.
- Air Quality Index (AQI) rated 'Moderate' (i.e. air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution) – 2,936 hours.
- Air Quality Index (AQI) rated 'Unhealthy for Sensitive Groups' (i.e. members of sensitive groups may experience health effects. The general public is less likely to be affected) – 629 hours.
- Air Quality Index (AQI) rated 'Unhealthy' (i.e. some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.) – 353 hours.
- Air Quality Index (AQI) rated 'Very Unhealthy' (i.e. health alert: The risk of health effects is increased for everyone.) – 7 hours.

PM_{10} is not recorded by the US Embassy in Guinea.

According to the World Health Organization (WHO), there is insufficient data to assess compliance with WHO Air Quality Guidelines[7].

A 2020 study found that *'actively functioning government air quality monitoring sites seem to be installed in just two of the 15 ECOWAS countries. No information was found for Cabo Verde, Gambia, Guinea, Guinea-Bissau, Liberia, or Sierra Leone'* (Celia Mir Alvarez, 2020).

7 https://cdn.who.int/media/docs/default-source/country-profiles/environmental-health/environmental-health-gin-2023.pdf

From the site visits it is apparent, especially in the Conakry urban areas, that air quality is poor. The predominant cause of this is large numbers of older petrol engine vehicles and heavy congestion. Further site-specific air monitoring will be undertaken during the ESIA process.

6.6 Surface Water

There are no obvious surface water bodies close to the sites that could be impacted by the activities on the sites if adequate pollution prevention measures are employed following Good International Industrial Practice. There will be no requirement to abstract from or discharge to any surface waters as a result of the project implementation.

6.7 Groundwater

According to the BGS, relatively little is documented about the hydrogeology of Guinea's aquifers: their characteristics and groundwater potential. The hydrogeology map and table below provide a basic overview.

In general, the sites (Poste de Kobaya and Poste de Dubréka) are located on unconsolidated sedimentary deposits. The aquifers associated with these deposits have low to high (viable) productivity. Aquifer properties are likely to be very variable, depending on the sediment lithology and thickness, Thick sands and gravels will have higher permeability and groundwater storage potential, but thin silts and fine-grained sands will have lower permeability and storage. Borehole yields can also vary seasonally in relation to rainfall. These aquifers are likely to be unconfined and may be in hydraulic contact with adjacent surface water - rivers or the sea. Along the coast, there is therefore a risk of saline intrusion if groundwater abstraction rates are high enough to draw down the water table below sea level.

For the sites located on the Mesozoic Igneous Intrusive rocks (Poste de Kipé, Poste de Matoto and Poste de Kaloum) very little is known of the aquifer characteristics of these rocks. They are likely to be crystalline with very low intergranular porosity and permeability so groundwater potential will depend largely on the degree and type of weathering and/or fracturing in the rocks. Groundwater is likely to be present mainly in the uppermost few tens of metres. Overall aquifer productivity is likely to be low.

In other words, none of the sites are believed to be located on sensitive aquifers with any kind of water resource value and thus the sites are not sensitive to groundwater impacts. There will be no need for groundwater abstractions associated with the development proposals.

6.8 Noise Environment

The Dubreka and Koubayah sites are located in predominantly rural locations with no substantive neighbouring activities and could be regarded as environmentally quiet

environments with no significant anthropogenic noise sources. In areas such as this, construction-related noise sources such as plant operations, piling, etc could have significant noise nuisance potential.

On the other three sites, they are in predominantly urban areas and close to major arterial traffic routes and are thus exposed to substantial anthropogenic noise sources. Consequently, the noise sources associated with the project-related construction activities are likely to be less influential on the baseline conditions. Noise monitoring is planned as part of the ESIA baseline surveys.

6.9 Weather and Climate

According to the World Bank[8] Guinea is divided into two climatic zones: the tropical zone for most of the territory and the subequatorial for Southeast Guinea. The annual rainfall regime is unimodal. The year is divided into two distinct seasons: dry and wet. The wet season takes place from May to October, followed by a dry season from November to April. Temperatures are high and constant. The country is characterized by significant climatic differences, due in large part to the variety of relief. The sub-Guinean tropical climate in Lower Guinea has average temperatures quite constant: 23° and 25°C and significant rainfall, between 2100 and 5000 mm, with a monthly maximum of over 1000 mm in August. In the tropical mountain climate type, in Middle Guinea, the two seasons are of approximately equal duration and the rainfall varies from 1600 mm to 2000 mm.

The monthly average minimum, mean, maximum air temperature and precipitation are outlined in **Figure *6-6***[9].

The Iowa State University Iowa Environmental Mesonet (IEM) collects weather information from a range of global observing networks[10]. The yearly climatology wind rose for Ahmed Sékou Touré International Airport also known as Gbessia International Airport (ID – GUCY) is outlined in **Figure *6-7***.

8 https://climateknowledgeportal.worldbank.org/country/guinea/climate-data-historical

9 https://climateknowledgeportal.worldbank.org/country/guinea#:~:text=Generally%20hot%20and%20humid%3B%20Guinea,and%20with%20northeasterly%20harmattan%20winds.

10 https://mesonet.agron.iastate.edu/

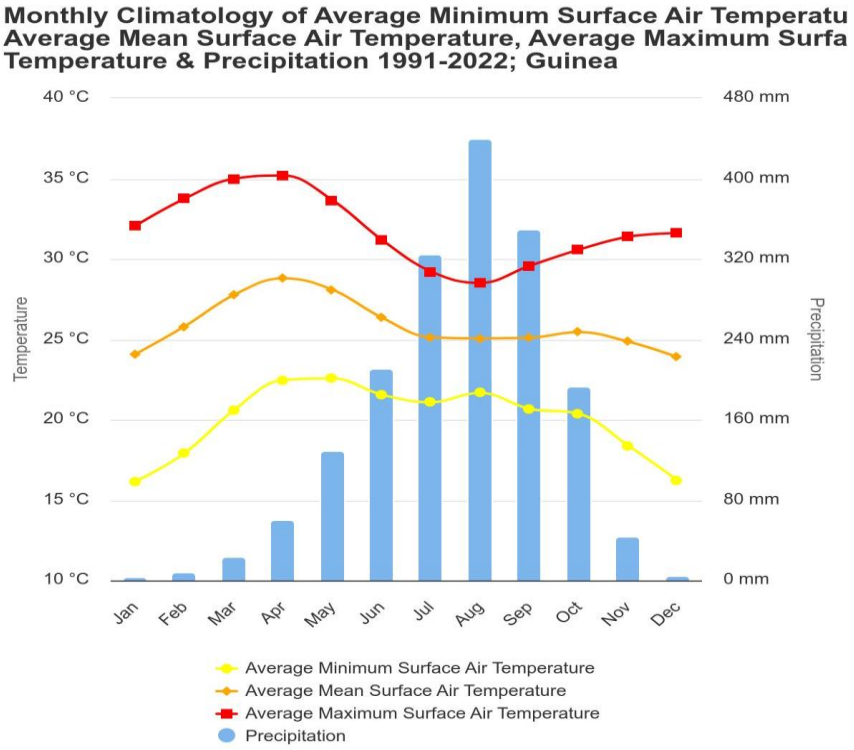


Figure 6-6: *Monthly average surface air temperatures and precipitation (1991-2022)*

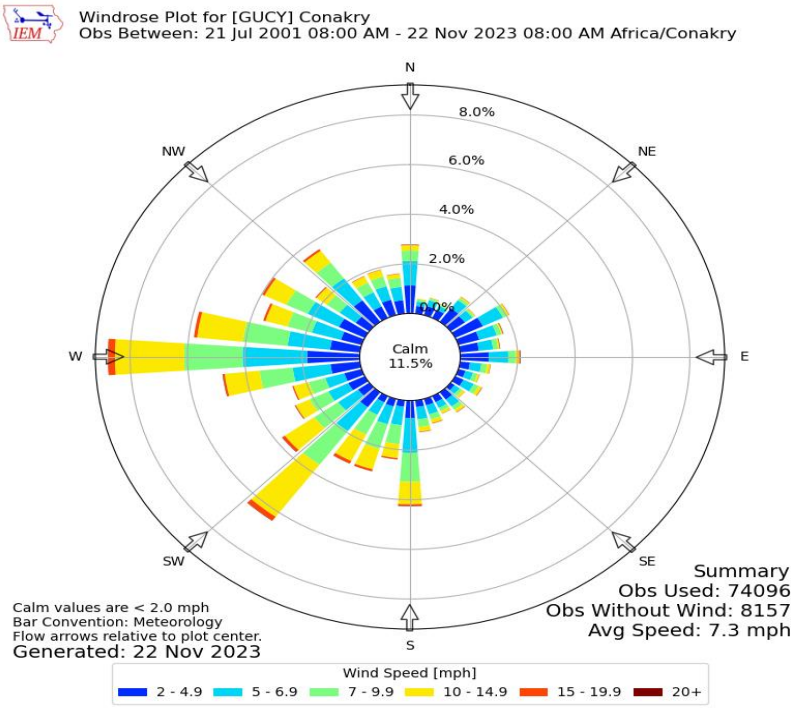


Figure 6-7: *Wind rose for Ahmed Sékou Touré International* Airport

6.10 Climate Change

Principle 2 of the recently updated version of the Equator Principles (EP4) introduces the need for a climate change risk assessment (for certain Projects) that aligns with the Task Force on Climate-Related Financial Disclosures (TCFD) Risk Assessment for Physical and Transition Risks.

Climate change and environmental degradation are sources of structural change that could affect economic activity or critical infrastructure and, in turn, the financial system and associated investments. Climate-related and environmental risks are commonly understood to comprise two main risk drivers:

- Physical risk refers to the financial impact of a changing climate, including more frequent extreme weather events and gradual changes in climate, as well as environmental degradation, such as air, water and land pollution, water stress, biodiversity loss and deforestation. Physical risk is therefore categorised as “acute” when it arises from extreme events, such as droughts, floods and storms, and “chronic” when it arises from progressive shifts, such as increasing temperatures, sea-level rises, water stress, biodiversity loss and resource scarcity. This can directly result in, for example, damage to property or reduced productivity, or indirectly lead to subsequent events, such as the disruption of supply chains.

- Transition risk refers to an institution’s financial loss that can result, directly or indirectly, from the process of adjustment towards a lower-carbon and more environmentally sustainable economy. This could be triggered, for example, by a relatively abrupt adoption of climate and environmental policies, technological progress or changes in market sentiment and preferences.

EAME has considered the various climate risk scenarios over 25 years and assumed that all investment obligations and returns will have been settled within that period.

6.10.1 Physical Risks Methodology

The high-level physical risks for the site location have been derived from a variety of sources, these include:

- **ThinkHazard!** – A web-based tool enabling high-level assessment of impacts on new development Projects. Users of ThinkHazard! can assess the level of river flood, earthquake, drought, cyclone, coastal flood, tsunami, volcano, and landslide hazards within their Project area to assist with Project planning and design. The tool provides the maximum hazard level within each district, province, or national administrative unit (administrative level 2, 1, and 0, respectively). It does not provide the hazard level at

specific locations. This tool is a starting point for increased awareness of the hazards present in an area and has been developed by The Global Facility for Disaster Reduction and Recovery (GFDRR) in partnership with, amongst others, the World Bank Group.

- **World Bank Group Climate Change Portal** – This is an online portal to explore historical and Projected climate data, climate data by sector, impacts, key vulnerabilities, and what adaptation measures are being taken. It has been used to explore the overview for a general context of how climate change is affecting Guinea. The Coupled Model Intercomparison Project (CMIP), Phase 5 (CMIP5) models are included in the IPCC's Fifth Assessment Report (AR5).

6.10.2 Transition Risks

Transition risks for a Project primarily relate to a change of technology to lower carbon practices. This is not relevant to the Proposed Development as there is limited opportunity to move to an alternative and regardless of the source of energy (renewables versus fossil fuels), the generated electricity will still require the sub-stations to enable it to be distributed efficiently to the network.

6.10.3 Physical Risks Assessment

ThinkHazard! has been developed and is maintained by the Global Facility for Disaster Reduction and Recovery (GFDRR). ThinkHazard! is an analytical tool designed to improve knowledge and understanding of natural hazards. The risks are classified accordingly:

- **High:** Users should be highly aware of potentially severe damage from this hazard for the project location. Without taking measures to mitigate the hazard and risk, high levels of damage can be expected to occur within the project or human lifetime (and potentially frequently in that timeframe, for hydro-meteorological hazards, e.g., floods, extreme heat).

- **Medium:** Users should be aware of the potentially damaging effects of this hazard on the project location. Potentially damaging events can be expected to occur within the project or human lifetime and measures to mitigate the hazard and risk should be considered. For hydro-meteorological hazards, damaging effects could occur frequently in that timeframe.

- **Low:** Potentially damaging events are less likely to occur within the project or human lifetime but are still possible. Measures to mitigate the hazard and risk would be prudent at critical locations. Hazard has been classified based on long-term averages, and there is still potential that damaging events could occur in this timeframe.

- **Very Low:** Available data suggest that potentially damaging effects are unlikely to occur, on average, in the project or human lifetime. Hazard has been classified based on long-term averages, and there is still potential that damaging events could occur in this timeframe.

- **No Data Available:** No dataset covering the chosen location is currently available in ThinkHazard!

The Project's physical risks are outlined and assessed (at a high level), in **Table *6-1***

Table 6-1: *Physical climate derived risks*

Hazard	Risk Level				
	Poste de Kaloum	Poste de Kipé	Poste de Matoto	Poste de Kobaya	Poste de Dubréka
Assessment Level	Dixinn/Kaloum	Ratoma	Ratoma	Ratoma	Dubréka
River Flood	Very Low	Very Low	Very Low	Very Low	Low
Urban Flood	Very Low	Low	Low	Low	HIGH
Coastal Flood	HIGH	HIGH	HIGH	HIGH	HIGH*
Extreme Heat	No Data	MEDIUM	MEDIUM	MEDIUM	MEDIUM
Wildfire	HIGH	HIGH	HIGH	HIGH	HIGH
Tsunami	Low	Low	Low	Low	Low
Earthquake	Very Low	Low	Low	Low	Low
Landslide	Low	Low	Low	Low	MEDIUM
Cyclone	No Data	No Data	No Data	No Data	No Data
Water Scarcity	Very Low	Very Low	Very Low	Very Low	Very Low
Volcano	No Data	No Data	No Data	No Data	No Data

Notes:

Classifications provided by ThinkHazard! (February 2024). The tool is provided by the Global Facility for Disaster Reduction and Recovery (GFDRR) which is part of the World Bank.

It is important to note that the ThinkHazard! Assessment process is applied at the district level so may not represent the actual on-site project risks e.g. the Poste de Dubréka * site is in a

rural area with no paved roads and at an elevated location so the chances of coastal flooding are very low, but this level of detail is not available from the online tool. The site-specific risks will be evaluated in more detail as part of the ESIA process.

6.11 Landscape and Visual Attributes

The main elements of the substations that may have visual implications include:

- Incoming power lines connected to the off-site overhead transmission line (OHTL) towers. Note the connection and OHTL and associated towers are outside the scope of this ESIA and are being dealt with under another ESIA programme.
- A security fence typically mesh or steel palisade up to a maximum of 2.5 metres.
- Transformers are large solid structures up to 10 metres.
- The control building is likely to be a solid structure up to a maximum of 12 metres.
- Security lighting is likely to be mast mounted up to a maximum of 10 metres.
- Outgoing transmission lines connected to the off-site OHTL towers. Note the connection and OHTL and associated towers are outside the scope of this ESIA.

The elements can be divided into lower (5-6 metre range) transparent or opaque structures (e.g. fences, buildings and transformers) and the taller (c. 10 metres) mostly transparent structures. The lower elements are likely to be visible whilst the taller structures should be less intrusive.

The approximate limit of visibility is dictated by the height, visual mass of the development, surrounding landscape and built features (e.g. topography, buildings, vegetation and other structures). Assuming a flat landscape the theoretical limit of visibility for a 5 metre structure is 7.9 km. Concerning the Proposed Development sites:

- Dubréka Substation – The site is in a flat rural area surrounded by oil palm plantations. Mature palms are single-stemmed and can grow to around 20 meters.
- Kobaya Substation – The site is in a flat rural area surrounded by rice fields. There are no screening features close to the site.
- Kipé Substation – The site is a flat urban area. The power station to the south and east and the large retail outlet to the west of the site will provide some screening.
- Kaloum Substation – The site is a flat urban area close to the coast.

- Matoto Substation – The site is an urban area within a zone of limited development. The railway line to the north of the site will provide some screening.

6.12 Biological Environment

According to UNEP-WCMC and IUCN Protected Planet - The World Database on Protected Areas and World Database on Other Effective Area-based Conservation Measures (UNEP-WCMC and IUCN, 2024) there are no protected sites within 1 km of the proposed substations sites.

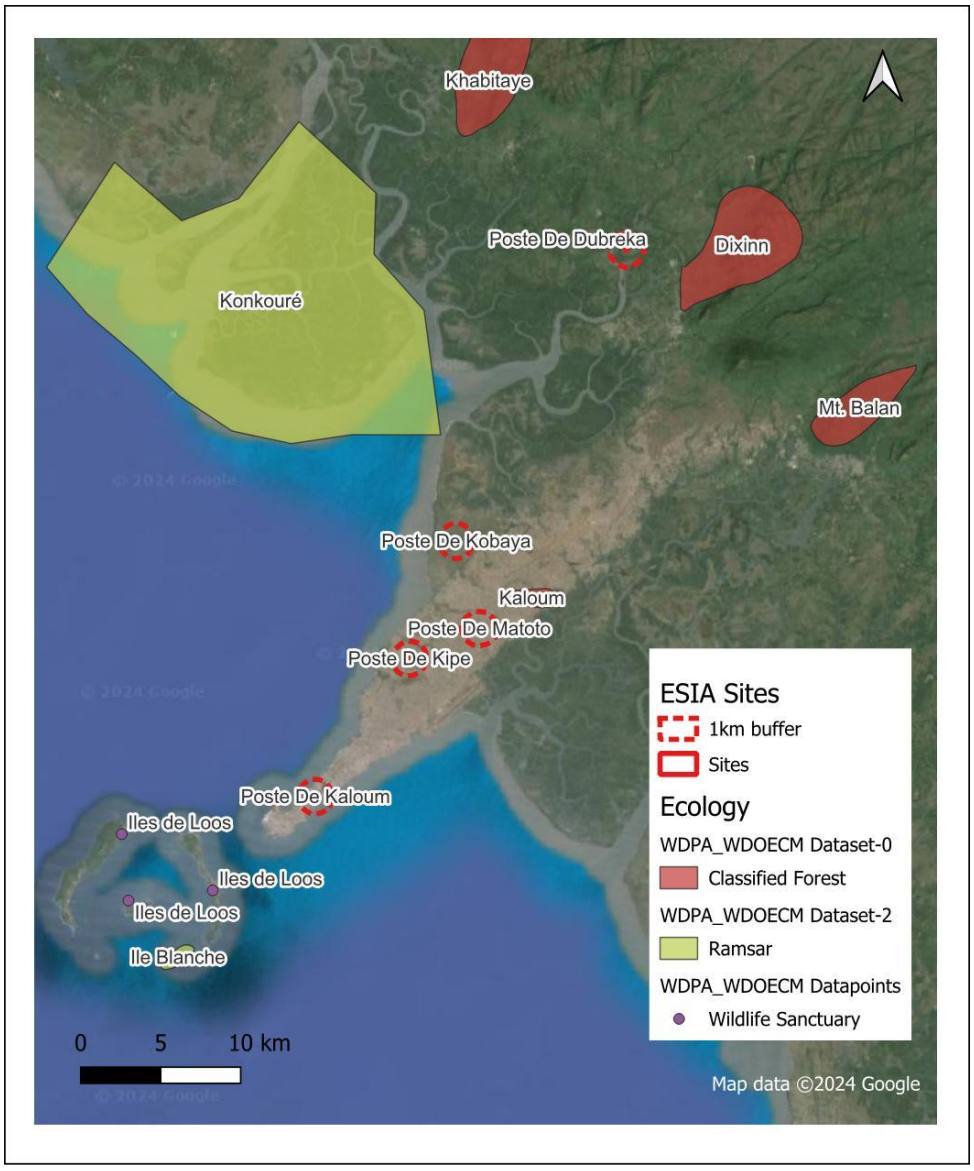


Figure 6-8: *Designated conservation sites*

Moreover, except for some small areas of low-value scrub vegetation, none of the sites have any substantial habitat resources on them and are not regarded as ecologically sensitive sites.

6.13 Socioeconomic Environment

6.13.1 Introduction

The Project AOI for the socioeconomic baseline can be divided into three spheres:

- **The primary sphere of influence** – This includes communities/receptors adjacent to the Proposed Development and/or whose land will potentially be either acquired or accessed/crossed by the Project. These communities are most susceptible to direct impacts by the Project in terms of livelihoods and well-being. For the baseline assessment, EAME will review surrounding areas for such communities within an area of 1 km of the Proposed Development site.

- **Secondary sphere of influence** – This includes communities/receptors located along transport roads and/or those that may be impacted indirectly by the Project. This sphere of influence provides the administrative context for the communities in the primary sphere.

- **Tertiary sphere of influence** – This provides the general context for the Project and the local districts.

6.13.2 Data Sources

Socio-economic data will be derived from published studies, government statistics and direct observation and consultations in the project (site) locations and approaches to them.

Some key socio-economic metrics and characteristics that will be considered in the ESIA evaluation are:

- Demographics, population size/density, gender-mix, age mix, etc;
- Healthcare access, disease, mortality
- Literacy and Education
- energy & utility provision
- sanitation standards & waste management
- potable water supplies

- Gender, ethnicity, equality and inclusion issues (Human Rights)
- Tribal, indigenous and internally displaced persons issues
- land uses, employment and commerce activities; and
- administrative and governance characteristics.

These may be consistent across all sites or may vary from site to site. This will be assessed and presented in the ESIA process and report.

7 Environmental and Social Baseline Studies

7.1 Introduction

The initial appraisal of the project and selected sites indicates a relatively low sensitivity to impact and the range of impacts that might be experienced are focussed mainly within the construction period. The operational facilities are generally environmentally benign and socially beneficial. Nonetheless, the proposed project has the potential to cause impacts to the immediate, surrounding, and regional environmental and socio-economic environs. Specific environmental and socioeconomic impacts will occur at different phases of the Project during the life of the Project. It will, therefore, be necessary to characterise the potentially affected environment and social context in more detail through more focused baseline surveys and studies. These are described in more detail below. The three most prominent aspects of the baseline environment that need to be more fully characterised and better understood are:

- the prevailing air quality
- the noise environment; and
- the local socio-economic environment

These are elaborated on below.

7.2 Air Quality

An initial receptor assessment has been undertaken during the preparation of the Scoping Report. It is considered likely to include the area immediately surrounding the Proposed Development site (within 500 metres).

Construction activities have the potential to impact air quality within the area. The main potential air quality pollutant during construction is the generation of dust and particulate matter (PM_{10} and $PM_{2.5}$) related to earthworks, the movement of traffic on unsurfaced roads, the loading/unloading of materials and from wind on exposed and unprotected soil stockpiles.

Additionally, air quality will be affected by exhaust emissions from diesel- and petrol-powered equipment, vehicles, and machinery during the construction phase. This includes the emission of particulate matter, nitrogen oxides (NOx), sulphur dioxide (SO_2), carbon monoxide (CO), and carbon dioxide (CO_2).

The source, location, duration, and intensity of the construction activities will be assessed to qualitatively determine their potential impact on sensitive receptors (including ecological

receptors where present). Exhaust emissions from the machinery used in construction will be estimated based on fuel use to establish the potential impacts.

The potential for dust emissions from construction activities would be greatest during the initial site clearing and material importation works.

Operational impacts are similar in type to that of the construction period although emission rates are likely to be significantly lower.

7.3 Noise and Vibration

Noise is defined as unwanted sound, and the normal unit of measurement is the decibel (dB(A)). Sound pressure levels range from the threshold of hearing at 0 dB(A) to levels of over 130 dB(A), at which point noise becomes painful to the human ear. Vibration can be defined as the analogous motion of the particles of a mass of air or the like, whose state of equilibrium has been disturbed, as in transmitting sound. The noise environment of each site and the prevalence and level of anthropogenic noise sources in particular need to be established and will be measured as part of the baseline survey activity.

7.4 Socio-economic Conditions

The key social receptors are communities, local businesses, and road users near the Proposed Development sites. There will be no actual displacement of individuals, households and/or communities due to the Proposed Project, based on the current site selection, although this could be an issue at the Khaloum site (i.e. truck parking, maintenance yard and security guard).

The Proposed Development is expected to result in job creation, increased local expenditures on goods and services, provision of new economic opportunities, road widening, upgrading and maintenance and the local increase in vehicle movements. Most notably it will make a significant contribution to the more reliable distribution of electrical power and is thus an overall societally beneficial project.

7.5 Baseline Field Surveys

EAME would propose to improve the understanding of the baseline environment, including the key issues raised above, through further on-site surveys at each of the five sites as outlined in **Table *7-1***.

Table 7-1: *Baseline E&S surveys*

Topic	Sites	Description
Air Quality	**All Sites**	**1 monitoring location per site (site centre)** <u>Long-term monitoring</u> • 1 x SO_2 diffusion tube – SO_2 tube with a detection limit of less than 2 ugm^{-3} over a 4-week exposure period. All analysis will be carried out within a Gradko International Ltd UKAS accredited laboratory. • 1 x NO_2 diffusion tube – NO_2 tube with 20% TEA/Water absorbent, all analysis will be carried out within a Gradko International Ltd UKAS accredited laboratory. Limit of detection of less than 1.5 ugm^{-3} over a 4-week exposure period. • 1 x H_2S diffusion tube – H_2S tube with a detection limit of less than 0.1 ugm^{-3} over a 4-week exposure period. • 1 x VOC passive sampling tube. Detection limits are variable and based on the analytical suite undertaken over a 4-week exposure period. The analytical suite is likely to include Total Total Petroleum Hydrocarbons (TPH) with Aliphatic/aromatic banding. <u>Short-term monitoring</u> Short term hourly monitoring (one hour continuously) at the same location will be undertaken using Aeroqual 500 series air monitors using calibrated heads for NOx and Particulates (PM_{10} and $PM_{2.5}$), Hydrogen sulphide (H_2S) and Formaldehyde.
Soils and Contamination	All Sites	**Average of 5 soil samples (per site)** It is proposed that 1 bulk soil sample shall be collected and analysed for Asbestos Screen & ID, pH, TOC, Total Sulphate, Sulphide, Monohydric Phenols, Total Cyanide, W/S Boron, As, Cr, Cu, Pb, Se, Zn, Cd, Hg, Ni, Speciated PAH, TPH1 & TPH CWG, Total Sulphate, W/S Sulphate, Total Sulphur, W/S Nitrate, W/S Chloride and Ammonium to establish the baseline conditions. All analyses are to be undertaken by i2 Analytical Ltd (UKAS certified).
	Dubreka and Koubayah	**Three bulk soil samples per site** To be analysed for organochlorine and organophosphate pesticide/herbicide residues.

Topic	Sites	Description
Ecology	All Sites	Site walk-over survey to record potential on-site habitats and fauna (especially nesting birds).
Noise	All Sites	**2 monitoring locations per site (site centre and nearest receptor), daytime and nighttime** Undertake 1-hour continuous noise monitoring (LAeq noise level) following IFC guidelines) at two locations. One at the centre of the site and one as close as possible to the nearest residential property or the site. 1-hour continuous LAeq data, plus minimum, maximum and average LAeq at each location (daytime). 1-hour continuous LAeq data, plus minimum, maximum and average LAeq at each location (nighttime).
Socio-economic	All Sites	Surveys of the local community including interviews, social media outreach and meetings to identify community activities.
Traffic	All Sites	**1-hour traffic count (each site)** Note vehicle movements (number and direction) and vehicle types on the standard EAME recording sheet for 1 hour continuously whilst other monitoring is taking place.
Visual Impact	All Sites	Take a series of photographs of the sites from the nearest residential zones to show their landscape context.

The onsite baseline surveys will be supported by additional desk-based research, review of relevant publications and stakeholder engagement and feedback.

The objective of the Scoping Report is for it to be a source of information for potentially affected stakeholders and communities that could be impacted positively or negatively by the Project and to prompt responses and feedback to the Project information and anticipated impacts.

EAME would like to receive comments and feedback on the project proposals, anticipated impacts and proposed baseline studies as presented in this report.

Please address any such comments to: guinea@eame.co.uk

Annexe A: Figures

Poste de Dubreka

Poste de Kobaya

Poste de Matoto

Poste de Kipe

Poste de Kaloum

0 5 10 km

Key

- Site Locations

Map data ©2024 Google

EAME
Earth & Marine Environmental Consultants

Title: Figure A1 - Site Locations

Client: Construction Management Services

Job Reference: 023-1951

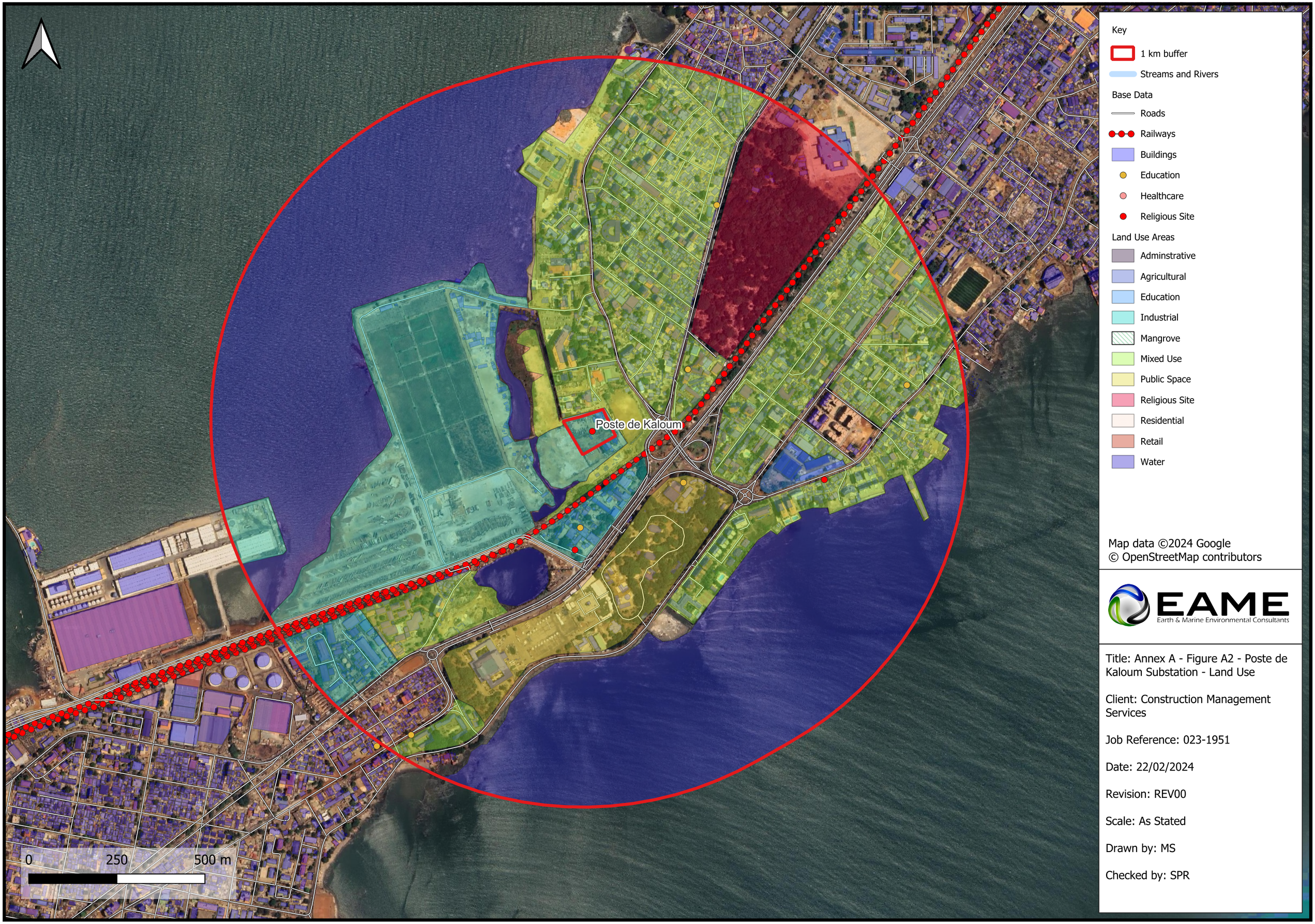
Date: 26/02/2024

Revision: REV00

Scale: As Stated

Drawn by: MS

Checked by: SPR



Key

1 km buffer

Streams and Rivers

Base Data

Roads

Railways

Buildings

Education

Healthcare

Religious Site

Land Use Areas

Adminstrative

Agricultural

Education

Industrial

Mangrove

Mixed Use

Public Space

Religious Site

Residential

Retail

Water

EAME
Earth & Marine Environmental Consultants

Title: Annex A - Figure A2 - Poste de Kaloum Substation - Land Use

Client: Construction Management Services

Job Reference: 023-1951

Date: 22/02/2024

Revision: REV00

Scale: As Stated

Drawn by: MS

Checked by: SPR

Key

1 km buffer

Streams and Rivers

Base Data

Roads

Railways

Buildings

Education

Healthcare

Religious Site

Land Use Areas

Adminstrative

Agricultural

Education

Industrial

Mangrove

Mixed Use

Public Space

Religious Site

Residential

Retail

Water

EAME
Earth & Marine Environmental Consultants

Title: Annex A - Figure A3 - Poste de Kipé Substation - Land Use

Client: Construction Management Services

Job Reference: 023-1951

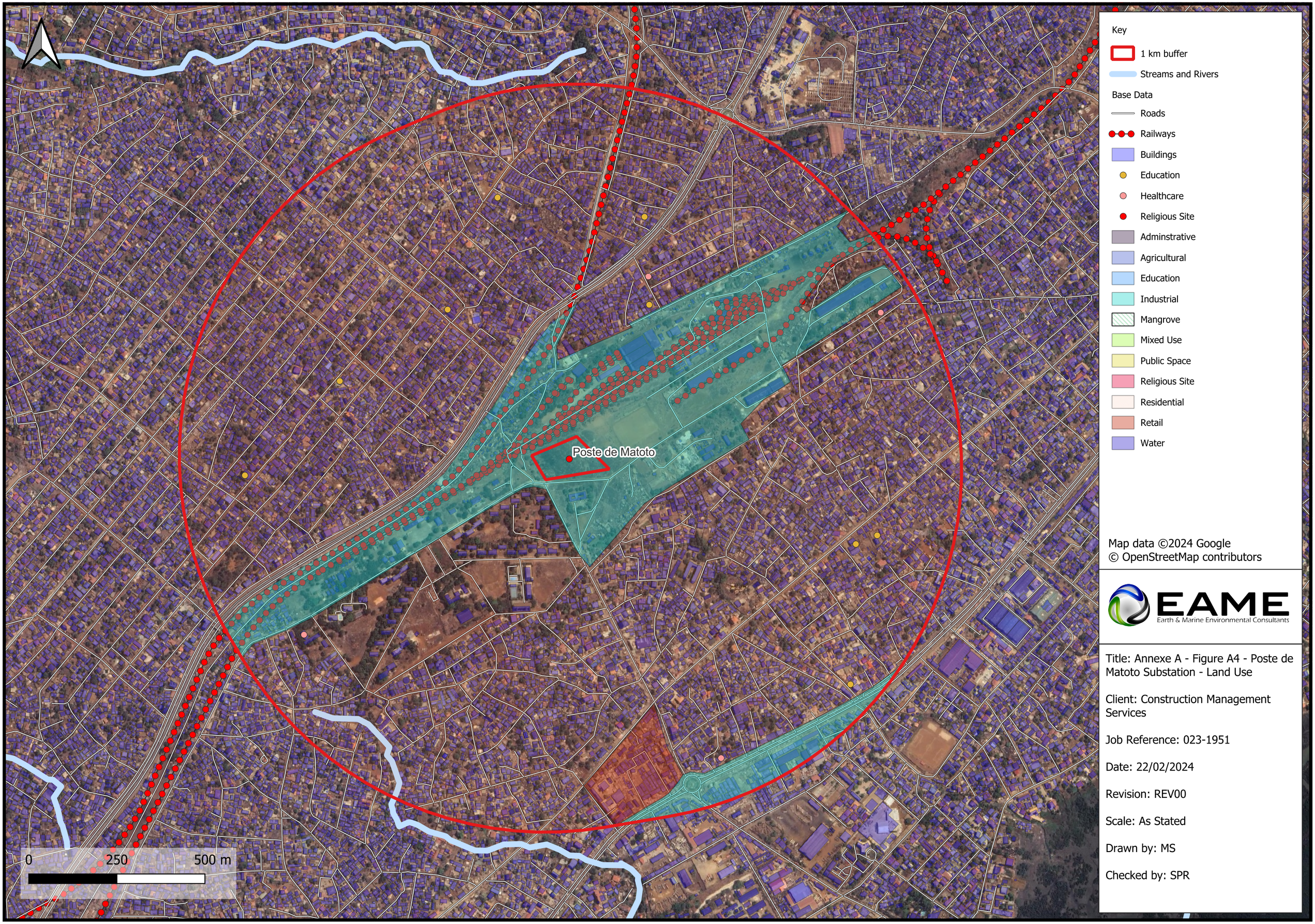
Date: 22/02/2024

Revision: REV00

Scale: As Stated

Drawn by: MS

Checked by: SPR


Poste de Matoto
0
250
500 m
Key
1 km buffer
Streams and Rivers
Base Data
Roads
Railways
Buildings
Education
Healthcare
Religious Site
Adminstrative
Agricultural
Education
Industrial
Mangrove
Mixed Use
Public Space
Religious Site
Residential
Retail
Water
Map data ©2024 Google
© OpenStreetMap contributors
EAME
Earth & Marine Environmental Consultants
Title: Annexe A - Figure A4 - Poste de Matoto Substation - Land Use
Client: Construction Management Services
Job Reference: 023-1951
Date: 22/02/2024
Revision: REV00
Scale: As Stated
Drawn by: MS
Checked by: SPR

Poste de Kobaya

0 250 500 m

Key

- 1 km buffer
- Streams and Rivers
- Roads
- Railways
- Buildings
- Education
- Healthcare
- Religious Site

Land Use Areas

- Adminstrative
- Agricultural
- Education
- Industrial
- Mangrove
- Mixed Use
- Public Space
- Religious Site
- Residential
- Retail
- Water

EAME
Earth & Marine Environmental Consultants

Title: Annex A - Figure A5 - Poste de Kobaya Substation - Land Use

Client: Construction Management Services

Job Reference: 023-1951

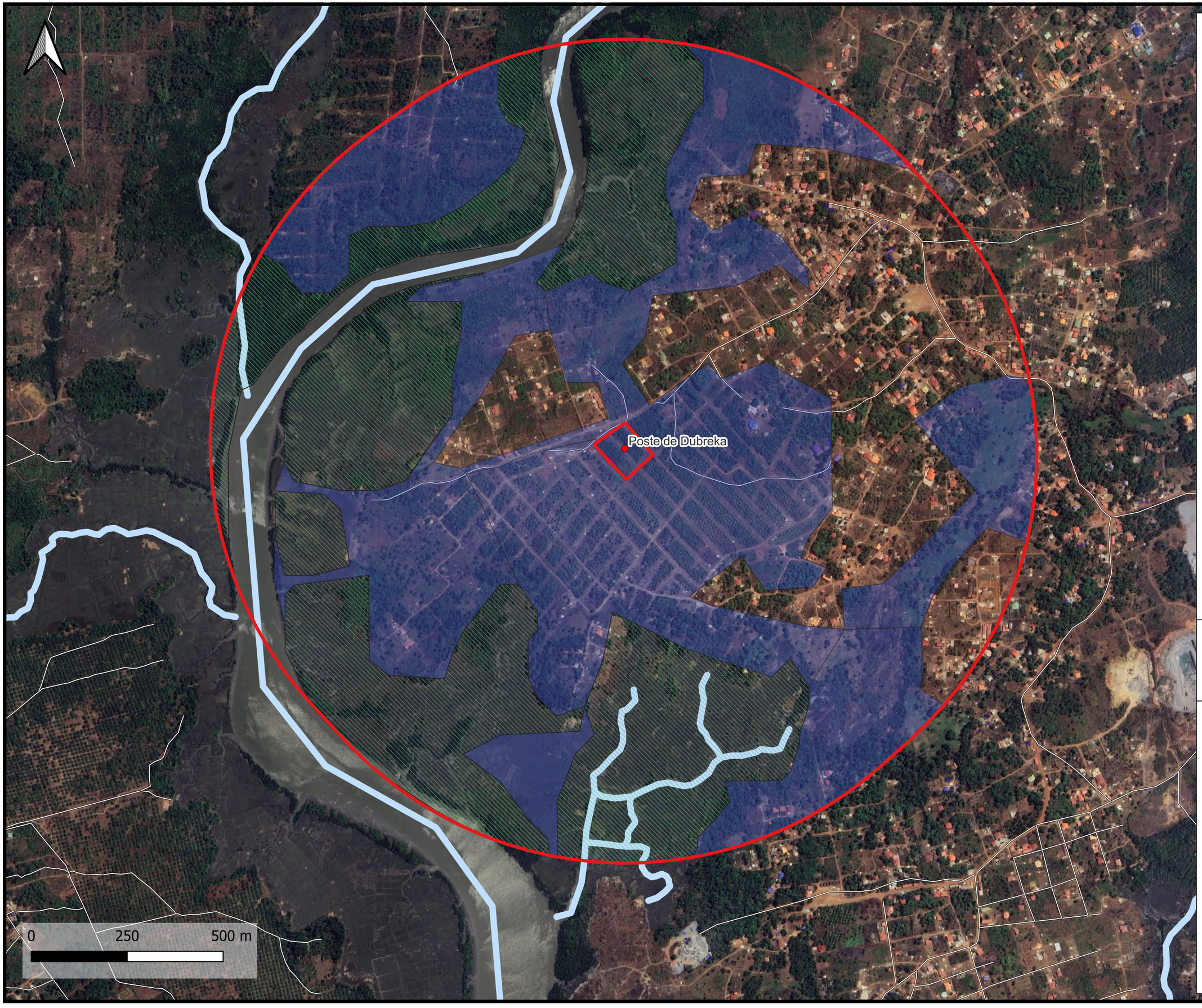
Date: 22/02/2024

Revision: REV00

Scale: As Stated

Drawn by: MS

Checked by: SPR



Key

- 1 km buffer
- Streams and Rivers
- Roads
- Railways
- Buildings
- Education
- Healthcare
- Religious Site

Land Use Areas

- Adminstrative
- Agricultural
- Education
- Industrial
- Mangrove
- Mixed Use
- Public Space
- Religious Site
- Residential
- Retail
- Water

EAME
Earth & Marine Environmental Consultants

Title: Annex A - Figure A6 - Poste de Dubréka Substation - Land Use

Client: Construction Management Services

Job Reference: 023-1951

Date: 22/02/2024

Revision: REV00

Scale: As Stated

Drawn by: MS

Checked by: SPR

Annexe B: Initial Site Visit Photographs

Annex B Photolog
Poste de Dubréka

EAME
Earth & Marine Environmental Consultants

Photograph 1-1: View across site

Photograph 1-2: View across site

Photograph 1-3: View across site

Photograph 1-4: View across site

Photograph 1-5: View across site

Photograph 1-6: General soil conditions on-site

Annex B Photolog

Poste de Kobaya

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Earth & Marine Environmental Consultants

Photograph 2-1: View across site

Photograph 2-2: View across site

Photograph 2-3: View across site

Photograph 2-4: View across site

Photograph 2-5: View across site

Photograph 2-6: View across site

Annex B Photolog
Poste de Matoto

EAME
Earth & Marine Environmental Consultants

Photograph 3-1: View across site

Photograph 3-2: View across site

Photograph 3-3: View across site

Photograph 3-4: View across site

Photograph 3-5: View across site

Photograph 3-6: View across site

Photograph 3-7: View across site

Annex B Photolog
Poste de Kipé

EAME
Earth & Marine Environmental Consultants

Photograph 4-1: General location – adjacent to power station

Photograph 4-2: General location – adjacent to power station

Photograph 4-3: General location – adjacent to power station

Photograph 4-4: General location – adjacent to power station

Photograph 4-5: General location – adjacent to power station

Photograph 4-6: General location – adjacent to power station

Photograph 4-7: Proposed site – existing tank bases

Photograph 4-8: Proposed site – existing tank bases

Photograph 4-9: Proposed site – existing concrete pads

Annex B Photolog
Poste de Kaloum

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Photograph 5-1: View of adjacent site to the west

Photograph 5-2: View across site

Photograph 5-3: View across site with current vehicle storage

Photograph 5-4: View across site

Photograph 5-5: View across site with vehicles on-site

Photograph 5-6: View across site from vehicle storage yard

Annexe C: Historical Satellite Imagery

Annex C Historical Review

Poste de Dubréka

EAME
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January 2004

EAME
Earth & Marine Environmental Consultants

January 2008

EAME
Earth & Marine Environmental Consultants

March 2014

EAME
Earth & Marine Environmental Consultants

March 2015

EAME
Earth & Marine Environmental Consultants

January 2017

EAME
Earth & Marine Environmental Consultants

November 2019

EAME
Earth & Marine Environmental Consultants

June 2021

EAME
Earth & Marine Environmental Consultants

March 2022

EAME
Earth & Marine Environmental Consultants

May 2022

EAME
Earth & Marine Environmental Consultants

April 2023

EAME
Earth & Marine Environmental Consultants

Annex C Historical Data

Poste de Kaloum

EAME
Earth & Marine Environmental Consultants

December 2000

EAME
Earth & Marine Environmental Consultants

May 2001

EAME
Earth & Marine Environmental Consultants

February 2007

EAME
Earth & Marine Environmental Consultants

January 2011

EAME
Earth & Marine Environmental Consultants

February 2014

EAME
Earth & Marine Environmental Consultants

January 2015

EAME
Earth & Marine Environmental Consultants

May 2015

EAME
Earth & Marine Environmental Consultants

February 2020

EAME
Earth & Marine Environmental Consultants

February 2021

EAME
Earth & Marine Environmental Consultants

April 2023

EAME
Earth & Marine Environmental Consultants

February 2024

EAME
Earth & Marine Environmental Consultants

Annex C Historical Data

Poste de Kipé

EAME
Earth & Marine Environmental Consultants

October 2000

EAME
Earth & Marine Environmental Consultants

December 2009

EAME
Earth & Marine Environmental Consultants

April 2012

EAME
Earth & Marine Environmental Consultants

March 2013

EAME
Earth & Marine Environmental Consultants

April 2014

EAME
Earth & Marine Environmental Consultants

December 2015

EAME
Earth & Marine Environmental Consultants

January 2019

EAME
Earth & Marine Environmental Consultants

January 2023

EAME
Earth & Marine Environmental Consultants

Annex C Historical Data

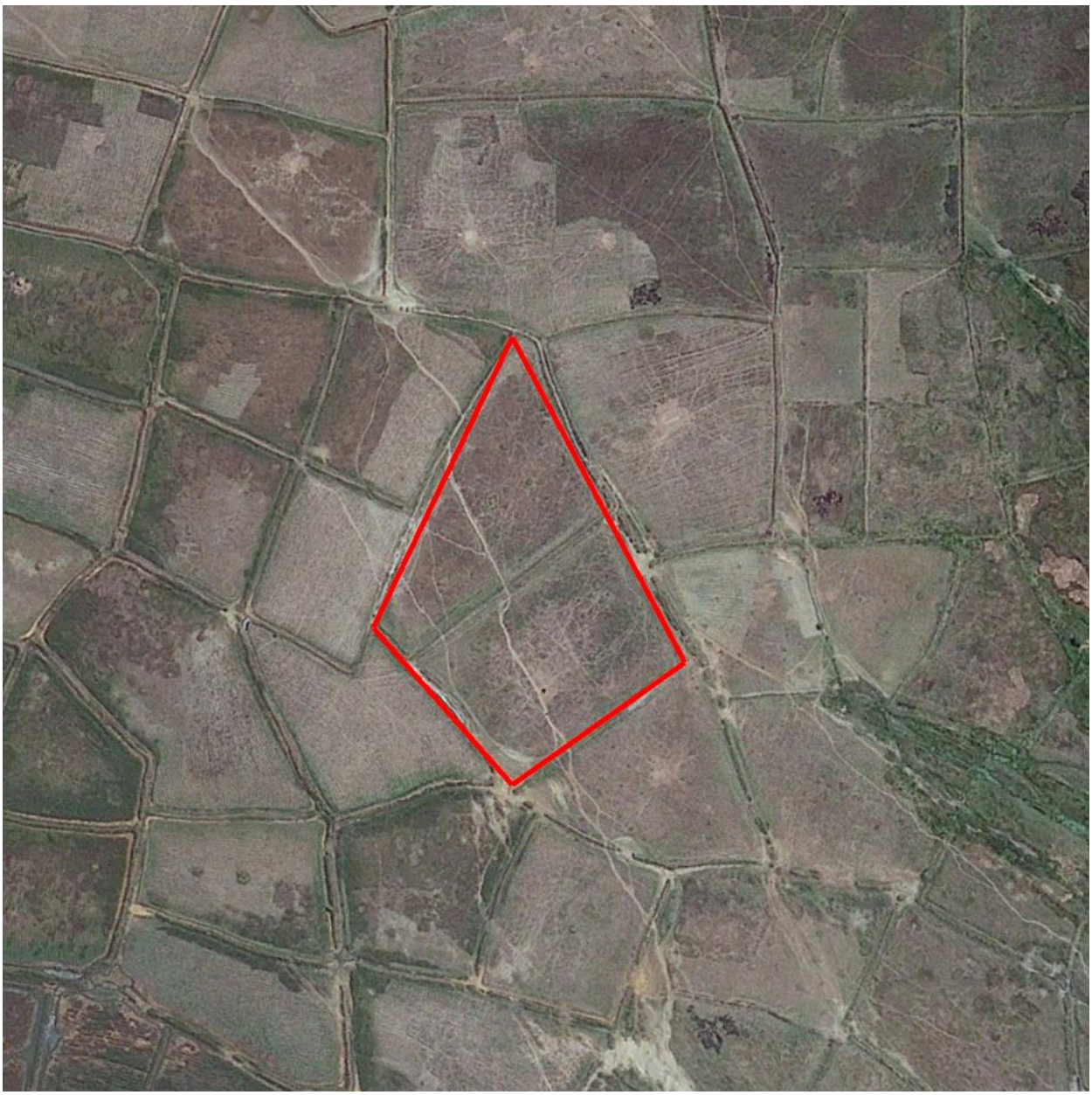
Poste de Kobaya

EAME
Earth & Marine Environmental Consultants

February 2007

EAME
Earth & Marine Environmental Consultants

April 2012



EAME
Earth & Marine Environmental Consultants

January 2019

EAME
Earth & Marine Environmental Consultants

September 2020

EAME
Earth & Marine Environmental Consultants

January 2023

EAME
Earth & Marine Environmental Consultants

April 2023

EAME
Earth & Marine Environmental Consultants

Annex C Historical Data
Poste de Matoto

EAME
Earth & Marine Environmental Consultants

October 2000

EAME
Earth & Marine Environmental Consultants

December 2006

EAME
Earth & Marine Environmental Consultants

December 2007

EAME
Earth & Marine Environmental Consultants

January 2011

EAME
Earth & Marine Environmental Consultants

November 2017

EAME
Earth & Marine Environmental Consultants

January 2019

EAME
Earth & Marine Environmental Consultants

January 2023

EAME
Earth & Marine Environmental Consultants