



**MINISTRY OF ROADS  
AND HIGHWAYS  
GHANA HIGHWAY  
AUTHORITY  
REPUBLIC OF GHANA**

## **Environmental Impact Assessment for the Eastern Corridor Road – Lot 1: Ashaiman Roundabout to Akosombo Junction Project, Ghana**

**Environmental Impact Assessment**  
Non-Technical Summary

V 2.0

28 January 2021

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## Signature Page

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# Environmental Impact Assessment for the Eastern Corridor Road – Lot 1: Ashaiman Roundabout to Akosombo Junction Project, Ghana

## Non-Technical Summary

V 2.0



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## CONTENTS

<b>1.</b>	<b>PREFACE</b> .....	<b>1</b>
1.1	Background.....	1
1.2	EIA Disclosure .....	1
1.2.1	Resettlement Framework.....	2
1.3	Where to get more information? .....	2
<b>2.</b>	<b>INTRODUCTION</b> .....	<b>3</b>
2.1	What is the Project?.....	3
2.2	Why is the Project needed? .....	5
2.3	Who is the Project Owner? .....	6
2.4	Why is this EIA needed?.....	6
2.5	What are the next steps after EIA? .....	6
<b>3.</b>	<b>WHAT ARE THE PROJECT MAIN FEATURES AND DEVELOPMENT PHASING?</b> .....	<b>7</b>
3.1	How will the Project be designed? .....	7
3.2	Relevant Standards for the Project .....	9
3.3	Construction Works .....	9
3.4	How long will the construction take and will it stop existing traffic flow? .....	10
3.5	Will there be any job opportunities in the Project? .....	10
<b>4.</b>	<b>HOW WERE THE EIA STUDIES CONDUCTED?</b> .....	<b>11</b>
<b>5.</b>	<b>HOW WAS THE STAKEHOLDER ENGAGEMENT CONDUCTED?</b> .....	<b>12</b>
5.1	Scoping Consultation Activities.....	12
5.2	Baseline Surveys and Project Disclosure .....	13
5.3	On-going Engagement during Construction.....	14
5.4	Grievance Mechanism .....	14
<b>6.</b>	<b>WHAT ARE THE EIA FINDINGS?</b> .....	<b>15</b>
6.1	Potential Impacts on the Physical Environment.....	15
6.1.1	Resources and Waste.....	15
6.1.2	Surface and Groundwater .....	15
6.1.3	Geology, Soils and Contaminated Land.....	16
6.2	Potential Key Ecological Impacts.....	16
6.3	Potential Impacts on Social Resources and Receptors .....	17
6.3.1	Economy and Employment.....	17
6.3.2	Land and Livelihoods .....	17
6.3.3	Community Health Safety and Security .....	19
6.3.4	Access to Infrastructure and Services.....	19
6.3.5	Community Cohesion.....	19
6.3.6	Cultural Heritage .....	20
<b>7.</b>	<b>MITIGATION MEASURES</b> .....	<b>21</b>
<b>8.</b>	<b>HOW MONITORING WILL BE HELD?</b> .....	<b>34</b>
<b>9.</b>	<b>HOW COMMISSIONING, HANDOVER AND POST CONSTRUCTION MAINTENANCE WILL HAPPEN?</b> .....	<b>36</b>
<b>10.</b>	<b>CONCLUSION</b> .....	<b>37</b>

## List of Tables

Table 3-1 Lot 1 Main Civil Engineering Tasks .....	7
Table 3-2 Summary of Restrictions to Physical Structures along the RoW during Construction and Operation .....	8
Table 6-1 Estimated Infrastructures Breakdown .....	17
Table 7-1 Major Potential Impacts during Construction .....	22
Table 7-2 Major Potential Impacts during Operation .....	31

## List of Figures

Figure 2-1 Project Area .....	4
Figure 2-2 Images from the existing road .....	5
Figure 3-1 Corridors within the 90 m RoW .....	8
Figure 3-2 Workforce Planner .....	10
Figure 5-1 Photos from the scoping meeting with local authorities .....	12
Figure 5-2 Photos from the scoping meeting with Ministry of Defence .....	13
Figure 5-3 Photos from the meeting with local communities .....	13
Figure 6-1 Location of Water Crossings .....	15

## Acronyms and Abbreviations

Name	Description
Aol	Area of Influence
EA	Environmental Assessment
ECR	Eastern Corridor Road
E&S	Environmental and Social
EHS	Environmental Health and Safety
EPA	Environmental Protection Agency of Ministry of Environment, Science, Technology and Innovation
EPC	Engineering Procurement Contract
ERM	Environmental Resources Management
EIA	Environmental Impact Assessment
ESMP	Environmental and Social Management Plan
GHA	Ghana Highway Authority (Project Owner)
GMMB	Ghana Museums and Monuments Board
GPHA	Ghana Ports Harbours Authority
IFC	International Finance Corporation
MRH	Ministry of Roads and Highways (Project Owner)
NTS	Non-Technical Summary
PAP	Project Affected Party
PCB	Pedestrian Crossing Bridges
PS	Performance Standards of IFC
RAP	Resettlement Action Plan
RF	Resettlement Framework
RoW	Right of Way
SEP	Stakeholder Engagement Plan
SHRR	Shail Hills Resources Reserve
STD	Sexually Transmitted Diseases

## 1. PREFACE

### 1.1 Background

The Ghana Highway Authority (GHA) is implementing the expansion/rehabilitation of the Eastern Corridor Road (ECR) from Ashaiman to Kulungugu; this is the National Road N2. The first part of the route – called Lot 1 – extends about 64 km from Ashaiman Roundabout (in Tema) to Asikuma Junction at Akosomobo, just before the Adomi Bridge at the Volta River. GHA has engaged the Germany-based contractor INZAG to perform the construction works for Lot 1 (called the “Project” in this document). Before construction can begin, INZAG must obtain the necessary construction permits and environmental approvals from the Ghana Environmental Protection Agency (EPA); this includes as well the need to undertake an Environmental and Social Impacts Assessment (EIA<sup>1</sup>) for the Project. In addition to the requirements of the Ghana EPA, the Project must also be in conformance with the stringent environmental and social (E&S) standards that are mandated by the international banks that are providing financing for the Project.

The initial approval steps with the Ghana EPA are already underway: the Project has been registered with the EPA and a so-called Scoping Report was undertaken in early 2020, which included initial discussions with village leaders and other responsible officials and community members in the area of Lot 1. The EPA approved the Scoping Report and laid out the requirements for the full EIA study. Currently, the full EIA study has been completed per the requirements of the EPA and of the international banks. The final EIA Report is written in English and is about 450 pages long, plus there are eight appendices providing various details to supplement the main text.

#### **This document is the Non-technical Summary (NTS) of the EIA Report.**

The NTS provides information on the Project and the potential E&S impacts of the Project – as well as the mitigation measures that will be undertaken by INZAG and GHA to avoid or minimize these impacts. This NTS also addresses how the local residents/community members can contact INZAG and GHA with any further inquiries they might have with regard to the Project.

### 1.2 EIA Disclosure

The EIA Report has been reviewed and approved by the Ghana EPA (and the international banks) and it will be made available for public comment through an EPA-led disclosure process in alignment with the EPA requirements. This means that anybody who is potentially affected by the Project in some way, or otherwise interested in the Project (together called “stakeholders”), can review the EIA Report and then communicate any comments/concerns they may have to the EPA and GHA/INZAG. These comments/concerns will then be considered by EPA, GHA/INZAG and the EIA experts during finalisation of the EIA Report.

The availability of the final EIA Report will be published in mass media and announced in local media of the seven districts in the Project area namely Ashaiman, Kpone Katamanso, Ningo Prampram, Shai Osudoku, Yilo Krobo, Lower Manya Krobo and Asuogyaman Districts.

Prior to commencement of the EIA disclosure process, all engaged stakeholders will be informed of the EPA-led public hearings and community meetings venues and where they can access copies of the EIA Report. The EIA Report will be made available in public places such as District Assembly offices, Regional EPA offices, and Public Libraries.

The proposed plan to organise public meetings in each settlement in the Project area is subject to the applicable COVID-19 restrictions. If the organisation of such public meetings is not considered

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<sup>1</sup> One of the specific changes requested by the EPA was to utilize the acronym “EIA” instead of “ESIA” for this assessment to align with the Ghana Environmental Assessment Regulations, 1999 LI 1652. Whilst the acronym EIA is now utilised throughout this report, the content of the report nevertheless still fulfils the requirements of what the international standards (such as IFC, Equator Principles etc) would refer to as an ESIA.

appropriate due to safety considerations, the approach will be redefined and the public will be informed of the new approach.

### 1.2.1 Resettlement Framework

Besides the EIA Report, a **Resettlement Framework** has also been prepared for this Project in accordance with international standards and Ghanaian regulations - in particular with the Resettlement Policy Framework for Road Sector Operations<sup>2</sup> issued by GHA. The Resettlement Framework describes how this businesses and families will be addressed who are affected by the Project construction – either permanently or temporarily.

The Resettlement Framework is a requirement for the environmental license of the Project and will be publicly available together with the EIA Report.

More information on the Resettlement Framework is provided in Section 6.3.2 of this document.

### 1.3 Where to get more information?

For any further comments or questions regarding the EIA Report or the Project in general, please contact **GHA or INZAG** at the contact details provided below:

Ghana Highway Authority	INZAG GHANA GMBH	INZAG GERMANY GMBH
Kinbu Rd, Ministries, Accra, Ghana T +233 030 266 6591	Mezzanine Floor One Airport Square, Plot 21, Airport City, Accra I Ghana T. +233 302 797 847/48 e. <a href="mailto:ghana@inzag.de">ghana@inzag.de</a>	Taunusstrasse 5 65183 Wiesbaden Germany T. +49 611 950014 86 e. <a href="mailto:info@inzag.de">info@inzag.de</a>

<sup>2</sup> Ministry of Roads and Highways, 2017.

## 2. INTRODUCTION

### 2.1 What is the Project?

The Ghana Ministry of Roads and Highways (MRH), through the GHA, is implementing a strategy to upgrade the existing 2-lane Eastern Corridor Road (ECR) to improve connections within the country and increase the transit and trade between Ghana and neighboring land-locked countries. The ECR is classified as a National Route (N2) and starts from the Tema Roundabout in the Greater Accra Region and ends at Kulungugu, at the border with Burkina Faso (approximately 773 Km). The ECR is important infrastructure, especially with regard to movement of freight within Ghana and to neighbouring Burkina Faso, Niger and Mali. The road also plays an important role in the north-south trade corridor by providing shorter access to the Port of Tema and by improving mobility between the Volta, Northern and Upper East Regions of Ghana and between Ghana and neighbouring countries.

The overall ECR was divided for construction purposes into seven (7) Lots. The promoter and initiator of the ECR rehabilitation works is the GHA who tendered the construction services under Engineering, Procurement and Construction (EPC) Contract models. The Contract for Lot 1 (a stretch of 64 km) was awarded to INZAG Germany GmbH (INZAG) as EPC Contractor in September 2020.

Note: The EIA Report (and this NTS) focus solely on the Lot 1 portion of the ECR – called the “Project”. The other six Lots of the ECR are being constructed by other firms and have their own separate EIA studies and permits from the EPA.

The upgrade of the ECR mainly involves improvement/renewal of the existing road-surface to make the whole route sturdier and safer for the increased car and truck traffic. At certain heavily-travelled locations in Lot 1 the roadway will be widened from the existing 1-lane (each direction) to 2-lanes or 3-lanes, and new roundabouts, junctions and interchanges will be constructed to provide safe traffic flow.

GHA will be responsible to supervise the construction works, monitor and check the construction progress. Upon completion of the construction period, GHA will continue to be responsible for the operation and maintenance of the roadway.

The ECR Lot 1 is presented in Figure 2-1 below.

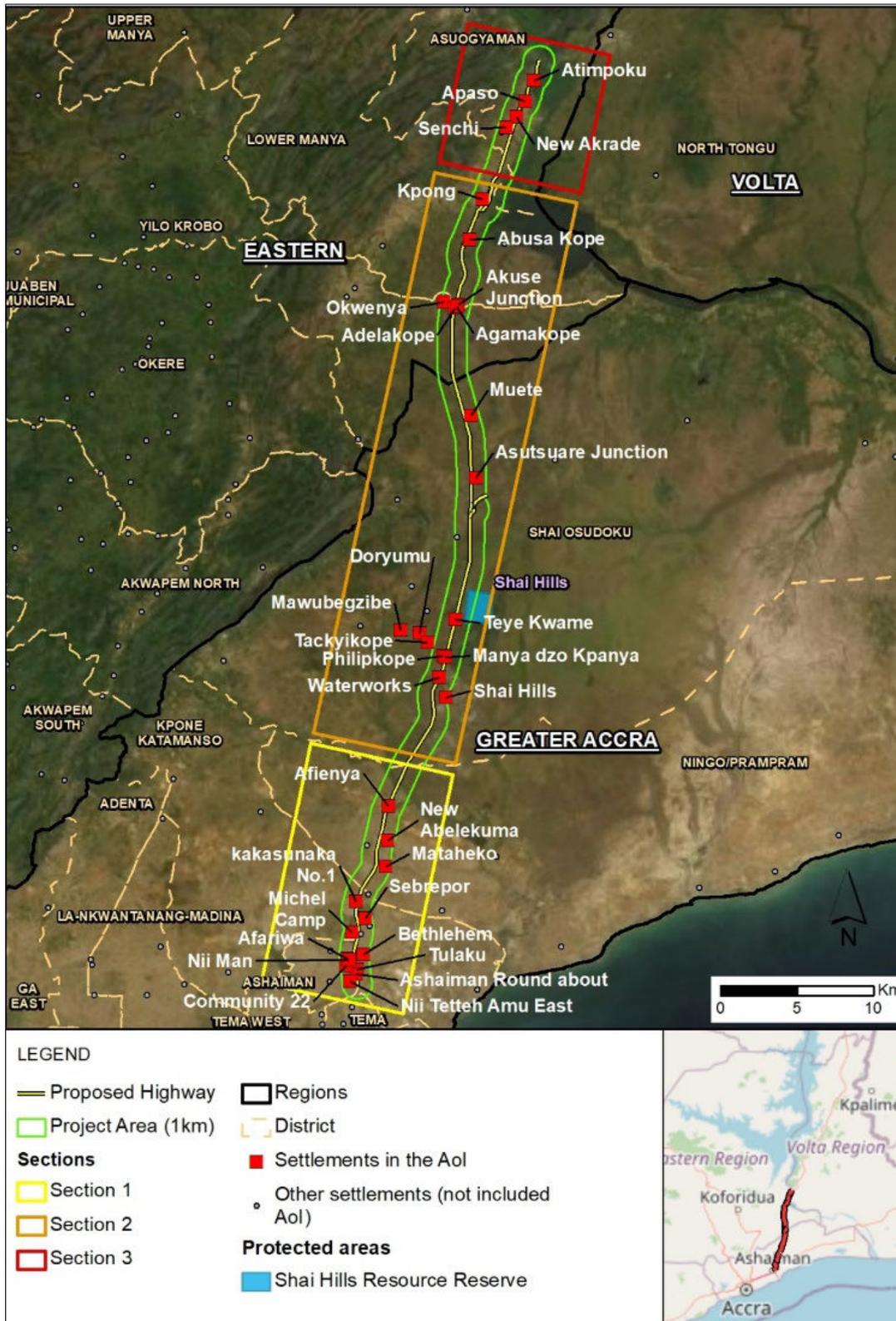


Figure 2-1 Project Area

## 2.2 Why is the Project needed?

The Tema Container Port at Tema Harbour is currently being expanded by the Ghana Ports and Harbours Authority (GPHA) together with private firms to expand and modernize the port for approximately USD 1.5 billion. Capacity of the new port facilities will increase roughly three-fold, making Tema one of Africa's largest container ports and among the top 50 globally. Without the appropriate road infrastructure – including the upgrade of the ECR/ N2 - smooth logistics operations will not be feasible, which would lead to considerable traffic disruption around the port.

For this reason, the current single-lane route (2x1) of the N2 in Lot 1 will be extended to a 2x2 Lanes + Local Lane from Pk 0+000 to Pk 6+300 and to a three-lane road (2x3) from Pk 6+300 to Pk 13+400. This will be followed by a two-lane expansion (2x2) of approx. 40 km and finally 9 km of single-lane (2x1) rehabilitation. The one exception where the ECR Lot 1 development will deviate from the existing N2 route is at the Kpong bypass, where the new road (as 2x1 lane) will be routed around the central residential area for a length of about 2km to avoid disturbance to this area.

The general implementation of the Project will have many positive effects in Ghana. During the construction period, materials such as aggregates, cement, chemicals, etc. and various machinery/equipment will be sourced from local suppliers. Also, the Project will create job opportunities for local skilled and unskilled workers.

A further benefit will be improved road safety. Ghana's roads are generally quite unsafe (2018: more than 1,600 road deaths with approx. 1.2 million registered vehicles). The N2 is a single lane road which is often overloaded, leading to serious accidents and often involving personal injury (*Ghana Motor Traffic and Transport Department, 2019*). Lot 1 will be upgraded to European safety standards. For example, clearly visible road markings and reflective edge markings – plus overhead lighting at key locations - will contribute to increased road safety in the dark, and thus to the prevention of serious accidents.

Examples of the existing conditions of the road stretches from Ashaiman Roundabout in Tema to Akosombo Junction are shown in the Figures below (all sources: *Google Earth retrieved August 2020*).



Figure 2-2 Images from the existing road

## 2.3 Who is the Project Owner?

The Ghana Ministry of Roads and Highways (MRH), through Ghana Highways Authority (GHA), is the Project Owner responsible to supervise the construction works, monitor and check the construction progress. Upon completion of the construction works, GHA will be responsible for the routine operation and maintenance of the roadway, just as they are now for the N2 and all other state roads in Ghana.

## 2.4 Why is this EIA needed?

The EIA Report describes the Project and the predicted potential impacts on environmental and social conditions in both construction and operation phases; it explains how the Project has been designed and how it will be implemented by GHA/INZAG in a way to minimise potentially adverse impacts and to maximise its benefits.

The EIA study is an obligatory step in the permitting process by the Ghana EPA. Also, the Project will be partly financed by international banks (via loans to the Ghana Ministry of Finance), and these banks require a comprehensive EIA study to be completed before they give loan approval.

The Final EIA Report will include a number of clearly defined actions that GHA/INZAG must undertake in the future to prevent negative impacts of the Project, and these commitments will be compiled in the Environmental and Social Management Plan (ESMP). These commitments of GHA/INZAG in the ESMP will be integrated into the loan agreement between the banks and Ghana Ministry of Finance.

## 2.5 What are the next steps after EIA?

During Project implementation in the coming years, INZAG and GHA will provide reports to EPA and the banks to show how progress with the EIA/ESMP is being made, and banks will also conduct their own periodic monitoring of the Project to confirm the conformance of INZAG and GHA. These follow-up actions and monitoring will take place during construction and extend as well into the operations phase. This will mean that if the E&S requirements are not implemented in a proper manner as specified in the EIA/ESMP, then the banks might discontinue the loan process. In addition, the Project construction and operations are of course subject to review and inspection by the Ghana EPA and other Ghanaian regulatory authorities.

### 3. WHAT ARE THE PROJECT MAIN FEATURES AND DEVELOPMENT PHASING?

#### 3.1 How will the Project be designed?

The alignment of the expanded roadway will be (with one exception explained below) within the 90 m Right of Way (RoW) of the existing N2 route and the design will be in line with both Ghanaian and international standards, including the IFC/World Bank EHS Guidelines for Toll Roads.

The one exception where the ECR Lot 1 development will deviate from the existing N2 route is at the Kpong bypass, where the new road (as 2x1 lane) will be routed around the central residential area for a length of about 2 km to avoid disturbance to this area.

The road widening will require the construction of new elements to ensure safety and access for vehicles and the local community. An overview of these key road elements is given below.

**Table 3-1 Lot 1 Main Civil Engineering Tasks**

Task	Details
Length of New Road	64 Km
Cross Sections <sup>3</sup>	Stretch 1 - 2x2 Lanes + Local Lane: Project kilometer (PK) 0+760 to 6+320; Stretch 2 - 2x3 Lanes: PK 6+320 to PK 13+430 Stretch 3 - 2x2 Lanes: PK 13+430 to PK 53+700 Stretch 4 - 2x1 Lanes: PK 53+700 to 64+700,
Roundabouts	2 (Ashaiman Roundabout and Kpong Roundabout)
Interchange	1 (Asutsuare Interchange)
Junctions	6 (at grade type)
Road Bridges	3 (next to existing bridges)
Fly-Over	1
Overpasses/Pedestrian Crossing Bridges	11 Steel structures with stairs and ramps designed in three different types according to the width of the road.
Toll Booth	1 Area x 4 Booths at PK: 11+400 (existing toll booth)
Lighting	Applicable for urban and densely populated areas
Underpasses	Not Applicable
Service Stations/Rest Areas	Not Applicable

The Pedestrian Crossing Bridges will enable people to safely cross over the road to the other side. There are no underpasses foreseen to cross beneath the road because these have several disadvantages, e.g. often flooded during rainy season, subject to trashing and vandalism, and viewed as unsafe to use during night-time, especially by girls and women.

There are over 40 existing petrol stations/repair shops along the N2 in Lot 1. As far as possible, these can remain in place and will be integrated within the Project design.

The GHA already owns title to all the land within the 90 m Right of Way (RoW) within which the ECR will be developed. The land was acquired in the 1990s and since then significant encroachment has

<sup>3</sup>The Design and Build Contract signed between GHA and INZAG on 18th September 2020 included a minor revision in the Project description: two small sections of one-kilometer each were removed from the scope of the Project (PK 14+925 to PK 15+925 and PK 61+225 to PK 62+225). At these two locations the new Tema – Mpakadan Railway Project crosses the alignment of the ECR Lot 1. As the railway is being built now, the EPC Contractor for the railway (Afcons Infrastructure Limited of India) will also construct the short new roadway segments at these intersections.

occurred<sup>4</sup> (meaning that some permanent or temporary structures/shops have been built within this RoW).

Fortunately, the future road widths will vary from 14 m (for 2x1 lane) to 45 m (for 2x3 lane), so that almost all of the new construction can occur within the 90 m RoW. To avoid, minimize and reduce environmental and social impacts, the Project designers will adjust the road alignment within the 90 m RoW to minimize impacts to existing structures and any sensitive ecology to the greatest extent practicable. Land use and access restrictions will vary within the RoW and are summarized in Table 3-2 and Figure 3-1 below.

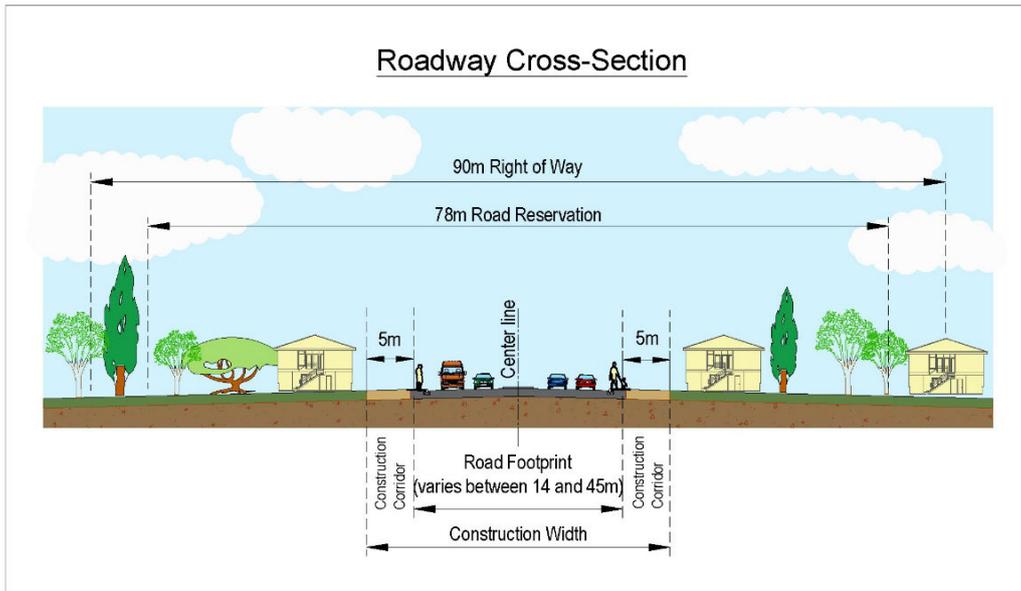


Figure 3-1 Corridors within the 90 m RoW

Table 3-2 Summary of Restrictions to Physical Structures along the RoW during Construction and Operation

Component	Construction Restrictions	Operation Restrictions
<b>90 m Right of Way – subdivided into three main Corridors</b>		
<b>Road Footprint</b>		
between 14 – 45 m, depending on number of lanes	<ul style="list-style-type: none"> <li>■ Permanent removal of all houses and structures.</li> <li>■ Land clearance and removal of all trees, crops and vegetation. No new trees or crops.</li> <li>■ No pedestrian access during construction and operation.</li> </ul>	<ul style="list-style-type: none"> <li>■ No houses/structures, crops and trees permitted.</li> </ul>
<b>Construction Corridor</b>		
5 m on either side of the Road Footprint	<ul style="list-style-type: none"> <li>■ Removal of all houses and structures.</li> <li>■ Land clearance and removal of all trees, crops and vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>■ No construction of new permanent houses or structures.</li> <li>■ No new crops and permanent plantations.</li> </ul>

<sup>4</sup> Regardless of formality of land title, the Project recognizes all affected people in line with the applicable Ghanaian Resettlement Policy Framework for Road Sector Operations as well as the requirements of IFC PS5.

Component	Construction Restrictions	Operation Restrictions
	<ul style="list-style-type: none"> <li>■ No entry for pedestrians in areas under construction.</li> <li>■ No business activities.</li> </ul>	<ul style="list-style-type: none"> <li>■ No permanent facilities.</li> <li>■ Permits for temporary activities may be obtained (e.g. commercial activities, street vendors).</li> <li>■ Trees and vegetation will be reinstated to original state</li> </ul>
<b>Remaining area up to the 90 m RoW</b>		
Between 17,5 m – 33 m either side of the boundaries of the Construction Corridor - depending on number of lanes	<ul style="list-style-type: none"> <li>■ Houses and structures allowed as long as safety can be guaranteed.</li> </ul>	<ul style="list-style-type: none"> <li>■ Houses and structures allowed as long as safety can be guaranteed.</li> </ul>

At the time of this EIA Report and Resettlement Framework, the final design plans for the ECR were not finalized yet and no detailed land requirements were yet defined.

### 3.2 Relevant Standards for the Project

All Project activities and the EIA study have been aligned with a defined reference framework of national and international standards, listed below.

- Ghana’s laws, regulations, and permits (including regional/local directives) that pertain to environmental and social issues (including expropriation/compensation);
- Equator Principles – version IV (effective 2020)<sup>5</sup>;
- OECD Common Approaches;
- International Finance Corporation (IFC) Performance Standards (PSs) (2012);
- World Bank Group/IFC Guidelines:
  - Environmental, Health, and Safety General Guidelines (2007);
  - Environmental, Health and Safety Guidelines for Toll Roads (2007).

The IFC PSs form the “backbone” of the international portion of the above-listed Relevant Standards that apply to the EIA.

### 3.3 Construction Works

INZAG’s strategy for construction includes the use of as much material as possible from the local sources (quarries, borrow pits), in order to minimize transport trips as well as disturbance to communities.

A typical construction methodology will be applied with activities such as:

- Site clearing from vegetation;
- Topsoil stripping and filling;
- Excavation;
- Application of granular layers;
- Application of pavement layers;

<sup>5</sup> The Equator Principles are voluntary international standards that many banks are following – these are mainly based on the IFC Performance Standards, while the new Version IV has additional requirements for certain topics.

- Construction of drainages.

### 3.4 How long will the construction take and will it stop existing traffic flow?

Construction is expected to begin by the second half of 2021. The construction period is planned for 30 months, based on 8-hours daily shift, from Monday to Friday, plus 4 working hours on Saturdays.

While planning for construction, the following aspects were considered:

- As the existing road is already being actively used by vehicles and pedestrians, INZAG will schedule and implement the construction programme in such a way to enable continuous vehicle and pedestrian traffic flow at all times;
- INZAG will optimize the resources existing at the construction works, creating work-fronts which enable reduced downtime and minimize possible duration of noisy and dusty activities at each location.

Note that “active construction works” at most locations will only take place over the course of a few weeks. However, temporary secondary roads and/or detours will be in place for longer periods, until the road sections are taken officially under operation by GHA.

### 3.5 Will there be any job opportunities in the Project?

INZAG plans to foresee a total of 967 workers during the construction peak, 95% of which will be local workers. The graph presented in Figure 3-2 indicates the estimated workforce for each respective month during the total construction period.



Figure 3-2 Workforce Planner

## 4. HOW WERE THE EIA STUDIES CONDUCTED?

The international company Environmental Resources Management (ERM) was engaged as an independent consultant to conduct the EIA for the Project. The team of ERM experts collaborated closely with PSS Urbania, a local independent E&S consultant from Accra, who supported the various field studies as well as the impact assessment conducted.

The EIA study works were conducted in accordance with obligatory stages required by the Ghana EPA and as is customary in international practice.

This included the following key steps:

- Submission to the EPA of the **Environmental Assessment (EA) Application for the Project**.
- Conducting **Scoping Study** to determine which topics will be most important for the assessment; this involved also visits to the Project area and initial discussions with stakeholders.
- Collecting **additional baseline data** by experts on the current ecological situation e.g: sampling of water quality in streams, air and noise measurements, evaluation of plants, and animals. An important topic was **also cultural heritage/archaeology specialist** worked closely with the authorities and stakeholders to determine areas of historical importance that need protection.
- Also social experts conducted **48 stakeholder meetings in total** during Scoping and Baseline Studies with national and local government representatives, and community members and representatives.
- Thorough assessment was made of potential impacts of the Project on the ecological and social baseline conditions. For impacts that might be significant, appropriate mitigation measures/solutions were recommended to avoid or minimize the impacts.

The final result of the impact assessment is the set of commitments that INZAG and GHA have made to mitigate potential impacts so that the remaining effects to humans and the environment are acceptable and in line with Ghanaian regulations and international standards. These commitments are then compiled in the ESMP, along with a description of how INZAG and GHA will ensure successful implementation.

## 5. HOW WAS THE STAKEHOLDER ENGAGEMENT CONDUCTED?

The term “stakeholders” refers to local residents, public institutions, private organisations and other persons who may be affected by the Project or are otherwise interested in the Project. Stakeholder engagement is all about how GHA as Project Owner and INZAG as EPC Contractor provide information to the stakeholders – and asks them about their views of the Project, including any comments, suggestions, questions or complaints. This two-way process of stakeholder engagement is a very important part of the overall Project, beginning prior to start of construction and continuing through the operations.

### 5.1 Scoping Consultation Activities

A total of 22 scoping consultation meetings were organized during January 2020, 14 with government officials and 8 with local communities. In total, approximately 700 persons attended those meetings.

During the initial scoping stage most of the identified stakeholders were engaged, at the exception of some utility companies (namely GRIDCO, the Chamber of Telecommunications (Telcos) and Electricity Company of Ghana), Kpone Katamanso Municipality and Local Community Representatives. Those stakeholders have been engaged with during the subsequent EIA consultation activities.

The meetings began with a project introduction and purpose of the meeting, followed by discussions and feedback collection. All meeting were attended and lead by a representative of INZAG, together with a team of experts from ERM and PSS Urbania. Attendees were able to raise any concerns related to the Project's potential impacts. Photos from the various meetings held are shown below.



**Figure 5-1 Photos from the scoping meeting with local authorities**



**Figure 5-2 Photos from the scoping meeting with Ministry of Defence**



**Figure 5-3 Photos from the meeting with local communities**

## 5.2 Baseline Surveys and Project Disclosure

In addition to the engagements performed during scoping phase, extensive stakeholder engagement was undertaken as part of the Project disclosure and social baseline data collection for the EIA.

Engagement as part of the EIA process was conducted between July 20<sup>th</sup> and August 7<sup>th</sup> 2020 and was led by a team of specialists from PSS Urbania. A representative from INZAG participated in some of the activities, namely meetings with national authorities and Community Representative Forums. The engagement was organized under COVID-19 restrictions and resulted in reduced face to face interaction and impossibility of organizing large public meetings.

The purpose of the field survey was:

- To collect specific socioeconomic, health, and human rights data at the local level to the extent available and at the District level; and
- To re-engage with key stakeholders and local community representatives to provide updates on the Project and collect feedback.

A total of 305 feedbacks, issues and concerns were collected during the EIA Baseline Survey engagements, of which 190 were formulated by national level stakeholders, 75 by District Authorities and 240 by community representatives. Some of the main issues flagged were:

- Environmental considerations on climate change and tree planting;
- Concerns related to labour influx, road safety and traffic management throughout construction;
- Timing concerns related to payments for land and structures;

- Livelihood restoration;
- Protection of the Shai Hills Resource Reserve;
- Effects caused to businesses and street traders.

### 5.3 On-going Engagement during Construction

The GHA, with the support of INZAG, will be continuing engagements with stakeholders on a regular and ad hoc basis. Meetings between the Traditional Authorities and GHA/INZAG regarding access to land for the Project's development are planned. In the same way, GHA/INZAG will continue to meet with interest groups in affected communities through community meetings engaging 32 settlements of the Aol.

The term Area of Influence (Aol) term is used to describe the boundaries to which Project impacts may be felt. The Aol includes all areas within where significant environmental and social impact may occur.

These interactions, together with the outcomes of Scoping and baseline data activities, are influencing the design of the Project on a day-to-day basis.

Throughout the construction phase, GHA (supported by INZAG) will continue to engage with individuals and communities affected by land easement and acquisition as part of the implementation of its Resettlement Action Plan. This includes monitoring the execution of land entry and exit protocols by INZAG parties and subcontractors, overseeing any necessary additional land take undertaken by subcontractors, and follow-up monitoring with residents to document the effectiveness of livelihoods restoration. GHA, with the support of INZAG, will undertake stakeholder engagement activities. Its goal is to ensure that those people whose land, properties and business are temporarily or permanently acquired are able to restore their livelihoods to pre-project levels or improve where possible.

### 5.4 Grievance Mechanism

The Community Grievance Mechanism is in place that will enable any stakeholder to make a complaint or a suggestion about the way the Project is being implemented. Grievances may take the form of specific complaints for damages/injury, concerns about routine Project activities, or perceived incidents or impacts.

The grievance mechanism will provide a formal and on-going avenue for stakeholders to engage with INZAG and GHA, whilst the monitoring of grievances provides signals of any escalating conflicts or disputes.

Grievances may be reported through a series of reporting channels for GHA and INZAG's consideration. Grievances or complaints shall be received through different channels including INZAG's Community Representatives, other INZAG's or Contractor Project workers in the course of their duties as well as through the District / Local Assembly representatives. Other designated access points will include a dedicated phone number, email and post address.

## 6. WHAT ARE THE EIA FINDINGS?

Generally, the Project's alignment tries to avoid residential areas, sensitive ecological areas, historical monuments and other protected areas as far as possible. Throughout the EIA process and in preparation of the final design, INZAG is working on further fine-tuning and continuously liaising with GHA on the final road alignment to minimize potential impacts.

A list of the most relevant impacts identified and proposed mitigation measures is provided in Section 7. The sections below provide some additional information on the most relevant topics assessed.

### 6.1 Potential Impacts on the Physical Environment

#### 6.1.1 Resources and Waste

During construction it is estimated that the amount of excavation material will range between 0.6 million m<sup>3</sup> to 1.2 million m<sup>3</sup> and most of this material may be useful for construction/filling of other parts of the Project. The aim will be to achieve a balance of cut and fill material as far as possible; the INZAG design considers a target of **"Zero" net surplus material** to optimize transport logistics and avoid the need for offsite material disposal. Other typical construction wastes will be stored temporarily onsite in appropriate containers and then transferred to and disposed of (or treated) via licensed waste transporters to licensed facilities, ideally located in the vicinity of the Project. The waste facilities used during construction will be selected by INZAG and approved by the GHA and EPA.

#### 6.1.2 Surface and Groundwater

There are six small watercourses that cross the alignment of the ECR Lot 1 roadway; water quality testing was done at each location. In addition, the large Volta River lies adjacent to the east of the Project area. Figure 6-1 presents the survey points for the water crossings. It is noted that the area has no perennial rivers with the exception of the Volta River.

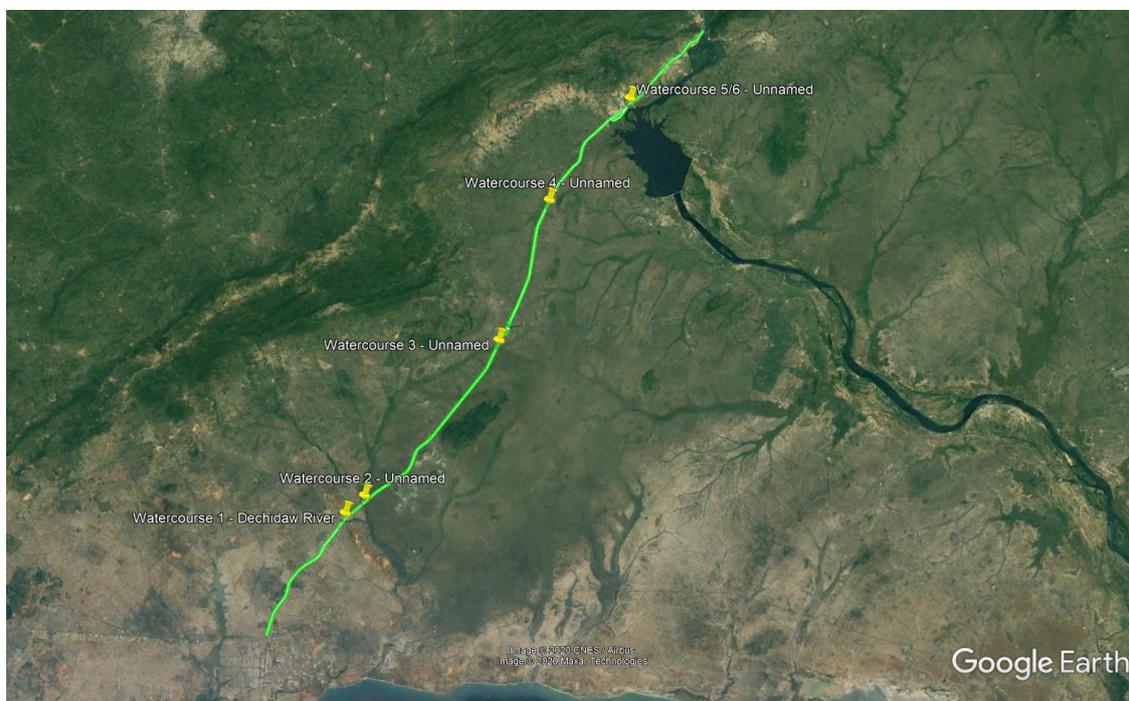


Figure 6-1 Location of Water Crossings

As outlined in above there are a number of impacts which may arise during the construction phase of the Project which can affect surface and groundwater resources, such as damage to freshwater ecosystems through a change in water quality as a result of runoff from the construction site into surface water courses. Furthermore, temporary dewatering can also have impacts on groundwater resources, and in this case, any drainage should be directed to nearby surface water, where possible. To avoid this, a series of measures (listed in section 7.1 of this document and in more detail in the EIA) are proposed to protect surface and groundwater resources.

No impacts are expected during the operational phase of the Project.

### 6.1.3 Geology, Soils and Contaminated Land

INZAG plans to keep the approximately 40 existing fuel stations within the RoW alignment and integrate them into the Project design as far as possible to avoid the need for relocation/removal of the fuel stations. However, a few of these stations may need to be relocated to make room for Project construction. Depending on the age of the station and the condition of the underground pipes and tanks, as well as other site-specific factors, there is a reasonable chance of encountering some moderate soil contamination during removal of any stations. Any impacts on surface water quality and quantity are considered to be temporary during construction/operation. Any possible spillage will be mitigated via common good practices and procedures set by INZAG.

## 6.2 Potential Key Ecological Impacts

The following key biodiversity areas<sup>6</sup> are found within 5 km of the Lot1 road :

- Shai Hills Resource Reserve (within 1 km); and,
- Sakumo Lagoon Ramsar Site and vicinity (just over 5 km).

The Sakumo Lagoon is a sensitive ecological area, but it is located more than 5 km away from the start of the Lot 1 at Ashaiman Roundabout and it will not be affected at all by the Project activities.

The N2 runs directly next to the Shai Hills Resource Reserve (SHRR) and GHA/INZAG are giving special attention to this area and designed the Project in such a way that the road extension is to the west away from the SHRR and thus does not encroach upon the reserve.

The major habitat types encountered along the road corridor are listed below:

- Agricultural lands: Farms and ornamentals;
- Coastal grassland;
- Thicket and Woodland; and,
- Riverine forest.

These habitats have been modified by mainly anthropogenic factors such as settlement, cultivation, and cattle grazing. Furthermore, numerous species of plants and animals were characterized in the study, some of which are rare or endangered and require special protection. Especially, during the field assessment in 2020, significant populations of baboons (*Papio anubis*) were recorded throughout the Shai Hills Resource Reserve. Through engagement with local population representatives it was possible to understand that baboons are present in large numbers, posing several risks to the local biodiversity as well as community health and safety and traffic safety.

Among the measures already planned by INZAG and GHA to minimize such risks, we can mention:

- INZAG's commitment to have one of the campsites originally planned at Cherekecherete Hill (CH03) to be moved to a new location that will be to the west of the existing road, and therefore

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<sup>6</sup> Key Biodiversity Areas (KBA) are 'sites contributing significantly to the global persistence of biodiversity', in terrestrial, freshwater and marine ecosystems. Sites qualify as global KBAs if they meet one or more of 11 criteria, clustered into five categories: threatened biodiversity; geographically restricted biodiversity; ecological integrity; biological processes; and, irreplaceability.

will not impact on either Cherekecherete Hill, Krobo Hill or Shai Hills. The new location is yet to be determined, but will be subject to assessment per the Project design-change protocols

- Speed of vehicles will be limited to minimise emission of dust in non-paved access roads and to lower the risk of accidents with fauna.
- Use of signs and/or fences in access roads and construction sites, to avoid any affection to areas out of the Project footprint. Protective measures will be implemented especially on the locations of active construction works. Use of fences in the construction sites will also avoid the entrance of fauna in them, avoiding accidents.

## 6.3 Potential Impacts on Social Resources and Receptors

### 6.3.1 Economy and Employment

The Project is intended to result in increased circulation throughout Ghana which is expected to have positive effects on the national economy. Beyond this, the Project is expected to generate positive impacts on local economic and employment conditions at the regional level throughout its life cycle. Primary impacts are expected to take place during the construction phase through the creation of **temporary employment opportunities** and the creation of **long-term benefits** associated with capacity enhancement of local labor through on-the-job training. Those who are able to secure employment on the Project during construction will likely have the opportunity to improve their skills, gain experience and thereby improve their opportunities for future employment within the construction and other sectors. Impacts to individuals and businesses is anticipated to result in long-term **positive** impacts at the local, regional, and national level.

### 6.3.2 Land and Livelihoods

Based on a review of Google Earth imagery, a total of **3,307 structures** have been identified within the 90 m RoW of Lot 1. These include a mix of commercial, residential and non-residential structures, of which:

- **27%** are residential structures;
- **28%** are commercial structures,
- **43%** are commercial/mixed structures; and
- about **1%** are other/industrial structures.

As explained above, many of the structures within the RoW can remain in place – except for those located directly within the construction width. The estimated breakdown is shown in the table below.

**Table 6-1 Estimated Infrastructures Breakdown**

Type of structure	% WITHIN the Construction Width	% OUTSIDE the Construction Width
Residential	2%	98%
Commercial	70%	30%
Commercial/Mixed	25%	75%

This shows that nearly all of the residential structures within the RoW (98%) can remain as they are, whilst most of the commercial structures (70%) will need to be removed. **Of the other structures characterized as mixed commercial use, most can remain in place (75%).**

Other potential impacts on lands and livelihoods have been grouped as follows.

### *6.3.2.1 Impacts on Physical Resources and Related Livelihoods*

#### *Loss of residential structures*

An estimated 372 structures have been identified and classified as either residential or residential mixed within the Road Footprint and Construction Corridor. Households residing in these structures will be physically displaced.

#### *Loss of Business Infrastructure*

The loss of local market areas during construction was raised as a major concern at stakeholder engagement activities specifically in the most urbanized areas. The loss of local market areas will affect those that use these areas for trading, and also as a space for social interaction.

### *6.3.2.2 Impact on Natural Resources and Related Livelihoods*

#### *Loss of agricultural and grazing land*

Within the 90 m RoW, around 62.5 ha of agricultural land will be affected (e.g. land for crop cultivation, fruit tree plantations, etc.). Of this affected agricultural land, around 25% (15.7 ha) is identified within the Footprint of the Road and the Construction Corridor. Assuming an average land parcel size of 0.5 ha, potentially around 31 plots may be affected. This affected agricultural land, crops and trees will be entirely cleared for the construction of the Project. Land owners and users will be affected facing the loss of livelihood source through permanent land take leading to economic displacement.

#### *Loss of access to ecosystem services*

Communities depend on a number of natural resources for their livelihoods. Forest and bush land is used for collection of timber for construction, fuel wood, medicinal plants and reeds in the area inside and outside of the RoW. Around 139 ha in the RoW have been classified as mixed vegetation, with 29% (40 ha) located within the Construction Width. This includes areas with seasonal vegetation, dense vegetation, forests, and riparian vegetation. Pastures are used as open grazing areas for livestock and open water for fishing activities, irrigation and household consumption.

### *Permanent Loss of Livelihoods and Household Income Due to Permanent Land Restrictions during Operations*

The following restrictions will apply during operations in the 5 m corridor either side of the highway to ensure access for its maintenance.

- Crop trees: planting of trees is not allowed inside the 5 m corridor either side of the road footprint. It should be noted that this is a very small area and more land is available nearby.
- Seasonal crops: crop cultivation is not allowed inside this corridor
- Permanent Structures: No structures will be allowed.

These restrictions will result in reduced areas available for cultivation and other livelihoods in particular commercial activities.

As a first step in the process for managing displacement impacts, INZAG has commissioned the development of a Resettlement Framework which will be supplemented by a Project Resettlement Action Plan (RAP) or multiple smaller RAPs. The Resettlement Framework outlines the commitment of GHA/INZAG to mitigate adverse socio-economic impacts from land acquisition or restrictions on affected persons' use of or access to land. The Resettlement Framework provides the foundation for the resettlement process including an entitlement matrix that will ensure adequate compensation, resettlement and livelihood restoration options are provided to people affected by the project.

### 6.3.3 Community Health Safety and Security

The Project activities could affect the health and safety and security of the communities along the route alignment as a result of worker- community interactions, the risk of injury associated with construction activities, increased road accidents and road trespassing, and competition for access to health care resources.

The construction phase of the Project may impact on road safety as it involves a large number of vehicles travelling on the unpaved road networks used on the Project site before the completion of the work. Also, there will be open work fronts and roadblocks, which will result in additional crossing difficulties and associated safety danger.

Road safety was one of the main concerns raised by stakeholders, and local community representatives in particular, during the numerous stakeholder meetings. The issue of road safety plays a major role for the Project; safety considerations have been incorporated into the design stage (crossing points, utility provisions, dust and noise mitigation etc.) for construction and operations.

### 6.3.4 Access to Infrastructure and Services

Construction activities of the ECR Lot 1 will induce impacts on utilities and infrastructure, mainly due to site clearance works, excavation and movement of soil, embankment construction, and construction of the various elements of the road. This is likely to generate pressure on existing local utility supplies (which already have temporary disruption), disturbance to traffic and transportation due to road crossings, and short-term planned and unplanned disruption to electricity, telecommunication, and water supply for irrigation, domestic, drinking and industrial purposes. However, local communities will benefit from infrastructure improvements made during construction as part of the Public Utilities Enhancement Plan, resulting in improved access to electricity, telecommunication and water.

### 6.3.5 Community Cohesion

Impacts to community cohesion are of particular importance to infrastructure projects which can often raise tensions within communities (intra-community tension) and between communities (inter-community tension). Common impacts include:

During construction:

- Disturbance from the presence of workforce;
- Community Severance; and
- Unmet expectations of benefits.

During operations:

- Business Infrastructure
- Loss of (access to) communal resources as well as infrastructure and social services
- Loss of community cohesion – severance issue

The minimization of severance impacts is one of the priority topics that will be addressed by appropriate design of the Project (e.g. numerous crossings). In any case, all existing roads that will be crossed by the road will be maintained through pedestrian crossing bridges or other appropriate design solutions to ensure the free passage. The final Project design will include safe road crossing options for pedestrians, bicycles, vehicles, animals, etc. to enhance access to communal resources, land and infrastructure where required. Bus stops are to be installed in relevant locations (e.g. schools, etc.).

The installation of additional road crossing options (underpasses or overpasses) will be considered by the Project designers if requested by the local citizens and subject to feasibility and GHA approval.

### 6.3.6 Cultural Heritage

Cultural Heritage sites were identified within the study area from south to north:

- Turaka Central Mosque (CH01),
- Youth Leadership Institute (CH02),
- Cherekecherete Hill site (CH03),
- Shai Hills Resource Reserve (CH04),
- Krobo Hill site (CH05),
- Former Hotel, Kpong (CH06).
- Bronze statue of Nana Kofi Asomani (CH07).
- Adomi Bridge Spiritual Foundation Stone (CH08).
- Possible Cemetery, Akosombo - Tema Rd, Atimpoku (CH09).

The EIA process considers both tangible/physical as well as intangible/non-physical items. Current religious practices are important intangible heritage. Small streams and rivers that cross the road may be considered deities and will require rituals to be performed by the traditional authorities before road or bridges could pass on them. Also, based on discussions with stakeholders and local populations it was noted that some communities celebrate various festivals and it would be considered offensive to work on such days. For this reason, a number of measures have been envisaged to help minimize the impacts to as low as possible, e.g.

- A Cultural Heritage Management Plan will be developed for the project to ensure all heritage issues are addressed and managed adequately.
- Liaison with the Ghana Museums & Monuments Board (GMMB) to agree a strategy for archaeological mitigation;
- Pre-construction archaeological investigations (agreed with the GMMB), to identify, investigate and scientifically remove any archaeological deposits encountered by the development;
- A Chance Finds Procedure will be designed and implemented to manage any unexpected discovery of archaeological material in-line with national and international requirements and guidelines.
- Archaeological monitoring at the location of the possible historic cemetery in Atimpoku and other areas;
- Access arrangements will be made to the satisfaction of the local communities through a Memorandum of Understanding which will allow them to use the pilgrimages unrestricted. This memorandum should be in place before construction begins.

## 7. MITIGATION MEASURES

Table 7-1 and Table 7-2 provide a summary of the key Project impacts for the construction and operation phase identified in the EIA report, along with corresponding actions (the mitigation measures) that INZAG and GHA will need to undertake to avoid or minimise the impacts. The impacts are ranked by severity, starting with Negligible, Minor Moderate and Major - and positive impacts are simply called Positive; each ranking level has its own colour-code in the table. The impacts are shown for each EIA topic (e.g. Resources and Waste Impact) and separately for the Construction Phase and the Operation Phase of the Project.

The tables first describes each relevant impact, and then show the ranking of the potential severity of the impact – before any mitigation/protection measures are considered. Then the recommended mitigation measures are described, followed by a second ranking assuming that these mitigation measures have been implemented. As shown in the tables, the severity of nearly all impacts can be reduced substantially by applying the mitigation measures; only a few impacts remain Major.

Note: There are many impacts identified in the EIA report that were found to be Negligible or Minor without further mitigation, and these are not shown in the tables; **these tables show only those items initially ranked Moderate, Major, or Positive.**

**Table 7-1 Major Potential Impacts during Construction**

ID#	Impact	Impact Assessment (Pre-Mitigation)	Key Mitigation Measures	Impact Assessment (Post-mitigation)
<b>AQ</b>				
<b>Air Quality</b>				
AQ1	Disturbance due to dust	Major	Develop and implement a Dust Management Plan (DMP) including monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and visual inspections. The DMP should also include 'action levels' for triggering further dust mitigation when exceeded. Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in a log book	Minor
AQ2	Disturbance due to vehicle emissions	Major	Ensure vehicles are all suitably maintained.	Minor
<b>GS</b>				
<b>Geology, Soils and Contaminated Land</b>				
GS1	Impacts related to soil instability risk	Moderate	During the construction phase, appropriate techniques will be implemented that will incorporate risk assessment before excavation and slope stability requirements to make sure that occupational and community safety risks are avoided.	Negligible
GS2	Impacts related to contamination due to runoff	Major	Implementation of Smart Design Solutions and consider to realign the design to include the existing fuel stations in RoW alignment to minimize relocation and relevant spillage risks during relocation process. Additionally, land contamination notification procedure will be implemented in case unexpected encounter of contaminated soils during construction	Minor
GS3	Impacts related to seismic events	Major	During the construction phase, appropriate techniques will be implemented that will incorporate risk assessment before excavation and slope stability requirements to make sure that occupational and community safety risks are avoided.	Negligible

ID#	Impact	Impact Assessment (Pre-Mitigation)	Key Mitigation Measures	Impact Assessment (Post-mitigation)
<b>SG</b>				
<b>Surface and Groundwater</b>				
SG1	Surface water- water quality	Moderate	Drainage from excavations will be collected and settled to remove suspended materials prior to discharge in accordance with required permits. Where practicable, local perimeter drains will be constructed around working areas to collect suspended run-off and direct it to a system of settlement basins before discharge in accordance with required permits. Spoil and soil storage areas and open stores of construction materials will be designed and managed to control loss of sediments into run-off by minimizing the length and angle of slopes.	Minor
SG2	Temporary dewatering of groundwater	Moderate	Effective water management plan to be in place.	Minor
<b>NO</b>				
<b>Noise</b>				
NO1	Disturbance due to noise, vibration at fixed infrastructure	Moderate		Minor
NO2	Disturbance due to noise, vibration due to traffic	Moderate		Minor
<b>RW</b>				
<b>Resources and Waste</b>				
RW1	Resources and waste generation	Moderate	An Environmental & Social due diligence will be conducted by INZAG for existing quarries to ensure permits are valid and operations are in compliance and international guidelines. Relevant suggestions will be made to improve current standards of the quarry and quarries will be monitored frequently. In case INZAG decides to open a new quarry, INZAG will establish a separate Quarry and Associated Facilities Management Plan as part of the ESMP to ensure compliance with applicable Ghana environmental standards and IFC Guidelines. The procedure will include criteria for selecting quarry and spoil disposal sites that integrates the relevant international requirements and include environmental and community HS factors like site sensitivity, travel routes, mining methods etc. in the decision-making process.	Minor

ID#	Impact	Impact Assessment (Pre-Mitigation)	Key Mitigation Measures	Impact Assessment (Post-mitigation)
RW2	Disposal of excavated waste soil	Moderate	INZAG will prepare a Soil Erosion, Reinstatement and Landscape Management Plan in accordance with Ghanaian laws and IFC guidelines Re-use of excavated soils in the Project area as far as possible and seek alternative uses of surplus spoil where practicable (eg landscaping and earth works for other projects) to minimise the requirements for off-site disposal.	Minor
<b>BD</b>	<b>Biodiversity</b>			
BD1	Loss of fauna	Moderate	Employment of an Ecological Expert who will prepare the environmental documentation on delivery of ecological requirements on site before construction activities commence. The ECoW will monitor construction activities to ensure that construction activities are delivered in accordance to relevant laws and Project commitments Speed of vehicles will be limited to minimise emission of dust in non-paved access roads and to lower the risk of accidents with fauna.	Minor
<b>EE</b>	<b>Economy and Employment</b>			
EE1	Employment Opportunities	Positive	INZAG will work with local authorities and employment organisations to ensure that all positions are advertised in a manner that is accessible to the communities in the AoI; and INZAG will ensure that the recruitment process is fair and transparent, public and open to all regardless of ethnicity, religion or gender; INZAG will develop specific measures to facilitate access to employment of women and youth.	Positive
EE2	Taxes and fees, procurement and worker spending	Positive	INZAG will implement a phased capacity building programme (sector by sector) that will enable local companies to achieve qualifications and potentially certification with the relevant standards and requirements well in advance of the tendering process; INZAG will engage with local government, and other organisations to determine opportunities for targeted training; Any selected potential suppliers will have to meet health, safety and quality standards; Following selection of primary contractors, INZAG will carry out training of contractors on the Project HSE and socioeconomic and health policies prior to the start of construction.	Positive

ID#	Impact	Impact Assessment (Pre-Mitigation)	Key Mitigation Measures	Impact Assessment (Post-mitigation)
EE3	Capacity enhancement	Positive	INZAG will enhance national supplier capacity through a comprehensive demand and supply analysis; phased capacity building program; targeted training agreed with local government and other organisations.	Positive
<b>LL</b>	<b>Land and Livelihoods</b>			
LL1	Impacts on residential structures	Major	Resettlement Framework and subsequent Resettlement Action Plan will be developed in line with the National Resettlement Policy Framework for Road Sector Operations as well as applicable international standards. Physical displacement impacts will be clearly assessed and verified through an asset inventory which will be conducted as part of the RAP studies once the Project design has been finalized by INZAG. RAP studies will identify all persons who will be displaced by the Project and determine who will be eligible for compensation and assistance. Cash compensation at agreed replacement rates for any area not replaced. Encroachers without title will be eligible to participate in focused Livelihood Support Programmes.	Moderate
LL2	Loss of non-residential structures	Major	Persons losing commercial structures will receive cash compensation at full replacement cost. In addition, a 15% disturbance allowance will be provided and they will have the right to salvage materials. Should the Project provide less than 6 months' notice to vacate, an additional disturbance will be applied. Impacted businesses may be entitled to compensation for the loss of revenue resulting from the resettlement process. This may include the loss of rental income for commercial rental structures and rental rooms, loss of income to businesses, and loss of revenue for infrastructure services such as water and power.	Moderate
LL3	Loss of access to business infrastructure	Major	The Project will compensate the responsible managing government entity/ private owner at full replacement cost of the affected business infrastructure. Replacement infrastructure will be of equal or greater quality than the infrastructure lost. Input from local government will be required prior to the design of institutional assets, as these entities will be assuming responsibility for the management of these facilities.	Moderate

ID#	Impact	Impact Assessment (Pre-Mitigation)	Key Mitigation Measures	Impact Assessment (Post-mitigation)
			Where only access is lost, the Project will work with residents to determine if a new access route can be used and compensation for the inconvenience will be applied.	
LL4	Loss of agricultural and grazing land	Moderate	The Resettlement Framework includes key compensation and livelihood restoration measures to restore land based livelihood sources, specifically agricultural activities. The Project will ensure that alternative land is made available to affected households and that temporary income losses through the clearance of crops are compensated for. Impacts to agricultural and pasture lands will be minimised by keeping the Project construction footprint as narrow as possible and efficiently restoring any damaged areas. INZAG will seek to replace the lost agricultural land plots within the same area (in-fill resettlement)	Minor
LL5	Loss of access to ecosystem services	Moderate	Design of safe road crossing options enhance access communal resources and infrastructure where required to reduce scale of impact.	Minor
<b>CHS</b>	<b>Community Health, Safety and Security</b>			
CHS1	Road safety	Major	INZAG will develop a Traffic Management Plan. A Project grievance mechanism will be developed and implemented, and information about this mechanism will be shared amongst local communities. The Contractor will also be responsible for managing a grievance mechanism that allows communities and employees to raise complaints.	Moderate
CHS2	Site trespass and injury	Major	INZAG will undertake a programme of stakeholder engagement and consultation to educate local communities of the risks of trespassing onto sites, the meaning of signs, the dangers of playing on or near equipment or entering fenced areas. This will include presenting in every primary and secondary school in communities in the Aol.	Moderate
CHS3	Environmental health	Moderate	As part of the Stakeholder Engagement Plan implemented by INZAG, awareness sessions to explain the type of noise, dust and emissions from Project activities, the mitigation measures implemented and a point person to contact in case of emergency etc. in order to alleviate potential concerns.	Minor
CHS4	Increased transmission of communicable diseases	Major	INZAG will develop a Workers' Management Plan that will include:	Moderate

ID#	Impact	Impact Assessment (Pre-Mitigation)	Key Mitigation Measures	Impact Assessment (Post-mitigation)
			A Workforce Code of Conduct detailing specific living and working conditions which will contribute to reduce the risks of disease transmission into the community as well as a worker grievance mechanism. The Code of Conduct shall expressly prohibit sexual interactions of any kind with underage persons.	
CHS5	Transmission of Sexually Transmitted Diseases (STDS)s	Major	INZAG will offer all workers including contractors and subcontractors voluntary screening for diseases, which will be submitted to confidential treatment. INZAG will ensure all workers including contractors and subcontractors receive education around STDs including transmission routes and symptoms. The training will include specific content regarding STD prevalence rates in Ghana and/ or the relevant Regions, expectations of local communities if a woman is made pregnant (e.g. marriage, financial implications, etc.) and law penalties for sexual assault.	Moderate
CHS6	Increased pressure on healthcare	Moderate	A Community Health and Safety Management Plan (CHSMP) will be developed by INZAG.	Minor
CHS7	Use of security personnel	Moderate	A Security Management Plan will be implemented by INZAG.	Minor
<b>LW</b>			<b>Labour and Working Conditions</b>	
LW1	Workers' rights	Moderate	INZAG will develop a Human Resources Policy. In addition, a Workers Management Plan will be developed by INZAG. INZAG and Contractors' will implement a program of socioeconomic compliance monitoring to inform internal auditing and monitoring process.	Minor
LW2	Worker health and safety	Moderate	INZAG will develop an Occupational Health and Safety (OHS) Plan as part of INZAG's Health and Safety Management System for the Project.	Minor
LW3	Child labour and forced labour in the supply chain	Major	INZAG will oversee if suppliers comply with all applicable child labour laws and only employ workers who meet the applicable minimum legal age requirement in accordance with international standards; Contractor contracts will specify monitoring to be undertaken by the contractor, establish the right for the Project monitoring and auditing of all contractors and subcontractors and the consequences for the contractor if they are found to be breaching national legal requirements, international standards, policies or clauses in the contract regarding forced child labour. Contractor contracts will specify that the same standards will be met by their sub-contractors and suppliers; and	Moderate

ID#	Impact	Impact Assessment (Pre-Mitigation)	Key Mitigation Measures	Impact Assessment (Post-mitigation)
			In all contractor contracts the Project will make explicit reference to the need to abide by Ghanaian law and international standards in relation to child labour.	
<b>IS</b>	<b>Access to Infrastructure and Services</b>			
IS1	Disruption to infrastructure and utilities	Moderate	<p>A Public Utilities Enhancement Plan will be developed by INZAG. Infrastructure relocated by the Project (electric and telecommunication lines, water supply and irrigation pipes, etc.) will be developed in a way that allows neighbouring communities to benefit from them after construction is over</p> <p>Where roads are closed, INZAG will find local solutions (including diversions if necessary) to be put in place.</p> <p>INZAG shall develop a Traffic Management Plan which will include a wide range of measures such as stakeholder engagement before temporary closure and diversion of the roads, appropriate signage, requirements in case a new access road needs to be built, etc.</p>	Minor
IS2	Temporary loss of water flow due to planned disruption to water pipeline	Moderate	<p>A detailed pre-construction survey will be signed off by landowners and conducted to identify infrastructure at risk.</p> <p>INZAG will develop a Public Utilities Enhancement Plan in which infrastructure relocated by the Project, including water supply and irrigation pipes, will be developed in a way that allows neighbouring communities to benefit from them after construction is over.</p> <p>Crossing of irrigation pipes and channels will be planned in cooperation with local communities and if feasible these will be planned during a time that irrigation is not required</p>	Minor
<b>CC</b>	<b>Community Cohesion</b>			
CC1	Presence of workforce	Moderate	<p>Stakeholder Engagement Plan (SEP) stating:</p> <ul style="list-style-type: none"> <li>■ Communication will be based on the principle of transparency and clarity, clearly explaining the selection process and criteria.</li> <li>■ Ongoing dialogue between the Project, through its Community Representatives (CR) and local communities to assist in information sharing with regard to employment practices and the use of non-local staff. Local communities to be provided information on the number of non-locals to be</li> </ul>	Minor

ID#	Impact	Impact Assessment (Pre-Mitigation)	Key Mitigation Measures	Impact Assessment (Post- mitigation)
			<p>brought to the area, their housing arrangements and the measures that the Project is putting in place to ensure that all workers abide by local customary practices. Information will also be shared on the number of local unskilled and semi-skilled positions available to local residents, along with the recruitment methods used to identify potential candidates.</p> <p>A Project grievance mechanism will be developed and implemented, and information about this mechanism will be shared amongst local communities. The Contractor will also be responsible for managing a grievance mechanism that allows communities and employees to raise complaints.</p>	
CC2	Community severance	Major	<p>Severance Management Plan with a detailed assessment and measures to mitigate community severance in each of the settlement locations</p> <p>A Social Investment Plan will be developed by the Project in consultation with local communities, with active engagement required to determine the location and nature of investments. All stakeholders will be kept informed on the progress of investment activities and opportunities.</p> <p>Orphaned land will be identified and compensation measures will be included in the eligibility matrix in the Resettlement Framework. Additionally, severance issues will be taken seriously and sufficiently addressed through compensation and livelihood restoration measures.</p>	Moderate
CC3	Unmet expectations of benefits	Moderate	<p>Communities will be engaged in the preparation of the Social Investment Plan activities to be taken forward in the vicinity of their communities. They will then be kept informed on the progress of such activities and opportunities for their involvement will be maximised.</p> <p>INZAG will release quarterly project update leaflets from six months prior to construction to the end of the construction phase. These information releases will emphasise the limited nature of employment and the recruitment processes and the progress of the Social Investment Plan.</p>	Minor

ID#	Impact	Impact Assessment (Pre-Mitigation)	Key Mitigation Measures	Impact Assessment (Post-mitigation)
<b>CH</b>				
<b>Cultural heritage</b>				
CH1	Impact on bronze statue of Nana Kofi Asomani due to construction earthworks	Major	Develop a management plan for the recording, removal, storage and re-erection of Bronze statue of Nana Kofi Asomani	Negligible
CH2	Former hotel, Kpong	Moderate	Undertake a Built Heritage Survey, including a full drawn, recorded and photographic survey of Former Hotel, Kpong  The Former Hotel, Kpong (CH06) has not been fully inspected or surveyed, and for this reason a conservative approach has been taken to assessing significance and therefore residual impact. It is proposed to undertake a full written, drawn and photographic record of the structures and then reassess the significance of the site once this has been undertaken. This will be undertaken as part of the Cultural heritage Management Plan.	Moderate
CH3	Possible cemetery	Moderate	A Chance Finds Procedure will be designed and implemented to manage any unexpected discovery of archaeological material in-line with national and international requirements and guidelines.	Minor
CH4	Restriction of traditional access	Major	Development a management plan to maintain existing public access routes to Cherekecherete Hill site	Negligible
<b>TO</b>				
<b>Traffic Operations</b>				
TO1	Traffic operations and road disturbance	Moderate	Effects are limited to the 18-24 month construction phase In most cases, Project traffic volumes would comprise a small share of existing traffic or existing truck traffic.	Minor
<b>CR</b>				
<b>Climate Risk</b>				
CR1	Stresses to other road infrastructure, such as steel in bridges through thermal expansion and movement of bridge joints, overpasses, culverts and viaducts.	Moderate	As the design is already using reinforced steel, regular checks will be done to identify potential damage and stress as a result of thermal expansion before major damage to infrastructure occurs such as bridge failure.	Minor

**Table 7-2 Major Potential Impacts during Operation**

ID#	Impact	Impact Assessment (Pre-Mitigation)	Key Mitigation Measures	Impact Assessment (Post-mitigation)
<b>AQ</b>	<b>Air Quality</b>			
AQ3	Disturbance due to vehicle emissions	Major	Mitigation or redesign may be required if significant negative impacts are identified due to road traffic.	Minor
<b>SG</b>	<b>Soil and Groundwater</b>			
SG1	Impacts related to accidental events	Moderate	Construction of all drainage structures (e.g. culverts, sediment basins and catch drains) will be established as early as possible	Negligible
<b>NO</b>	<b>Noise</b>			
N4	Disturbance due to noise, vibration	Moderate	High quality road surface to be installed which reduced noise impacts.	Minor
<b>BD</b>	<b>Biodiversity</b>			
BD2	Loss of fauna	Moderate	Fauna crossing points (i.e. culverts) should be installed along the road. This will increase the permeability of the road and will reduce the barrier effect. Reduced speed limit within the area of SHRR to reduce the risk of interactions with fauna. Limit centre lighting of the road in certain places to minimise light disturbance to fauna, and bats.	Minor
<b>EE</b>	<b>Economy and Employment</b>			
EE4	Employment Opportunities	Positive	GHA will develop a Recruitment and Employment Plan ensuring that the recruitment process is fair and transparent, public and open to all regardless of ethnicity, religion or gender.	Positive
<b>LL</b>	<b>Land and Livelihoods</b>			
LL6	Loss of land and livelihoods	Moderate	Impacts during the operations phase will be managed by GHA. Mitigation measures will include the following: <ul style="list-style-type: none"><li>Responsibilities will include monitoring and providing the necessary follow-up to support households to restore their livelihoods throughout the operations phase.</li></ul>	Minor

ID#	Impact	Impact Assessment (Pre-Mitigation)	Key Mitigation Measures	Impact Assessment (Post-mitigation)
			<ul style="list-style-type: none"> <li>The grievance mechanism established during the construction phase will be maintained during operations to ensure that local communities and stakeholders have an adequate channel to voice concerns.</li> </ul>	
<b>CHS</b>	<b>Community Health, Safety and Security</b>			
CHS8	Road safety	Major	GHA will maintain the Grievance Mechanism that will be accessible to all communities.	Moderate
<b>LW</b>	<b>Labour and Working Conditions</b>			
LW4	Child labour and forced labour in the supply chain	Major	Commitment to audit supply chain labour practices.	Moderate
<b>IS</b>	<b>Access to Infrastructure and Services</b>			
IS3	Improvement to infrastructure and services	Positive	The Public Utilities Enhancement Plan developed by INZAG will continue to bring access to improved telecommunication lines, water supply and irrigation pipes, etc. to neighbouring communities, specially to the settlements located in semi-urban and rural areas with poor access to infrastructure and services such as those along Section 2 of the road in Shai Osudoku and Yilo Krobo, and Lower Many Krobo districts in particular.	Positive
<b>CC</b>	<b>Community Cohesion</b>			
CC4	Business infrastructure	Major	<p>Livelihood restoration measures will aim to enhance the positive effect the road will have considering its improved transportation infrastructure. Vending, trading, transportation and other businesses could have an increased customer range.</p> <p>To ensure access to business infrastructure is not lost and adequately re-established, the Project will continue to monitor this issue and make the grievance mechanism available.</p>	Moderate
CC5	Loss of access to communal resources as well as infrastructure and social services	Moderate	While the final Project design will include safe road crossing options for pedestrians, bicycles, vehicles, animals, etc. to enhance access to communal resources, land and infrastructure, these may not be sufficient. INZAG will monitor this issue and make the grievance mechanism available. Relevant grievances will be acted upon and installation of additional crossings will be considered.	Minor

ID#	Impact	Impact Assessment (Pre-Mitigation)	Key Mitigation Measures	Impact Assessment (Post-mitigation)
CC6	Loss of community cohesion-severance issue	Major	Severance Management Plan with a detailed assessment and measures to mitigate community severance in each of the settlement locations A Social Investment Plan will be developed by the Project in consultation with local communities, with active engagement required to determine the location and nature of investments. All stakeholders will be kept informed on the progress of investment activities and opportunities. Orphaned land will be identified and compensation measures will be included in the eligibility matrix in the Resettlement Framework. Additionally, severance issues will be taken seriously and sufficiently addressed through compensation and livelihood restoration measures.	Moderate
<b>CH</b>	<b>Cultural heritage</b>			
CH6	Cherekecherete Hill site, Shai Hills Resource Reserve, Krobo Hill site	Major	Monitoring of a management plan to maintain existing traditional public access routes to Cherekecherete Hill site, Shai Hills Resource Reserve, and Krobo Hill site.	Negligible
<b>CR</b>	<b>Climate Risk</b>			
CR3/	Road surface material can soften and expand, which can result in rutting and potholes, cracks can be developed and heat can cause stress to other road elements	Moderate	Asphalt will be used which is as heat resistant as feasible. Routine maintenance will be done to avoid cracks developing into potholes	Negligible
CR6	Flooding and debris brought by extreme weather events could obstruct the road could interrupt normal road operation	Moderate	The drainage/runoff systems, culverts, bridges, potential flooding areas such as Tema and Ashaiman etc will be designed to handle the peak flows and floods. Enhancement of road segment resistance, e.g. on embankments, creating deeper road foundations on slopes, enhancing drainage structures. Consider planting vegetation and flowers in close proximity to the road which will absorb any excess surface water. This may require engineering to divert the water towards the vegetation. Monitoring of extreme weather events and how the road system responds.	Minor

## 8. HOW MONITORING WILL BE HELD?

An Environmental and Social Management Plan (ESMP) was developed to outline the mitigation measures needed to be undertaken by INZAG (during construction) and GHA (during operation). This will serve as the “handbook” to reduce the potential impacts of Project activities. The ESMP is part of the full EIA report.

The ESMP is essential for successfully implementing the Project’s environmental and social performance throughout the life of the Project. Having this Plan in place helps ensure a systematic approach to bringing environmental and social considerations into decision-making and day-to-day operations. It establishes a framework for tracking, evaluating and communicating environmental and social performance and helps ensure that environmental risks and liabilities are identified, minimized and managed.

It is, however, important to approach the ESMP as a living document, which will continue to develop during the construction phase to enable continuous improvement of the Project’s social and environmental performance.

The core objectives of this ESMP are as follows:

- Ensuring compliance with regulatory authority stipulations and guidelines, which include local, national and international;
- Ensuring that there is sufficient allocation of resources on the Project budget so that the scale of the ESMP related activities is consistent with the significance of Project impacts;
- Verifying environmental and social performance through information on impacts as they occur;
- Periodically updating the ESMP as the Project activities progress;
- Responding to unforeseen events; and
- Providing feedback for continual improvement in environmental performance.

The ESMP includes an outline of the numerous management plans which will be developed for each topic. These plans will set out how the mitigation measures will be put into practice, monitored and upheld. The key management plans are listed below.

### **Environmental:**

- Dust Management Plan
- Waste Management Plan;
- Hazardous Materials Management Plan;
- Biodiversity Management Plan;
- Biorestoration and Aftercare Plan;
- Emergency Preparedness and Response Plan;
- Traffic & Transportation Management Plan;
- Occupational Health and Safety Plan; and
- Chance Find Procedure.

### **Social:**

- Severance Management Plan;
- Stakeholder Engagement Plan (SEP) - update;
- Employment and Workforce Management Plan;

- Community Health and Safety and Security Plan;
- Cultural Heritage Management Plan;
- Local Content and Procurement Plan.

Together with this ESMP, these specific plans will form the overall Environmental and Social Management System (ESMS) for the Project.

GHA is ultimately responsible for the management and supervision of all Project activities and will have principal responsibility for implementing this ESMP and the mitigation measures.

INZAG is committed to providing resources and establishing the systems and components essential to the implementation and control of the ESMP. These include appropriate human resources and specialized skills, training programmes, communication procedures, documentation control and a procedure for the management of change (e.g. what to do in case there needs to be a change of design or construction methodology).

## **9. HOW COMMISSIONING, HANDOVER AND POST CONSTRUCTION MAINTENANCE WILL HAPPEN?**

Once construction works are completed by INZAG, the whole Project area will be inspected by GHA to make sure that all the work has been done correctly. Also, GHA will check that any grounds or vegetation that were disturbed during construction are being renovated in a satisfactory manner, and that INZAG is properly implementing the mitigation measures (as described further below in this NTS). Once GHA has accepted the construction works of INZAG, the Project will be handed over to GHA.

GHA will operate and maintain the road, same as they do other roads in Ghana in line with GHA's operation manuals and plans. GHA will also need to implement the various mitigation measures that apply during the Project operations.

## 10. CONCLUSION

The EIA study has examined the Project's potential negative and positive E&S impacts, and recommended appropriate measures needed to prevent, minimize or mitigate for adverse impacts. Consequently, these measures will help improving the Project's environmental and social performance.

As shown in the tables in Section 6.3, the significance of nearly all potential negative impacts can be reduced (e.g from Major to Moderate, or Moderate to Negligible) via application of the recommended mitigation measures, and positive impacts can be further enhanced.

In general, impacts on the biological and physical components of the Project will be low or medium, with the application of all proposed mitigation measures. Social impacts related with permanent or temporary resettlement of businesses and families will follow the guidance provided by the Resettlement Framework that has been prepared for this Project in accordance to national legislation and international standards.

Based on the assessed information, the planned Project is environmentally and socially feasible, provided that the protection measures and the ESMP program proposed in this study are implemented.

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