Environmental and Social Assessment and E&S Management Plan

Grove to Timehri Road Infrastructure Development Project

29 July 2022

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Environmental and Social Assessment and E&S Management Plan

Grove to Timehri Road Infrastructure Development Project

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Acronyms and Abbreviations

Acronym	Description
APNU	Alliance for Change
BSG	Bureau of Statistics Guyana
°C	Degrees Celsius
CCP	Construction Contingency Plan
CEMP	Construction Environmental Management Plan
CHSP	Construction Health and Safety Plan
CLO	Community Liaison Officer
CJIA	Cheddi Jagan International Airport
CO	Carbon monoxide
CPI	International Corruption Percentations Index
CP	Contingency Plan
CRFM	Caribbean Regional Fisheries Mechanism
EA	Executing Agency
CARICOM	Bureau of Statistics Guyana
CDEMA	Caribbean Disaster Emergence Management Agency
CH&PA	Central Housing and Planning Authority
CIA	Cumulative Impact Assessment
CITES	Convention on International Trade in Endangered
DDC	Diamond Diagnostic Centre
EBDPR	East Bank Demerara Public Road
ENSO	El Niño Southern Oscillation
EPA	Environmental Protection Agency
EPC	Engineering Procurement Contractor
ERM	Environmental Resources Management
ESAL	Estimated Equivalent Standard Axle Loads
ESA	Environmental and Social Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
ESPF	Environmental and Social Policy Framework (IDB, 2021)
ESPS	Environmental and Social Performance Standard
FRC	Flame Retardant Clothing
GAB	Gender Affairs Bureau
GCM	General Circulation Model
GDP	Gross Domestic Product
GDP pc	Gross Domestic Product per capita
GEA	Guyana Energy Agency
GFDRR	Global Facility for Disaster Relocation and Recovery
GGMC	Guyana Geology and Mines Commission
GHTK	Guyana Help the Kid's Foundation
GII	Guyana's Gender Inequality Index

Acronym	Description
GLSC	Guyana Land and Surveys Commission
GM	Grievance Mechanism
GNBS	Guyana National Bureau of Standards
GOG	Government of Guyana
GPHC	Georgetown Public Hospital Complex
GPL	Guyana Power and Light
GPR	Ground Penetration Radar
GPHC	Georgetown Public Hospital Complex
GT&T	Guyana Telephone and Telegraph Company
GWI	Guyana Water Incorporated
HFA	Hyogo Framework for Action
HRLMP	Human Resources and Labor Management Plan
IAI	Indirect Area of Influence
ICCAT	International Committee for the Conservation of Atlantic Tunas
ICP	Informed Consultation and Participation
IDB	Inter-American Development Bank
INC	Guyana's Initial National Communication
ILO	International Labor Organization
ITCZ	Inter -Tropical Convergence Zone
IUNC	International Union for Conservation of Nature
KC	Kofi Channel
KCOCA	Konashen Community Owned Conservation Area
Km	Kilometers
Km/h	Kilometers per hour
KPI	Key Performance Indicator
LCDS	Low Carbon Development Strategy
LRP	Livelihood Restoration Plan
M	Meters
MICS	Multiple Indicator Cluster Survey
MM	millimeters
Meters per second	m/s
MPW	Ministry of Public Works
NBSAP	National Biodiversity Strategy and Action Plan
NDIA	National Drainage and Irrigation Authority
NDC	Nationally Determined Contributions
NDCs	Neighbourhood Democratic Councils
NDS	National Development Strategy
NEPA	National Environmental Action Plan
NGOs	Non-Government Organizations
NO_2	Nitrogen Dioxide
NREAC	Natural Resources and Environmental Advisory Committee

Acronym	Description
PAP	Project Affected People
OAS	Organization of American States
OHS	Occupational Health and Safety
OSHA	Occupational Health and Safety Administration
PAC	Project Areas Commission
PCLO	Project Community Liaison Officer
PPE	Personal Protective Equipment
PSC	Private Sector Commission
RDCs	Regional Democratic Councils
REDD	Reducing Emissions from Deforestation and Forests
RoW	Right of Way
SBPA	Shell Beach Protected Area
SDGs	United Nations Sustainable Development Agenda and Goals
SEP	Stakeholder Engagement Plan
SGBV	Sexual and/or gender-based violence
SOPs	Standard Operating Procedures
SO_2	Sulphur dioxide
TAU	Texila American University
TB	Tuberculosis
TPMP	Traffic and Pedestrian Management Plan
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Framework Convention to Combat Desertification
UNFCC	United Nations Framework Convention on Climate Change
UCFCS	Upper Corentyne Fishermen's Cooperative Society
VEC	Valued Environmental Component
VOC	Volatile Organic Compounds
UNDP	United Nations Development Programme
USGS	U.S. Geological Survey
WBG	World Bank Group
WSG	Ministry of Public Works- Work Service Group

EXECUTIVE SUMMARY

The country of Guyana is experiencing economic growth at a rate of 36.2% until 2023.[1] However, Guyana is currently ranked 104 out of 140 economies[2] in road infrastructure and has one of the most limited road networks in all of South America, drastically straining economic growth opportunities. Transportation access is limited as connection between rural communities in the interior and urban communities in coastal areas is minimal, and roads surrounding rural areas are in especially poor condition. The country's constrained transportation sector has incentivized the Government of Guyana to invest in the improvement of roads in the country which are anticipated to result in positive multipliers such as better access to markets, employment, social services, and reduced cost of goods.

The Inter-American Development Bank (IDB) is supporting the Government of Guyana through the funding of the upgrade of the two-lane East Bank Demerara Public Road, specifically the section that runs from Grove to Timehri ("The Project"). The scope of works addresses increased commercial activity and population growth in the area by providing safe access for pedestrians and vehicles, improving traffic flow, and regularizing parking. The Project is anticipated to deliver benefits from the rehabilitation of the roadway given the improvements in quality, accessibility, climate change resilience (i.e., considering rise in sea level), and safety conditions of Guyana's road transport infrastructure; however, it is acknowledged that the Project could also potentially lead to negative environmental and social impacts during its construction. To determine the possible impacts of the Project's on the surrounding environment, an Environmental and Social Assessment (ESA) study was undertaken between 2014 and 2015. Said ESA has been updated to reflect design changes, current environmental and social conditions along the Project and included requirements that are now mandatory under the IDB Environmental and Social Policy Framework, effective Oct, 2021. The current document is the updated ESA (2022); therefore, while is largely based on the 2015 ESA, this document was adjusted to reflect the changes mentioned above.

The E&S assessment carried out determined that most risks and impacts are experienced during the construction phase and any unintended consequences can be avoided or minimized through the application of mitigation measures identified in this report. An Environmental and Social Management Plan (ESMP) has been developed outlining the measures and actions necessary to avoid and further minimize impacts to acceptable levels. In addition, implementation of the Project would result in positive environmental and social impacts as the Project components would address the roadway's inefficiencies.

Key impact causing activities associated with the construction phase of the Project include (i) general social interaction; (ii) operation of heavy machinery; (iii) traffic diversion; (iv) road repaving; (v) raising of crosswalks; (vi) multi-use path paving; (vii) sign replacement; (viii) installation of new light posts; (ix) road widening (within the Right of Way - RoW); (x) reconstruction of the lateral drainage system; (xi) culvert construction; and, (xii) relocation of utility infrastructure. Most significant direct impacts relate to increase in road traffic, noise generation, and economic displacement. The ESMP includes Project-specific Plans which will be implemented to avoid and minimize the risk and impacts associated with the various Project activities. The Management Plans will be also designed to address the main concerns voiced by stakeholders during consultation.

[1] IMF- world Economic Outlook (10/2021)

[2] According to the Global Competitiveness Index (GCI)

1. INTRODUCTION

1.1 Project Background

The Republic of Guyana is located in the north-eastern Atlantic Coast of South America, bordered by Suriname, Venezuela, and Brazil, with a population of approximately 786,550 people. Most of the population is concentrated in the northern coastal plain portion of the country. Guyana's interior is mainly tropical rainforest, occupying some 80% of their territory. The capital city of Georgetown and its suburbs are home to approximately 45% of Guyana's population (World Population Review, 2021).

The economy in Guyana has traditionally been open market and primarily based on commodities such as gold, bauxite, oil and agricultural products, thus, the economic performance has heavily relied on exports of extractives, among other commodities, as the main source of foreign earnings (90%) and fiscal income (46%) (Inter-American Development Bank, 2017). The transport sector in Guyana is key for their economic development. Efficiently working transport systems provide economic and social opportunities and benefits that result in positive multipliers effects such as better accessibility to markets, employment, social services, enhanced cost and time savings, lower price for commodities, increased competitiveness, and additional investments. The East Bank Demerara Public Road (EBDPR) is the major artery for goods coming to the coast and of supplies being transported to the interior. This includes timber from interior locations; and sand and loam from pits along the Soesdyke-Linden Highway. Albeit beneficial and much needed, the construction and operation of the improvement of this section of the road presents challenges from the encroachment by the Demerara River; the presence of large critical drainage structures; extensive use of the roadway by heavily loaded trucks; and the increasing buildup of homes and commerce along the road.

The Government of Guyana, through the Ministry of Public Works – Work Service Group (WSG) and with funding provided by the Inter-American Development Bank (IDB) plans to improve the quality, accessibility, resilience, and safety conditions of Guyana's road transport infrastructure through an increase in paved road coverage, reduction of non-revenue water, climate resilient interventions and the rehabilitation and upgrading of the national road connecting the capital Georgetown to the international airport. In addition, the Project must align with the IDB Environmental and Social Policy Framework (effective October, 2021) to obtain the funds for this Project. To determine the possible impacts of the Project's on the surrounding environment, an Environmental and Social Assessment (ESA) study was undertaken between 2014 and 2015; said ESA has been updated to reflect design changes, current environmental and social conditions along the Project and alignment with IDB's ESPF. This ESA (2022) and the corresponding Environmental and Social Management Plan (ESMP) is intended to assess risks and impacts of the Project considering all 10 E&S Performance Standards (ESPS) and establish the measures, plans, procedures, and additional documents so WSG aligns with said requirements.

1.2 Purpose and Need

Despite the recent increase in investment in Guyana's road sector, a number of problems still persist: (i) low density and lack of availability of climate resilient road infrastructure in good condition, as well as limited land connections with cities along the coast and in the interior of the country, which affect access to/from the various production centers and raise transport costs; (ii) increase losses of Non-Revenue Water (NRW) in aging networks that have gone over their life cycle; (iii) limited institutional capacity to coordinate the growing project portfolio; and (iv) challenges intrinsic to comprehensive road safety and axle-load control. Poor quality roads and lack of efficiently working transportation infrastructure constrains economic development opportunities for Guyana. Rural communities in the interior of the state and populated coastal communities would benefit from the connectiveness provided by the development of climate-resilient road infrastructure. Investing in improvements to the country's transportation sector will

provide economic and social benefits with positive multipliers including an improved standard of living and increased protection against the risks associated with climate change.

This Project will improve the quality, accessibility, climate change resilience, and safety conditions associated with road transport from Grove to Timehri. The specific objectives of the Project are the following:

- Address the current deterioration of the road pavement.
- Improve road safety and traffic congestion throughout the highway by widening the road and adding traffic signals and clear marking of the right of way (RoW) and the shoulders.
- Adding pedestrian and if possible, bicycle lanes/facilities, primarily in more urbanized areas of the roadway.
- Adding roadside facilities and safe alignments.
- Improve, replace, relocate, and install utility infrastructure as needed (light poles, culverts).
- Addressing flooding cause by the instability of the Demerara River and future sea-level rise.
- Improving night-time visibility through the use of retroflective signage and thermoplastic road markings.

The details of the current proposed design and Project activities can be found under Section 1.5.

1.3 Environmental Assessment Objectives

The objective of this ESA is to update the 2015 assessment of the Project's potential environmental and social risks and impacts and prepare Management Programs aligned with IDB's E&S Policy Framework (ESPF, 2021). While it is anticipated that the Project will have a benefit to Guyana, the potential exists for environmental and social impacts to occur. This document describes the potential positive and negative effects of the Project and includes a document describing the Executing agency (EA) WSG's Environmental and Social Management System (ESMS) for the Project as well the Environmental and Social Management Program (ESMP) to be put in place to augment positive effects and avoid, mitigate, manage, and monitor potential adverse impacts and risks for the life of the Project.

This ESA/ESMP has the following main objectives:

- Update the 2015 ESA to reflect changes in Project design, current social and environmental conditions along the Project and align to ESPF's requirements.
- Identify positive and/or negative changes in the human and natural environment that may affect the quality of life, as well as current and future options for sustainable social and economic development in the Project's Area of Influence, also referred to in this ESA as the Project AoI.
- Conduct a Gap Analysis between Guyana Local Law and IDB ESPF as well as measures needed to close identified gaps.
- Identify measures to minimize negative impacts and enhance positive impacts of the Project, following the mitigation hierarchy[3].
- Analyze alternatives and provide recommendations for the best course of action inclusive of any relevant prevention or mitigation measures.

[3] The mitigation hierarchy includes the following steps to manage potential adverse impacts of a proposed activity: avoid, reduce/minimize, remedy/restore and offset.

- Update and prepare Management programs to avoid, mitigate, and minimize identified Project impacts.

The ESA process included the following activities:

- A document review and Project design, environmental and social assessments provided by WSG in addition to other documentation from IDB including the GY-L1081 Project Profile Package, GY-L1081 Initial ESRS, GY-L1081 Draft Aide Memoire, and GY-L1021 Aide Memoire, as well as other publicly available sources. The complete list of documentation reviewed can be found in Section 9.
- Updating of the 2015 environmental and social assessment through the following:
    - A site reconnaissance including visual observation of the relevant areas directly and indirectly affected by the Project, meetings with relevant individual/groups/organizations, and data and information collection.
    - Semi-structured interviews with stakeholders in areas with most encroachment (Grove/ Friendship and Soesdyke/Timheri.
    - Updating the Stakeholder Engagement Plan (SEP) based on newly produced information.
    - Once the Public Consultation occurs (August 2022), this ESA and the ESMP will be updated and become final versions that will be implemented during construction.
- Evaluation of the legal and regulatory framework applicable to the Project, including IDB Environmental and Social Policy Framework (ESPF).
- Assessment of the potential environmental, social, cultural, health, safety, and labor impacts and risks associated with the Project.
- Measures for mitigation, management, and monitoring required for the Project in an Environmental and Social Management Plan (ESMP).
- A meaningful public consultation with affected stakeholders (still pending).

1.4 Environmental and Social Assessment Scope

This ESA considers both the construction and operations phase of the Project, and focuses mainly on the relevant existing physical, biological, and socioeconomic environments within the direct footprint of the Project, namely the area surrounding the proposed section of roadway. However, it is understood that in the case of some impacts such as air quality, noise and traffic, impacts may extend beyond the immediate Project footprint. As such, both a Direct Area influence (DAI) and an Indirect Area of Influence (IAI) are defined for the Project as follows below.

1.4.1 Direct Area of Influence

The DAI for the Project is defined as the footprint of the Project, where the majority of the E&S impacts from the Project are expected to occur and/or be experienced most acutely, namely:

- Project corridor, 23.5 km of roadway stretching from Grove to Timehri.
- Widening of the carriageway of the road by 1m within the existing RoW (see section 1.5 on Project description for details of the width of the RoW across the roadway).

- Temporary facilities during construction such as laydown areas and day camps for workers (these have not been defined yet)
- Utilities: upgrade and new utility infrastructure; electricity poles and drainage structures (culverts, sluices).

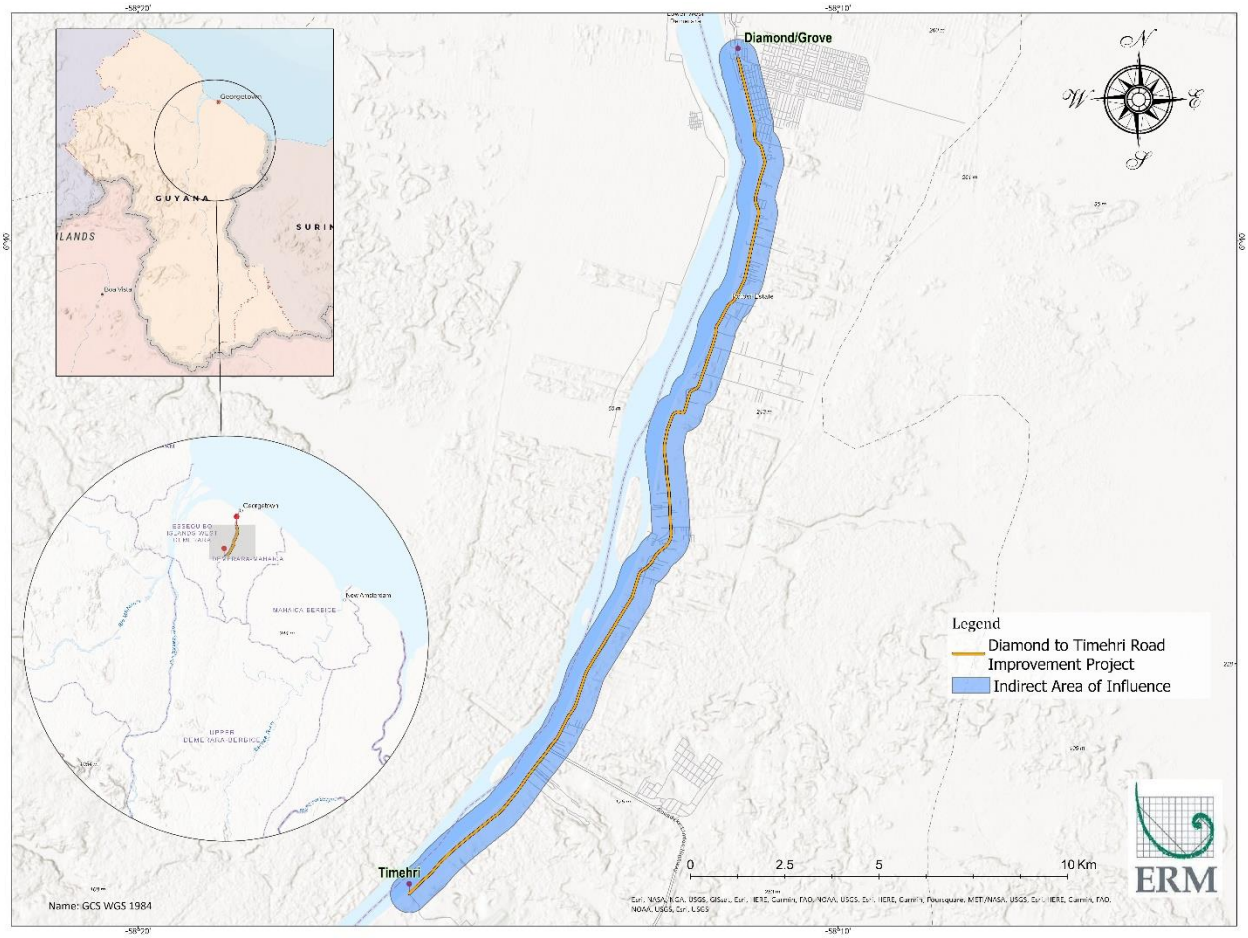
At the moment of writing this report, the EPC contractor had not been selected and the final design of the road works was not ready either; therefore, the exact location of temporary facilities such as laydown areas has not been defined yet. For this reason, the DAI on this ESA only considers the Project corridor, the widening of the carriageway and utilities along the available RoW. The criteria for selection of temporary laydown areas can be found in section 1.5.3.5.

1.4.2 Indirect Area of Influence

The IAI of the Project is defined as the area within a 500-m radius of the Project footprint where some impacts such as traffic, dust and noise disturbance could occur, but generally with a lower level of intensity than in the DAI. Impacts in the indirect area of influences also include parts of the Demerara River which is at risk of increased sedimentation, erosion and flooding on account of Project activities that divert water from the existing drainage infrastructure.

In the case of the socioeconomic baseline, affected populations are considered to be those who either reside, travel through, or engage in commercial or recreational activities within the DAI and/or IAI.

It is noted, that in many cases secondary sources of baseline data are available only for wider administrative areas. Data at these levels are supported by DAI- and IAI-specific information and data from interviews and field reconnaissance activities to provide as accurate a characterization of the impacted areas as possible. IAI is shown in Figure 1-1.



Note: IAI indicated in blue and DAI in yellow.

Figure 1-1 Direct and Indirect Area of Influence

1.5 Project Description

1.5.1 Project Location

The Project will encompass a 23.5 km stretch of the two-lane road from Grove, near the southern outskirts of Georgetown, to Timehri, near the Cheddi Jagan International Airport (CJIA), running along the eastern bank of the Demerara River (EDBR). The Project will run through both open and residential areas that are constrained for space on either side of the RoW due to physical barriers. The corridor is essential for supporting economic activities as the East Bank Demerara Public Road is widely relied on for the transportation of goods from the coast, supporting value chains in sectors including manufacturing, food-processing, construction, mining, and forestry. The Grove to Timehri section specifically, provides essential access to the Airport as it is the only road connecting the airport to the capital city, Georgetown.

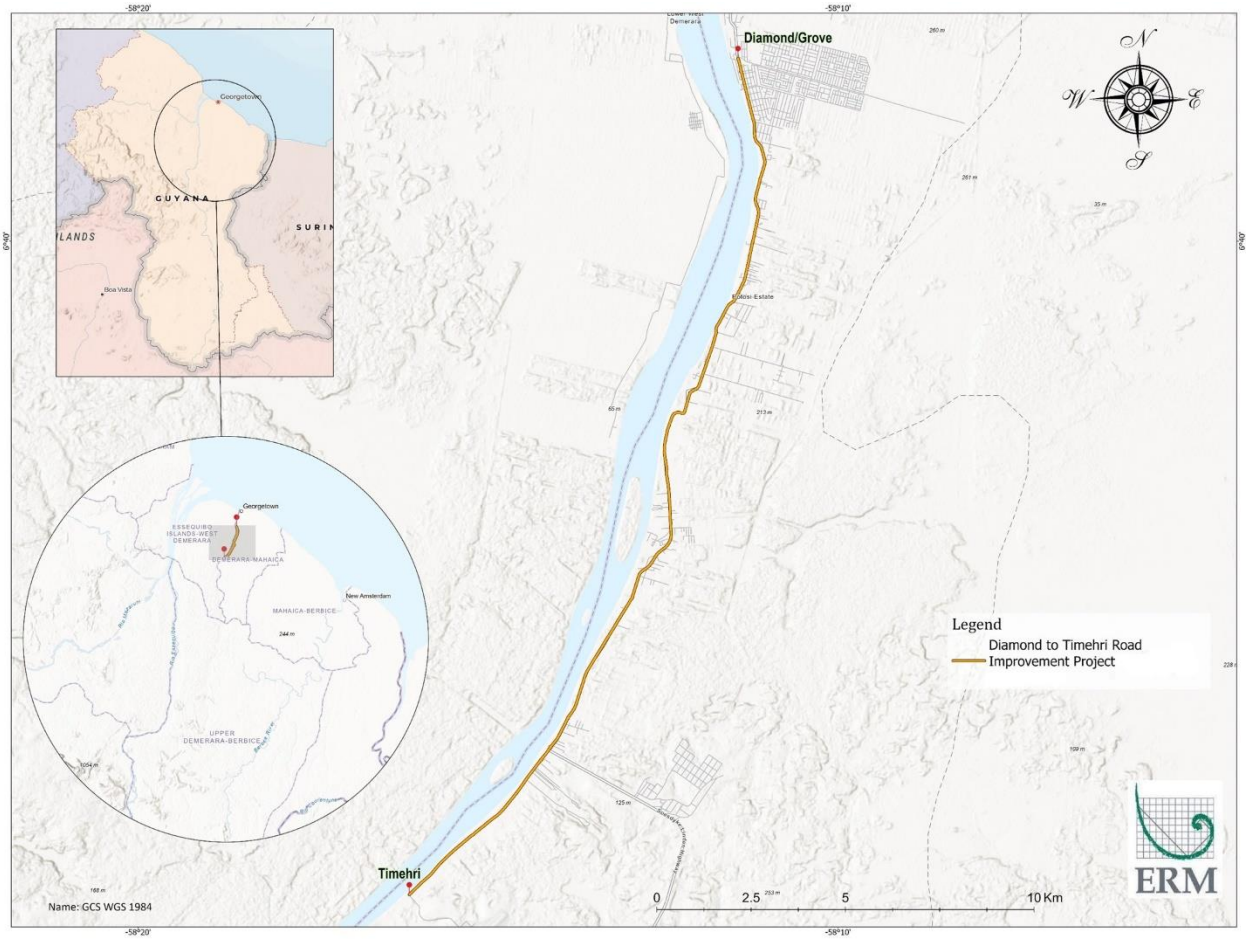


Figure 1-2: Site Location

1.5.2 Project Overview

The WSG is the Executing Agency (EA) of the Government of Guyana that will sponsor the Grove to Timehri Road Infrastructure Development Project ("the Project"). The Project will improve 23.5 km of the existing 2-lane highway from Grove to Timehri to the extent that the rehabilitated road will remain in operation for a period of 20 years, given adequate preventative maintenance activities are carried out. The objective of the Project is to achieve improved road safety and traffic congestion throughout the entire Project corridor for all road users, including pedestrians, bicyclists, motorcyclists, and vehicles (cars, trucks, buses). The road improvements are not designed to increase road capacity. The rehabilitation of the road should respond to increasing commercial activity and population growth along the corridor by facilitating the flow of traffic and ensuring the availability of parking and access for local businesses and services. Along the road, and including within the existing RoW, there are commercial and industrial activities, so economic displacement is expected but. However, there will be no physical resettlement. According to the ESPF, the Project has been categorized as "B" based on the potential localized negative environmental and social impacts associated with rehabilitation and upgrading of the roadway.

Roadway improvements include the following. All activities will occur within the existing RoW:

- Increase the travel lanes (carriageway) width by 1 meter on each side.

- Install stormwater structures.
- Add a multi-use path adjacent to the road.
- Relocate utilities as necessary to accommodate the new infrastructure.
- Add additional parking (if possible)

The width of the legal RoW is 24 m (80 feet) from side to side. However, some areas such as Grove and Soesdyke show encroachment within the RoW. In order to minimize affectations to local communities, WSG adjusted the Project design on different sections of the Road. These adjustments consider the available space for widening the carriageway and—based on the remaining space after the widening—the width and location of other improvements will change accordingly. This means that the width of the multi-use path will vary along the roadway, the location of culverts, light poles and the existence or not of additional parking on a specific section.

The variable design is depicted in 10 different cross-sections for the Project, shown in the Widening Existing Roadway Section below and in Figure 1-3.

The Project is estimated to have between 250-300 workers, inclusive of contractors. Workers are expected from nearby areas; therefore, no workers overnight camps will be installed. All workers will have temporary areas to rest, with the corresponding hydration stations and portable bathrooms.

1.5.3 Project Activities

1.5.3.1 Interventions during construction

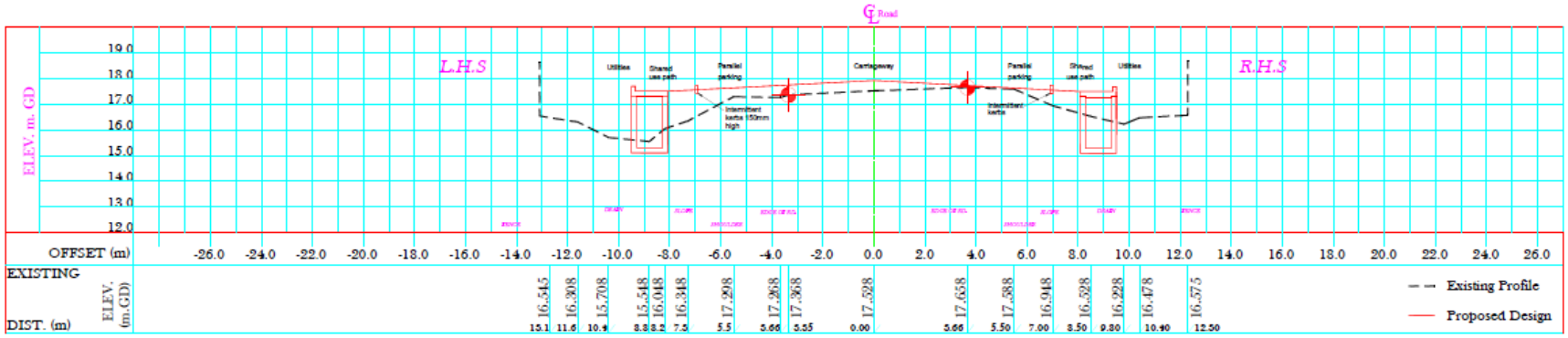
Key interventions during construction include road rehabilitation, widening the existing carriageway, adding and relocating culverts, and relocating light poles and telephone lines along the roadway. The Project activities are generally described below. Once the final design of the Project is finalized (4-6 months before beginning of construction), the EPC contractor will prepare a Construction Plan detailing the schedule and proposed activities. Such Plan will be reviewed and approved by WSG before beginning of construction.

As mentioned previously, the total width of the RoW will vary along the different sections of the Project depending upon existing buildings and available space withing the RoW. Figure 1-3 shows cross-sections that display the initially proposed design and the available space in each of the sections of the roadway. Note that the carriageway is the only aspect of the Project that will remain unchanged; it will measure 4.5 on each side (9 m total), which already considers the 1 m expansion. The remaining structures of the upgrade will vary in size and position; these include culverts, kerbs, multi-use shared path, parallel parking and utilities; within the constraints of the construction area (physical barriers such as fences and walls).

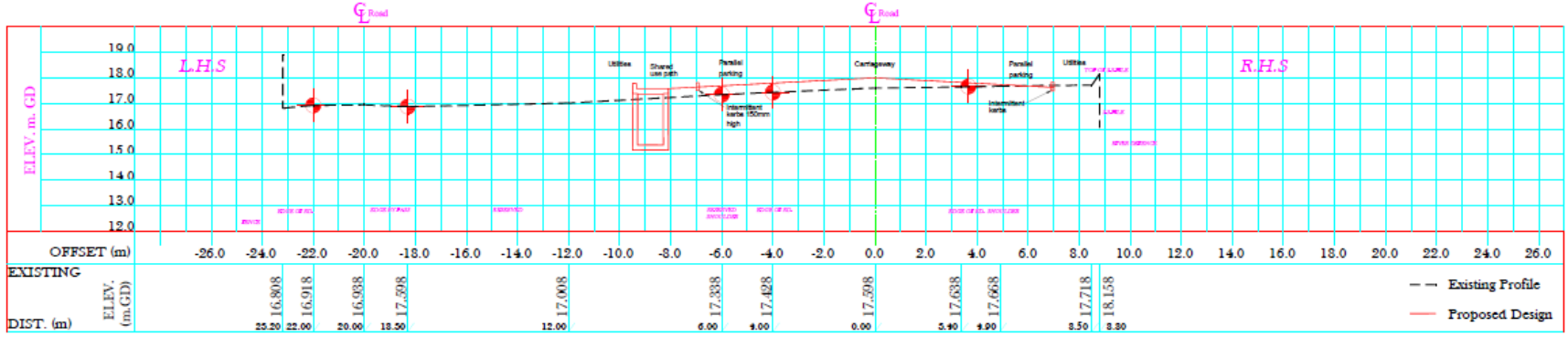
Additional notes are:

- Labels of each structure are annotated at the bottom of each cross-section, in purple.
- Red Circles correspond to the current edge of the road.
- Red line is the proposed design; black dotted line corresponds to current conditions.
- Red box refers to concrete drainage.

Figure 1-3 Cross sections of the Grove to Timehri Project (preliminary design)



CROSS SECTION @ CH.1+588 (GROVE - GOOD SUCCESS)



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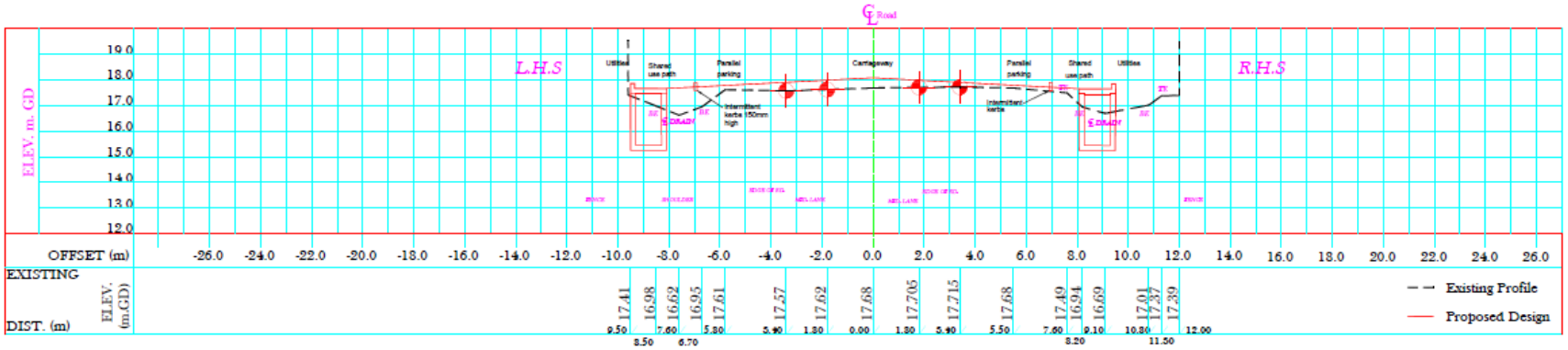

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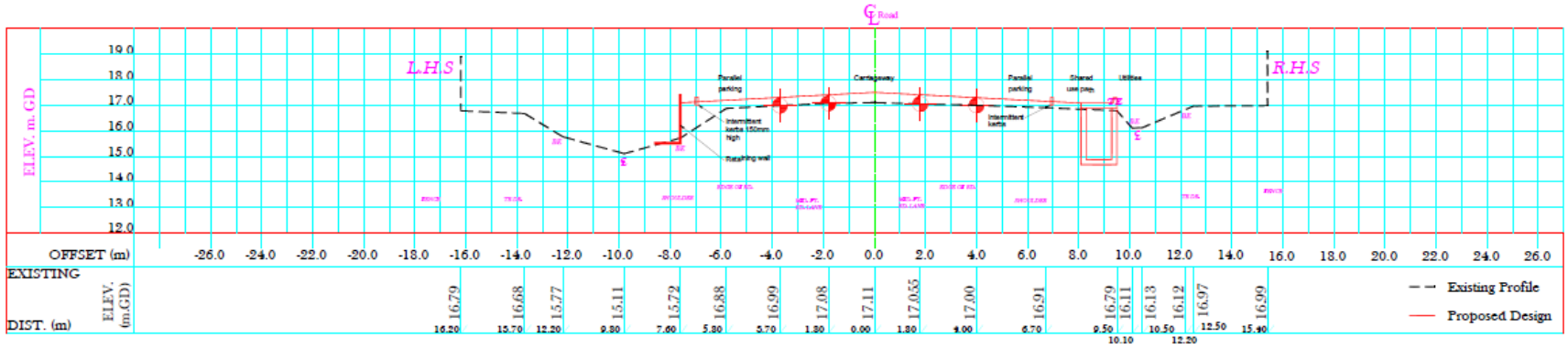

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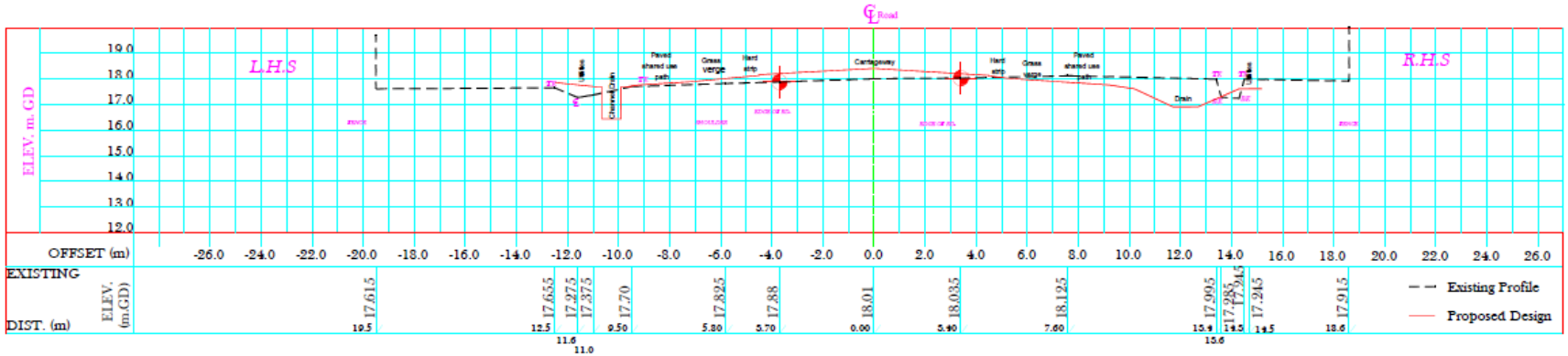

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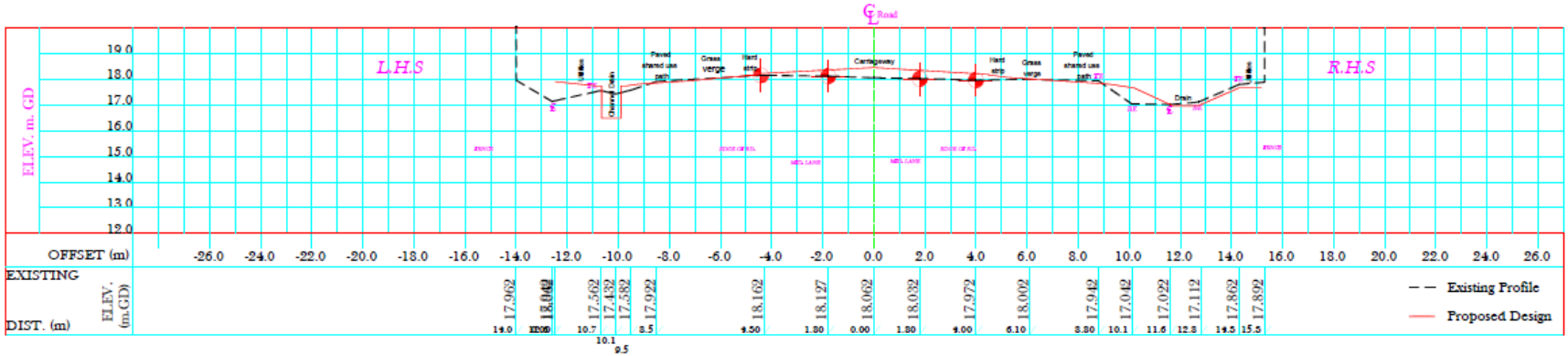
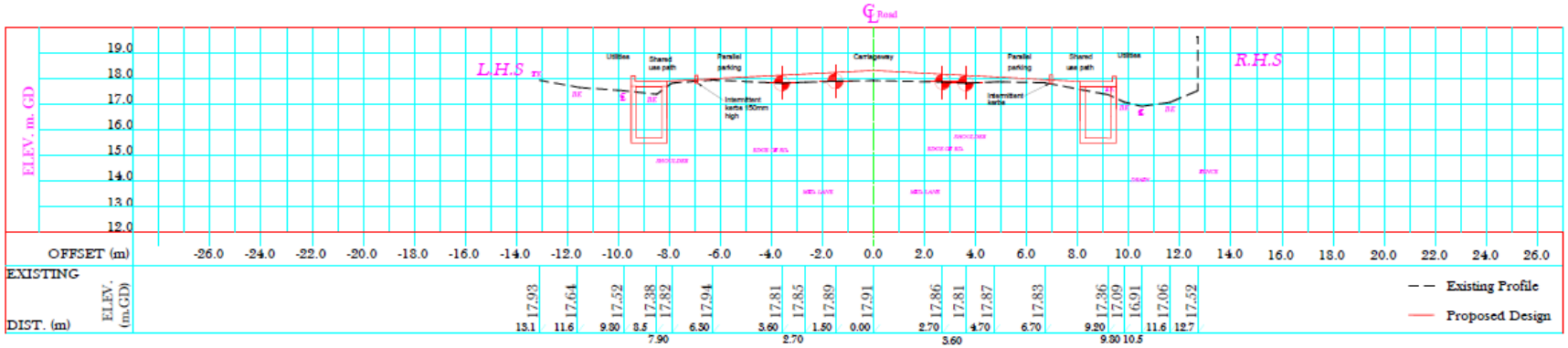


CROSS SECTION @ CH.13+555 (LAND OF CANAAN)



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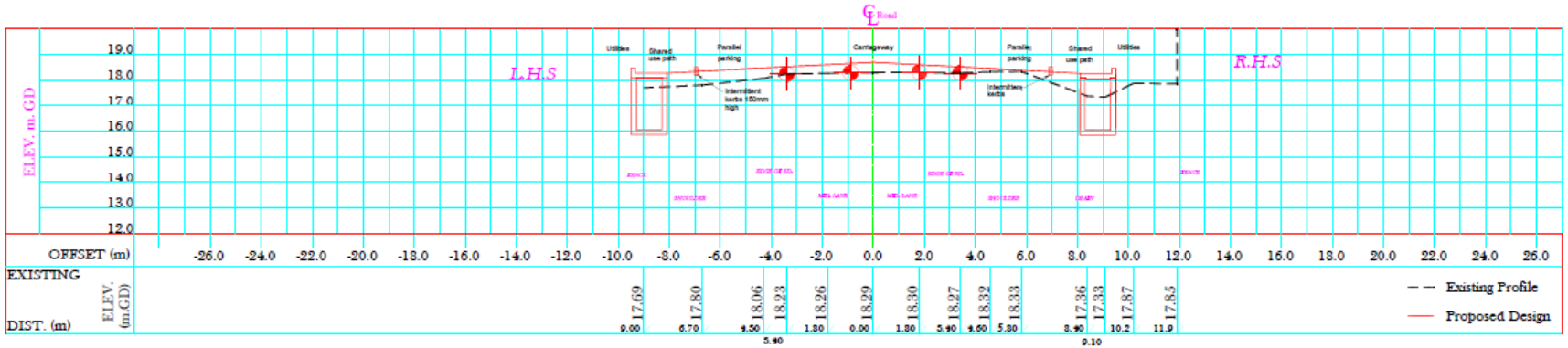
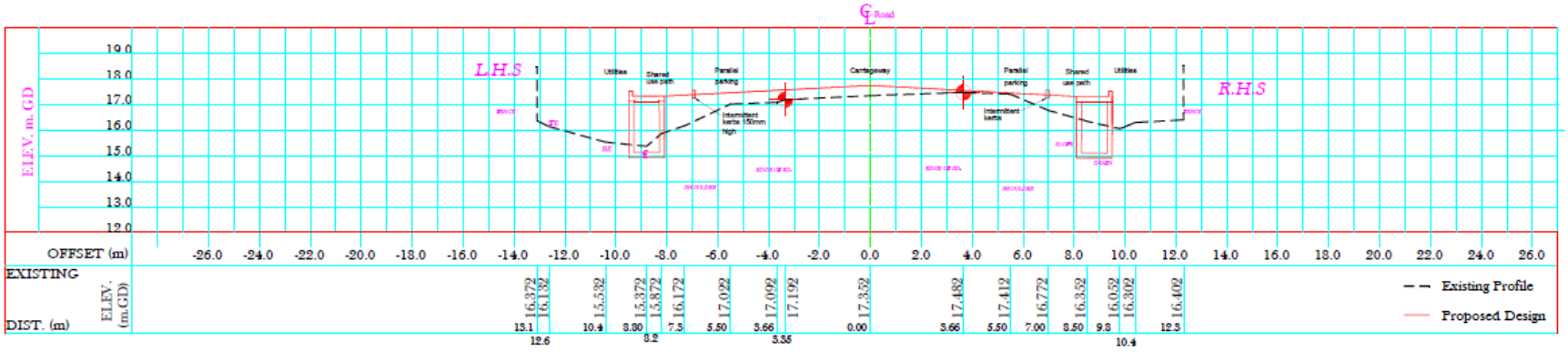
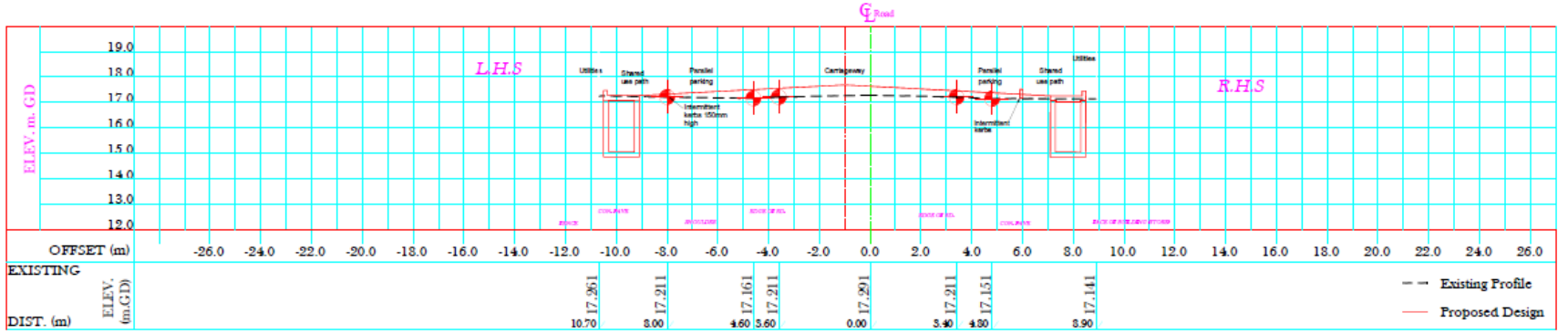


CROSS SECTION @ CH.19+540 (SOESDYKE)



CROSS SECTION @ CH.1+588 (GROVE)



CROSS SECTION @ CH.0+170 (GROVE)

Source: WSG and E&A, 2022. Drawings 01 to 06.

Road Rehabilitation

Rehabilitation work will be carried out to alleviate problems associated with the deterioration of the road pavement, road safety and traffic congestion, pedestrian and bicyclist safety, replacement of structures, and stability of the Demerara River.

- The road will be repaved with bituminous road mixtures to increase thickness to 200mm to reduce impacts of overloading. A weight control facility will also be installed on the Linden Highway (as short distance from the junction with the Project Road) to manage damage to pavement caused by transport of heavy loads (see activity described below).
- A paved multi-use path will be provided along the entire length of the roadway but may not run continuously on one side of the road as physical barriers are present, particularly on riverside of the roadway. The purpose of the multi-use path is to separate pedestrians and other vulnerable road users from vehicular traffic via a 150 mm raised pathway. The majority of the path will be 2.5m wide but reduced to 1.2m in width at its narrowest point. At its widest points, the multi-use path will encompass 2m of grass buffer between the path and the road.
- Additional pedestrian safety improvements include the installation of crosswalks particularly in school zones and areas that experience heavy foot traffic. Cross walks will be raised 150mm above the roadway and adequate signage will be placed ahead of cross walks to signal to drivers to reduce speed and yield if necessary.
- Signage will be replaced and upgraded to meet US standards and will be replaced with high-grade retroflective material to enhance visibility at night. All speed limit signs will be reviewed and amended, as necessary. Other improvements to enhance night-time visibility include the upgrade to thermoplastic for marking the road. Thermoplastic contains glass beads that reflect the light from vehicle headlights. Bulbs in streetlights will be replaced throughout the entirety of the roadway and new light posts (metal columns and lanterns) will be installed where illumination gaps currently exist.

Widening Existing Roadway

The Project includes the widening of existing roadway by 1m on both sides, creating a 9 m wide two-lane road (carriageway) of 4.5 m on each side. Shoulders on both sides of the road will also be widened by 0.7m on each side, with the exception of Km 0+000 to Km 1+600 in the Village of Grove due to physical barriers. Parallel parking (2.4 m), shared use path (2.6 m) and space of utilities (1.1 m) will also be added to the existing road. The total length on each side will be in general 10.6 m. Some sections may vary depending upon physical barriers, for instance, fences, walls and buildings (see Figure 1-3).

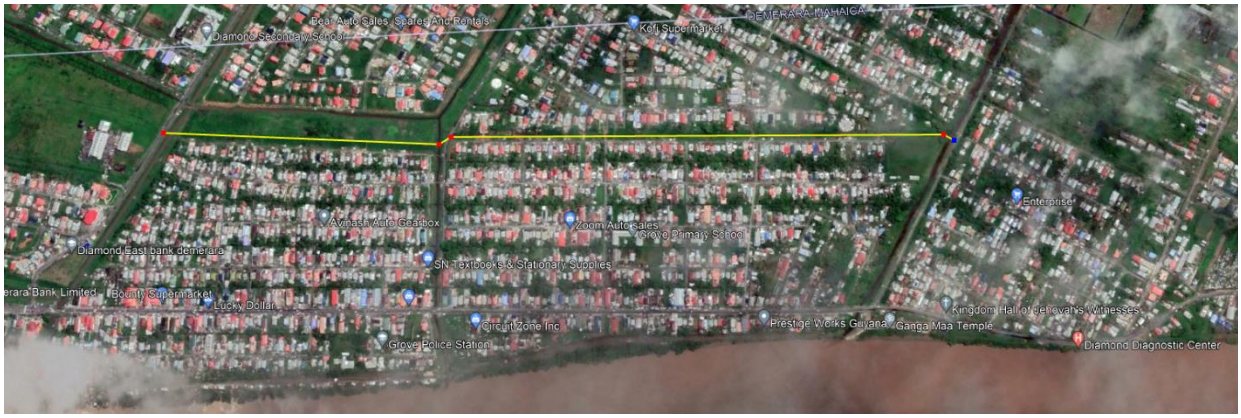
Detour roads

To divert traffic during construction works, WSG will create detour roads. These will alleviate traffic as construction will take a full lane during the execution of the proposed activities.

Currently, WSG has identified two options for the diversion of traffic during construction:

1. Detour road #1 from Diamond to Good Success.
2. Detour #2 is at Good Hope, in front of the GTT Exchange.

The first option will include the construction of bridges to cross water streams along the way. Both proposed detour roads are shown below:



Detour Road # 1

Detour Road #2

After the EPC contractor is selected, the latter could add additional detour roads or make modification to the currently proposed ones. Detour roads are also detailed in WSG's Traffic and Pedestrian Management Plan, any changes proposed by the EPC contractor will be reflected in said Plan.

Drain and Culverts Construction

Reconstruction of the entire lateral drainage system, including the replacement of concrete U drains and ditches, rehabilitation of 58 perpendicular culverts, and installation of a sluice system is included in the Project design. Drainage studies were carried out to ensure the design of the drainage system provides adequate capacity given predicted rainfall and sea-level rise in Georgetown. Of the 58 cross-drainage structures currently situated between Grove and Timehri, most are unable to provide the required capacity storage to manage tide locked conditions. Inadequate drainage infrastructure can increase the risk of surface flooding, damaging the road surface and creating unsafe conditions for road users and nearby communities, as discussed in section 5.4.3. Existing culverts will be cleared of debris to improve waterflow and reduce flood risk and the culvert and associate culvert at the Kofee Koker[4] structure will be

[4] Kofee Koker (or sluice gate) is a gate at the end of the canal. Much of coastal Guyana is below sea level and protected by dikes. At low tide the koker can be opened and water will drain through the dike and into the sea. The koker needs to be closed at high tide or the land will be flooded with sea water.

entirely replaced. Location of culverts and drains will consider flooding risks along the Project, including existing risks despite infrastructure that is already present (i.e., sea defences, existing culverts, etc)

Utilities Relocation and Construction

The WSG has contracts with Guyana Power and Light (GPL), Guyana Water Incorporated (GWI), and the Guyana Telephone and Telegraph Company (GT&T) for the relocation of utility infrastructure located near the existing road and within the existing RoW. Ideally, utilities that are associated with electricity, water, internet, and telephone services should be relocated prior to the start of construction. However, depending on the final Project design and the Construction Plan, the order of construction activities may change. Either way, WSG will approve any changes proposed by the EPC contractor. In addition, the utility companies will provide detailed location of the utilities and the conceptual design of the relocation works and technical specifications for materials and components. Contact information for affected individuals in the corridor will also be provided.

Additionally, each utility company will provide WSG with a list of certified subcontractors with the capacity to undertake the utility replacement work. The EPC contractor will be the ultimate responsible for utility relocation; therefore, the EPC contractor will be in charge of the selection and hiring of the certified subcontractor from the options provided by the utility companies. Relocation works will be conducted optimally by sequencing removal activities to minimize service disruptions. Given that light services are being upgraded (modernized), the old systems will be decommissioned only after the new systems have been installed, therefore disruptions will be minimal. In addition, there will be previous notification through media. Water and telephone lines will not have disruptions.

Utilities to be relocated include the following:

- GT&T has poles located at 30 m centers and assets located underground at three to four locations in the corridor
- GPL has one, 69KV Transmission Line stretching from the Garden of Eden Power Plant to the proposed cross section of the road at Garden of Eden. E-Networks may also have poles along that corridor that will need to be addressed
- GWI has 4,400 customers connected to distribution mains in the corridor.

In the case of GWI, a consultant will be hired to perform Ground Penetration Radar (GPR) to determine all underground assets in the Project corridor.

Some wooden light poles present in the RoW will also be removed and replaced as part of road rehabilitation work.

Weight control facility

The purpose of having a weight control facility is to control and track the weight of vehicles using the improved road and prevent overloading. Road pavements are designed to carry a range of “standard” (8.2 tonne) axles (also equates to the legalaxle load limit in Guyana) over a period of time. The number of ”Equivalent Standard Axles” (ESAs) are determined with respect to the type of traffic expected to use the road over its design life. WSG commissioned a Weight Control report that estimates that the maximum allowable Gross Vehicle Mass (GVM) should be 56.6 tonnes.

This measure will limit the road deterioration and prevent from damage to the improved road. WSG will weight all vehicles over 3,500 kg gross mass, bypassing the weighting stations could result in a fee. The location of weighting stations is yet to be determined.

Source: IMC, 2015. Weight control facility report.

Figure 1-4: Typical 4 m x 3 m unit scale

1.5.3.2 Design Safety Criteria

Rehabilitation of the roadway has been designed in accordance with the following codes and standards:

- Roads Act, 1909 Chapter 51:01
- Motor Vehicles and Road Traffic Act, 1940 Chapter 52:01
- Town and Country Planning Act
- Labour Act, 1942, Chapter 98:01
- Occupational Safety and Health Act, 1997

Road rehabilitation work will also adhere to the principles of universal design as defined in the Convention on the Rights of Persons with Disabilities [5].

1.5.3.3 Materials

Construction materials have not been defined yet as the EPC contractor has not been selected by WSG. All materials will be included in the Construction Plan that will be delivered by the EPC contractor and approved by WSG.

[5] Universal design relates to the design of products, environments, programs, and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. “Universal Design” shall not exclude assistive devices for particular groups of persons with disabilities where this is needed (Article 2 of the United Nations (UN) Convention on the Rights of Persons with Disabilities (CRPD)).

1.5.3.4 Equipment

The EPC construction Contractor has not been confirmed by WSG and a list of equipment is not yet available. Typical construction equipment includes:

- Dump trucks;
- Bobcats;
- Tractors;
- Water trucks;
- Tractor-loader-backhoes;
- Pick-up trucks; and
- Excavators.

1.5.3.5 Criteria for Selection of Temporary Laydown Areas

Location of temporary laydown (staging) areas have not been selected at the time of writing this report. The EPC Contractor is responsible for determining the location of these areas and developing a plan for the placement of material stockpiles to be shared with WSG. WSG is responsible for reviewing proposed locations and ultimately approve them. WSG will consider adequate zoning and E&S criteria before final selection of laydown areas.

In the event that land outside of the existing RoW is required for these laydown areas, WSG is responsible for granting the necessary approvals. Laydown areas will consider minimizing impacts to stakeholders (such as impeding access to their homes or businesses, avoiding areas of higher traffic and other considerations). In addition, temporary laydown areas will be placed in areas devoid of natural vegetation, will not require land acquisition nor physical displacement, and will not interfere with access to houses, schools or other high-foot traffic areas, and will have the appropriate zoning for the intended use.

1.5.3.6 Waste Generation

Most waste will be produced during the construction phase and is primarily comprised of domestic, construction (e.g., excavation material, cement, lumber, etc.), and hazardous (e.g., waste oil, lubricants) waste. In addition, there will be sanitary waste (i.e., liquid effluents due to temporary bathroom stalls for workers) and domestic waste from food consumed on site. Construction activities are planned to occur over a period of 36 months, and the amount of waste to be generated has not been determined yet. Operations

During operations, some waste is expected from maintenance works, but in lesser amounts than during construction. Maintenance activities will be carried out as needed to ensure the road remains in good condition. Maintenance activities including patching, edge repair, crack sealing, shoulder grading, vegetation control, and ditch cleaning, among others. Overall, the Project is expected to provide long term benefits for the community as described in section 5.5.2.

Waste Management Plans are described in Section 7.4.1. In addition, the EPC Contractor will also prepare a Closure Plan to be implemented upon completion of construction. The Closure Plan includes the following activities: (i) the removal of physical structures including fences and pipe culverts that were utilized to facilitate construction but are not to remain on site upon operation of the roadway; (ii) disposal of all construction waste in an approved landfill as indicated in the Contractor's Waste Management Plan; (iii) disconnection of temporary water and electricity hookups made to accommodate workers and

construction equipment during the construction phase; (iv) backfill of remaining trenches and pits; and, (v) the temporary laydown/staging area will be restored to its original state.

2. POLICY, LEGAL, ENVIRONMENTAL REGULATORY AND ADMINISTRATIVE FRAMEWORK

This section of the ESA evaluates the existing Guyanese institutional and regulatory frameworks as well as the IDB Environmental and Social Policy Framework and the E&S Performance Standards applicable to the Project.

2.1 National and International Applicable Framework

Several statutes of Guyana will be used to regulate the Project. These statutes contain requirements to be implemented to ensure compliance with the applicable laws and regulations of Guyana.

This Section reviews the relevant laws and regulations in Guyana that are applicable to the Project; the chapter is separated into three sections:

1. *National Legal Framework:* describes the laws and regulations that apply to environmental issues in a general context, such as the Constitution of Guyana, as well as national laws that focus specifically on environmental issues such as the Environmental Protection Act, as amended in 2005. This section also identifies several resource-specific environmental laws that are more narrowly focused and have either direct or indirect relevance to the Project.
2. *National Policy Framework:* describes the Government of Guyana's strategies and policies that apply to the Project. These strategies and policies articulate the Government's management goals with respect to various environmental issues.
3. *International Conventions and Protocols:* describe the international and regional conventions and protocols to which Guyana is a signatory and which are relevant to the Project.

2.1.2 National Legal Framework

The key environmental legislation, currently in force in Guyana that pertains to resources that could be affected by the Project include the following:

2.1.2.1 National Constitution of Guyana

Guyana is governed according to the Constitution of the Co-operative Republic of Guyana, which took effect in 1980 and expressly provides for protection of the environment. Article 25 establishes "improvement of the environment" as a general duty of the citizenship. In addition, Article 36 reads as follows:

> *"In the interests of the present and future generations, the State will protect and make rational use of its land, mineral and water resources, as well as its fauna and flora, and will take all appropriate measures to conserve and improve the environment."*

2.1.2.2 Environmental Protection Act (Chapter 20:05 – 5th June, 1996[6])

In 1996, the Environmental Protection Act was enacted to implement the environmental provisions of the Constitution. The Act is Guyana's single most significant piece of environmental legislation because it articulates national policy on important environmental topics such as pollution control, the requirements

[6] http://ggmc.gov.gy/main/sites/default/files/Divisions/Environmental%20Protection%20Act.pdf

for environmental review of Projects that could potentially impact the environment, and the penalties for environmental infractions. It also provides for the establishment of an environmental trust fund.

Most importantly, the Act authorizes the formation of the Environmental Protection Agency (EPA), and establishes the EPA as the leading agency on environmental matters in Guyana. The Act further mandates the EPA to oversee the effective management, conservation, protection, and improvement of the environment. It also requires the EPA to take the necessary measures to ensure the prevention and control of pollution, assessment of the impact of economic development on the environment, and sustainable use of natural resources.

2.1.2.3 Environmental Protection Water Quality Regulations 2000

These regulations require, among other matters the registration and environmental authorization by any person/entity whose construction, installation, operation, modification or extension of any facility cause the discharge of effluents. It establishes that the EPA shall, at any time after the commencement of the Regulation, establish parameter limits of effluent that may be discharged into any inland or coastal waters or land of Guyana. Guidelines on the discharge of effluents and disposal of waste are detailed in these regulations. Includes reporting requirements, penalties for violations of standards, and permitting requirements for discharges. Additionally, standards for drinking water quality have been developed by the Guyana National Bureau of Standards (GNBS). However, no standards have been developed for surface or sub-surface water, and more specifically, for discharges to receiving waters from road rehabilitation operations.

2.1.2.4 Environmental Protection Noise Management Regulations 2000

Under the Environmental Projection Noise Management Regulations 2000, operations that emit noise in the execution of various activities such as construction, transport, industry, commerce and any institution are required to apply to the Agency for an environmental authorization. The regulation establishes general provisions for noise avoidance and restrictions from multiple commercial and industrial sources including sound making devices, night clubs, equipment, tools, and construction activities.

The EPA is responsible for the establishment of standards for permissible noise levels in industry, construction and other areas. The EPA may grant authorization for noise emission unconditionally or subject to conditions and may require environmental audit procedures. EPA and the Guyana National Bureau of Standards (GNBS) together with other relevant agencies developed Guidelines for Noise Emission into the Environment. The regulation includes reporting requirements, penalties for violations of standards, and permitting requirements for operations that emit noise.

2.1.2.5 Environmental Protection Air Quality Regulations 2000

Establishes that the EPA shall, at any time after the commencement of the Regulation, establish limits for any of the contaminants specified in the Regulation. Sets ambient air quality standards, reporting requirements, penalties for violations of standards, and permitting requirements for stationary and mobile sources of air emissions. However, elements related to parameter limits on air contaminants and emission samplings are not stated in the regulations as these have not been developed by the EPA.

2.1.2.6 Protected Areas Act (ACT No. 14 of 2011 – 27th September, 2011[7])

The Protected Areas Act was enacted in 2011. It provides for protection and conservation of Guyana's natural heritage and natural capital through a national network of protected areas and creates a Protected Areas Commission to oversee the management of this network. It also highlights the importance of

[7] http://parliament.gov.gy/documents/bills/Act%20No.%2014.pdf

maintaining ecosystem services of national and global importance and public participation in protected areas and conservation and it establishes a protected areas trust fund to ensure adequate financial support for maintenance of the network.

Other functions of this act include promoting national pride in and encouraging stewardship of Guyana's natural heritage, recognizing the conservation efforts and achievements of Amerindian Villages and Amerindian Communities and promoting the recovery and rehabilitation of vulnerable, threatened, and endangered species.

2.1.2.7 Other Resource-Specific National Environmental and Social Laws

Several additional Guyanese environmental laws with more narrowly defined scopes pertain to specific biological or physical natural resources. Other laws that primarily have a public health related focus may also be relevant to the Project. Several of Guyana's environmental statutes were enacted prior to the Constitution and were subsequently incorporated into the newly formed national legal framework, but most were enacted after 1980 (Table 2.1Table 2.1).

Table 2.1: Other National Environmental and Social Laws

TITLE	OBJECTIVE	RELEVANCE TO THE PROJECT
Biological Resources		
Wild Birds Protection Act, 1987	Protects listed wild birds in Guyana.	Sections 3 and 6 prohibit knowingly wounding or killing wild birds listed in the First and Second Schedule of the Act. Penalties are also established as part of the Act.
Species Protection Regulations, 1999	Provides for the establishment of a Management Authority and a Scientific Authority in compliance with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).	Provides for wildlife protection, conservation, and management.
Wildlife Management and Conservation Regulations, 2013 (supplemented by passing of Wildlife Conservation and Management Act, 2016)	Provides for the establishment of a Management Authority and the management of the country's flora and fauna. Provides for classification of some species as vulnerable, endangered, or critically endangered; 2016 Act specifies that the Act applies to all species in CITES Appendices I, II and III unless otherwise reserved by Guyana.	Provides a supportive mechanism cognizant of the national goals for wildlife protection, conservation, management and sustainable use.
Environmental Protection Hazardous Waste Regulations (2000)	Establishes requirements for generating, handling, and disposing of hazardous waste as well as penalties for violations of these requirements.	Identifies waste subject to regulation, including several types of waste that could be generated as part of the Project.
Pesticides and Toxic Chemicals Control Act Cap. 68:09 (2000, as amended in 2007)	Provides for the formation of a Pesticides and Toxic Chemicals Control Board. Establishes requirements for registration, licensing, and trade in pesticides and toxic chemicals. Amended in 2007 to provide rules for the exportation of pesticides and toxic chemicals.	Establishes regulations pertaining to the use of toxic chemicals and pesticides. Pesticides will not be required for this Project but small amounts of chemicals may be used. This Act regulates the importation, registration, and use of such chemicals. NOTE: Where a third party is involved, the Third Party shall have all the necessary permits to comply with this regulation.

TITLE	OBJECTIVE	RELEVANCE TO THE PROJECT
Guyana Standard, Requirements for Noise Emission into the Environment, 2010	Establishes standard used for monitoring of noise emission into the environment; sets permissible noise levels for residential, commercial, and industrial areas (day and night).	Relevant to Project-related noise levels that could be perceived in commercial, residential or industrial districts along the roadway
Public Health		
Occupational Safety and Health Act (1997) Cap. 99:06	Legally defines the responsibilities of workers and management with respect to keeping workplaces safe.	Generally, applies to Project workers and Project-related activities.
Food & Drug Regulations (Food and Drug Act, 1971) Cap. 34:03	Regulates the sale, advertisement, preparation, and handling of food products; regulates the manufacture, advertisement, trade, and administration of pharmaceuticals; provides the Ministry of Health authority to facilities to establish compliance with sanitation standards.	Governs the preparation of food and provision of medications at Project facilities.
Ministry of Health Act (2005)	Sets out the functions of the Ministry of Public Health (previously the Ministry of Health) and the duties of the Minister. Among the responsibilities conferred to the Ministry by the Act are to provide oversight of health care services including mental health; provide advice to government and establish policies on health; develop and ensure the implementation of the National Health Plan and other action plans and directives including human and all other resource requirements; enter into service agreements with the Regional Health Authority (RHA) and review and approve their health plans and budgets; and facilitate the accreditation and regulation of the health care professionals, hospitals, and other health facilities in the public and private sectors.	Generally, applies to health care services supplied to Project workers.
Regional Health Authority Act (2005)	Provides the RHA with the responsibility for providing for the delivery and administration of health services and health programs in specified geographic areas and for matters incidental thereto or connected therewith.	Establishes the regional regulations under which health services would be provided to Project workers.
Health Facilities Licensing Act (2007)	Under the act, all health facilities must be licensed by the Minister of Public Health. The Act also provides for inspectors who are authorized to enter any facility and conduct inspections. Offenses are outlined with fines and imprisonment upon summary conviction. Importantly, the act also provides for the Minister to make regulations related to licenses, renewals, standards for health facilities, record keeping, prescribing and governing the construction, establishment, location, equipment, maintenance, and repair of, additions and alterations to, and operations of health facilities.	Sets the requirements for health facilities at which services would be available to Project workers.

TITLE	OBJECTIVE	RELEVANCE TO THE PROJECT
Social / Cultural Resources		
National Trust Act (1972) Cap. 20:03.	Stewardship of historic resources and places of cultural significance.	Governs the management of any building, structure, object, or other manmade or natural feature that is of historic or national cultural significance that could be impacted by the Project. This would apply to artifacts such as Koffer Kokers, which date from the dutch period.
Prevention of Discrimination Act (1997) Cap. 99:08.	Provides for the elimination of discrimination in employment, training, recruitment, and membership in professional bodies and the promotion or equal remuneration to men and women in employment who perform work of equal value.	Prevents discrimination in employment practices.
National Insurance and Social Security Act (1969) Cap. 36:01.	Establishes a system of national insurance and social security providing pecuniary payments by way of old age benefit, invalidity benefit, survivor's benefit, sickness benefit, maternity benefit, and funeral benefit, and to substitute for compensation system of insurance against injury or death caused by accident arising in the course of employment or resulting from disease due to the nature of employment; establishes a National Insurance Fund.	Provides the overarching framework for workers' insurance and other benefits.
Employment of Young Persons and Children Act. Cap. 99:01.	Seeks to implement certain conventions relating to the employment of young persons and children.	Restricts the ages of young persons who may be employed by the Project.
Termination of Employment and Severance Pay Act (1997, 1999) Cap. 96:01.	Makes provision for the conditions governing termination of employment and grant of redundancy or severance payment to employees.	Governs payments to employees or the termination of employment. This could be relevant to contractors and subcontractors to the Project.
Labour Act (1942) Cap 98:01	Specifies conditions that an employer must observe in the contracting of employees. For example, wages of employee must be paid in cash unless otherwise agreed. Wages should be payable either weekly, fortnightly or monthly, except otherwise agreed.	Governs form and timing of payment to employees. Relevance to contractors and subcontractors to the Project and applies generally to project workers. WSG will follow the regulations of the Ministry of Labour in regarding to working conditions and recruitment of personnel.
Social Infrastructure and Services		
Town and Country Planning Act (1996) Cap. 20:01.	Provides for the orderly and progressive development of urban and rural lands and the preservation and improvement of amenities pertaining to such development. Development under the Act is restricted to buildings and roadworks incidental to buildings.	Could be relevant if the Project builds commercial, industrial or residential structures. It would also be relevant for the land use clearance process (within the building permit process) within the Central Housing and Planning Authority.
Water and Sewerage Act (2002) Cap. 30:01.	Provides for the ownership, management, control, protection and conservation of water resources, the provision of safe water, sewerage and advisory services and the regulation thereof.	The Project will install, move and construct sluices, culverts and other drainage infrastructure.

TITLE	OBJECTIVE	RELEVANCE TO THE PROJECT
Roads Act (1909) Cap 51:01	Covers the administration, maintenance and construction of roads. Act provides for the public to be informed about any alterations and expansion to existing road structure and states that the Minister will determine compensation (if any) for displacement of private property or occupants. Act provides for traffic management in which the Chief Officer is responsible.	Governs compensation of potentially affected community and provides framework for traffic management.

2.1.3 National Policy Framework

Guyana's government has articulated national policies on several environmental and social topics that are relevant to the Project. This section provides an overview of the key government environmental and social policies applicable to the Project.

2.1.3.1 Green State Development Strategy

Launched in June 2017, the Framework of the Green State Development Strategy was the paradigm for national development activities in Guyana from 2018-2020. The Framework outlines Vision 2030 for "greening" Guyana. It encompasses seven key thematic areas as follows, structural transformation, resilient infrastructure, sustainable management of natural resources, transitioning to renewable energy, human health and wellbeing, governance, and international cooperation. The framework was the focus of national consultations by the Government of Guyana in 2018.
The Green State Development Strategy: Vision 2040 is aligned with the country's commitments under the United Nations Sustainable Development Agenda and Goals (SDGs). Several of the SDGs address environmental and social imperatives. Specifically, SDG-13 Climate Action seeks to, "Take urgent action to combat climate change and its impacts".

2.1.3.2 National Development Strategy

The Draft National Development Strategy (NDS) developed in 1997 was one of Guyana's early attempts at setting priorities for Guyana's economic and social development policies. The six volumes of the NDS contains technical analysis of problems and future prospects in all sectors of the economy and in areas of social concern. It also contains governmental policies with regard to the environment as well as social and gender equity.

It identifies 12 distinct features of Guyana's natural resources and environment and sets policies governing the management of each feature. Features covered under Volume 3 with relevance to the Project include waste management, pollution control, and environmental impacts (NDS 1997).

2.1.3.3 National Environmental Action Plan

Guyana's National Environmental Action Plan (NEAP) articulates the government's approach to managing the environment from the perspective of economic development. The NEAP considers the issues of environmental management, economic development, social justice, and public health to be inextricably linked. It identifies deforestation, pollution, and unregulated gold mining as historically minor but with growing environmental problems, and identifies private sector investment as one of the primary opportunities to generate the necessary capacity within Guyana to:

1. Provide an appropriate level of public services to its citizens;

2. Reduce and/or eliminate the avoidable environmental degradation that occurs when resource development occurs without appropriate regulation; and
3. Reduce unsustainable development of natural resources due to the socioeconomic pressures of widespread poverty.

2.1.3.4 National Land Use Plan

The 2013 National Land Use Plan is Guyana's strategic framework for land development in Guyana. The plan lays out the various primary development options for various geographical locations in Guyana. The plan is anchored in several national policies and strategies and seeks to provide a spatial element to development planning in Guyana. Another major objective is the decentralization of land use planning from the national level to the regional levels.

2.1.3.5 Guyana's National Biodiversity Strategy and Action Plan

Guyana's current National Biodiversity Strategy and Action Plan (NBSAP) was formally adopted in 2015 and is in its third iteration. It establishes the national vision for biodiversity, which is to sustainably utilize, manage, and mainstream biodiversity in all national plans and sectors by 2030, thereby contributing to the advancement of Guyana's biosecurity, and socioeconomic and low carbon development. The plan is the main tool for integration of biodiversity in national policies through 2020. The NBSAP recognizes the importance of biodiversity to the fledgling ecotourism industry and other economic sectors. The NBSAP sets forth nine strategic objectives intended to promote conservation and sustainability on a national scale, improve biodiversity monitoring, harmonize legal and policy-based mechanisms across all levels of government to support biodiversity conservation, and prioritize funding to meet these objectives. The NBSAP is aligned with Guyana's commitment to the United Nations Convention on Biodiversity (UNCB) which the country has ratified.

2.1.3.6 Gender and Social Inclusion Policy

In 2018, the Government of Guyana formulated its intentions regarding gender equality and gender mainstreaming in its National Gender and Social Inclusion Policy. The policy articulates the vision for Guyana in becoming an inclusive society with gender mainstreaming in all sectors. The plan proposes to tackle all forms of gender discrimination against women and girls in Guyana especially gender-based violence. The plan also included measures for achieving economic development and inclusion, wellness, and health care and advocates for education, training and skills development for all Guyanese.

2.1.4 Applicable International Conventions and Agreements

Guyana is signatory to a number of international agreements and conventions relating to environmental management and community rights, although not all of these agreements have been translated into national legislation.

Guyana is a member state of the International Labour Organization (ILO), which administers multiple international treaties and conventions. The ILO has established eight fundamental conventions that provide certain general protections to workers in signatory states such as the right to organize, standards for remuneration, restrictions on child labour (including minimum ages to work), and protection from forced labour. In addition to these fundamental agreements, Guyana is signatory to several specific agreements that will govern certain specific aspects of the Project as they relate to labour.

2.1.4.1 United Nations Convention on Migratory Species[8]

This text serves as an accord between Contracting Parties where they agree to comply with different articles regarding activities that may affect migratory species when executing the Project.

2.1.4.2 The Hazardous Chemicals and Waste Conventions

Guyana is a signatory to several international conventions that addresses chemicals and waste management including reduction of the movement of hazardous waste between nations, and specifically to prevent transfer of hazardous waste from developed to less developed countries. Among these conventions are the Basel, Stockholm Convention, Montreal Protocol, Rotterdam and Minamata conventions. The Basel convention specifically addresses the transboundary movement of chemicals and waste. The Montreal Protocol seeks to protect the stratospheric ozone layer by establishing guidelines for countries on substances that deplete the ozone layer. The Stockholm Convention addresses the issue of Persistent Organic Pollutants and the Rotterdam Convention focuses on the Prior and Informed Consent for certain hazardous substances in international trade. Finally, national mercury uses, and its disposal is the focus of the Minamata Convention.

2.1.4.3 Rio Conventions

The three United Nations Conventions, the United Nations Convention on Biological Diversity, (UNCBD, United Nations Framework Convention on Climate Change, UNFCC and the United Nations Convention to Combat Desertification UNCCD aims to address issues related to climate change, biodiversity and conservation and desertification and land loss. Guyana as ratified all three conventions. The Rio Conventions, particularly the UNFCC and the UNCBD are important to Guyana. The UNFCC establishes Guyana's commitments to climate change including is Nationally Determined Contributions (NDC).

2.1.4.4 International Standards Applicable to the Project Activities

Table 2.2Table 2.2 shows the performance criteria to be applied regarding different aspects that are related to the Project activities in accordance with different international standards:

Table 2.2: Summary of Key Environmental and Socioeconomic Performance Criteria to be used by the Project

Aspect	Performance Criteria to be Applied	International Standard Which References Applied Performance Criteria
Air Quality	Comply with requirements.	World Health Organization's Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulphur Dioxide; Air Quality Guidelines for Europe; World Bank Air Quality Standards
Noise	Comply with requirements.	Guidelines for Community Noise, World Health Organization (WHO), 1999.

[8] Convention on the Conservation of Migratory Species of Wild Animals – Bonn, Germany on 23 June, 1979.

Aspect	Performance Criteria to be Applied	International Standard Which References Applied Performance Criteria
Cumulative Impacts	The cumulative impact assessment for the Project has been conducted in general accordance with international best practice guidance.	IDB Invest Practical Guide on the Evaluation and Management of Cumulative Impacts in Latin America and the Caribbean (2022)

2.1.5 *Inter-American Development Bank* (IDB) Environmental and Social Policy Framework

IDB requires its projects to apply the set of ten Environmental and Social Performance Standards (ESPS) presented in their Environmental and Social Policy Framework (2021). The ESPS are summarized in Table 2.3Table 2.3.

Table 2.3: IDB Environmental and Social Performance Standards

IDB ESPS	Objective
ESPS 1 – Assessment and Management of Social Risks and Impacts	• To identify and evaluate environmental and social risks and impacts of the project. • To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, affected communities, and the environment. • To ensure that grievances from project-affected people are responded to and managed appropriately. • To promote and provide engagement with project-affected people and other stakeholders throughout the project cycle and disclose environmental and socially relevant information.
ESPS2 – Labor and Working Conditions (Project will have direct and indirect workers on site)	• To promote the fair treatment, non-discrimination, and equal opportunity of workers. • To establish, maintain, and improve the worker-management relationship. • To promote compliance with national employment and labour laws. • To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain. • To promote safe and healthy working conditions, and the health of workers. • To avoid the use of child labour and forced labour. • To ensure accessible and effective means to raise and address workplace concerns. • To support the principles of freedom of association and collective bargaining of project workers.

IDB ESPS	Objective
ESPS 3 – Resource Efficiency and Pollution Prevention (Project will consume resources and will produce waste and emissions)	• To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. • To promote more sustainable use of resources, including energy and water. • To reduce project related GHG emissions. • To minimize and manage generation of waste and impacts of pesticide use.
ESPS 4 – Community Health, Safety and Security (There are communities and foot traffic in the Project's area of influence)	• To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances. • To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities. • To anticipate and avoid adverse impacts on the project itself from natural hazards and climate change during the project life cycle.
ESPS 5 – Land Acquisition and Involuntary Resettlement (There will be economic displacement, but not physical resettlement)	• To anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. • To improve, or restore, the livelihoods and standards of living of displaced persons. • To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.
ESPS 6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources (There will be no vegetation clearance and the Project is brownfield)	• To protect and conserve biodiversity. • To maintain the benefits from ecosystem services. • To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.
ESPS 7 – Indigenous People (There are no Indigenous Peoples identified at the Project site or its area of influence)	• To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples. • To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts. • To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner. • To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life cycle. • To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present.

IDB ESPS	Objective
ESPS 8 – Cultural Heritage (There are no currently no formally or informally recognized archeological or cultural heritage artifacts or areas in the Project's area of influence)	• To protect cultural heritage from the adverse impacts of project activities and support its preservation. • To promote the equitable sharing of benefits from the use of cultural heritage.
ESPS 9 – Gender Equality (Project will have risks and impacts on people of all genders, sexual orientation and identities).	• To establish actions to prevent or mitigate risks and impacts, including sexual and gender-based violence (SGBV). • To achieve inclusion from project-derived benefits of people of all genders, sexual orientations, and gender identities. • To promote safe and equitable participation in consultation and stakeholder engagement processes regardless of gender, sexual orientation, and/or gender identity. • To meet the requirements of applicable national legislation and international commitments relating to gender equality.
ESPS 10 – Stakeholder Engagement and Information Disclosure (As it is required for all projects during its whole lifecycle))	• To assess the level of stakeholder interest and enable stakeholder's views to be considered in project design and E&S Performance. • To promote engagement with project-affect people on issues that could affect or benefit them from the project • To ensure environmental and social risks and impacts of the project is disclosed to stakeholders

Climate change management provisions require the screening and assessment of climate-related risks that may affect IDB investments (particularly when an investment is located in an area highly prone to disasters) in accordance with ESPS 1, 3 and 4. In addition to the emergency preparedness and response requirements in ESPS 1, IDB also requires that clients disclose information on their emergency preparedness and response activities to Affected Communities, relevant government agencies, or other relevant parties in the planning and operational phases and to provide information promptly in the case that an emergency or disaster occurs.

2.1.6 Additional Requirements from the ESPF with Respect to National Legislation

The Project will meet requirements of the EPSF that are different from National legislation. These include:

- Establishing an Environmental and Social Management Systems for the Project, per requirements of ESPS 1.
- Adopting workers H&S requirements of ESPS 2.
- Establishing a Workers Grievance Mechanism per ESPS 2.
- Addressing community health and safety, per ESPS 4.
- Developing and implementing a Livelihood Restoration Plan, as needed, compliant with the requirements of ESPS 5.
- Assess and address potential gender-based impacts and risks, per the requirements in ESPS 9.

- Conducting stakeholder engagement activities in line with the requirements of ESPS 10.

Table 2.4 details the differences between local legislation in Guyana and requirements of IDB's ESPF.

Table 2.4: Gap Analysis between Guyana's National Laws and Regulations and IDB's ESPF

IDB ESPS	IDB Requirement	Guyana Requirements	Gap between local Law and IDB ESPF	Action items to close the gap for this Project

ESPS 1: Assessment and Management of E&S Risks and Impacts	• Environmental and Social Management System (ESMS), including the following sections:
	  ○ Project-specific environmental and social framework
	  ○ Identification of risks and impacts
	  ▪ Must consider vulnerable populations, including African descendants, LGBITQ, women, Indigenous Peoples and other minorities.
	  ▪ Cumulative Impact Assessment (CIA)
	  ▪ Analysis of alternatives
	  ○ Management programs
	  ○ Organizational capacity and competency
	  ○ Emergency preparedness and response
	  ○ Stakeholder engagement and Public Consultation, as required
	  ○ Monitoring and review
		• Environmental Impact Assessment
		  ○ Environmental baseline (fieldwork)
		• Environmental monitoring of air, water and noise against Guyana's National Bureau of Standards (GNBS).
			• Impacts must include vulnerable groups
			• WBG maximum limits
			• Cumulative Impact Assessment
			• Project alternative analysis
			• Environmental audits
				• Establishment of an Environmental and Social Management System that considers risks and impacts to vulnerable groups
				• Preparation of a CIA
				• Analysis of alternatives
				• ESA/ESMP must be implemented by EPC contractor and lower tier contractors
				• ESMS should be adopted by WSG
				• Monitoring should consider most stringent maximum limits.
				• Environmental audits and self-monitoring
				• Adaptive management, based on unforeseen risks and impacts and lessons learned during execution

ESPS 2: Labor and Working Conditions	• Risk assessment of occupational health and safety • Impacts to primary suppliers • Labor assessment to prevent forced and child labor • Worker's grievance mechanism	• Obligations regarding handling of chemical, physical, and biological agents in the workplace. • Follow Guyana laws (for example, minimum statutory age of workers, daily hours of work, etc.)	• Impacts to primary suppliers • Worker's grievance mechanism	• Implementation of a Worker's Grievance Mechanism • Consideration of impacts to primary suppliers, and other risks and impacts related to child and forced labor
ESPS 3: Resource Efficiency and Pollution Prevention	• Consider resource efficiency, waste generation, water consumption, and hazardous waste management • Minimize project-related GHG emissions • Quantify gross GHG emissions if more than 25,000 tons of CO_2	• Environmental monitoring of air, water, and noise against Guyana's National Bureau of Standards (GNBS) • Follow national regulations for controls of hazardous waste and chemicals	• Control measures to minimize emissions • Inventory of GHGs • Resource efficiency strategies	• Triggering quantities of GHG emissions are not expected for this Project. • Implement controls to minimize emissions and waste production • Implement resource efficiency strategies
ESPS 4: Community Health and Safety	• Impacts to affected people during the Project lifecycle, including assessment of impacts related to disease transmission from workers entering communities • Consideration of worker's influx for the risk of disease transmission to local communities	• Currently, no requirement for impact assessment for health and safety risks on communities	• Consideration of risks and impacts to community health and safety	• Development of a Traffic and Pedestrian Management Plan • Implement COVID-19 protocol on site

IDB ESPS	IDB Requirement	Guyana Requirements	Gap between local Law and IDB ESPF	Action items to close the gap for this Project
ESPS 5: Land Acquisition and Involuntary Resettlement	• Public consultation to establish a census of individuals economically displaced • Preparation of Livelihood Restoration Plan	• No specific guidance on the planning or implementation of livelihood restoration and resettlement. Typically, the resettlement and livelihood restoration processes must be undertaken through an Order or the Courts.	• Preparation of a Livelihood Restoration Plan, including census of individuals impacted	• Completion of a Livelihood Restoration Plan (including preparation of a compensation scheme and a cutoff date) • Conduct consultation with stakeholders affected
ESPS 6: Biodiversity, Conservation, and Sustainable Management of Living Natural Resources	• Consider impacts to biodiversity during Project lifecycle • Mitigate impacts to biodiversity, species, and habitats as necessary • If critical habitat is designated, a Biodiversity Action Plan is required	• Environmental impact assessment	• Consider Key Biodiversity Areas based on species found on site, in addition to officially Natural Protected Areas • Consideration of invasive species • If critical habitat is established, preparation of a Critical Habitat Assessment (CHA) and a Biodiversity Management Plan	• Its requirements not applicable as there will be no vegetation clearance and the Project is brownfield, no Key Biodiversity Areas (KBA) in the area, no protected areas or endangered species have been identified during due diligence
ESPS 7: Indigenous Peoples	• Identification of communities and Indigenous Peoples within the Project area and consideration of the impacts • Inclusion as part of a stakeholder analysis and engagement plan	• Currently no requirement for impact assessment on indigenous communities	• Consideration of Indigenous Peoples within impact assessment processes and a culturally appropriate stakeholder engagement	• Consideration of Indigenous Peoples within impact assessment processes • There are no identified Indigenous communities in the Project Area.
ESPS 8: Cultural Heritage	• Cultural heritage presence, both officially and non-officially recognized • Environmental and social risks and impacts identification to determine whether the proposed location is in areas where cultural heritage is expected to be found during construction or operations • Chance Find Procedure	• Currently, no requirement of impact assessment for cultural heritage.	• Assessment of cultural heritage presence • Environmental and social risks and impacts related to cultural heritage • Chance Find Procedure	• For this Project, it is not expected that there will be a cultural heritage component, as there not formally or informally recognized archeological or cultural heritage artifacts or areas in the Project's area of influence. Historic artifacts such as Koffer Kokers will not be impacted nor moved; hence no impacts are expected. • Consideration of Cultural Heritage in Risks and impacts • Implementation of a Chance Find Procedure will support in case anything is found during construction.
ESPS 9: Gender Equality	• High-level Gender Analysis to identify gender-related risks and impacts (gender violence, gender-based exclusion, discrimination on the basis of gender or sexual orientation) • Updated Stakeholder Engagement Plan focused on gender issues and impacts to disadvantaged groups	• Currently, no requirement to assess gender-based impacts • Regulations against discrimination	• Gender analysis for specific risks and impacts • Code of conduct to consider gender-based violence • Workers Grievance Mechanism	• Gender-specific risks and impacts analysis • Prepare a code of conduct enforceable to all subcontractors • Implementation of Grievance Mechanism • Toolbox talks and awareness around Gender Based Violence

IDB ESPS	IDB Requirement	Guyana Requirements	Gap between local Law and IDB ESPF	Action items to close the gap for this Project
			• Special considerations to hire women for non-traditional work (i.e., at the construction site)	
ESPS 10: Stakeholder Engagement and Disclosure	• Stakeholder identification and mapping • Direct and Indirect area of influence (AOI) • Stakeholder grievance mechanism • Public Consultation • Social Impact Assessment ○ Social baseline (fieldwork)	• Public consultation and notification required as part of EIA proceedings, per EPA requirements	• Grievance mechanism • Specific stakeholder identification methods, including mapping and identification of the direct and indirect AOI.	• Implement external grievance mechanism • Implement Stakeholder Engagement Plan throughout the lifecycle of the Project

2.2 Environmental Permits

WSG will file an application to the Environmental Protection Agency (EPA) to obtain the environmental permit for the construction of the Project. The permit number is not yet available. The EPA permit is obtained through submission of a standard application form that focuses on environmental assessment.

The application requires any Project proponent to provide with the following information:

- Project name and contact information of the applicant (telephone, address, email, location of the Project, type of activity or business, name of the local authority where the Project is located, capital investment needed and annual financial turnover).
- Alternative sites, if any.
- Project description (description of the area, Project's lifetime, stages, vegetation needed to be cleared, listing of proximity to sensitive ecosystems, buildings and infrastructure surrounding the site, topography and soil type, description of the construction phase and the operation phase, layout of the Project).
- Waste characteristics and volume (solid waste, hazardous) and methods for storage disposal, effluents (treatment and disposal).
- Impact assessment to soil, air, water, noise/vibrations, and the corresponding mitigation measures (all impacts and mitigations are enlisted in a form).
- Application has a section to add further details and include attachments.

The EPA application form does not include sections for social impact assessment, stakeholder engagement or public consultations. There are no other permits or licenses required in addition to the EPA permit. Given the fact that the Project is a Public Road, it is MPW's sole responsibility to maintain it. Therefore, construction approval will be determined by MWP once the EPC Contractor is selected. WSG will be supported by Supervision Consultant, who will provide direct oversight during construction activities.

2.3 National Institutions

The main authorities that oversee the environmental operations/Projects that currently exist or are registered in the Cooperative Republic of Guyana in order to keep protection of the environment and the country's resources are highlighted below.

2.3.1 The Environmental Protection Agency (EPA)

The Environmental Protection Agency (EPA) was legally established by the Environmental Protection Act in 1996. It has the responsibility to take the necessary measures to manage, conserve, protect and improve environment. This entails that the Agency takes actions to prevent and control pollution; assess the impact of economic development on the environment; and ensure the sustainable use of Guyana's natural resources. The EPA is under the umbrella of the Department of Environment, Ministry of Presidency. The Agency is regulatory with authority to grant or not grant permits for developmental project that will impact on the environment. As a regulator, the Agency is also required to monitor activities of development and to enforce the provisions of the Act.

2.3.2 The National Drainage and Irrigation Authority (NDIA)

The National Drainage and Irrigation Authority (NDIA) functions as Guyana's apex organization dealing with all public matters pertaining to management, improvement, extension and provision of drainage, irrigation and flood control infrastructure and services in declared areas of the country. Established in 2006 by an Act of Parliament, No. 10 of 2 004, the Drainage and Irrigation Act, the Authority has developed an institutional structure in terms of water resources management strategy and water use planning for the primary purpose of locating, evaluating, conserving and distributing water resources of the country for agricultural purposes. In meeting its mandate, the NDIA has focused on improving and upgrading drainage and irrigation services countywide, thereby enhancing the competitiveness of the various sectors and improving productivity.

2.3.3 Central Housing and Planning Authority

The Central Housing and Planning Authority (CH&PA) was established in 1948 to address the housing needs of the citizens of Guyana. The agency is under purview of the Ministry of Housing and Water and has the primary objectives:

- Divestment of Government land to eligible Guyanese for residential use.
- Development of housing schemes and regularization and upgrade of squatter settlements. Orderly and progressive development of Land, Cities, Towns, Urban and Rural areas.
- Granting security of tenure, (Transports and Certificates of Title to Land).
- Preparation of development plans for urban centers.
- Provision of services (access roads, internal road networks, water distribution networks, drainage, electricity).
- Collaboration with stakeholders for the development of sustainable housing.

2.3.4 Neighborhood Democratic Councils

There are over sixty (60) NDCs throughout Guyana, providing services to citizens under the 1998 Local Government Act. The number of Councillors elected may range from 12 to 30 depending on the size of the population of the neighborhood and its topography. These Councils operate under Local Government Act Chapter 28:02.

A NDC covers a relatively small geographic area within each region and is tasked with responsibility for the management and administration of these areas within its boundaries. The Overseer of the NDC is responsible for the day-to-day administration of the office and assisting in the execution of the council's decisions.

Functions of the Neighborhood Democratic Councils

- To provide efficient services for the residents as stated in the Laws. Services include sanitation, garbage disposal, road/dam maintenance, market facilities, burial grounds, abattoirs, drainage, etc.
- To maintain and protect public property
- To levy and collect rates.

2.3.5 Protected Areas Commission

The Protected Areas Commission (PAC) was created by Act of Parliament on July 07, 2011. The PAC is mandated to manage, maintain, promote and expand the national protected areas system in Guyana including the Shell Beach Protected Area on the Region 1 coast.

2.3.6 Gender Affairs Bureau

Located in the Ministry of Social Protection, the Gender Affairs Bureau (GAB) is the national machinery for the mainstreaming of gender in national policies and plans. The Bureau is composed of Men and Women Affairs Bureaus. The agency implements national plans and programs for the attainment of gender equality in Guyana.

2.3.7 The Civil Defense Commission (CDC)

The Civil Defense Commission (CDC) was established in 1982 to make plans and conduct operations to deal with all types of disasters in Guyana. By 1985, a comprehensive National Disaster Preparedness Plan had been implemented.

At the time of its establishment, the Commission operated under the authority of the Office of the Prime Minister. Responsibility for the CDC was subsequently moved to the Office of the President in 1992. In September 2001, Standard Operations Procedures for the National Emergency Operations Centre were upgraded to meet new challenges of the worsening domestic and international disaster situation.

The CDC of Guyana is a full member of the Caribbean Disaster Emergence Management Agency (CDEMA).

The Commission functions as follows:

- Service Provider – Promoting its role of providing services to local authorities/communities and for that purpose, to develop programs designed to enhance those services.
- Planning and Implementation – Ensuring the promotion and development at national level of disaster planning and management and, in co-operation with local authorities, facilitating the implementation of disaster management measures for the purpose of emergency relief and support;
- Loss Reduction and Mitigation – Promoting the adoption of disaster loss reduction and mitigation policies and practices at the national and local authority level;
- Voluntary Service – The promotion and development of voluntary service as an integral aspect of disaster management;
- Training and Education – To establish and promote the development, maintenance and improvement of the tenants of disaster management training and education; and
- Permanent Staffing – Maintaining a permanent body to enhance the national capacity for disaster management services.

Responsibility for disaster management in Guyana extends to every individual, family, community, government and private sector organizations. The Civil Defense Commission coordinates the national system with these bodies and is committed to initiating and supporting the disaster management process throughout Guyana.

3. ANALYSIS OF ALTERNATIVES

3.1 Current Conditions

Poor quality roads in Guyana constrain the transport sector and reduce economic growth opportunities. The Government of Guyana (GOG), through funding received from the IDB, is widening the East Bank Demerara Public Road to four lanes between the Villages of Providence and Diamond. The same road will also be widen its carriageway by 1 m on each side. The rehabilitation and widening work will focus on improving the safety and road conditions of the existing two-lane road.

3.2 Alternatives Assessment

3.2.1 Other Location Alternatives

Rehabilitation of the existing roadway is the most feasible alternative. No alternatives for the road are considered as the road is already in use and all rehabilitation work would occur within the existing right of way.

3.2.2 Utilities

Utility relocation as described in section 1.5.3 will be carried out by certified contractors as identified in the tender documents. Several proposals were discussed during meetings with the utilities companies to determine the most appropriate approach for the relocation of assets. Relocation will occur in a sequenced manner to minimize service disruption.

3.2.3 Drainage

An evaluation of alternative channel and road culvert configurations was carried out and provided in the 2014 Drainage Studies Draft Report. The adequacy of a three barrel versus a four-barrel culvert was considered in three flood relief channels: Kofi Channel (KC) 1, KC2, and KC3. For this analysis, the invert level of the culvert was 12.0 m GC and the barrels were 3.65 m wide.

The replacement of the culvert is anticipated as part of the improvements provided in the scope of works for the Project, while the flood relief channel would be undertaken by the National Drainage and Irrigation Authority (NDIA) of Guyana.

Dimensions for Kofi Channel considerations:

- KC1 (land on either side is privately owned; WSG preference is to minimize land take)
    - Bottom width 10m
    - Invert level of 12.0 m GD
    - 1:2 side slopes
    - 3m berm on either side at 15.0 m GD
    - Top width of 44m
- KC2
    - Bottom width 10m
    - Side slops of 1:1.5
    - Top width of 35.5m
- KC3 (similar to existing channel)

- Bottom width 5m
- Top width 30.5 m

In the scenario where a 3-barrel culvert was used at KC1 and KC2, water levels decreased, while water levels increased at KC3. Increasing the culvert to 4 barrels at KC3 did not improve the simulated water levels. Upon conclusion of the study, it was recommended that the Project incorporates a three-barrel culvert and NDIA improve the flood relief channel dimension to the dimensions of KC2. This would require a 5m land take throughout the length of the channel. WSG will discuss with the EPC contractor the final design of culverts to assure that the chosen alternative be within the construction area (“fence to fence”).

3.3 Alternatives Conclusion

The road is already in operation and WSG is only making improvements to the road within the existing RoW; therefore, no other alternatives were considered except for the location of the utility relocation and drainage system upgrades.

4. DESCRIPTION OF THE EXISTING ENVIRONMENT

This section of the ESA describes the existing conditions within the area of influence of the proposed Project improvement area. It is divided into three major sections: physical environment, biological setting (biodiversity), and socioeconomic and cultural setting. This Section describes the baseline environmental conditions against which the predicted impacts of the Project are measured in Section 5. Information presented corresponds to primary and secondary information obtained in 2015 during the preparation of the first ESA. It was complemented by assessment during a site reconnaissance visit conducted in June, 2022. The description of activities conducted and photolog of the site visit can be found on Appendix A.

4.1 Physical Environment

4.1.1 Climate

Guyana's climate is influenced by the following major elements:

- Seasonal shifts in the Inter -Tropical Convergence Zone (ITCZ);
- Tropical Waves;
- Upper Level Troughs;
- Southern Hemisphere Upper Troughs; and
- El Niño Southern Oscillation (ENSO) Events.

Guyana has a wet tropical climate characterized by two pronounced wet seasons and year-round warm temperatures. The bimodal wet/dry regime is caused by the annual migration of the ITCZ, which changes latitude based on the Earth's position and angle in relation to the sun. In the areas closest to the ITCZ, one can expect increased thunderstorm activity and heavy rainfall between mid-April and the end of July, with peak rainfall in June. This period is known in Guyana as the primary wet season. The secondary wet season occurs during the southward migration of the ITCZ from mid-November to the end of January, with peak rainfall in December.

According the World Bank Group climate change knowledge portal (WBG, 2021[9]), the mean temperature in Guyana is 25 ‑ 27.5 degrees Celsius (°C) throughout the year in most regions except the upland regions in the west, where mean temperature is 20 ‑ 23°C. Guyana experiences two wet seasons; most of the country receives 250 ‑ 450 millimeters (mm) per month between May and July, and the second wet season affects mainly the northern, coastal regions which receive around 150 ‑ 300 mm per month in November to January. El Niño episodes lead to dry conditions throughout the year and bring warmer temperatures between June and August and La Niña years bring wetter and cooler conditions than normal during the long wet season (McSweeney et al., 2010). Relative humidity averages around 70% in the Savannahs, 80% on the coast and 88% in the rainforest. Morning fog can be widespread and persistent in the hinterland districts.

Temperatures in Georgetown are quite constant, with an average high of 32°C and an average low of 24°C in the hottest month (July), and an average range of 29°C to 23°C in February, the coolest month. The highest temperature ever recorded in the capital was 34°C and the lowest only 20°C. Humidity averages 70 percent year-round. Locations in the interior, away from the moderating influence of the ocean, experience slightly wider variations in daily temperature, and nighttime readings as low as 12°C have been recorded. Humidity in the interior is also slightly lower, averaging around 60 percent (IMC, 2015). Near the Project the hot season lasts approximately for 2.7 months, from August 12 to November

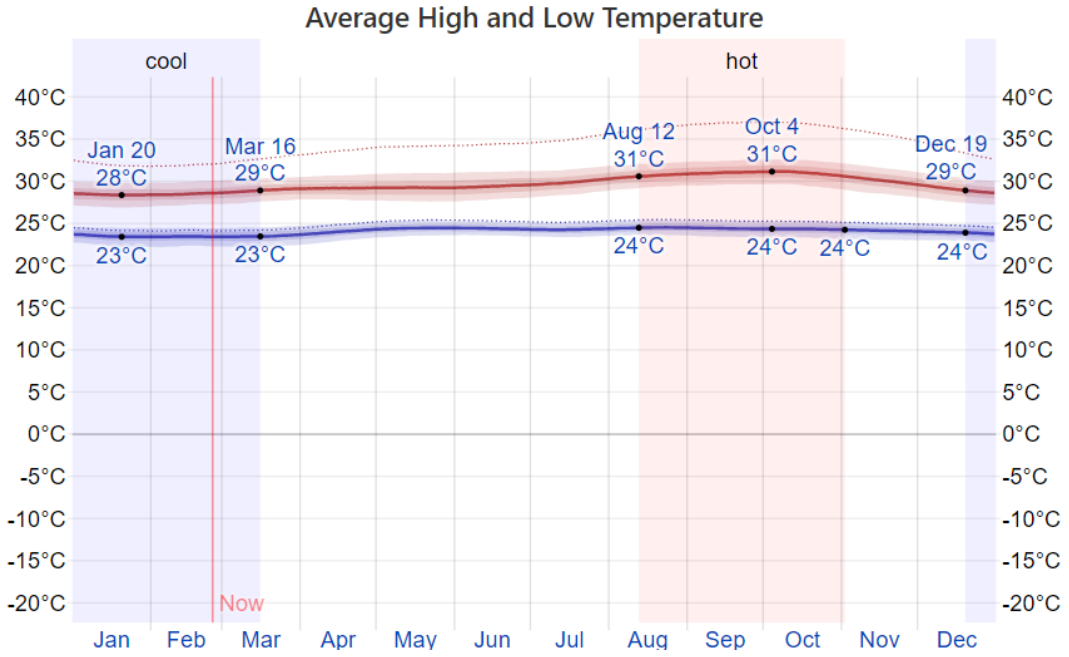
[9] World Bank Group: https://climateknowledgeportal.worldbank.org/country/guyana/climate-data-historical

2, with an average daily high temperature above 31°C. The cool season lasts approximately for 2.9 months, from December 19 to March 16, with an average daily high temperature below 29°C (see Figure 4-1). In Georgetown approximately 2,400 mm of rain fall per year. The wettest month is June, with 345 mm and the driest is September, with 90 mm (see Figure 4-2).

In the central-eastern parts of the coast, where Georgetown is located, between the two relatively dry seasons, in September-October (when 90/95 mm or 3.5/3.7 inches of rain fall per month), it rains just a little less than in February-March, so the difference is not significant. Here, therefore, there is no real dry season. In Georgetown, 2,400 mm (94.5 in) of rain fall per year. The wettest month is June, with 345 mm (13.5 in) of rain. Here is the average precipitation.

Average wind speeds for Guyana are typically 6 meters per second (m/s). However, between July and August, stronger westerly winds, which influence the prevailing wave climate, are experienced. Wind speeds also vary seasonally. During the dry season, the strongest winds are experienced between January and April when the northeast Trade Winds dominate. Wind speeds range, on average, between 9 kilometer per hour (km/h) (wet season) and 12 km/h (dry season).

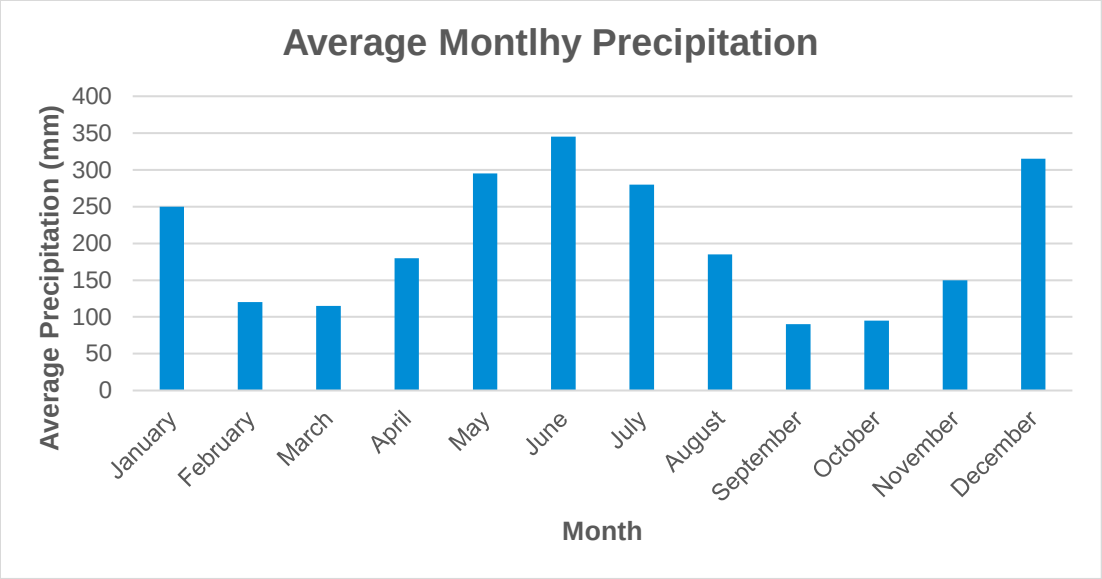
In the central-eastern parts of the coast, where Georgetown is located, between the two relatively dry seasons, in September-October (when 90/95 mm or 3.5/3.7 inches of rain fall per month), it rains just a little less than in February-March, so the difference is not significant. Here, therefore, there is no real dry season. In Georgetown, 2,400 mm (94.5 in) of rain fall per year. The wettest month is June, with 345 mm (13.5 in) of rain. Here is the average precipitation.



The daily average low (blue) and high (red) temperature with percentile bands (inner band from 25th to 75th percentile, utter band from 10th to 90th percentile).

Source: Cedar Lake Ventures, 2021.

Figure 4-1: Daily Average Temperature for Georgetown



ERM, 2021. Adapted from Climates to Travel – https://www.climatestotravel.com/climate/guyana

Figure 4-2: Average Monthly Precipitation for Georgetown

4.1.2 Air Quality

The major air emission sources in the Project Area are attributable to heavy traffic from the roadway itself. Therefore, it can be presumed that average air quality in the Project Area is medium and typical of an urban environment with dense traffic. The major air pollutants likely to be present in the Project Area include inhalable particulate matter (mostly smoking in public places), and combustion/exhaust emissions such as carbon monoxide (CO), sulphur dioxide (SO_2), nitrogen dioxide (NO_2), and volatile organic compounds (VOC). Most of the roads are paved, which results in low dust generation. Primary data was not collected at the time of writing the 2015 ESA. WSG will measure ambient air quality prior to commencing activities and will periodically monitor air quality after the start of construction per the Environmental Management Plan described in section 7.4.1.

The most significant existing air pollution sources in the Project Area are likely to include vehicles movement or idling and its access roads (cars, trucks, buses, and motorcycles);

Traffic activity, wind speed, and direction can have a big influence on pollutant concentrations. Generally, the more traffic, the higher the emissions; however, certain activities like congestion, stop-and-go movement or high-speed operations can increase emissions of certain pollutants. The traffic congestion and stop-and-go movements on the Project road restrict the proper dispersion of vehicle exhaust emissions, which further increases emissions of some pollutants in the Project Area. Section 19+700 to 25+000 which occurs right after Linden junction experiences a far less destructive traffic regime and therefore will produce lower pollution concentrations.

Growth of passenger carrying and commercial vehicles on the roadway is directly tied to economic activity which can be measured by evaluating Gross Domestic Product (GDP) and GDP per capita (GDP pc), as shown in Table 4.1.

Table 4.1 Traffic Forecast

	Forecast Variable	Growth % 2014-2050	Elasticity Value	Forecast Traffic Growth %
Commercial Vehicles	GDP	3.49	1.09	3.8
Light Vehicles	GDP pc	3.54	1.35	4.8

Source: Economic Appraisal Final Design

The pavement design was informed by estimated equivalent standard axle loads (ESAL[10]) for a period of 10 and 20 years, based on expected GDP growth. A greater increase in vehicles on the road is expected on the rehabilitated roadway at section 0+000-19+900 compared to section 19+900-25+000. Regardless, the number of vehicles is both sections is expected to increase in the next 20 years.

Table 4.2 Traffic Design

Section	Design Life (years)	Design Traffic (ESALs)
0+000 – 19+900	10	10,173,327
	20	23,390,223
19+900 – 25+000	10	1,563,979
	20	6,613,280

Source: Pavement Design Report, 2015.

4.1.3 Noise

The major noise sources in the Project Area are attributable to traffic. Therefore, it can be presumed that the average noise level in the Project Area is medium and typical of an urban environment with dense traffic. However, primary data on noise levels was not provided in the 2015 ESA. WSG will conduct noise monitoring prior to the start of activities to establish a baseline and periodically monitor noise levels after the start of construction, per the Environmental Management Plan described in section 7.4.1.

The most significant existing sources of noise pollution in the Project Area are likely to include:

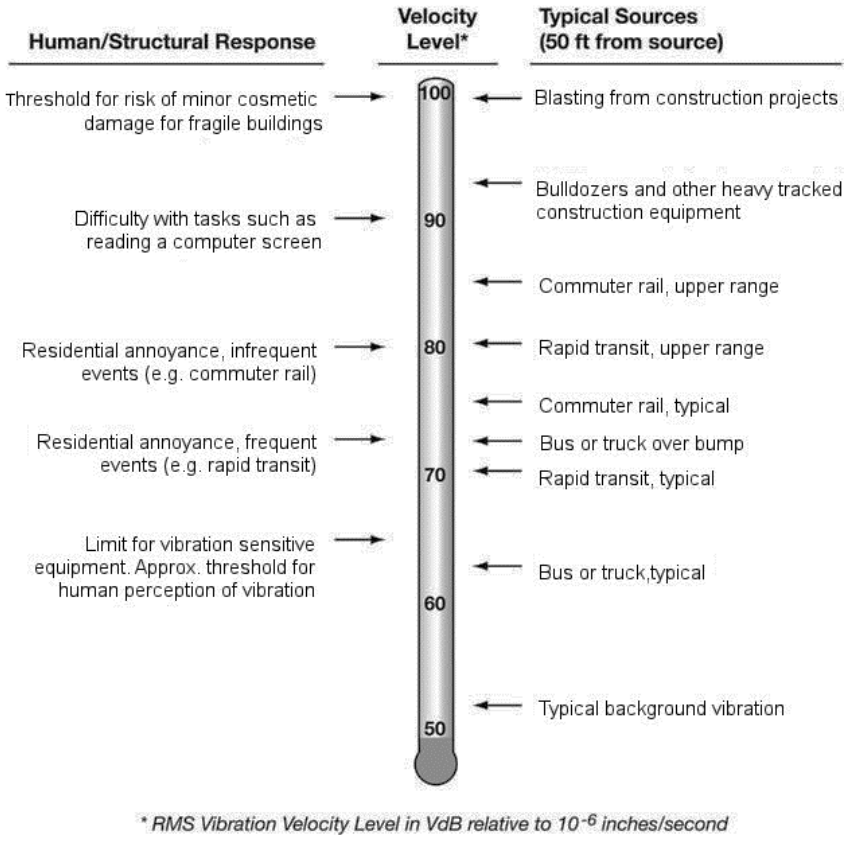
- Vehicle movement on the project road and surrounding secondary roads (passenger cars, trucks, buses, and motorcycles);
- Backup alarms from trucks on access roads.

The Project Area is surrounded mostly by commercial receptors, although there are residential lodgings too, corresponding to business owners who live above their shop or commerce. The buildings present in the Project area, as indicated in the Stakeholder Engagement Plan, determined the following structures are present:

[10] One ESAL represents the loading that produces an amount of damage to the pavement structure equivalent to one pass of a single 18,000-pound, dual-tire axle with all four tires inflated to 110 psi (US Department of Transportation)

- Residential homes
- Homes with a storefront
- Stores
- Auto sales stores
- Post office
- Supermarkets
- Office spaces
- Warehouses
- Construction sites
- Schools
- Junkyards
- Religious buildings
- Political offices
- Bridges
- Empty lots

Figure 4-3 shows typical day-night sound levels for different land uses and transit sources.



Source: FTA, 2006.

Figure 4-3: Typical Day-Night Sound Levels

4.1.4 Geology and Physiography

In general, Guyana is comprised of four main physiography Regions: Coastal Plain, Hilly Sand and Clay, Interior Savannahs, and Forested Highlands Regions (Guyana Lands and Survey Commission, 2013). The Project site is located in the Coastal Plain Region.

The Coastal Plain is a narrow belt, ranging between 8 and 65 kilometers (km) in width, with a length of 440 km that stretches from the Corentyne River in the east to Waini Point in the west and providing most of the agricultural production in the country. East of the Essequibo River the plain consists of recent and old sediments with recent deltaic and fluvio-marine clays and silts occurring on the coast with silty clays and sands inland.

Many areas of the coastal plain are below sea level while other areas are man-made and built-up to raise them above the surrounding land level. An elaborate system of sea defenses, along with irrigation and drainage canals, slice gates and dikes are required to protect the area from flooding. There is gravity drainage that allows water to drain to the west, into the Demerara River.

The soils of the low Coastal Plain are characterized as poorly drained and are comprised of four types of clay: Mara Clay, Brickery Clay, Tuschen Clay, and Lama Muck.

The stratigraphy geology of the Coastal Plain is comprised of four formations:

- The Demerara and Coropina Clay Formations: The average thickness of these formations is approximately 45 m and they are commonly known as the uppermost clay, overlying the White Sand Series. The Coropina Formation or old coastal plain is a reddish-yellowish compact clay overlain by the recent grey-brown Demerara Clay, which extends seaward approximately 15 km. The area covered by the above clays is poorly drained and marshes and coastal lagoons are developed on it. The clays, which contain brackish water, confine the upper part of the White Sand complex.
- White Sand Series Formation: This formation consists of up to 1500 m of a clastic sequence that extends from the Essequibo River in the west to the Corentyne River in the southeast, through Suriname. Laterally, the formation is comprised of the following series: loose angular quartz sands; intermediate clays and sands; lower sands; alternating sand and clay beds; and the B sands.
- Berbice Formation: Metamorphic, magmatic and volcanic rocks of Precambrian age form the basement complex of the Guiana Shield. The exposed contacts between the basement and the White Sand Series delineate the boundary of the coastal artesian basin.

These four formations are essentially comprised of a sequence of unconsolidated sediments considered to be of Plio-Pleistocene to recent age overlying a Precambrian age basement complex of metamorphic, magmatic and volcanic rocks of the Guiana Shield (Bleackley, 1956).

4.1.5 Hydrology and drainage

Guyana has an extensive network of rivers and streams that have many rapids and waterfalls, with an absence of naturally occurring lakes. Surface water (which is extracted from shallow reservoirs, streams, or drainage canals) is primarily used for agricultural and industrial purposes. Only about 10% of the country's drinking water comes from surface water. Guyana faces the typical water pollution problems of developing countries in tropical regions. Biological and chemical contamination of surface water varies in magnitude according to location but is increasing with population growth and land use demands (USACE, 1998).

According to the USACE (1998) excess water is a major concern in the coastal lowlands where the land surface is below sea level. The lower elevations of the country along the coast, where most of the population is located, are threatened by tidal flooding, especially during high spring tides. The coastal lowlands are drained of water through a series of canals. During low tide, the gates or kokers of these canals are opened to allow the water to drain into the adjacent rivers or into the Atlantic Ocean. Large-capacity pumps are also used at various sites to drain the canals. Short-term localized flooding is common when heavy rains coincide with high tide, forcing the influx of water out of the canal banks until the gates are opened again.

Fresh groundwater is the most reliable and important source of water for public use and is abundant along the coastal lowlands and foothills to the immediate south where most of the population resides. Throughout the country, nearly 60% of the ground water produced from drilled wells is used for domestic water supply. With a growing demand on surface water for agricultural and industrial needs, ground water is becoming an increasingly important water source.

The Project is located in the lower floodplain of the Demerara River, characterized by poor internal drainage conditions due to clay-rich soil. Drainage throughout the corridor relies primarily on canals equipped with sluices. Additionally, several drainage ditches are constructed along the corridor, due to human settlement near the Project right-of-way. These drainage ditches connect to the main drainage channels and empty into the Demerara River. Inadequate capacity of road cross-drainage structures to accommodate high-intensity short-duration rainfall could result in surface flooding. A drainage study was issued in September 2014 concerned with the drainage design of the road between Grove and Timehri and considered existing conditions of the Demerara River, potential sea level rise, and storms. 58 cross drainage structures exist in the corridor, most of which have the capacity to manage potential flooding that is predicted for the area. However, it is recommended that several channel improvements are made, as described in Table 4.3, below.

Table 4.3 Recommended Improvements to Drainage Design

Structure	Chainage	Invert level (m GD)	Soffit level (m GD)	Width (m)
5	3.200	14.00	60.50	2.50
6	4.130	14.00	16.50	3.5-
10	5.730	14.50	16.50	2.50
16	8.950	14.50	16.75	2.50
17	9.100		To be closed	
22	11.800	14.50	17.25	3.00
25	12.800	15.00	17.00	2.00
28	13.800	15.00	17.00	2.00
40	18.700	15.00	17.00	2.00
42	19.100	15.50	16.50	1.50
44	19.900	60.00	17.25	1.50

Source* CONSULTANCY SERVICES FOR UPGRADE AND EXPANSION PROGRAM East Bank Demerar Public Road (Golden Grove to Timehri) Road Design Project Drainage Studies Draft Final Report, September 2014

4.1.5.1 Water Quality Baseline

Untreated stormwater and sewage typically flows directly into the Demerara River and nearby canals, polluting the waterbodies. Mining operations upriver, leaching from agricultural activities, and

indiscriminate disposal of solid waste also add to the pollution of the River. To determine ambient pollutant conditions, water quality baseline studies for the Demerara River were conducted in 2015 and are presented in Table 4.4, below. Seven parameters, conductivity, salinity, total dissolved solids, pH, dissolved oxygen, temperature, and turbidity were evaluated at 11 sampling stations throughout the Timheri Corridor. However, water quality impacts resulting from road construction may be difficult to determine when compared against the baseline data collected, due to non-point sources of pollution. Likewise, sustained levels of high turbidity have been noted in the Demerara River but, long-term monitoring data of flow discharge was not available at the time of writing to demine the cause for the phenomenon.

Table 4.4 Demerara River Water Quality Baseline (2015)

Location	Conductivity µ5	Salinity mg/l	Total Dissolved Solids mg/l	pH	Dissolved Oxygen mg/l	Temperature c	Turbidity NTU
CH 0+800	9.28	5.2	5.00	6.54	5.33	29.7	99.9
CH 4+00	711	0.3	345	7.14	1.49	28.3	16.3
New Hope-Eroded Demerara River Area	3.45	1.8	1780	7.3	4.82	28.3	1081
New Hope Fisheries	3.41	1.7	1780	7.4	4.79	29	1078
Koffi Structure (Eastern Side)	8.87	4.9	4.81	6.98	1.49	27.7	99.9
Koffi Structure (Western Side)	15.5	5.8	1735	5.34	4.34	29	1100
CH5+400	8.28	3.2	6.80	6.34	4.33	29.1	98.9
Friendship Gas station 9(Western Side)	781	0.04	380	7.31	0.83	29.2	40.1
Ch 7+40	326	0.2	157	3.66	4.16	29.1	6.4
CH 10+200	245	0.1	136.4	7.45	6.17	29.5	16.4
Jettoos Area	320	0.1	150.6	3.79	4.00	29.4	14.5

Source: IMC, 2015

From the baseline data it can be determined that the river transports large volumes of sediments, as sampling indicates a total suspended solids level of 1100 mg/L and total dissolved solids level of 1780.

Erosion can be expected during flooding and according to the Project Manager for the River Defense project, some areas of the river experience active erosion.

4.1.6 Soils and Geomorphology

The topography of the Project area is typically low–lying and flat. The soils of the area are a combination of Demerara clays, white sand, and pegasse in some areas Dam. The soils are characterized by four different types of clays Mara Clay, Brickery Clay, Tuschen Clay and Lama Muck a combination of the following is expected:

- Mara Clay: Poorly drained soil developed from relatively old marine sediments. It occurs in depressions and is characterized by a shallow peat deposit over thick grey clay underlain by greenish grey clay subsoil.
- Brickery Clay: Poorly drained soil developed in river alluvium. The alluvium may have been deposited over fluvio-marine sediments. It is characterized by a thin dark grey surface over grey clay subsoil mottled with brownish yellow, yellow red and brown. The substratum is soft green grey clay, which may contain numerous bits of partially decomposed organic matter. The soil is strongly acid, slowly permeable and has a moderate level of fertility.
- Tuschen Clay: Poorly drained soil developed in river alluvium. It is characterized by a thin dark grey clay surface over a grey to greenish clay subsoil with mottles of brownish yellow, yellowish red and brown. The soil is strongly acid, slowly permeable and has a moderate level of fertility.
- Lama Muck: Poorly drained organic soil occurring in expressional areas. The soil consists of well decomposed muck underlain by dark reddish brown peat. The substratum is greenish grey soft clay.

4.1.7 Natural Hazards and Climate-related Risks

A recent study identified Guyana as exhibiting high climate vulnerability to effects on fishing and food security (Ding *et al*., 2017). Both changes in rainfall patterns and predicted sea-level rise associated with climate change pose threats to the Guyanese population and its livelihoods. For reference, the mean relative sea level rise in Georgetown between the years 1960 and 2010 was 9.25 inches, resulting from a combination of global mean seal level rise and coastal subsidence. The projected rise in sea level by 2100 is 3 feet in Geogetown. Additionally, historical land surveys and Survey Commission levelling data indicate large parts of the east and west bank of the Demerara river are threatened by salt-water inundation as a result of the anticipated sea level rise. This is exacerbated due to the country's outdated and insufficient drainage systems. Human factors such as inefficient management of solid waste and lack of regular maintenance of existing drainage and irrigation infrastructure add to these risks.

Recognizing this, the country invests continuously in the construction and maintenance of sea and river defences infrastructure, as well as a system of reclaimed lands, drainage and irrigation canals, pumping stations, and conservancy dams to protect agriculture in the vulnerable coastal areas. Despite this investment, floods continue to threaten public safety and infrastructure along the coast.

Guyana has various Early Warning Systems in place to manage these climate-related risks. An overarching EWS based on hydrological, meteorological, and health hazard assessments works with three main ministries who provide warnings (Agriculture, Public Works, and Health). Guyana's EWS adheres to the Hyogo Framework for Action (HFA) as the overarching DRM international agenda as well as following the HFA-based Early Waring guidance from the Caribbean Disaster Management Emergency Agency. The draft version of the Multi-hazard Disaster Preparedness and Response plan developed by the CDC in 2013 encompasses Guyana's disaster risk governance arrangements. The plan outlines the formulation of emergency or contingency plans at the national level including a set of

"Response Sub Plans and Standard Operating Procedures (SOPs)". Provisions and regulations for the establishment of contingency plans in the different sectors and ministries are further detailed in the plan.

Per the Project Profile (GY-L1081), the IDB Disaster and Climate Change Risk Classification for the Project is High. The justification for the classification as provided by IDB is as follows: "the area [of the Project] is prone to flooding and the criticality and vulnerability estimated for the infrastructure's interventions are high due to the potential negative impacts of service failure given the roadway's importance as a corridor to the main international airport." Additional hydrological analysis of the Demerara River basin was conducted taking into account historical rainfall and General Circulation Model (GCM) data for the climate change scenario. Extreme precipitation events are estimated for different return periods in the Georgetown-Timehri Road section, considering historical and climate change scenarios. Historical precipitation events are based on information from 4 rainfall measurement stations and future extreme precipitation is studied based on daily precipitation data from 5 GCMs for the climate change scenario.

The World Bank Group's Think Hazard! tool[11] is a high-level, on-line, natural hazard risk data base for emerging market countries (the web-based tool developed by the Global Facility for Disaster Relocation and Recovery (GFDRR) in partnership with the World Bank Group and other institutions, and with data contributed by numerous organizations around the world. This tool was queried to assess relative risk ratings for a suite of potential natural hazards for Guyana to provide additional context around the IDB Disaster and Climate Change Risk Classification. The relevant risk categories identified in Region No. 4 (Demerara Mahaica) are listed in decreasing order of risk:

- River flooding (high).
- Coastal flood (high).
- Extreme heat (medium).
- Wildfire (medium).
- Urban flooding (low[12]).
- Tsunami (low).
- Cyclone (low).
- Landslide (low).
- Water scarcity (very low).
- Earthquake (very low).

Flooding risks are described below in the context of Georgetown and the Project Area. In addition to the risks of extreme storms and high winds. The risks for the occurrences of tsunamis, cyclones, landslides and earthquakes are not discussed as these risks are not considered to be relevant for the region assessed.

According to ThinkHazard.org tool, the hazard of coastal flooding in the Project area is classified as *High* based on modelled flood information currently available. This means that potentially damaging and life-threatening river floods and coastal waves are expected to flood the coast and riverine areas at least once in the next 10 years. Sea Level rise studies were carried out at the Guyana Coastline near

[11] https://thinkhazard.org/en/

[12] Urban flooding was marked as high-risk for Guyana in general but low for Region 4. Nevertheless, during a site visit and through photographs of the site, there are urban structures along the road; mainly commercial, which, due to their location, could be prone to flooding.

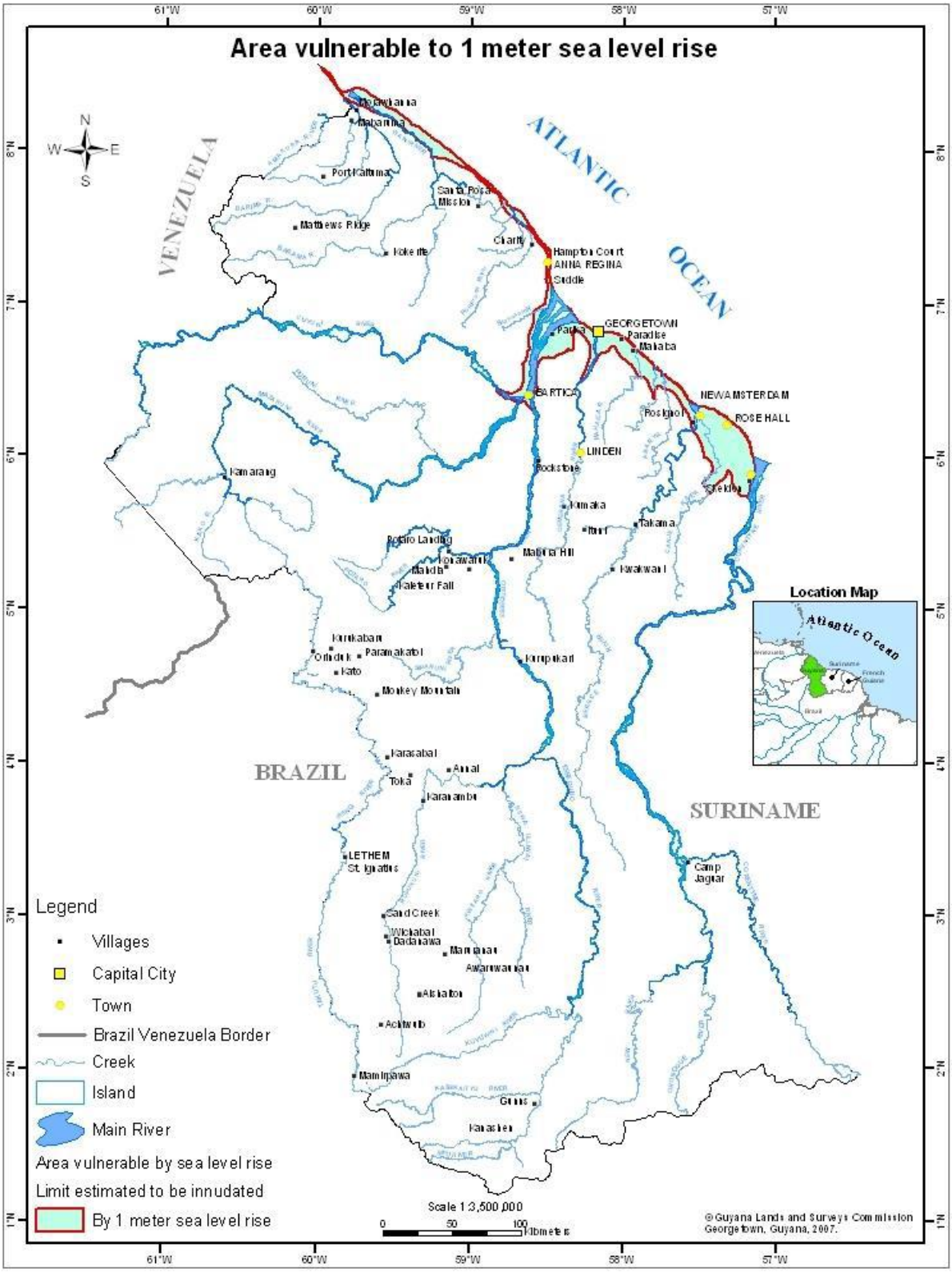
Georgetown. In the year 1970, sea level was measured at a height of 57.1100 ft GD at the Kingston Lighthouse in Georgetown. Sea level rise was measured again at the same location in the year 2008 and was registered at 56.9763ft GD, a difference of 1.60 inches. The observed difference over the period of 38 years suggests coastal subsidence.[13] Subsidence in Georgetown is likely related to groundwater abstractor for the city's potable water supply. Additionally, the mean relative sea-level rise in Georgetown over a period of 50 years is 9.25 inches, compared to a global mean sea-level rise of 7.9 inches over a period of 100 years.

The hazard of river flooding in the Project area is classified as *High* based on modeled flood information currently available. Potentially damaging and life-threatening river floods are expected to occur at least once during the next 10 years. Climate change is anticipated to increase the likelihood and severity of river flooding as extreme rainfall events are expected to increase.

Based on this information, the impact of coastal and river floods must be considered in different phases of the project for any activities located near the coast and river. Project planning decisions, project design, and construction methods must consider the level of coastal and river flood hazard. The eustatic sea level rise to be considered for the design of Grove to Timehri should be 55mm/year.

Short-term weather variability such as high intensity rainfall or wind or tidal/wave activity is the usual cause of floods, while sustained periods without rain cause droughts. The extent of flooding is also influenced by human factors such as the management of solid waste, and the maintenance of physical infrastructure for drainage and irrigation, conservancies and sea defences (UNDP, 2012). Figure 4-4 shows hazard areas vulnerable to one meter sea level rise due to climate change. The most destructive coastal flood occurred in January 2005, as heavy rainfall caused catastrophic flooding along Guyana's coasts, affecting 290,000 people – almost half of Guyana's population. Total flood damage was estimated at $465 million, or nearly 60% of the country's GDP, prompting the government to work towards increasing its capacity to manage flood risk.

[13] NASA Sea Level Change Portal," NASA (NASA, February 19, 2021), https://sealevel.nasa.gov/understanding-sea-level/regional-sea-level/subsidence#:~:text=In%20coastal%20areas%2C%20sinking%20land,the%20seaward%20migration%20of%20coastlines



Source: UNDP, 2013.

Figure 4-4: Flood Hazard Map for Guyana

4.2 Biodiversity

The Project is located within the East Demerara River of the East Demerara Coastal Plain. The coastal plain is characterized by cultivated fields and secondary vegetation (Huber et. Al., 1995)[14] . Human activities, current and historic, have modified the primary ecological functions and species composition, resulting in fragmentation and loss of natural habitats through agriculture, urbanization, and industrial activities. Only species that easily adapt and thrive successfully to rapidly changing environments are present within the modified coastal habitats. No invasive species were observed in the project area, per fieldwork conducted in 2015.

The East Demerara Coastal Plain consists of habitats that include urban areas and the extensive landscape east and southeast of the Project site previously used for sugar cane cultivation. Habitats typical of the East Bank of the Demerara River include: mangroves (Protected Habitats); salt/brackish marsh lands; mudflats; cultivated/abandon sugar cane fields; pasture and secondary forest lands; urban areas; and drainage canals.

Figure 4-5: Fly-over Timehri section of roadway

Source: Captudata, 2022.

Faunal species typical of the landscape are predominantly species that adapt easily to human disturbed habitats. Birds known to occur in the landscape of the Project include the Kiskadee (*Pitambus sulphuratus*), Cattle egret (*Bubulkus ibis*), Blue-gray tanager (*Thraupis episcopus*), humming bird (*Amazilia fimbriata*), Wattled Jacana (*Jacana jacana*), Yellow Plantain (*Icterus nigrogularis*), herons, common flycatchers, doves (*Columbigalla paserina*), kingfishers, parrots, and vultures.

Common fish species include cichlids such as the Patwa (*Cichlasoma bimaculatum*), and Sunfish (*Grenicichla alata*), the Hassar (*Hoplosternum littorale*), piraucu (*Arapaima gigas*) and the freshwater barracudas or Houri (*Hoplias malabaricus*). Herpetofaunal species such as caimans (*Caiman crocodilus*), the Crapaud (*Bufo marinus*), gecko (*Thecadactylus rapicauda*), salipenta (*Tupinambus teguixin*), and the common Frog (*Hyla minuta*) are known to occur, as well as several snake species. Domesticated animals

[14] Huber et al., 1995; Vegetation Map of Guyana; Centre for the Study of Biological Diversity, University of Guyana

such as sheep and cattle are common in disturbed secondary forests, but none are present in the Project area.

4.2.1 Flora and Fauna

The Demerara River originates in the northern slopes of the Makari Mountain and flows north for 346 km until it reaches the Atlantic Ocean in Georgetown. The river flows through a huge area of the hilly sand and clay belt, mainly covered by forest, and the last part of the river lies in the flat alluvial coastal plain, with the most economic activities (mostly sugar) and highly populated areas. This part has a completely human-made water management system, engineered by the Dutch in the 18th and 19th centuries to control the water in the low-lying regions. The substrate consists predominantly of fine white sand, with some clay and organic matter. The project roadway runs along the east side of the river. The project team observed mostly mobile and common species such as lizards, salipentas, butterflies, and ants. In addition, during the site visit conducted on 2022, vegetation alongside the road seemed heavily disturbed.

The shoreline along the Demerara River is largely developed with impervious surfaces comprised of marinas, businesses (mostly fishing), and industrial sites. Patches of significantly fragmented and/or degraded riparian habitats characterize the banks where there are no developments. The Flora consists of common weeds and shrubs. Identified species include the carrion crow bush (*Senna alata*), sleep and wake plant (*Mimosa pudica*), wild eddoes (*Colocasia antiquorum)*, and bamboo (*Bambusa vulgari*). Much of the natural habitats are degraded due to Georgetown's poor stormwater drainage infrastructure as well as untreated sewage discharge, as described in section 4.1.5.1. Due to the River's urban location and its high concentration of pollution, including garbage and raw sewage, it supports minimal flora and fauna biodiverse habitats, and in the Georgetown area, is practically devoid of any benthic, flora or fauna communities. The Cecropia (*Cecropia* spp.) tree is a common vegetation species that grows in disturbed areas throughout Guyana. Similarly, the spectacled caiman (*Caiman crocodilus*) is a common (and IUCN Least Concern) reptile species that is typically found in slow moving waterways and wetlands. Common green iguanas (*Iguana iguana*) are also found throughout the urban environment near and in Georgetown. Baseline work was not been updated at the Project site since 2015; in addition, common species were identified through secondary sources at a regional level. No endangered species or species identified in IUCN species listings or restricted by the CITES listings were identified in the Project area during 2015 field efforts.

4.2.1.1 Protected Species

The Project area is largely modified and is not known to contain any endangered species. None of the species identified during baseline work or site visits were listed on the IUCN species listings or restricted by the CITES listings.

4.2.2 Ecosystem Services

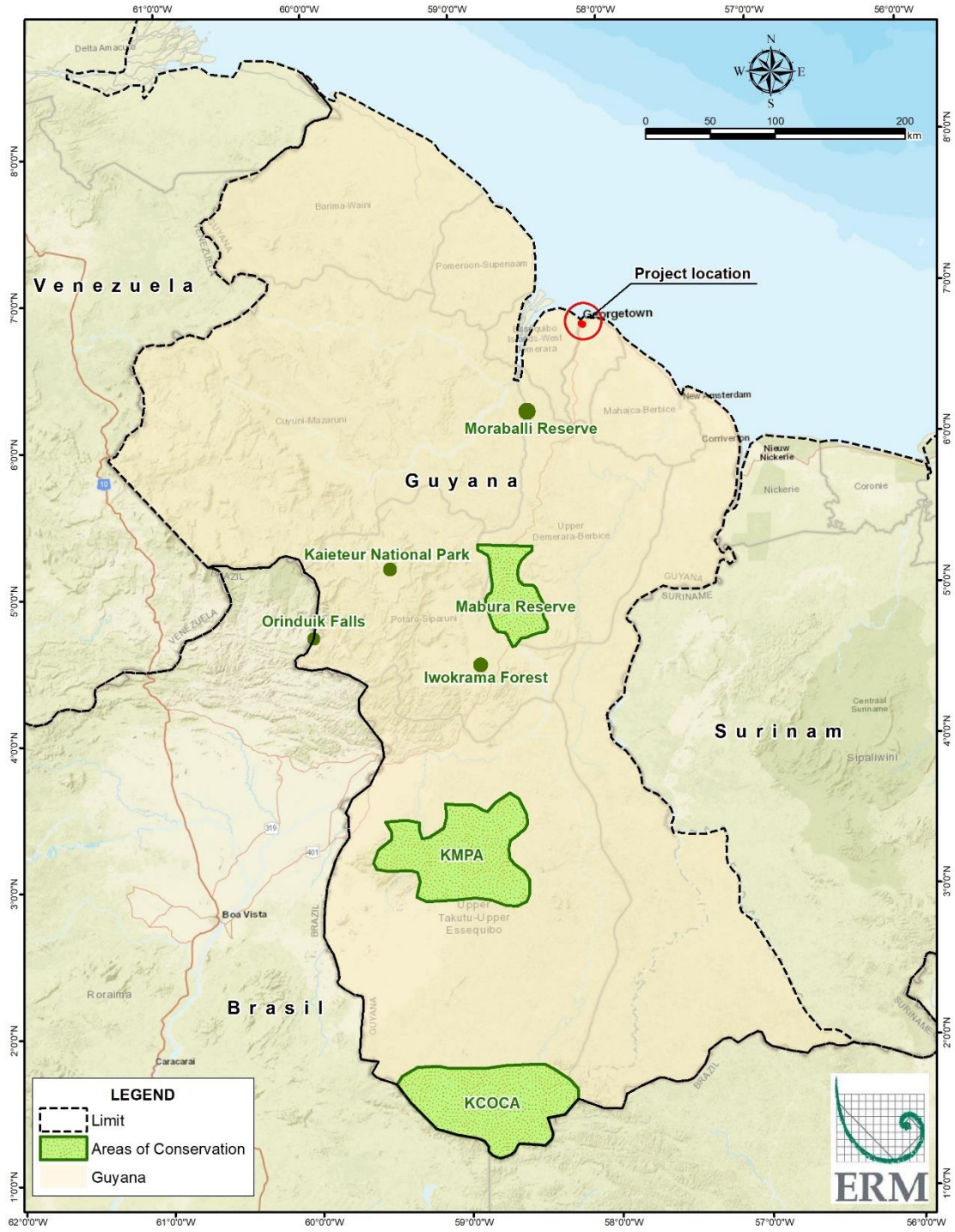
Guyana has a strong cultural sector and fisheries, which correspond to a large portion of its economy. Forestry (mangroves) and aquatic resources (rivers) play a substantial role in the provisioning of several ecosystem services such as reducing erosion, flood control, and regulating water and soil quality. Nonetheless, these are not directly affected by the Project given that activities dependent on these services are outside of the AoI. Stakeholders affected by the Project are business owners and residents whose activities will be impacted through alteration of access to their shops and increased road traffic, but not by impediment or reduction of ecosystem services that they depend on. There will be no land use change (i.e., vegetation clearance) that could alter benefits for stakeholders.

Mangrove forests play an important role in nutrient cycling and provide habitat for a diversity of flora and fauna, some of which are exploited by humans as provisioning services, and some of which have tourism value. Aquatic ecosystems are important producers of oxygen through phytoplankton photosynthesis and estuarine sediments and mudflats contribute to nutrient cycling.

4.2.3 Areas of Conservation

The area of the Project has not been identified by the Government of Guyana (GOG) as a priority for conservation interest. The conservation initiatives in Guyana are largely focused on the larger forested landscapes of central and southern Guyana or in the Rupununi Savannah region.

The conservation priority sites identified by the GOG include the legally protected areas of the Kanuku Mountains (KMPA), the Shell Beach Protected Area (SBPA), the Kaieteur National Park, the Iwokrama Rainforest Reserve, and the Community Owned Conservation Area at Konashen (KCOCA), and other areas of biological interest not legally protected including the Guyana Forestry Commission Moraballi and Mabura Reserves, the Orinduik Falls and Roraima Mountains (see Figure 4-6). None of the legally protected areas and other areas of biological interest are located within the area of influence of the Project. There are currently no classified KBAs in the Project area as the setting is urban and highly disturbed and there are no endangered species registered so far.



Source: Prepared by ERM, 2021. Note: The Location of the Project is approximate and corresponds to the beginning of the road

Figure 4-6: Guyana Areas of Conservation

The National Mangrove Management Action Plan (2010) established a legal framework for mangrove ecosystem management which developed effective protection and rehabilitation of mangrove ecosystems. The Forests Act (2009) Part 3. 5.2.3 (1) mandates the EPA to declare specific areas of state forests as protected areas for a period not exceeding 25 years. Amendment of regulation 17 of Principle Regulations of The Forests Act strengthened the legislation specifically around mangroves. The amendment states that “no mangrove should be felled without first obtaining permission in writing of an authorized forest officer not below the rank of an assistant commissioner of forests” (The Forests Act, Section 42).

4.3 Socioeconomic and Cultural Resources

This baseline was developed using a combination of desktop (secondary) and field-based (primary) research. Desktop studies draw upon publicly available information such as the national census, non-governments organizations, and multilateral institutions. It is noted that although all efforts were made to locate recent data, in some cases, the available data are relatively dated (e.g., the most recent census was conducted in 2012).

Field-based research includes a qualitative stakeholder engagement survey conducted in communities in the Project area; specifically, Grove, Friendship, Soesdyke, and Timehri. The survey included questions about basic demographic information and public knowledge/sentiment about the Project, and potential impacted peoples. The surveys took place on July 6 and July 7, 2022, as part of early-stage stakeholder engagement efforts, and involved interviewing 33 people in the Project area. The survey form may be found in Appendix D.

4.3.1 Administrative Structure

Guyana is divided into ten administrative regions, pictured Figure 4-7. The regions are overseen by Regional Democratic Councils (RDCs) which are further subdivided into 70 NDCs and nine town councils (TCs) that are comprised of villages. Villages are the smallest administrative unit within the NDCs. In addition, there is one city that serves as the capital (Georgetown), and nine townships. Four of these townships were designated as new townships by the Ministry of Communities in 2015 as part of an administrative decentralization effort. Of the ten administrative regions, this ESA is focused on Region 4.

Source: Prepared by ERM, 2021. Note: The location of the Project is approximate and corresponds to the beginning of the road

Figure 4-7: Administrative Regions and Townships of Guyana

4.3.2 Historical and Political Context

Originally a Dutch colony in the 17th century, Guyana was transferred to the British in 1815. The country mostly remained in British possession after 1796, and after purchase of other adjoining areas (Demerara, Berbice and Essequibo), became consolidated as the colony of British Guiana. After the abolishment of slavery in 1807 and full emancipation in 1838, freed slaves established their own settlements in the coastal plain. Plantation owners imported indentured workers from India to replace the slave labor. Universal adult suffrage was introduced in 1953 as part of a new constitution, which marked the beginning of a tumultuous, albeit improving, political landscape. In 1970, Guyana was officially proclaimed a cooperative republic within the Commonwealth (Guyana - The World Factbook (cia.gov)). The country's legacy was a strong factor in its development and progress, as explained in this section.

4.3.2.1 Poverty and Development

Guyana was long considered one of the poorest countries in South America. However, as of 2016, Guyana was reclassified from a lower middle-income country to an upper middle-income country by the World Bank (World Bank, 2016), resulting in improvements in reducing the incidence and severity of poverty. The country is well-endowed with natural resources, including major oil reserves, which is one of the largest contributors to the economic development in Guyana (World Bank 2021).

Guyana's economy relies heavily on trade, with exports totaling $558.79 billion GYD ($2.794 billion USD) in 2020, up from $338.47 billion GYD ($1.692 billion USD) in 2019 (Bank of Guyana 2021). The main export products for the country are sugar, rice, bauxite, gold, forest products, and—as of 2020—crude oil (FAO 2015; Bank of Guyana 2021). In 2020, exports of sugar, timber, and other goods declined by 13.4 percent, 17.9 percent, and 37 percent, respectively. Oil exports began in 2020, amounting to 26.6 million barrels (4.3 million cubic meters [m3]) over the year, valued at approximately $222.376 billion GYD ($1.112 billion USD).

In 2020, Guyana ranked 122 out of 189 ranked countries for human development, falling into the "Medium Human Development" category. The country's Human Development Index (HDI) score in 2020 was 0.682, in comparison with an overall 2018 Latin America and the Caribbean (LAC) score of 0.758 (UNDP, 2021). Trend data for Guyana shows a slow but positive trend in recent years.

As of 2022, more than 43 percent of Guyana's population lives on less than $5.50 per person per day, and children from rural areas, urban poor families, Amerindian communities and other vulnerable and marginalized groups suffer from numerous poverty-related deprivations (2022-PL9-Guyana_and_Suriname_draft_CPD-EN-2021.11.15.pdf (unicef.org))

4.3.2.2 National Development Goals

Guyana launched a low-carbon development strategy (LCDS) in 2009, and established a partnership with Norway for a Reducing Emissions of Deforestation and Degradation, and fostering conservation, sustainable management of forests, and enhancement of carbon stocks (REDD+) "payment for forest conservation" agreement. The Government also developed in 2018 developed a Green State Development Strategy (GSDS) to guide the country's economic and socio-cultural development over the next 15 years. The GSDS included principles for the gradual decoupling of economic growth from environmental degradation, aiming for transition to 100% renewable energy by 2025, and redirecting investment to green economic sectors. However, since the defeat of the previous administration at the polls, the new government has reverted to using the LCDS as the overarching developmental paradigm for the country (Ministry of the Presidency, 2017).

Part of the GSDS is a National Land Transport Strategy, in which the country's infrastructure is updated to support the economic and socio-cultural development through trade flows, travel, and promoting

economic assets and human settlements. Economic activity and equitable access to services heavily relies on roads in Guyana, which is a significant impetus for the country's focus on improving road infrastructure. According to the 2022 IDB Country Strategy with Guyana, the country "ranks 104th in terms of road infrastructure" out of the comparative 140 economies. Guyana has approximately 2,605 kilometer of recorded roads, with around 35% along the coast and the riverbanks. The general conditions of the roads throughout Guyana vary, but most generally display different levels of distress, further contributing to the national road connectivity issues (Green State Development Strategy, 2018)

4.3.3 Population and Demographics

4.3.3.1 Population Distribution and Migration

Most of Guyana's population is located in the six coastal regions, and according to the 2012 national census, nearly half of the country's population lives in Region 4 (Demerara-Mahaica), which includes the capital city of Georgetown. Table 4.5 summarizes the distribution of population within Guyana's 10 regions in 2012, the last year for which complete census data are available.

Table 4.5: Regional Population Distribution in Guyana

Region		Population 2002	Population 2012	Population change since 2002	Percent of Guyana's Total Population
1	Barima-Waini	24,275	27,643	+13.9%	3.7%
2	Pomeroon – Supenaam	49,253	46,810	-5.0%	6.3%
3	Essequibo Islands – West Demerara	103,061	107,785	+4.6%	14.4%
4	Demerara-Mahaica	310,320	311,563	+0.4%	41.7%
5	Mahaica – Berbice	52,428	49,820	-5.0%	6.7%
6	East Berbice – Corentyne	123,695	109,652	-11.4%	14.7%
7	Cuyuni-Mazaruni	17,597	18,375	+4.4%	2.5%
8	Potaro – Siparuni	10,095	11,077	+9.7%	1.5%
9	Upper Takutu – Upper Essequibo	19,387	24,238	+25.0%	3.2%
10	Upper Demerara – Berbice	41,112	39,992	-2.7%	5.3%
	Guyana	748,084	746,955	-0.6%	100.00%

Source: Bureau of Statistics Guyana, 2012; Bureau of Statistics Guyana, 2002.

Of the total population taken in the 2012 census, 49.8% were male and 50.2% were female (Bureau of Statistics Guyana, 2012). On average, the population density has remained constant (between 3.8 to 3.9 persons) per square kilometer from 2012 to 2017 (World Bank Data). However, large parts of the country such as the hinterlands, remain uninhabited or have a very sparse population. Regarding age distribution, nearly 71 percent (529,457) people was comprised of people below the age of 40 in 2012.

As previously discussed, Region 4 has the highest population of the regions in Guyana. The Project site, due to its dual location in Region 4 and proximity to Georgetown, has a high population relative to other areas in the country. The Project area has a population of approximately 61,265 people, according to the 2012 National Population Census. Villages near the area of influence include Great Diamond (9,071); Soesdyke (4,114); Timehri (4,433); Eccles (3,585), and Herstelling (3,255). As of 2012, the gender breakdown of Region 4 was comprised of 48.9 percent males and 51.1 females. The population distribution by age in Region 4 in 2012 is described in Table 4-6.

Of the 34 survey respondents in the Project area, gender was evenly split in half between males and females, and respondent ages ranged from 17 years of age to 79 years of age.

Table 4.6: Regional Population Distribution by Age

Region	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Demerara-Mahaica	18,340	22,948	16,616	15,697	13,957	10,126	4,972	2,377	886

4.3.4 Vulnerable Peoples

Vulnerable peoples are considered those who are physically, mentally, economically, or socially disadvantaged who may be unable to meet their basic needs (Vulnerable Groups | INEE); namely, women, children, elderly, people with disabilities, and minorities. The following sections explore vulnerable demographics in Guyana, Region 4, and the Project area.

4.3.4.1 People with Disabilities

Approximately 6.5 percent of the national population (48,419 people) was identified as having a disability in the 2002 census. Of that population, approximately 22 percent were in the labor force. The proportion of females with disabilities was higher than males with disabilities.

In the Project area, age, and combined mental and physical handicaps were the most prevalent disabilities among nearly 8 percent of respondents or their household members.

4.3.4.2 Women and Children

Guyana faces challenges related to gender equality and gender-based violence. Guyanese women and children are largely considered vulnerable to widespread violence due to the persistent presence of harmful norms, practices and traditions, patriarchal attitudes, and deep-rooted stereotypes regarding the roles, responsibilities, and identities of women and men in all spheres of life (UN Women, Guyana: Concluding Observations Report, July 2012). In 2019, Guyana ranked 115 out of 189 in the Gender Inequality Index (2022-PL9-Guyana_and_Suriname_draft_CPD-EN-2021.11.15.pdf (unicef.org))

Education is an area in which women are considered highly disadvantaged. Although the country does not have a significant educational gender gaps at the nursery, primary, and secondary levels, more female primary and lower secondary school children are out of school than their male counterparts, with 4.6% and 2.9%, respectively. Moreover, in 2021, 45.3% of females were not actively engaged in education, employment, or training, as opposed to the 25.7% rate for males. However, despite disparities related to early-level education gaps, one of the two tertiary education institutions, the University of Guyana, reported that the majority of attendees (62.83%) were female during the 2017-2018 academic year (Gender Annex Guyana, 2022).

In addition to education, gender discrimination in the workforce is also a prevalent issue in the country. In 2019, the female labor force participation rate was 46.43%, compared to the 70.63% for men and, as of 2018, 64% of working women were considered as working in vulnerable employment conditions. Further compounding the employment issues, females earn 30.69% less than their male counterparts. Guyana's Gender Inequality Index (GII), calculated by the UNDP based on a range of women's reproductive health, empowerment and labor market indicators, was 0.96115 in 2020. This placed Guyana at 122 out of 160 ranked countries. In comparison, Belize and Suriname ranked 89 and 99, respectively, on the GII index that same year.

Moreover, according to the UNICEF child protection data, 18% of children aged 5-17 years old in Guyana are engaged in child labor; and 70% of children aged 1 to 14 years old have experienced violent

discipline (psychological aggression and/ or physical punishment) in the past month (UNICEF, Multiple Indicator Cluster Surveys, 2014).

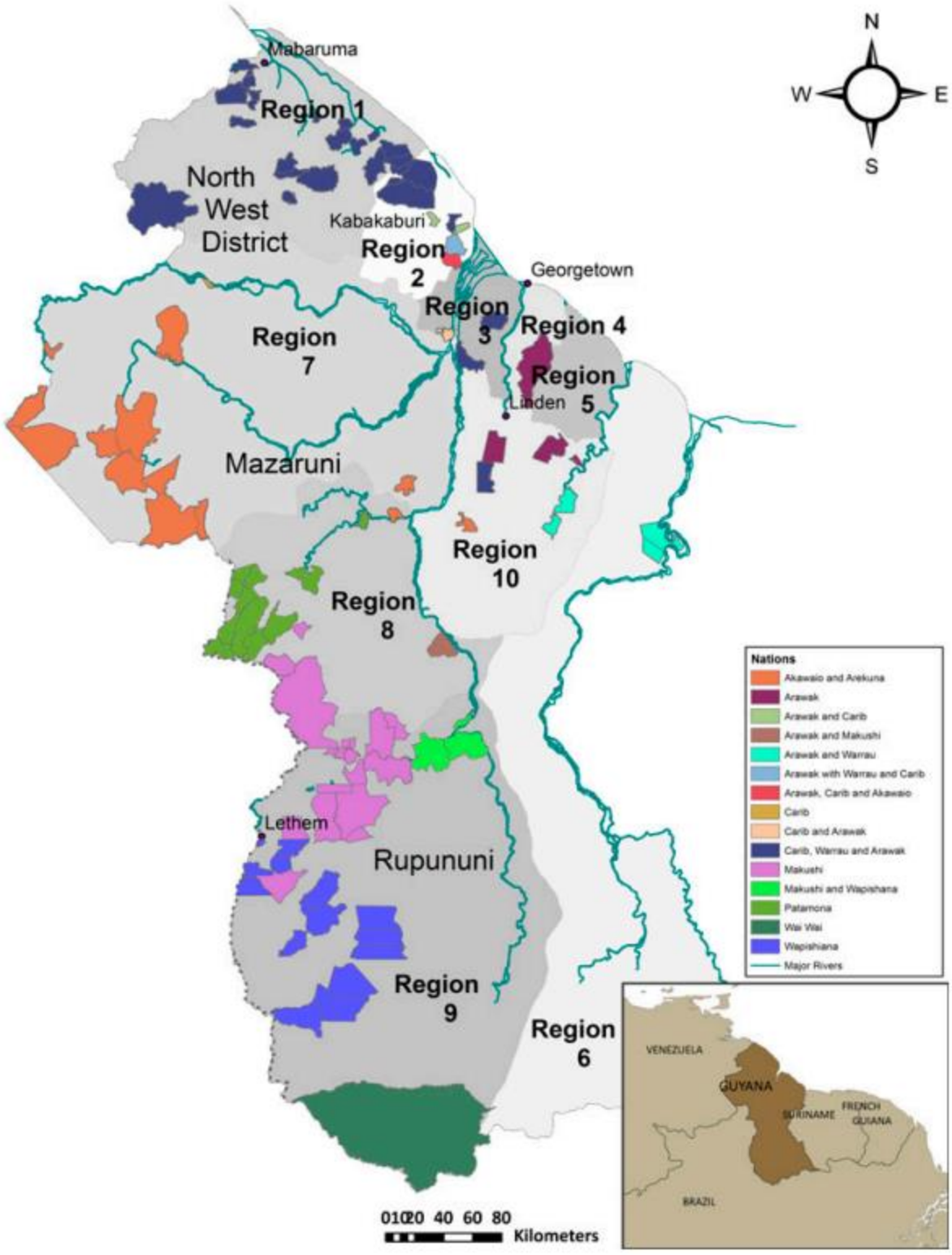
Among the survey respondents, half (17 people) were women and, of this group, 50 percent completed secondary school, 25 percent completed primary school, 12 percent completed post-secondary school, and 6 percent completed either primary school and 6 percent completed university/tertiary. Moreover, 12 of the 17 female respondents (75 percent) were employed full time. The remaining 25 percent were either employed part time, self-employed, or other.

4.3.4.3 Indigenous Peoples

Amerindians in Guyana numbered 78,492 as of the 2012 census, and their population is on the rise, with growth of 12.8 percent seen in the period 2002-2012. There are nine main Amerindian groups in Guyana, of which three are primarily coastal: the Carib, Warao, and Arawak tribes. Other groups tend to inhabit the country's hinterland regions (Minority Rights Group International, 2008). Although there are designated Amerindian villages, many of Amerindian people live in non-Amerindian communities among the general population.

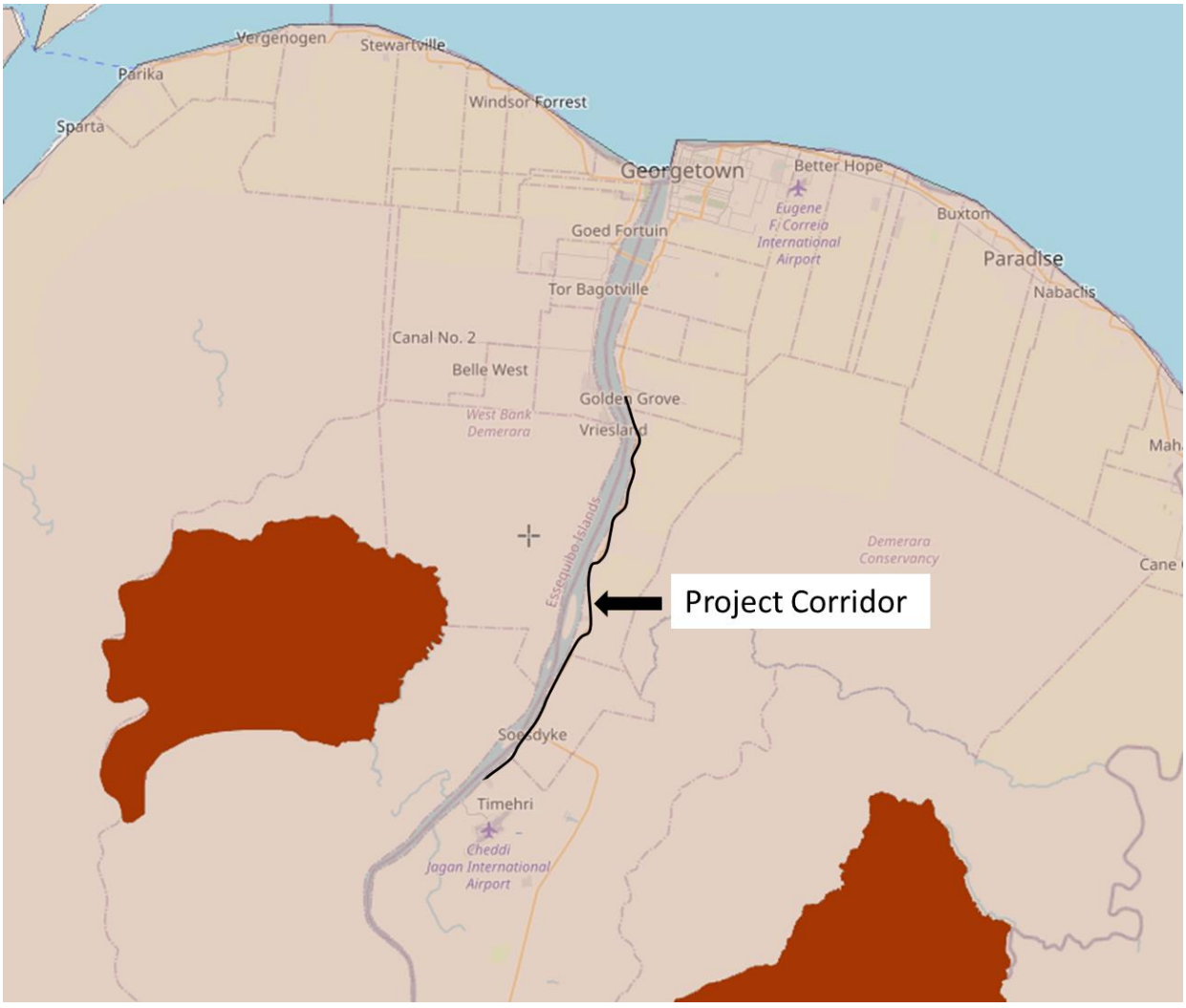
Although there is a respectively high national Amerindian population, Region 4 only comprises of 0.95 percent of the total population (Bureau of Statistics, Guyana, 2016). In relation to the Project, there is expected to be little interference or impacts on Amerindian communities given the Project location, vicinity to Amerindian villages, or population of Amerindian members in the DAI communities. Only one respondent of the 34 to the stakeholder engagement identified as being of Amerindian ethnicity. Moreover, given the Project is a road that is currently in operation, there is expected to be little interference or impacts on Amerindian communities.

Figure 4-8 shows Guyana's formally titled indigenous areas and Figure 4-9 displays the closest indigenous areas to the Project and its AoI. As shown in the figures, there are no indigenous areas overlaping with the Project.



Source: Map prepared by Anthony Cummings. Taken from Janette (2013)

Figure 4-8: Map of Guyana showing 10 administrative regions, formally titled indigenous areas, and names of indigenous nations.



Source: https://www.landmarkmap.org/ Date consulted: July 29th, 2022.

Figure 4-9: Indigenous areas closest to the Project and its Area of Influence

4.3.4.4 Lesbian, Gay, Bisexual, Transgender, Queer, and Other (LGBTQ+) Populations

This sub-population is at high risk due to Guyanese laws criminalizing same-sex sexual activity, and a lack of anti-discrimination laws. More information is provided in Section 4.3.12 Human Rights Context.

4.3.4.5 Informal Households

In the 1980s and 90s, settlers with no legal title to the land they occupy, also known as ‘squatters’ or ‘squatter’ communities, became common in Georgetown due to shortages of affordable land and housing for low-income families, as well as long wait times for registering property and obtaining construction permits. The lands the squatters occupied often this consisted of government lands reserved for maintenance of public infrastructure, or lands on top of levees that are not considered safe for human habitation due to the city’s high flood risk (IDB, 2016).

Squatter communities are still common in Guyana today, including in the Project’s DAI. Untitled encroachment along the length of the roadway is a notable risk of the project, as the people living and working along the AoI without legal rights will be the main affected during construction activities. These

impacts are discussed in section 5.4.2 Impacts to Livelihoods and a Livelihood Restoration Plan was developed to manage such impacts, shown in Appendix C.

The Guyanese Central Housing and Planning Authority (CHPA) has made recent efforts to "regularize" informal settlements in some areas by adding roads and utilities infrastructure and has also relocated many settlers of areas considered unsafe for habitation to newly built social housing schemes.

While progress has been made in the regularization process, there are still hundreds of people in Georgetown living in settlements without basic infrastructure such as electricity, potable water, sanitation and roads, and some are in areas at constant risk for flood damage (IDB, 2016; McHardy & Donovan, 2016). These populations are considered to have a higher level of vulnerability than the general population.

4.3.5 Land Use

Guyana is divided into the following four main geographic zones:

- The flat, low-lying coastal plain that is about 4.5 feet below sea level and which comprises about 5 percent of the country's land area. This zone stretches 440 kilometers (273 miles) from the Corentyne River in the east to Waini Point in the west and ranges from approximately 5 km to 65 kilometers (~3 to 40 miles) wide along the coast; this is where the Project is located.
- The "white sand belt", a largely vegetated zone dominated by white sandy soils lying inland from the coastal zone, ranging from approximately 150 km to 250 km (~93 mi to 155 mi) wide and containing most of the country's mineral deposits;
- The interior highlands that extend from the white sand belt to the country's southern borders and makes up the largest land area in the country; and
- The Interior Savannahs, which consist of two main savannah complexes: the Rupununi Savannahs and the Intermediate Savannahs. The Rupununi Savannahs cover 15,540 square kilometres (km^2) (6,000 square miles [mi^2]) and lie in the southwestern part of the country. The Intermediate Savannahs cover over 5,180 km^2 (2,000 mi^2) and lie 97 kilometres (60 miles) from the mouth of the Berbice River.

As previously described, much of Guyana's population is concentrated in the coastal plain region. In 2012, the cultivated area in Guyana was estimated at 1,107,000 acres. Cultivated land is also concentrated in the coastal plain, where most of the population resides (FAO, 2015). Agriculture in these areas is dominated by sugar, rice, and coconut plantations, interspersed with smaller scale establishments of non-traditional crops and livestock.

4.3.5.1 Land Ownership

There are two land markets: one consisting of freehold properties[15] and one consisting of the lease of state-owned land. Amerindian lands are owned collectively and are not subject to transfer or sale. Approximately half of the farms in the coastal area are freehold properties and these tend to be small properties of 5-15 acres each (Government of Guyana, 1997). Leases of government-owned lands are issued by the Guyana Lands and Surveys Commission (GLSC).

Despite the country's low population density, there are housing shortages that have resulted in large measure from skewed land ownership patterns whereby the Guyana Sugar Company (GuySuCo) and the

[15] Lands that are titled to an individual

government collectively own the large majority of available land in the coastal plain. Particularly in the 80s and 90s this resulted in a shortage of developable land in the Georgetown area, which was hemmed in by sugar estate lands. This led to a proliferation of squatting in the 1990s. Since that time the government has made extensive efforts to both divest public lands, and to regularize squatter communities (IDB 2016).

In Region 4, Growth of the oil and gas sector in Guyana has influenced demand for and value of land, specifically in the Georgetown area (Guyana Lands and Surveys Commission 2019, pers. comm.). In addition to serving as the country's commercial and infrastructure center, Region 4 also uses land for agricultural purposes including sugar and coconuts. The majority of Guyana's sugar estates are located in Region 4, including the Enmore, Blairmont, Rosehall, Albion, and Skeldon estates. The average output of each estate varied from $261,000 to $3.8 million GYD ($1,250 to $18,098 million USD)) from 2011 to 2016. Similar to Region 3, sugar production has significantly declined with the closure of GuySuCo's sugar estates in 2016 and 2017. Outside of corporate sugar production, there were approximately 1,210 private sugar cane farmers in Region 4 as of 2017 (Singh 2021).

Nearly 60 percent of respondents to the stakeholder engagement survey owned their land while 23 percent leased or rented. Five respondents (15 percent) had an informal agreement, and the remaining 3 percent did not know what their land ownership status entailed.

4.3.6 Education

4.3.6.1 Educational Attainment

School attendance is compulsory up to the age of 15, and primary and secondary school are free. The Ministry of Education is responsible for education budgets, policies, and standards and administers these by district. The country is divided into eleven education districts, ten of which correspond with the administrative regions, while the city of Georgetown makes up the eleventh district.

As the most highly populated area in the country, Region 4 serves the highest proportion of students and schools in Guyana. For example, as of 2021, there were 6,542 secondary-age students in Region 4, and 12,592 in Georgetown, together accounting for nearly 30 percent of the nation's secondary-age students. During the 2017-2018 school year, the gross enrollment rates for males and females at the primary level were 93 percent and 94 percent, respectively. Enrollment rates decreased to 66 percent and 71 percent at the secondary level (MOE EDUCATION SECTOR PLAN 2021 - 2025.cdr).

The stakeholder engagement survey found that primary and secondary education were dominant among the 34 survey respondents as the highest level of education attained, while post-secondary and university education were the highest level attained for only a small fraction of respondents, a trend that is consistent with national education levels. The breakdown of educational attainment among survey respondents may be found in Figure 4-8.

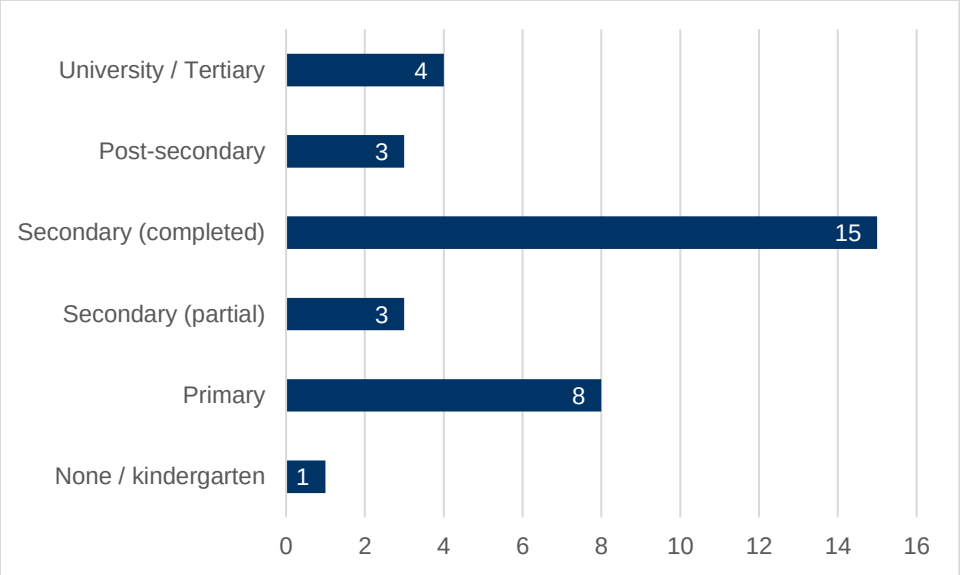
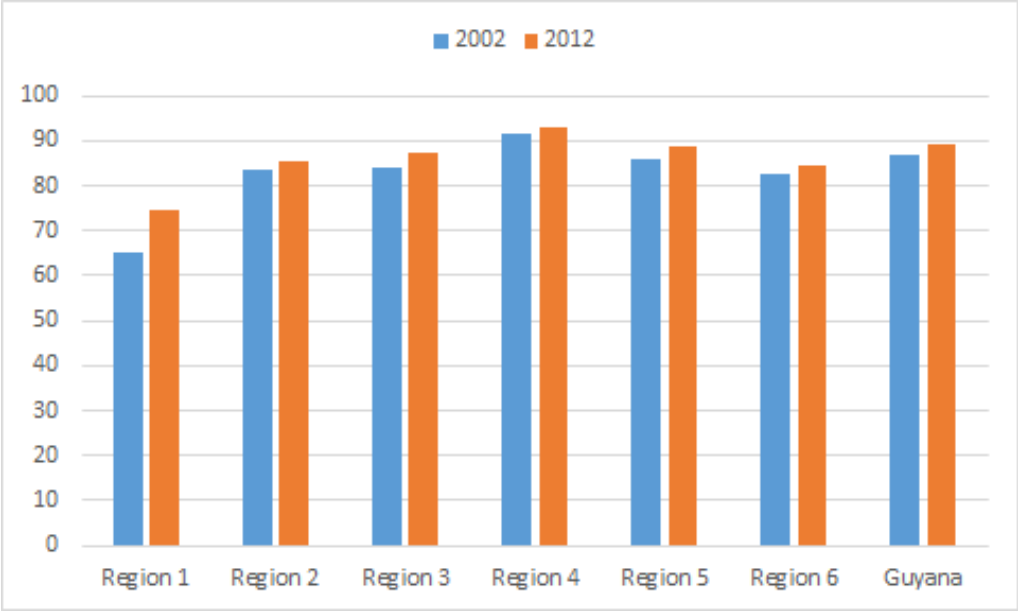


Figure 4-8: Educational Attainment Among Stakeholder Engagement Survey Respondents

4.3.6.2 Literacy

The adult literacy rate (defined as the percent of population age 15 and above that can read and write) in Guyana increased by 2.5 percent between the 2002 and 2012 censuses (Bureau of Statistics Guyana, 2012). As of 2012, Region 4 had the highest level of literacy in the country (Figure 4-10).



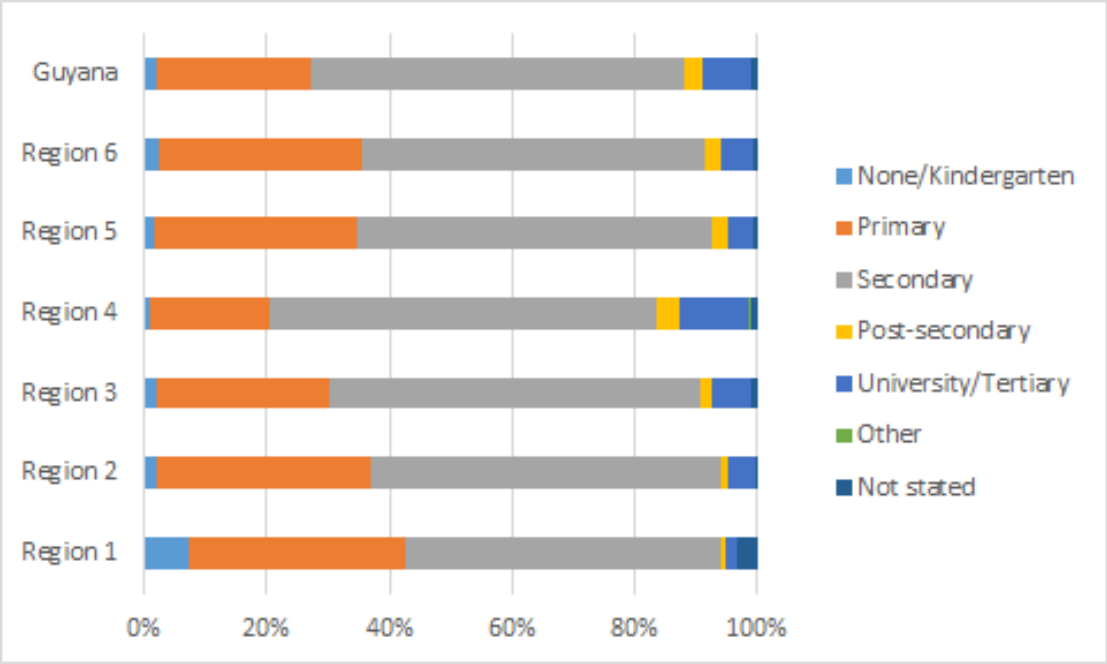
Source: Bureau of Statistics Guyana, 2012

Figure 4-10: Adult Literacy Rate by Region, 2002 and 2012

Literacy levels in Guyana segregated by gender show similar levels among females and males. Literacy rates for young women ages 15-24 edge out young men by one percent at 98.0 percent, with the literacy rate of region four being 98.2 percent, while the overall literacy rate for young men is 97.7 percent and 97.4 in region four (UNICEF, 2014). At the secondary level, females account for 88%, 7% higher than males at 81% (Ibid).

4.3.6.3 Educational Attainment

Data on the highest level of education attained by the adult population indicate that the majority of adults in Guyana attained the secondary level. Of the coastal regions, educational attainment was highest in Region 4, where access to education at all levels poses a challenge due to the communities' remote nature (Figure 4-11).



Source: Bureau of Statistics Guyana, 2012

Figure 4-11: Educational Attainment by Region

4.3.7 Employment

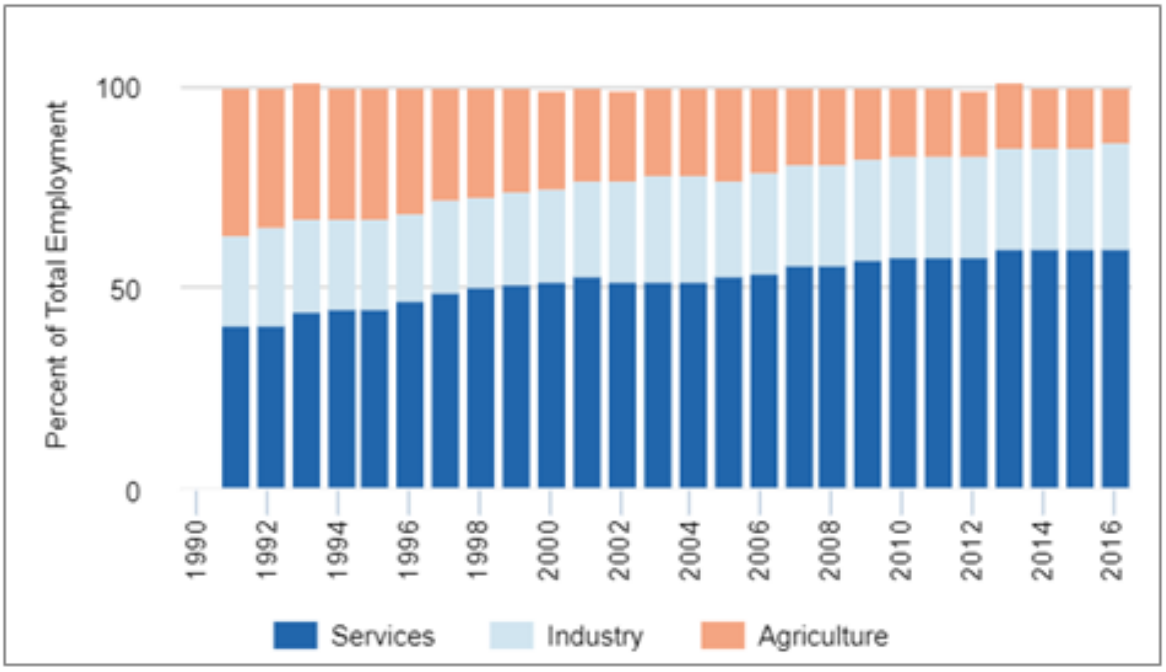
Results of the most recent national census indicate that 87.5 percent of the labor force was employed, and 12.5 percent was unemployed at this time (2012). Data from the previous census in 2002 indicate that the unemployment rate did not change in this 10-year period (BSG 2012; BSG 2002). In 2019, unemployment rate was 11.85%, according to the World Bank which rose significantly in 2020 due to the COVID-19 pandemic. According to data from the World Bank, the GDP per person employed (constant 1990 PPP $) was US $20,198 in 2016 (World Bank Data, 2016). The labor force participation rate in 2016 (% of total population ages 15+, modelled by the International Labour Organization estimate) was 57.6% (0.3 million).

According to the Guyana Times, a national newspaper, a quarterly labor force survey[16] done during the period of July to September 2017 revealed that the unemployment rate for persons aged 15 and above

[16] The survey was done from a total population of 550,831 persons 15 years and above, with some 72.2% living in urban areas.

was 12%, with the situation for women being substantially worse than for men (Guyana Times, March 16, 2018). According to the findings of the survey, unemployment among women was 15.3 percent and among men 9.9 per cent. The youth unemployment rate among 15 to 24-year-olds was almost twice that of adults, at 21.6 percent. In 2012, the unemployment rate in Region 4 was 11.3 percent.

Figure 4-10 displays that, among the working population, the largest source of employment is the services sector, which has been growing since 1991. The industry sector has remained steady, but the percent of employed persons in the agriculture sector has decreased. This reflects a global trend of urbanization whereby more and more people are moving to bigger cities.



Source: ILO, KILM database.

Figure 4-10: Employment Rates by Sector, 1991-2016

However, statistics from the 2012 census indicate that the agricultural sector remains important for rural populations in Guyana. The data show that 23.0% of the employed population 15 years of age and over in Region 1, 27.9% in Region 2, 18.8% in Region 3, 6.9% in Region 4, 35.2% in Region 5 and 35.0% in Region 6 had occupations in the Agriculture, Forestry, and Fishing industry group in 2012 (BSG, 2016). This was the industry group employing the largest number of workers in Regions 2, 3, 5 and 6, while in Region 1 this group was second to Mining and Quarrying. It should be noted that the Agriculture, Forestry, and Fishing industry group, and the primary sector[17] in general, is dominated by male workers, with female workers making up less than ten percent of the workers employed in this industry group in these regions.

[17] According to the BSG, the primary sector industries (e.g., agriculture, fishing, forestry, and mining) make direct use of natural resources and include the production of raw materials and basic foods. The secondary sector is engaged in manufacturing using raw products from the primary sector and includes processing, construction, textile production, brewing and bottling, etc. The tertiary sector provides services to the general population and businesses, including retail and wholesale trade, transportation and distribution, entertainment, tourism, healthcare, etc.

Oil and gas is an increasingly important field for employment. As of May 2018, one of the major oil and gas companies working in Guyana had 585 Guyanese nationals employed in country and had provided 61,000 training hours to workers. The company also used 309 Guyanese-owned companies in its supply chain as of the end of 2017, and continues to build local supplier capacity through training programs offered at its Centre for Local Business Development (OilNow, 2018. “Over 500 Guyanese gain employment through ExxonMobil operations”). As Georgetown is the administrative center of the nation, Region 4 primarily benefitted from the oil and gas employment opportunities.

The major sources of employment recorded in the communities along the EBDR are service and sales, skilled agriculture, forestry and fishery, craft and related trades, plant/machine operators and assemblers, and elementary occupation. Commerce associated with these businesses has flourished in recent years due to increased oil and gas activity in the Region.

The primary employment by sector in the Project area among stakeholder engagement survey participants is outlined in Figure 4-11.

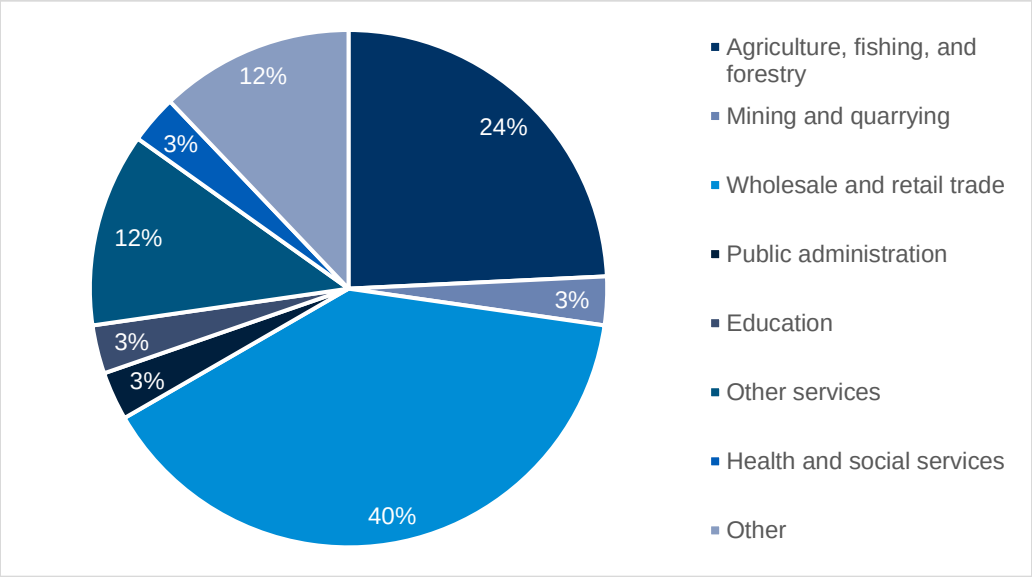


Figure 4-11: Employment Rates by Sector, 1991-2016

4.3.8 Socio-Economic Activities

Guyana is at the cusp of unprecedented economic growth and transformation as shown in the graph below (Figure 4-12). Guyana’s nominal GDP in 2020 was $ 6.8 billion U.S. dollars (USD)[18]. The per capita GDP in 2019 was $ 6,609.6 USD (World Bank Data, 2020). Guyana was reclassified by the World Bank from a lower middle income to an upper middle-income country in 2016 (World Bank, 2016). The dominance of the agricultural sector as the main contributor to the GDP of the country has been declining for a number of years being replaced by the services sector initially and now oil production. Guyana’s main sectors by contribution to GDP are summarized in Table 4-7 and Figure 4-12 explores Guyana’s project economic growth.

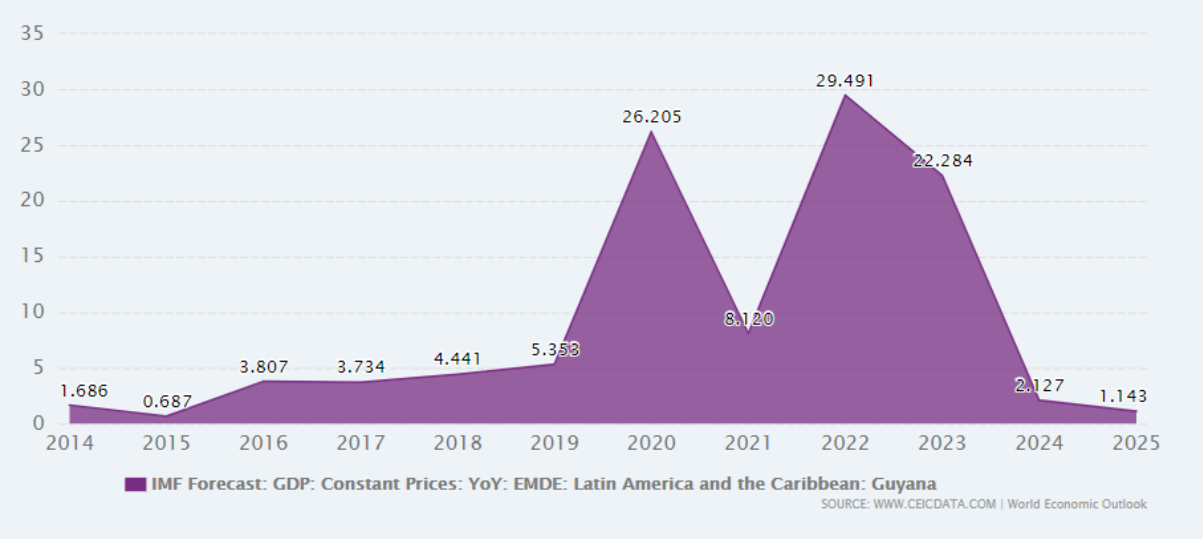
Table 4-7: Economic Sectors and Contributions to Gross Domestic Product, GDP

[18] As per IMF estimate for 2020.

Sector	Percent of GDP
Agriculture, Fishing, and Forestry	18.13%
Mining and Quarrying (including petroleum and gas)	29.17%
Wholesale and Retail Trade	5.2%
Transportation and Storage	2.97%
Construction	7.15%
Manufacturing	4.56%
Public Administration	6.55%
Information and Communication	2.29%
Financial and Insurance Activities	4.04%
Education	3.06%
Other Services	0.23%
Health and Social Services	1.74%
Electricity and Water	0.86%
Real Estate	8.31%

Source: Bank of Guyana 2021

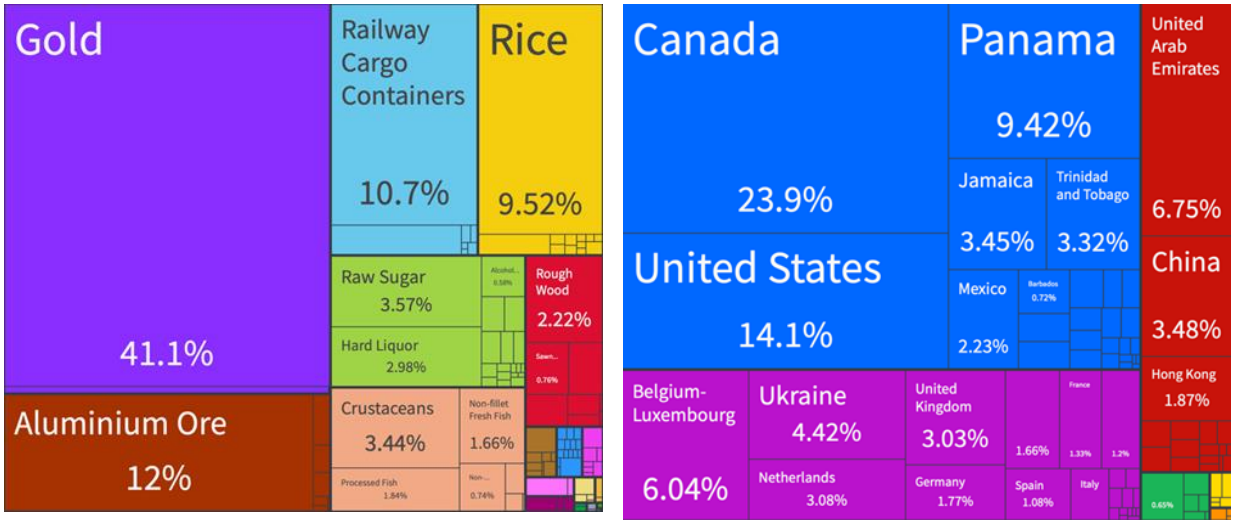
Note: Percentages do not add to 100 percent (likely in part due to rounding) but have been verified by the Consultants to be as-reported in the referenced source.



Source: IMF, 2020.

Figure 4-12: Projected Economic Growth in Guyana

Guyana relies heavily on trade, with exports totaling $3.981 Billion USD) in 2019, up from $1.377 Billion USD in 2010 (Guyana Bureau of Statistics, 2018, 2015 OEC 2021). The main export products for the country in 2018 in order of dominance is raw gold, rice, shrimp and prawns, timber, prepared foods, and bottled rum and spirits (FAO, 2019). Guyana's main exports and export destinations are outlined in Figure 4-13 below.



Source: OEC, 2021

Figure 4-13: Guyana's Exports (left) and Export Destinations (right), 2021[19]

Looking forward, Guyana may be among the countries most significantly impacted by the oil crisis (low oil prices), owing to the rapid reduction of global oil prices. Prior to the crisis, GDP growth was projected at over 80 percent for 2020, with an assumed oil price of over $60 per barrel. With oil prices trading as low as $20 per barrel recently, the report presents a simulation suggesting that if prices were to remain in this range, Guyana's economic growth could fall to less than half of its pre-crisis projected level. In this context, the government has taken actions to improve the public economic sector's capacity to respond, but the implementation of broader fiscal measures has been complicated by the current political situation (Ministry of Finance, 2020).

Sectors that are uniquely tied to the coastal environment in Guyana, as well as the mining sector, are described in further detail below.

4.3.8.1 Agriculture

Agriculture is a major export earner for Guyana and employs a significant portion of the population. Agriculture in 2019 contributed 18% to GDP. The agriculture sector in Guyana has stagnated, driven by the divestiture of the sugar industry by the previous government. Agriculture remains a significant employer of the labor force in Guyana. Guyana's tropical climate and topography incentivizes production of crops that differ largely from those grown in the cooler climates of the United States. Guyana's proximity to the United States makes it an ideal investment destination for agriculture.

In addition, the livestock industry contributed more than $US58 M to Guyana's economy in 2012, playing a significant role in furthering Guyana's economic and social development. Livestock includes dairy and beef cattle, swine, poultry, sheep, goats, and other livestock such as rabbits and bees. Guyana is "self-sufficient" in fresh meats, but not in milk. Despite the increase in most of the livestock production observed over the years, the Ministry of Agriculture highlights that it is still well below potential capacity (Ministry of Agriculture, A National Strategy for Agriculture in Guyana 2013-2020).

[19] https://oec.world/en/profile/country/guy

Rice

According to 2018 FAO statistics, Guyana has the highest production of rice per capita in the world - ten times more than India. The rice sector accounted for 3.4% of Guyana's GDP during 2017 with a value contribution of GYD$ 13.9 billion, while its share in Guyana's GDP during the same period for 2016 was 3% with a value contribution of GYD$ 11.8 billion (PSC, 2017).

Guyana ranks in twenty-first place for rice yields and thirty-ninth for global production. Guyana continues investment in research and development for rice through its Guyana Rice Development Board (GRDB 2020). The rice sector in Guyana despite COVID expanded by 4.8 percent in 2020. However, rice farming is the predominant agricultural activity in the coastal areas of Regions 2 and 3, but not in Region 4,where the Project is located. According to 2018 FAO statistics, Guyana has the highest production of rice per capita in the world - ten times more than India. Guyana ranks in twenty-first place for rice yields and thirty-ninth for global production. Guyana continues investment in research and development for rice through its Guyana Rice Development Board (GRDB 2020). The rice sector in Guyana despite COVID expanded by 4.8 percent in 2020.

Sugar

Guyana's sugar industry was nationalized as the Guyana Sugar Corporation (GuySuCo) between 1975 and 1976, at which time there were 11 sugar plantations nationwide producing 337,776 tons of sugar with a workforce of 28,406. This made it the largest employer in the country and a large contributor to foreign exchange at the time. Sugar accounted for 2% of Guyana's GDP with a value contribution of GYD$ 8.08 billion during the year 2017 in comparison to 2.7% in 2016 with a value contribution of GYD$ 10.8 billion. The sugar growing sector, is estimated to have contracted by 3.7 percent, with production falling to a low of 88,868 tonnes in 2020. This was primarily due to a shortfall of more than 17,000 tonnes in the second crop which, in turn, resulted from the protracted lack of capital investment in factories which caused downtime, and reduced the volume of sugar extracted from canes. Additionally, high rainfall in November and December resulted in the flooding of some fields and restricted access to canes.

However, in 2017, sugar production declined to 137,307 metric tons from 183,491 metric tons for the same period in 2016. This decline represented a 25.2% contraction in the sugar industry, a result of the Government's actions to review and close various estates and pursue privatization of the industry. Four estates closed in the period 2016-2018, resulting in the retrenchment of 4,733 workers and causing economic crisis in communities that have historically been economically dependent on the industry (iNews Guyana, $2.4B in severance payments included: Wales sugar workers also included, November 1, 2018). Sugar accounted for 2% of Guyana's GDP with a value contribution of GYD$ 8.08 billion during the year 2017 in comparison to 2.7% in 2016 with a value contribution of GYD$ 10.8 billion. The sugar growing sector, is estimated to have contracted by 3.7 percent, with production falling to a low of 88,868 tonnes in 2020. This was primarily due to a shortfall of more than 17,000 tonnes in the second crop which, in turn, resulted from the protracted lack of capital investment in factories which caused downtime, and reduced the volume of sugar extracted from canes. Additionally, high rainfall in November and December resulted in the flooding of some fields and restricted access to canes.

Coconut

The coconut industry in Guyana has grown in recent years and shows potential for continued growth due to high international demand for products such as coconut oil and coconut water. Other products that are made locally using the various components of the coconut include roofing tiles made from the husk, coconut-based wine, coconut butter, coconut flakes, ornaments, jewelry, and kitchen utensils (Newsroom.gy, June 2016).

Given these developments, the government has emphasized further development of the coconut and cassava subsectors (IDB, 2017). The coconut industry ranks third after rice and sugar in terms of acreage cultivated and is grown primarily in the coastal regions, including along the Pomeroon River and the Essequibo Coast in Region 2. According to recent news media articles, the amount of land in the Pomeroon area being converted to coconut cultivation is increasing (Guyana Chronicle, 2016; Stabroek News, 2016).

Other Cash Crops

Non-traditional crops (crops other than sugar cane and rice) grown in Guyana include: tubers such as cassava, sweet potato, and eddo; vegetables such as eggplant, pumpkin, and okra; spices such as hot peppers, sweet peppers, and ginger; and fruits including banana, papaya, mango, and pineapple. Data from the Ministry of Agriculture (2016) show that production for most tuber and vegetable crops has increased in recent years, while yields for fruits have been more variable, with some fruit crops showing declines from 2014 to 2015.

Guyana has signed protocols for exporting fruits and vegetables to Caribbean countries, particularly to Barbados. The Agriculture Export Diversification Program, which was implemented between 2007 and 2014, was established to increase production and processing of non-traditional products by building packaging facilities and strengthening the New Guyana Marketing Corporation, the government agency in charge of marketing and promoting non-traditional crops (IDB, 2017).

4.3.8.2 Fisheries and Aquaculture

Marine Fisheries

Marine fisheries in Guyana are well developed. This industry contributes significantly to the nation's economy in terms of providing employment, earning foreign exchange and providing food for the nation. The FAO-IICA's 2018 Outlook for Agricultural and Rural Development in the Americas notes that the Guyanese population's fish consumption has risen in recent years, amounting to a quantity well above the minimum recommended by international health organizations (35 kg/capita/year, versus the recommended 12 kg/capita/year). Fisheries exports were also reported to be the 3rd greatest contributor to GDP in 2017, and is estimated to employ 15,000 people in the country (SeafoodSource, 2018).

There are four main types of marine fisheries in Guyana (Ministry of Agriculture 2013), as differentiated by the species targeted, gear types used, and the depth of water where the fishing takes place. Table 4.7 summarizes the characteristics of these fisheries. Tuna, such as yellowfin tuna (*Thunnus albacares*) and skipjack tuna (*Katsuwonus pelamis*), have also been identified as a potential oceanic target species of commercial interest. The industrial and artisanal components of Guyana's marine fishing together accounts for over 90% of the country's total landings (mostly finfish and shrimp).

Table 4.7: Primary Characteristics of Marine Fisheries in Guyana

Type of Fishery	Species	Gear	Depth
Industrial	Seabob, shrimps, and prawns	Trawls	Primarily between 13-16 m, but can occur from 0-75 m
Semi-industrial	Red snapper and vermillion snapper	Fish traps and lines	Edge of continental shelf

Type of Fishery	Species	Gear	Depth
Artisanal	Mixed fish and shrimp	Gillnets, seines, and others	0–18 m
Shark	Various	Trawls, gillnets, and hook and line	Throughout the continental shelf waters

Source: Department of Fisheries, 2013.

The industrial fishing fleet consists of about 145 trawlers (about 21 m in length) and involves six shrimp/fish processing plants and numerous wharves and dry-docking facilities. Ice and freezing facilities servicing this industry are owned and operated by participants within and outside the fishery sector. The larger vessels have ice boxes and their operations are either tidal or diurnal. Except for the large hand liners or trap boats and drift seiners, which may or may not be decked, most artisanal vessels are flat-bottomed dory type with little draft, which affords great maneuverability over shallow muddy and sandy bottoms.

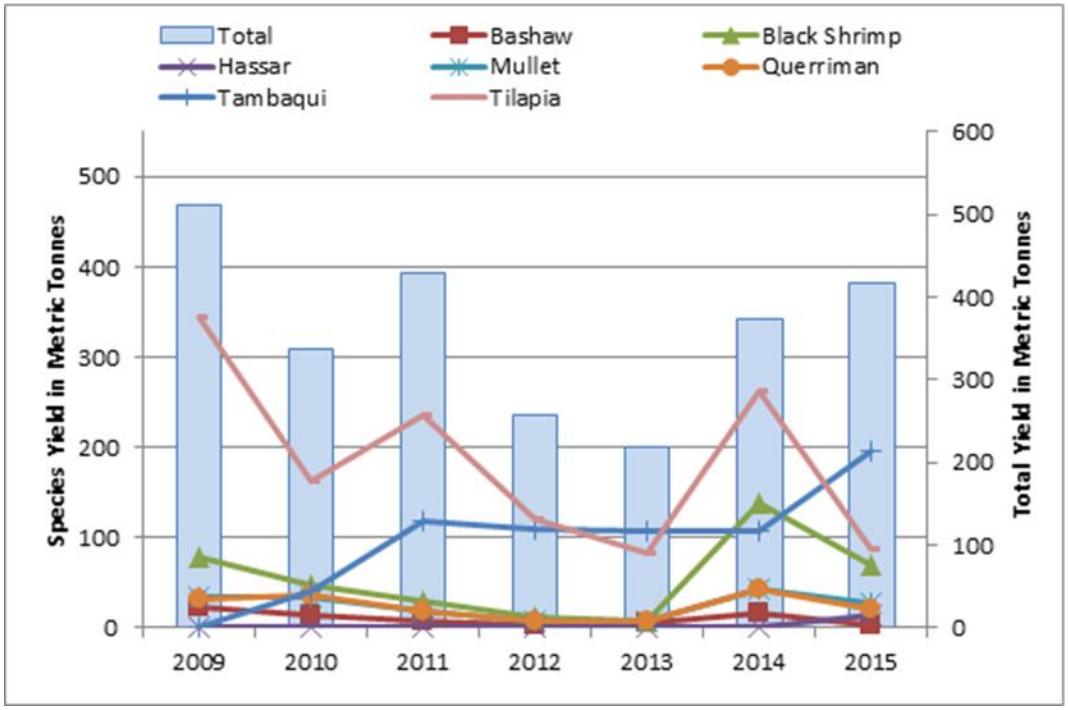
Artisanal fishing consists of approximately 1,129 vessels ranging in size from 6 to 18 meters propelled by sails, outboard or inboard engines and using gear that includes the Chinese seine (a fyke net), which targets whitebelly shrimp (*Nematopalaemon schmitti*) and seabob shrimp (*Xiphopenaeus kroyeri*). Other gear types such as the pin seine cadell lines and gill nets primarily capture finfish.

The larger vessels have ice boxes and their operations are either tidal or diurnal. Except for the large hand liners or trap boats and drift seiners, which may or may not be decked, most artisanal vessels are flat-bottomed dory type with little draft, which affords great maneuverability over shallow muddy and sandy bottoms.

Artisanal fishing is of critical importance for all six coastal Regions, though dependence on the activity and the scale at which it occurs varies by community. In general, however, in all of the coastal regions 2 through 6, fishing provides direct employment and income for numerous fishing folk and indirect employment for numerous others in supporting services.

According to data from the PSC and the Ministry of Agriculture, the fishing sector contributed 2% to Guyana's GDP in 2017 with a value contribution of GYD$ 11,434 million (PSC, 2017).

According to data from the Ministry of Agriculture (2016a), the main species produced in aquaculture establishments are the bashaw, hassar, mullet, querriman, tambaqui, tilapia, and black shrimp. Data show that tilapia once dominated aquacultural yields, but have declined in production, while yields of tambaqui and black shrimp have increased considerably in recent years (Figure 4-14). The total yield of aquaculture product has been variable in the period from 2009-2015. The data also suggest that aquaculture is still a small industry in Guyana. Given its growing importance in the international economy, the Ministry of Agriculture has made recent efforts to further develop the sector in Guyana, for example through a recent training program for 56 participants, offered by aquaculture expert from China (DPI, 2018).



Source: Ministry of Agriculture, 2016.

Figure 4-14: Fish Yields from Aquaculture, 2009-2015

Fishing Institutions

The institutions and organizations that have responsibility for the management of marine biodiversity include the Ministry of Agriculture and its Fisheries Department (fishing management and development in both marine and inland waters), the Guyana Defence Force Coast Guard and Guyana Police Force Marine Police (fisheries enforcement), the EPA (Natural Resources Management which includes Biodiversity, Wildlife and Protected Areas), the Fishermen's Cooperative Societies (artisanal fishermen) and regional/international agencies such as the Caribbean Regional Fisheries Mechanism (CRFM), the International Committee for the Conservation of Atlantic Tunas (ICCAT), and FAO's Western Central Atlantic Fishery Commission (WECAFC).

Fishing cooperatives in the country vary in their structure and level of oversight, with some having essentially disbanded due to lack of leadership, and others remaining active. Others such as the Upper Corentyne Fishermen's Cooperative Society (UCFCS) and Greater Georgetown Fishermen Cooperative Society provide their members with ice, twine, fishing equipment, fuel, docking facilities and market areas (FAO 2005). Republic of Guyana Fisheries Profile; Guyana Chronicle, Upper Corentyne Fishermen's Co-op Society persevering despite challenges, (December 11, 2013).

4.3.8.3 Mining and Quarrying

2016 was a pivotal year for this sector as it recorded the largest growth rate during the period 2007-2017. This was largely driven by a 58.0 percent increase in gold output that year. However, in 2017, all sub-sectors showed declines, including bauxite, and diamond outputs. Total diamond declaration decreased by 62.7% from 139,889.6 metric carats during 2016 to 52,161 metric carats at the end of 2017. However, crushed stone output increased in 2017 by 11% as output was recorded at 453,136 tons, up from 408,405 in the previous year (PSC, 2017).

4.3.8.4 Oil and Gas Exploration and Production

The establishment of the oil and gas sector in Guyana is a relatively recent development. In 2000, the U.S. Geological Survey (USGS) identified the Guyana-Suriname Basin as having the second highest resource potential among unexplored oil basins in the world and estimated the mean recoverable oil and gas reserves at more than 13.6 billion barrels of oil and 32 trillion cubic feet of gas. A number of international oil and gas companies (IOCs), including Esso Exploration and Production Guyana Limited, Repsol (Spain) and CGX Energy (Canada) have been participating in exploration and drilling activities.

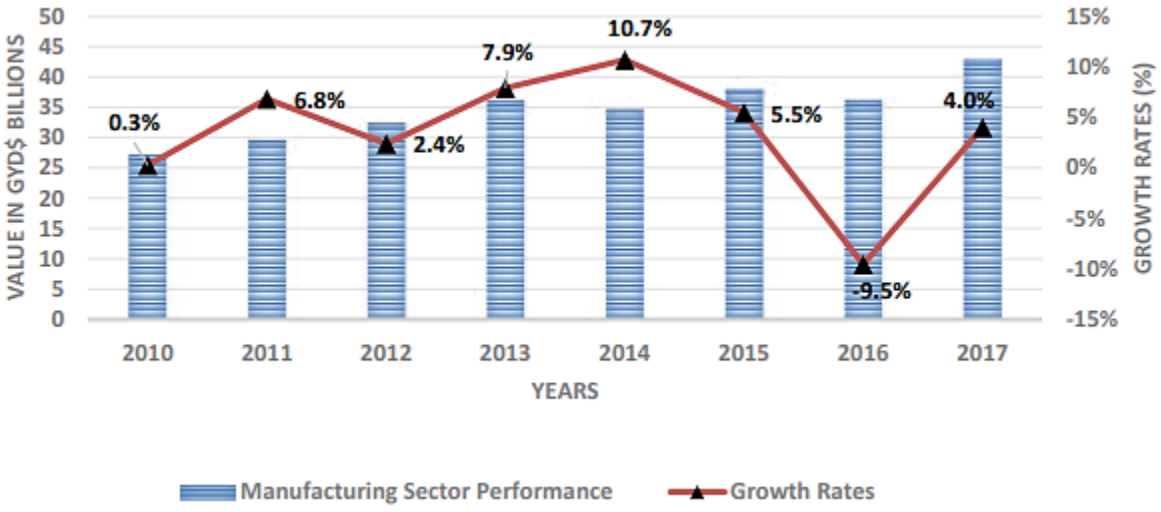
In 2016 the Government of Guyana commenced a review and update of Guyana's National Energy Policy in order to develop a cohesive and broad-based national energy policy to move Guyana from an economy that was inefficient in its energy use and wholly dependent on imported fuels, to efficient energy natural resources like biomass, sun, wind and water (Guyana Energy Agency, Annual Report 2016). In addition, very recently, in August 2018 a fully functional Department of Energy (DoE) was established within the Ministry of the Presidency, assuming the responsibility of the oil and gas sector from the Natural Resources Ministry (DPI, 2018).

The Government of Guyana is currently in the process of developing a Local Content Policy for the oil and gas sector that would guide the State in allowing preferential treatment for local companies, rather than being bypassed in favor of foreign companies and workers. The latest version of the draft Policy was public released in January 2020 and is under review by the government.

Guyana is currently producing more than 100 thousand barrels/day in production. By the end of 2022, it expects that to move to more than 300 thousand barrels/day.

4.3.8.5 Manufacturing

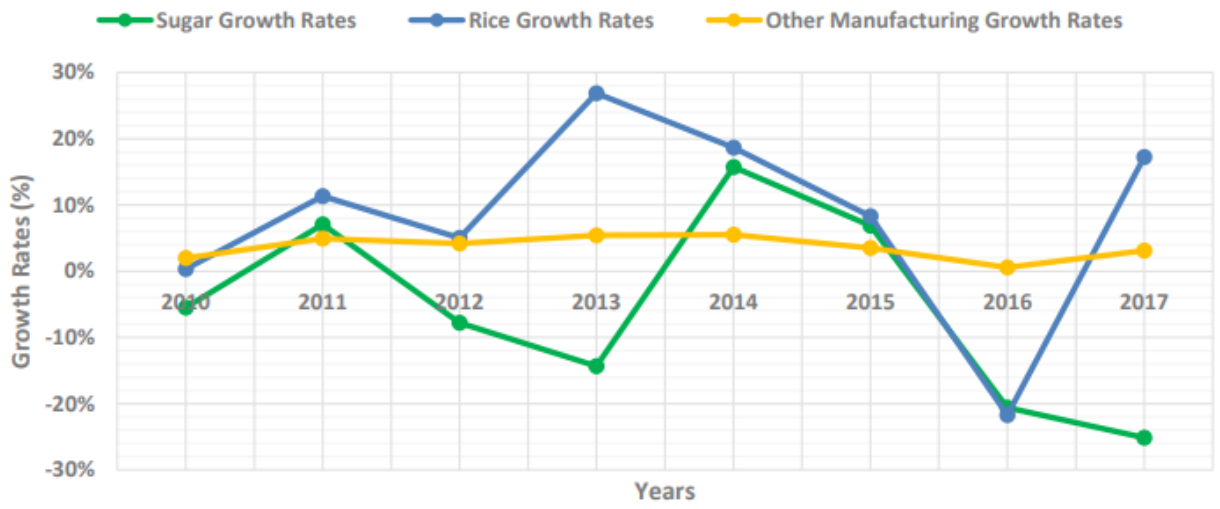
The manufacturing sector improved significantly during 2017, growing by 4.0% compared to the 9.5% negative growth of the previous year. Figure 4-15 displays the annual growth rates for the manufacturing sector from 2010 to 2017 along with the sector's contribution to Guyana GDP for the corresponding years.



Source: PSC, 2017.

Figure 4-15: Manufacturing Sector Performance, 2010-2017

As of December 2017, the manufacturing sector accounted for 5.7% (GYD$ 42,922 Million) of Guyana's GDP. The main sub-sectors in the sector include rice milling, and value-added sugar products. Figure 4-16 shows the performance of these three subsectors over the last seven years with regards to the respective growth rates.



Source: PSC, 2017.

Figure 4-16: Growth Rates in the Manufacturing Sub-sectors, 2010-2017

It is evident that much of the sector's growth was ascribed to the huge recovery in rice milling activities, which grew by 17.3% during 2017 in comparison to 2016. On the other hand, manufacturing in the sugar industry declined significantly in 2017 by 25.2%. Other manufacturing or light manufacturing grew by 3.1% as at December 2017 with the sector contributing heavily towards Guyana's GDP adding 3% (GYD$ 22,420 Million) while rice and sugar contributed 2.3% (GYD$ 17,366 Million) and 0.4% (GYD$ 3,135 Million) respectively during 2017.

4.3.8.6 Tourism

According to the World Travel and Tourism Council, travel and tourism directly contributed 19.5 billion GYD to the country's GDP in 2017, representing 2.6% of the country's GDP. This is projected to rise by 4.3% in 2018. Direct employment from the travel and tourism sector is estimated at 8,500 jobs (2.9% of the country's total employment). Total employment from travel and tourism including indirect jobs is estimated at 22,000 jobs (7.3% of all employment).

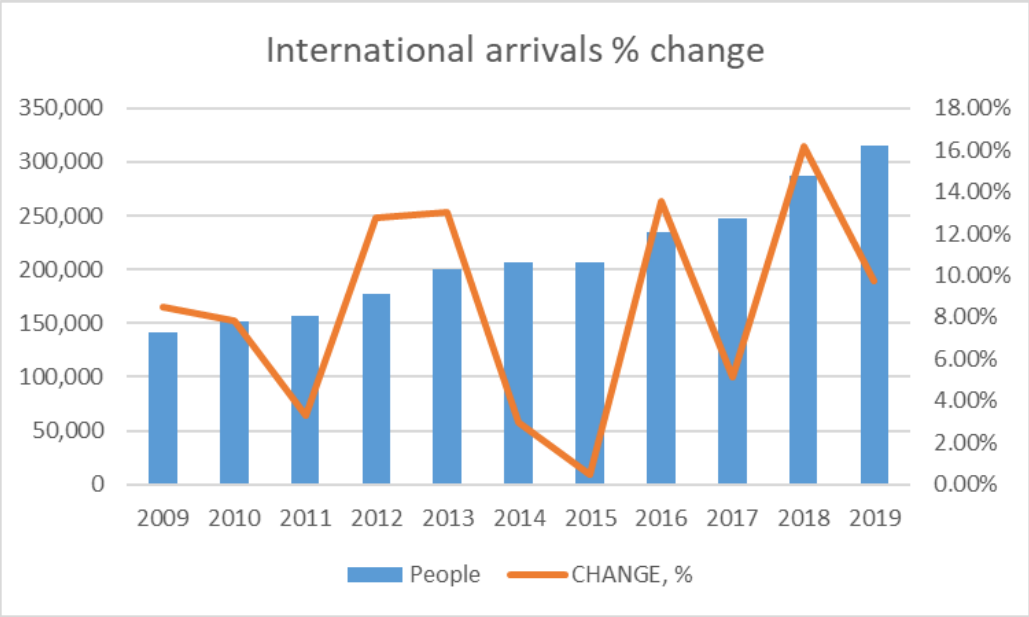
Many of Guyana's tourist attractions are located in the country's hinterland. Tourism based in Guyana offers nature, culture, and adventure-based experiences such as trips to waterfalls, Amerindian villages and eco-lodges, mostly in the country's interior. It is expected that if ecotourism attractions can be developed appropriately, they may contribute to the conservation of the country's largely intact interior environment.

Georgetown also has a number of popular tourist attractions such as museums, parks, public gardens, the zoo, and Stabroek Market. The Georgetown area is also known for its many historic buildings dating from the late eighteenth through the mid-nineteenth century. Guided tours of Georgetown's historic buildings and sites are available, as are guided tours of the Essequibo River, the El Dorado Rum Factory, the Georgetown City Centre, and other attractions (Figure 4-17).

Source: ERM, 2016.

Figure 4-17: Stabroek Market, Georgetown

Data from the World Bank (2021) indicate that the number of international visitors to Guyana has doubled since the early 2000s (see Figure 4-18), with the largest number of visitors originating from the United States, followed by the Caribbean, Canada, and Central and South America. Because the majority of visitors consist of Guyanese expatriates returning to visit family, visitor numbers peak during the summer vacation (July and August) and key holidays (e.g., Christmas in December).



Source: Guyana Tourism Authority, 2021.

Figure 4-18: Annual International Visitors to Guyana, 2009-2019

4.3.9 Services, Facilities, Infrastructure

The villages along project area have the benefit of the major utilities. These include electricity, potable water, and telephone and telecommunications services. A combination of Government and Private utility companies, provides these utilities. Guyana Water Incorporated (GWI) is a public company that provides water services at a cost to consumers. Water supply includes piped water, septic tanks, and wells.

According to the GWI, in Region Four and in the sub-region of the East Bank, Demerara there is a population of 58,294 customers and its operational areas ranged from Eccles on the East Bank of Demerara to Timehri and the Linden Highway up to Silver Hill with 17,574 households and 19,631 customers servicing 2,442, 1,669, and 2,987 customers respectively with service to twenty-one (21) communities.

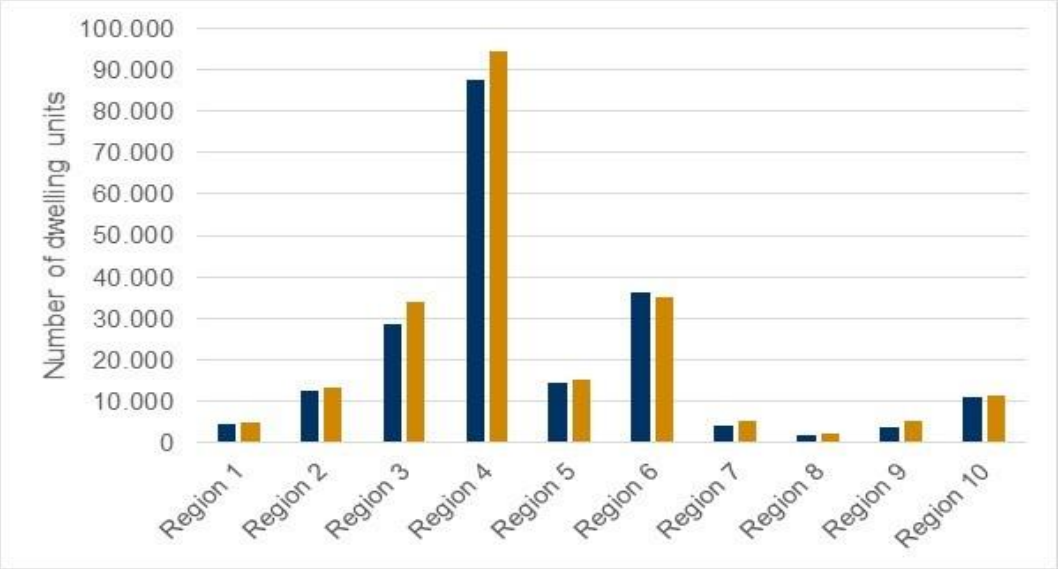
There are 13 pump stations that service thirty (30) communities and four (4) State facilities at Timehri. The operations provided service to 509 commercial, 18,989 domestic, 84 industrial, and 49 institutional. There are 14 Schools and 8 Health Centres that utilize the public water company. GWI ensured that the regional health facilities and schools were provided with a reliable supply of safe potable water from pumps that operated 24 hours daily supplying water to the treatment plants which operated booster pumps for between 14 to 16 hours daily (Guyana Water Incorporated, 2017)

UNICEF through its 2014 MICS report, stated the 83 percent of households in Region 4 had access to both an improved source of drinking water and improved sanitation facilities (90 percent for urban populations, 81 percent for rural, 88 percent for coastal, and 55 percent for interior). An estimated 87 percent of households used a sanitation facility that was not shared (Ibid). Notably, water contamination in the distribution system in Guyana remained a significant problem.

4.3.9.1 Housing

According to the most recent census, there were 221,741 dwelling units in Guyana in 2012, with the highest number of units in the most populated regions 3, 4 and 6 (see Figure 4-19). When compared with

the 2002 census, the data show an increase of 8.1% in the number of housing units over the 10-year intercensal period. The data further indicate that only about 3 percent of available housing units were vacant, giving further indication of the short supply of housing in the country. Some households have established informal housing in encroaching settlements in response to these difficulties in obtaining land and housing, however data on their number and characteristics are not available.



Source: BSG, 2016. Note: Blue bars correspond to 2022 and golden bars to 2012

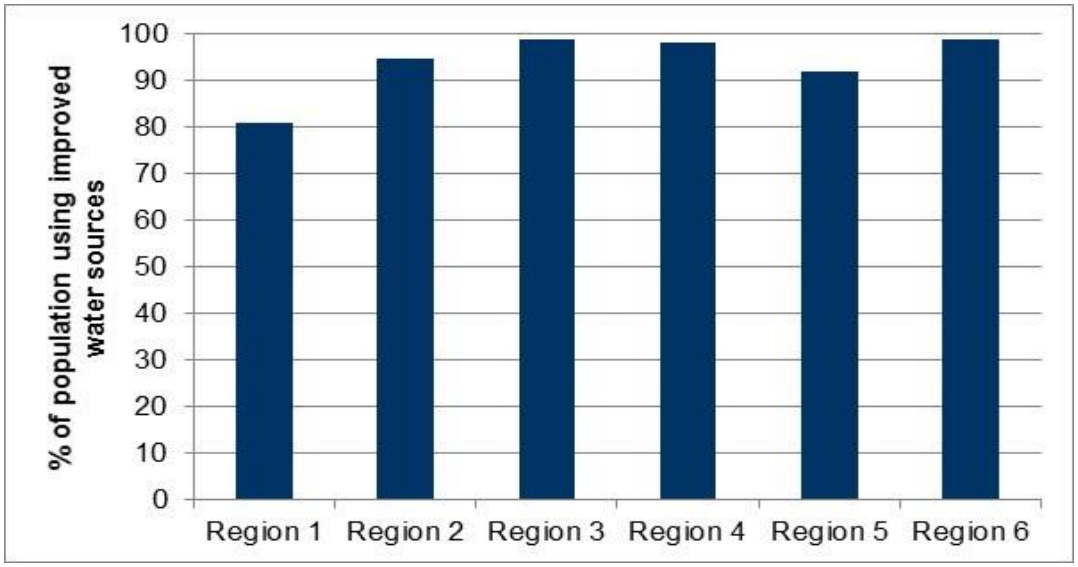
Figure 4-19: Regional Distribution of Dwelling Units, 2002 and 2012

4.3.9.2 Water and Sanitation

According to the most recent Guyana Multiple Indicator Cluster Survey (MICS)[20], 94 percent of Guyana's population had sustainable access to improved drinking water sources[21] as of 2014, and 95.4 percent used an improved sanitation facility (UNICEF 2014). Figure 4-20 shows the percentage of the population with access to improved sources of drinking water, by region. However, while access to improved water sources has improved over the years, wastewater and sanitation coverage and infrastructure in the country are limited, thus hampering efforts to improve health conditions (World Bank 2016).

[20] The MICS program was developed by the United Nations Children's Fund and serves as an international household survey program to collect internationally comparable data on a wide range of indicators on the situation of children and women.

[21] Improved water sources refer to any of the following types of supply: piped water into dwelling, compound, yard, to neighbor, or to public tap/standpipe; tube well/borehole; protected well; protected spring; and rainwater collection. Bottled water is considered as an improved water source only if the household is using an improved water source for handwashing and cooking.



Source: UNICEF 2014.

Figure 4-20: Percent of Population with Access to Improved Water Sources by Region, 2014

In 2012, approximately 97 percent of the population in both urban and rural areas used an improved drinking-water source (as compared to 83 percent in rural areas in 2000). However, an assessment conducted by multilateral partners in 2014 points out that the quality of water supply services is hindered by decaying distribution networks, with 50 percent to 70 percent of wastewater going unaccounted for at the national level (and more than 70 percent in Georgetown) (World Bank 2016).

4.3.9.3 Waste Management

Currently Guyana's primary methods of waste disposal are legal and illegal dumping, and burning. Legal dumping is primarily undertaken by sanitary service companies that truck waste to permitted dumpsites. Each region has at least one dumpsite which receives municipal waste from households, and are also used for the disposal of commercial and industrial waste. The dumpsites are intended only for the disposal of non-hazardous wastes, however it is likely that hazardous waste is sometimes included among the received waste since control over incoming waste is generally not rigorous.

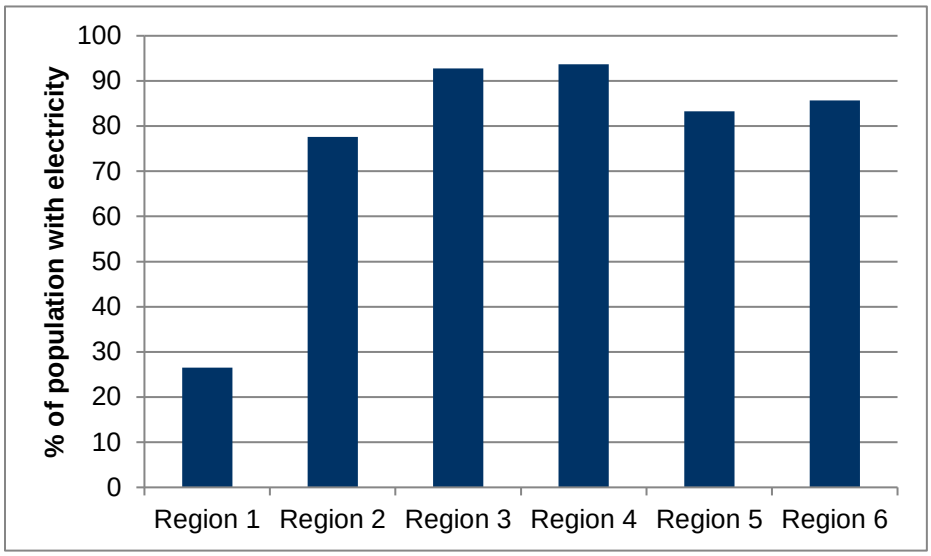
The Haags Bosch engineered municipal landfill site in Georgetown is the only permitted sanitary landfill site in the country. After its opening in 2011 the facility had operational problems, including a fire in 2015. It was also the subject of several non-compliance notices from the EPA relating primarily to leachate management. Since then, a new operator has been appointed and remediation of the site and upgrading of the operation is underway. The landfill is lined and now has a leachate collection system and a leachate treatment system.

Although waste pickers are operating at the site, controls have been put in place by the landfill operator to minimize the health and safety risks of their activities and to reduce their interference with the operations of the site. Other controls (e.g., safe venting of landfill gas) and environmental monitoring are also planned for the site (Stabroek News, 2017).

Guyana's Ministry of Communities has developed a National Solid Waste Management Strategy (NSWMS) aimed at integrating the country's efforts to improve waste management infrastructure, enforce existing waste management legislation, including a shift in the country's culture of littering and other unlawful disposal, and promote waste-to-energy initiatives.

4.3.9.4 Power

Results of the MICS indicate that an estimated 91.2 percent of the coastal population and 56.2 percent of the interior population have access to electricity. Figure 4-21 shows the percent of the population with electricity in each of the coastal regions.



Source: UNICEF 2014.

Figure 4-21: Percent of Population with Electricity by Region, 2014

The state-owned Guyana Power and Light (GPL) provides electricity to most areas of the country's coastal plain (GPL, n.d. Our Business). The large majority of the country's installed power generation capacity is represented by thermoelectric diesel generators.

4.3.9.5 Transportation Infrastructure

The transport sector comprises the physical facilities, terminals, fleets and ancillary equipment of all the various modes of transport operating in Guyana, as well as the transport services, agencies providing these services, organizations and people who plan, build, maintain, and operate the system, and the policies that shape its development.

Although there exists a fairly good road network in the more densely populated areas of the coast, transportation needs still exist in all parts of the country. As a result, rivers still provide an invaluable and crucial means of transport where roads are absent.

Roads

Guyana's road network consists of approximately 3,990 kilometers of road including six main national roads which are paved and each have two lanes, with the exception of some four-lane segments along the East Bank and East Coast Demerara. The road network is used by the approximately 100,000 vehicles in the country and relies on a system of bridges and culverts that allow for crossings over the system of canals, drains and sluices along the coast.

The main coastal roads are, from west to east: the Essequibo Coast Road, the Parika to Vreed en Hoop Road, the East Coast Demerara and West Coast Berbice Roads, and the Corentyne Highway from New Amsterdam to Moleson Creek. All of these roads are paved. South of Georgetown, the primary road is the

East Bank Demerara Road, which runs from Georgetown to the Port area and then further to Timehri, where the Cheddi Jagan International Airport is located.

Georgetown has a compact, grid-based network. Traffic congestion is a chronic problem in the Georgetown area, with many different transportation modes including cars, trucks, mini-buses, horse-drawn carts, bicycles, motorcycles, scooters and pedestrians all sharing the same travel lanes.

The East Bank Demerara Road in particular sees considerable congestion due to back-ups from the Demerara Harbour Bridge, which provides the only road crossing over the Demerara River. The bridge is opened daily for about one hour to allow passage of ocean-going vessels, and this causes severe traffic congestion at both ends of the bridge. The Government of Guyana is in the process of investigating different options for replacement of the bridge with a larger bridge that will both allow for more efficient road traffic flow, thus precluding the need to open the bridge (e.g. a high-span fixed bridge, or a bridge with a moving section allowing for passage of ships) (Demerara Waves, 2018).

The increased demand for safe and efficient road transport networks commissioned the National Land Transport Strategy and Action Plan. Developed from a study of the land transport sector, the NLTSAP aims to develop a “sustainable and interconnected land transport system within and between the coastland and hinterland communities and proposed development areas” (Analytical Evidence to Support Guyana’s Green State Developent Strategy: Vision 2040, Annex A). The Strategy contains 3 key objectives that address:

1) The legal and institutional framework
2) Efficiency, safety and environmental considerations
3) Coastal and hinterland connectivity and integrated national development

Air Transport

Guyana has one international airport (Cheddi Jagan International Airport, Timehri); one regional airport (Eugene F. Correira Airport, commonly known as Ogle Airport); and about 90 airstrips, 9 of which have paved runways. Several local airlines depart from both Ogle Airport on the East Coast Demerara, 6 mi (9.7 km) southeast of Georgetown and from Cheddi Jagan International Airport, at Timehri, 25 mi (40 km) southwest of Georgetown.

Guyana ranks 131 out of 211 countries on the Air Connectivity Index (World Bank 2011), and 49 out of 141 economies for the quality of its air transportation infrastructure (World Economic Forum 2015). International passengers are moved to and from the country almost entirely by air. In addition, the potential of this mode of transport for the movement of cargo, especially exports, continues to increase.

Air transport plays a vital role in the development of Guyana. Within the country, it provides a link between the coastal areas and communities in the hinterland, many of which are inaccessible by other modes of transportation. Thus, the economic and social wellbeing of these areas and their integration into the fabric of the nation are critically dependent on the availability of air transport.

Marine Transport

Guyana’s Transport and Harbour Department provides scheduled ferry services between the shores of in the Essequibo, Demerara and Berbice Rivers. Small privately owned speedboats supplement these services.

Virtually all of Guyana’s exports and imports are transported by sea. The main port of Georgetown, located at the mouth of the Demerara River, has more than 40 wharves, including six primary cargo wharves and a number of privately owned facilities. According to Marine Traffic, in the 30 days prior to January 16, 2019, 41.4% of ships arriving at the Port of Georgetown consisted of cargo vessels, 13.8% of

tankers, 42.1% special crafts and 2.1% tug vessels (Marine Traffic, 2018). The commercial ports of Guyana are located at Georgetown, Port Kaituma, and New Amsterdam.

A shipping channel with a dredged depth of 5.9 meters is maintained on the lower Demerara River, used by private, commercial and military vessels. Pilotage is provided by the Harbour Master. There are fishing ports and landing sites all along the coast in Regions 2-6. While the majority of fishing occurs well inshore from the continental shelf, some tuna fishing occurs at the edge of the shelf, about 150 kilometers from shore.

4.3.9.6 Sea Defences

Guyana's coastal plain is situated at one-meter below sea-level to sea-level, making it highly vulnerable to erosion and salinization especially during spring tides (GMRP, 2010). Approximately 90 percent of the population, infrastructure, and economic activities are concentrated in the coastal plain, so protection from sea level rise and coastal flooding is a national priority. As a result, Guyana's national government has established a network of coastal protection measures that consist of a combination of hardscapes and natural buffers. This network is known collectively in Guyana as the "sea defences."

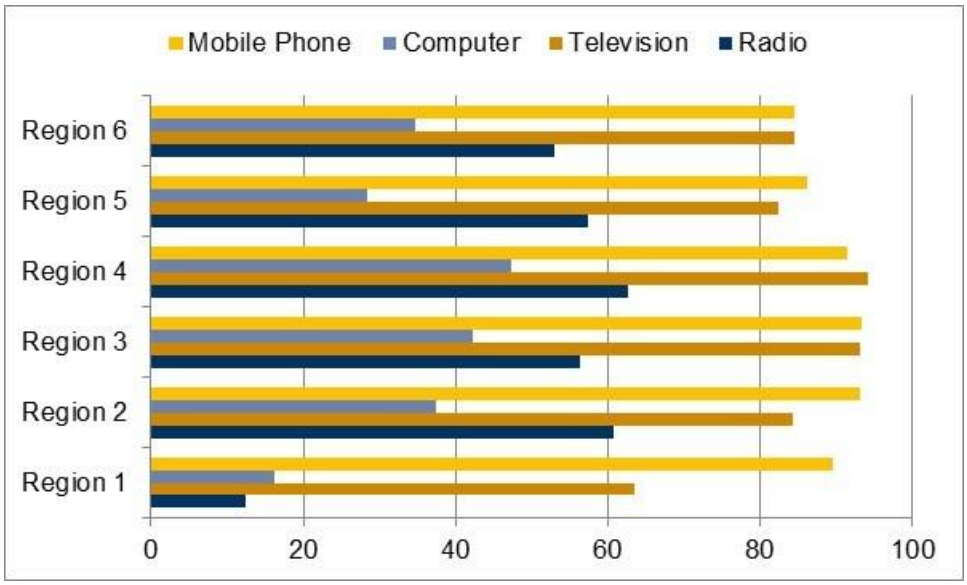
Hardscaped defences generally consist of an earthen embankment protected on the seaward side by a concrete slab and/or a (coping) wave wall or by rock armouring (rip-rap) (Royal Haskoning, 2004. Institutional Capacity Building Activities on Guyana Sea Defences, Volume 1 Executive Summary.).

Most of the existing hard structures are between 30 and 70 years old, and many are in need of repair. The natural sea defences are a combination of mud-banks and mangrove forests along the Guyana coastline. The mud-banks are comprised of fine sediments that originate from the Amazon, and are carried by the North Brazil Current along the northern coast of South America. Waves from the Atlantic Ocean (swell) break on the mud-banks, protecting part of the coastline from wave attack (Royal Haskoning, 2004. Institutional Capacity Building Activities on Guyana Sea Defences, Volume 1 Executive Summary.). The mud-banks also promote further sediment accretion and mangrove growth, thereby enhancing the resilience of the natural sea defences network.

4.3.9.7 Telecommunications

Results of the 2014 MICS show that the majority of households in the coastal regions have access to mobile phone service, with an average of 88.6 percent of households in the country having at least one member with a mobile phone.

There is more disparity in other forms of telecommunications, with Region 1 in particular showing lower levels of access to computers, television, and radio relative to other regions. However, the lack of 4G network access has been a major barrier to increased business investment in Guyana, and an issue that the PSC has prioritized. In 2016, the first 4G network in the country was installed (Figure 4-22).



Source: UNICEF, 2014

Figure 4-22: Household Access to Telecommunications, 2014

4.3.10 Cultural Heritage

Guyana's National Trust Act of 1972 protects national monuments, defined as resources of "historic, architectural or archaeological interest attaching to it or its national importance." According to this law, the National Trust of Guyana is responsible for designating resources as national monuments.

There are a range of historic buildings and monuments in Georgetown including the City Hall, St. George's Cathedral and the Red House. Georgetown is also home to cultural institutions housing collections of artefacts of national significance, such as the National Museum and the Walter Roth Museum of Anthropology. The Walter Roth Museum of Anthropology, the first museum of anthropology in the English-speaking Caribbean. Its collections include excavated artefacts from all of the ten Regions of Guyana (Exploreguyana.org, 2018).

According to World Monuments Fund, the heritage sector in Guyana faces many challenges, including unplanned rapid urbanization, limited or no documentation of heritage resources, demands to modernize historic structures, the notion of "in with the new, out with the old" and the idea that heritage is a hindrance to progress (WMF, 2017).

There are numerous living heritage structures such as churches and mosques integrated into the urban landscape, and potentially built heritage structures that could have historic or aesthetic value to local communities in the project area. The Koker Koffers, dating from the eighteenth century (during the Dutch period), are active artifacts used to keep water out, could be considered as cultural heritage due to their history. While they do not have a formal recognition for cultural heritage, such artifacts have historic value will not be removed, replaced or damaged during construction. They will be considered as part of the Chance find procedure to prevent any interventions to said structures.

Source: ERM, 2022. Note: Photo taken during the site visit along the Project Site

Figure 4-23: Koffee Koker

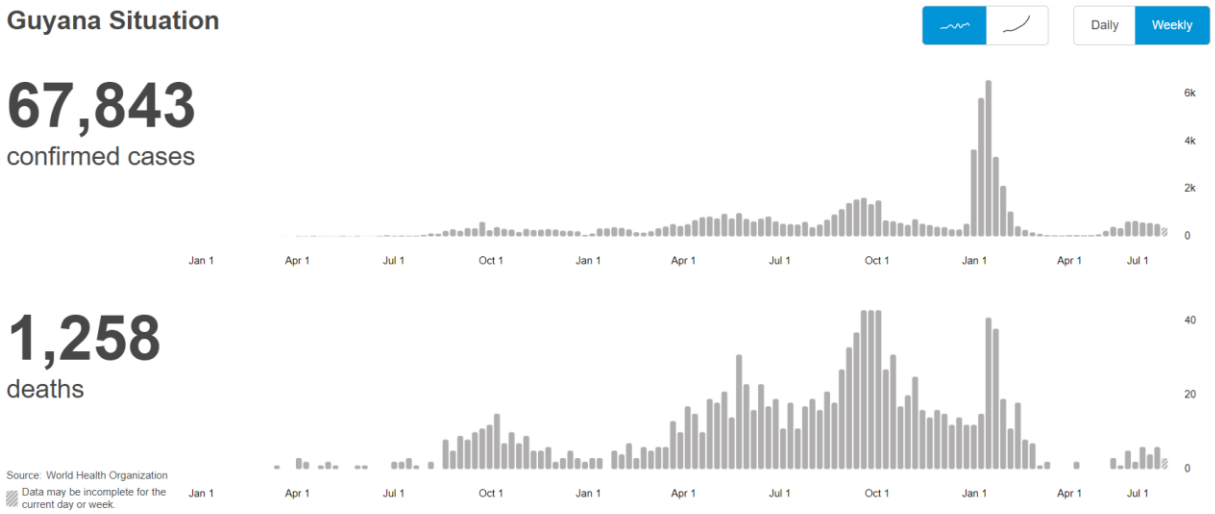
4.3.11 Health Context

Data from the Ministry of Public Health suggest that health outcomes in Guyana are continuing to improve steadily. Life expectancy increased by 13.6 percent between 2002 and 2017. In 2019, life expectancy at birth for Guyana was 70 years. The gender breakdown of life expectancy for women averages at 73, while for men it is 67 years (United Nations Development Programme, 2018). No specific data is available on life expectancy for the Project area.

Region Four, the project's administrative region infant mortality rate is "16 per 1,000 births" (UNICEF, 2016), while the national average is 32 per 1000 live births. (Bureau of Statistics, 2016). Analysis by the 'Guyana Help the Kids Foundation' (GHTK) suggests that the IMR "has declined significantly over the past seven to eight years" due to the provision and improvements of facilities (Staff Reporter, 2019).

The Healthcare sector in Guyana is a mix of public and free health care and private facilities that patients are required to pay at market costs out of pocket. Patients that contribute to the National Insurance Scheme, are refunded part of their medical expenses if they decide to use private facilities. The public and the private health sector's positive incline in the past decade are notable.

The coronavirus that causes COVID-19 was first confirmed in Guyana on March 11, 2020. As of July 2022, there have been 67,843 reported cases with 1,258 deaths (see Figure 4-24: Total Coronavirus Cases in Guyana, 2020 – 2022).



Source: WHO, 2022. Available at: https://covid19.who.int/region/amro/country/gy

Figure 4-24: Total Coronavirus Cases in Guyana, 2020 – 2022

4.3.11.1 Health Status

Common Diseases and Health Problems

As with many other developing countries, Guyana is undergoing an epidemiological transition by which non-communicable diseases are beginning to replace communicable diseases as the leading causes of illness and mortality. This shift is largely due to trends toward more sedentary occupations and lifestyles, as well as unhealthy diets and habits such as tobacco and alcohol use.

The most common non-communicable diseases and causes of illness and mortality in 2013 were diabetes, cardiovascular diseases, heart diseases, hypertension, cancers, chronic lung diseases, gastroenteritis and liver disease, accidents, violence-related injuries, and mental illnesses (Persaud, 2013.).

Obesity is on the rise in the country, along with other forms of malnutrition. Although Guyana is considered self-sufficient for food, accessibility and utilization of the right types of food to maintain health are of concern, leading the Ministry of Agriculture to develop the Guyana Food and Nutrition Security Strategy 2011-2020 Plan. This plan aims, among other goals, to integrate agricultural practices with improved food security and nutrition (Ministry of Public Health 2013a).

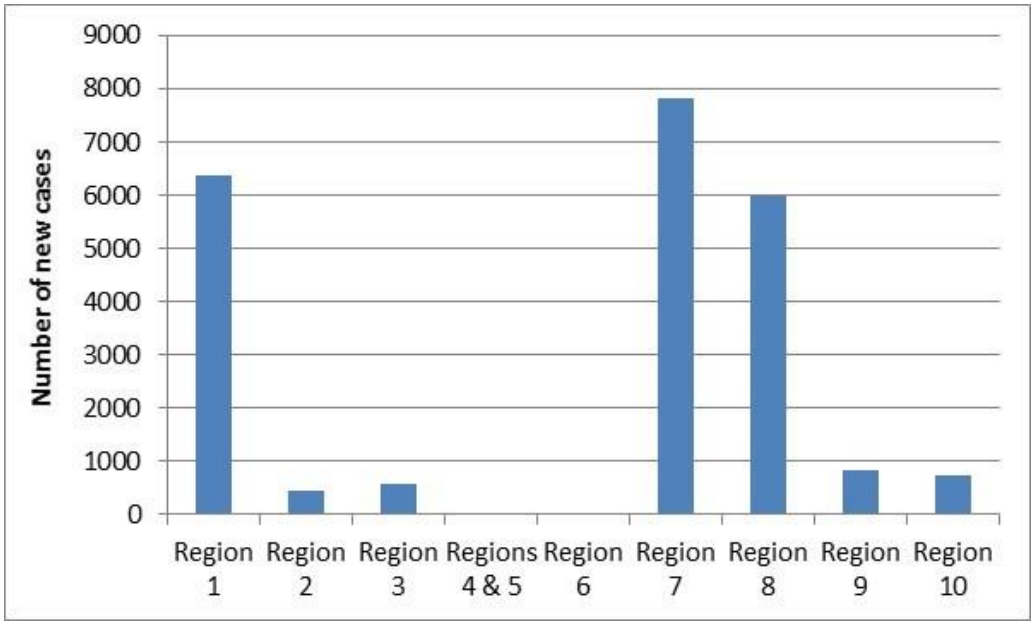
According to the Ministry of Public Health, in 2013, 6.2 percent of the population had been diagnosed with diabetes, with an estimated incidence rate of 4,000 new cases annually. Type 2 (non-insulin dependent) diabetes accounted for 92 percent, with Type 1 (insulin-dependent) making up the other 8 percent (Persaud, 2013). Hypertension is also on the rise, with a 2013 prevalence rate of 9 percent of the population over 30 years old and with an estimated 16,000 new cases reporting annually. Hypertension is the major contributing cause of strokes for persons over 40, as well as for heart attacks, disability, and others health issues affecting productivity of working age adults (Persaud, 2013).

Communicable diseases also continue to impact productivity, quality of life, and wellbeing in Guyana, particularly in the hinterland regions. This is due to a number of interrelated factors including poverty, nutritional deficiency, and inadequate access to health services. In 2012, the most common

communicable diseases were malaria (31,876 cases), tuberculosis (725 cases), and human immunodeficiency virus (8,263 cases) (Persaud, 2013).

Malaria is found in much of Guyana and is most prevalent in Regions 1, 7, 8, and 9. Malaria control efforts, such as distribution of insecticide-treated bed nets and indoor residual spraying[22], have been ongoing in these regions for decades. After an initial reduction in malaria prevalence in the early 2000s, the number of cases increased from 2007 to 2012. Figure 4-25: Malaria Incidence by Region, 2010 shows the number of reported new malaria cases for each region in 2010, the most recent year for which data broken down by region are available.

Dengue fever, chikungunya, lymphatic filariasis, and Zika are also locally transmitted in Guyana. Unlike malaria, transmission of these diseases tends to be common in populated and urbanized areas.

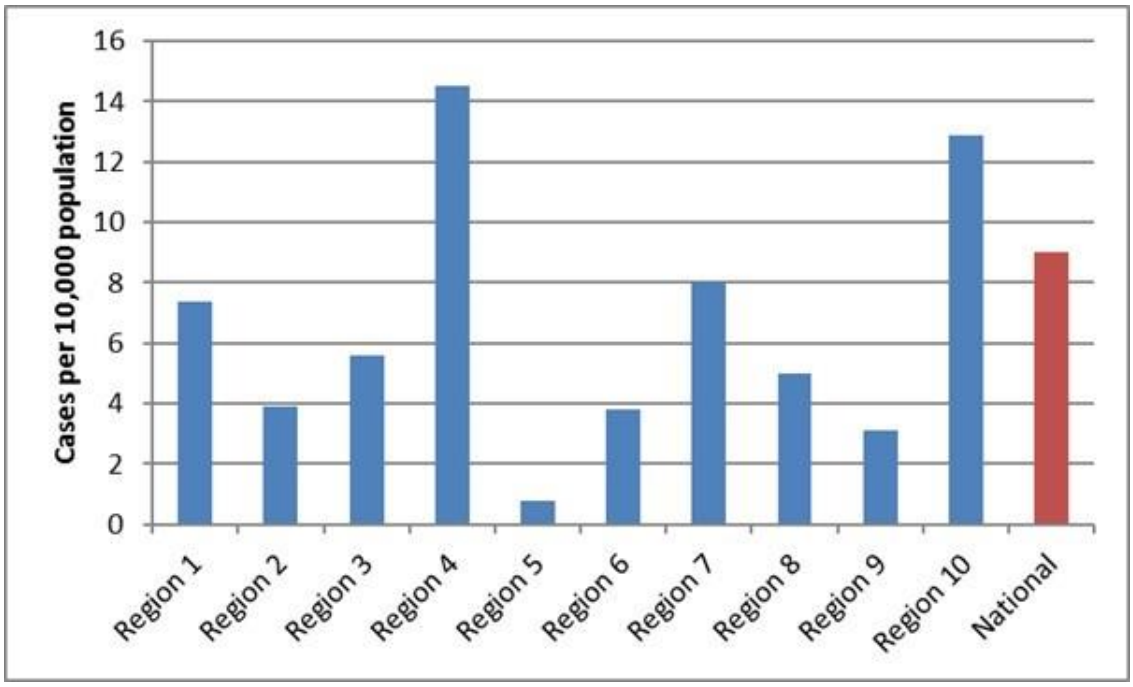


Source: Ministry of Public Health, 2013b

Figure 4-25: Malaria Incidence by Region, 2010

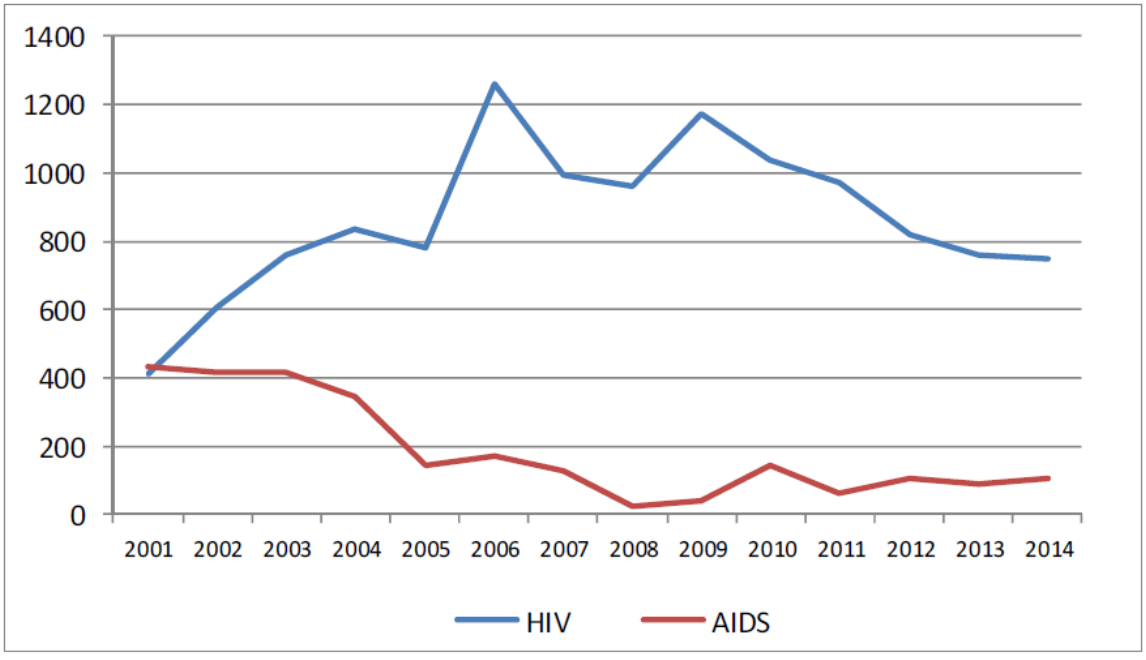
Tuberculosis (TB) continues to be a priority health concern in Guyana. It was nearly eradicated in the 1980s but saw resurgence in the 1990s due to its association with the HIV/ AIDS epidemic. In 2014, the national average for TB incidence was 10.3 per 10,000 people. Regional distribution of cases in 2010 is shown on Figure 4-26: TB Incidence by Region, 2010. In 2016, the number of people living with HIV in Guyana was estimated at 8,500, and the prevalence rate in the population aged 15 to 49 was 1.6 percent. According to the Joint United Nations Program on HIV/AIDS (UNAIDS, 2015), progress has been made in addressing the HIV epidemic in the country, with a reduction in the number of HIV cases reported since 2009, as well as a reduction in the number of AIDS cases (Figure 4-27: Annual Number of HIV and AIDS Cases, 2001-2014) and AIDS-related deaths.

[22] Indoor residual spraying involves coating the walls and other surfaces of a house with an insecticide that has residual activity (i.e., continues to work over several months, killing mosquitos on contact with the sprayed surfaces) (Centers for Disease Control and Prevention 2012).



Source: Ministry of Public Health, 2013b

Figure 4-26: TB Incidence by Region, 2010



Source: UNAIDS, 2015

Figure 4-27: Annual Number of HIV and AIDS Cases, 2001-2014

The tropical diseases lymphatic filariasis and soil-transmitted helminthiasis continue to be problematic in Guyana, leading to deformity, malnutrition, and social stigma in impacted populations. Efforts to combat these diseases in the country include mass drug administration campaigns and improvements in sanitation in endemic areas.

Maternal and Child Health

Guyana has made improvements in maternal and child health in recent years, but has not achieved its Millennium Development Goal targets of reducing child mortality rates by two thirds, and maternal mortality ratio by three quarters between 1990 and 2015. The crude birth rate[23] is down from 22.8 per 1,000 persons in 2003 to 17.7 per 1,000 persons in 2011, and the infant mortality rate has also declined from 17 to 15.1 per 1,000 live births during this same time period (Persaud, 2013). However, marked disparities exist in rural and hinterland areas, with the rate of under age 5 mortality at 48 per 1,000 live births in rural areas and 11 per 1,000 live births in urban areas (BSG *et al*., 2015).

The primary causes of infant death at birth include premature birth and respiratory distress, both of which are preventable, with the secondary causes being congenital deformity and birth defects that are not preventable (Persaud, 2013).

Mental Health

Guyana has a high suicide rate but has seen notable decreases in recent years. According to the WHO, Guyana had the highest rate of suicide of any country in the world in 2014, at 44.2 deaths per 100,000 people, versus the global average of 16 deaths per 100,000 people (WHO, 2014). However, this dropped to 29 deaths per 100,000 people in 2015, against a global average of 10.7 deaths per 100,000 people (WHO 2016). This decline can be attributed to several initiatives being implemented by the Ministry of Public Health with support from WHO/Pan American Health Organization, including a National Mental Health Action Plan for 2015–2020 and a national suicide prevention plan.

4.3.11.2 Health Care System

The Ministry of Public Health is responsible for setting national policy, regulation, and standards; building and refurbishing of healthcare facilities; and financing the employment of doctors, nurses, and emergency response workers. At the regional level, the Regional Health Authorities have the autonomy to assess, plan, and implement health services and manage the facilities for a defined population in a defined geographic area, including day-to-day management of the facilities and employment of all other staff working in the health sector.

The country's main framework for health is the Health Vision 2020, which sets the strategy and overall planning for the health sector. Government health spending compares favorably with that of other Latin American and Caribbean countries and has averaged about 3 percent of GDP in recent years, equivalent to $11.5 billion GYD annually ($55.6 million USD) (Ministry of Public Health, 2013b).

The healthcare system in the country is highly decentralized, with RDCs and Regional Health Authorities managing, financing, and providing health services. The Ministry of Public Health established priorities in 2013 for the national healthcare system to increase financial and technical support to improve the following (Persaud, 2013):

- Family health (child, adolescence, women, men, elderly);
- Disease eradication and mental health;

[23] The crude birth rate is the number of live births occurring among the population of a given geographical area during a given year, per 1,000 mid-year total population of the given geographical area during the same year (OECD 2013a).

- Violence, accidents, and injury rates;
- Healthcare facilities at all levels (community centres to city hospitals);
- Nutrition and food security; and • Access to health for frontier, migrant, remote, and vulnerable populations.
- Health Facilities

Health care facilities in the coastal regions are summarized in Table 4.8 below. In addition to these facilities, there is one National Ophthalmology Centre and one National Psychiatric Hospital in the country, both located in Region 6.

Table 4.8: Health Facilities in the Coastal Regions

Region	Regional Hospital	District Hospital	Diagnostic Centre	Health Centre	Health Post
Region 1	1	4	-	4	44
Region 2	-	2	1	11	17
Region 3	1	2	1	17	22
Region 4	1	1	1	39	7
Region 5	-	1	1	14	1
Region 6	1	3	-	21	2

Source: Ministry of Public Health, 2016

Healthcare Professionals

Retention of healthcare professionals in Guyana is a challenge, as in many other developing skilled workers routinely emigrate to more to developed countries. The most recent available statistics from the Ministry of Public Health indicate that there were nine physicians and 13.3 nurses per 10,000 people in the country in 2012 (Ministry of Public Health, 2013a).

Guyana currently has a Health Human Resource Action Plan for Guyana 2011-2016 that is aimed at addressing this issue. Additionally, this plan supports the Health Vision 2013-2020[24] which sets out the plan for long term health planning aimed at consolidating the progress made to date in health outcomes and system strengthening in Guyana

4.3.12 Human Rights Context

According to the U.S. Department of State's 2017 Human Rights Report for Guyana, the most concerning human rights issues in the country are harsh prison conditions and the existence of national laws criminalizing same-sex sexual activity (U.S. Department of State, 2017). Amnesty International also concludes that there is ongoing concern regarding excessive use of force by the police, violence against women and girls, and discrimination and violence towards LGBTI people (Amnesty International, 2018).

There were no recent reports of politically motivated killings in Guyana as of 2017, nor practices of torture or other inhumane punishing, other than the aforementioned excessive use of force and poor conditions for prison inmates. The most significant human rights issues in Guyana are described further below.

[24] https://www.paho.org/guy/index.php?option=com_docman&view=download&category_slug=health-systems-and-services&alias=123-guy-healthvision-2013-2020&Itemid=291

4.3.12.1 Prison and Detention Centre Conditions

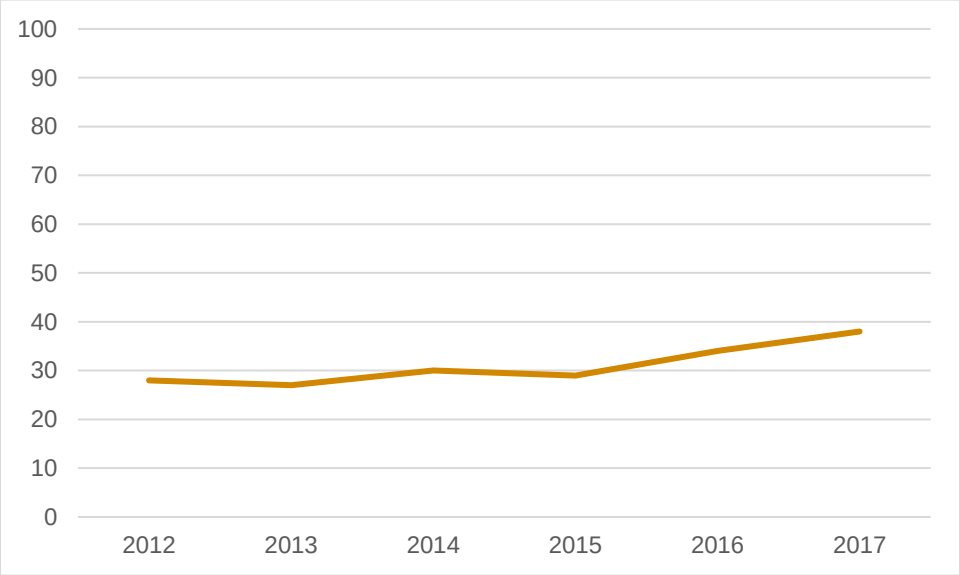
Prison and jail conditions, particularly in police holding cells, are reportedly harsh and potentially life threatening due to overcrowding, physical abuse, and inadequate sanitary conditions and medical care

In September 2017 the Guyana Prison Service reported there were 2,004 prisoners in five facilities with a combined design capacity of 1,179. As of July 2021 a total of 1,018 prisoners were in Georgetown's Camp Street Prison, designed to hold 550 inmates. Overcrowding was in large part due to a backlog of pre-trial detainees, who constituted approximately 30 percent of the total prison population (U.S. Department of State, 2017).

4.3.12.2 Corruption

The law criminalizes corruption by public officials; these laws are generally considered to be effectively implemented. Some cases of government corruption were reported over the course of 2017, all of which were investigated or otherwise responded to by the government.

Public perceptions of widespread corruption remain; however, Transparency International's Corruption Perceptions Index (CPI) suggest that the situation is improving. Guyana's CPI score[25] for 2017 was 38, with a ranking of 91st out of 180 ranked countries. Previous years' data indicate there has been overall improvement in recent years (Figure 4-28).



Source: Transparency International, 2017.

Figure 4-28: Corruption Perceptions Index Trend for Guyana, 2012-2017

[25] The CPI consists of a 100-point scale from 0 (highly corrupt) to 100 (very clean).

4.3.12.3 Treatment of Vulnerable Groups

Women

The U.S. Department of State 2017 Human Rights Report highlights that domestic violence and violence against women, including spousal abuse, is widespread.

Although rape is criminalized and there are stringent penalties provided by law, there are few successful rape prosecution cases. The law also prohibits domestic violence, with penalties ranging from fines of 10,000 GYD (about US$48) to 12 months' imprisonment. However, cases of police accepting bribes from perpetrators have been reported.

Although the law specifies that women are entitled to the same legal status and rights as men, gender-related discrimination in employment is widespread, both in hiring practices as well as incomes between men and women for equal work (U.S. Department of State, 2017 Human Rights Report).

Children

Physical and sexual abuse of children is considered a widespread problem. Non-Government Organizations (NGOs) report that, as in cases of domestic abuse, police and magistrates are sometimes bribed to overlook cases of child abuse (U.S. Department of State, 2017 Human Rights Report).

Indigenous Peoples

With respect to Indigenous peoples, the 2017 Human Rights Report highlights that the standard of living in indigenous communities was lower than that of the general population, plus they had limited access to education and health care. A UN study found that pregnant women in indigenous communities were not receiving mandatory HIV tests (U.S. Department of State, 2017).

Underlying many of these problems is the continued threat posed to indigenous communal territory, even titled land, by mining concessions. While the 2006 Amerindian Act was supposed to resolve these issues, problems persist with weak implementation and continued obstruction by authorities to community claims. (Minority Rights Organization, 2018).

Members of the indigenous population claim to be discriminated against by the two main ethnic groups in the country and by the government, with claims of insufficient government resources going to the development of indigenous communities (Cultural Survival, 2015. Indigenous Rights Violations in Guyana; Guyana Times, 2016 "Discrimination against Amerindians rampant – Nandlall". September 26, 2016).

LGBTQ+ Populations

Homosexual activity between adult men is illegal under the law and is punishable by up to two years in prison. No anti-discrimination legislation exists to protect persons from discrimination based on sexual orientation or gender identity, and NGOs reports noted widespread discrimination and harassment in employment, access to education and medical care, and in public spaces (U.S. Department of State, 2017).

5. IMPACT ASSESSMENT

5.1 General Methodology

The primary purpose of an Environmental and Social Assessment (ESA) is to predict the impacts resulting from the proposed project. Impacts can be direct, indirect, or induced, as defined in Table 5.1.

Table 5.1: Impact Designation Definitions

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

The assessment of impacts proceeds through an iterative process that considers four questions as illustrated in Figure 5-1.

Source: Prepared by ERM, 2021

Figure 5-1: Impact Prediction and Evaluation Process

These questions are expanded in Steps 1 through 4 below.

5.1.1 Step 1: Predict Impacts

An ESA evaluates potential project impacts by predicting and quantifying to the extent possible the magnitude of impacts on resources (e.g., water and air) or receptors (e.g., people, communities, wildlife species, habitats). Magnitude is a function of the following impact characteristics:

- Type of impact (i.e., direct, indirect, induced).
- Nature of the change (what is affected and how).
- Size, scale, or intensity.
- Geographical extent and distribution (e.g., local, regional, international).
- Duration and/or frequency (e.g., temporary, short term, long term, cyclic, permanent).

Magnitude describes the actual change that is predicted to occur in the resource or receptor. The magnitude of an impact considers all the various dimensions of a particular impact in order to make a determination as to where the impact falls on the spectrum (in the case of adverse impacts) from Negligible to Large. Some impacts can result in changes to the environment that may be immeasurable, undetectable, or within the range of normal natural variation. Such changes can be regarded as essentially having no impact, and are thus characterized as having a Negligible magnitude. In determining the magnitude of impacts on resources and receptors, embedded controls (i.e., physical or procedural controls that are planned as part of the project design) are taken into consideration (e.g., the magnitude of impacts on stream water quality from construction takes into consideration the effectiveness of proposed sediment and erosion control measures).

In addition to characterizing the magnitude of impact, the sensitivity/ vulnerability/importance of the impacted resource/receptor is characterized. A range of factors is considered when defining the sensitivity/ vulnerability/importance of the resource/receptor:

1. Where the resource is physical (e.g., a waterbody), its sensitivity to change and extent (on a local, national, and international scale) are considered.
2. Where the resource/receptor is biological or cultural (e.g., the riverine environment), its importance (e.g., its local, regional, national, or international importance) and its sensitivity to the specific type of impact are considered.
3. Where the receptor is human, the vulnerability of the individual, community, or wider societal group is considered, including if they are vulnerable groups or minorities (i.e., Indigenous peoples, African descendants). Other factors may also be considered when characterizing sensitivity / vulnerability / importance, such as legal protection, government policy, stakeholder views, and economic value.

As in the case of magnitude, the sensitivity/vulnerability/importance designations themselves are universally consistent (i.e., Low, Medium, and High), but the definitions for these designations would vary on a resource/receptor basis.

5.1.2 Step 2: Evaluate Impacts

An ESA evaluates the significance of a potential project impact by considering, in combination, the magnitude of the impact and the sensitivity/vulnerability/importance of the impacted resource or receptor. The assignment of a significance rating facilitates decision-makers and stakeholders to understand how much weight should be given to the issue in their process. In the case of positive impacts, the significance is assigned as Positive.

Significance was assigned for each impact using the matrix shown in Table 5.2. This matrix applies universally to all resources/receptors.

Table 5.2: Evaluation of Significance of Impacts

Impact Significance Matrix		Sensitivity/Vulnerability/Importance of Resource/Receptor		
		Low	**Medium**	**High**
Negative Impacts				
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major
Positive Impacts				
Magnitude of Impact	NA	Positive	Positive	Positive

In terms of what the various significance designations represent, the following considerations are provided:

- An impact of ***Negligible*** significance is one where a resource/receptor (including people) would not be affected by a particular activity, or the predicted effect is deemed to be imperceptible or is indistinguishable from natural background variations.
- An impact of ***Minor significance*** is one where a resource/receptor would experience a noticeable effect, but the impact magnitude is sufficiently Small (with or without mitigation) and/or the resource/receptor is of Low sensitivity/vulnerability/importance. In either case, the magnitude should be well within applicable standards.
- An impact of ***Moderate significance*** has an impact magnitude that is within applicable standards but falls somewhere in the range from a threshold below which the impact is Minor, up to a level that might be just short of breaching a legal limit. To design an activity so that its effects only just avoid breaking a law and/or cause a major impact is not best practice. The emphasis for Moderate impacts is therefore on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable. This does not necessarily mean that impacts of Moderate significance have to be reduced to Minor, but rather that Moderate impacts are being managed effectively and efficiently.
- An impact of ***Major significance*** is one where an accepted limit or standard may be exceeded, or Large magnitude impacts occur to highly valued/sensitive resources/receptors.
- An impact of ***Positive significance*** is one that has been identified as having a positive effect on the receptor/resource. Generally, this ESA does not attempt to characterize magnitude for positive impacts.

A goal of an impact assessment is to get to a position where a project does not have any Major residual impacts (i.e., after management measures are considered), certainly not ones that would endure into the long term or extend over a large area. However, for some aspects, there may be Major residual impacts after all practicable management options have been exhausted. An example might be the visual impact of a facility. It is then the function of the decision-makers and stakeholders to weigh such negative factors against the positive ones, such as employment, in coming to a decision on a project, and to promote offsets or compensation.

5.1.3 Step 3: Management and Enhancement

An ESA process aims to ensure that project decisions are made in full knowledge of their likely impacts on the environment and society. A vital step within the ESA process is therefore the identification of measures that could be taken to mitigate potential impacts of the project being assessed.

This process involves identifying where potentially significant impacts could occur and identifying ways of mitigating those impacts as far as reasonably possible. The mitigation hierarchy was used for this ESA, in which preference was given to trying to avoid or minimize the impact before considering other types of mitigation (i.e., remedy, compensate, offset):

- Avoid —remove the source of the impact
- Minimize —reduce the magnitude of the impact
- Mitigate— “repair” the results of the impact after it has occurred
- Compensate/offset—address the loss or change to a resource by replacing the loss/change in kind or with a different resource of equal value

5.1.4 Step 4: Residual Impacts

Once management measures are determined, the next step in the impact assessment process is to determine the residual impact significance. Residual impacts are the impacts that are predicted to remain after both embedded controls and committed management has been taken into consideration. In most cases, the sensitivity/vulnerability/importance of a receptor is unaffected by proposed management measures: the management measure is typically intended to reduce the magnitude of a predicted impact, thereby reducing its overall significance.

5.1.5 Summary Impacts

The project activities (i.e., lane widening, multi-use path, drainage, and utility relocation) will occur within an existing, widely used ROW. In general, the anticipated impacts are typical of construction projects un urban and peri-urban areas and are temporary and localized. Typical impacts of these activities will occur during construction, and include emissions from equipment, noise, temporary disruption of traffic, and temporary disruption of access to businesses and residences. Given the status of the ROW, no impacts to biodiversity or cultural resources are predicted. Potential economic impacts are being quantified and are anticipated to be moderate to minor. No physical displacement is planned. Table 5.3 displays the phases of the Project and the activities on each phase that will cause impacts.

Table 5.3: Activities that will cause impacts

Phase	Impact-Causing Activities
Pre-Construction	• Installing temporary laydown areas and temporary workers camps (rest areas). • Site preparation, mobilization of equipment and workers.
Construction	• Operation of heavy machinery and movement of soil • Traffic diversion/use of a full lane for rehabilitation • Road repaving

Phase	Impact-Causing Activities
	• Raising of crosswalks • Construction of a multi-use path • Adding parallel parking (in certain sections) • Sign replacement • Installation, repositioning, and upgrade of new light posts • Road widening (carriageway) • Opening of ditches • Reconstruction of the lateral drainage system • Culvert construction • Adding a weight control facility
Operations	• Traffic management during maintenance activities • Drainage structure maintenance

Typical mitigation measures for these impacts are well understood and widely used in the construction industry. Table 5-3 summarizes the anticipated impacts, mitigation measures, and significance of the impacts before and after the implementation of mitigation measures; the table also identifies in which phase of the Project each impact is created. The rest of this section expands the description and evaluation of impacts.

Impact Significance Rating

Negligible
Minor
Moderate
Major
Positive

Table 5.4 Summary of Environmental and Social Impacts

Impact	Project Phase	Pre-Management Impact Significance	Management Measures	Post-Management Impact Significance	Means of Verification	Monitoring and Reporting
Air Quality						
Air emissions and dust generation from construction vehicles, equipment and increased combustion and exhaustion emissions from private and commercial vehicles	Pre-Construction, Construction and Operations (operations' impacts were deemed negligible).	Moderate	▪ Implementation of the Construction Environmental Management Plan (CEMP) on the air quality and dust management measures. ▪ Maintain all construction equipment in accordance with manufacturer's specifications; keep the service log up to date. ▪ Suppress dust as needed in unpaved areas (e.g., use of water sprays or water carts). ▪ Where dust is identified as an issue, dust control measures will be implemented. These will primarily be the use of water carts but may include surface treatments ▪ Avoid burning non-vegetative wastes (refuse, etc.) at construction sites. ▪ Avoid unnecessary idling of construction equipment or delivery trucks when not in use. ▪ Keep work vehicles clean (particularly tires) to avoid tracking dirt around and off the site. ▪ Cover work vehicles transporting friable materials to prevent materials being spread around and off the site. ▪ Minimize drop heights of materials. ▪ Area to be disturbed minimized. Clearance lots to be approved by Project Manager. ▪ Implement the external grievance mechanism to follow-up on dust and/or exhaust emissions complaints being received by the community and workers. ▪ Vehicle movements controlled, optimize signaling to reduce traffic congestion (implement Traffic and Pedestrian Management Plan) ▪ Enforcement of speed limit and other traffic laws at the site ▪ Use of dust masks by workers (number of workers wearing them) ▪ Provide dust and air quality awareness talks as part of the environmental induction process	Minor	Site inspection during construction Grievance log Maintenance service logs	Monthly progress reports during construction. Quarterly air quality monitoring

Impact	Project Phase	Pre-Management Impact Significance	Management Measures	Post-Management Impact Significance	Means of Verification	Monitoring and Reporting
Water Quality						
Contamination to surface water	Construction	Minor	▪ Implemented the Construction Environmental Management Plan regarding sediment and erosion control and waste management ▪ Provide appropriate waste bins, type, volume, and service frequency to accommodate anticipated waste streams ▪ Enforcement of a strict no dumping policy especially in drainage canals and areas nearest the waterways ▪ Separate hazardous waste from non—hazardous waste ▪ Place of trash disposal bins around the construction site and worker day-camp ▪ Provide information regarding waste management in site specific inductions, including waste separation and importance of securing vehicle loads. ▪ Ensure licensed contractors are used to collect controlled wastes ▪ Disposal of all waste in the Haags Bosch Landfill site ▪ Installation of appropriate fencing and containment in waste management areas ▪ Implement management measures to prevent and manage spills, per Contingency Plan ▪ Storage of excavation material in designated laydown areas away from drainage channels and water bodies ▪ Selection of laydown areas by the contractor away from drainage channels and water bodies ▪ Appropriate training for staff on waste management practices and safe handling and storage of hazardous materials ▪ Implementation of Spill Management Measures established in the Contingency Plan (i.e., Implementation of sumps and oil traps to prevent fuel leaks and spills from contaminated surface water, have spill kits on site, storage of collected material in drums before transport to license disposal site)	Negligible	Site inspection during construction, Number of incidents related to waste management and spills, Grievances from the community, water quality testing along strategic sections of the roadway and against established baseline	Monthly progress reports during construction and grievance log
Noise						

Impact	Project Phase	Pre-Management Impact Significance	Management Measures	Post-Management Impact Significance	Means of Verification	Monitoring and Reporting
Noise generated by construction equipment and activities	Pre-Construction, Construction	Moderate	▪ Implementation of the Construction Environmental Management Plan (CEMP) on noise management measures. ▪ Maintain all construction equipment in accordance with manufacturer's specifications. ▪ If possible, schedule construction, modification, and rehabilitation work during daylight hours when increased noise levels are more tolerable. ▪ If possible, schedule construction and rehabilitation work to minimize activity during peak periods of tourism and recreation (weekends, holidays, etc.). ▪ Avoid unnecessary idling of construction equipment and trucks. ▪ Include a communications protocol regarding construction as part of the external communication mechanisms to stakeholders to inform adjacent receptors (e.g., commercial and industrial businesses) of construction activities. ▪ Install broadband spectrum backup alarms on construction vehicles as opposed to the typical single-tone frequency alarms (broadband alarms attenuate more quickly over distance due to the incorporation of higher frequencies). ▪ Pre-start checks and maintenance schedules to ensure equipment performance as required. ▪ Noise-dampening equipment to be used on equipment with excessive noise generating characteristics ▪ Implementation of community grievance mechanism ▪ Use of auditive protection equipment by workers (i.e., ear muffs)	Moderate	Site inspection during construction Service logs for equipment/machinery used on site Number of grievances by community members and workers Number and percentage of workers using auditive protection	Monthly progress reports during construction Grievance log
Hydrology and drainage						
Disruption to drainage and water service, negative alteration of hydrology conditions of runoff water crossing the Road.	Construction	Moderate	▪ Follow technical specifications for base width, side slope, and invert level for the 58 drainage structures as recommended in Appendix F of the drainage study for the improvement of roadside drainage. ▪ If needed, conduct a flood hazard assessment to finalize drainage design ▪ If possible, perform relocation of utility infrastructure prior to the start of construction activities. Otherwise, liaison with relevant service providers to limit service disruptions	Minor	Site inspection during construction, number of grievances of community members	Monthly progress reports during construction, grievance log
Geology and Physiography						
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Impact	Project Phase	Pre-Management Impact Significance	Management Measures	Post-Management Impact Significance	Means of Verification	Monitoring and Reporting
Soil and Water Resources						
Erosion and sedimentation	Construction	Moderate	▪ Disturbance area will be minimized and clearly demarcated. ▪ Works will only be conducted within the works zone. ▪ Vehicle movements will be restricted to the defined roads/tracks. ▪ Where possible, works area will be designed to ensure stormwater runoff drains into the site. ▪ Where required, sediment controls will be put in place. These will include, but not be limited to, rock check dams, sediment basins, sediment fences and silt socks. ▪ Sediment controls will be reviewed during site inspections and/or after significant rainfall (more than 10mm in 24hrs resulting in site runoff). ▪ Strategic location of detention basins to separate sediments in surface water runoff from water discharged to drains ▪ Locate material stockpiles away from waterways and with perimeter berm ▪ Re-routing drainage network to facilitate construction of Kofi Structure and other culverts ▪ Periodic cleaning of drainage canals per maintenance guidelines ▪ Landscaping and revegetation measures	Minor	Site inspection during construction	Monthly progress reports during construction
Natural Disasters and Risks						
Climate change and natural hazards (flood risk)	Construction	Moderate	▪ Incorporate into the Project design, results from the drainage study, to inform the design specifications for 58 cross drainage structures, including invert level, soffit level, slope, and base width, as applicable ▪ Installation of manually operated sluice gates (kokers) at the downstream end of the drains to prevent flooding and intake of brackish or salt water during high tide ▪ Consult with the Sea defense Board to inform Project design ▪ Implementation of Construction Contingency Plan for general actions in the presence of floods ▪ Reporting of disaster event(s) to appropriate authorities ▪ Carry out planned maintenance of drainage infrastructure	Minor	Site inspection, number of consultations with the Sea Defense Board, percentage of planned maintenance activities carried out	Monthly progress reports, records of consultations with the Sea Defense Board
Climate Change and natural hazards (flood risk)	Operations	Positive	▪ Implementation of contingency plan in the event of floods ▪ Reporting of disaster event(s) to appropriate authorities ▪ Carry out planned maintenance of drainage infrastructure	Positive	Maintenance reports	Maintenance reports

Impact	Project Phase	Pre-Management Impact Significance	Management Measures	Post-Management Impact Significance	Means of Verification	Monitoring and Reporting
Biodiversity						
Disturbance to surrounding vegetation	Construction	Minor	▪ Minimization of the construction footprint by refraining from the removal of vegetation ▪ Demarcation of work area with fencing to minimize disturbance of natural vegetation ▪ Minimization of temporary and permanent construction footprints during the design phase. ▪ Plan equipment access locations that minimize impacts, where possible; avoid areas with less stable structure such as steep banks. ▪ Revegetation as necessary	Negligible	Site inspection during construction	Monthly progress reports during construction
Wildlife injury or mortality.	Construction	Negligible	▪ Implement noise and air pollution management measures outlined in Section 5.2.2 and Section 5.2.1 respectively ▪ Implementation of construction contingency plan (CCP) (see Section 7.4.3). ▪ CCP establishes procedures and plans to respond in a timely and efficient manner, and with the necessary resources to accidents, attacks, and any other emergency situation including potential wildlife encounters. ▪ Implementation of the Traffic and Pedestrian Management Plan (see Section 7.4.6) will further reduce risk of injury or mortality resulting from vehicle collision with wildlife by (i) ensuring routes are planned to reduce the need for excessive vehicle movement, (ii) eliminating the need to reverse, (iii) ensuring adequate visibility for drivers	Negligible	Site inspection during construction	Monthly progress reports during construction
Degradation of aquatic habitat	Construction	Minor	▪ Implementation of drainage system to direct surface runoff to the stormwater systems ▪ Implementation of construction waste management plan ▪ Installation of sediment and erosion controls ▪ Avoidance of vegetation disturbance.	Negligible	Site inspection during construction Number of incidents related to waste management and spills	Monthly progress reports during construction Plant density and vegetation ground cover reports to monitor necessary revegetation

Impact	Project Phase	Pre-Management Impact Significance	Management Measures	Post-Management Impact Significance	Means of Verification	Monitoring and Reporting
Labor Conditions						
Occupational Health and Safety and Working conditions	Construction	Moderate	• Implement the Construction Health and Safety Management Plan • Training for the safe use of construction equipment and machinery to all workers. • Conduct toolbox talks about H&S, safety hazards and other relevant topics of the ESMS • Conduct Job Hazard Analysis before conducting a task. Ensure Work Permits are issued for hazardous work, as required • Use of appropriate protective clothing and safety gear including hard hats, hearing protection, goggles, and other devices; consider individual fitting of PPE for women and employs who do not fit one-size-fits-all and purchase safety helmets equipped with chin straps to improve fit • Application of signage such as reduced speed in work zone and presence of workers. Signage must be in appropriate language (i.e., other than English if workers who speak other languages are present) • Provision of ample supply of potable water, shade and required number of sanitary facilities on site; ensure women have separate facilities • Waste bins should be available near temporary camps and rest areas to minimize working in excess heat • Communicate with local hospitals to determine protocol in the event of an emergency • Maintain first aid kits on site that are fully stocked at all times. • Implement workers' grievance mechanism to raise concerns regarding H&S or working conditions. • Conduct H&S meetings as needed to discuss issues or incidents. Incidents resulting in fatalities must be reported immediately • Implement COVID-19 protocol;	Minor	Site inspection during construction H&S statistics on incidents	Monthly progress reports during construction Grievance log
Provision of construction jobs to local companies and materials sourced from the local economy	Construction	Positive	• Implement job quotas for local employment and sourcing requirements for construction contractors based on the size and scope of the Project • Encourage hiring women • Attract local workers, suppliers and contractors	Positive	Number of women hired Number of local companies hired Number of grievances related to job opportunities	Grievance log Human resources reports on composition of the workforce (nationality, men and women ratio)
Livelihood						
Temporary economic displacement to local businesses	Construction	In evaluation	• Implement a Livelihood Restoration Plan, that accounts for all stakeholders impacted on their means of living. • Design a compensation program for eligible stakeholders	In evaluation	Written agreements with affected stakeholders, number of grievances	Monitoring reports of compensation schemes, grievance log

Impact	Project Phase	Pre-Management Impact Significance	Management Measures	Post-Management Impact Significance	Means of Verification	Monitoring and Reporting
Community Health and safety						
Impacts on health and safety of the community	Construction	Moderate	• Develop and implement a Construction Health and Safety Plan and the Traffic and Pedestrian Management Plan • Appropriate and timely engagement of stakeholders on an ongoing basis, to ensure that they are well informed of the nature and duration of Project activities and have a good understanding of associated safety risks. • Implement good housekeeping practices in and around the Project construction sites including elimination of standing water or, if not practicable, treatment of standing water to kill mosquito larvae, proper management of construction waste, and regular maintenance of drainage canals to minimize flood risk • Implement stakeholder outreach to vulnerable subpopulations or to those responsible for maintaining their safety • Establish and publicize a Grievance Mechanism in the appropriate language to receive and respond to grievances. • Develop a Code of Conduct that strictly prohibits SGBV of any kind within the workforce and community. • Implement COVID-19 protocol	Minor	Site inspection during construction, grievance log, written agreements with affected stakeholders	Monthly progress reports during construction, grievance log,
Infrastructure Damage	Construction	Minor	• Conduct an assessment of properties along the RoW to determine the physical state of property (including fencing and walls) prior to the start of construction activities in order to determine if damaged occurred resulting from construction activities • Cover material transport truck to prevent air borne debris that could damage property • Enforcement of Traffic and Pedestrian Management Plan to reduce the likelihood of vehicles colliding with infrastructure	Negligible	Inspections, community grievances	Inspection reports, grievance log
Community Health and Safety	Operations	Positive	• Regular maintenance to the road • Use of reflective traffic signs and road markings • Sufficient street lighting • Installation of raised pedestrian cross walks • Universal access features • Road safety campaign • Implementation of contingency plans for natural hazards	Positive	Maintenance reports	Maintenance reports
Cultural Resources						
Restricted access to cultural heritage sites	Construction	Negligible	• Construction of concrete access bridges to religious and cultural sites • Improved parking and drainage infrastructure • Location of bus stop and pedestrian crossings in consideration of proximity to access for cultural sites • Implementation of chance find procedure	Negligible	Site inspection during construction Grievances regarding cultural heritage Stakeholder feedback during the public consultation	Monthly reports during construction Grievances log
Living cultural heritage	Construction	Negligible	• Include cultural heritage during the public consultation event. and assess churches mosques, mandirs, or other living heritage sites nearby or withing Project's AoI to understand operating hours and minimize disruptions and accessibility. • Implementation of chance find procedure	Negligible	Site inspection during construction Grievances regarding cultural heritage Stakeholder feedback	Monthly reports during construction Grievances log

Impact	Project Phase	Pre-Management Impact Significance	Management Measures	Post-Management Impact Significance	Means of Verification	Monitoring and Reporting
					during the public consultation	
Road Traffic						
Increased pedestrian and vehicle traffic congestion and disruption.	Construction	Moderate	• Maintain the traffic and schedule activities, to the extent possible, to be conducted not during peak times (e.g., early in the morning) as stipulated in the EPA permit guidelines. • Provide advance notice of scheduled construction activities and major traffic constructions via public service announcements (radio, TV, newspaper) • Coordinate the delivery of construction materials at times that minimize impacts to the existing traffic • Deploy traffic, safety, and road detour signs in appropriate language and close cooperation with the authorities. • Maintain one lane of carriageway open at all times to facilitate the flow of traffic • Install beams, retention walls and temporary passageways as needed (e.g., road safety barriers to facilitate safe access during construction) • Site H&S and security will be maintained during the construction phase by fencing will be erected to form a secure construction site to prevent entry by children, members of the public, trespassers and vandals. Warning signage to be placed at strategic points on the perimeter fencing. Information signage to be placed at the site entrance. • Development and implementation of a Traffic and Pedestrian Management Plan in consultation with Police, residents, and NDC. Update the Plan as needed during construction.	Moderate	Grievances related to traffic and local businesses impacts, number of traffic accidents and fatalities	Monitoring reports, grievance log Continual review controls and requirements of the Traffic and Pedestrian Management Plan

5.2 Physical Resources Impact Assessment

5.2.1 Air Quality and GHG emissions

During the construction phase, communities will be disrupted by nuisances typical to construction activities, including increased noise levels from the operation of heavy machinery and dust generation from the transportation of materials. Mitigation measures as described in more detail in section 5.1.3 can be applied to reduce the magnitude of these impacts.

This section assesses the Project's construction and operations impacts on air quality and it considers the magnitude and sensitivity of the affected receptors. The project is not expected to produce more than 25,000 tons of CO_2 equivalent annually, however no quantitative assessment of potential impacts from Project construction and operations was undertaken (i.e., no air dispersion modelling). In addition, there is absence of detailed equipment specifications and logistics at this time. The IDB ESPS 3, Resource Efficiency and Pollution Prevention, requires the borrower to consider ambient air quality conditions to address potential adverse impacts. Likewise, the presence of vulnerable individuals (children, elderly, people with respiratory problems, etc.), considered highly sensitive to air quality impacts will be assessed as part of the consultation process and throughout the construction phase through the Project's external Grievance Mechanism. Regarding the general public, proximity of residential homes to the roadway will heighten impacts from reduced air quality on these stakeholders but can be mitigated through the application of standard practices defined below.

5.2.1.1 Construction Phase

The following Project components would generate air emissions during road rehabilitation activities:

- Material excavation for the construction of sidewalks and bike paths
- Soil disturbance from materials transport for road rehabilitation
- Dust generation from uncovered material transport trucks
- Mechanical equipment operating at sub-optimal levels

Dust accumulation and combustion/exhaust emissions during the Project construction would increase air pollution and may create a health nuisance due to the proximity of residents, business owners, pedestrians, motorists and other road users along the roadway.

The potential direct impact to air quality during the construction phase of the Grove to Timehri Road Infrastructure Development Project include:

- Emissions of airborne particles from the excavation and increased traffic of trucks transporting excavated material along the roadway
- Increases in combustion/exhaust emissions from construction equipment, machines, and project vehicles. Throughout the corridor, residents and businesses are located in close proximity to the carriage way.
- Dust from construction activities, material and waste stockpiles and movement of heavy-duty equipment can affect workers and nearby residents and businesses.
- Vibration from pile driving equipment can cause structural damage to nearby property. This is a particular concern where bridges and culverts are being constructed.
- Noise from the operation of machinery and construction activities. Throughout the corridor, residents and businesses are located in close proximity to the carriage way. These impacts will be more significant especially in the Grove area which is extremely built up.

Figure 5-2: Fly-over capture of roadway in Grove area

Source: Captudata, 2022.

The potential for dust emissions is higher during dry and windy weather and it is less of an issue during the wettest months (May to July and December-January, see Figure 4-2).

Considering the Project's activities would be localized, and occur over a period of 36 months, the Project impacts to air quality are expected to be ***moderate*** (medium magnitude, medium sensitivity) as community members and road users will notice impacts given the need for the movement of construction equipment, materials, and vehicles during the construction phase, but all work will be conducted in an urban area already subjected to fugitive emissions and dust generation from traffic congestion. Dust generation and fugitive emissions resulting from construction will be easily mitigable given the application of standard mitigation measures outline in Table 5.4.

Residual Impact

Implementation of the management measures described in section 7.4.1 is expected to reduce construction air impacts to *minor* and no long-term impact on the environment and local community are expected.

5.2.1.2 Operations Phase

During the operations phase, combustion emissions from heavy equipment and construction vehicles are expected to reduce for periodic maintenance works. However, during operations, traffic congestion is expected to continue due to high number of vehicles on the roadway and the potential for traffic accidents to cause back-ups. Conversely, improved road surface is expected to reduce vehicular emissions given that traffic congestion is expected to decrease. In order to continuously monitor air quality conditions, WSG could include air quality monitoring instruments to capture data continuously. Alternately, semi-annual air quality monitoring is recommended during operations.

Overall, the Project operations are expected to have *negligible* impacts to air quality as the environment and local community will not be affected.

Residual Impact

No residual impacts to air quality resulting from maintenance activities during operations are expected.

5.2.2 Noise

This section assesses the Project's construction and operations impacts on noise quality and it considers the magnitude and sensitivity of the affected receptors. For noise, however, it is usually possible to predict noise levels quantitatively and compare them against standards that are resource/receptor-specific and inherently take into account resource/receptor sensitivity. No quantitative assessment of potential impacts from Project construction and operations has been undertaken yet (i.e., no noise propagation modelling), due to the absence of detailed equipment specifications and logistics information at the time of writing this report. In order to have baseline readings, WSG will conduct data collection prior start of construction activities, as described in the Construction Environmental Management Plan (Section 7.4.1).

Construction equipment and project vehicles are expected to admit noise during working hours; daytime 06:00h to 18:00 h, night-time 18:00h to 06:00hr. The Guyana National Bureau of Standards (GNBS) Guidelines for Noise Emissions into the Environment, provided below, are less strict than World Bank Group (WBG) Guidelines. World Banks maximum limits specifies a 70 dB(A) limit in industrial areas and 55 dB(A) limit during the day or 45 dB(A) at night in residential areas. These limits are below limits permitted by the EPA. Per the IDB ESPF3, the Project will comply with the more stringent guidelines for permissible noise limits between WBG and the from Guyana, the former being the more stringent.

Receptor	Daytime Limits in dB(A)	Night-time Limits in dB(A)	
Residential	75	60	
Institutional	75	60	
Educational	75	60	
Industrial	100	80	
Commercial	80	65	
Construction	90	75	
Transportation	100	80	
Recreational	100	18:00-01:00h	100
		01:00-08:00h	70

5.2.2.1 Construction Phase

The potential direct impact to noise quality during the construction phases road rehabilitation include increases in noise emissions from use of heavy construction equipment and vehicles. Due to close proximity to businesses, road users and residents along the roadway, noise impacts on the community will be noticeable, especially in the Grove and Soesdyke which have a larger concentration of local people. However, noise impacts are expected to be short-term and during the construction phase.

Table 5.5 provides a list of typical construction equipment at their typical noise levels at 15 m (50 ft.).

Table 5.5: Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level (dBA), 15 m from Source
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Jack Hammer	88
Loader	85
Paver	89
Pneumatic Tool	85
Pump	76
Roller	74
Scrapper	89
Shovel	82
Truck	88

dBA = A-weighted decibel

Source: US DOT 2006 (Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006).

Given there is no baseline data for noise in the area, is not possible to determine at this time the relative increase in noise once construction begins; once baseline noise levels are obtained and monitoring during construction occurs, WSG will be able to manage impacts from noise. Given the proximity of the road to local businesses and other populated areas (including residences), a conservative approach is to assume 5-10 dB increase (Medium magnitude). Similarly, the sensitivity of the receptor can be deemed as Medium given that there is already traffic and noise in the area.

The construction activities associated with roadway expansion and improvement would result in noise increases in the immediate vicinity. However, considering the Projects activities would be localized and occur over a 36-month time period, the impacts on noise quality is expected to be ***Moderate*** (medium magnitude and medium sensitivity).

Residual Impact

Noise impacts are expected to be short-term and during the construction phase only. No residual impacts are anticipated.

5.2.2.2 Operations Phase

During the operations phase, sporadic maintenance of the roadway will be carried out. If machinery will be operated to perform maintenance activities the same mitigation measures described as during construction.

Residual Impact

No residual impacts resulting from noise generation are expected during the operations phase.

5.2.3 Geology and Physiography

In general, the proposed Project would have negligible effects on the upland geology and topography at site during the construction and operations phases of the Project. The Proposed project would not modify the underlying geology or significantly alter the topography of the Project area.

5.2.4 Hydrology and drainage

During construction, WSG plans to avoid water service disruptions. Nevertheless, water diversions will be required during the construction of culverts to ensure that adequate drainage is maintained, which could temporarily affect current drainage during works. In addition, the corridor is identified as a flood prone area which can be exacerbated due to alteration of drainage networks to facilitate construction of culverts, particularly the Koffi Structure. A Flood Hazard Assessment is currently being executed to determine existing flood conditions in the area. Results of the study will be used to inform Project design to reduce the likelihood of flooding from construction activities.

Guyana's coastal plane is at high risk of flooding and has poor internal drainage that naturally gravitates towards the Demarara River. Therefore, the sensitivity of the receptor (coastal plan and drainage system) can be considered high. The installation of culverts has the potential to disrupt overall drainage services and the current hydrology system in the area which has the potential to impact the community, especially surrounding businesses. Therefore, the impact is considered moderate (medium magnitude, medium sensitivity).

5.2.5 Soil and Water Resources

The Demerara River is characterized as heavily silted and polluted by sources external to the Project, though road rehabilitation and construction activities can further impact erosion conditions of the river if not properly mitigated using established engineering practices. Likewise, drainage infrastructure, such as culverts, can increase flood risk if not properly adapted. Areas throughout the corridor are identified as flood prone areas and are equipped with drainage canals that empty into the Demerara River. Proper management of stormwater runoff is necessary to reduce impacts to surface water quality during the entire life cycle of the Project.

An analysis has been carried out to assess the proposed drainage infrastructure. Flooding of the roadway will be addressed by the Project design which includes raising the level of the road and installation of efficient drainage infrastructure or repair of existing infrastructure that has the capacity to manage surface runoff and storage.

The Contractor will determine if there will be an asphalt plant and, if so, the contractor will obtain permission from the EPA. Asphalt poses several hazards related to polycyclic aromatic hydrocarbons (PAHs) and alkyl PAHs which are considered carcinogenic. The potential for these compounds to containment surface water in the corridor can be mitigated.

5.2.5.1 Construction Phase

Potential direct impacts to soil and water resources during construction includes:

- Increased sediment loading in drainage canals resulting from improper storage of excavation materials and poor management of stormwater runoff in drainage canals nearest the corridor
- Soil compaction from the operation of heavy machinery and vehicles in unpaved areas

Increased risk of water-borne disease resulting from blocked water ways from the alteration of drainage networks during the construction of culverts represents a potential indirect impact during construction of the Project. Likewise, the diversion of surface water for rehabilitation activities increases the likelihood of

erosion. Increased surface run-off from pluvial flooding is another indirect impact of the Project and is exacerbated by climate change.

Given the poor drainage in the area (including for naturally occurring soils) and the preexisting risk for flood, resource sensitivity is high for soil erosion and sedimentation. Nevertheless, construction works are aiming to improve drainage and prevent flooding and planning the location of culverts and U concrete drainage will minimize impacts. Likewise, construction activities will take place in sections, making flood conditions easier to manage as drainage canals nearest construction activities can be careful watched for blockages. Natural hazards such as pluvial flooding present the greatest risk to soil and water resources and have the potential to cause long-term disruptions. However, heavy rainfall is already prevalent in the Project area and the impacts are unlikely to be exacerbated by construction activities. Therefore, the magnitude of the impact is small and overall impact significance, moderate.

5.2.5.2 Residual Impact

Implementation of management measures are expected to reduce the likelihood of soil erosion and contamination and decrease the severity of impacts to drainage canals and the Demerara River.

5.2.5.3 Operations Phase

Monitoring of water courses for erosion and sedimentation and periodic cleaning of drainage canals can reduce impacts to soil and water quality during maintenance activities. Overall, no impacts to soil and water resources are expected during operations.

5.2.6 Water Quality

5.2.6.1 Construction phase

The Project will be inland with sections of the road running parallel to the Demerara River. The Project will not use or discharge liquid effluents or other waste into the river. Nevertheless, indirect impacts are expected from surface run-off during heaving rains, and material stockpiles and excavated materials resulting in an increase in sediment loading in the drainage channels throughout the corridor. Additionally, other impacts to water are those resulting from inadequate implementation of management procedures:

- Water contamination from fuel/oil spills due to proximity of drains throughout the Grove to Timehri Corridor
- Improper liquid waste (e.g., sanitary effluents) and solid waste disposal from construction workers (e.g., food wrappers, boxes)

The Demerara River has historical records of altered water quality and does not support diverse aquatic habitat or populations, its sensitivity is low. The Project right of way is located approximately 400 m from the Demerara River; the risk of erosion resulting from Project activities is unlikely, however material stockpiles do have the potential to carry sediments to the Demerara River. Additionally, pollution to the river from poor management of hazardous materials spills, liquid waste, and solid waste is possible. However, final laydown areas have not been selected by the EPC contractor at the time of writing this report to determine the magnitude of unplanned impacts; assuming chemicals and hazardous materials are not expected to be stored close to the river and that quantities will be low, if there is a fuel or chemical spill, the latter is not expected to be large. However, based on information reviewed, the event of unplanned water contamination resulting from runoff and improper waste and drainage management during the course of a 3-year construction period is likely to occur during normal operating conditions. Therefore, potential impacts to water quality are considered minor (medium impact and low sensitivity).

5.2.6.2 Operations phase

During operations, the drainage network will be improved, therefore impacts to water quality are expected to be negligible.

5.2.6.3 Residual impact

Impacts to water quality are expected to be easily avoidable, short-term and during the construction phase, only. No residual impact is anticipated.

5.2.7 Natural Hazards and Risks

According to a Global Assessment Report on Disaster Risk Reduction prepared by the United Nations, a hazard is a dangerous phenomenon, human activity, or condition that may cause loss of life, injury, or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (UNISDR, 2009). A disaster is defined as a serious disruption of the functioning of a community or a society involving widespread, human, material, economic, or environmental losses and impacts that exceeds the ability of the affected community or society to cope using its own resources.

The Disaster and Climate Change Risk Classification for the Project is High due to potential flooding and infrastructure interventions are estimated to have a high level of vulnerability and criticality given the roadway is a corridor to the main international airport. The Project itself would be exposed to natural events, such as floods (river and coastal), which could be induced or exacerbated by sea level rise resulting from climate change and potable water abstraction in Georgetown. Mean sea level rise at Port Georgetown increased 9.25 inches between the years 1960 and 2010. Natural hazards have the potential to affect the Project during both construction and operations. For example:

- **Construction Phase**: Flooding could impact construction activities and could result in damage to Project components (e.g., damage to construction sites and equipment) and exacerbate impacts to surrounding communities.
- **Operations Phase**: Careful attention in the design of Project components must be taken to ensure the Project is resilient to the potential increase of precipitation resulting from climate change, so that flood conditions are not exacerbated.

As part of and in addition to risk prevention measures, there will be plans in place to assure emergency preparedness and response in the event of a forecasted event (e.g., tropical storm with a risks of causing flooding), unforeseen event (e.g., extreme rainfall event) or in the instance where drainage canals become blocked due to Project activities. This will involve securing equipment and materials, stabilizing disturbed areas, proper drainage management during construction, and similar actions as well as procedures for site evacuation.

A drainage study was carried out in 2014 and a total of 58 existing cross drainage structures were surveyed to check their adequacy against the provision for a 50-year flood event. The study concluded 11 of these structures require total replacement. All other structures were determined to be satisfactory but, would benefit from channel improvements in order to provide adequate storage in urban areas during tide locked conditions. Land to the east side of the Demerara River is higher and a natural depression separates the river from the East Demerara Water Conservancy. The depression serves as natural flood storage during tide lock conditions. Urban development in the area has the potential to impact the natural depressions and reduce natural flood storage capacity and therefore would benefit from channel improvements.

5.2.7.1 Residual Impact

It is expected that the implementation of Project control measures would reduce the potential impact from natural disasters to the Project to *M*inor (small magnitude, medium sensitivity) and decrease the likelihood of floods from occurring, benefiting the local community.

5.3 Biodiversity Impact Assessment

Both the disturbed/degraded condition of natural habitat along the Project corridor limit the significance of the Project's impacts on biodiversity. There is no anticipated vegetation clearance and therefore impacts on Flora are expected to be minimal. Fauna disturbance, if any, would be punctual and isolated. No net loss or improvement on natural habitat is proposed. The potential direct and indirect impacts to biodiversity resulting from the Project are as follows:

- Degradation of Aquatic Habitat by alteration of water quality; and
- Wildlife Injury or Mortality

5.3.1 Disturbance to Surrounding Vegetation

Any potential disturbance of vegetation is limited to erosion due to divergence of water or soil removal during the relocation of utility assets (phone lines, light poles, culverts). If removal of vegetation occurs, WSG will conduct an assessment of the exact polygon and determine through the EPA the need for additional studies or activities prior to removal. Potentially affected vegetation will consist of narrow areas of secondary 'disturbed' vegetation, primarily common weeds, shrubs, herbaceous plants and trees along the project corridor. The vegetation along the project corridor is defined as secondary due to the low species diversity and heavy habitat disturbance. Disturbance of this vegetation community, if any, would be temporary during construction and disturbed areas of weeds, shrubs and herbaceous plants would revegetate quickly as species observed at the site consisted primarily of highly mobile species that adapt easily to changing environments. This vegetation also contributes to erosion control and shade for residential areas and economic activity. Landscaping and revegetation will be included as part of roadway design and maintenance if any vegetation removal does occur. Impacts to vegetation during the construction phase of the Project are expected to be Minor (small magnitude and medium sensitivity of the resource).

Residual Impact

Implementation of the management measures detailed in Table 5.4 result in no anticipated residual impact on surrounding vegetation.

5.3.2 Degradation of Aquatic Habitat

Improper disposal of waste oil from the servicing of mechanical vehicles is a major area of concern for aquatic habitats. Although water quality is already compromised throughout the corridor, the drainage of waste oil into soils or water ways can exacerbate impacts and contribute to reduced water quality and therefore aquatic habitat. Potential erosion could ruin spawning beds for fish that have been found to spawn in drains close to the road. The impacts of the Project on aquatic ecosystems will mostly fall on an already degraded aquatic ecosystem due to the history of land use and maritime activities in Georgetown and the Demerara River.

Impacts from the Project to the aquatic habitats are expected to be Minor (medium magnitude and low sensitivity).

Residual Impact

Implementation of the above-mentioned management measures would reduce impact rating to a *Negligible* level (small magnitude and a low sensitivity).

5.3.3 Wildlife Injury or Mortality

The project corridor is lined with small businesses and residential buildings, drastically altering the food chain and greatly reducing the biological value of most of the species. Wildlife consists of mostly highly mobile species fragmented into microhabitats fragmented by urban structures. No domesticated roaming grazers (cows, sheep, goat) are presently found along the project corridor. There are no endangered species or sensitive habitats in the project area. For the most part, wildlife will move away from work areas during construction, avoiding injury or mortality from Project activities. Since vegetation disturbance is not planned, any existing wildlife will likely return to the area once construction has ceased. Impacts from the construction phase of the Project to area wildlife are expected to be Negligible *(*small impact and low sensitivity). No additional impacts from current conditions are expected to wildlife during the operations phase of the Project.

Residual Impact

Implementation of the measures described above will reduce impact on terrestrial biodiversity to a Negligible level (small magnitude and small sensitivity).

5.3.4 Additional Management/Enhancement Measures for Biodiversity

The following additional management measures would further help reduce the potential impacts of the Project on biodiversity:

- Demarcate work area with fencing to minimize disturbance or removal of natural vegetation;
- Plan equipment access locations that minimize impacts to riparian areas, where possible; avoid areas with less stable structure such as steep banks; and
- Minimize temporary stockpiling and place stockpiles outside of the active floodplain. Prevent runoff from stockpiles from entering creeks by using erosion control measures such as silt fences and/or straw wattles.

5.4 Socioeconomic and Cultural Heritage Impact Assessment

5.4.1 Labor Conditions

This section assesses impacts to workers during the construction phases of the Project. All employees involved in the road rehabilitation Project will receive training on basic health and safety precautions and effective traffic control mechanisms. A Traffic and Pedestrian Management Plan will be implemented by the contractor during the mobilization and construction phases to minimize risk of accident to workers resulting from collisions with motorized vehicles. The EPC contractor will implement its Standard Operational Procedures (SOPs) and its own H&S protocols in addition to the general guidelines established by WSG's ESMP (see Sections 7.4.2 and 7.4.4 for details on occupational H&S and labor and working conditions respectively).

The Project will address gender and diversity gaps present in Guyana by promoting female employment for the construction and maintenance of the road rehabilitation Project. Currently, women make up only 5% of workers in the construction sector in Guyana. The Project will develop training programs specific to

the development of women to obtain the necessary skills appliable to successful careers in the construction sector.

Regarding recruitment of personnel, WSG does not have its own policies or procedures to prevent child or forced labor. They will adhere to the Regulations dictated by the Ministry of Labour of Guyana. Guyana's national laws have a statutory minimum age of 15 to work. WSG and the selected EPC contractor will go through the selection process to assure people under 18 do not engage in hazardous work. These provisions are prescribed in section on Human Resources and Labor Management, which is part of the ESMP.

5.4.1.1 Construction Phase

The number of estimated workers is not known yet, nor where they will come from; however, due to national content requirements by the Government of Guyana, WSG will prioritize recruitment of local workers and local suppliers. WSG has had up to 250 workers on site, inclusive of contractors, on similar road infrastructure projects, so the peak of workers could be expected around 250-300.

During the construction phase, all workers will be exposed to a number of health and safety hazards that will be mitigated through the implementation of a Health and Safety Plan prepared by the Contractor. These hazards include:

- Exposure to noise levels above permissible limits if operating heavy machinery without adequate hearing protection
- Detachment of pile driving hammer from protective encasement leading to injury
- Exposure to hazardous materials and waste
- Potential for worker exhaustion
- Working extensive periods in high temperatures (workers exposed to heat stress or heat stroke)
- Fatal or serious injury accidents resulting from distracted or aggressive driving in the corridor.

The IDB ESPF enforces non-discrimination and equal opportunity employment which includes the assessment of risks that may disproportionately affect women. Women employed by the Project are at risk of experiencing gender-based violence by co-workers, managers, and community members. Women can also be subjected to ill-fitting personal protective equipment (PPE), as the design of PPE is generally designed for larger frames. Improper fitting PPE can come in many forms as described below:

- Work boots are difficult to find in women's sizes. Smaller sizes designed for men are often too wide increasing the risk of slip, trips, falls, and irritation
- Safety goggles that are too big for a women's face can expose the eye to hazards or provoke fidgeting as the women attempts to keep the goggles comfortably on her face, increasing the risk of distracted working and restricted vision
- Safety helmets that are too big may also provoke fidgeting and restrict vision
- Hand protection that is too big can make it difficult to hold onto and handle construction equipment safely
- Safety harnesses that are too big and are unable to tighten the appropriate amount can restrict movement and increases the risk of fall from heights

Impacts associated with labor, including supply chain, will be addressed in the Human Resources and Labor Management Plan (HRLMP) included in the ESMP (Section 7.4.4). Requirements identified in the HRLMP will be included in the operation's legal requirements, bidding documents, and contractor and

supplier contracts. Additionally, the HRLMP outlines the workers grievance mechanism as required by the IDB ESPF.

There are no publicly available reports or statistics on forced or child labor in Guyana; however, legislation considers young persons (between 15 to 18 years of age) to work, although not in hazardous work, night shifts or extended shifts. In addition, employment rates in Guyana are low, around 12% at the national level and 11% in Region 4, where the Project is located. Given that unemployment is low and there has recently been employment thanks to the development of the Oil and Gas industry, sensitivy of the population to forced or child labor can be considered Medium. Adequate management of labor and working conditions starts by selecting Contractors with high environmental and social capacity and good labor practices. WSG is responsible for ensuring the Contractor implements mitigation and general good practice measures to prevent accidents to workers and protect the welfare of the workforce in line with applicable regulations; WSG has a Human Resources Department comprised of 6 people, including the HR manager, who would be in charge of assuring the EPC contractor and direct workers abide by national Law. The bidding documents and the EPC contract will bind the selected contractor to align to WSG ESMP and therefore to the IDB ESPF. The risk of having child or forced labor on site is small considering the above.

The construction activities associated with H&S conditions would result in increased risk for Project workers. However, considering many of the risks are mitigatable, workers are protected by the contracting company with experience and procedures in place. With appropriate Management Measures the impacts on H&S labor conditions are expected to be Minor (small magnitude and medium sensitivity). Forced/Child labor is considered low risk given the low unemployment rate of the area and Organizational capacity of WSG to manage Human Resources issues.

5.4.1.2 Residual Impacts

Residual impacts are expected to be positive but short term and are elaborated in Section 5.5.1.

5.4.2 Impacts to Livelihoods

During construction, the roadway upgrades and expansion is expected to generate impacts that could disrupt livelihood activities locally, leading to potential temporary economic displacement. The Livelihood Restoration and Resettlement Plan (LRRP) found on Appendix C includes the results of a census conducted to assess all affected businesses, including moving vendors, residents and other road users in the Project's area of influence, and to establish an appropriate compensation scheme to mitigate the Project impacts.

It is envisioned that in the long term, the Project will have beneficial, indirect livelihood impacts for a much larger and widely dispersed population in Guyana, via improved efficiency of the roadway leading to an improved quality, resilience, and safety conditions of Guyana's road transport infrastructure.

5.4.2.1 Construction Phase

Construction of the Project would generate traffic in and out of the Project area for movement of construction materials, supplies, wastes, and workers. The volume of traffic that will be generated, and the extent of disruption to different roadways over the Project duration, will be temporary and of short duration. However, it is expected that construction activities and traffic could disrupt both formal and informal commercial activities around the Project area to the extent that economic displacement is expected, despite all Project activities occurring in the existing RoW. As described above, there are commercial and industrial business in the area that range from electricity generation to chicken farming and some temporary stalls selling vegetables and other goods are present. Disruption could occur through temporary increase of truck traffic while construction is underway, deterring would-be patrons due

to increased traffic congestion or safety risks, or otherwise creating challenges to gaining access to the establishments such as limiting parking available. Local livelihoods could also be affected if entrepreneurs' assets are accidentally damaged in the course of construction activities, for example, delivery vehicles from traffic accidents or cash crops from Project-induced flooding; however this last would be an unplanned event given that WSG is not planning to enforce the RoW nor tear down fences or buildings. The extent of the impact has not yet been determined; nevertheless, business owners could be dependent upon their shops or stalls to make a living and depending on the nature of their establishment (temporary stall vs fixed structure), they could be more or less vulnerable to the Project's impacts. Public consultation and determination of the economic displacement will shape the magnitude of the impact.

The urban commercial landscape can be impacted by increased dust and emissions and the likelihood of localized flooding causing damages to vehicles and buildings increases as drainage infrastructure can become blocked during construction. However, these impacts can be mitigated through the application of mitigation measures described in section 5.1.5.

Management/Enhancement Measures

All efforts should be made to avoid economic displacement by phasing construction activities, and by creating alternate entrances for vehicles, walkways and pedestrian entrances to businesses, detours and parallel parking areas. This will require advance engagement of the Engineering Procurement and Construction (EPC) contractor with affected businesses to understand peak hours and existing constraints, and thereby jointly develop managements appropriate to each establishment.

Positive (though temporary) livelihood impacts may be realized if opportunities for local employment are provided during Project construction. This can be done by including stipulations for the contracted EPC to hire a target percentage of workers from the local community.

A stakeholder Engagement Plan (SEP) was developed for the Project and includes a grievance mechanism that is a reliable and consistent process to seek remedy in the event of unforeseen accidents that could affect livelihoods. The SEP considered special needs of vulnerable subpopulations. The Project will utilize a Multi Stakeholder Commission to facilitate communication between the public and WSG.

Residual Impact

It is expected that implementation of the proposed management and enhancement measures would reduce the significance of livelihood impacts.

5.4.2.2 Operations Phase

Disruptions to livelihoods are not expected during the operations phase. Small impacts during maintenance works are possible, but these would be more localized and are considered negligible.

5.4.3 Impacts to Community Health and Safety

During the construction phase of the Project, activities can heighten health and safety risks for road users and for populations of adjacent neighborhoods. Impacts regularly associated with construction includes nuisances associated with dust and noise, street closures impeding access to residencies, businesses, and community infrastructure, traffic and pedestrian accidents, and increased traffic congestion. However, it is envisioned that over the long term the Project will be beneficial from a safety perspective due to improvements in traffic efficiency and safety, and better accommodation of non-motorized modes of transport like pedestrians and bicycles. These benefits are described in more detail in section 5.5.

The Disaster and Climate Change Risk Classification for the Project is considered high. The hazards identified are floods (river and costal resulting from sea level rise) and droughts. A disaster risk assessment (DRA) will be performed to determine the possibility and extent of impacts of natural disaster on road conditions and will inform the design of the road including the design for the drainage system. Since the corridor connects two international airports, criticality, and vulnerability of the infrastructure component of the Project is considered high, exacerbating the need for effective implementation of appropriate mitigation measures as determined by the DRA.

5.4.3.1 Construction Phase

Given that air quality, and hazardous materials impacts are all expected to be minor with the application of the relevant management measures, it is expected that associated impacts on community health and safety from these will also be minor.

However, due to the densely populated area and increased traffic congestion anticipated during construction, noise impacts are considered moderate. Vehicles, pedestrians, and other road user traffic and accidents are expected to increase during construction, but these conditions are expected to be short-term and improved during operations (see section 5.4.5). Stakeholders voiced concerns that adequate signage that indicates the presence of workers and construction equipment on the roadway would be neglected. The EPC contractor is required to display all applicable signage and other necessary safety equipment on site in appropriate language prior to the start of construction. The contractor is also responsible for proper management of construction activities, including adequate securing of equipment and machinery, to prevent unforeseen incidents potentially causing injury or death.

The Project may also increase the likelihood of disease in the community. Population shifts caused by the influx of workers from other parts of the country or internationally have the potential to cause changes in transmission patterns of some communicable diseases, particularly if workers originate from countries with higher rates of diseases that are transmitted person-to-person, such as Tuberculosis (TB), sexually transmitted infections, and COVID-19

- Guyana has a lower rate of TB incidence than the global average (79 cases per 100,000 population in 202019, versus the global average of 12730) but has a higher rate than most developed countries (WHO 2022, (World Bank, 2021). Guyana's rate of HIV prevalence is comparable to the global average.
- As of July 27, 2022, the country had recorded 1,262 deaths from COVID-19 and a total of 68,225 cases (Ministry of Health 2022). Although the effects of COVID-19 have been noteworthy in Guyana, established measures and prevention methods are in place for the workforce. This is especially important as only 58.62% of the Guyanese population is fully vaccinated.
- Moreover, disruption of drainage infrastructure during construction can also lead to stagnant or pooling water on the road surface. Still water is at risk of creating breeding sites for disease causing vectors (e.g., mosquitoes).

Due to the reasons above, local community has a Medium sensitivity. Potential Impacts can have a Medium magnitude; given the size of the Project, it is not foreseen the worker's influx will be high (250-300 people at its peak), although such estimations are not confirmed. When applying management measures the potential impacts can be small, leading to a Minor impact to community H&S.

Stakeholders also expressed concern that project construction would cause damage to buildings along the corridor. Damage could result from unsecure materials carried by material transport trucks and vehicle collisions with infrastructure. As of November 2021, 44% of grievances filed pertained to property matters and infrastructure exists in close proximity to the roadway. For these reasons, the local community has a medium sensitivity. Potential impacts are expected to have a small magnitude as airborne material from

transport trucks will likely be excavation materials causing only degradation to paint and other superficial damage. Vehicle collisions with infrastructure is also unlikely to occur. The overall sensitivity of the impact is minor.

Residual Impact

No residual impacts are foreseen for community H&S.

5.4.3.2 Operations Phase

Many stakeholders voiced concern that rehabilitated roads will increase the likelihood of speeding during stakeholder interviews in 2015. This impact can be mitigated through safety features included in the Project design that address road safety concerns for vehicles, pedestrians, and cyclists. This includes raised crosswalks at 150mm above the surface of the road. Signage will be placed before these speed bumps to indicate to drivers that speed is to be reduced and pedestrians may be present ahead.

During the operations phase, road traffic should occur more efficiently and safely than before the Project, including reducing the amount of time spent traveling on the road , indirectly improving cost efficiency for drivers. This will have beneficial health and safety effects by reducing stress and fatigue, reducing the amount of time road users are exposed to exhaust fumes, freeing time that may then be spent on more productive or health-promoting activities, and potentially increasing the number of road users choosing the less sedentary options of pedestrianism and bicycling due to safer road conditions. Therefore, impacts of the operations phase of the Project are expected to be *Positive*.

5.4.4 Cultural Heritage

This section assesses the impact on cultural heritage resources in the Project Area. There are places of worship (mosques, churches) located along the road; however, they will not be affected by construction activities; WSG will not move or relocate such places nor will it impede access to them during construction. In addition, there are no listed monuments in the Project footprint, and the improvements will occur within the existing right of way for the road where cultural heritage is expected to be low. However, WSG will consult with stakeholders if intangible or other unregistered cultural heritage artifacts could be present in the Project's AoI. Currently, the possibility of cultural heritage in the Project area is low after assessing the Project area and potential risks (i.e., no deep excavations will occur, the area is an urban setting), however, a Chance Find Procedure was developed and can be found in Section 7.4.7.

No cultural resources occur within the construction area. Therefore, no impacts are anticipated.

5.4.4.1 Construction Phase

The existing road will be widened by 1 m on either side with no deep excavation. As such, it is unlikely that undiscovered subsurface cultural heritage would be discovered or damaged. Since the activities will not alter the character of the landscape or skyline, it is also not anticipated that the Project would have any visual effects on the Project's AoI.

During stakeholder consultations held in March 2015, residents and the NDC expressed that access to cemeteries and religious sites should be improved and preserved. Another round of consultations with stakeholders will be carried out during a consultation event in August, 2022.

The significance of impact on cultural heritage is considered to be *negligible*, given that the road expansion is not anticipated to have any effects on any cultural heritage sites.

5.4.4.2 Operations Phase

No activities with the potential to change levels of access to living heritage sites, or cause damage or alteration to built heritage or other forms of cultural heritage are anticipated during the operations phase.

5.4.5 Road Traffic

Traffic is expected to increase along the 23.5 km section of road from Grove to Timehri. Streets parallel to the rehabilitated roadway will be used to divert traffic and alleviate congestion. All side streets will benefit from 6m wide paved connections with the rehabilitated roadway and the replacement of timber bridges with more durable structures. However, the Grove area is constrained for space and is a major thoroughfare, accounting for greater traffic congestion that will be exacerbated during the construction phase of the road rehabilitation Project. Operation of work vehicles and storage of excavation materials and construction equipment on site will block one carriageway and slow the flow of traffic, which is already heavy during peak hours. Statistically, Guyanese road users are more inclined to avoid traffic congestion by using side streets. If sufficient mitigation measures are not implemented to ease traffic flow during construction, secondary roadways will experience an influx of drivers as congestion on the main roadway is avoided. Additionally, limited space in the corridor causes concerns for stakeholders related to the availability of parking to facilitate access to local businesses, particularly in Grove and Soesdyke, already constrained areas. Increased traffic in the main Road can in turn increase traffic along secondary roads. Temporary reduced access to commercial business and public services on account of limited parking and blocked entrances is also expected. For more information on road traffic impacts refer to section 5.4.5 and section 7.4.6 for the Traffic and Pedestrian Management Plan to manage such impacts.

Without a Traffic and Pedestrian Management Plan that defines working hours, temporary infrastructure, and designated parking spaces, congestion in the corridor will lead to temporary economic displacement for local businesses and increase risks of accidents for the local population.

The impact on road traffic will have a medium duration (36 months) and will create a difference from baseline conditions. Nonetheless, the area is localized and it will be a one event impact (construction) expect when periodic maintenance occurs. In addition, to alleviate traffic WSG proposed two detour roads that aim at alleviating traffic. Based on these characteristics, it is determine that the magnitude of the impact is Medium. In turn, while the footprint of the Project is not large (23.5 km long) there are several businesses and high activity currently. Local population can adapt to the impacts of construction; therefore the receptor's sensitivity is determined as Medium. The overall significance of the impact is Moderate.

5.4.5.1 Residual Impact

No residual impacts are expected although the significance of the impacts on traffic will remain the same after applying management measures (the latter are designed to reduce H&S risks on the community). Traffic congestion from construction activities will be medium term and localized. Traffic flow is expected to improve during operations. See section 5.5.2.3 for more information.

5.5 Positive impacts

The Grove to Timehri Road Infrastructure Development Project is expected to have both short- and long-term positive impacts on the local community. Long-term benefits are contingent on effective road maintenance. The expected road maintenance activities include (i) patching, edge repair, crack sealing; (ii) condition sensitive items patching, edge repair, and crack sealing; (iii) shoulder grading; (iv) vegetation control; and, (v) ditch cleaning. Additionally, road design will include principles of Universal Design to facilitate access for persons with disabilities.

5.5.1 Short-Term Benefits

Short-term benefits are related to the creation of employment opportunities during the construction phase.

5.5.2 Long-Term Benefits

Implementation of mitigation measures defined in section 5.3, 5.4, and 5.5 will have to be implemented along with general road maintenance activities and weigh-stations to ensure the integrity of long-term benefits associated with the project. The long-term benefits identified are localized and can be categorized into three main themes: safety, economy, and efficiency.

5.5.2.1 Safety

During the period of 2008 to 2013, 40 fatal crashes resulted in 43 deaths occurred on the roadway that will be rehabilitated as part of the Project. Of the 43 victims, 31% were pedestrians, 26% were passengers in either a car, truck, or bus, 19% were motorcyclists, 17% were the drivers of either a car, truck, or bus, and 7% were bicyclists. Improved infrastructure for pedestrian, bike, and vehicle traffic and overall reduction of road deterioration will decrease the likelihood of traffic accidents from occurring. In the current state of the road, several problems have been noted by the Ministry of Public Works (MPW) related to the current signage, marking, and lighting of the roadway. These problems include: (i) dirty signage obstructing posted information; (ii) inconsistent use of bend warnings; (iii) lack of speed limit signs in certain sections of the road; (iv) missing cross walk warning signs; and, (v) confusing road markings and lack of outer lane markers. As part of the work plan for the road rehabilitation, improvements to address these issues will be made. All road signs will be updated to meet US standards and include use of reflective signs and thermoplastic to mark the road surface, increasing night-time visibility. Pooling of water on the road surface following heavy rain was another issue noted by MPW. Drivers will swerve to avoid accumulated waster causing head-on collisions. Improved drainage infrastructure and elevation of the roadway will reduce the risk of pooling and accidents that result from driver’s loss of control.

5.5.2.2 Economy

An efficient transportation system provides economic opportunities including increasing accessibility to markets and employment. Greater accessibility will increase competitiveness and attracts investment into the area, indirectly increasing property values. Locals can also anticipate lower commodity costs as market competition grows. Improvements made to drainage infrastructure will also reduce the likelihood of floods which impact cash crop production, making profits more predictable for local farmers. Gross Domestic Product per capita (GDB pc) is expected to grow 3.54% from the period 2014 to 2050 with a forecasted increase in traffic of 4.8%.

5.5.2.3 Efficiency

Traffic flow is expected to improve throughout the entirety of the 23.5km upgrade section that runs from Grove to Timehri. Reduced congestion will not only minimize travel time for road users but, will decrease fuel consumption, attributing to reduced travel cost and fewer emissions to the environment. Likewise, resurfacing of the road and effective speed signage will lower vehicle maintenance cost.

6. CUMULATIVE IMPACT ASSESSMENT (CIA)

This chapter focuses on potential cumulative impacts from the Project. Cumulative impacts are defined as the successive, incremental, and/or combined effects of a Project or activity, accumulated with other Projects or activities. Given that the Project is complying with the IDB ESPF, cumulative impacts will be assessed in the context of ESPS 2 through 10, but will be evaluated utilizing IFC's Cumulative Impact Assessment (CIA) guidance – Good Practice Handbook – Cumulative Impact Assessment and Management: Guidance for Private Sector in Emerging Markets (IFC, 2013).

6.1 Key Terminology

The following are definitions for key terminology used in the CIA.

Cumulative Impact: Impacts that result from the successive, incremental, and/or combined effects of an action, project, or activity added to other existing, planned, and/or reasonably anticipated actions, projects, or activities. For practical reasons, the identification, assessment, and management of cumulative impacts are limited to those effects generally recognized as important on the basis of scientific concern and/or concerns of Project-Affected Communities (PACs)[26].

CIA: Process to identify and evaluate cumulative impacts.

Other Projects: Existing, planned, or reasonably expected future developments, projects and/or activities potentially affecting Valued Environmental Components (VECs).

External Drivers: Sources or conditions that could affect or cause physical, biological, or social stress on VECs, such as natural environmental and social drivers, human activities, and external stressors. These can include climate change, population influx, natural disasters, or deforestation, among others. These are typically less defined and planned than Other Projects.

Valued Environmental Components (VECs): Environmental and social components considered as important by the scientific community and/or potential PACs. VECs may include:

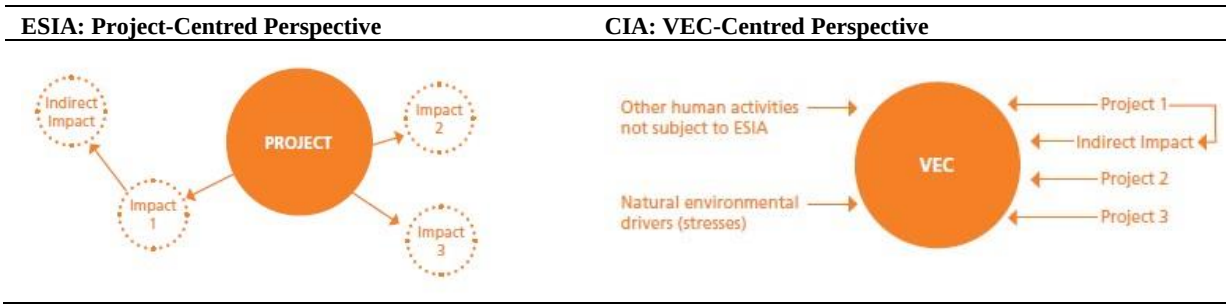
- Physical features, habitats, wildlife populations (e.g., biodiversity, water supply);
- Ecosystem services (e.g., protection from natural hazards, provision of food);
- Natural processes (e.g., water and nutrient cycles, microclimate);
- Social conditions (e.g., community health, economic conditions); and
- Cultural heritage or cultural resources aspects (e.g., archaeological, historic, traditional sites).

VECs reflect the public and scientific community's "concern" or special interest about environmental, social, cultural, economic, or aesthetic values (IFC, 2013). According to the IFC's methodology, VECs are considered the ultimate recipients of cumulative impacts because they tend to be at the ends of ecological pathways.

6.2 Approach

Unlike the rest of the ESA, which focuses on the Project as a generator of impacts on various environmental and social receptors, the CIA focuses on VECs as the receptors of impacts from different projects and activities (see Figure 6-1). In the CIA, the overall resulting condition of the VEC and its related viability are assessed.

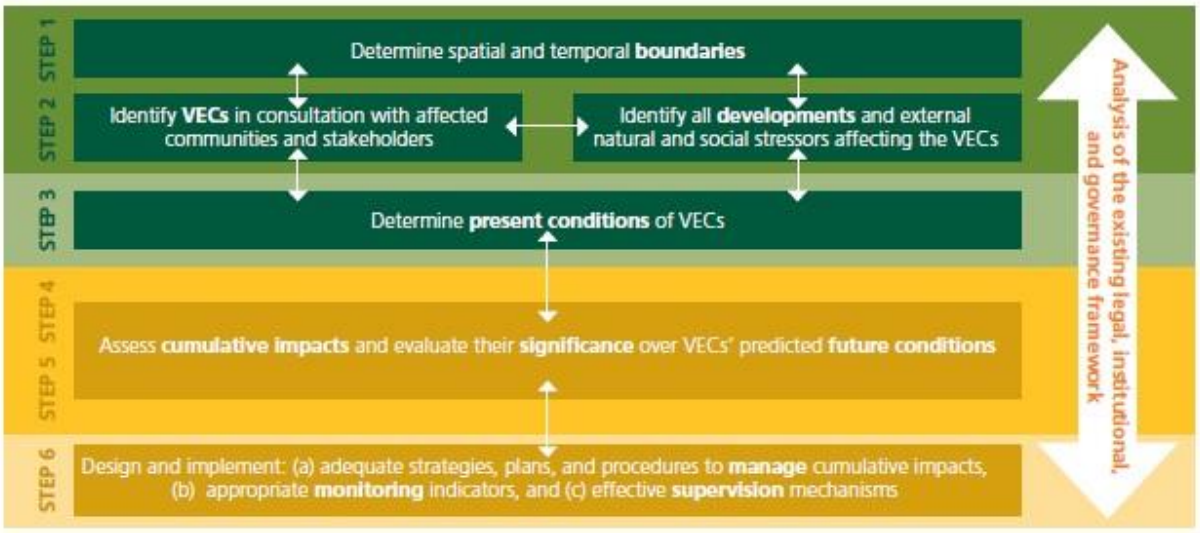
[26] PACs are defined as local communities potentially directly affected by the Project (consistent with IFC Performance Standard 1, paragraph 1 [IFC 2012a]).



Source: IFC, 2013.

Figure 6-1: Comparing ESIA and CIA

This CIA follows the IFC's six step methodology (see Figure 6-2). The process is iterative and flexible, with some steps having to be revisited in response to the results of others. For example, the VEC selection step usually needs to be adjusted after the potential impacts of the Project are identified. The steps are described in detail below.



Source: IFC, 2013.

Figure 6-2: Summary of the Cumulative Impact Assessment Methodology

6.3 Limitations

The IFC CIA Handbook methodology takes into consideration the limitations that a private developer may face carrying out a CIA. The limitations applicable to this CIA include: (1) detailed information about other projects and activities (e.g., the information is not available in the public domain); (2) uncertainty with respect to the implementation of future projects; and (3) difficulty in establishing thresholds or limits of acceptable change for VECs, and therefore the significance of cumulative impacts.

6.4 Determination of Spatial and Temporal Boundaries

Based on the identified VECs for the CIA, it was determined that the spatial boundary would include 23.5 km extent of the Project, along with a 500 m buffer on either side. As the buffer zone includes parts of the Demerara River, riparian and freshwater impacts have been considered.

Temporal delimitation for a CIA is future focused and therefore frequently a challenge due to the uncertainty inherent to potential future other projects. For this reason, good international industry practice suggests consideration of a three-year temporal boundary when conducting a CIA (IFC, 2013), and revisiting the CIA periodically (every 3-5 years) to identify changes in proposed projects and external drivers and therefore expected cumulative impacts. Based on the expected timeline of the Project, the improvement of the road is estimated to take between 36 months. The CIA uses the three-year temporal boundary to cover the Project construction and initiation of Project operations activities.

6.5 Other Projects

Through a review of publicly available information, ERM identified existing and future planned projects located within the spatial and temporal boundaries of the CIA, which also have the potential to impact VECs. The sources researched to identify other existing or planned projects for this CIA included:

- IDB website;
- World Bank Group;
- Caribbean Development Bank;
- Islamic Development Bank; and
- Other publicly available information.

The Projects that can result in cumulative impacts on identified VECs are listed in Table 6.1.

Table 6.1 Identification of other Projects for the CIA

Other Project Name	Loan Agency/Funding Body	Project Status [a]	Located within the CIA´s Spatial Boundary	Potential Overlap with the Project´s Temporal Boundary
Sheriff – Mandela Road Project	IDB	Ongoing	No	No
Mandela to Diamond	Government of India	Ongoing	No	Yes
Linden Soesdyke Highway Update	Islamic Development Bank	Planned	Yes	Yes
Linden to Mabura	Caribbean Development Bank	Planned	No	Yes
Ogle to Diamond Bypass	Government of India	Proposed	No	Yes

[a] *Project status categories*: *ongoing* (*activity is currently underway*), *under construction, proposed* (*in permitting process*), *and planned (reasonably foreseeable, but permitting process not yet started)*

If no detailed impact information was available, ERM assumed common sector-based impacts.

Source: WSG, 2022

Figure 6-3: Proposed Road Projects Guyana

Based on the spatial and temporal boundary, the only project with the potential to create cumulative impacts is the Linden-Soesdyke Highway Project. This project will construct a roundabout at the junction of the Soesdyke Linden Highway and the East Bank Public Road in Soesdyke. As this project is happening at the same time as the Grove to Timehri upgrade, it is likely that at the point of overlap there will be cumulative impacts.

6.6 External Drivers

ERM identified the following external drivers: natural hazards and climate change. Please see Section 4.1.7 for a description of natural hazards including flooding, extreme storms, and high winds. The relevant high-risk categories for natural hazards identified for the Georgetown area are:

- River flooding (high)
- Coastal flood (high)

The risk to the Project itself could be induced or exacerbated by climate change. According to Guyana's Office of Climate Change, Guyana's coasts are at risk of some of the effects of climate change including:

- Floods – rising sea levels and severe weather events cause flooding and damage to homes, businesses, roads and other infrastructure.
- Health Risks – extreme heat waves, floods, and drought results in increased illness, pests and diseases.

Over the last century Guyana has observed significant changes in climate. Guyana's Initial National Communication (INC) in Response to its Commitments to the UNFCCC (2002), provided an analysis of these changes, as described below:

- An increase by 1.0°C in the mean annual temperature in Georgetown within the last century (1909-1998).
- Below average rainfall since 1960.
- A mean relative sea level rise of 10.2 mm per year for the period of 1951 to 1979. This is more than five times the global average over a similar period.

Guyana's vulnerability to the effects of climate change is due to many reasons, including:

- Approximately 90% of the country's population resides on the Coastal Plain, approximately 0.5 to 1 meter below mean sea level.
- The coast is relatively flat, favoring rapid accumulation of rainfall runoff and making natural drainage into the ocean difficult and presenting challenges to the drainage and irrigation systems. Over the years, high levels of flooding have been observed, especially along the coast and in some inland areas. Climate change is likely to increase the frequency and intensity of flooding events.
- Approximately 75% of the country's economic activities are located on the coastal area, where the major economic activities, such as agriculture, fisheries and industries are found. These sectors are extremely sensitive to extreme weather events and sea-level rise and are therefore highly vulnerable to changes in climate.
- The country has already suffered greatly over the last decade from weather related disasters (OCC, 2020).

6.7 VEC Selection and Description

6.7.1 Selection of VECs

To be included, VECs must be a subset of the environmental components likely to be affected the project under evaluation (i.e., Construction of the Berths and the Annex) and also by other projects and external

drivers. The identification of VECs was based on social and environmental receptors identified in the assessment of impacts of the ESA, other known activities in the Project area, supplemented with information obtained during the baseline, and the consultation process.

The studies conducted as part of this ESA concluded that most of the resources affected by the Project will incur *Minor* or *Negligible* impacts that were very localized in extent and duration. The major environmental and social concerns related to the Project include traffic, community health and safety related concerns, air quality and greenhouse gas emissions, and economic displacement. Section 4 of this Report describes the baseline conditions of the existing environment, and Section 5 describes the potential impacts.

All potentially eligible VECs were analyzed against the following criteria: (1) confirmed to be valued by an identifiable stakeholder group; (2) reasonably expected to be impacted by the Project (i.e., at least one potential residual impact significance rating of Minor or above); ***and*** (3) reasonably expected to be potentially impacted by some combination of other projects and external drivers. To be included in the CIA, the VEC had to meet all three criteria. Table 6.2 presents the results of this analysis, and highlights the VECs that are selected in the CIA. These VECs are a subset of environmental and social components potentially impacted by the Project.

Table 6.2: Selected of VECs

VEC	Valued by Stakeholders	Potentially Affected by the Project [a]	Potentially Affected by One or More Other Projects	Potentially Affected by One or More External Drivers
Road traffic	Yes	Yes	Yes	Yes
Community Health and Safety	Yes	Yes	Yes	Yes
Air Quality and GHG Emissions	Yes	Yes	Yes	Yes
Economic displacement & Livelihood	Yes	Yes	Yes	Yes

[a] *At least one potential residual impact significance rating of **Minor** or above.*

Several environmental and socioeconomic resources or components were not selected as potentially eligible for the CIA; in all cases they were not reasonably expected to be significantly impacted by the Project (i.e., at least one potential residual impact significance rating of **Minor** or above for a planned Project activity)—and in some cases they were also not reasonably expected to be potentially impacted by some combination of other projects or external stressors. Table 6.3 presents the components that were not selected as VECs for the CIA.

Table 6.3: VECs Not Selected for Inclusion in CIA

VEC	Valued by Stakeholders	Potentially Affected by the Project [a]	Potentially Affected by One or More Other Projects	Potentially Affected by One or More External Drivers
Erosion and Sedimentation	Yes	No	No	Yes

VEC	Valued by Stakeholders	Potentially Affected by the Project [a]	Potentially Affected by One or More Other Projects	Potentially Affected by One or More External Drivers
Noise	Yes	Yes	No	No
Occupational Health and Safety	Yes	No	Yes	Yes
Water Quality	Yes	No	No	Yes
Vegetation	Yes	No	No	Yes
Wildlife	Yes	No	No	Yes
Cultural Heritage	Yes	No	No	Yes
Geology and Physiography	Yes	No	No	Yes

[a] *At least one potential residual impact significance rating of **Minor** or above.*

6.7.2 Description of VEC Conditions

The baseline conditions of the selected VECs were previously described (see Section 4 of this ESIA). The VEC baselines provide information on the VECs' current conditions, the anticipated resilience against external stressors and potential impacts (cumulative impacts and sources of stress), and thus provide an indication of their viability and sustainability.

6.7.3 Assessment of Cumulative Impacts

CIAs are future-oriented and Project contributions are assessed as the difference between the expected future condition of the VEC in the context of all possible known stressors and that condition plus the Project under evaluation. This step of the CIA assesses the future conditions of the VECs, considering the impacts from the Project, other projects, and external drivers. The potential impacts to VECs were established from the results of the Project ESIA and other available information. If no impact information was available (e.g., for other projects), ERM assumed common sector-based impacts.

The results of the CIA are presented in tabular format. The significance of cumulative impacts is not evaluated in terms of the magnitude of change but in terms of VEC response and the resulting condition and sustainability. If cumulative impacts do not exceed the VEC threshold, the development of the project under assessment is considered acceptable. Given the intrinsic limitations of Project-driven CIAs, the present assessment was not intended to obtain sufficient baseline information to establish thresholds of the selected VECs and therefore establish the significance of the cumulative impacts. Instead, based on the publicly available information and the findings of the stakeholder interviews, cumulative impacts were categorized by priority using the following definitions:

- **High Priority:** The VEC is expected to or is currently being adversely impacted by other projects and/or external drivers and the future addition of the Project could incrementally contribute to the adverse impact. Actions will be implemented in the short term to mitigate potential adverse cumulative impacts on the VEC.
- **Medium Priority:** The VEC could potentially be impacted by other projects and/or external drivers, and the Project could potentially contribute to the adverse impact. Actions will be implemented in the medium term to mitigate potential adverse cumulative impacts on the VEC.
- **Low Priority:** The VEC is not expected to be potentially impacted significantly by other projects and/or external drivers, and therefore the Project impacts will not be expected to contribute to an

adverse cumulative impact. No actions are required to mitigate potential adverse cumulative impacts on the VEC beyond proposed Project management measures.

Table 6.4 summarizes the results of the assessment of cumulative impacts identified for the selected VECs. As all of the other projects are also road update projects, the potential impacts are discussed together. Based on the potential cumulative impacts, a priority ranking is established for each VEC.

In summary, the VECs of Traffic, Community Health and Safety, and Air Quality and GHG Emissions were deemed Low priority cumulative impacts. The VEC of Economic Displacement and Livelihood was deemed to be a Medium priority cumulative impact.

Table 6.4: Summary of Cumulative Impact Assessment

VEC	Potential Impacts from the Site Improvement Components of the Project	Potential Impacts from Other Projects	Potential Impacts from External Drivers	Cumulative Impact	Priority Ranking
Road Traffic	During construction, there will be an increase in the volume of land traffic, consisting of cars and light trucks transporting equipment and parts. This increase in road traffic can disturb users of adjacent properties, lead to traffic delays, and possibly have public safety implications. The volume of traffic generated will be partially mitigated by the implementation of a traffic and pedestrian management plan (see Section 7.4.6) Therefore, the impacts during Construction will be **Moderate**. During operation, most traffic will be related to standard commuting activities. The improvements and expansion of the road will alleviate traffic on both the project roadway and the side roads, ultimately alleviating traffic throughout the vicinity of the project corridor. The impacts during Operations will be **Positive**.	The Linden Soesdyke Project will construct a roundabout at the junction of Linden highway and Soesdyke public road. During construction, the project road will be partially closed or blocked, increasing traffic through other roads for a defined period of time. Additionally, transport of personnel, heavy trucks delivering or picking up equipment and machinery, and maintenance vehicles could cause congestion. During operations, the improvements to the roads and creation of a bypass highway will alleviate traffic concerns. Impacts during operations will be **Positive**.	*Climate Change and Natural Hazards*: To the extent the frequency or intensity of severe storms and flooding could be influenced by climate change, these could potentially damage roadway infrastructure. Natural disasters may also result in damaged roads.	The Project and other projects could contribute to the potential negative impacts on this VEC by increasing traffic during the construction phase, especially near the junction where the Linden-Soesdyke project and the East Bank Public Road meet. The external driver could exacerbate traffic due to potential damages to road infrastructure. Following construction, the road improvements to the drainage system should result in fewer flooding impacts, and in turn, in more overall climate resilience throughout the system. The management measures proposed by the Project will appropriately mitigate the negative impacts and contribution (**Moderate** for the short-term construction and then **Negligible** or **Positive** for operations). In sum, the Project could potentially contribute incrementally to the adverse impact, but VEC conversion and/or degradation is not likely to occur, or the Project's contribution will be expected to be negligible.	**Low**
Community Health and Safety	During construction, Project activities could create heightened health and safety risks for road users and populations of adjacent neighborhoods. Risks from road based safety concerns will likely be mitigated by the Traffic and Pedestrian Management Plan (Section 7.4.6). In the long term, the Project is expected to be beneficial from a safety perspective due to improvements in traffic efficiency and safety. Other impacts to community health and safety during construction come from the potential for increased disease transmission in the community due to an influx of workers from other parts of the country or internationally (for example increased spread potential for COVID-19). The disease spread potential is likely to be mitigated by measures included in the Construction Health and Safety Management Plan (Section 7.4.2). Therefore, during construction, the impacts will likely be **Minor**. During operations, community health and safety has the potential to increase due to the implementation of new safety features in the Project design. The impact during operations phase will, therefore, be **Positive**.	During construction, other road projects could also create heightened health and safety risks for road users and populations in adjacent neighborhoods. Although the Ogle to Diamond Bypass falls within the spatial boundary, the only project that overlaps the same roadway concurrently is the Linden Soesdyke Highway Update. As of yet, the Linden Soesdyke Project has not provided information on potential traffic and health and safety management plans.	*Climate Change and Natural Hazards*: Rising temperatures associated with longer-term global climate change could potentially affect the dispersion and thermodynamics of pollutants emitted to the air as well as increase the number of illness, pests and diseases. Increased severity and frequency of storms and flooding could also damage roads and impact community safety.	The Project, other projects, and external drivers could contribute to the potential negative impacts on this VEC: quality of the air shed, potential for disease spread, and potential safety due to vehicle traffic. However, with the exception of the Linden Soesdyke Highway, the other projects are not in the immediate vicinity of the Project. The Linden-Soesdyke Highway Project has the potential to exacerbate negative impacts on this VEC, especially in terms of disease spread during construction. Following construction, the upgrade to the Linden-Soesdyke Highway combined with the East Bank Public Road will increase the community safety significantly, due to safety features included in both projects. The Project's embedded controls and management measures proposed will appropriately mitigate the negative impacts and contribution (**Minor** or **Negligible**). In sum, the Project could potentially contribute incrementally to the adverse impact, but further VEC conversion and/or degradation is not likely to occur, or the Project's contribution will be expected to be negligible.	**Low**
Air Quality & GHG Emissions	During Construction, air quality could be negatively affected by activities related to movement of heavy machinery and increased land traffic in surrounding areas. These activities could increase the amount of dust and certain gases (CO_2 and other GHGs) in the environment. These potential impacts will be localized and short term, and with the application of the proposed management measures (such as equipment maintenance and hour restrictions on vehicle movement activities) the impact will be **Minor**. During Operations, there are no expected emissions that will negatively affect air quality.	*Road Projects:* During Construction, air quality could be negatively affected by activities related to earth movement, which will generate dust, and by emissions from diesel engines combustion gases. Additionally, movement of heavy machinery and increased land traffic in surrounding areas are expected.	*Climate Change and Natural Hazards*: Rising temperatures associated with longer-term global climate change could potentially affect the dispersion and thermodynamics of pollutants emitted to the air. Emissions of greenhouse gases could worsen climate change.	The Project, other projects, and external drivers could contribute to the potential negative impacts on this VEC through decreased air quality. The potential impacts from all projects will be localized and short term. The Project's embedded controls and management measures proposed will appropriately mitigate the negative impacts and contribution (**Minor** or **Negligible**). In sum, the Project could potentially contribute incrementally to the adverse impact, but further VEC conversion and/or degradation is not likely to occur, or the Project's contribution will be expected to be negligible.	**Low**

VEC	Potential Impacts from the Site Improvement Components of the Project	Potential Impacts from Other Projects	Potential Impacts from External Drivers	Cumulative Impact	Priority Ranking
Economic Displacement & Livelihood	During construction, it is expected that there will be disruption of economic activities. An example of this disruption is for people who have shops along the roadside that will have to be moved during the expansion. There is an additional but less likely risk for physical displacement. These risks will likely be mitigated by a Livelihood Restoration Plan (see Section 7.5.7 and Appendix C). The impacts during construction could range from **Minor** to **Moderate,** dependent on the scope and effectiveness of the implementation of the Livelihood Restoration Plan. During operations, any mitigation measures to compensate displaced people would have occurred. It is possible that there would be some residual economic affects for people who have been displaced, but as a whole, the compensatory measures would have been carried out. Therefore, impacts during operations could be deemed as **Minor.**	During construction, other road projects such as the Sheriff – Mandela Road Project and the Linden Soesdyke Highway Update will be expected to disrupt economic activity and potentially lead to economic displacement, through movement of roadside shops during construction.	*Climate Change and Natural Hazards:* An increase in frequency and intensity of storms and flooding influenced by climate change could also exacerbate economic displacement and damage storefronts and supplies.	The Project, other projects, and external drivers could contribute to the negative impacts on this VEC by increasing the overall economic displacement in the area. The nearly complete Sheriff – Mandela Road Project has mitigated economic displacement through their own Livelihood Restoration Plan, although the effectiveness of this mitigation is not known at this time. The Linden Soesdyke Highway overlaps spatially at the end point of the Project span and could, therefore, worsen the economic displacement in that area if precautions are not taken. Currently the Linden Soesdyke Highway update is in the early loan acquisition phases so it is unclear how much active overlap there will be and what mitigation measures will be taken. The existing and proposed management measures for Livelihood Restoration will serve to appropriately mitigate the negative impacts (**Minor**). In sum, the Project could potentially contribute incrementally to the adverse impact, but further VEC conversion and/or degradation is not likely to occur, or the Projects contribution will be expected to be minor if handled accordingly.	**Medium**

6.8 Cumulative Impacts Management Framework

Although there are other projects taking place in the area, the Project area is already highly developed and these impacts are already considered in the Project's baseline; therefore, the Project itself is not anticipated to result in significant cumulative social impacts.

However, the importance of ongoing proper stakeholder engagement, understanding of community concerns, and the provision of (where possible and appropriate) training and employment opportunities to community members becomes paramount.

Internationally recognized good practices for managing cumulative impacts include:

- Effective application of the management hierarchy (avoid, reduce, and remedy) in the environmental and social management of the specific contributions of a project to expected cumulative impacts; and
- Undertaking best efforts to engage, leverage, and/or contribute in multi-stakeholder collaborative initiatives or discussion groups to implement management measures that are beyond the capacity and responsibility of any individual project developer (IFC, 2013).

The embedded controls and management measures included in the ESIA provide a means to mitigate the specific contributions of the Project to effects on VECs, following the mitigation hierarchy. Supplementing these controls and management measures, the CIA provides a framework of additional actions that WSG could apply in the regional and Project context to manage potential cumulative impacts on these VECs.

6.8.1 Project Level

Effective application of the mitigation hierarchy (avoid, reduce, remedy) to manage individual contributions of cumulative impacts will be applied as best practice. A number of management measures detailed in the ESIA have been proposed to address potential impacts from the Project. The ESA also includes an Environmental and Social Management Plan (see Section 6.9), which summarizes the management and monitoring measures for all environmental parameters, including the VECs assessed in this CIA.

At the Project level, the above measures are considered sufficient to address the contributions of the Project to cumulative impacts on the identified VECs.

6.8.2 Regional Level

Ultimately, the management of cumulative impacts is the responsibility of government and regional planners. However, it is considered best international practice that private-sector developers make best efforts to engage relevant stakeholders and promote management of cumulative impacts in their project areas (IFC, 2013; Franks, 2010).

The CIA identified low priority cumulative impacts on the following VECs: Road traffic, Community Health and Safety, and Air Quality and GHG Emissions. Medium priority cumulative impacts were identified for Economic Displacement and Livelihood. Additional mitigation measures for this VEC, include implementation and monitoring the effects of the Livelihood Restoration Plan (see Appendix C).

6.9 Conclusion

The results of the environmental and social impact assessment presented in this ESA are valid insofar as the design of the Project remains the same. Given the results of the CIA, no further mitigation plan is needed. Should the design of the Project or any of its components change, then the results presented in this Report may have to be updated to reflect the changes.

7. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

7.1 Introduction

This impact assessment has identified a range of potential environmental, socioeconomic, and cultural impacts related to implementation of the Project components, as described in Section 5 Impact Assessment. As part of the environmental and social management requirements established by IDB and according to industry good practice, an Environmental and Social Management Plan (ESMP) must be developed and implemented for the Project.

This ESMP describes the approach that the Project proponent and other involved parties (e.g., contractors) would follow to manage, mitigate, and monitor the potential impacts of the Project. It includes the Project commitments and management measures as identified in Section 5, Impact Assessment. This ESMP will be updated based on the final Project design as determine by the EPC contractor and is subject to change during the execution of works.

7.2 Environmental and Social Management Plan Guiding Principles

7.2.1 Plan, Do, Check, Review

Industry good practice follows the general principles of the “Plan, Do, Check, Review” cycle as described below, and outlined in Figure 7-1.

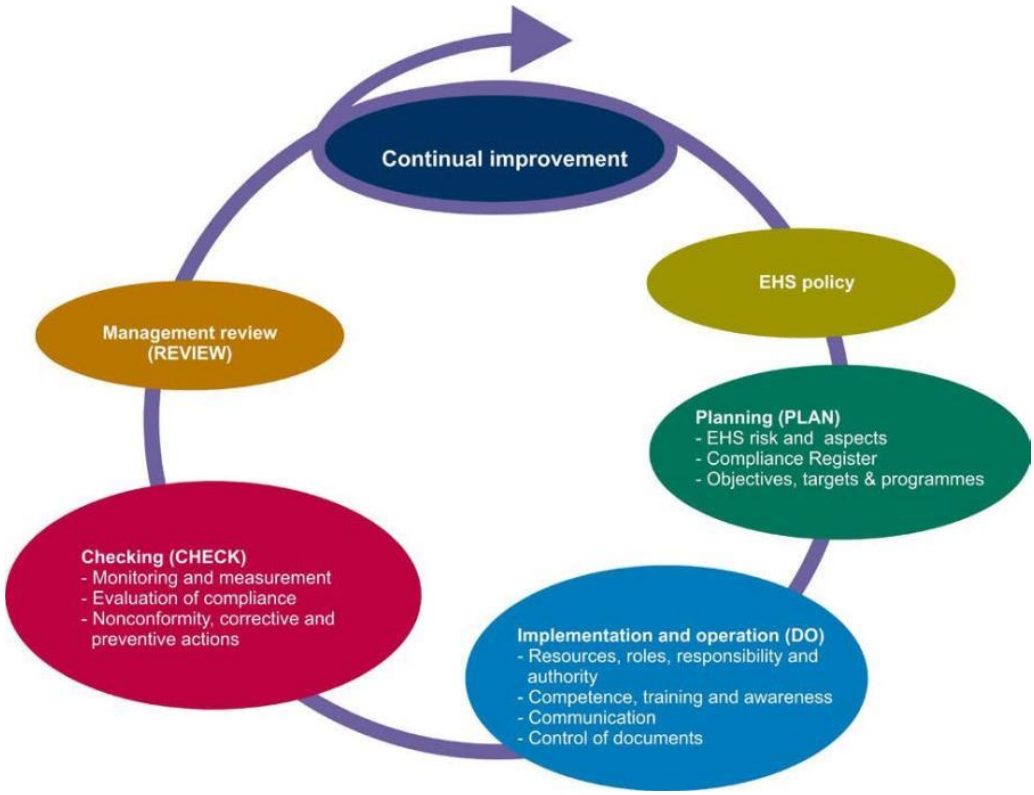


Figure 7-1: Plan, Do, Check, Review Cycle

7.2.1.1 Plan

- Define policies and objectives for environmental and social performance.
- Identify environmental and social impacts and risks of the operations.
- Develop managements and operational controls to address impacts and risks.
- Develop a management plan to achieve these objectives.

7.2.1.2 Do

- Implement a management plan.
- Implement management and operational controls.

7.2.1.3 Check

- Monitor performance against policies and objectives.
- Check that management and operational controls are effective.

7.2.1.4 Review

- Make corrections to plans, management, or controls in response to performance monitoring or out of control events.

7.2.2 Mechanism for Auditing, Adjustments, and Reporting

Auditing and adjustment are an essential part of a successful ESMP. Auditing systems include inspections and monitoring to confirm proper implementation of the ESMP, as well as effectiveness of management measures. Corrective actions include response to out-of-control situations, non-compliances, and non-conformances. Actions also include those intended to improve performance.

The parties involved in overseeing the day-to-day activities of Project implementation will conduct continuous monitoring to ensure that all Project personnel (contractors) are fulfilling their obligations under this ESMP.

Monitoring will be conducted to ensure compliance with the commitments in this document and to evaluate the effectiveness of operational controls and other measures intended to mitigate potential impacts. Project monitoring activities are summarized below.

WSG will keep relevant authorities informed of the Project performance with respect to environmental and social matters and implementation of this ESMP by way of written status reports and/or face-to-face meetings as needed. Contractors will also be required to provide HSE performance reporting as relevant based on the contractor's responsibilities. WSG will continue the stakeholder engagement efforts described and communicate with stakeholder groups regarding Project activities and the results of environmental and social monitoring. WGS will report E&S aspects of the Project to the IDB on a biannual basis, as part of the progress report of the project. WSG will use the content of the supervision consultant and the contractor 'reports to gather the required information on E&S compliance. The Environmental and Social Compliance Report Form can be found on Appendix E. This will be further adapted for the project

7.2.3 Training

All Project personnel will be qualified to do the particular job that they are performing and undergo further training to meet the needs of the working environment, as required. All personnel, regardless of position, will be given specific job oriented HSE training prior to starting work and as necessary thereafter. All

personnel will be trained on general awareness of environmental and social issues and specific procedures aimed at the avoidance of environmental damage as well as human health and safety. New staff, contractors, and visitors will be given basic induction training and follow Project HSE procedures.

7.3 Organizational Capacity and Policies

WSG will be the ultimate responsible of the ESMS implementation and assure the EPC contractor and its subcontractors align with it. In addition, WSG will select a supervision firm that will provide support and oversight of the construction.

Given the scale and nature of this Project, as a minimum the following roles will be required to support ESMP implementation:

Project Manager- Responsible for effective representation of WSG as the key liaison person with external stakeholders and foreign funded donors; playing the lead internal role in coordinating the development and strategy and master plan; and providing indicators/benchmarks for verifiably measuring outputs; developing quality control/assurance procedures for project work. The Project Manager will study and review all supporting documents, such as Agreements, aide-memories, memoranda of understanding, Reports, etc., agreed and exchanged between donors and the Government of Guyana, and extracts all relevant information and benchmarks and participates in the process of formulating and reviewing strategic plans, objectives and targets. This role requires a Bachelor's degree in either civil, hydraulic, structural engineering or equivalent plus Post-graduate in a management-related discipline and six years post undergrad experience in design, construction, and management of Projects similar to those of WSG.

Social Environmental Officer- responsible for assisting the Environmental Engineer and by extension the Works Services Group in formulating and administering environmental and social policies, plans and programmes for the entire group. The Social Environmental Officer will monitor the implementation of Environmental and Social Plans by supervisory consultants and contractors by means of site visits and by evaluating written progress reports and advises the group on remedial action where necessary. The role requires organizing with government bodies and local authorities to obtain approvals for environmental and social impact assessments and environmental and social management plans. Requirements for this role is a bachelor's degree in Environmental Science, Engineering, or equivalent qualification plus 3 years of experience in conducting socio environmental research and data collection and previous experience in environmental monitoring of similar Project undertaken by WSG.

Community Liason Officer (CLO) – Local resource to effectively handle any number of issues identified during the ESIR process which will require communication and stakeholder liaison during Project execution. The role is responsible for producing annual summaries that provide details related to the use of the grievance mechanism as well as logging and closing out all grievances in a timely manner. This role does not necessarily require an additional personnel but can be taken on as an additional duty provided the individual have the required training and experience so as to be able to address any potentially sensitive issues representing the Contractor. Requirements for this role will be a degree in social sciences (or equivalent) and at least 5 years' experience of stakeholder engagement.

A more detailed description of the above and additional positions can be found on Section 7.4.5.5 (as part of the Stakeholder Engagement Plan)

7.4 Environmental and Social Management Plan

The ESMP provides a description of the various management plans recommended to be implemented by the Project proponent and other involved parties (e.g., contractors) to manage, mitigate, and monitor the

potential impacts of the Project. They include the Project commitments and management measures as identified in Section 5 Impact Assessment.

The Management Plans that comprise the ESMP and they general contents are the following:

Management Plan	General contents
Construction Environmental Management Plan	○ Introduction ○ Project Description ○ Project Roles, Responsibilities, and Contacts ○ Training, Awareness and Competency ○ Environmental Management ○ Management sheets for air quality and dust, noise, sediment and erosion, housekeeping and waste. Each sheet has its own Key Performance Indicators (KPIs)
Construction Health and Safety Management Plan	○ Introduction ○ Project Description ○ Site Conditions and Requirements ○ Policy and Systems ○ Project Roles, Responsibilities, and Contacts ○ Training, Awareness and Competency ○ Personal Protective Equipment ○ Work Permits ○ Complaints ○ General Monitoring Arrangements ○ Emergency Procedures ○ COVID-19 ○ Health and Safety Risk Management ▪ H&S Risk assessment template form ○ Key Performance Indicators

Management Plan	General contents
Construction Contingency Plan	○ Introduction ○ Emergency Levels ○ Procedures to be Followed During the Implementation of the Contingency Plan ○ Types of Contingencies ○ Phases Considered for Each Event (fire or explosions, spills, falls from heights, cur wounds, electrocution or burns, equipment or infrastructure failure, damage to infrastructure, attacks and sabotage). ○ Key Performance Indicators
Human Resources and Labor Management	○ Forced Labor ○ Child Labor ○ New Employee Safety Orientation ▪ ESHS Orientation Checklist ○ Workers Grievance Mechanism ○ Code of conduct ○ Key Performance Indicators
Stakeholder Engagement Plan (see Section 7.4.5 of this document)	○ Background and Objectives ○ Regulatory Framework ○ Stakeholder Analysis ○ Completed Stakeholder Engagement ○ Roles, Responsibilities and Resources ○ Grievance Mechanism ○ Monitoring and Reporting
Traffic and Pedestrian Management Plan	○ Introduction ○ Project Description

Management Plan	General contents
	○ Diversion roads ○ Project Roles, Responsibilities, and Contacts ○ Training, Awareness, and Competency ○ Communication with Relevant Stakeholders ○ Traffic and Pedestrian Management ▪ Management sheet for Road intervention Work Area ○ Specific Work Practices ▪ Management sheets with mitigation measures and controls for local business impacts, pedestrian safety, vehicle route, vehicle reversing, drivers safe work practices, signalers/banksman practices and construction equipment.
Chance Find Procedure	○ Introduction ○ Objectives ○ Procedure ○ Project Roles, Responsibilities and Contacts ○ Training, Awareness and Competency ○ Key Performance Indicators
Livelihood Restoration Plan (see Appendix C of the ESA/ESMP, 2022)	○ Introduction ○ Legal Framework for Livelihood Restoration ○ Methodology ○ Identification of Project Affected Persons and Potential Impacts ○ Entitlement Framework ○ Implementation ○ Public Consultation, Participation and Disclosure ○ Monitoring, Evaluation and Reporting

Management Plan	General contents
E&S Monitoring Plan	○ Objective ○ Scope ○ Selection of Key Performance Indicators ○ KPI Assurance and Monitoring Implementation

7.4.1 Construction Environmental Management Plan

This Construction Environmental Management Plan (CEMP) provides a working template that will be used by the selected construction contractor (the Contractor) appointed by the Executing Agency (WSG). It details the specific management requirements and focus areas identified through the Environmental Assessment, but also recognizes that the selected Contractor will have their own policies and procedures that will need to be inputted to this plan. It also recognizes that as the Contractor develops the Project designs, this may influence how construction will be undertaken and progress, and these aspects will need to be integrated into this plan.

7.4.1.1 Introduction

Overview

This Section provides the Construction Environmental Management Plan (CEMP) for the Grove to Timehri road rehabilitation Project (the "Project"), a Category B Project that focuses on:

- Rehabilitation of 23.5 kms of roadway;
- Widening of the carriageway by approximately 1m on both sides;
- Construction of drainage along the roadway;
- Improved safety conditions for pedestrian and vehicle traffic; and,
- Relocation of utility infrastructure.

The CEMP sets out the expectations of WSG and the IDB, and defines how the Contractor will implement and manage environmental matters.

Objectives

The CEMP will ensure that the Project is delivered in full compliance with legal requirements, and also address the requirements of the IDB's ESPF. Specifically, it will ensure the Project aligns with the environmental legislation by the Guyana Environmental Protection Agency (EPA).

The IDB has established its own framework to ensure that projects financed by the IDB group are sustainable. The CEMP will comply with all applicable Environmental and Social Performance Standards, in particular:

- ESPS 1 – Assessment and Management of Social Risks and Impacts. The CEMP takes part of WSG's ESMS.
- ESPS 3 – Resource Efficiency and Pollution Prevention. The CEMP focuses on how to manage resources, emissions and waste generation.

7.4.1.2 Project Description

Once the Project's design is finalized, the construction Contractor needs to prepare the CEMP and include specific details on the proposed works, duration, relevant plans, etc. The following provide guidance on what should be included in this section.

- **Scope of Construction Works:** Description of the full range of construction works / activities proposed (e.g., clearing of land, placement of poles, bridge piles and other infrastructure, filter rock, geotextile fabric and armor rock; installation of drainage structures; etc.).

- **Description of the Construction (Disturbance) Footprint:** Full description of the existing areas that will be disturbed by the construction works and those immediately adjacent;
- **Timing of Works:** Provide a description of both the total duration of the works and the time of year they will occur. The latter would include consideration of expected climate during this time (e.g. anticipated rainfall / storm events, wind direction and speeds);
- **Site Plan:** The project site plan would clearly show the full extent of the proposed works area of the construction project. This would typically include a map with the full construction boundary and disturbance footprint marked clearly over a current aerial photograph (i.e., including all construction activities, associated laydown areas etc.). It would also include site specific information, for example the location of any important waterways, ditches or adjacent vegetation to be protected, national heritage listed areas, or the location of sediment and erosion traps, electrical services, etc.

7.4.1.3 Project Roles, Responsibilities and Contacts

All positions across the Project have environmental responsibilities to some extent. These vary in relation to duties described in Table 7.1, but everyone has a base level duty of care to prevent environmental harm. Project roles include direct workers from WSG, EPC contractor, supervision firm and other subcontractors as needed.

Table 7.1: Project Roles, Responsibilities and Contact Details to be Finalized by the Construction Contractor for the CEMP

Position	Responsibilities	Company	Name	Contact Details*
Project Manager				
Site Supervisor				
Environment Manager				
HSE Representative				

7.4.1.4 Training, Awareness and Competency

The CEMP prepared by the construction Contractor must include a code of conduct to be followed by all employees and outline how environmental training, awareness and competency will be delivered / assessed throughout the Project, to ensure the relevant aspects of this CEMP are communicated to the project team and front-line staff (including contractors and sub-contractors) in compliance with the local labor laws and regulations and ILO standards to which Guyana is party to. Examples include:

- Site Environment Induction
- Daily Pre-Start Meetings
- Environmental Toolbox Talks
- Incident bulletins
- Subcontractors kick-off meeting
- Contractor and client site kick-off meeting

7.4.1.5 Environment Management

This section presents a summary of the environmental risks and controls that have been identified for the proposed construction project. The Contractor should determine what additional risks and proposed

management controls are required based on their final design and work method statements. A project risk assessment or job hazard analysis for specific task(s) should be performed.

The following tables are based on the ESA that has been performed. Note that this is not an exhaustive list, and it would be expected that Contractor develops risk management strategies, controls, etc. that suit the scale/nature of finalized construction project.

Air Quality and Dust Management

AIR QUALITY AND DUST MANAGEMENT			
Objective(s)	1. To obtain baseline readings on air quality and particulate matter. 2. To ensure the impacts of air quality and dust on adjacent areas and the community are minimized.		
Management Strategy	Air quality and dust issues managed principally by emission controls at source, and administrative controls during works.		
		Responsibility	Timing
Control(s)	Due to lack of baseline data, prior the start of construction WSG will collect data through a Air Quality, which will measure PM_{10} and $PM_{2.5,}$ NOx, SOx, Ozone, lead and CO. Monitoring can be done quarterly; dust monitoring in highly congested areas or where duts is higher can be done through a Portable Particle Monitor. The air quality impacts could be minimized using the following measures: • Maintain all construction equipment in accordance with manufacturer's specifications; keep service logs of equipment up to date. • Suppress dust as needed in unpaved areas (e.g., use of water sprays). • Where dust is identified as an issue, dust control measures will be implemented. These will primarily be the use of water carts but may include surface treatments • Avoid burning non-vegetative wastes (refuse, etc.) at construction sites. • Avoid unnecessary idling of construction equipment or delivery trucks when not in use. • Keep work vehicles clean (particularly tires) to avoid tracking dirt around and off the site. • Cover work vehicles transporting friable materials to prevent materials being spread around and off the site. • Minimize drop heights of materials. • Area to be disturbed minimized. Clearance lots to be approved by Project Manager. • Implement the external grievance mechanism to follow-up on dust and/or exhaust emissions complaints being receivedby the community and workers. • Vehicle movements controlled, optimize signaling to reduce traffic congestion (Implement the Traffic and Pedestrian Management Plan) and kept to established tracks and haul roads. • Enforcement of speed limit and other traffic laws at the site • Use of dust masks by workers (Number of workers wearing them) • Provide dust and air quality awareness talks as part of the environmental induction process.		
Performance Indicator(s)	No. complaints from adjacent commercial premise, workers and/or community. No. of workers wearing PPE against dust		

<table>
<tr><th colspan="4">AIR QUALITY AND DUST MANAGEMENT</th></tr>
<tr><td></td><td>Air quality readings below maximum limits per EPA and WBG standards.
Percentage of equipment and vehicles with their service up to date.</td><td></td><td></td></tr>
<tr><td>Monitoring</td><td>Baseline information and quarterly monitoring of air quality will be compared against World Bank maximum limits and EPA Standards (Air Quality Regulation 2000). WGS will aim to comply with the most stringent limit.

<table>
<tr><th>Parameter</th><th>Averaging period</th><th>Maximum Limit per EPA, 2000 (µg/m^3)</th><th>Maximum Limit per WBG (µg/m^3)</th></tr>
<tr><td>PM $_{2.5}$</td><td>24 hours</td><td>15</td><td>25</td></tr>
<tr><td>PM $_{10}$</td><td>24 hours</td><td>-</td><td>50</td></tr>
<tr><td>SOx</td><td>24 hours</td><td>-</td><td>20</td></tr>
<tr><td>NO_x</td><td>1 hour</td><td>-</td><td>200</td></tr>
<tr><td>O_3</td><td>8 hours</td><td>160</td><td>100</td></tr>
<tr><td>CO</td><td>8 hours</td><td>10 mg/m^3</td><td>-</td></tr>
<tr><td>Lead</td><td>Quarterly</td><td>1.5</td><td>-</td></tr>
</table>
*Source: World Health Organization (WHO). Air Quality Guidelines Global Update, 2005. PM 24-hour value is the 99th percentile. Environmental Protection Agency (2009) and the US EPA National Ambient Air Quality Standard (NAAQS) (2010).

Daily inspection of works sites to occur, including:
• visual check for dust crossing the site boundaries.
• visual check of high potential dust areas, such as haul roads, stockpiles and operational areas.</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>Any complaints or incidents to be reported to the project manager.
Monitoring reports for baseline air quality and quarterly monitoring.</td><td></td><td></td></tr>
<tr><td>Corrective Action(s)</td><td>• Investigate cause of excessive dust or.emissions that go over the maximum allowed limits within the averaging period assessed.
• Implement controls immediately (e.g., water carts, corrective maintenance of potentially malfunctioning equipment).
• Implement corrective measures prior to the recommencement of site works.
• Implement administrative controls if required, such as rescheduling of dust generating activities to more favourable weather conditions.</td><td></td><td></td></tr>
</table>

Noise Management

NOISE MANAGEMENT			
Objective(s)	1. To obtain baseline readings on noise in the Project area 2. To minimize the impacts of noise on the amenity of the surrounding areas. 3. Construction activities undertaken in accordance with best practice controls.		
Management Strategy	Noise to be managed primarily through administrative and equipment controls during the construction phase.		
		Responsibility	Timing
Control(s)	Noise baseline data will be obtained throughout the entire roadway, adding more points in highly populates areas like Grove and Soesdyke. Noise readings can be done with a portable device. During construction, noise impacts associated with the Project components could be minimized using the following measures: • Maintain all construction equipment in accordance with manufacturer's specifications. • If possible, schedule construction and rehabilitation work during daylight hours when increased noise levels are more tolerable. • If possible, schedule construction and rehabilitation work to minimize activity during peak periods of tourism and recreation (weekends, holidays, etc.). • Avoid unnecessary idling of construction equipment and trucks • Include communications regarding construction as part of the external communication mechanisms to stakeholders to inform adjacent receptors (e.g., commercial and industrial businesses) of construction activities. • Install broadband spectrum backup alarms on construction vehicles as opposed to the typical single-tone frequency alarms (broadband alarms attenuate more quickly over distance due to the incorporation of higher frequencies). • Pre-start checks and maintenance schedules to ensure equipment performance as required. • Noise-dampening equipment to be used on equipment with excessive noise generating characteristics. • Implementation of community grievance mechanism • Use of auditive equipment by workers		
Performance Indicator(s)	No complaints from adjacent commercial premises, workers and/or community. Percentage of workers wearing auditive protection on site Percentage of equipment and vehicles with their service up to date.		
Monitoring	• Daily inspection of works sites to occur. • Service logs for equipment/machinery used on site. • Grievance logs		

	• Quarterly noise monitoring Noise monitoring will occur quarterly, which can be done using a portable device. The maximum limits for noise will be the ones of the World Bang Group, corresponding to 70 dB for industrial areas and 55 dB during daylight and 45 dB for nighttime for residential areas. If baseline results show greater noise levels than the maximum limits, then the monitoring results will not exceed in more than 3 dB than those of the baseline.		
Reporting	Any complaints or incidents to be reported to the Project manager.		
Corrective Action(s)	• Investigate cause of excessive noise. • Implement corrective measures prior to the recommencement of site works. • Reschedule of noise-generating activities to reduce noise annoyance.		

Sediment and Erosion Control

SEDIMENT AND EROSION CONTROL			
Objective(s)	1. To ensure that the effects of erosion and sedimentation on the environment are minimized. 2. Minimize soil disturbance, degradation and erosion.		
Management Strategy	Ensure that direct impacts (land disturbance) are limited to the works area, and that indirect impacts do not impact adjacent areas.		
		Responsibility	Timing
Control(s)	Measures to be applied include: • Disturbance area will be minimized and clearly demarcated. • Works will only be conducted within the works zone. • Vehicle movements will be restricted to the defined roads/tracks. • Where possible, works area will be designed to ensure stormwater runoff drains into the site. • Where required, sediment controls will be put in place. These will include, but not be limited to, rock check dams, sediment basins, sediment fences and silt socks. • Sediment controls will be reviewed during site inspections and/or after significant rainfall (more than 10mm in 24hrs resulting in site runoff). • Strategic location of detention basins to separate sediments in surface water runoff from water discharged to drains • Locate material stockpiles away from waterways and with perimeter berm • Re-routing drainage network to facilitate construction of Kofi Structure and other culverts • Periodic cleaning of drainage canals per maintenance guidelines • Landscaping and revegetation measures		
Performance Indicator(s)	No evidence of significant sediment deposition outside the works area. No evidence of significant riling, gullies or other instances of run-off erosion.		
Monitoring	• Daily inspection of work site to occur. • Sediment controls will be reviewed during site inspections and/or after significant rainfall (more than 10mm in 24hrs resulting in site runoff). Review will include removal of accumulated sediments as required.		
Reporting	• Incident report for non-conformance of sediment control. • Logging of sediment control structures - location and condition during weekly site inspection.		
Corrective Action(s)	• Investigate cause of sediment control failure. • Review flow path and determine most appropriate controls are in place, additional controls which can be place in-stream and/or changes that can be made to flow path • Review similar controls on-site (even though these may not have failed) for similarities.		

Housekeeping and Wastes

HOUSEKEEPING AND WASTES			
Objective(s)	1. Reduce waste volume, maximize recycling, reuse and recovery, and prevent any construction waste/litter entering the environment.		
Management Strategy	Minimize environmental impacts through appropriate controls and site inductions of employees and sub-contractors.		
		Responsibility	Timing
Control(s)	• Provide appropriate waste bins, type, volume, and service frequency to accommodate anticipated waste streams • Enforcement of a strict no dumping policy especially in drainage canals and areas nearest the waterways • Separate hazardous waste from non—hazardous waste • Place of trash disposal bins around the construction site and worker day-camp • Provide information regarding waste management in site specific inductions, including waste separation and importance of securing vehicle loads. • Ensure licensed contractors are used to collect controlled wastes • Disposal of all waste in the Haags Bosch Landfill site • Installation of appropriate fencing and containment in waste management areas • Implement management measures to prevent and manage spills, per Contingency Plan • Recycle oil and waste lubricants to be used for construction equipment (e.g., chains saws) • Reuse of excavation materials for resurfacing and widening road shoulders • Storage of excavation material in designated laydown areas away from drainage channels and water bodies • Selection of laydown areas by the contractor away from drainage channels and water bodies • Donation of unused construction material to the Neighbourhood Democratic Council (NDC) • Appropriate training for staff on waste management practices and safe handling and storage of hazardous materials • Use of PPE for the handling of hazardous materials		
Performance Indicator(s)	• Hazardous materials all appropriately disposed. • Recycling of all recyclable construction metal waste. • Records kept of waste leaving site.		
Monitoring	• Daily inspection of work site to occur. Review of waste bins (% full, time to next service). • Waste volumes leaving site from waste contractors		

Reporting	Environmental incident reports.	Project Manager	Throughout project
Corrective Action(s)	• Investigate cause of inappropriate waste disposal. • Review cause of issue and develop response, such as variation to bin size, service schedule or waste separation awareness. • Implement controls.	Project Manager	Throughout project

7.4.2 Construction Health and Safety Management Plan

This Construction Health and Safety Management Plan (CHSP) provides a working template that will be used by the selected construction contractor (the Contractor) appointed by the Executing Agency (WSG). It details the typical requirements and focus areas for health and safety, however it is recognized that the selected Contractor will have their own policies and procedures that will need to be inputted to this plan. It also recognizes that as the Contractor develops the Project designs, this will influence how construction will be undertaken, and these aspects will need to be integrated into this plan.

7.4.2.1 Introduction

Overview

This document is the Construction Health and Safety Plan (CHSP) for the Road Infrastructure Development Project (the "Project"). The CHSP sets out the expectations of WSG and the IDB and defines how the Contractor will implement and manage environmental matters.

Objectives

The CHSP will ensure that the Project is delivered in full compliance with legal requirements, and ensures:

- All workers, including contractors and subcontractors, are fully trained and experienced to do the tasks requested of them;
- Implements measures to eliminate hazards, and where elimination is not possible, puts in place controls to ensure that hazards and risks are minimized to acceptable levels; and
- Ensures protection and well-being of the surrounding communities and visitors.

It is intended that through the implementation of this plan:

- Hazards that may be encountered during the project are identified;
- Assessments are made to quantify the risk; and
- Control measures that require being introduced are implemented to minimize the risks.

The CSHP is a dynamic document that will change and develop throughout the Project. The Plan will be reviewed monthly to ensure that the content reflects the needs of the Project. Additionally, the Plan will be reviewed in light of any unforeseen occurrence.

7.4.2.2 Project Description

Once the Project's design is finalized, the construction Contractor needs to prepare the CHSP and include specific details on the proposed works, duration, relevant plans, etc. The following provide guidance on what is needed.

- **Scope of Construction Works:** Description of the full range of construction works / activities proposed (e.g. clearing of land, dredging activities, geotextile fabric and armor rock; installation of sheet piles; etc.).
- **Description of the Construction (Disturbance) Footprint:** Full description of the existing land area that will be disturbed by the construction works and those immediately adjacent;

- **Timing of Works:** Provide a description of both the total duration of the works and the time of year they will occur. The latter would include consideration of expected climate during this time (e.g., anticipated rainfall / storm events, wind direction and speeds);
- **Site Plan:** The project site plan would clearly show the full extent of the proposed works area of the construction project. This would typically include a map with the full construction boundary and disturbance footprint marked clearly over a current aerial photograph (i.e., including all construction activities, associated laydown areas etc.). It would also include site specific information, for example the location of any important waterways or adjacent vegetation to be protected, national heritage listed areas, or the location of sediment and erosion traps, electrical services, etc.

7.4.2.3 Site Conditions and Requirements

Details must be presented clearly in this plan related to existing site conditions, security and restrictions. This should cover items such as:

- Personal Protective Equipment Requirements - Safety footwear, dust masks, safety goggles, hi-vis vests appropriate gloves and hard hats will be provided and worn as set out by the specific work activities by all site operatives and visitors.
- Tree Protection - Temporary protective fencing will be installed if trees and/or vegetation is to be protected.
- Ground Conditions - A Site investigation will be conducted prior to works commencing and the results will be fed into this plan.
- Potential Risks to Construction Workers – to consider items such as:
    - The concentrations of contaminants at the site are understood to be low and are unlikely to require measures beyond that required for health and safety purposes on a construction site. Suitable precautions should be in place.
    - Health and safety measures for work in excavations and confined spaces below ground put in place.
    - Maintain first aid kits on site that are fully stocked at all times.
- Cross reference the requirements of the Construction Environmental Management Plan.
- Communicate with local hospitals to determine protocol in the event of an emergency
- The Contractor will liaise with the local residents and businesses prior to any works being undertaken to make them aware of works taking place and address any concerns by these affected parties. Access to the work sites will have secure gates will prevent entry to unauthorized persons.
- Working hours are generally 0800-1700 on weekdays, 0900-1400 on Saturdays. WSG and EPC contractor will establish if more than one shift will be needed to increase works to 24 hours.
- Priority will be given to maintaining continuous safe access.
- Maintain good housekeeping conditions at site (avoid having debris or construction material lying around).
- Install temporary camps for workers with enough shade, water and sanitary facilities. These should be proportional to the number of workers on site (ideally 1 portable toilet for every 4 workers). Waste bins should be available near temporary camps and rest areas.

- Conduct good practices in and around the Project construction sites including elimination of standing water or, if not practicable, treatment of standing water to kill mosquito larvae.

7.4.2.4 Policy and Systems

This Section must include an outline of the Contractors policy and management systems for the Project.

7.4.2.5 Project Roles, Responsibilities and Contacts

All positions across the project have health and safety responsibilities. These vary in relation to duties described in Table 7.2 but everyone has a base level duty of care to manage health and safety and avoid accidents and incidents.

Table 7.2: Project Roles, Responsibilities and Contact Details to be Finalized by the Construction Contractor for the CHSP

Position	Responsibilities	Company	Name	Contact Details*
Project Manager				
Site Supervisor				
Health & Safety Manager				
HSE Representative				

7.4.2.6 Training, Awareness and Competency

The CHSP prepared by the construction Contractor must outline how health and safety training, awareness and competency will be delivered / assessed throughout the project, to ensure the relevant aspects of this CHSP are communicated to the project team and front-line staff (including contractors and sub-contractors). Examples may include:

- Site Health & Safety Induction
- Daily Pre-Start Meetings
- Health & Safety Toolbox Talks
- Incident bulletins
- Sub-contractors kick-off meeting
- Contractor and client site kick-off meeting
- Toolbox talks

The Contractor must also detail its organization and arrangements for the promotion of safety, health, and welfare. Overall responsibility for the site and its management will be the Contractor. On the first arrival at site, allowance must be made for:

- Site induction for individuals, which will include ‘‘Site Safety Rules’‘.
- Mandatory Booking in and out of site (includes lunch and breaks).
- Registering workers with appropriate training and competency certificates where necessary.
- Providing inspection and other certificates for equipment and machinery to be used safely.
- Daily / weekly site briefing.
- Demonstrating how contractors will monitor safety and its duration and issuing copies of these reports to the Site Project Manager.

- Pre-existing health issues.

All workers will have a safety orientation session as part of the new employee/onboarding process. The contents of the sessions are detailed in section 7.4.4.3 and could be modified as needed, depending on risks and internal procedures by WSG and the EPC contractor.

7.4.2.7 Personal Protective Equipment

This section establishes the requirements to be followed to provide adequate protection from workplace hazards through the proper selection and use of personal protective equipment (PPE). PPEs shall not be used as a substitute for adequate engineering or administrative controls, when feasible.

- The use of PPE will be mandatory. They will not prevent accidents, but will eliminate or reduce the severity of an injury.
- It is the responsibility of the contractors to provide their workers with the personal protection equipment required in the execution of any work that generates risks.
- The equipment will be new and of good quality.
- It is the responsibility of the immediate supervisor of each worker to determine the need for personal protective equipment and to ensure that the worker makes use of them.
- The worker will be responsible for the care, conservation and proper use of any equipment entrusted to him.

WSG and Contractors will:

- Ensure that the required PPE Assessment has been performed, verified, and certified.
- Provide the resources necessary to ensure effective implementation.
- Communicate Management's expectations to employees.
- Ensure that quarterly inspections are performed on unassigned and general use of PPE.
- Evaluate workplace hazards with the goal of establishing PPE requirement for both routine and non-routine work situations.
- Ensure that required PPEs are being used properly and in good condition.
- Promote work practices which minimize exposure potential.
- Ensure employees have the required PPE training before initial assignment, and ensure they receive refresher training as needed.
- Ensure that adequate supplies of appropriate PPEs are available for the employees, contractors and visitors they are responsible for.
- Conduct and document an semi-annual inspection of personally-assigned PPE until construction works are over.

All workers will:

- Participate in training to know when to use PPEs and shall use the appropriate PPEs.
- Properly wear all prescribed PPEs.
- Inspect personally assigned PPEs for serviceability and defects prior to use.
- Clean, maintain and store PPEs in a manner that will ensure its serviceability.

- Not intentionally damage PPEs.
- Report or correct situations where current PPEs use is not adequate to protect against the hazard(s) encountered

The purchaser of equipment will:

- Ensure that adequate supplies of appropriate PPEs are available and that manufacturer storage requirements are met.
- Ensure that PPEs equipment specifications are met.
- An appropriate variety of glove types are available for various jobs

Hazard assessment and job/task safety analyses process. Additional responsibilities include:

- Provide technical support for the completion of the Risk Assessment in order to identify PPEs needs.
- Support the selection of appropriate PPEs and the necessary training and medical examinations according to the hazards identified by the Risk Assessment.
- Provide technical support for those performing Job Safety Analysis.
- Ensure that annual inspection of personally assigned PPEs and quarterly inspection of general use PPEs are performed and documented.
- Performing an analysis of the possible need for Flame Retardant Clothing (FRC).
- Mark areas with signs to identify special PPEs needs.
- Train employees (or arranging training) on the proper use of PPEs.

7.4.2.8 Work Permits

All projects must comply with the requirements and procedures established by local law, including those related to work permits in order to prevent unnecessary risks and/or accidents, and must comply with the following:

- It is necessary to obtain work permits in all areas with risk where work is carried, and they must be issued by authorized personnel.
- No work will be started before the respective work permit has been issued and it has been verified that the recommendations and demands required have been complied with.
- Supervisors authorized to issue and receive work permits will be responsible for the correct issuance of the same. They will also be responsible for ensuring that the security conditions are maintained during the time required to carry out the work.

A work permit will not be issued, covering several areas with different risks. As a general rule, each specific job will require a separate permit.

7.4.2.9 Complaints

A complaints procedure shall be outlined within the Contractor's safety management system and shall be available and used whenever a member of the public wishes to raise a complaint. WSG's workers' grievance mechanism is an additional channel to raise observations or concerns

7.4.2.10 General Monitoring Arrangements

Safety standards will be monitored by the Contractor through:

- A continuous inspection process by the Site Project Manager is in force. A checklist for these inspections is included with the site safety records. These inspections will include all contractors working on the site and a report of all actions required will be given to the contractor's foremen with instructions to rectify non-conformance in a timely manner.
- Once per week the Site Project Manager or appointed representative will inspect fire equipment, first aid equipment (and replenish if necessary), registers and site documentation.
- Monthly by the Contract Manager or appointed representative, who will carry out an inspection of the site and produce a written safety inspection report for distribution.
- The scheduled progress meeting chaired by the senior Contractor representative will as part of agenda discuss health and safety reports, and relevant discussions between the Client, the Contractor and other relevant stakeholders.

7.4.2.11 Emergency Procedures

The Contractor shall document emergency procedures covering the following:

- On-site facilities and responsibilities e.g., First-Aid kits and designated First Aiders.
- Escalation procedures for incidents and accidents.
- Numbers for local emergency services and details of nearby hospitals and other emergency needs.
- Site evacuation procedures and an Emergency Plan for different types of emergencies e.g. fire, flooding, etc.
- Incident reporting requirements and accident investigation procedures.

More information on emergency procedures are provided in the Construction Contingency Plan provided in the next Section.

7.4.2.12 COVID-19

Worker influx can spread COVID-19 in the community. The contractor can implement the following to minimize the spread of COVID.

- Weekly rapid tests on site
- PCR tests on site (to confirm positive cases from rapid tests)
- Self-quarantine daily follow-up for confirmed cases
- COVID 19 awareness toolbox talks
- Medical evaluation on site at Completion of self-Quarantine for persons recovered after being confirmed for COVID-19
- Vaccination promotion against COVID 19

WSG will follow-up Government of Guyana guidelines' and will adopt more stringent measures if needed.

7.4.2.13 Health and Safety Risk Management

This section will be completed by the Contractor to present a summary of the key health and safety risks and controls that have been identified for the proposed construction project. The Contractor should determine what additional risks and proposed management controls are required based on their final design and work method statements. A project risk assessment or job hazard analysis for specific task(s) should be performed.

The template table should be used for each of the following health and safety risks:

- Excavations
- Use of heavy equipment
- Use of and contact with power tools
- Working at heights
- Manual handling
- Live services
- Tag out procedures
- Noise, vibration, and dust
- Hot works
- Confined Spaces
- Traffic management and protection of neighboring communities/businesses.
- Storage of waste materials
- Temporary works

Note that this is not an exhaustive list, and it would be expected that Contractors develop risk management strategies, controls, etc. that suit the scale/nature of finalized construction project.

7.4.2.14 Key Performance Indicators

In addition to specific KPIs established for each specific activity, the following are general KPIs for H&S on site:

- Zero Lost Time Incident (LTI)
- Zero worker injuries
- Number of grievances by workers.
- Number of H&S incidents (observations, near-miss, new work hazard identified)
- Number of Work Permits issued
- Number of Job Hazard Analysis (JHA) performed
- Number of Toolbox meetings held
- Number of H&S meetings (supervision meetings or others)
- Number of workers using their PPE (which can be verified through observation cards, grievance mechanism or on the spot by the supervision firm)

Template

H&S RISK			
H&S Risk Identified			
Method statements and Risk assessment	Either detail here or refer to separate document		
Management Strategy			
		Responsibility	Timing
Control(s)			
PPE Requirements			
Performance Indicator(s)			
Monitoring			
Reporting			
Corrective Action(s)			

7.4.3 Construction Contingency Plan

This Contingency Plan (CP) provides a working template that will be used by the selected construction contractor (the Contractor) appointed by the Executing Agency (WSG). It details the typical requirements and focus areas for emergency management, however it is recognized that the selected Contractor will have their own policies and procedures that will need to be inputted to this plan. It also recognizes that as the Contractor develops the Project designs, this will influence how construction will be undertaken, and these aspects will need to be integrated into this plan.

7.4.3.1 Introduction

Overview

This Contingency Plan considers general actions to be taken into consideration in case of emergencies related to the construction of the Project. Although some events can be prevented, as is the case with spills, fires, explosions, etc.; there are others that cannot be controlled; however, impacts can be mitigated by being prepared, as is the case with natural hazards such as: flooding and strong winds, etc. All of these events must be considered in a contingency plan.

The Contingency Plan is a live document and requires that the construction contractor carry out training activities and periodic drills for personnel, as well as continuous review and update of the physical and operational data, as well as equipment and products.

Objectives

The main objectives of this Contingency Plan are:

- Prevent or control operational emergencies or possible industrial accidents that may arise during the construction phase of the Project.
- Establish procedures and plans to respond in a timely and efficient manner, and with the necessary resources, to fires, accidents, attacks and any other emergency situation that may arise.
- Prevent the consequences of a major event (fire, spills of dangerous products) from damaging human lives and property.
- Manage equipment and installations through periodic inspections.

The contingency plan presents the most important guidelines for subsequent adoption and implementation by contractors. One of the fundamental purposes is to protect and safeguard the human life of all those involved and reduce the losses of public and private property.

There are three elements that significantly influence the success of any contingency plan, which are:

- Resources: appropriate personnel and equipment;
- Strategies, techniques and action plan; and
- Response management: leadership, cooperation and communication.

7.4.3.2 Emergency Levels

For the operation of the Contingency Plan, it is important to first characterize the emergency by seriousness of the situation in order to apply the appropriate level of response:

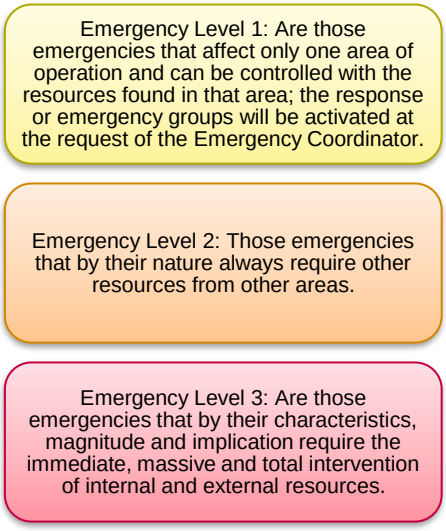


Figure 7-2: Emergency Levels

7.4.3.3 Procedures to be Followed During the Implementation of the Contingency Plan

Considerations for the designation of the appropriate response measures:

- **Identification of Available Resources.** The most important resource to respond to possible contingencies is the people present at the Project site. The actions to be developed will depend to a large extent on the knowledge, confidence and capacity of the staff to carry out the actions previously assigned in the respective plan. It is imperative that the people at the Project site meet training requirements and are provided with the appropriate personal protective equipment (PPE) emergency response equipment, and information to fulfil their mission.
- **Access to information.** Provide all the necessary information in a concise manner to minimize confusion, and to avoid rumors and exaggeration. Obtaining timely and updated information is a dynamic process and is the best way to provide feedback to the plan.
- **Communication.** The problems associated with communication are mainly related to the content of the messages, the means of transmission, and the interpretation by the person who receives it. Communication systems used internally should be prepared to handle a specific amount of information during an incident.
- **Priority setting.** At the scene of an incident, the personnel in charge of responding to the emergency must be able to alter priorities quickly, in order to face possible changing and/or unexpected situations.
- **Coordination between the Authorities.** An emergency coordinator must be determined for the Project by the contractor during the construction phase. This emergency coordinator will be in charge of coordinating with the appropriate authorities during an emergency.
- **Communication with the communities.** Throughout the construction phase, contractors must take communication initiatives with communities for their safety. These initiatives may include an emergency alert system, a method to provide information on Project activities and how to

respond, collaborate with communities to establish action plans, organize demonstrations or training in how to respond to emergencies for communities, and/or identify the emergency response team to communities to establish a relationship before an emergency occurs.

Construction Phase

It is the contractor's and Project sponsor's responsibility to oversee risk management, this responsibility is shared with subcontractors if applicable. WSG, as supervisor and owner of the project will have to ensure that the contractors manage risks and prepare an appropriate contingency plan as required. Therefore, the contractors and/or subcontractors will be required to comply with all safety, occupational health and environmental procedures to complete and deliver the work without incidents. As previously stated, Contingency Plans are live documents that may be revised and adapted if necessary, according to the appropriate requirements for the construction activities.

The Contractors and Sponsor will ensure compliance with the standards as required based on the type of work, by jobs or disciplines. Such obligations include but are not limited to:

- Guarantee workers with safe conditions in the workplace.
- Instruct and train workers regarding the prevention of accidents, occupational diseases, the risks to which they are exposed in the performance of their work; as well as the use of personal protection equipment according to the work done, through training sessions, posters, etc.
- Design a program of occupational health and safety according to the activities to be performed that contains safety measures to be implemented, in order to avoid injury to personnel or property damage.
- Provide workers with personal protection equipment, according to the work done to prevent injuries.
- Regarding vehicles, machinery and equipment, comply with preventive and / or corrective maintenance programs and safety requirements.
- Organize and maintain health and safety services such as first aid kits in accessible places and ensure staff is knowledgeable.
- Record in writing any statements made by the workers in relation to unsafe conditions and the worker's environment and carry out corrective measures immediately.
- Report any occupational diseases, work accidents and any other unsafe condition that is present in the workplace.

Employees will have to fulfil the following obligations:

- Exercising their specific functions in accordance with the work contract in order to avoid risks and protect their personal safety and health, and that of their work colleagues.
- Immediately report to supervisors any unsafe condition that could threaten their physical integrity or their own health and / or that of other workers.
- Use and maintain personal protection equipment as required, and immediately report to the person responsible for its supply, of the loss, deterioration or expiration of the same.
- Bring to the attention of your superior if you feel that the requested safety or security measures do not appropriately manage the risk.
- Immediately comply with any request that is made for the benefit of your safety and that of others.

- Care for and maintain sanitation and security facilities facilitated to the workers during the construction phase.
- Adhere to all safety and security requests made in the training materials, posters and posted notices.
- Accept the provisions of the medical service and the competent bodies in matters of occupational safety for the prevention, treatment of occupational or non-occupational diseases, and occupational accidents.

Emergency Procedures

The following Section describes the actions and procedures to be considered by the Contractors and Sponsor in case of emergencies and events that may arise.

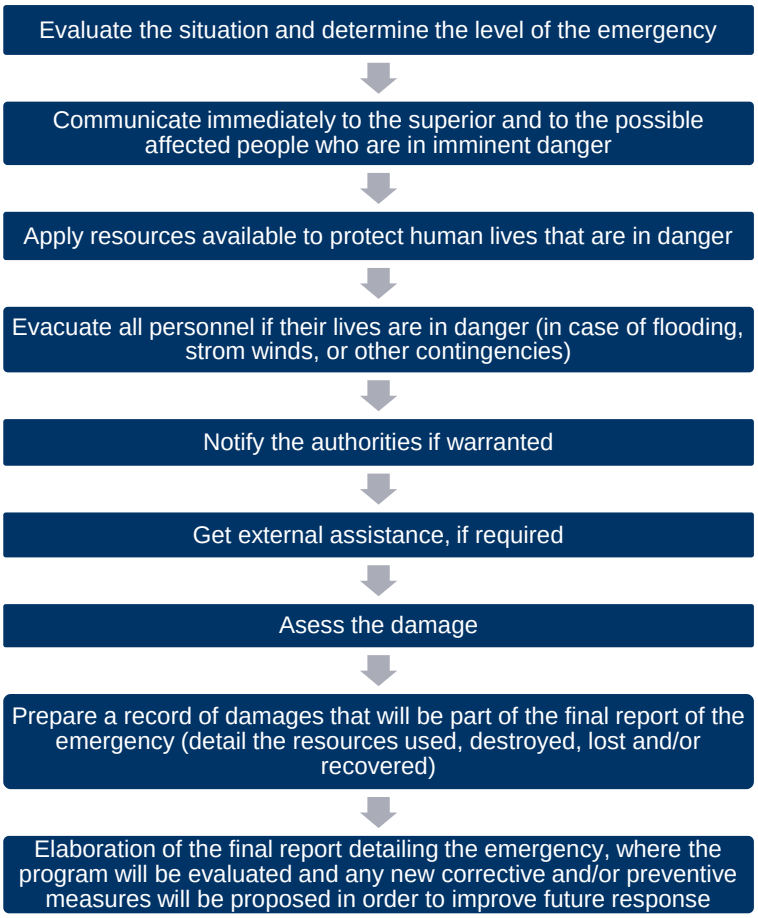


Figure 7-3: General Procedures during an Emergency

The Contractor or Sponsor must lay out a sequence of actions to be followed in the event of an unplanned event or accident, which may be as follows:

- Notification: Inform all personnel of the accident.

- Verification and evaluation: Confirm that the notification provides an accurate representation of the status of the works and associated risk at the moment that the notification of the event is received.

A notification scheme must be included in the Contingency Plan to include the main local authorities, (may include: the municipalities where the projects are developed, the local police, and/or the local firefighters).

Calling Plan

The Contractor or Sponsor must prepare a calling plan consisting of three types of communications, internal, external, and support.

- Internal Calls: The internal calls include the communication of the emergency to top management personnel, as well as the members of the Contingency Plan who are outside the facilities.
- External Calls: Communication of the emergency to the appropriate Government Authorities, depending on the type of occurrence.
- Support Calls: Support personnel in order to control the emergency (dependent on the type), for example the fire brigade, the national police, ambulance service, medical attention if necessary, government authorities, etc.

Emergency Committee

An Emergency Committee must be organized by the Contractor or Sponsor for the construction phase. It is recommended that the Committee be composed of:

- Environmental supervisor
- Security Supervisor
- Maintenance supervisor

7.4.3.4 Types of Contingencies

The types of contingencies that may arise in the project areas are classified according to their origin:

- Natural phenomena, such as flooding, strong winds, etc.
- Operational emergencies or incidents normally caused by operations, fires, falling machinery, etc.
- Industrial accidents of personnel or contractors, normally caused by unsafe acts, unsafe conditions or as a consequence of the natural phenomena or operational emergencies previously stated.
- Social phenomena such as sabotage, terrorism, robberies, etc.

7.4.3.5 Phases Considered for Each Event

Prevention Process

The best way to control an event and the impact that these may have on the environment is to prevent them from happening by implementing preventive measures. Preventive measures are described below.

Organization and order

Prior to the start of the work, the Contractor or Sponsor will develop a safety, organization and order program for direction, providing guidance everything from inspections to identify faults, to the types of collection waste/trash receptacles provided for the different types of wastes (organic, inorganic waste, solid waste, liquid, and hazardous waste). Transportation and final disposal method, in accordance with the national regulations, must also be included. In addition, the following requirements will be fulfilled:

- Each employee will keep their work site clean and in good condition.
- The employee will notify his supervisor about spills of oil, grease, etc., and will be cleaned as soon as they occur.
- All tools, screws and any other material equipment used in the performance of a job will be kept in order, and these objects should not be placed in places where they can be dangerous.
- The flammable substances and wastes will be handled and stored accordingly in order to avoid the risk of spontaneous fire.
- There should be a staging area or adequate space for orderly storage of bulky objects, equipment, or materials.
- Every workplace should be provided with fresh and potable water in sufficient quantity for workers to use.
- The toilets and bathrooms (one toilet for every 20 workers) will be kept in optimal conditions and with sufficient supply of toilet paper, water and soap.
- If employees eat at the workplace, the workplace should have a dedicate area for eating, protected from weather elements. No waste and debris will be left in place and the use of Styrofoam food containers is prohibit.

Training

Every worker, new or old, will receive operational training from their immediate supervisor (supervisor), in order to develop knowledge and skills for the safe execution of the assigned work, especially on:

- Industrial safety corresponding to construction.
- Occupational health.
- Fire Prevention.
- First aid.
- Personal protective equipment.
- Organization and order.
- Accident prevention.
- Accident analysis.
- Fire protection.
- Works that require written permission for their execution.
- Emergency control.
- Factors of physical risks (electrical, mechanical, noise and vibrations, lighting, heat, ventilation, etc.)
- Factors of chemical risks (smoke, gases in the environment (vapors, fumes), toxic, alkaline and corrosive substances, etc.)
- Other risk factors (health, third-party actions, environmental, etc.).

Emergency Response Actions

The Contractor or Sponsor shall prepare a list of general emergency response actions to include:

- Upon receiving notice of an emergency, immediately evaluate the level of emergency and determine which response measures are necessary, notifying the corresponding response groups.
- If necessary and in accordance with the magnitude of the event, order the evacuation of the area or facilities and initiate the respective response procedures.
- Notify the relevant authorities.
- Consult the emergency response procedures in order to verify the appropriate response for each emergency, ensure all the response procedures have been applied and record descriptive information of the event.
- Restrict access to the event area.

Procedures to be followed during a Natural Disaster (Natural Disaster Risk Management)

General Actions in the Presence of Hurricanes and Floods

In the case of occurrence of threats due to extreme weather conditions, the following actions should be considered:

Preparation

- Train operational personnel to act in the event of hurricane and flooding emergencies, so that personnel are prepared for these events.
- Conduct period maintenance cleaning of all drainage canals to remove trash, sediment, and other debris to promote adequate drainage of stormwater during these events
- Inspect emergency equipment and make sure it is ready for use. Ensure emergency equipment includes drinking water and canned food.
- Secure with ropes or chains all equipment that cannot be secured inside a building.
- Place the vehicles in a manner so they are protected against hurricane winds.
- Call the relevant authorities for the Project or Operations, the Police and the security company, if any, and indicate that only the minimum emergency personnel will be left on site.
- Close the main gate if able to.
- The Coordinator will determine, according to the prevailing or progressive conditions, if emergency stop procedures should be executed.

After the Emergency

- Equipment will not be energized/turned on until it has been checked by expert electricians/mechanics.
- In case of spills or fires, implement response procedures in accordance with the procedures related to these events in the contingency plan.
- Take a tour and assess the damages incurred.
- Proceed to repair minor damages and those necessary to provide immediate service.

- Proceed to clean debris and artefacts that obstruct the operations of the same.
- Prepare a written report at the end of the emergency. Said report shall contain the results of estimation of damages to the property of the company, affected persons, damages to private properties, and to the environment.
- Response plans should be updated based on the emergency to remain effective.

When flooding events are exacerbated due to drainage blockage (caused by construction activities), the EPC contractor will divert traffic to avoid people and vehicles from crossing the flooded area, while the drains get unblocked/the issue is resolved. Depending on the size of the flood and the section when it occurs, WSG along with the EPC contractor can add another detour road to the Project area.

Fires and/or Explosions

A fire can lead to serious damage to equipment or personnel, and should be taken care of as quickly as possible. The following recommendations should be included in the Contractor's Contingency Plan in case of a fire.

Before a Fire

- Provide training to all personnel through courses on fire practices and simulations of accidents, use of fire extinguishers, etc.
- Have infrastructure and equipment for fire protection, and extinguishers that work in different environments depending on the type of project (for example, Class A extinguishers for ordinary combustibles such as wood and paper, Class B extinguishers for use on flammable liquids like grease, gasoline and oil, etc.).
- Develop rigorous preventive maintenance programs for all types of equipment, inspect and recharge fire extinguishers, etc.
- Identification and signage of safe areas and establish evacuation routes in all facilities or work fronts.
- Keep extinguishers in good condition.
- Provide first aid kit, battery-operated flashlights, extra batteries, etc. on site.

During a Fire

- Evacuate and or stop work in the area and / or facilities.
- Communicate with the local Fire Brigade, National Police and other entities depending on the severity of the emergency.
- Protect mouth and nose with damp cloths.
- Keep calm and avoid running.
- Assist affected people immediately, if any.
- If appropriate, try to put out the fire with the use of extinguishers and other existing means. Ensure extinguishers are periodically inspected to ensure they are in working condition.
- If any equipment is involved in the fire or explosion, the operator must manually disconnect the electrical power that feeds the equipment, as long as it can be done safely or without risk to human life.

In the event that the fire cannot be fought directly with the extinguishers, or there is danger to the personnel, the actions to be taken are:

- Notify firefighters immediately for help.
- Evacuate the place to the meeting point previously agreed in the training plan and risk drills.
- Once the firefighters have determined that the emergency has ended, the emergency coordinator of the project owner should be informed.
- Proceed along with the maintenance crew to an inventory of damages and then make a detailed report on the matter.

After a Fire

- Clean the affected area.
- Remove all debris.
- Repair and / or demolish affected facilities in case of major damages.
- When the fire has been extinguished, proceed with the maintenance crew to prepare an inventory of damages and then make a detailed report on the matter.

Adequate Staff Training

Practices or simulations should be carried out every six months (can include coordination with the local Fire Department), and should include response procedures for personnel all personnel.

Use and Disposal of Fire Extinguishers

- Fire extinguishers must be located in appropriate places and easily accessible.
- Every extinguisher must have a plaque with the information about the kind of fire for which it is suitable and expiration date. Also, they must have operation and maintenance instructions.
- Each extinguisher must be inspected every two months, tested and maintained in accordance with the manufacturer's recommendations; similarly, they must carry a label with test dates and expiration date.
- If an extinguisher is used, it will be refilled immediately; or if necessary, it will be replaced immediately.

Spill contingency response

The purpose of spill contingency response measures is to provide a course of action, which will be implemented to allow a prompt and orderly response to spills that may occur during construction. A spill of any liquid, solid or gaseous substance, which could impair the usefulness of the land, water or air where it is released will be responded to by the procedures outlined in this contingency plan. The main objectives of the Spill Contingency Response are

- To reduce the risk of harmful exposure to individuals and the surrounding environment;
- To clearly outline the action to take if a spill will occur; and,
- To ensure that project staff is aware of the correct response required.

Preparation:

- Implementation of sumps and oil traps to prevent leadks and spills from contaminated surface water
- Storage of collected material in drums before transport to licensed disposal site
- Preparation and availability of spill kits on site

Equipment and Materials Needed for Spill Response

The contractors will have a spill kit to deal with spill incidents. The spill kit will be stored at the Contractors site office and/or strategic places to be used in the event of a Spill. The kit will comprise the following materials:

- Absorbent material, such as sand, sawdust, absorbent cloths (depending on spilled material), absorbent foam
- Skimmers
- Fire extinguishers
- Gloves, safety goggles and respirators and boots
- Gallon sealable containers
- Caution Tape
- Bags containing saw dust
- Bags containing white sand
- Plastic Spade
- Heavy Duty Garbage Bags
- Empty Five Gallon
- Containers with lids to store spilled materials.
- Photographic camera to document the incident

In the event of a spill, formal communication including completion of an incident investigation report will be sent to all relevant personnel which includes the IDB and may include local authorities. The time frame for reporting spill incidents is dependent on the nature and severity of the spill in line with general good practice guidelines for incident classification. The extent of contact with local authorities will also depend on the classification of the spill.

Falls from Heights, Cut Wounds, Electrocution and Burns

Before

- Training for personnel should include industrial safety so that they do not commit unsafe acts and use the appropriate protective implements, such as a helmet, boots, safety glasses, restraint harness, etc.
- Also, training of personnel in the implementation of first aid, so that they may help injured co-workers or themselves, until the arrival of medical or paramedical personnel to the place of the accident or their transfer to a hospital for professional attention.
- Provision of personal protection equipment to all workers, as necessary.

During

In case of an accident in the facilities, the staff will act as follows:

- If it is a minor accident, apply first aid to the injured person and transfer them immediately to the nearest clinic or hospital so that they can be seen by a doctor, in order to rule out possible after-effects.

- If it is a serious fall from heights, shelter the injured person and request an ambulance for immediate transfer to a hospital.
- If a person is not breathing, provide rescue breathing (mouth-to-mouth breathing or mouth-to-nose) and request an ambulance for urgent medical attention.
- In case of burn, do not apply home remedies to the injured only water at the time and request an ambulance for its transfer to the clinic or hospital soon.
- For hemorrhage from a puncture wound, hold a gauze in place to avoid blood loss. If located in the extremities, make a tourniquet to cut blood loss, loosening the tourniquet every 10 minutes to avoid gangrene and to move the injured person to a nearby assistance center.
- If trapped with weight on the chest, lever the heavy element and remove it so that the victim does not suffocate, until the arrival of the ambulance.
- If the victim has suffered an electric shock, ensure they are breathing, provide rescue breathing (mouth-to-mouth breathing or mouth-to-nose), and simultaneously request medical assistance or transfer to a clinic or hospital.

Immediate attention to an injured person through knowledge of First Aid can save a life. Always seek the appropriate medical attention by a professional.

After

- Analyze the causes of the accident and the actions taken to assist.
- Prepare the preliminary and final report of the industrial accident.

Equipment or Infrastructure Failure

- The person who detects a fault or failure will immediately notify the Supervisor or Chief of Operations identifying themselves and indicating the place and type of emergency.
- Try as much as possible to isolate the area or prevent vehicles or people from approaching.
- After overcoming the problem, analyze the root cause of the emergency/fault or failure.
- Prepare preliminary and final reports and submit to the appropriate authorities in a correct and timely manner.

Damage to infrastructure

The Contractor should conduct an assessment of existing properties within the Right of Way. This includes fences, walls, and buildings (commercial and private) to determine preexisting conditions of all structures prior to the start of construction activities. Reports of infrastructure damage resulting from construction activities are to be submitted to the appropriate authorities to determine adequate response.

Attacks and Sabotage

- Provide strict control of the entry of personnel into the facilities by a contracted Security Company, as well as provide surveillance in strategic areas, as necessary.
- In the event of an attack or sabotage, the person who detects it will immediately notify the emergency supervisor of the emergency, indicating the place and equipment affected.
- The shift leader will immediately inform the Police and personnel in charge of the surveillance of the facilities, to neutralize the aggressors.

- If an attack leads to an emergency event (such as a spill or fire), the response strategy to the specific type of emergency will be determined and instructions will be given to the external support units: police, fire brigades, etc.

Prepare preliminary and final reports and submit to the appropriate authorities in a correct and timely manner.

7.4.3.6 Key Performance Indicators

- Percentage of actual versus planned emergency drills carried out
- Percentage of actual versus planned maintenance activities for drainage canals carried out
- Total training hours for the safe execution of work
- Reporting of incidents (natural phenomena, operational emergency or incident, industrial accidents, social phenomena)

7.4.4 Human Resources and Labor Management

7.4.4.1 Forced labor

Although the risk of forced labor is low, WSG will ensure forced labor is not present in any work or service performed by the contractor or any subcontractor or anywhere in the Project supply chain. Forced labor is defined as any involuntary or compulsory labor which includes:

- Indentured labor
- Bonded labor
- Labor-contracting arranges
- Employment of trafficked persons

If forced labor is identified the EA will take immediate action to remedy the situation.

7.4.4.2 Child labor

The minimum working age in Guyana is 15. No hazardous work is to be undertaken by individuals less than 18 years of age. This is in line with the minimum age requirements as established by IDB ESPS 2. WSG is responsible for identifying all individuals employed under the age of 18. All work performed by individuals under the age of 18 will undergo an appropriate risk assessment and regular monitoring to determine the adequacy of health, working conditions, and working hours. the Project will comply with the national regulation. Those over the minimum age but below 18 shall not engage in the following activities:

- Work that is economically exploitative
- Work that is considered hazardous
- Work that may interfere with the child’s ability to receive an education
- Work that is harmful to the child’s mental, physical or spiritual state
- Work that can result in health impacts
- Work that is deprives the child’s social development.

7.4.4.3 New Employee Safety Orientation

Trainings will be developed in two phases, first will be carried initial training and second refresh training session to ensure employee´s awareness and competence.

Specialized training must be completed to perform activities as work at heights, hot works, confined space, electrical works, hazardous materials handling, lifting operations, and other activities that are considered medium or high risk evaluated.

Initial Training

Management personnel responsible for enforcing this procedure shall read this procedure and complete a testing to demonstrate understanding of its requirements.

Refresher Training

There is no refresher training frequency required unless this procedure is significantly modified or if a management employee responsible for executing this procedure does not, or cannot, demonstrate understanding (e.g., compliance audit failure to properly implement this procedure).

Figure 7-4 ESHS Orientation Checklist

PART 1: GENERAL DISCUSSION **ENVIRONMENTAL AND SAFETY POLICIES, PROGRAMS & RESPONSIBILITIES** Inform the employee of the following Company policies and programs, and his/her responsibilities regarding safety and health issues.		
Yes	N/A	
		WSG and EPC contractors Policies regarding ESHS.
		IDB Environmental and Social Policy Framework and Construction ESMP
		Code of conduct (with refresher training every year)
		The employee's responsibility for performing his/her work in a safe manner, in accordance with policies and procedures, and Guyana Laws and Regulations.
		ESMP minimum requirements for wearing personal protective equipment, including hard hats, safety glasses, and steel-toed safety shoes or boots.
		The employee's responsibility to report all injuries and incidents, including near misses, to his/her supervisor. Inform employee where to get reporting forms and procedures for completing them.
		The disciplinary policy regarding violation of safety policies and procedures.
		The employee's right to report hazardous or unsafe conditions without fear of reprisal (Stop Work Authority).

		The workers' Grievance Mechanism.
		The alcohol, smoke, drugs and psychoactive prevention of consumption policy.
		Traffic and Pedestrian Management Plan. The use of mobile phones (talking, texting, checking email, etc., even when equipped with hands-free devices) is always prohibited when operating a vehicle.
		The responsibility for attending daily EHS talks and EHS meetings.
		The employee's responsibility for participating in mandatory safety and E&S training.
		Prohibition of weapons (e.g. firearms, knifes, etc)
		The employee was given a copy of the ESMP, which includes E&S requirements of national law, IDB ESPF and EPC contractor requirements.

Initial Safety Equipment Issue:
Uniforms, PPE requirements & participation in applicable programs: head protection (eye, face, ear), hand protection, foot Protection, respiratory protection, and fall protection).
Required PPE shall be issued, or made available, and requirements for use shall be discussed in the following:

		Uniforms
		Hard Hat
		Safety Glasses
		Earplugs
		Steel-toed safety boots.
		Other (specify)

PART 2: OVERVIEW OF PROCEDURES / POLICIES / PROGRAMS

Inform the employee of the hazards associated with the site and the job he/she will be performing. The plans and procedures to control the risks and how to avoid accidents and illness.

Safety Training
Briefly discuss the following safety programs with all full-time, part-time, and temporary Company employees. Discuss applicable programs with temporary service company employees based on their level of involvement and responsibility.

Yes	NA	

		Safety Orientation
		Safety Observation & Stop Work Authority
		Construction Health and Safety Management Plan
		General Safety Rules
		Personal Protective Equipment
		Permit to Work System and Job Hazard Analysis (work at height, hot work, electrical work)
		Housekeeping & Office Safety
		Ergonomic Hazards (Heavy lifting, repetitive motion)
		Use of forklifts and major construction equipment
		Signs & Tags
		Contractor Management
		Pre-start Safety Review
		Hazardous Materials (Describe various types of hazardous materials present.)
		Flammables and Combustibles
		Hazardous Energies (Work requiring the use of a lockout/tagout.)
		Hearing Conservation Measures and High Noise Areas
		Respirable Dust
		Bloodborne Pathogens
		Fire Protection Systems & Portable Fire Extinguishers
		Fire Prevention Plans
		Hazard Communication
		Heat Stress
Environmental Management Plan		
Yes	N/A	

		Waste Management
		Air Quality Management Measures
		Noise Management
		Sediment and Erosion Control
		General Housekeeping
EMERGENCY PREPAREDNESS AND RESPONSE PLAN: EXPLAIN OPERATION OF SAFETY/EMERGENCY EQUIPMENT, INCLUDING:		
Yes	N/A	
		Construction Contingency Plan
		Medical Emergency Response Procedures
		Fire and Explostion Response Procedures
		Spill Response Procedures
		Natural Disaster Response Procedures
		Accidents (falls, cut wounds, burns)
		Evacuation procedures
PART 3: TOUR OF WORK AREA		
		Break Rooms
		Restrooms
		Safety Equipment & Supplies
		Safety Observations
		Extinguishers
		Eyewash and Emergency Showers
		First Aid Kits
		Incident Reporting Forms
		Hazardous Waste Storage Areas

		Chemical Storage Areas (Point out various labeling systems used.)
		Flammable & Combustible Storage Areas
		Hazardous Noise Level Areas

7.4.4.4 Workers Grievance Mechanism

The Contractor must develop and implement an internal grievance mechanism through which workers can express concerns about the workplace, including unsafe working conditions, environmental nonconformities, and issues of gender-based violence, gender inequality, and sexual harassment. The grievance mechanisms complies with IDB ESPS 1 (Assessment and Management of Environmental and Social Risks Impacts.) and ESPS 2 (Labor and Working Conditions). The Contractor internal grievance mechanisms must be fully available to all subcontractors. All grievances received via contractor and subcontractor grievance mechanisms must be reported to WSG for Project-wide tracking of worker grievances received and how they are being or have been resolved.

Receive and register a Claim

Any temporary or permanent employee, as well as any consultant, contractor, subcontractor, or supplier, can submit, both verbally and through a written form, a claim to their immediate manager, the human resources department, or a worker representative.

The grievance process is initiated when a claim is received from a staff member, contractor, or anonymous person to a manager in charge of the process. If the claim is readily resolvable (e.g., a request that can be immediately granted or an easy solution can be applied without an investigation process), the person receiving the claim (i.e., immediate manager, human resources, compliance or worker representative) takes action to address the issue directly and records the details in an Internal Grievance Log. If the claim subject is considered sensitive by the claimant (e.g., in cases regarding abuse, sexual harassment, or other forms of gender-based violence), a special point of contact with adequate training will be provided. The claimant will have the option to talk to a point person of their same gender, if requested.

Claims will not be applicable in cases when:

- A claim is under the Government's sphere (e.g., Its nature exceeds the scope of the present Internal Grievance Mechanism)
- A claim is regarding another Project in the area (e.g., it is out of WSG's influence)
- The complainant has no standing to file (e.i., the complaint is incoherent, or nonsensical)

When the claim is classified as non-applicable following the above criteria, WSG will clearly communicate the reasons why it cannot be considered to the claimant, and when possible, WSG will provide information to help them redirect their claim to the right institution or party.

Screen and assess

For claims that have not been resolved immediately by the receiver, Human Resources makes an initial assessment of severity and assigns the claim to a Claim Owner (e.g., asset manager, country manager, or other area involved directly within the claim, such as the Community Relations team if regarding a local community). Human Resources and the Claim Owner agree to timelines for an investigation and any follow up actions. The investigation might include interviews with witnesses, a visit to the site if applicable,

and review of documentation. The Claim Owner will not be assigned to a case if he or she (whether they are a manager or not) are directly involved in the grievance case in order to protect the claimant.

Claims can be classified into one of four categories:

- NOT APPLICABLE: Claims that meet one or more criteria listed above.
- LOW RISK: This category refers to those claims that do not require resolution per se, but instead only require information or a certain clarification to be provided to the claimant. If there are recurring complaints that have been previously received and addressed by the Project, WSG will reconsider elevating the importance of the complaint, as this might be a sign that the response to the grievance has been insufficient or inadequate.
- MEDIUM RISK: Those claims that require resolution and are related to minor risks associated with health, the environment, construction, transportation, and contractor and subcontractor personnel. Although important, they do not pose an immediate risk.
- HIGH RISK: Includes those claims related to the security and safety of Project personnel and community stakeholders, as well of those that, according to criteria of the Human Resources team, require immediate response as the claim poses an immediate major health and safety risk or a risk to an individual, to a large or small group or several groups of stakeholders. This includes claims regarding illegal and abusive activities.

For claims regarding issues for which a more appropriate company process already exists, Human Resources refers the matter to the appropriate Claim Owner for further action. This is typically the case for claims related to contractual or commercial issues, business integrity or criminal matters, and issues subject to current or pending litigation. Human Resources updates the Internal Grievance Log stating to which department it was transferred to.

Track and document

Once an agreement is reached, Human Resources is responsible for following up with the claimant to confirm that the appropriate resolution measures are implemented and continually coordinate with the areas involved in the claim. In case of an anonymous case, the resolution will be published on a visible and accessible notice board on site and communicated in regular staff meetings. WSG will periodically communicate to all employees how the GM is working in order to incentivize the usage of the mechanism.

Human Resources is responsible for maintaining documentation of the claims. Human Resources is also responsible for tracking the resolution of the claims, coordinating with the areas involved through weekly meetings, and facilitating the participation of the claimant.

The Internal Grievance Log provides a record that documents the actions tracked and carried out.

Duty of confidentiality

Claimants and anyone else involved in the claim has a right to remain anonymous and WSG as the responsibility of protecting their identity. This duty extends to all employees and representatives of WSG and its contractors who participate in the Internal Grievance Mechanism process.

Information about a claim is shared within the company on a need-to-know basis and only to the extent necessary to complete the steps in this directive. WSG will not share personal information with third parties unless required by law or authorized by the claimant.

Special protections are to be provided for internal grievance reports of sexual and/or gender-based violence (SGBV).

7.4.4.5 Code of conduct

The code of conduct will be part of the onboarding training received by all employees and will be easily accessible in resting areas and temporary camp facilities. The code of conduct will become part of the contract with the worker. The code of conduct aims to contribute to the preservation of the environment and to the health and hygiene conditions of workers. At the same time, it aims to ensure the quality of relations with the communities surrounding the works, as well as respect for the environment and environmental legislation, discipline and other relevant aspects.

The minimum requirements contained in the Code of Conduct are:

Overview

- The conduct of workers before, during and after working hours shall be exemplary and shall be strictly in accordance with the law. In particular, a polite and respectful relationship with all will be maintained; hostile conduct towards the local community will not be permitted, but respect for local values, customs and culture will be shown at all times.
- Any form of discrimination based on social conditions, race, gender, age or religion is strictly prohibited.
- All workers must carry credentials that allow easy identification of their names, position and company for which they work.
- It is strictly forbidden to carry weapons, consume alcoholic beverages or drugs, as well as carry pornographic images or objects in all areas of the project. The sale of products within or near the boundaries of the construction camp will be monitored. For this, a cadaster of the merchants will be carried out and the number of people who can perform this service will be limited.
- Any damage to camp establishments and/or third-party property will be reported in a timely manner to the direct supervisor.
- Graffiti on the premises of the construction camp is prohibited, as well as any other form of vandalism that affects the property of the contractor/executing company, the ANDE or third parties.
- No worker of the contractor/executing company may make statements related to the project to the press or any other media, as they are only allowed to ANDE or the Community Relations and Participation Plan team.
- Every employee must immediately report to his or her supervisor any conduct that violates the General Code of Conduct.

Gender-based violence and sexual harassment

- Workers will be sensitized and familiar with actions that constitute gender-based violence, so they can identify when they manifest themselves.
- Workers will be informed that gender-based violence is not only directed at women and girls, but also at sexual minorities (e.g. gay and transgender people).
- Workers will be informed about the prohibition of any action that constitutes physical, emotional, sexual and/or power and financial control and use against workers, homosexuals and also against women from the communities surrounding the works.

- Each worker will be informed about the punishments for any action that constitutes sexual harassment, rape or any form of physical or verbal aggression against workers, homosexuals and also against women from the communities surrounding the works.
- Workers will be informed about the risks of contracting or transmitting sexually transmitted diseases in contact with the population of the communities surrounding the works.
- Workers will be informed about punishments for teenage pregnancies living in nearby communities, caused by sexual relations with construction workers.
- When hiring local workers, it will be prohibited to deny opportunities to women, including impediments to compete for jobs recognized as male, to participate in job training, among other opportunities.

Hygiene and safety

- Every employee must strictly comply with occupational safety standards. Any failure to comply with these rules will be considered a serious offense by the Occupational Safety Coordinator of the contractor/executing company.
- Every employee must report to the Immediate Safety Supervisor any conduct that is unsafe or does not conform to health and safety standards.
- Medical examinations must be carried out for admission, dismissal and for any change of work function.
- Any employee who shows symptoms of illness should report it immediately.
- All workers must take vaccinations provided by the contractor/executing company.
- Every employee must have good personal hygiene habits. The disposal of garbage outside the specified garbage containers will not be allowed. The bathrooms must be used on the premises.
- Drivers of heavy machinery and equipment operators working outside the work facilities shall strictly follow road signs and traffic rules. And they must respect the ban on littering on the roads during travel.
- The transport of third parties in work vehicles during construction-related activities is strictly prohibited. The transport of third parties is only allowed with express authorization and under the direct responsibility of the Contract Manager and / or Resident Engineer of the Contractor / executing company.
- The use of service roads for construction, speed limits and any instructions contained in the signs must be complied with at all times.

Environmental and cultural heritage

- Fishing and hunting of wildlife, as well as unauthorized cutting of vegetation, is strictly prohibited. Any worker found performing such actions will be terminated immediately.
- All eye contact with local terrestrial fauna within cleared areas for construction should be reported without delay to the immediate supervisor for the environmental monitoring team to take appropriate action.
- Feeding local wildlife is prohibited.
- It is forbidden to keep any type of pet in the project areas.
- Walking in sensitive environmental areas outside the authorized intervention limits is prohibited.

- It is strictly forbidden to light small campfires or start open burns.
- Any archaeological, paleontological or historical remains or vestiges found during construction must be preserved and reported without delay to the immediate supervisor.

General safeguarding

- Some situations or aspects not foreseen above may arise during the process of execution of the works. In all these situations, diligent conduct is expected on the part of workers, following the same ethical standard that guided the preliminary elaboration of this Code of Conduct.

7.4.4.6 Key Performance Indicators

- Number of Grievances; percentage of grievances solved under 30 days
- Number of worker-hours for training regarding onboarding procedures
- Number of violations to the code of conduct
- If non-compliances are raised, percentage of closure within 30 days.

7.4.5 Stakeholder Engagement Plan

Stakeholder consultation is an integral part of a robust ESA process, with the level and methods of consultation designed to be commensurate with the Project's complexity, the anticipated significance of its impacts, and the level of public interest in the Project.

This section provides the framework for the development of a Project-specific Stakeholder Engagement Plan (SEP). The IDB's Environmental and Social Safeguards (specifically ESPS 1 and ESPS 10) require development of an SEP that is appropriately scaled to the project's risks, impacts and development stage.

A stakeholder is defined by the IDB as "…individuals, groups, or institutions that have a stake, or an interest, in the project: They may be affected by it (either positively or negatively), or they may have an interest in it and be in a position to influence its outcomes." This SEP framework focuses on engagement with external stakeholders, meaning those not directly involved in the construction, operations, permitting or financing of the Project.

A SEP is a 'living' document and is developed progressively, and updates issued, as a project moves through the various phases of planning and implementation.

A typical SEP structure is as follows:

- Section 1 provides background information about the Project and outlines the objectives of stakeholder engagement;
- Section 2 outlines national and international requirements for stakeholder engagement;
- Section 3 provides an overview of the local context, and describes how stakeholders are identified and the methods and tools used to support engagement;
- Section 4 summarizes stakeholder engagement undertaken to date by the Project proponent and developer;
- Section 5 describes roles, responsibilities and resources for stakeholder engagement;

- Section 6 outlines a grievance mechanism for the Project which allows for a consistent and transparent means to receive, respond to and address stakeholder concerns and complaints; and
- Section 7 describes the monitoring and reporting of stakeholder engagement activities.

Implementation, update and implementation of the SEP for this Project will be the responsibility of the WGS and the EPC contractor.

7.4.5.1 Section 1: Background and Objectives

Stakeholder engagement (including consultation and the disclosure of information) is a key element of project planning, development, and implementation. Effective stakeholder engagement assists good design, builds strong relationships with local communities, and reduces the potential for delays through the early identification of issues to be addressed as a project progresses.

The activities of engagement are guided by international best practice, as well as all applicable laws and regulations in Guyana.

The aims of stakeholder engagement, and of the Project SEP, are to:

- Promote the development of respectful and open relationships between stakeholders and the Project proponent and developer during the Project life-cycle;
- Identify Project stakeholders and understand their interests, concerns and influence in relation to Project activities, particularly during the construction phase;
- Provide stakeholders with timely information about the Project, in ways that are appropriate to their interests and needs, and also appropriate to the level of expected risk and adverse impact;
- Provide stakeholders the opportunity to express their opinions and concerns in relation to the Project, and for these to be reflected in the Project's Environmental and Social Management System (ESMS), and decisions about Project construction and operations activities, where possible;
- Support compliance with Guyanese legislation for public consultation and disclosure and alignment with financing standards and guidelines for stakeholder engagement; and
- Record and resolve any grievances arising from Project-related activities through a formal Grievance Procedure.

Additionally, should a livelihood survey and census indicate that the Project could result in economic displacement, the SEP will also:

- Provide the framework for stakeholder involvement in identifying appropriate processes for compensating displaced individuals and businesses

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7.4.5.2 Section 2: Regulatory Framework

This section should provide the regulatory framework that governs the Project including national legislation and policy, as well as applicable Bank policies.

Guyanese regulatory requirements and applicable IDB's Policies are outlined in Section 2.1 of this ESA document.

7.4.5.3 Section 3: Stakeholder Analysis

Local Context Overview

It is helpful to group stakeholders based on common interests and characteristics. Use of a number of 'stakeholder categories' helps structure activities for stakeholders of the Project, including a summary of the anticipated interest of these groups with respect to the Project and within the local context (e.g., potential impacts, benefits, concerns). A database of stakeholders should be developed and continue to be updated as additional stakeholders are identified. Typical stakeholder categories used in this step include:

- National government
- Regional and local governments
- Local population and community groups
- Land and resource users and rights holders
- Local businesses
- Business development or worker associations
- Providers of local services and infrastructure
- Interested non-governmental organizations (NGOs)
- Media
- Academic and research organizations

Stakeholder Identification and Mapping

The process of stakeholder identification includes identifying individuals, groups, local communities and other stakeholders who may be affected by the project; identifying broader stakeholders who may be able to influence the outcome of the project; identifying legitimate stakeholder representatives (such as elected officials, non-elected community leaders, etc.); and, mapping the impact zones by placing the Affected Communities within a geographic area.

As part of the stakeholder identification process, it is important to include vulnerable individuals and groups who may find it more difficult to participate in engagement and to understand how each stakeholder may be affected, or perceives they may be affected, so that engagement can be tailored to inform them and understand their views and concerns in an appropriate manner.

Examples of this may be performing engagement activities specifically for women, single-caregiver households, and visible minorities, separate from those for the general public to ensure their voices are adequately heard and considered.

The appropriate type of engagement is determined by a number of factors, including the likely impact of the project on the stakeholder (often related to location), their influence over the project, and their preferences and abilities to access information and participate in consultation.

Updated Stakeholder identification

A list of stakeholders was prepared as part of a site visit conducted in July 5 and 6, 2022. During those dates, two consultants performed 34 interviews to stakeholders, mainly in the areas of Grove and Soesdyke-Timehri, where most businesses and buildings are located. During the site visit, it was observed that most people interviewed had positive views about the Project and recognized that the road

is in a very poor condition therefore it should be upgraded to improve safety for people and vehicles. The survey form used to collect stakeholder's answers can be found In Appendix D. Table 7.3 summarizes views from people interviewed on key topics.

Table 7.3: Summary of feedback from Stakeholders

Key questions	General comments from stakeholders / summary of answers
Are you familiar with the East Bank Demerara Public Road upgrade project?	Most people interviewed new about the Project, but some mentioned they did not know the details
What, if any, would be the best safety improvements that could be made to the road?	All stakeholders established the road needs improvement, that there are potholes and proper drainage, there is nowhere to park or walk.
On a scale of 1-10, how would you rate the positive impact this project will have on the community? Explain why	Most stakeholders said the positive impacts were close to 10 or 10 because the road is necessary to access businesses and houses.
On a scale of 1-10, how would you rate the negative impact this project will have on the community? Explain why and please also share if you have a proposed solution to the problem / impact, if any.	Most people could not think of negative impacts. Some mentioned that previous experiences and fixings of the road are not durable, and the improvements do not last.
Do you have any specific concerns about the project?	Stakeholders thought the improvements should be done as fast as possible to minimize disruptions, other mentioned the need of alternative roads and focus construction efforts during the day, other highlighted the importance of improving drainage to avoid flooding. Stakeholders mentioned adequate notice is important for them. Stakeholders are concerned for the quality of the works and hope they road is upgraded correctly. Additional comments from some stakeholders include the possibility of expanding the road to 4 lanes. Finally, some people mentioned that although they wanted the Project to happen, they are not sure why it has not started yet, as they have been approached in the past but there is no schedule announced nor construction has begun yet.

As the Project progresses, it will be the responsibility of the WGS to update this stakeholder list and continue open communication protocols with the stakeholders as described in the following sections.

Disclosure and Engagement Methods and Materials

The engagement process encourages meaningful participation by stakeholders. The Project proponent and EPC will employ a range of methods and channels for disclosing information in order to tailor disclosure to the interests and needs of the various stakeholder groups, and will also produce materials appropriate for specific stakeholders and types of engagement. This may include: interviews with

stakeholder representatives and key informants; surveys, polls, and questionnaires; public meetings, workshops, and/or focus groups with specific groups; and other participatory methods.

Feedback mechanisms (also referred to as Project contact vehicles) are adapted to suit the needs and preferences of different stakeholders and their physical locations. To give stakeholders easy and convenient access to the Project, the following contact vehicles should be considered:

- Toll-free number for general Project inquiries
- General email address
- Mailing address

The contact vehicles must be monitored regularly and response protocols will be developed to ensure all inquiries are tracked for reporting purposes and that responses are provided. Designated personnel from WSG or the EPC should serve as identified points of contact for stakeholders.

7.4.5.4 Section 4: Completed Stakeholder Engagement

As a living document, the SEP should be updated to document stakeholder engagement activities as they are conducted, including public consultation meetings, community meetings, and interaction with the various government entities involved in planning, permitting and approvals for various components of the Project. A brief summary of the events, along with appended minutes and attendance sheets, should be provided. The stakeholder database should also be updated with new information obtained over the course of the engagement events.

7.4.5.5 Section 5: Roles, Responsibilities and Resources

WSG should allocate staff and resources devoted to managing and implementing the Project's SEP. As the formal stakeholder engagement process commences, WSG will identify the primary staff members responsible for stakeholder engagement at all levels as it pertains to the environmental and social components of the Project. The following positions should be filled as necessary to implement this SEP:

Table 7.4: Roles and Responsibilities of WSG, Supervision Firm and EPC Contractor

Role	Responsibility
Executing Agency WSG	
Director of Operations	Responsible for the overall management of the project and liaising with the GOG and IDB
Project Supervisor	Oversees the operations of the project, liaising with the Supervisory Engineering Firm, Contractor's Project Management Team, the MSC, and other stakeholders
Procurement Officer	This person is responsible for procuring goods and services and for transparent accounting of the Loan funds related to the Project.
Environmental Engineer	Responsible for ensuring that the project complies with legal and other environmental standards and prescriptions. The Environmental Engineer interacts with the Supervisory Engineering Firm and Contractors' project

Role	Responsibility
	management teams, carries out inspections, keeps a record of incidents requiring corrective action, and checks to ensure that follow-up action has been taken and the project is in full compliance. The Environmental Engineer would attend regular meetings with the Supervisory Engineering Firm and Contractors, the EA's Social Specialist and the Project Community Liaison Officer.
The Supervisory Engineering Firm	
The Project Manager or Resident Engineer	Responsible for the overall quality of Supervision. He/she should be a full member of the MSC and attend MSC meetings.
Social Specialist/Community Liaison Officer	Primary point of contact responsible for coordination of the Supervisor and Contractors SEP activities, stakeholder communication. A member of the MSC meetings and table reports within the Supervisors monthly progress report. The PCLO will oversee the functioning of the Grievance procedures, risk analysis, investigations and carry out site inspections and ensure appropriate follow up.
Contractor	
Construction Firm Project Manager	This person has overall responsibility for the construction of the road and environmental and social safeguards and should attend all MSC meetings.
Contractors Environmental and Social Specialist (sometimes referred to as Environmental Manager in ESMP)	These persons are responsible for ensuring that the Contractor meets the requirements of the ESMP and SEP.
Experienced Community Liaison Officer included in Contractor's management	These persons are expected to work in close collaboration with the Supervisors Project Community Liaison Officer (PCLO) and the Environmental and Social Specialist/ Environmental Inspector (ESS/EI)and the EA Environment and SS.
Construction Site Foreman (and supervision Team)	This person supervises the works on the ground and should attend MSC and contractors quarterly open forums

WSG should continually update the stakeholder register as additional stakeholders are identified, or as new information regarding stakeholders becomes known. WSG should also complete attendance records at every meeting and have designated note-takers at each meeting to document stakeholder feedback and questions.

7.4.5.6 Section 6: Grievance Mechanism

The Project should establish and publicize a Grievance Mechanism for implementation throughout the Project's construction phase. This should be designed to accommodate grievances of any type from

nuisance impacts like noise and dust, to complaints associated with the compensation process for economically displaced businesses or persons.

Introduction

During any construction Project, stakeholders may have complaints about Project activities and this type of feedback is managed through the Project's External Grievance Mechanism (GM).

A grievance is a complaint that a stakeholder has about the activities of the Project that might stem from:

- A specific incident – such as a road accident, property damage or night-time noise;
- The behavior of workers – such as disrespectful or discriminatory actions;
- An environmental impact – such as soil contamination, or damage to agriculture;
- A social impact – such as disruption of economic or recreational activities; and
- Other types of impacts – such as traffic, health, and cultural heritage impacts.

The external grievance mechanism is proportionate to the risks and impacts of the Project and is designed to address comments and concerns promptly and effectively.

Objectives

The purpose of the Grievance Mechanism is to:

- Ensure transparency and engagement between WSG and community stakeholders
- Provide community stakeholders with an accessible and efficient process to submit concerns, suggestions, and grievances that may emerge in relation to WSG activities
- Allow community stakeholders to raise their concerns, suggestions and grievances anonymously.
- Define a methodology to receive, document, screen, assess, track and resolve concerns, suggestions, and grievances in a timely manner without retaliation.
- To demonstrate the Project's commitment to meaningful stakeholder engagement, and respect for local opinions and concerns

The EPC will use the GM, working in partnership with and with oversight from the IDB, as a critical component of the broader stakeholder engagement activities, including monitoring and reporting.

A member of the EPC team will be assigned as the person in charge of managing the GM, including the internal processes for ensuring grievance resolution. This individual should work closely with the competent team involved in similar actions as part of the Stakeholder Engagement Plan to ensure consistency in the content and processes involved, as well as to share information and lessons learned, and to prevent stakeholder fatigue from over-engagement.

Guiding Principles

The GM must follow international standards, particularly E&S Performance Standard 1 on Assessment and Management of Environmental and Social Risks and Impacts and E&S Performance Standard 5 on Land Acquisition and Involuntary Resettlement (the latter, to target the temporary economic displacement impacts).

The guiding principles for the GM should be the following:

- Provision of information: All affected people should be informed about the GM from the first time engagement takes place, early in the Program planning process, and details about how it operates should be easily available, for example, in public areas impacted by the Project including shops, schools, churches etc.
- Transparency of the process: Affected Populations must know to whom they can turn in the event of a grievance and the support and sources of advice that are available to them.
- Ensuring up to date information: The process should be regularly reviewed and kept up to date, for example, by referencing any new statutory guidelines, changes in routes or benefits.
- Confidentiality: The process should ensure that a complaint is dealt with confidentially.
- Non-retribution: Procedures should guarantee that any project affected person that raising a complaint will not be subject to any reprisal.
- Reasonable timescales: Procedures should allow for time to investigate grievances fully, but should aim for swift resolutions. The longer a grievance is allowed to continue, the harder it can be for both sides to get back to normal afterwards. Time limits should be set for each stage of the process, for example, a maximum time between a grievance being raised and the setting up of a meeting to investigate it.
- Right of appeal: An Affected Person should have the right to appeal to a higher level of Project management if he or she is not happy with the initial finding.
- Right to be accompanied: In any meetings or hearings, the aggrieved party should have the right to be accompanied by a colleague, friend or legal representative.
- Recordkeeping: Written records should be kept at all stages. The initial complaint should be in writing if possible, along with the response, notes of any meetings and the findings and the reasons for the findings.

Receive and Register a Claim

The Community Liaison Officer (CLO) will assign a number and classify the complaint within 24 hours of receiving the complaint.

- Establish forms to be filled in with all necessary information – clarity that if a grievance is submitted verbally, it must be transcribed as soon as possible after.
- Details should be compiled – electronically if possible, and registers of chain of custody and communication must be established.
- When a grievance is received with a name attached, the aggrieved party must be notified within a specific timeline that their grievance has been registered, as well as providing a timeline for future activities, including the timeline by when the Project should have a proposed resolution.
- When a grievance is received without a name attached, the grievance must be addressed and documented within a pre-specified timeframe. The report should be compiled with others of the same sort, and the relevant information (general concerns, how they have been addressed) should be periodically posted somewhere public, where they can be seen. This should in no way infringe on the confidentiality of any aggrieved party and should not include any specifics (e.g.

Complaints about timeline for compensation – have completed an investigation as to the hold-up, and have started discussions with the bank to speed-up payments).

Any stakeholder can make a claim and has the right to anonymity. Community stakeholders can submit claims through the following avenues and general points of contact:

- The Project Telephone Hotlines
- System for direct communications/ contact mechanisms
- The quarterly Stakeholder Forums held by the Contractor, MSC
- Direct contact/visits to the Supervisor or Contractors Offices CLO's office Complaints may also be made to construction staff on the site, the contractors staff must pass these on to the CLO.

The Community Liaison Officer (CLO) will manage the flow of information around this process but the Responsibility for the investigation and recommendation of action resides with the Supervisor and contractor technical teams.

The CLO receives and logs the complaint assigning it a number and opening an investigation file within 24 hours. If the CLO assesses the complaint as having a high risk or being an emergency the Supervisors Resident Engineer will be informed immediately and will inform the EA and the Contractor ESC and construction foreman by phone immediately.

Evaluation and categorization of grievances

- Categorization should differentiate based on relevance (question rather than complaint, request, issue not associated to the project), and urgency (risk to life or property), extent (individual complaints vs. group complaints) etc.
- Where necessary/relevant an interview with the aggrieved party could be helpful, including requesting further details.
- Directing the grievance to the relevant teams for follow up.

The Community Liaison Officer is responsible for keeping the Stakeholder informed and explaining the process.

The CLO must identify a specific response time for confirming receipt of grievance, for completing an investigation and for providing an initial offering of resolution. If at any point these timelines are not addressed, this must also be justified in the documentation. Time frames for investigation and corrections are determined by the risk level identified in the risk assessment. Table 7.5 shows the time frames for according to risk.

Table 7.5: Levels of risk for the External Grievance Mechanism

Level	Risk Level	Action	Resolution Time Frame
Low	Likely to be of minor impact	Inform the appropriate parties within 48 hours of CLO receiving the complaint	Investigation to be completed recommendation endorced by complainant within 15 days and

Level	Risk Level	Action	Resolution Time Frame
			corrective action completed within 30 days
Medium	Possible risk and likely one-off event	Inform appropriate parties within 3 days of CLO receiving complaint	Investigation to be completed recommendation endorsed by complainant within 10 days and corrective action completed within 15 days
High	Serious violations or risk to public or project	Inform appropriate parties within 24 hours of CLO receiving complaint; WSG may request works be stopped while investigation is ongoing	Investigation to be completed recommendation enforced by complainant within 3 days and corrective action completed with 5 days or sooner

Options for resolution or response

- Options for response should include: including unilateral response; bilateral response (the aggrieved party and the Company can offer a solution together); third party response (though a mediator); or through a judicial process, outside of the mechanism. Considering the purpose of the mechanism is to effectively address concerns before they escalate, it is important to maximize the opportunities for bilateral response wherever possible.
- Preparing the response.
- Closing the case.

Resources and Costs

- A budget should be put in place to pay for any responses involving compensation (in kind or monetary), as well as for the time of those involved in investigating and addressing any issues.
- The relevant management staff should be involved in the grievance process from the earliest point in the process, and decision makers should be involved in the process from the onset, to ensure timely turnaround of responses.
- The grievance must be escalated as needed, and there must be clarity on the part of all management staff the importance of appropriate responses to grievances.

Responsible parties

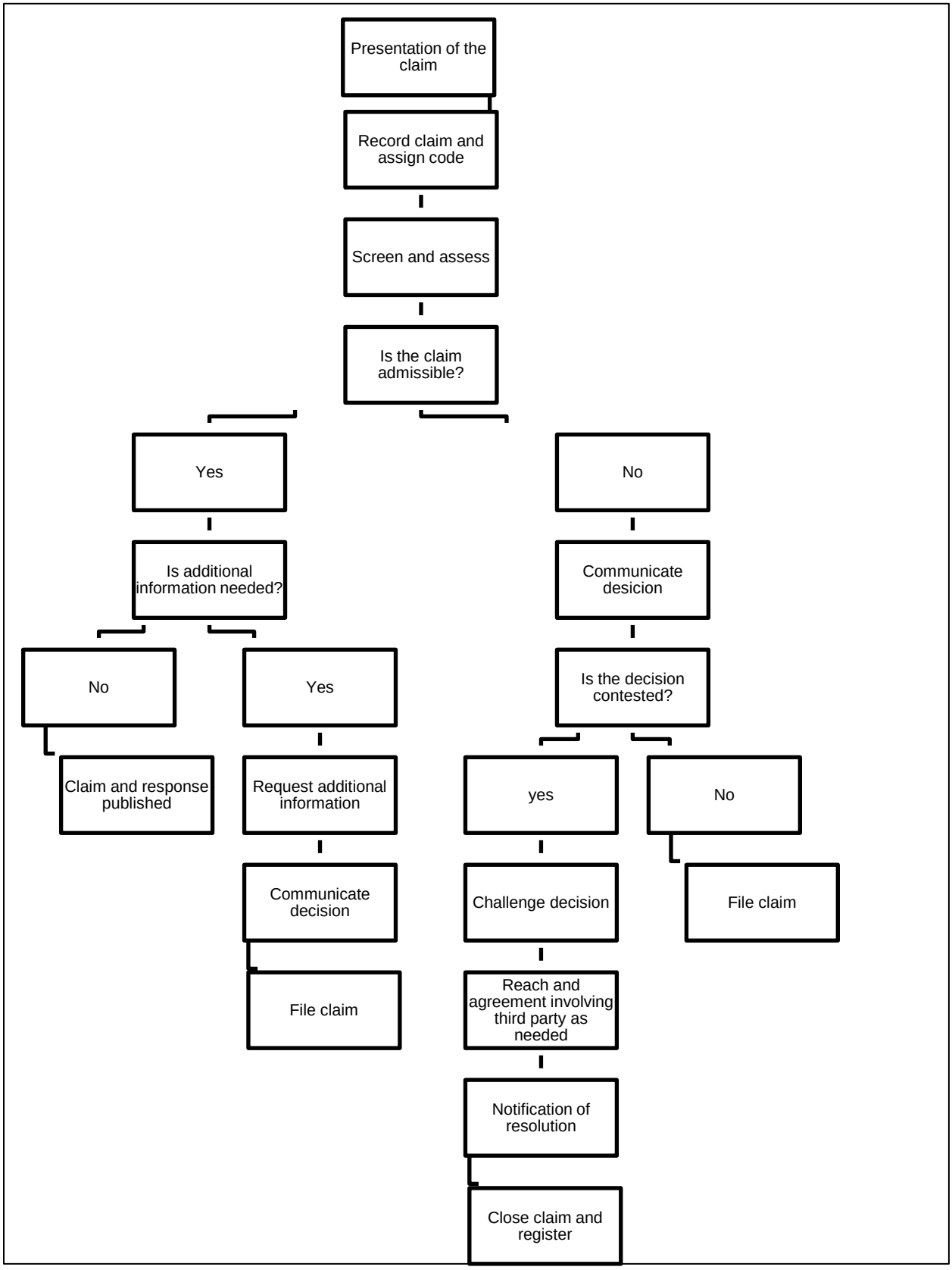
The GM should be implemented throughout every phase of the Project by an appropriate team, led preferably by the same person who leads the Stakeholder Engagement activities. The composition of the team responsible for the implementation should be sufficient to cover the necessities (considering number of project affected households, the magnitude of impact, etc.)

Key Performance Indicators

There are a number of indicators that should be considered in order to make best use of the GM as a tool throughout the life of the Program. These include, but are not limited to:

- Number of grievances registered (by week, month);
- Time in resolving grievances or complaints;
- Number of complaints or grievances by category (i.e. payment, treatment, damage etc.)
- Number of grievances not completed within the timeline
- Cases of re-incidence – when the same issues come up several times

Community Grievance Mechanism Process



Example Grievance Form

External Grievances Form			
Grievance Number:			
Personal Information			
*Last name:		*Address:	
*First name:		*Telephone:	
Sex:		Municipality:	
Age:		Occupation:	
*This information is not required to allow for anonymous reporting			
Reason for the grievance			
Details (indicate when the events of this claim happened, the persons involved, questions, rational or evidence, or any other corresponding information			
Requested response			
Are you including the presentation of documented information in this response: yes__ no__ Please indicate what documents these are			
Signature			Date
Person receiving complaint (WSG)			Date

7.4.5.7 Section 7: Monitoring and Reporting

Monitoring

It is important to monitor stakeholder engagement to ensure that consultation and disclosure efforts are effective, and in particular that stakeholders have been meaningfully consulted throughout the process. Stakeholder engagement monitoring is managed through the Program's Environmental and Social Management Plan (ESMP).

Monitoring should include:

- auditing implementation of the Stakeholder Engagement Plan;
- monitoring consultation activities conducted with government authorities and non-governmental stakeholders;

- monitoring the effectiveness of the engagement processes in managing impacts and expectations by tracking feedback received from engagement activities; and
- monitoring and analyzing any grievances received.

Tracking Stakeholder Engagement Activities

Performance will be reviewed regularly against the SEP. Tracking of stakeholder engagement will be used to assess the effectiveness of the Program's stakeholder engagement activities. Indicators for tracking will include, among others:

- place and time of formal engagement events and level of participation including by specific stakeholder categories and groups (e.g. women, single-caregiver households);
- number of comments by topic and type of stakeholder, and details of feedback provided through the Grievance Procedure or other means (office visits, emails, phone calls) always removing identifying information to ensure continued confidentiality;
- numbers and types of grievances and the nature and timing of their resolution;
- recording and tracking commitments made to stakeholders; and
- community attitudes and perceptions on Program activities based on media reports and stakeholder feedback.

Program Reporting

Semi-annual Reports will summarize all activity for the period, and provide a summary of issues raised and how they have been addressed and reporting on E&S Management. Potential issues include timeliness of responses and corrective and mitigation measures taken to address grievances, and analysis of trends in key performance indicators (KPIs). These may include:

- total numbers of stakeholders engaged according to stakeholder category;
- numbers of comments and queries received according to topic and responses;:
- Number of people enrolled in support programs;
- Number of people completing the support program;
- Social Indicators over time:
- Level of access to services/utilities;
- Health indicators (types and quantities of illnesses);
- Security incidents;
- Responses to satisfaction surveys;
- Media spots (positive, negative and neutral);
- Social Media trends; and
- protests, strikes, posters, fliers against the project.
- numbers of grievances lodged; and
- grievance resolution timeliness.

The SEP will be reviewed on a regular basis and revised as needed to reflect completed engagement activities and revise and confirm future engagement plans.

7.4.6 Traffic and Pedestrian Management Plan

This Traffic and Pedestrian Management Plan (TPMP) provides a working template that will be used by the selected construction contractor (the Contractor) appointed by the Executing Agency (WSG). This working template details the specific management requirements and focus areas identified through the Environmental and Social Impact Assessment. However, the plan as a document is 'dynamic' and will be revised and added to as the project evolves and recognizes that the selected Contractor will have their own policies and procedures that will need to be inputted to this plan. It is also recognized that as the Contractor develops the Project designs, this may influence how construction will be undertaken and progress, and these aspects will need to be integrated into this plan.

7.4.6.1 Introduction

Overview

This Traffic and Pedestrian Management Plan (TPMP) for the Project sets out the expectations of the Executing Agency and IDB and defines how the Contractor will implement and manage environmental matters. The Traffic Management Plan will be further developed in consultation with the Neighborhood Democratic Council (NDC) and local community members to reduce accidents and speeding on the newly rehabilitated roadway in the most effective manner.

Objectives

The purpose of the TPMP is to minimize the interface wherever possible between the public (pedestrians, visitors, tourists, residents, etc.) and site and project-related traffic, as well as minimize economic losses of local businesses throughout construction. This document provides practical guidance on the planning and control measures that will be implemented.

The objectives of this plan are:

- Minimize the impact on the public road network approaching and adjacent to the project by road-based construction traffic. This will be achieved by identifying clear controls on routes, vehicle types, vehicle frequency, vehicle quality and hours of site operations.
- To establish main principles for vehicle and pedestrian movement within the site boundary maintaining positive segregation between personnel and vehicles.
- To provide measures to help minimize economic losses of local businesses during construction.

The main construction Contractor is responsible for the execution of the plan, and the plan as a document is 'dynamic', and will be revised and added to as the project evolves.

7.4.6.2 Project Description

This section needs to include specific details on the proposed works, duration, relevant plans, and other characteristics of the project. The following provide guidance on what is needed.

- **Scope of Construction Works:** Description of the full range of construction works / activities proposed (e.g., clearing of land, dredging activities, placement of poles, geotextile fabric and armor rock; installation of sheet piles; etc.).
- **Description of the Construction (Disturbance) Footprint:** Full description of the existing land area that will be disturbed by the construction works and those immediately adjacent;

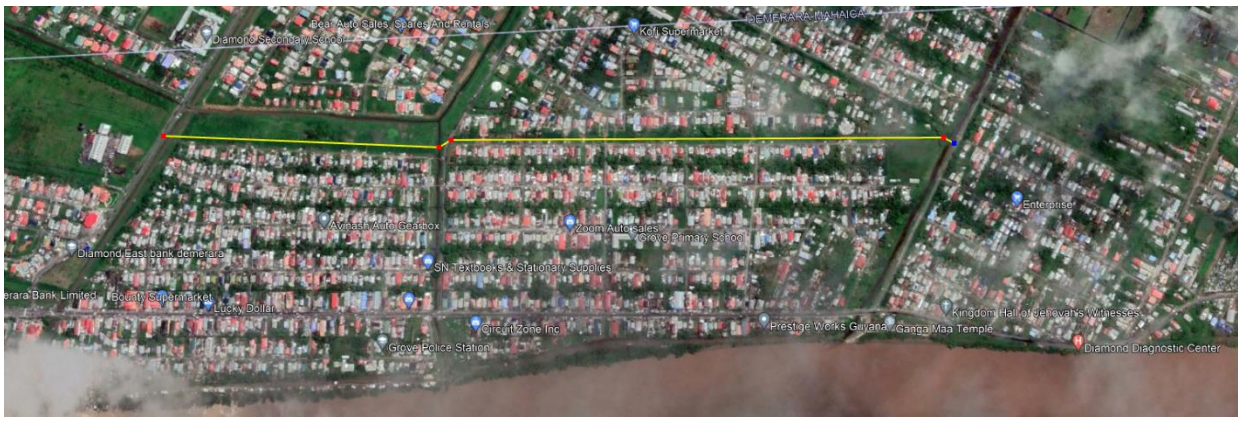
- **Timing of Works:** Provide a description of both the total duration of the works and the time of year they will occur. The latter would include consideration of expected climate during this time (e.g. anticipated rainfall and storms events, wind direction and speeds);
- **Site Plan:** The project site plan would clearly show the full extent of the proposed works area of the construction project. This would typically include a map with the full construction boundary and disturbance footprint marked clearly over a current aerial photograph (i.e. including all construction activities, associated laydown areas, etc.). It would also include site specific information, for example the location of any important waterways or adjacent vegetation to be protected, national heritage listed areas, or the location of sediment and erosion traps, electrical services, utilities, crossings, larger concentration of businesses, etc.

7.4.6.3 Diversion Roads

Currently, WSG has identified two options for the diversion of traffic during construction:

3. Detour road #1 from Diamond to Good Success.
4. Detour #2 is at Good Hope, in front of the GTT Exchange.

Figure 7-5 shows the proposed detour roads; detour #1 would involve the construction of temporary bridges to cross canals that are present in the area. In addition, after the final design of the road is completed and once the EPC contractor is selected, said roads could be modified or more could be added.



Detour Road # 1

Detour Road # 2

Figure 7-5: Proposed Detour Roads to Divert Traffic during Construction

7.4.6.4 Project Roles, Responsibilities and Contacts

All positions across the project have traffic and pedestrian responsibilities to some extent. These vary in relation to duties described in Table 7.6, but everyone has a base level duty of care to prevent environmental harm.

Table 7.6: Project Roles, Responsibilities and Contact Details to be Finalized by the Construction Contractor for the TPMP

Position	Responsibilities	Company	Name	Contact Details*
Project Manager				
Site Supervisor				
Environment Manager				
HSE Representative				

7.4.6.5 Training, Awareness and Competency

The TPMP prepared by the construction Contractor must outline how traffic training, awareness, and competency will be delivered / assessed throughout the Project, to ensure the relevant aspects of this TPMP are communicated to the Project team and front-line staff (including contractors and sub-contractors). Examples may include:

- Site Induction
- Daily Pre-Start Meetings
- Toolbox Talks
- Incident bulletins
- Sub-contractor's kick-off meeting
- Contractor and client site kick-off meeting

This awareness and training must also be extended to delivery drivers and trade contractors.

7.4.6.6 Communication with Relevant Stakeholders

WSG will maintain an open line of communication with the affected stakeholders through its external grievance mechanism. Prior to commencement of the work, the TPMP should be disclosed to the appropriate stakeholders in order to ensure all concerns and issues are appropriately mitigated. Any issues and concerns expressed during public consultations should be addressed in the updated TPMP. In addition to disclosure of the TPMP, the public must also be made aware of available communication methods in order for them to express any issues and/or concerns (see 7.4.5.6 Grievance Mechanism, above). It is important that the GM is made available to the public at all times, and that handling of any grievances is done in an expedited manner. All grievances as well as their resolutions shall be recorded.

7.4.6.7 Traffic and Pedestrian Management

Work Area Considerations

This section presents a summary of the risks and controls that have been identified per work areas for the proposed construction Project when considering traffic management and interface with pedestrians. The Contractor should determine what additional risks and proposed management controls are required based on their final design and work method statements. A project risk assessment or job hazard analysis for specific task(s) should be performed.

The following table is based on the assessment that has been performed. Note that the table does not contain an exhaustive list of potential issues, and it would be expected that Contractor develop risk management strategies, controls, etc. that suit the scale/nature of finalized construction Project.

Roads Intervention Work Areas

ROADS INTERVENTIONS WORK AREAS		
Work Area and Route Maps	**Route Maps:** Maps will need to be shown that identify the main roads, crossings and pedestrian and cycle footpaths that are adjacent and/or perpendicular to the Project site, construction site access points and delivery locations that will be affected by construction activities and which will be used for deliveries. The following aspects need to be carefully considered (to be shown in the figure to the right): • **Roads:** vehicular and bicycle traffic along the East Bank Public Road and relevant street crossings. • **Parking:** parking areas along the streets • **Pedestrians and cycles** • **Buildings:** Particularly those with more affluence of people, such as markets, schools and places of worship.	A detailed map to be inserted here. Add additional pages as necessary.
Specific Considerations	The contractor should identify and prepare specific actions – including the following aspects: • During the construction phase maintain the traffic and schedule construction activities, to the extent possible, to be conducted not during peak times (e.g., early in the morning) as stipulated in the EPA permit guidelines. • Provide advance notice of scheduled construction activities and major traffic constructions via public service announcements (radio, TV, newspaper) • Coordinate the delivery of construction materials at times that minimize impacts to the existing traffic. • Deploy traffic, safety, and road detour signs in appropriate language and close cooperation with the authorities. • Coordinate the delivery of construction materials at times that minimize impacts to the existing traffic. • Maintain one lane of carriageway open at all times to facilitate the flow of traffic • Install beams, retention walls and temporary passageways as needed (e.g., road safety barriers to facilitate safe access during construction) • Site H&S and security will be maintained during the construction phase by fencing will be erected to form a secure construction site to prevent entry by children, members of the public, trespassers and vandals. Warning signage to be placed at strategic points on the perimeter fencing. Information signage to be placed at the site entrance.	

7.4.6.8 Specific Work Practices

This section presents a summary of the risks and controls that have been identified for specific work practices when considering traffic management and interface with pedestrians. The Contractor should determine what additional risks and proposed management controls are required based on their final design and work method statements. A project risk assessment or job hazard analysis for specific task(s) should be performed.

The following tables are based on the assessment that has been performed. Note that these do not contain an exhaustive list of potential issues, and it would be expected that Contractor develop risk management strategies, controls etc. that suit the scale/nature of finalized construction Project.

Local Business Impacts

PEDESTRIAN SAFETY			
Objective(s)	1. Minimize Economic Losses of Local Businesses		
Management Strategy	Management Controls		
		Responsibility	Timing

Control(s)	Measures to be applied include:
	• Coordinate the delivery of construction materials at times that minimize impacts to the local businesses.
	• Provide contact information to all residences and business in the Project area (email, phone number) through the Project's Grievance Mechanism
	• Alert all residences and business commencement of work at least two weeks before construction starts.
	• Establish measures to ensure continuous access to businesses:
	  ○ Provide access lanes.
	  ○ Install signs to indicated that businesses are open (e.g., "XXX is OPEN").
	• Provide to all residences and businesses bi-weekly updates on project construction progress and schedule, including expected date of completion		

Performance Indicator(s)	Number of complaints received through the Grievance Mechanism		
Monitoring	Communication protocols, public disclosure events		
Reporting	Incident report on grievances received and resolution.		
Corrective Action(s)	• Investigate grievances • Review controls and requirements		

Pedestrian Safety

PEDESTRIAN SAFETY			
Objective(s)	1. To ensure and protect pedestrians both inside and outside the construction work sites. 2. Ensure clear separation of pedestrians from work activities and traffic.		
Management Strategy	Controls, signage and physical separation.		
		Responsibility	Timing
Control(s)	Measures to be applied include: • Ensure pedestrian routes are clearly separated from vehicle routes by fencing and/or a kerb, or other suitable means. • Ensure pedestrian routes are wide enough to safely accommodate the number of people likely to use them at peak times. • Ensure pedestrian routes allow easy access to relevant local work, tourist and residential areas. • Ensure pedestrian routes are kept free of obstructions. • Ensure pedestrian routes are clearly and suitably signed. • Ensure pedestrians can safely cross the main vehicle routes. • Ensure pedestrians have a clear view of traffic movements at crossings and at gates which lead onto traffic routes. • Ensure pedestrians have clearly marked, separate access for use at loading bays and site gates. • Ensure pedestrian routes provide safe access to welfare facilities.		
Performance Indicator(s)	No accidents or incidents.		
Monitoring	Daily inspection of work areas, route signage and protection.		
Reporting	Incident report for non-conformance of pedestrian issues.		
Corrective Action(s)	• Investigate cause of any accident/incident/near miss. • Review controls and requirements		

Vehicle Routes

VEHICLE ROUTES			
Objective(s)	1. To ensure clear and well-signed vehicle routes into and out of the construction site. 2. Ensure non-construction traffic impacts are minimized.		
Management Strategy	Controls, signage and physical separation.		
		Responsibility	Timing
Control(s)	Measures to be applied include: • Ensure routes suitably consider pedestrian issues (as above). • Ensure routes are wide enough to safely accommodate the number of vehicles likely to use them at peak times. • Ensure routes allow easy access to delivery areas. • Ensure routes free of obstructions, and are clearly and suitably signed. • Ensure routes eliminate or reduce the need for reversing. • Ensure that at the final point of exit can the driver see pedestrians on the pavement. • Ensure temporary structures are protected from vehicle impact. • Ensure provision of suitable parking areas. • Ensure routes are planned to reduce the need for excessive vehicle movement. • Ensure measures to prevent vehicles depositing mud on the roadways.		
Performance Indicator(s)	No accidents or incidents.		
Monitoring	Daily inspection of work areas, route signage and protection.		
Reporting	Incident report for non-conformance of traffic movements.		
Corrective Action(s)	• Investigate cause of any accident/incident/near miss. • Review controls and requirements		

Vehicle Reversing

VEHICLE REVERSING			
Objective(s)	1. To minimize vehicle reversing by following the reversing hierarchy.		
Management Strategy	Management controls.		
		Responsibility	Timing
Control(s)	Implementation of the reversing hierarchy: *1. Eliminate need to reverse* — Implement one-way systems around the site and in materials and staging areas. Provide designated turning areas. *2. Reduce reversing operations* — Reduce the number of vehicle movements as far as possible. Instruct drivers not to reverse, unless absolutely necessary. *3. Ensure adequate visibly for drivers* — Design vehicle reversing areas which: • Allow adequate space for vehicles to manoeuvre safely • Exclude pedestrians; and • Are clearly signed and have physical stops or buffers to warn drivers that they have reached the limit of safe reversing areas. *4. Ensure safe systems of work are followed* — Ensure everyone on site understands site rules on vehicle safety. Drivers and signalers need to be in constant communication during reversing operations. Signalers should not be put at risk from vehicle movement, e.g. by standing directly behind reversing vehicles. Ensure all vehicles on site are fitted with appropriate warning devices. *5. Provide warnings when vehicles are reversing* — Ensure reversing warning lights and alarms are in good working order and instruct workers to keep clear of moving vehicles.		
Performance Indicator(s)	No accidents or incidents.		
Monitoring	Daily briefings of drivers and contractors. Inspection of driving practices.		
Reporting	Incident report for non-conformance of traffic movements.		
Corrective Action(s)	• Investigate cause of any accident/incident/near miss. • Review controls and requirements		

Drivers Safe Work Practices

Drivers Safe Work Practices			
Objective(s)	1. To minimize vehicle incidents through good driver behaviours and practices.		
Management Strategy	Management controls.		
		Responsibility	Timing
Control(s)	Implementation of the following safe work practices for drivers: • Only operate vehicles if you are competent and authorized to drive them (i.e., authorized work permit if required) • Do not drive with impaired abilities (ill health, poor vision, prescribed/illegal drugs or alcohol) • Make sure you fully understand the operating procedures of the vehicles you control • Know the site routes and follow them. Take care at pedestrian crossovers. • Understand the system of signals used on site • Visiting drivers: seek appropriate authority to enter the site and operate vehicles • Know the safe operating limitations of your vehicles ,particularly relating to safe maximum loads and gradients • Carry out daily checks on your vehicles and report all defects immediately to supervisors • Follow site procedures and comply with all Site rules • Do not drive at excessive speeds (i.e., respect speed limits designated at the site) • Wear appropriate PPE when out of the car • Ensure that windows and mirrors are kept dean and dear • Keep the vehicle tidy and free from items which may hinder the operation of vehicle controls • Do not allow passengers to ride on vehicles unless safe seating is provided • Park vehicles on flat ground wherever possible, with the engine switched off, the handbrake and trailer brake applied and where necessary use wheel chocks • Do not reverse without reversing aid or banksman assistance • Where visibility from the driving position is restricted, use visibility aids or a signaler. Stop if you lose site of the signaler or the visibility aids become defective. • Do not attempt to get off moving vehicles • Do not make adjustments with the engine running and guards removed • Do not use a mobile phone whilst driving on site		
Performance Indicator(s)	No accidents or incidents.		

Drivers Safe Work Practices			
Monitoring	Daily briefings of drivers and contractors. Inspection of driving practices.		
Reporting	Incident report for non-conformance of traffic movements.		
Corrective Action(s)	• Investigate cause of any accident/incident/near miss. • Review controls and requirements.		

Signalers/Banksman Practices

SIGNALERS/Banksman Practices			
Objective(s)	1. To minimize vehicle incidents through good driver behaviours and practices.		
Management Strategy	Management controls.		
		Responsibility	Timing
Control(s)	Implementation of the following practices: • Use relevant safety procedures and correct signaling systems • Ensure drivers understand the correct signaling systems • Signal instructions clearly • Ensure you are visible to the driver and the driver is visible to you; if not, stop the vehicle moving • Stand in a safe location at all times • Warn pedestrians and make sure they are kept away from vehicle operations • Wear appropriate protective clothing, including high-visibility clothing • Report work hazards to supervisors • Make sure you can get to and from your work location safely • Do not ride on the vehicle you are directly unless you are in a designated safe position • Do not direct vehicles if your ability is affected by alcohol or drugs • Do not use a mobile phone whilst directing vehicles		
Performance Indicator(s)	No accidents or incidents.		
Monitoring	Daily briefings of drivers and contractors. Inspection of driving practices.		
Reporting	Incident report for non-conformance of traffic movements.		
Corrective Action(s)	• Investigate cause of any accident/incident/near miss. • Review controls and requirements.		

Construction Equipment

Construction Equipment			
Objective(s)	1. To minimize equipment incidents through good operator behaviors and practices.		
Management Strategy	Management controls.		
		Responsibility	Timing
Control(s)	Implementation of the following practices: • Allow only trained people to drive construction equipment; Work Permits must be approved. • Conduct Job Hazard Analysis before commencing a task involving construction equipment, • Provide stop blocks at the edges of excavations, pits, spoil heaps, etc. to prevent equipment falling. The blocks need to be positioned a sufficient distance away from any unsupported edges and slopes to prevent the weight of the vehicle causing collapse • Do not operate the site equipment controls unless seated on the driving seat • Do not carry passengers unless purpose built seats are provided • Do not drive on gradients in excess of those safe for the plant/equipment (see manufactures instructions) • Avoid maneuvering on sloping ground • Drive at appropriate speeds for site conditions (i.e., respect the site's speed limits) • Do not leave the engine running when you leave the vehicle • Be aware of the difference in performance of the site equipment when loaded and unloaded (o.e., with construction materials), particularly speed, braking and stability on slopes • Be aware of the different handling and braking characteristics of the vehicle in wet conditions • Do not alter tire pressures outside the manufacturers specifications • Do not use a mobile phone while operating equipment		
Performance Indicator(s)	No accidents or incidents.		
Monitoring	Daily briefings of drivers and contractors. Inspection of driving/operating practices.		
Reporting	Incident report for non-conformance of plant and equipment movements.		
Corrective Action(s)	• Investigate cause of any accident/incident/near miss. • Review controls and requirements.		

7.4.7 Chance Find Procedure

7.4.7.1 Introduction

The purpose of this procedure is to protect cultural heritage that is inadvertently discovered during construction activities of the Grove to Timehri Project. WSG understands that cultural heritage has high social value, is susceptible to disturbance, and is a finite resource. Cultural heritage is protected for its historical, cultural, scientific, and educational value to the scientific community, local communities, general public, and future generations. Impacts to cultural heritage must be avoided or carefully managed

7.4.7.2 Objectives

The objectives of this procedure are:

- Identify, record, and protect cultural heritage that has not been previously identified (i.e., chance finds); and
- Protect cultural heritage identified during previous cultural heritage investigations (i.e., known resources).

7.4.7.3 Procedure

Chance finds can be made by anyone in the Project, including WSG direct workers, contractors and subcontractors, visitors or guests. The following types of cultural heritage could potentially be found during construction:

- Archaeological features (e.g., habitations, hearths, burials);
- Artifacts (e.g., ceramic sherds, stone tools);
- Historic archaeological features (e.g., brick wells and foundations);
- Historic artifacts (e.g., clay pipes, bottle fragments, and coins);

In case of a discovery, the following activities will occur:

- The perimeter of the archaeological resource or site will be marked with high-visibility caution tape;
- Signs will be posted that the marked area is a protected archaeological site and that entry with mechanized vehicles is prohibited.
- Depending on the discovery, an a cultural Heritage Specialist will be called to get to the site and remove the artifact from the discovery area
- When ground-disturbing activities in the area are concluded, the caution tape and sign will be removed.

7.4.7.4 Project Roles, Responsibilities and Contacts

The Project roles to implement the Chance Finds Procedure are displayed below.

Figure 7-6: Project Roles, Responsibilities and Contact Details to be Finalized by the Construction Contractor for the Chance Find Procedure

Position	Responsibilities	Company	Name	Contact Details*
Project Manager				
Site Supervisor				
Environment Manager				
HSE Representative				
Cultural Heritage Specialist				

7.4.7.5 Training, Awareness, and competency

Relevant Project personnel (i.e., all Project personnel involved in ground-disturbing activities) will receive training and demonstrate competency in the identification of chance finds and the Chance Find Procedure described above. This training will be incorporated into the overall induction process for Project and contractor personnel and will include a quick reference handout. The Project Manager and Site Supervisor will maintain records of all Cultural Heritage Training provided to Project personnel.

All employees must be aware that it is illegal and forbidden to disturb or remove cultural heritage objects offsite for personal gain. To support the training process, the Project will develop training materials for use in the overall induction process.

The Project Manager and the Site supervisor will maintain records on chance finds and the implementation of treatment plans. These will include:

- Monthly reports summarizing reporting period activities, including chance finds identified, the results of any chance find assessments, internal and external communications and instructions, and supporting photographic documentation (or other reference materials as appropriate); and
- Any additional reports prepared to fulfil specific requirements of the IDB

7.4.7.6 Key Performance Indicators

KPIs related to the Chance Find Procedure are:

- Number of Toolbox talks regarding the Chance Find Procedure
- Number of discoveries, if any.

7.4.8 Monitoring and Review

7.4.8.1 Introduction

Monitoring and measurement activities are conducted to ensure that the ESMS is effectively implemented and the impacts, risks, and compliance obligations are appropriately managed. The ESMS defines dynamic mechanisms, such as internal inspections and audits to this aim. It identifies the information, including KPIs, that is periodically checked, measured, and recorded to track WSG's performance.

Through monitoring and performance, WSG:

- Establishes ESHS KPIs that allow quantitative measures of performance;
- Establishes the activities to collect data and information required for updating KPIs;
- Monitors key characteristics of operations and activities that can have significant ESHS impacts, and that can generate significant H&S risks;
- Tracks its ESHS performance (including progress in achieving objectives and targets);
- Tracks compliance with established procedures and regulatory requirements; and
- Calibrates and maintains monitoring equipment.

Monitoring criteria for the following areas should be established:

- Effectiveness of the ESMS operational control documentation to manage the significant ESHS impacts and risks generated by WSG's activities and its contractors;
- Conformity with ESHS regulations and other requirements related to the Project ESHS impacts and risks; and
- Achievement of ESHS objectives and targets and the progress of the ESHS programs.

7.4.8.2 Objectives

The purpose of the Monitoring and Reporting Management Plan is to describe the methodology to develop and implement effective monitoring of the Project's environmental and social performance based on systematic data collection and analysis.

An effective Environmental, Social, Health and Safety (ESHS) monitoring supports WSG to:

- Evaluate ESHS performance;
- Assess the effectiveness of mitigation and compensation measures;
- Assess compliance with ESHS legal requirements;
- Measure progress toward achieving ESHS improvement objectives and targets;
- Gather information to improve performance and increase efficiency;
- Assess compliance with the IDB Environmental and Social Policy Framework requirements; and
- Identify nonconformities and areas requiring corrective actions.

7.4.8.3 Scope

The Monitoring and Reporting Management Plan forms a part of the ESMS document system. It covers all Project activities. It includes activities carried out on WSG behalf by contractors and subcontractors.

7.4.8.4 Selection of Key Performance Indicators

Each plan described in this ESMP provides Key Performance Indicates (KPIs) in either the example management tables or at the bottom of each plan.

KPIs are selected to measure and evaluate the Project's ESHS performance or to obtain relevant information about WSGs processes to achieve objectives and the desired performance. The KPIs or metrics developed in this ESMP take into account the following attributes:

- Specific;
- Measurable;

- Attainable and timely;
- Simple and understandable;
- Objective;
- Practical;
- Comparable,
- Accurate;
- Reliable;
- Relevant to achieve the objectives and targets; and
- Relevant to inform about ESHS performance.

7.4.8.5 KPI Assurance and Monitoring Implementation

For KPIs that have to be monitored, the following information must be defined:

- Plan / Management Program;
- KPI, factor, hazard, or aspect;
- Goal / Limits
- Frequency;
- Method / Tool describing the appropriate technology as needed;
- Responsibilities and an Action Tracking Register.

Monitoring and measurement results should be evaluated at least once per month to evaluate the efficiency of the proposed mitigation measures, assess compliance with ESHS legal requirements, and verify the effectiveness of the ESMS processes allowing the identification of potential deviations. WSG or any Contractor conducting monitoring and measurement activities can identify non-compliance situations.

Figure 7-7 Non-Conformity and Corrective Action Report Form

Report No.				Date:	
Description / Root Cause Analysis (add more pages as needed):					

Action	Worker	Due Date (MM/DD/YYYY)	Evidence	Verification date (MM/DD/YYYY)	Comments

	Yes	No	New corrective action No.	Incident investigation number
Has the risk been eliminated?	☐	☐		

Closure date (MM/DD/YYYY): Approved by: Name: Position:	Signature:

7.5 Public Consultation Meeting

7.5.1 Consultation Plan Key milestones

There are five milestones in relation to public consultation:

1. Prepare consultation materials (invitations, Power Point presentations, posters, brochures, or other visual materials).
2. Notify the nearest Neighborhood Democratic Council (NDC) that WSG will hold a Public Consultation event about the Project.
3. Hold a meeting between IDB, WSG and external consultants as needed, regarding the agenda of the event and participants
4. Conduct the Public Consultation event to inform stakeholders of the Project. Stakeholder feedback will be registered and considered for the ESA/ESMP
5. Issue updates to the general Public at least quarterly about the progress of the Project. These can be in form of brochures, public announcements (in radio or newspapers, website) or bulletins, detailing the progress of the construction in non-technical language.

The first Consultation event will take place between August 15 and 19, 2022, after public disclosure of this document (ESA/ESMP, 2022). Based on Stakeholder views, said documents will be updated. For this Event, the steps above will be taken. This first meeting will be open to the general public, it is expected that people living or having economic activities along the road will attend. The agenda of the first meeting will focus on the following.

- Presentation of the Project
    - Background and project description in non-technical language
- Tentative schedule of activities
- Main risks and impacts
- Controls and mitigation measures; general description of the ESA/ESMP
- Description of the External Grievance Mechanism and its channels.
- Next steps (start of construction, future meetings, how will the Project provide updates to the community)
- Questions and Answers (Q&A) session.

Specific provisions for the consultation event are as follows:

- Types of invitations: invitations will be published in the local newspaper, broadcast in radio announcements, transmitted via WhatsApp® (using WSG's distribution list), The MPW's facebook page and other social media platforms, and indirect mailings to NDCs. Invitations will be sent at least 10 days prior to the event.
- Groups of stakeholders: The invitations will be intended to reach all stakeholders along the Project corridor of 23.5 km, including residents, business owners, mobile vendors, NDC representatives, and the community at large.

- Information provided in advance of the meeting: The environmental documents will be published in WSG's webpage (Work Services Group | Ministry of Public Works (mopw.gov.gy)) and the address will be provided in the invitation materials.
- Follow-up to promote participation: Announcements on newspapers and radio will be repeated at least 5 days before the event. WSG will send reminders to the NDCs.

Stakeholder Engagement and Stakeholder meetings will continue during construction. At least one meeting will be held once the EPC contractor is selected prior commencement of activities and additional meetings will be scheduled as needed. The following section describe the general approach for public consultation and stakeholder meetings during construction going forward.

7.5.2 Consultation Process during Construction

7.5.2.1 Background and Objectives

Consultation with stakeholders is key for informed decision-making and good governance. Meaningful stakeholder consultation has the following objectives:

- Capture the view and perception of people who may be affected by the project
- Validate and verify data obtained through environmental and social assessments carried out
- Enable project-affected individuals to understand their rights and responsibilities in relation to the Project
- Foster trust and transparency between stakeholders and the project

Stakeholder Engagement and consultations will occur throughout the construction phase, as needed.

7.5.2.2 Responsibility

WSG is responsible for ensuring stakeholder engagement is carried out in line with this consultation plan. WSG will appoint a social specialist responsible for ensuring project safeguards are being met and to oversee implementation of the consultation plan including: (i) ensuring stakeholders are aware of meetings and events; (ii) minutes of meetings are produced and circulated; (iii) project public education, such as the project website are coordinated and maintained. Additionally, the Community Liaison Officer (CLO) will lead the coordination of consultation events and all stakeholder communication, throughout the Project's construction phase.

The Community Liaison Officer will maintain the following responsibilities:

- Serve as the point person for the public to interface with the project.
- Man the Telephone Hotline (see activity below).
- Attend quarterly contractors' Open Forums keep a separate report of issues as well as log of any
- complaints.
- Accompany the Social Specialists /CLOs when they interface with specific stakeholder groups as requested.
- Oversee the production and dissemination of project information in the form of signs, posters, and flyers.

- Meet with NDC's and other local authorities such as heads of schools, health centers, police stations, businesses along the EBDPR, etc to facilitate partnerships for stakeholder outreach and information dissemination.
- Have overall responsibility for tracking, planning, participating, and reporting on stakeholder engagement activities as specified in this Project Communication Mechanism
- Conduct monitoring and evaluation tasks.

Stakeholders can be engaged in a variety of ways including public meetings, focus group meetings, open forums, telephone, or via direct contact with individuals. The Community Liaison Officer should engage with stakeholders early in the Project lifecycle, when Tender Documents go on sale and prior to the Bidding Process.

7.5.2.3 Inception Plan

An Inception Workshop should be held to ensure that all parties involved in the implementation of the project are aware of the project documents, management structure, and project safeguard requirements. This workshop will be held in the preconstruction period following the award of contracts and establishment of the Multi Stakeholder Committee (MSC), which includes members of WSG, EPC contractor, IDB, the Supervision firm and external consultants, as needed.

This workshop is a critical as it should allow for a common understanding of the project management system, the background documents, expectations, respective roles and responsibilities, and a thorough understanding of the SEP, the project schedule, and the various safeguards that have to be achieved. The following background documents should be presented, discussed, and understood, with a focus on the SEP:

1. Final Road Designs
2. The ESMP
3. Initial and Final Consultation Reports
4. The Stakeholder Feedback matrix

Consideration should be given to holding such a workshop annually to confirm/renew the various project mechanisms and to make adjustments if needed. In addition, WSG will notify the Neighborhood Democratic Council (NDC) nearest of where the consultation event will take place (within Region 4, where the Project is located) at least one week before the event occurs. The ones that are within the Project's area of influence are displayed in Table 7.7

Table 7.7: Neighborhood Democratic Councils in Region 4

Name of NDC	Address	Council Members	Statutory Meeting	Location of Meeting	Telephone Number
Soesdyke/Huist' Coverden NDC	Soesdyke, East Bank Demerara	18	4th Wednesday, 15:00 Hrs	NDC office	261-5224
Caledonia/Good Success	Craig, East Bank Demerara	18	1st Monday, 09:00 Hrs	NDC office	266-2239

Name of NDC	Address	Council Members	Statutory Meeting	Location of Meeting	Telephone Number
Golden Grove/Diamond Place	Grove Housing Scheme, East Bank Demerara	18	4th Tuesday, 15:00 Hrs	NDC office	265-2256

Source: https://mlgrd.gov.gy/neighbourhood-democratic-councils/

7.5.2.4 Consultation materials

WSG will prepare, with support from external consultants, consultation materials that will serve to disclose information with affected stakeholders, these can be invitation/notification letters, Power Point Presentation, banners, posters or other visual materials to discuss the Project in non-technical language, brochures, video, among others.

Feedback will be recorded in a matrix with Stakeholder's description of their concern, question or comment and responses when applicable, by WSG.

7.5.2.5 Multi-Stakeholder Committee Briefing

The MSC is fundamental to the safeguard's strategy providing a mechanism for formalizing stakeholder interaction through the construction and operational phases of the project.

The induction of the MSC will take place at the Project Inception Workshop. It is not advised that the MSC hold regular separate open forums but that they attend those held by the Contractor (defined below), regular visits to the site on the part of the MSC and attendance at the Contractors Open Forums provide opportunity for the public to interact directly with the members of the Committee to raise and clarify critical issues. Site visits allow the MSC to see the road works firsthand and ensure that the MSC's opinions are rooted in the views and positions of broadly based stakeholders. This will afford the MSC opportunity to gauge the sentiments of stakeholders on the ground directly in a public open manner.

7.5.2.6 Contractor Consultation with Stakeholders

The different types of stakeholder engagements during construction are the following:

Contractors' Open Forums: allow stakeholders another avenue for engagement and an opportunity for discussions to better understand the project and various safeguards. Open Forums will also create a channel between the contractor and community that can reduce the levels of misunderstanding, conflicts and allow the project safeguards staff to meet and become familiar with stakeholders in their work zone. The Contractor's work plans and other plans required by the ESMP as well as the final road design should be made available and discussed as required. The open Forums are also another channel to receive any complaints and formally log them.

Initial and closing site conferences: work out details relating to work and schedules. The EA and Contractor should host the MSC and all relevant NDC members at the field site for a show and tell so that MSC members have firsthand exposure to the site and field issues related to environmental and social safeguards. The Initial Site Conferences should occur as specified in the ESMP, before construction begins.

Village Inception Meetings in Each Settlement: discuss traffic and local access arrangements and the overall construction plan. These meetings are important for introducing the contractors to the

communities and should be fully supported by the EA, NDC and MSC and CLO. Given that this project will pass through nineteen villages, the contractor may choose to cluster smaller ones together. In the case of Grove and Soesdyke it may be advisable to hold more than one meeting.

7.5.2.7 Key Performance Indicators

KPIs for the Consultation Plan are:

- Number of Contractors' Open Forums held and number of stakeholders in attendance
- Attendance of Initial and closing site conferences
- Number of Meetings and number of stakeholders in attendance

8. CONCLUSIONS

8.1 Impact Assessment Overview and Environmental Characterization

In accordance with IDB ESPF, screening and classification, the Project will have impacts on the environment and the community and is therefore classified as Category “B.” Category B projects “are likely to cause mostly local and short-term negative” impacts, for which “effective management measures are readily available”. The ESA determined that the Project would likely result in some environmental and social impacts, but these impacts could be readily mitigated and managed, as long as the actions identified in Table 5.4 and in the ESMP are effectively implemented.

Monitoring measures should be used in addition to implementing measures to minimize or avoid the potential adverse impacts of the Project. Measures to enhance the positive effects of Project activities, as described in the ESMP, could be implemented to maximize the short- and long-term benefits of the Project. Ultimately, implementation of the Project would result in positive environmental and social outcomes because the proposed Project will improve road conditions, facilitating economic growth, and make travel in the Grove to Timehri corridor safer and more efficient.

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APPENDIX A SITE RECONNAISSANCE VISIT

Activities description

A site reconnaissance visit was conducted on June 10th, 2022, where ERM and the WSG drove around the 23.5 km Project area, took photographs, observed the vicinity of the Project, located important features or areas of interest that could be impacted by the Project. ERM took pictures to document existing infrastructure (pipelines, gutters, lamp posts, telephone lines), delineate/understand the extension of the RoW and presence of commercial or residential buildings within the RoW. The main risk and potential impact of the Project after that first visit was economic displacement of existing inhabitants that are encroached in the RoW.

Although the overall Project footprint has not been determined yet, during the site visit ERM identified the main areas congested, which correspond to the Grove Public Road and at the Soesdyke Junction. In those two areas there where structures such as shops, vegetable stalls, derelict vehicles and other encumbrances were observed in the ROW (as highlighted by the WSG team). In addition, Grove can be considered a hotspot, as it is populated and there is an abundance of businesses ranging from bars, groceries, jewelry shops, telecommunication businesses, vehicle repair shops, hardware stores, schools, clinics and restaurants within the community. Structures such as kokers and culverts which would undergo rehabilitation during the project were also highlighted. Photos taken demonstrate some of the structures in the ROW along the Grove Public Road. Wooden electricity poles were also observed which would need to be relocated The WSG indicated that arrangements with the utility companies – Guyana Power and Light Inc (GPL) and Guyana Water Incorporated (GWI) and the Guyana Telephone and Telegraph Company (GT&T) for relocation of associated infrastructure.

The photolog of the site visit can be seen below.

Photolog – Site reconnaissance visit June 10th, 2022

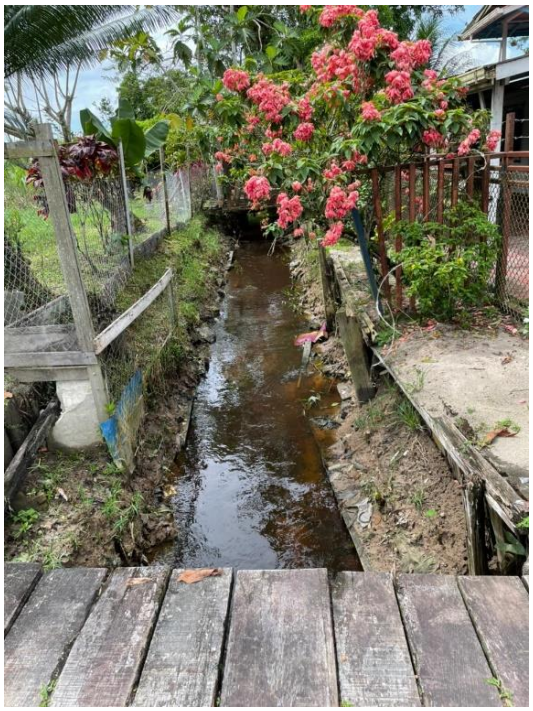
Picture 1 -Blue fence in Grove indicates where all fences should end

Picture 2 - Some of the stalls on Grove Public Road

Picture 3 - A vegetable stall in Grove and a light pole for electricity

Picture 4- A mosque / place of worship

Picture 5 - Koffee Koker



Picture 6 Culvert earmarked for rehabilitation

Picture 7 Concrete Fence being constructed at Soesdyke Junction

Picture 8 Demerara River alongside the current road

Picture 9- A school along the East Bank Demerara

Picture 10 -Derelict Vehicles along road

Picture 11 Shop along the Road at Grove

Picture 12 Concrete Drain being Constructed at Oil and Gas Shorebase Facility

APPENDIX B ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM SUMMARY DOCUMENT

APPENDIX C LIVELIHOOD RESTORATION PLAN

APPENDIX D STAKEHOLDER ENGAGEMENT SURVEY FORM

Interview guide for community members

Good morning/good afternoon, my name is _____ and I work for ERM Guyana, a company that conducts social studies of communities near productive projects and the construction sector. At this moment we are interviewing some residents in communities along the East Bank Demerara Public Road to learn a little more about their way of life, their opinions about the current road conditions, as well as the problems and needs they face. We have the commitment and obligation to keep the information you provide us with in strict confidentiality and to only use it for the purposes of this study. In addition, your answers will be anonymous and at no time will your name or the name of any other member of your family be mentioned.

General information

Questions	Notes
Demographics / Vulnerable Peoples	
Gender • Male • Female • Non-binary • No answer	
Age	
Education • None / kindergarten • Primary • Secondary (partial) • Secondary (completed) • Post-secondary • University / Tertiary • Other • No answer	
Ethnicity • East Indian Descent • African Descent • Mixed ethnicity • Amerindian • Chinese • Portuguese • Other • Unknown • No answer	

Questions	Notes
Number of people living in your household	
Number of household members below the age of 18	
Number of household members above the age 65	
Does any member of your household have the following? • Handicapped (mobility) • Handicapped (learning capacity) • Blind (deaf) • Age (elderly) • Woman headed household • Internally displaced persons • Teenage or adolescent household • Homeless • Other • Unknown • No answer	
Primary Occupation • Farming, agriculture, or agribusiness • Fishing • Housewife / househusband • Civil servant or public sector employee	

Questions	Notes
• Retail services • Hospitality • Business owner (what type) • Retired • Student • Other • No answer	
Primary Employment Sector • Agriculture, fishing, and forestry • Mining and quarrying • Oil and gas • Wholesale and retail trade • Transportation and storage • Construction • Manufacturing • Public administration • Information and communication • Financial and insurance activities • Education • Other services • Health and social services • Electricity and water • Real estate • Other	
What type of employment do you have? • Full-time • Part-time • Contract/gig • Seasonal • Self-employed • Other • No answer	
How long have you been occupying this space? • Less than a year • 1 to 5 years • 10 to 15 years • More than 15 years	
What is your total monthly income? (**leave this question to the very end of the survey**)	

Questions	Notes
• Less than 60,000 • 60,000-100,000 • 100,000 – 200,000 • 200,000 – 300,000 • 300,000 – 400,000 • 400,000 – 500,000 • More than 500,000 • Other • No answer	
Is INSERT COMMUNITY NAME where your primary residence is located?	
What type of tenure do you have on the land of your primary residence? • Own • Lease • Informal agreement • Use land – no agreement • Unknown • No answer	
Project Opinions	
To the best of your knowledge, are you aware of any previous construction Projects in the area? If so, do you recall if women were employed by those Projects?	
In your opinion, are women in your community interested in receiving construction employment-related training, such as handling heavy machinery, building, administration, etc.?	
In your opinion, what are changes or initiatives that could be implemented by the Project to allow women to attend such trainings, if they were interested?	

Questions	Notes
What efforts, if any, do you identify as being important for ensuring women feel safe in a construction-based workplace or traveling to and from?	
Are you familiar with the East Bank Demerara Public Road upgrade project?	
What is your opinion about the road in its current condition?	
What, if any, would be the best safety improvements that could be made to the road?	
Where, if at all, are locations that you would like specific additions made to the road? (e.g., a traffic light near a school zone, new signage, etc.)	
What is your opinion about the availability of parking in the area and along the road and how do you think better parking can be integrated into the update?	
Do you have any specific concerns about the project?	

Questions	Notes
Do you currently use the road? If so, what for?	
On a scale of 1-10, how would you rate the positive impact this project will have on the community? Explain why	
On a scale of 1-10, how would you rate the negative impact this project will have on the community? Explain why and please also share if you have a proposed solution to the problem / impact, if any.	
Do you use this road for any economic purposes? (e.g., selling goods, traveling to and from work, customers use the road exclusively to access your business)	
Are you aware of anyone else who uses this road for economic purposes?	
Do you know of any homes, business, structures, etc., that are located on the immediate sides of the road?	
Do you know of any crops, agriculture, livestock yielding, etc., that occurs on the immediate sides of the road?	

Observation guide

CHARACTERISTIC	DESCRIPTION
1. Description of the physical environment	
What is the community environment like? Topography, climate, bodies of water (rivers, dams, ponds, etc.), and how is the community structured, does it seem planned? Are the houses together or separated? any other relevant aspect of the community.	
2. Social composition of the community	
Is there interaction between community members or not? Is the existence of social classes evident through assets (condition of housing, type of cars)? Are there any migrants present or anything indicating their presence? Are there young people or children on the streets, and is alcohol or drug use perceived?	
3. Housing characteristics	
What are the houses like (roofs, walls, floors, etc.)? Are there houses that stand out from the others? Are there abandoned houses?	
4. Economic activities	
What type of activity seems to predominate? Farms, livestock, industry, commerce, etc. How do women participate? Is there a division of tasks by gender? Is there any primary production for self-consumption?	

CHARACTERISTIC	DESCRIPTION
5. Commerce	
Are there commercial establishments, of what type?	
6. Basic public services	
Street lighting, drainage, piped drinking water (water meters), electricity (electricity meters), road conditions.	
7. Access roads to the community	
How well connected is the community, does it have access to roads, what is the condition of its roads, highways, etc.?	
8. Cultural diffusion spaces	
Presence of libraries, cultural centers, village theaters, auditoriums, etc.	
9. Presence of meeting/recreation sites	
Where do they meet, are there parks or other meeting places?	
10. Sacred spaces	
Existence of archaeological or sacred sites (temples, churches, chapels, places of worship, etc.)	

CHARACTERISTIC	DESCRIPTION
11. School access	
Does the community have schools: preschool, elementary, junior high, or high school? What is their condition?	
12. Access to healthcare services	
Does the community have health centers, clinics or hospitals? What is the condition of the health centers?	
13. Public Security	
Guard booths, police presence in the locality, armed forces, army, navy, etc.	
14. Cultural and political expressions	
Graffiti, political propaganda, or propaganda related to local organizations.	
15. Media and communications	
Are there any community print media? (e.g. newspapers, pamphlets) Is any local broadcast media identified? (e.g. indigenous radio, local radio, town crier)	

CHARACTERISTIC	DESCRIPTION
16. Industrial projects	
Presence of industrial projects (mines, hydroelectric plants, thermoelectric plants, wind farms, photovoltaic parks, pipelines, etc.). Is there evidence of social investment projects (plaques in schools, posters) Is there evidence of environmental or social deterioration (pollution, damage to infrastructure) Are there signs of protest or nonconformity (graffiti, vandalism)?	

APPENDIX E ENVIRONMENTAL AND SOCIAL COMPLIANCE FORM

Program	

Semi-annual report sheet of the socio-environmental management of the Program

Socio-environmental team member of WSG, EPC contractor or Supervision firm

Specialty	Name and surname, profession	Profile requirements	Company	Contact information
Social				
Environmental				
Occupational Health and Safety				
Other				
Resources allocated to socio-environmental management				

Socio-environmental training activities provided to the staff of the WSG

Topic	Participants	Date	Training entity

Fulfillment of socio-environmental conditions of the ESMP

REQUIREMENT	Current compliance status	Next steps			LINKED DOCUMENTS
		Description	Date	Responsible	
Conditions for loan disbursements					
Special Conditions					

OTHER COMMENTS

Develop		Date:		
Revised				

Report of accidents/incidents in the semester

Number of cases in the semester:		Frequency index:	
		Severity index:	

EVENT	REGISTRATION DATE	CORRECTIVE, MITIGATING, PREVENTION OR INDUCTION ACTIONS	Responsible	LINKED DOCUMENTS
		Example: Conducting research reports		

Meaningful public consultations and community engagement processes

REQUIREMENT	Actions carried out in the semester	Mitigation, corrective and/or next steps			LINKED DOCUMENTS
		Description	Agreed date	Next steps	
Meaningful inquiries	*Date and place of public consultation, number of participants, existence of minutes.*	*Actions agreed in the consultations (if applicable)*			
Relationship activities	*Compliance with the community relations plan: dissemination and education activities, press releases, generation of information material, meetings with leaders, etc.*				
Participatory monitoring (if applicable)					

Complaints and claims response system (this table can be replaced by the report or record that the care system already generates or possesses)

Responsible for the system:	
Number of grievances received:	
Average response time:	

No.	Subject of the application	Averag e	Response granted	Actions to be taken based on the content of the request or complaint	Execution Manag	Linked documents
	Briefly summarize the topic of the application	*Mail, phone, mailbox on site, etc.*	*Briefly indicate what response was given, on what date and by what means.*	*Indicate if there are any subsequent actions. Ex: design adjustments, work plan, communication, etc.*		*E.g. Minutes of meeting with the interested party, reply email, photographic report*

Other aspects of social management (if applicable)

REQUIREMENT	Current status	Mitigation actions, corrective actions and next steps			LINKED DOCUMENTS
Description		Description	Agreed	Responsibl	
Gender aspects	*For example, in relation to codes of conduct, hiring of labor, etc.*	*Actions planned for the following semester.*			
Other					

Environmental monitoring carried out in the semester

Date	Sampling point	Coordinate s	Result		Legal/standard limit used	Is it above the allowed limit?	CORRECTIVE, MITIGATING OR PREVENTIVE ACTIONS	RESPONSIB LE	LINKED DOCUMENTS
Surface water									
Air quality									
Soil									
Others (effluents, sound level, etc.)									

Developed:			Date:	
Revised:				