PROJECT TO PROTECT AND REHABILITATE THE RN1 BETWEEN KINSHASA/NDJILI – BATSHAMBA

COUNTRY : DEMOCRATIC REPUBLIC OF CONGO (DRC)

SUMMARY OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)
APRIL 2019

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SUMMARY OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

| Project Title: Project to Protect and Rehabilitate the RN1 between Kinshasa/Ndjili-Batshamba | SAP Code: P-CD-DB0-012 |
| Country: Democratic Republic of Congo | Category: 2 |
| Department RDGC | Division: RDGC.1 |

1. Introduction

This first national highway rehabilitation project along the Kinshasa-Batshamba segment extends from Nsele Bridge (PK615+00) to Batshamba (PK1.238+00). It is located in the Democratic Republic of Congo (DRC), within the central economic zone retained in the Bank's Country Strategy Paper. The aim of protecting and rehabilitating this road section is to improve and maintain the level of road transport services between Kinshasa/Ndjili and Batshamba, thereby ensuring the effective continuation of the gradual rehabilitation of RN1 linking Matadi to Lubumbashi. The works to be carried out under the project will focus solely on the rehabilitation of critical areas. Therefore, the cumulative distance covered by the interventions on RN1 will be 30 km.

This Summary was prepared in compliance with DRC’s environmental and social requirements, and the African Development Bank’s (AfDB) Integrated Safeguards System (ISS) for Category 2 projects. The project description and rationale are first presented, followed by the legal and institutional framework to guide the project implementation. The basic environmental conditions of the intervention area are then presented, together with a summary of the public consultations and the alternatives considered.

Environmental and social impacts were summarised for the road’s preparation, construction and operation phases. Recommendations were made to increase benefits and/or prevent, minimise, and mitigate negative impacts. Lastly, the monitoring and capacity-building programme was presented, as well as the environmental and social management costs of implementing the project.

2. Project Rationale and Description

2.1. Project Rationale

National Highway One (RN1) is the backbone and the main structural artery of DRC’s road transport system. Running over 3,130 kilometres, it connects Banana and Matadi ports to the major cities in the west of the country and Lubumbashi in the south, up to the Zambian border. It primarily serves the Kongo Central, Kinshasa, Kwango, Kwilu, Kasai, Kasai Central, Kasai Oriental, Lomami, Haut Lomami, Lualaba and Haut Katanga provinces, home to a significant segment of the Congolese population. Lastly, it links Mbuji-Mayi with RN2, which serves Kasongo, Bukavu (South Kivu) and Goma (North Kivu), in the east of the country, thus connecting them to Rwanda and Burundi.

RN1 is also a community highway of major significance for Central Africa. It is located on the CD-07 (Pointe Noire-Dolisie-Brazzaville-Kinshasa-Kikwit-Tshikapa-Mbuji-Mayi-Mwene-Ditu-Kamina-Nguba-Likasi-Lubumbashi-Sakania), CD-08 (Matadi-Kinshasa-Kikwit-Mbuji-Mayi-Kasongo-Bukavu-Bujumbura) and CD-09 Development Corridors (Matadi-Kinshasa-Kikwit-Mbuji-Mayi-Kasongo-Bukavu-Gisenyi-Kigali), selected in the First Priority Programme of the Consensual Transport Master Plan in Central Africa (PPP/PDCT-AC). Given RN1’s predominant role in the country's economic and social development, internal access and sub-regional trade, the Government has allocated a large part of the funding of donors involved in the transport sector to its rehabilitation.
The Kinshasa/Ndjili-Kenge-Kikwit-Batshamba segment (622 km) is part of RN1 from Moanda to Kasumbalesa. This section links Kinshasa Province, the capital of the Democratic Republic of Congo, with Kwango and Kwilu Provinces. There are currently major difficulties in connecting Kinshasa and Batshamba due to severe road infrastructure damage (potholes, bank spalls, ruts, pullouts, and broken drainage structures such as gutters, downspouts, ditches and curbs, gullies on shoulders, silting of certain lowlands) and numerous erosion head cuts that pose a serious threat to access. This situation creates difficulties in supplying food products to Kinshasa, reducing industrial activity in the regions served and making it difficult for the population to access social and community services. The rehabilitation of RN1 will help to improve food security by increasing the availability of agricultural products. It will also contribute to solving a number of problems that arose due to its deterioration.

2.2. Project Description

The project has two components: Component A, concerns the following road works: (i) rehabilitating critical sections on approximately 622 km of the Kinshasa/Ndjili-Batshamba road, on RN1; (ii) developing 4 parking areas (Bankana, Kenge, Masimanimba and Kikwit); and (iii) repair of water collectors/downspouts and vegetation of cuttings and embankments. Component B includes related facilities and support for women and youths: (i) works to rehabilitate and equip basic infrastructure in Bankana, Kenge and Kikwit (rural markets, warehouses, latrines, drinking water wells with standpipes); (ii) rehabilitating urban roads in Kikwit crossed by the road; (iv) rehabilitating/constructing and equipping two dormitories (boys and girls) with a canteen in the technical and vocational institute in Kikwit; (v) rehabilitating/constructing and equipping a computer room at the Kikwit Technical and Vocational Institute; (vi) rehabilitating two buildings at the Saint John Bosco Mixed Technical School in Kenge; and (vii) developing and constructing a small port warehouse on the Kwilu River in Kikwit. The project's technical features are presented in the table below.

<table>
<thead>
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<th>Road's Technical Features</th>
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<tr>
<td>Width of the platform</td>
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<td>Width of the pavement</td>
</tr>
<tr>
<td>Two shoulders of 0.50 m</td>
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<tr>
<td>Pavement slopes</td>
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<tr>
<td>Shoulder slope</td>
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<tr>
<td>Embankment slope backfill angle</td>
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<tr>
<td>Excavated embankment slope</td>
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<td>Pavement slopes in curves</td>
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These measures may, however, be amended if necessary. The slope of the shoulders will in all cases remain outwards to reflect existing situations. The area between Kinshasa and Kikwit is made up of secondary age sands (from 251 to 65 million years old). Tertiary age sands - called Kalahari wind sands - can be found from Kikwit to Batshamba. Morphologically, this route forms a corridor leading to the outer limits of the plateau areas (Kinshasa-Kwango and Kikwit-Batshamba), which in the middle part (Kwango-Kwilu) take turns through an area of hills that are sometimes layered and interrupted by numerous watercourses.
### Works Description

The content of works is presented in the table below. The works are scheduled to take six (6) months.

<table>
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<tr>
<th>Works Description</th>
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| **Excavation works**      | Desilting;  
                          Soft soil excavation and removal;  
                          Rock excavation and removal;  
                          Yellow earth backfill from borrow sites to restore initial road shoulders and eliminate existing gullies. |
| **Pavement works**        | Asphalt repair;  
                          Partial pavement rehabilitation;  
                          Scarification of pavement strips where there is scuffing for recycling before repair with bitumen;  
                          Stripping;  
                          Drainage layer in geotextile, drainage materials, riprap;  
                          Base layer in selected materials;  
                          Gravel base layer 0/31.5 (thickness = 0.20 m);  
                          Permeation;  
                          Bond coat (or tack coat);  
                          Asphalt surfacing (thickness: 0.04 cm);  
                          Supply and installation of protruding edging;  
                          Supply and installation of levelled edges. |
| **Sanitation works**      | Construction of gutters;  
                          Construction of the D1 0.15 m deep downspout;  
                          Construction of 1x1 culverts;  
                          Construction of 60x60 culverts;  
                          Construction of 80x80 culverts;  
|
Construction of a low wall made of 20 x 20 x 20 x 40 x 40 solid masonry blocks; Apron in reinforced concrete dosed at 350 kg/m³; Walls in 20 x 20 x 20 x 40 solid blocks.

Vegetation works

Supply and planting of vetiver grass; Supply and planting of *cynodon dactylon* (Bermuda grass).

3. **Strategic, Legal and Institutional Framework**

3.1. **Strategic Framework**

The following are the key policies and programmes relevant to the project:

- The Growth and Poverty Reduction Strategy Paper (GPRSP)
- National Environmental Action Plan (PNAE)
- The National Strategy and Action Plan for Biological Diversity
- National Health Development Plan (PNDS)
- Strategic Framework for the Implementation of Decentralisation (CSMOD, July 2009)
- Land Reform Programme
- National Strategy to Combat Gender-based Violence (SNVBG), November 2009
- National Policy on Gender Integration, Family Promotion and Child Protection

3.2. **National Legal Framework**

In legal terms, the project's environmental and social management is based primarily on the Constitution of the DRC, adopted in February 2006, which stipulates in Article 53 that “All persons have the right to a healthy environment that is favourable to their development. They have the duty to defend it. The State ensures the protection of the environment and the health of the population.”

The Environmental Framework Law also lays down the fundamental principles for environmental protection and aims to promote the sustainable management of natural resources, prevent risks, combat all kinds of pollution and nuisances, and improve the quality of life of the people while respecting the ecological balance.

Other legislative texts to take into account are:

- Decree No. 14/019 of 02 August 2014 laying down the operating rules on procedural mechanisms for environmental protection. This is the new text that provides a framework for the entire Environmental and Social Impact Assessment (ESIA) procedure
- Law 011-2002 of 29 August 2002 on the Forest Code, which focuses on land clearing and erosion issues
• Order No. 007/2002 of 11 July 2002 on the Mining Code and Mining Regulations of March 2003, which define the conditions for opening and operating material deposits

• Order No. 71-016 of 15 March 1971 on the Protection of Property


• Law 73 - 021 of 20 July 1973 concerning the general regime of property, land tenure, real estate and security arrangements.

3.3. International Legal Framework

The project is subject to AfDB's Integrated Safeguards System (ISS), especially the following operational safeguards:

• OS 1 is triggered because of the potential negative impacts of the project during implementation, which justifies the preparation of an ESMP. Similarly, the project's impacts are localised and reversible after applying mitigation measures;

• OS 2 is triggered due to the need to acquire land acquisition and loss of economic activity;

• OS 4 is triggered because of the potential generation of waste (hazardous and inert) during works; and

• OS 5 is triggered due to risks faced by workers, particularly working at height, and the lack of necessary PPE such as hearing protection, gloves and other work gear, safety glasses and footwear for company employees.

3.4. Institutional Framework

From the institutional perspective, the project's environmental and social management will involve the following strategic services:

• Ministry of Environment, Nature Conservation and Sustainable Development;

• Ministry of Infrastructure, Public Works and Reconstruction;

• Ministry of Mines;

• Ministry of Public Health;

• Kinshasa, Batshamba, Bankana, Kenge, Masimanima, Kikwit, Mongata and Bandundu cities.

• Non-Governmental Organizations (NGOs) and other Local Community Associations;

• Network management companies.

At the operational level, the following stakeholders will be involved:

• Congolese Environment Agency (ACE)
Eastern Provincial Environmental Coordination (PEC)
Roads Authority
Provincial Directorate of the Roads Authority
Provincial Mining Departments
National Programme to Combat AIDS and STIs
City Council
Technical Services
Municipalities
District Leaders;
District Associations;
Grassroots Community Organizations.

An analysis of the capacity of stakeholders involved in project environmental and social management shows that the environmental and social dimensions are of major importance to project activities. Therefore, outside ACE, the performance and effectiveness of other stakeholders will still have to be improved in terms of environmental and social safeguards, due to the lack of adequate human resources and skills in environmental and social management.

4. **Description of the Project Environment**

4.1. **Biophysical Environment**

*Climate:* The climate in the project area is mostly tropical and marked by two main seasons: wet and dry. The mean temperature is 28°C during the rainy season and 24°C in the dry season. The rains are heavy and the annual rainfall is within the range of 1200-2400 mm.

*Soils:* The soils in the study area are ferralic, deep, with little differentiated horizons and have diffuse or gradual transitions. Red and yellow ferralic soils are the most common. They can be linked to lithosols on ferruginous breastplates or sandy loose sediments. The high clay content of the soils makes them vulnerable to water erosion, landslides and mudflows.

*Topography:* The topography of the project area varies. It starts from the plain, extending from the capital Kinshasa to Nsele, and the Plateaus, passing through Kenge, Masimanimba, Kikwit and Batshamba.

*Hydrography:* The main rivers that cross RN1 are the Lufimi, Kwango, Mamboma, Kenge, Kwilu, etc. Large engineering structures facilitate the crossing of these rivers.

*Flora:* The vegetation in the project area is dominated by grassy savannah, wooded savannah and forest. The *Andropogon* (bluestem grass) savannah is the main feature of the whole area. The area has been severely degraded by human activities and successive bushfires.
**Wildlife:** Until recently, the region was still a relatively game-rich region. Unfortunately, the outskirts of villages and open forests today seem almost completely deserted by wildlife. Due to human activity, no protected species has been identified.

**Protected Areas:** As a protected area within the project impact area, RN1 is adjacent to the Nsele Nature Reserve. The Nsele Park was created by Order No. 83-110 of 5 May 1983 as a natural wildlife reserve known as the “Mobutu Presidential Park”. It covers an area of 3550 hectares, adjacent to the RN1, less than 2 km from the road. The reserve can be reached via an access ramp from the RN1. There are still some species of *Brazza cercopithecus*, warthogs, sitatungas, turtles, Nile monitors as well as guinea fowls and partridges in abundance. The park's habitats have been largely devastated by human activities. RN1’s surrounding areas are thought not to contain any threatened or IUCN red-listed species because of their high anthropisation.

### 4.2. Socio-economic Environment

**Demography:** project activities will be conducted in four (4) of the country's provinces, namely the Province/City of Kinshasa, Kwango, Kwilu and Mayi-Ndombe. Kinshasa's population is estimated at 12 million, with a density of more than 1100 inhabitants/km2 and an annual growth rate of 4%. The population of Kwango province is about 2 million inhabitants, with a growth rate of 3%. Kwilu province has 5 million inhabitants with a population density of 70 inhabitants per km2 and a growth rate of 3%. Women represent the majority of the population in all the provinces (51%)

**Economic Activity:** the main income-generating activity in Kinshasa's City/Province is trade, most of which is carried out informally and employs more than 70% of the City's total workforce. Kwango derives most of its resources from farming, livestock and agricultural products. This province has a rich subsoil and abundant potential for wood, livestock, agriculture and hydropower. The main activities in Kwilu province are petty trade, agriculture, fishing, livestock and services. The main agricultural products in the project area are cassava, maize, rice, groundnut, cowpea, squash, plantain, banana, sugar cane, *voandzoo* (Bambara bean) and sesame. Overall, supplying the capital has long been an economic outlet for producers. Rehabilitating the road infrastructure is expected to revitalise agricultural product the marketing.

**Access to Health and Education:** Kinshasa City/Province has 2390 primary schools and 1412 secondary schools. It also has about 50 accredited higher education and university-level institutions, as well as 287 health centres and 25 hospitals. Kenge, the capital of Kwango Province, has 3 hospitals, 63 health centres, 591 primary schools, 369 secondary schools, and 6 tertiary institutions. These are insufficient compared to the population size. Recurrent diseases are malaria, acute respiratory infections and anaemia. Available statistics on Kwilu Province concern the City of Kikwit, where there are 5 hospitals, 43 health centres, 449 primary schools, 289 secondary schools, 2 universities and 7 tertiary institutions. Recurrent diseases are malaria, acute respiratory infection, diarrhoea, sexually transmitted diseases and typhoid fever.

### 5. Variant Analysis

The two main alternatives studied under the project to protect and rehabilitate RN1 between Kinshasa-Ndjili-Batshamba are: (i) Option 1: No rehabilitation of RN1; and (ii) Rehabilitation of the critical areas of RN1. The two options were compared based on technical, economic, environmental and social criteria.

#### 5.1. Maintain the Status Quo

The features of the existing road and its surface condition vary from one section to another. The width of the platform depends on the topography and relief of the surrounding area, and whether it crosses a plain or filled area, with a variation of 7 to 9m. Due to lack of maintenance, visibility and safety conditions have been reduced by vegetation and tree branches invading the roadway in several areas. There are currently
several impairments: potholes, spalls on the edges, ruts, tears, broken drainage works (gutters, downspouts, ditches and curbs, gullying of shoulders and silting of swamps. The transverse hydraulic structures listed on the existing road consist of several types: circular metallic nozzles with corrugated sheet metal, single or multiple. Some structures are operational. Others are already blocked, causing erosion with the risk of leading to a road collapse.

The status quo option will maintain RN1 in its current state of degradation. This will constitute a major handicap for the movement of goods and people and for developing local, regional and national socio-economic activities. Moreover, the continuous deterioration of the road could result in discomfort for users, accidents and health risks to the public due to a lack of fast means of transportation. Therefore, this option cannot be considered in view of all these constraints.

5.2. Rehabilitation of RN1 Critical Areas

The project will be implemented in a predominantly sandy soil area. Environmental and social risks are remarkable at all erosion sites due to agricultural activities (fields, crops, ponds), residential houses, schools and commercial activities (stalls, markets, etc.). The alternative of rehabilitating the critical areas of RN1 was retained because it will have significant positive impacts on the entire project area. It will improve local, regional and national connections, and facilitate access in several localities. At the end of the rehabilitation works, there will be heavy traffic on this highway for local, regional and national commercial transactions. The availability of a good road will also improve access to community social infrastructure. With the RN1 rehabilitation option, there will be less encroachment on the plots of the local communities in villages along the road since the current road right-of-way is wide enough. The entire right-of-way is more or less free of all temporary or permanent occupation, which significantly reduces the risk of expropriation.

6. Public Consultations

The main objective of public consultations was to ensure the involvement of affected persons and other stakeholders in project implementation and in planning the resettlement actions, so that their concerns could be taken into account in the decision-making process.

Specifically, it involved: (i) informing the various stakeholders about the project, its potential impacts, and compensation measures; (ii) enabling persons likely to be affected by the project to express their views and opinions on the project and compensation measures; (iii) compiling the various concerns of persons affected (fears, needs, expectations, etc.) about the project, and working out mitigation and compensation measures; and (iv) compiling their suggestions and recommendations on environmental and social management activities. A two-phase methodological approach was adopted to ensure the participation of all local stakeholders in the public consultation: a preparatory phase to share the objectives of the mission and a consultation phase with all stakeholders. Public information and consultation activities regarding the RAP and ESIA brought together provincial, local and customary authorities, as well as the local populace including PAPs. The analysis of the interviews showed that the main issues raised by the public during these consultations related to:

- avoiding any unintentional displacement;
- organising a preliminary consultation to discuss the rights-of-way selected for the sub-projects;
- compensating the PAPs before work begins;
• avoiding an obstruction of existing educational and health infrastructure to ensure the safety and health of users;
• prior and exhaustive information on the start of works; and
• recruitment of local labour during the construction phase.

Responses to concerns expressed were taken into account in the project's mitigation and enhancement measures.

7. Potential Environmental and Social Impacts

7.1. Negative Impacts during the Construction Phase

7.1.1. The Biophysical Environment

Air pollution by dust and exhaust gas: dust could be generated during excavations, levelling, transportation and installation of materials with the movement of heavy machinery, especially when crossing built-up areas during the dry season. The transportation and storage of excavated materials will also have a negative impact on air quality. Similarly, greenhouse and toxic gas emissions (SO2, NOx, CH4, CO, CO2, etc.) produced by heavy equipment and machinery used for the site's needs could contribute to increased atmospheric pollution in the project area.

Landscape degradation and visual pollution during construction: the visual features of the segments and those areas affected by the works will be unattractive due to the presence of machinery and equipment, temporary material stockpiles, excavated material and other solid wastes provisionally stored on site. However, this impact is temporary and localised.

Pollution and degradation of ground and surface water: movements of construction machinery can alter the normal flow of runoff water and directly affect watercourses. Moreover, solid waste discharges into watercourses can alter their quality and obstruct their flow, particularly during the construction of civil engineering structures (bridges; gutters; etc.) on watercourses. By setting up a base camp, washing and maintenance of machinery and engines can generate waste oils that could also pollute waterways. Non-compliance with rules governing the storage of site materials (laterite, sand, gravel, etc.) can be a potential source of pollution of water resources.

Water resources: Rehabilitating the RN1 will require significant water consumption (soil and laterite humidification, staff needs, etc.). Moreover, operating the base may require taking samples from watercourses.

Accelerated soil erosion and degradation during construction works: site installations, the base camp and movement of machines and trucks can cause erosion, compaction and destruction of soil structure; contamination by solid and liquid waste discharges, and the discharge of waste oils, fuel, etc. Furthermore, the rehabilitation works will require the collection of a certain amount of laterite from existing quarries. The operation of quarries and borrowing areas would have some impact on the soil in terms of destructuring and erosion risks, if the operation is not controlled.

Reduced vegetation cover: The RN1 layout already exists with a wide right-of-way. Hence, there is virtually no need for clearing along the axis. However, some tree felling may be required to accommodate the installation of the base camp, the construction sites, the possible opening of access roads and the transportation of equipment. The work will also cause the disruption of chlorophyll synthesis along the roads due to dust emission, which slows down growth of the surrounding vegetation.
Disruption of wildlife and its habitat: it is to be noted that the RN1 road rehabilitation work will not require encroachment into surrounding vegetation because the current right-of-way is consistent with existing width of the lanes to be rehabilitated. The wildlife habitat will be affected under the project by the opening or development of quarries and borrowed areas. Noise and movement of machines could disrupt wildlife tranquility.

7.1.2. On the Human Environment

Loss of property and sources of income: vacating the road right-of-way will result in the relocation of thirty-one (31) makeshift structures (kiosks, huts, stalls, etc.) located along the road, causing a temporary loss of sources of income. The seven-metre right-of-way retained for the works prevents any encroachment into nearby farm plots. However, it is possible that setting up base camps, opening quarries and bypass roads (all activities not yet defined at the current stage of the project) may require land acquisition and loss of socio-economic assets. In these circumstances, compensation will be made in accordance with the provisions of the Resettlement Action Plan (RAP) contained in a separate document.

Health risks to the public and workers: the works will generate dust and noise that can indispose workers and residents, and increase acute respiratory infections, especially in the dry season. Exposure to polluting substances (particles, SO2 and NOX) could also cause respiratory problems. Moreover, there is risk of an increase in STIs and HIV/AIDS among local communities.

Risk of altering the ambient sound and the atmosphere: the living environment of local residents may be affected by the noise of machines and the consequent dust emissions. This risk is extremely high for people living near the construction site, particularly for markets located around the site.

Risks of social conflicts: the dissatisfaction or frustration of the local people with project-related issues (nuisances, accidents, non-recruitment of locals, rumours about the project, bad behaviour of project employees, etc.) can generate conflicts during project works.

Risks to cultural heritage: Earthworks can cause the degradation of buried objects of cultural value. Similarly, the circulation of construction vehicles along the edge of cemeteries may cause debris and clods of earth to be thrown onto the graves.

Risk of road accidents: The additional movement of machinery at the site, quarry and material transport routes can be a source of accidents for workers and the local people. This risk is even higher at urban and market crossings.

7.2. Negative impacts during the operating phase

7.2.1. Physical Environment

Air pollution caused by traffic: The increase in road traffic will generate air particles and increase the concentration of CO, CO2, and other particles such as lead, from exhaust pipes, tyre wear and dust from laterite roads. Gas emissions from road traffic could also increase greenhouse gas emission. Such pollution will increase in the dry season, and especially in urban areas.

Water and soil pollution by runoff: pavement runoff will be loaded with sand and other suspended solids, which can pollute or silt up streams and swamps (outfalls) if a good drainage and discharge system is not in place. This will be more severe in some areas (e.g. between Kikwit and Batshamba) where the soils are clayey silt, resulting in a lot of fine sand and suspended solids in the runoff.

Increased risk of fraudulent forest exploitation: the project's impact area is not an industrial timber extraction area since it lacks dense natural forests. However, there is evidence of artisanal and energy (wood
energy) extraction. Moreover, with the upgrading of RN1, there is a risk that forest operators and local craftsmen (woodworkers, charcoal makers, etc.) will expand their income-generating activities in a radius that will affect all wooded areas closest to the roads. However, this risk is limited.

**Increased risk of accidents to wildlife:** The most significant potential impacts on wildlife during the RN1 commissioning phase are the risk of accidents with animals (small animals) crossing or using roads, as a result of increased road traffic. However, it will not be necessary to provide specific passageways for wildlife.

7.2.2. **Human Environment**

**Public health risks:** The expansion of road traffic on RN1 could lead to an increase in: (i) respiratory diseases (acute respiratory infection/ARI) due to dust and exhaust gases; (ii) STIs and HIV/AIDS among road users and within the local communities.

**Risk of road accidents:** The rehabilitation of RN1 could cause an increase in speed by road users. This will also heighten the risk of accidents.

7.3. **Positive Impacts**

7.3.1. **During the Construction Phase**

The positive impacts on the biophysical environment during construction concern groundwater recharge through increased infiltration (due to weeding and clearing during soil preparation, the soil is uncovered). Since there will be less runoff during rains thanks to the slope, water will infiltrate into the groundwater table.

The project's positive impacts on the human environment will mainly concern job creation and economic activity:

**Developing socio-economic activities on the rights-of-way and poverty reduction:** Road works will contribute to wealth creation for neighbouring communities through various types of trade. The work sites will facilitate the development of a number of related activities (catering, crafts, trade, etc.) in the urban areas (Kikwit, Kengue, MBankana, Masimanimba), thereby boosting income and reducing poverty.

**Job creation:** It is estimated that the project will create between 400 and 800 direct and indirect jobs. The locals could seize these opportunities based on their profiles. The additional income generated will stimulate economic activities in the areas concerned.

**Development of the local and regional economy:** According to feasibility study estimates, the project's initial capital investment cost is estimated at EUR 50 million. The rehabilitation work will certainly have an impact on the local economy, thanks to the use of small- and medium-sized enterprises (SMSEs). The level of involvement of local and national companies will depend on their interest in the project and their competitiveness. Local businesses dealing in building material could also develop their activities through this project, by supplying some of the required materials. The same will be true of service companies and local subcontractors.

7.3.2. **Operation Phase**

During the operating phase, the positive impacts will be mainly socio-economic:

**Better service of the project area:** The project will give a very strong boost to the road transport system in the project area. This will have an impact on the local, provincial and national economy. Project
implementation will restore trade flows that had disappeared due to infrastructure degradation, help to meet existing but unfulfilled needs (overloaded vehicles combining passenger and freight transport, rotting agricultural products waiting for uncertain means of transport, etc.), lower passenger and freight transport costs, spur the emergence of new types of high-capacity vehicles following changes in passenger and freight loading (buses and articulated units), increase the proportion of normal traffic from about 15% to 35%, and improve traffic conditions.

**Time saving and improved access to basic social services:** The project will improve the movement of goods and people and, above all, reduce the current road travel time. Furthermore, it will facilitate the supply of necessities (lowering their cost), access to social infrastructure (health centres, schools), passenger transport, and the purchase of basic foodstuffs, etc.

**Reduction in road accidents:** The project will contribute significantly to reducing the risk of accidents (vehicle rollover) caused by the very dilapidated state of some sections of the road. Clearing the rights-of-way and rehabilitating the roads will undoubtedly improve visibility and lower the risk of accidents.

### 8. Mitigation Measures and Complementary Initiatives

#### 8.1. Impact Mitigation Measures

#### 8.1.1. Normative Measures

This requires ensuring that the project is compliant with applicable regulations, in particular:

**Compliance with environmental and social regulations:** During the commissioning, the Roads Authority (OR) shall ensure compliance with the national environmental regulations in force during both the construction and operational phases. The company in charge of works shall contact the environmental services to ensure the regulatory compliance of the installations.

**Compliance with land regulations:** The Road Authority shall ensure the strict implementation of the prepared Abbreviated Resettlement Action Plan and shall specifically ensure that affected persons are compensated prior to the commencement of works. For potential impacts on borrowing and quarry areas, all expenses should be identified and settled before the commencement of works.

**Compliance with mining regulations:** The companies in charge of works are required to have the necessary permits to operate quarries and borrow pits (temporary or permanent) in accordance with the relevant national legislation. Priority will be given to sites already opened and authorised.

**Compliance with forestry regulations:** The implementation of activities envisaged under the project shall be subject to compliance with forestry regulations. In this regard, any deforestation shall comply with forestry legislation procedures. The areas to be cleared shall be indicated in a plan. Forestry services shall be consulted for land clearing regulations. Logging fees shall also be paid in advance.

**Obligation to comply with environmental and social clauses:** Construction companies shall comply with the environmental and social clauses included in the bidding documents to optimise the protection of the environment and the socio-economic milieu during the works. They will submit a Site Environmental and Social Management Plan (SESMP), which the Environment Agency shall validate within 45 days of contract award. The SESMP will address the potential impacts of the site, including deforestation and reforestation, air quality and noise, traffic, waste, soil and erosion management, wetland works, health and safety as well as damages during construction. The company will also develop a Local Recruitment Plan and a Code of Conduct for its employees. The SESMP is the single reference document in which the company defines in detail all the organisational and technical measures it will implement to meet the environmental, health and safety requirements.
### 8.1.2. Measures to Mitigate the Negative Impacts of Works

**Mitigation measures for site installation:** The Contractor shall establish its temporary site facilities in a manner that minimises environmental disruption, preferably in areas that have already been cleared of trees or used, where such exist. Fields, plantations or watercourse surroundings will be avoided. The base camp shall have adequate sanitary facilities (site latrines) to prevent water pollution, as well as septic tanks and garbage bins. The Contractor shall clearly display the internal regulations at various spots on the base camps.

**Information, awareness raising and communication with local residents:** Local residents have varied concerns about the works. Hence, a good communication strategy is necessary to win their support for the smooth running of the works to avoid conflicts. This communication/sensitisation can take the form of village meetings, a site logbook for complaints, and the empowerment of local organisations to provide information and follow-up.

**Measures to protect cultural and religious sites:** The contractor shall proceed as follows in the event of the discovery of religious, historical or archaeological artefacts during works: (i) stop work in the area concerned; (ii) immediately notify the contracting authority who shall protect the site to avoid any damages; a protective perimeter shall be identified and materialised on the site, within which no activity shall take place; (iii) refrain from removing and moving objects and artefacts. Work shall be suspended within the protective perimeter until the national agency responsible for historic and archaeological sites gives permission to continue.

**Management of impact on air quality:** The company shall spray water on the base camp site, as well as on the road used by trucks to transport materials during the dry season and in case of significant dust build-up in urban areas; switch off the engines of parked machinery and vehicles; maintain and keep the construction equipment in good working condition to avoid excessive emission of air pollutants; and limit the speed of filled trucks, particularly in urban areas (towns, quarters and villages) and at the base camp.

**Measures concerning water resources (surface and groundwater):** (i) indicate in the companies' terms of reference, environmental clauses concerning rational water management, including the cleanliness of the water sources to be used throughout the works. The contractor shall avoid water abstractions for road works from wells used to supply drinking water to the people; (ii) prohibit the refuelling of vehicles and machines within 30 metres of watercourses and floodplains. The contractor shall formally prohibit any fuel storage within 100 metres of a watercourse. (iii) avoid any discharge or disposal of wastewater, sewage, fuel, and pollutants of any kind into surface or groundwater, and treat wastewater before discharge, etc.

**Soil-related measures:** (i) indicate in the Contractor's terms of reference, environmental clauses concerning the restoration of affected areas (borrow areas, sites on which materials and equipment are kept, base camps, etc.); (ii) ensure effective management of solid/liquid waste and fuelling of machinery to avoid any spillage that could result in soil pollution. Provide specific storage and handling areas for petroleum products, and for the maintenance of site vehicles (oil change, repair, etc.). The contractor will provide accidental spill kits. In the event of accidental spillage, the contractor will proceed to recover the contaminated soil; (iii) develop and implement soil stabilisation measures to minimise site erosion; (iv) avoid the use of heavy machinery in wet areas; (v) stabilise slopes near drainage structures; (vi) reserve topsoil for reuse during reforestation.

**Measures for flora and fauna:** (i) protect trees located outside the work area and install the base camp in areas with limited vegetation cover. Felled trees must be cut and stored in areas approved by the contracting authority; (ii) develop and carry out a compensatory reforestation programme to replenish depleted forest species.
Management of impacts on ambient sound: The contractor is required to limit site noise likely to seriously affect residents, either because it lasts unduly long or because it extends outside normal working hours. The thresholds not to be exceeded are 55 to 60 decibels during the daytime and 40 decibels at night. The contractor shall fit silencers to earth-moving equipment powered by internal combustion engines.

Management of impacts of solid and liquid waste: (i) set up a solid and liquid waste management plan: waste collection system on site as soon as the site is set up, and transportation to a site approved by local authorities and technical services; (ii) set up a waste oil collection system and envisage recycling or reuse through appropriate recovery units.

Management of impacts on site water: The company will avoid tapping water sources used by the locals to supply the site (or to tap from water downstream of rivers used by the locals). It is recommended to drill boreholes for work purposes that could then be handed over to local communities. If this is not feasible, then private suppliers should be used.

Measures on the landscape and environmental aesthetics: the Contractor shall limit the storage areas for vehicles, machinery, materials and site equipment to the barest minimum, remove non-hazardous waste as work progresses and restore the site at the end of works.

Conflict prevention measures: Besides implementing the ARAP, the project shall: (i) develop an information/awareness campaign on the project's stakes and outcomes; (ii) give priority to the locals when recruiting workers; and (iii) ensure a wide dissemination of the recruitment criteria. In recruiting workers, women, youths and the locals must not be sidelined. The project will aim to recruit 30% women among the locals hired. The project shall set up a complaint management mechanism.

Health and safety: For the safety and health of the local community and staff working on the site: demarcate and restrict access of the locals to the sites; plan for the installation of adequate sanitary infrastructure for staff on the site (water, sanitation, changing rooms, first aid kit, etc.); raise awareness among local residents on protection of their movable property and food against dust.

Occupational safety and risk management during works: keep a register for staff medical monitoring, a register for recording accidents at work and a security register; provide workers with personal protective equipment (PPE); draw up a security plan before starting work; draw up a site traffic plan; ensure regulatory and/or preventive inspections and maintenance of machinery, equipment and site installations; build sufficient and standard toilets; limit construction noise that may indispose residents living around the site.

Measures targeting users and the local population: take measures to raise awareness among the locals and road users on the risks of STIs and HIV-AIDS. Provide workers with condoms against STI/HIV-AIDS. These activities will be carried out as part of the support measures.

Traffic and its impact management: prevent the obstruction of public access. Maintain traffic and access for the locals at all times during construction works. Ensure that no excavations or trenches remain open at night without adequate signage approved by the contracting authority. Provide temporary detours to facilitate safe traffic.

8.1.3. Mitigation Measures during the Road Commissioning

Runoff water management and erosion control measures: The project includes provision for water drainage from the roadway and its extensions through longitudinal and divergent trenches. However, these absorption basin sites should be located as far as possible from the surrounding villages. There are also plans to build a drainage channel and a collector in the lower part of Kikwit as an erosion control measure.
Landscaping and slope management: The project will also protect slopes by installing a 0.15 m thick layer of topsoil to facilitate vegetation regrowth and hence maintain materials in place. Shrub and/or plants with superficial roots or vetiver grass should be cultivated on the backfill in rural areas.

Road safety measures: The following measures should be implemented at “high risk” areas to reduce the risk of accidents: (i) build shoulders in villages crossed and parking lots especially on sections with reduced right-of-way; (ii) build car parks; (iii) install road signs at "high risk" areas; (iv) install road signs in quarters and villages crossed by the highway, markets, schools, health centres, car parks, public transport stops, corners, engineering works and bridges, etc. (v) Install speed bumps at the entrance to urban areas; and (vi) develop and implement a road safety awareness programme.

8.2. Enhancement Measures

Additional initiatives to be taken come under the project’s main component and concern: (i) the construction of agricultural and rural infrastructure; and (ii) social and community infrastructure, to enhance the project’s positive impacts. The measures were identified following public consultations. Agricultural and rural infrastructure includes:

- rehabilitation of basic infrastructure (Dumi (RN1) - Cité Guanela-Muliono-Bondo-Nkene-Mutiene (RN1) rural road over a 40-km stretch (including gutter-type engineering structures);
- Construction of a rural market in Bankana,
- construction of 5 warehouses and latrines (small ports at Kwilu, Bankana, Batshamba, Dumi, Mutsiêné),
- construction of 6 drinking water boreholes with the installation of standpipes in Guanela, Muliono, Nkene,
- construction of the Bankana rural market,
- rehabilitation of the Don Bosco Institute in Kenge and the ITPK in Kikwit;
- equipment of the existing Batshamba borehole with solar panels;
- installation of a scale at Bankana market; and
- rehabilitation of the Batshamba integrated health centre

The social infrastructure relate to:

- renovation of buildings: renovation of two buildings at the Saint Don Bosco Mixed Technical School in Kenge, renovation/construction and equipment of the computer room, two dormitories (boys and girls) with a refectory at the Kikwit Technical and Vocational Institute; renovation of the dormitories of the Centre for the Mentally Handicapped in Guanela, renovation and equipment of three OR provincial directorates in Kinshasa, Kenge and Kikwit, CSSP Kinshasa offices;
- equipment of technical buildings: solar panels and power generators (institutes, workshops).
9. Management of Expected Residual Effects and Environmental Risks

*The main risks, prevention and emergency response measures should they occur during the construction phase.* The construction company employees are most vulnerable to these risks. The project's main health and safety risks are at the construction work sites, with at least one concrete mixing plant, various workshops (ironwork, formwork, welding workshops, etc.) and works areas. Large quantities of diesel, which is a source of risk, will be stored on the site. Therefore, the main risks include fire and explosion, electricity, climate change, use of heavy vehicles, machinery, equipment and tools, noise and vibration, falling, handling, collapse and falling objects, traffic and movements, and diesel-related hazards. Mitigation measures have been developed in the ESMP for risks and hazards identified.

10. Monitoring Programme

10.1. Environmental and Social Monitoring

Environmental and social monitoring includes all inspection, control and intervention activities to ensure that: (i) all environmental protection requirements and conditions are effectively met before, during and after the works; (ii) prescribed or planned environmental protection measures are put in place and are effective in achieving the set objectives; and (iii) risks and uncertainties can be promptly managed and addressed. Environmental and social monitoring shall be conducted by the Control Mission (“Mission de Contrôle” - MdC), the Roads Authority and the Congolese Environment Agency (ACE), whose principal tasks will include:

- ensuring compliance with all current and specific project mitigation measures;
- reminding contractors of their environmental obligations and ensuring compliance during the construction period;
- drafting environmental monitoring reports throughout the works phase
- inspecting works and requesting appropriate corrective action, if necessary;
- preparing the final report of the environmental monitoring programme.

10.2. Environmental and Social Monitoring

Environmental and social monitoring is a scientific operation used to evaluate real project impacts and assess the adequacy of proposed mitigation measures. Therefore, it is the continuous review and observation of one or more relevant environmental and social components during the project's operational period. The objective is to regularly assess the status of implementation or execution of the mitigation measures recommended by the ESMP, to enable the contracting authority to specify, adjust, redirect or possibly adapt certain measures in light of the nature of the project's receiving environment.

The environmental monitoring programme uses environmental and social indicators to verify compliance with current national standards and AfDB operational safeguards activated by the project. Environment and social monitoring under this project will be carried out mainly by ACE through the measurement of a series of socio-environmental indicators. Monitoring will include the effectiveness of implementing the mitigation measures identified in the ESMP. The following aspects shall be monitored:

- deforestation/logging;
- soil erosion;
• air quality, soil and water pollution
• land acquisition and disruption of agricultural and socio-economic activities;
• health and safety on construction sites;
• land disputes and their resolution.

The following reporting arrangements are proposed for better monitoring of ESMP implementation:
• periodic monthly and/or detailed reports on ESMP implementation produced by the environmentalist of the company awarded the works contract;
• periodic (half-yearly and yearly) monitoring reports on ESMP implementation produced by the Control Mission (MdC);
• Half-yearly monitoring reports produced by ACE on environmental parameters (erosion, vegetation, water quality, air quality, noise levels, etc.) and violations observed in the project area.
• OR shall duly submit monthly reports to AfDB on complaints from the locals and road users (recommendation of appropriate solutions to the various issues raised);
• half-yearly or detailed reports on the supervision of ESMP implementation produced by OR and transmitted to AfDB.

11. Environmental and Social Management Plan

To be effective, the ESMP must be fully integrated into the overall project management in all its phases. The operational framework is summarised in environmental monitoring and follow-up activities (during the construction and operation phases). Therefore, the ESMP addresses and describes the framework within which all proposed mitigation measures must be implemented, in terms of the structure to be established for the effective implementation of mitigation measures, environmental monitoring and follow-up, the roles and responsibilities of various project stakeholders, the main tasks to be carried out during the project construction and operation phases, additional studies deemed necessary, and the financial resources to be mobilised and their sources.

11.1. Organisational Framework for Implementing the ESMP

Roads Authority (OR): as project promoter, the OR’s role is to ensure that all stakeholders play their roles effectively. Its role in preparing the ESMP is to: inform stakeholders, organises the ESMP feedback and validation seminar, consult with civil society during the ESMP implementation, regularly monitor the implementation through a monitoring mission that reports to stakeholders on issues raised during project and ESMP implementation, ensure the implementation of complementary measures to address environmental and social issues that affect the project impact area. Through its environmental division, the Roads Authority shall participate in supervision missions to enable it to take charge of environmental and social monitoring during the maintenance phase.

Ministry of Environment, Nature Preservation and Tourism (MECNT): the Ministry operates essentially through ACE and the Regional Environmental Coordination (CPE) of the provinces concerned, especially with regard to the validation of ESIAs and environmental/social monitoring (quarterly supervision mission).
ACE and Provincial CPEs: ACE acts on behalf of MECNT. It validates and monitors the implementation of project environmental and social measures. At the provincial and local level, the provincial CPEs will provide this monitoring.

The Construction Companies: these will be in charge of the physical execution of work on the ground, including implementing the ESMP. Companies will ensure the effective execution of certain mitigation measures contained in the ESMP and, where applicable, additional mitigation measures identified through environmental monitoring and surveillance. Internally, environmental monitoring will be carried out by the Company's environmental manager, who will ensure that the Company applies all the measures recommended in the ESMP.

Control Mission (MdC): the Control Mission will carry out the environmental and social monitoring of works, and check the effectiveness and efficiency of the environmental measures contained in the works contracts.

Local Authorities in the Project Area: these will participate in monitoring, public awareness and social mobilisation activities. Local technical services in each targeted community will closely monitor the implementation of ESMP recommendations. The local authorities will participate in social mobilisation, adopt and disseminate information contained in the ESMP, and monitor the infrastructure put up.

NGOs and other Civil Society Organizations: these organisations could also support the project by informing and raising awareness among transport system stakeholders and project beneficiaries about environmental and social aspects of road works and commissioning, as well as the risks of illegal poaching and logging.

11.2. Institutional Capacity Building Plan

Effective integration of environmental and social issues into project activities requires building the capacity of stakeholders responsible for implementing the project and monitoring the mitigation measures identified. They also include road users and the communities living in the project area.

ACE and the Roads Authority will be responsible for overseeing this capacity-building programme, which involves several components. As part of the overall project supervision, particularly the environmental and social aspects, the OR has an Environmental and Social Division that will be charged with ensuring that environmental aspects are effectively taken into account throughout the project implementation chain, and reviewing the environmental documents commissioned by the project. However, with respect to other stakeholders, efforts must be made to improve their environmental and social management capacity. In this regard, the training and capacity-building activities will involve the contracting authority and the project manager; local authorities, NGOs and local communities (information and awareness raising).

Training of stakeholders involved in project implementation: the training will target planning, management and monitoring/evaluation of the environmental and social components, as well as local technical services, construction companies and control offices. This will entail organising a training and refresher workshop to familiarise the structures involved in works implementation and monitoring with the ESIA, and their responsibilities in its implementation, etc. The topics will focus on: (i) land, environmental and social stakes of the works; (ii) health and safety; (iii) appropriate environmental regulations; (iii) a regulatory framework for environmental assessment; AfDB operational policies and safeguards; good environmental and social practices; environmental site control and environmental monitoring.

Information and sensitisation of the people and stakeholders concerned: OR shall coordinate the implementation of information and awareness campaigns targeting local communities, residents and road users, particularly on the nature of works and environmental and social issues during project
implementation. Local associations, transporters' organisations, and environmental and social NGOs should be actively involved in this process. Local authorities should also be fully involved in developing and implementing n of these awareness-raising and social mobilisation strategies. Awareness raising will also cover land issues, conflict management, vulnerability factors such as HIV/AIDS, accident risks, etc. This will involve organising information and presentation sessions in each targeted community, and holding people's assemblies at each site, through NGOs or pre-trained local facilitators. The local customary authorities should act as intermediaries with the people to inform them and sensitise them on project issues. Information at the local level (villages, etc.) could be entrusted to associations or NGOs with proven expertise in this area.

A provision of USD 50,000 was made for institution-building activities related to the ESMP. This amount will cover capacity-building activities in environmental and social management for technical departments, NGOs, city councils and others, etc.

**ESMP Implementation Budget**

The cost of implementing environmental and social measures is estimated at two hundred and sixty thousand US dollars (USD 260,000) excluding the Resettlement Plan, and corresponds to the amount that the project shall set aside for information and awareness of local communities, monitoring and implementation of environmental and social measures, capacity building for various stakeholders, environmental monitoring and follow-up. The costs are summarised in the table below:

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Cost USD</th>
<th>Quantity</th>
<th>Total Implementation Cost USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical and Institutional Capacity Building</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental and social capacity building activities for technical departments, NGO's, city councils and others, etc.</td>
<td>Lump sum</td>
<td></td>
<td>50 000</td>
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<tr>
<td>Institution Building of OR's Environmental Division</td>
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<tr>
<td>Recruitment of an environmental expert</td>
<td>5 000</td>
<td>12</td>
<td>60 000</td>
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<tr>
<td>Purchase of a 4x4 vehicle</td>
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<td>40 000</td>
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<tr>
<td>Provision of the OR Environment Division with computer hardware and office equipment</td>
<td>Lump sum</td>
<td></td>
<td>10 000</td>
</tr>
<tr>
<td>Awareness-raising, Monitoring and Mitigation Measures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of a drainage channel and collector in lower Kikwit</td>
<td>PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness-raising activities (STI/AIDS, water-related hygiene regulations)</td>
<td>Lump sum</td>
<td></td>
<td>20 000</td>
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<tr>
<td>Compensatory reforestation activities</td>
<td>Lump sum</td>
<td></td>
<td>40 000</td>
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<tr>
<td>Service provider for maintenance of plants</td>
<td>Lump sum</td>
<td></td>
<td>10 000</td>
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<tr>
<td>Environmental and social monitoring activities</td>
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<td>30 000</td>
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<td>Measures for preventing incidents and accidents on the site</td>
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<td>PM</td>
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<tr>
<td>Additional Initiatives</td>
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<td></td>
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<tr>
<td>Drilling of boreholes and construction/rehabilitation of health and school facilities</td>
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<tr>
<td><strong>Cost of ESMP</strong></td>
<td></td>
<td></td>
<td><strong>260 000</strong></td>
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</table>
12. REFERENCES AND CONTACTS

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