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Social and Environmental Impact Assessment (SEIA) Addendum for GAC's Bauxite Export Project, Guinea

Non-technical summary

Guinea Alumina Corporation S.A. (GAC)

October 2015

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Guinea Alumina Corporation S.A. (GAC)

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Signed by: Camille Maclet



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On behalf of ERM France SAS

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NON-TECHNICAL SUMMARY

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This document is a Non-Technical Summary (NTS) of the social and environmental impact assessment (SEIA) Addendum study undertaken by Emirates Global Aluminium (EGA)/ Guinea Alumina Corporation (GAC) in 2014-2015 for GAC's proposed export-grade bauxite project (the Project). It provides an overview of the SEIA findings, focusing on the key social and environmental issues arising from construction, operation and closure of the Project, as well as the approach that GAC proposes to adopt in order to manage these issues, and where possible enhance the Project's positive impacts.

This NTS is structured as follows:

- Section 2 is an introduction on GAC's commitment to health, safety and the environment.
- Section 3 introduces GAC, the proponent of the Project. It also includes a summary of the Guinean regulatory framework and international standards that were considered in developing the SEIA Addendum.
- Section 4 describes the Project and key alternatives considered.
- Section 5 describes how the Project will translate in terms of employment for professionals in Guinea and beyond.
- Section 6 outlines the stakeholder engagement program followed by the SEIA.
- Section 7 provides a summary of the evaluation of environmental and social impacts and benefits of the Project, and summarizes the measures that GAC proposes to implement to address them.
- Section 8 outlines end-of-mine-life closure and rehabilitation activities.
- Section 9 provides a summary of how GAC will implement environmental and social management measures, through a Project-specific Social and Environmental Management Plan (SEMP).

As stated in EGA/ GAC's Code of Business Conduct, "A key Charter value is our overriding commitment to health and safety and our aspiration for Zero Harm to our people, the environment and the communities in which we operate".

In application of this commitment, EGA has adopted a Health, Safety and Environment (HSE) policy that states:

"We at EGA are committed to Health, Safety and Environment of our stakeholders and society at large wherein we carry out our business, also committed to continuous improvement and sustainable development".

The GAC bauxite export project is being developed by EGA/ GAC in line with these HSEC commitments. This implies EGA and GAC's continuous attention to proactive and sound management of health, safety and environmental risks and impacts.

3.1 *GAC*

Guinea Alumina Corporation (GAC) is a Guinean registered company owned by Emirates Global Aluminium (EGA), a joint venture of Mubadala, an investment and development company established by the Government of Abu Dhabi, and the Investment Corporation of Dubai (ICD) established by the Government of Dubai. EGA acquired full ownership of GAC in June 2013.

Under previous ownership, in 2004, GAC signed a concession agreement with the Government of the Republic of Guinea to develop a bauxite mining and refining project in the sub-prefecture of Sangarédi, prefecture of Boké, in the north-west of Guinea. The agreement also includes a port concession in the coastal city of Kamsar, to allow for the shipping of product to the international market.

The original project was subject to initial SEIA studies, carried out by GAC in 2004, 2005 and 2006, and subsequently submitted to and approved by the Guinean ministry in charge of environmental affairs. The results of these SEIA studies were compiled in an integrated social and environmental impact assessment (SEIA) in 2008. The original study contemplated mining and refining operations in the northern part of the concession. The original integrated SEIA was disclosed to the International Finance Corporation (IFC) as part of financing discussions.

3.2 *LIKELY BENEFITS OF THE PROJECT FOR GUINEA*

With its low cost, high quality bauxite and relatively central location to both the Asian and Atlantic market, Guinea has an opportunity to become an anchor supplier to the global bauxite and aluminum markets.

The Project will be transformational for Guinea. The country has only one significant bauxite export mine under operation (CBG's operations in Sangarédi and Kamsar). The Project will lead to the development of a second major bauxite mine in Guinea, which will improve the positioning of Guinea on the world market (nowadays, Guinea produces less than 7% of world bauxite, even though it has over 50% of known resources).

The Project will translate into an investment of approximately USD 1.1 billion, increasing Guinea's visibility and improving international credibility and business perception. The Project will generate and estimated incremental USD500 million per annum of GDP contribution and USD250-300 million to the Guinean trade balance given 100% of production destined to export.

In terms of employment and local economic uplift, the Project will lead to:

- the creation of more than 2,200 jobs during construction, about 700 permanent jobs and 1,500 indirect jobs; and
- the integration of 200 Guineans in EGA's operations for training and up-skilling in the UAE for subsequent redeployment in Guinea.

At regional scale, through infrastructure improvement at the port of Kamsar (commercial quay to be completed in 2015-2016), the Project may contribute to the emergence of other regional opportunities for economic development, including agricultural export, as well as material import. This may provide a pillar and catalyst for the development of the Boké corridor as an alternative to the congested Conakry Port.

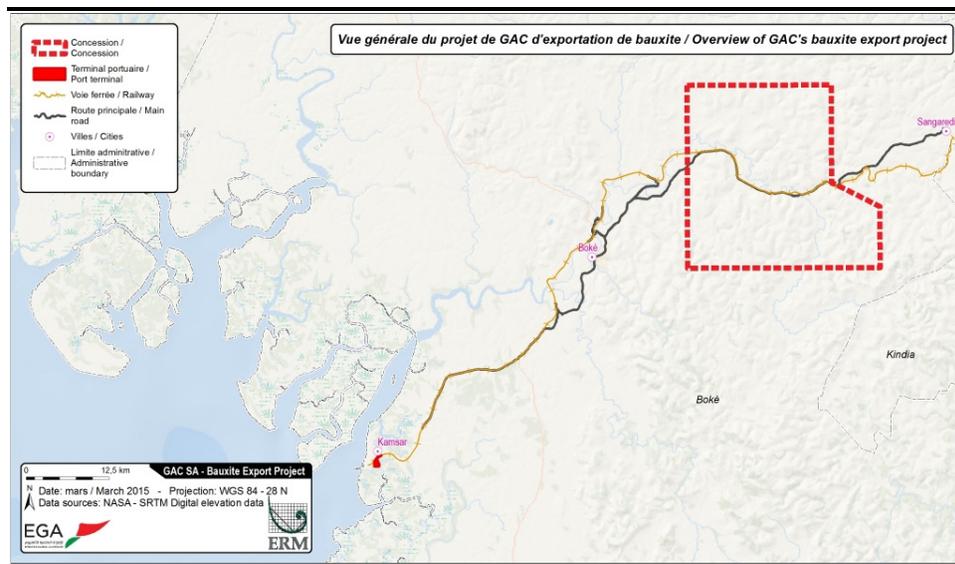
3.3 CONFIGURATION OF THE BAUXITE EXPORT PROJECT

GAC's bauxite export project will include:

- Greenfield bauxite mining activities in the southern part of the GAC concession, with capacity to produce up to 17 million tons per annum (Mtpa) of high grade bauxite.
- The development of two rail sidings connected to the existing Sangarédi to Kamsar rail line, at the mine and port locations to load and unload the ore.
- A bauxite ore crushing plant, stockyards and rail loading facility, to be located adjacent to the bauxite mine, within the concession area.
- The development of bauxite storage and export facilities at the GAC port concession in Kamsar.

The regional setting of the Project is shown in *Figure 1.1*.

Figure 3.1 Overview of GAC's bauxite export project in the Préfecture of Boké



3.4 THE SEIA ADDENDUM

The SEIA Addendum developed for the Project aims to complement the initial SEIA studies undertaken between 2004 and 2008, focusing on the southern half of the concession and the specific infrastructures and activities of the Project.

3.5 THE GUINEAN REGULATORY FRAMEWORK

Regulations on environmental impact assessments (EIA) in Guinea are defined by *ordonnance N°045/PRG/87 du 28 Mai 1987, modifiée par l'ordonnance N°022/PRG/89 du 10 Mars 1989, portant Code de la protection et de la mise en valeur de l'environnement (Order N°045/PRG/87 of 28 May 1987 modified by Order N°022/PRG/89 of 10 March 1989 defining the code for protection and valorisation of the environment)*. In addition, the *décret présidentiel 199/PRG/SGG/89 du 8 novembre 1989 codifiant les études d'impact sur l'environnement (Presidential decree 199/PRG/SGG/89 of 8 November 1989 defining the rules for environmental impact assessments)* defines projects subject to an EIA and its approval by the ministry in charge of environment. Lastly, *arrêté ministériel 990/MME/SGG/90, du 31 mars 1990, définissant le contenu, la méthodologie et la procédure de l'étude d'impact sur l'environnement (Ministerial act 990/MME/SGG/90 of 31 March 1990 defining the content, methodology and process for environmental impact assessments)*, establishes the content, methodology, and procedures to be complied with when carrying out an environmental impact assessment.

The General Guide for Impact Studies, published in February 2013 has clarified the approval process of the SEIA. The entire submission and permitting procedure is managed by the *Bureau Guinéen des Etudes et Evaluations Environnementales (BGEEE – the Guinean environmental*

directorate). Formal review of the permitting documentation is undertaken by the *Comité Technique d'Approbation Environnementale* (CTAE), an ad-hoc multi-disciplinary team composed of representatives of various ministries relevant to the Project. The final environmental compliance certificate is issued by the Ministry in charge of environment. Final approval is under the responsibility of the ministry in charge of the Project – in the case of GAC, the ministry of mines. The Guidelines for Environmental and Social Impact Assessment for Mining Operations of February 2013 (*Directive de réalisation des études d'impact environnemental et social des opérations minières*) sets out specific guidelines with regards to the procedure and the content of an environmental and social impact assessment for mining projects.

3.6

GAC'S APPROACH TO SOCIAL AND ENVIRONMENTAL RESPONSIBILITY

GAC has developed key operating principles that include protecting the health & safety of its employees, contributing to sustainable development and conducting business with integrity. GAC aims to work closely with host countries and communities, respecting their laws and customs and ensuring a fair share of benefits and opportunities. This defines the way GAC manages the economic, social and environmental challenges of its operations and are important to fulfilling the company's commitment to contribute to sustainable development.

The key HSSEC policies developed by GAC will be applicable to the Project. Key GAC policies that will be enforced throughout the Project lifecycle include:

- GAC Code of Business Conduct;
- GAC Environmental Policy;
- GAC Community Policy;
- GAC Health & Safety Policy;
- GAC Drug & Alcohol Policy; and
- GAC Procurement Policy.

3.7

INTERNATIONAL LENDERS REQUIREMENTS

GAC is expecting that the Project will be financed with the participation of different international financial institutions (IFIs). It is expected that such IFIs will require the Project to comply with applicable international environmental and social sustainability standards.

The most widely accepted international standards are the International Finance Corporation's Environmental and Social Performance Standards (2012) or IFC PS and African Development Banks Integrated Safeguards System (Dec 2013).

The IFC's Sustainability Framework (updated 1 January 2012) and AfDB Integrated Safeguards System (Dec 2013) are widely considered as the most

complete sets of standards for environmental and social management. The Project will therefore seek compliance with the IFC and AfDB's standards.

The Performance Standards (PS) relevant to the Project are:

- PS1: Social and Environmental Assessment and Management Systems.
- PS2: Labor and Working Conditions.
- PS3: Resource Efficiency and Pollution Prevention.
- PS4: Community Health, Safety and Security.
- PS5: Land Acquisition and Involuntary Resettlement.
- PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.
- PS8: Cultural Heritage.

The Operational Safeguards (OS) relevant for the Project are:

- OS 1: Environmental and social assessment;
- OS 2: Involuntary resettlement land acquisition, population displacement and compensation;
- OS 3: Biodiversity and ecosystem services;
- OS 4: Pollution prevention and control, hazardous materials and resource efficiency; and
- OS 5: Labor conditions, health and safety.

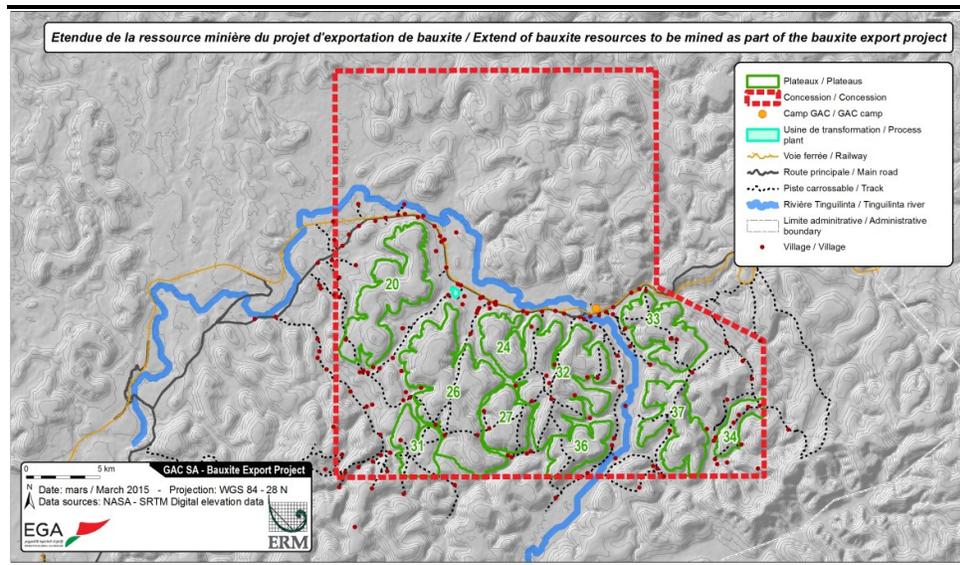
In addition, the World Bank Group / International Finance Corporation (IFC), Environmental, Health and Safety (EHS) Guidelines of April 2007 and AfDB relevant keysheets were used to provide specific guidelines on effluents and wastes management, and supplement Guinean regulatory standards, where the IFC standard or AfDB keysheet were found to be more stringent than the national standard.

GAC is also expecting that the Project will be financed with the participation of international commercial banks, some of which will be signatories of the June 2013 version Equator Principles.

4.1 OVERVIEW OF THE MINE

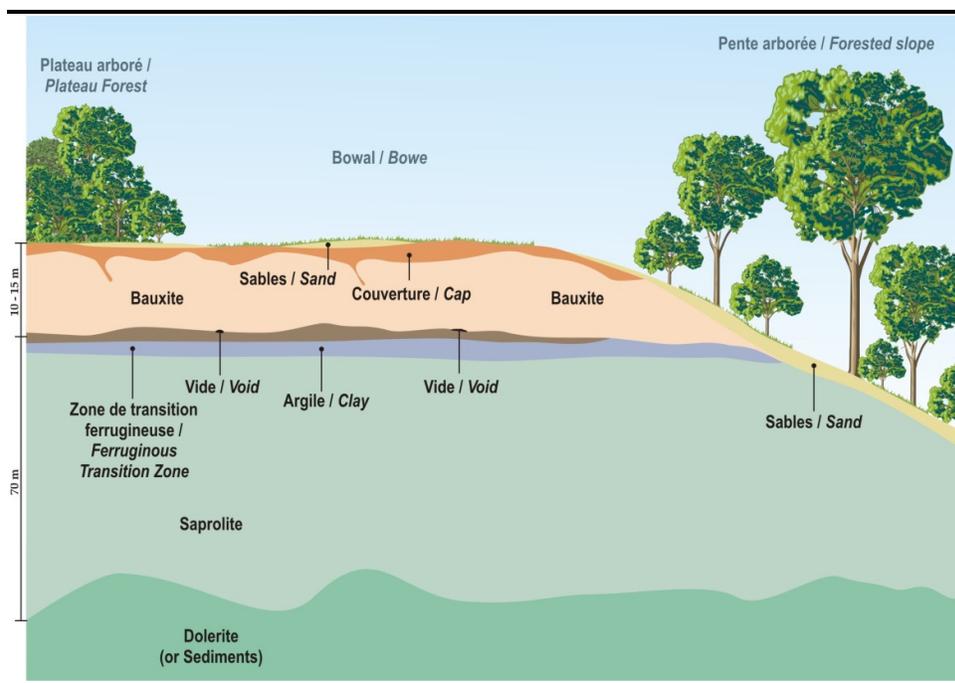
The location of bauxite resources to be mined in GAC's concession near Sangarédi, as well as the location of proposed mine infrastructure, is shown in Figure 4.1

Figure 4.1 Extent of bauxite resources to be mined as part of the Project



The bauxite ore is located on top of the plateaus in a layer of 8 to 10 m in deep, as shown in Figure 4.2.

Figure 4.2 *Illustrative geological cross-section of bauxite deposits in the GAC concession*



GAC intends to mine, process and export 8 Mtpa (dry) of bauxite from Q2 2018, ramping up to potentially 17 Mtpa (dry) from 2020, for a proposed Project life of at least 20 years.

Ore transportation will require upgrading the existing Sangarédi to Kamsar rail line, currently operated under concession by CBG (Compagnie des Bauxites de Guinée). All necessary rail upgrades (except GAC's rail sidings at the mine area and the port) will be managed by CBG and are therefore not covered as part of this SEIA Addendum.

The ore will be mined on the different plateaus, in open pits created by drilling and blasting the rock, then loading it onto haul trucks and moving it to crushers and sizers.

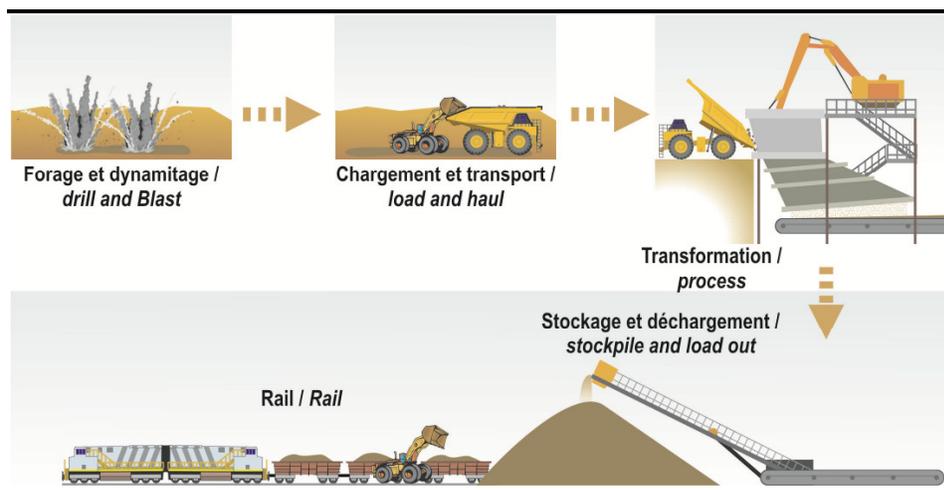
The mining plan is not yet totally defined. However, mining activities will start on plateaus 20, 24, 26 and 27. They will then extend to other plateaus. At any given stage during mine life, GAC expects that at least three plateaus will be actively mined. Several pits may be mined simultaneously to ensure consistent product quality on a given plateau.

In order to achieve target grade requirements, the bauxite mined from various pits will be blended at the pit location and at the mine processing infrastructure.

The mine has been designed to provide both export and future refinery-grade bauxites. The export grade bauxite will be transported to the crusher and

stockpiled close to the mine plant. Where needed, refinery-grade material will be mined concurrently with export grade and stockpiled on the plateaus at a distance of 2 to 5 km maximum from the pit for future use. This will allow for mine restoration to be carried out on the mined-out areas. Areas of solely refinery grade will not be mined but left *in-situ*. No further mining operation are planned in the future in these areas. Overburden will be stored on the plateaus to be used during the concurrent rehabilitation of the pit.

Figure 4.3 *Key stages in the mining process*



The mine will operate on the basis of a 24h day, seven days per week (drilling bauxite excavation, loading, hauling and processing). Blasting will happen during daytime only.

Plateaus will be connected by haul roads running along the tops of the plateaus and designed to accommodate the selected vehicles. Haul roads will connect plateaus to one another and to the processing facility

The Project does not expect mining activities to generate any significant quantity of mine water, since most of the bauxite reserves are located above the saturated zone.

4.2 **MINE INFRASTRUCTURE**

The mine infrastructure area will include the crushing plant, transfer conveyor, ore stockpile, loading platform as well as a water clarification and settling dam and cover a footprint of approximately 3 to 4 ha. It will be located approximately 500 meters south of the existing road linking Boké to Sangarédi.

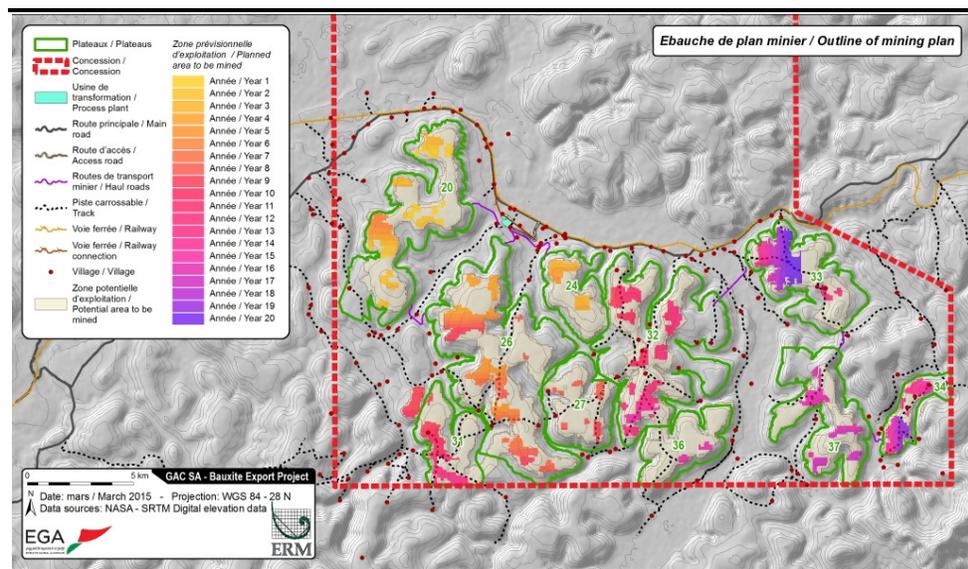
In addition to the main facilities the mine will also include:

- a diesel-fueled power generator (10 MW) to supply electricity to the ore processing plant and other facilities;
- a bulk fuel storage facility (500 to 2,000 m³ storage tank);
- an explosives storage area, already developed and permitted, and located in the northern half of GAC's concession;
- fire system and associated water tanks;
- a drinking water treatment unit and storage facilities;
- wastewater and storm water collection and treatment facilities; and
- offices.

4.3 PROGRESSIVE REHABILITATION AND MINE CLOSURE PLANNING

The Project mining plan is based on the successive mining of the bauxite plateaus, and the reclamation of these after they are mined. Therefore potential physical or economic displacement linked to the exploitation of plateaus will occur progressively in accordance with the Mining Plan. Whilst activities in the west of the GAC concession will start from year 1 of the Project, the central and eastern parts of the concessions will only be mined after several years. This is illustrated in the outline of indicative mine plan shown in Figure 4.4 hereafter.

Figure 4.4 Outline of indicative mine plan



Once a mining pit is depleted, mine closure and rehabilitation activities will take place. These will be done according to GAC's Mine Closure and Rehabilitation plan, particularly with regards to safety, water drainage, reinstatement of soils and ecosystems in a manner consistent with the natural environment, and land use plans agreed through the stakeholder engagement process and environmental assessment. Mine closure and rehabilitation

activities are expected to start within approximately one to three years of the start of operations depending on pits.

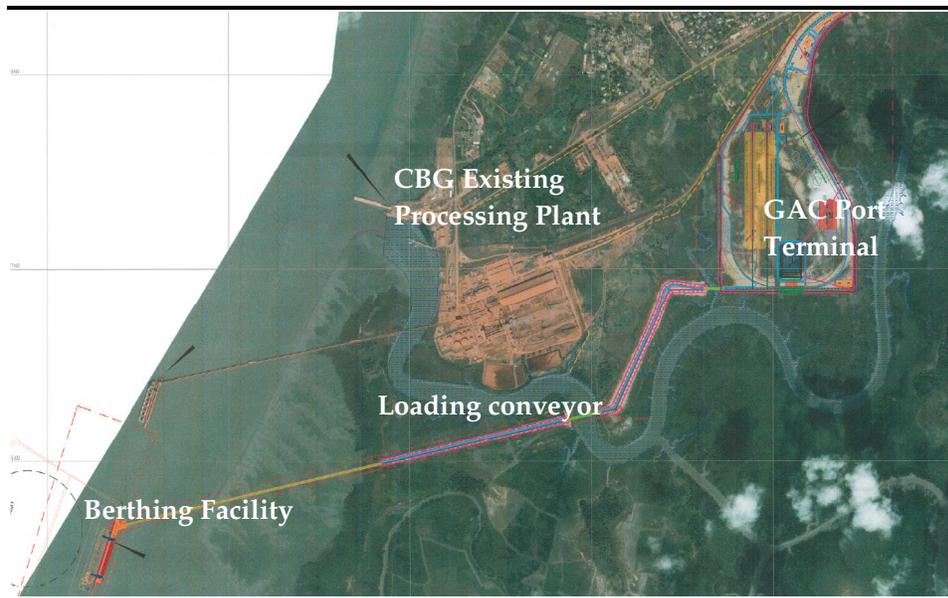
4.4 OVERVIEW OF THE PORT

In 2007, GAC developed a compacted sand platform over the entirety of its port concession area at Kamsar, to the south of the existing ANAIM rail line, and north of the Dougoufissa Creek flowing into the Rio Nuñez estuary.

As part of the bauxite export Project, this platform will include a rail terminal and train offloading facilities, a bauxite stockpile area as well as a reclaiming and conveyor transport to load the bauxite onto vessels, at a new loading berth to be located approximately 2.5 km to the west of the GAC port platform.

Supporting utilities and ancillary facilities, including water desalination, power generation, and workforce accommodation will also be constructed in the port concession.

Figure 4.5 Overview of proposed port components



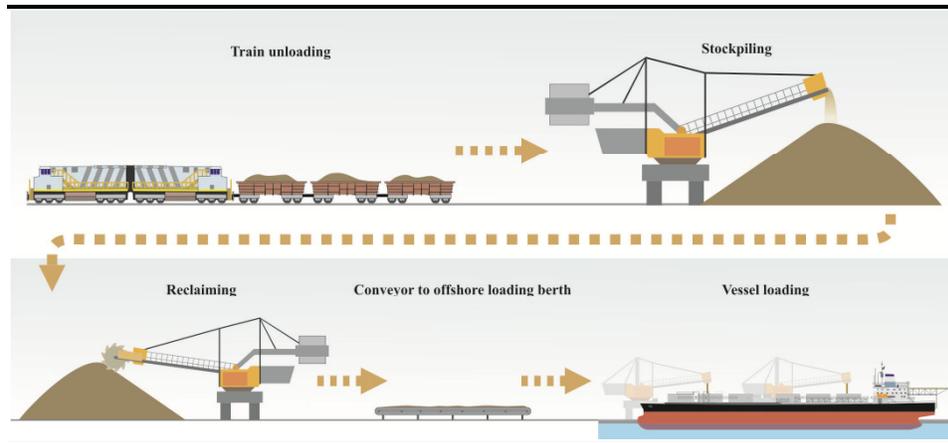
Key activities to take place at the port will be:

- unloading of rail wagons using a dual rotary tippler;
- conveyor from bauxite unloading point to a stacker / stockpile facility, into the bauxite stockpile;
- bauxite reclaimer and loading onto a conveyor to the vessel loading berth; and

- use of transshipment vessels to complete the loading of vessels partially loaded at the berth and then topped up in a dedicated transshipment area located outside the entrance of the channel.

Proposed port operations are illustrated in *Figure 4.6*.

Figure 4.6 Key stages in proposed port operations



The port infrastructure area will be powered by diesel generators. The power requirements are estimated to be less than 25MW.

A reverse osmosis (RO) desalination plant will also be constructed within the port concession area, to treat water pumped from the Dougoufissa Creek, with a production capacity of 450- 600 m³/d of treated water.

4.5

DREDGING

As presented above, GAC considered different options for the loading and export schemes of the ore. The preferred one would be to export 100% of the bauxite in Capesize vessels without using transshipment vessels (TSV), allowing vessels to be loaded directly at the berth. For this option, the existing navigation channel in the Rio Nuñez estuary would need to be increased from its existing width by an additional 80 m. In addition, the channel would need to be deepened from its current 9 m depth, to 19m.

The dredging program will be implemented in successive phases. This will include the initial widening and deepening of the channel to allow Newcastlemax vessels to sail to the berth to be partially loaded, and then topped-up at a transshipment site. At a further stage, the channel will be deepened to allow Newcastlemax vessels to be fully loaded at the berth and sail at mean high water neap tides. The exact schedule of these deepening stages is not yet defined and will be influenced by economics determined by the bauxite international market.

The execution of this dredging program would generate 6 million m³ of dredging sediments in the first phase (widening and deepening) and an additional 28.4 million m³ in total for the further phases (deepening for fully loaded Newcastlemax passage).

4.6 *KEY PROJECT ALTERNATIVES CONSIDERED*

The SEIA Addendum presents various alternatives that were considered by GAC as part of the Project definition process, with a view to maintaining an acceptable balance between technical and commercial feasibility and environmental and social impacts and benefits.

The key alternatives considered and the preferred options are as follows:

- Development of the mine plan across GAC's concession, and rate of mining of bauxite plateaus within the proposed mining area. Ultimately, the mining of the southern part of GAC's concession associated with wet ore exportation was considered as the best case, mainly considering its commercial feasibility.
- Mine infrastructures locations, to the east or west of the GAC southern concession. The western alternative was selected. This allows shortening train travel from the mining area to the port, and therefore limiting transportation time, costs and nuisances. This also allows reducing the needs for stakeholder resettlement at the proposed infrastructure footprint.
- Water supply to mine operation – options considered included surface water pumping from the Tinguilinta River, groundwater pumping and raw water reservoir. Given the need to maintain sufficient flow in the Tinguilinta River, particularly during the dry season, water will be supplied from a combination of these three sources, with no surface water pumping from the Tinguilinta in months of low flow. Where possible, run-off water from the mine area will be recycled, e.g. for dust controls at the mine site.
- Marine terminal site selection - considering the railway infrastructure and the limited resettlement potential associated with the site, the option of the platform constructed by GAC in 2007 was preferred.
- Different marine loading and export schemes were evaluated by GAC on their technical feasibility. The option of exporting 100% of the bauxite in Newcastlemax vessels without using transshipment vessels considered as the best case, mainly considering its commercial feasibility and the potential economic development for the region and the country. The dredging program to implement this option may be implemented step by step taking advantage of the maintenance dredging undertaken every three to four years.

Prospective workforce numbers for the Project (including subcontractors) are as follows:

- Construction: between 800 and 1000 (peak workforce) at the mine, and up to 2200 (peak workforce) at the port.
- Operation: between 200 and 500 at the mine, and between 300 and 500 at the port.

The ratio of supervisory to execution and support-level staff is expected to be 10% to 15%.

Workforce will be recruited locally where possible, based on available skills, competence, and professional experience.

Through the EGA/ GAC Code of Business Conduct, GAC is committed to equal opportunity, freedom from harassment, worker security and zero harm to health and safety of its workforce. This is transcribed into GAC's human resources processes and health and safety policy and operational procedures.

Guinean regulations and international good practice in social and environmental assessment and management require developers to identify and engage with stakeholders through pro-active and timely consultation and disclosure about the Project and its impacts. The program of consultations undertaken as part of the SEIA was designed to inform stakeholders about the developing plans and give them an opportunity to express views on the Project and on impacts that should be investigated in the SEIA.

The project undertook the engagement at different levels and the main authorities, associations and organizations involved in the Project were consulted, including various technical departments, the port authorities, the police, the personnel of the healthcare and education infrastructure, private contractors and representatives of civil society organizations.

The *Bureau Guinéen des Etudes et Evaluations Environnementales* (BGEEE), responsible for overseeing the environmental permitting procedure in Guinea and coordinating the review of environmental and social impact assessments was also consulted during key stages of the SEIA development process.

A large number of civil society organizations and NGO's are active in the footprint of the mine Project, including the *Centre du Commerce International pour le Développement* (CECIDE), active in the mining sector, on Corporate Social Responsibility (CSR) and on protecting people's interests

Over the course of the SEIA, multiple rounds of consultations were organized at the mine and port area, including as part of the first phases of the SEIA but also during the scoping and baseline phases of the SEIA Addendum. About fifty consultations with more than 1,900 people were carried out in the communities of the Mine area. Almost 20% of the total adult population recorded were informed and consulted on their concerns and expectations concerning the GAC Project.

The results of the stakeholder engagement were taken into account during the process of completing the SEIA and are discussed in the SEIA Report. Key concerns raised by consulted people included:

- loss of access to land;
- compensation for the restoration of livelihoods;
- employment opportunities with Project subcontractors, youth employment;
- impacts on cultural heritage;
- impacts of in-migration, including education infrastructure;
- infrastructure development and access to safe drinking water; and
- disturbance related to Project-induced pollution and nuisances such as air emissions, dust and noise.

Following the submission of this SEIA Addendum report to Government, the next steps proposed as part of the SEP are to organize another round of public consultations, whereby the SEIA Addendum Report will be made widely available for public comment, and its findings communicated to affected communities through a wide variety of means. All comments made on the Project, its impacts and the proposed mitigation will be considered in completing the final design, planning construction, operation, as well as finalizing and implementing the Social and Environmental Management Plan.

7 SUMMARY OF SOCIAL AND ENVIRONMENTAL IMPACTS ADDRESSED IN THE SEIA ADDENDUM

7.1 SEIA ADDENDUM REPORT ORGANIZATION

The SEIA Addendum report is divided in four separate volumes covering the environmental (Volume 1), social studies (volume 2) and a Social and Environmental Management Plan (volume 3), and annexes (volume 4). Each volume is divided in chapters addressing the different components of the Project, from the mine to the port, and covering a very wide range of impacts.

Both volumes 1 and 2 follow a similar structure and present information on;

- Baseline conditions, i.e. existing environmental and/or social conditions, prior to Project development.
- The expected significance of potential impacts, both negative and positive: in other words, the importance of environmental and social changes that may result from the Project, across the Project life. This has included a comparison of predicted changes with relevant standards.
- Mitigation or enhancement commitments: the measures the Project proposes to implement in order to avoid, reduce, mitigate and/or compensate for negative impacts, and to enhance the benefits of the Project through design and operation.

7.2 THE NATURAL ENVIRONMENT

7.2.1 Key topics addressed in the SEIA Addendum

The SEIA Addendum covers the topics outlined in *Table 7.1*:

Table 7.1 *Environmental topics addressed in the SEIA Addendum*

Topic	Mine site	Port site
Air quality	Included	Included
Greenhouse gas emissions	Included	Included
Noise and vibration	Included	Included
Soils/Geology	Included	Included
Surface water	Included	Included
Groundwater	Included	Included
Topography and visual resources	Included	Included
Terrestrial biodiversity	Included	Included
Freshwater ecology	included	Included
Waste and hazardous materials	Included	Included
Marine Physicochemical environment	Not relevant	Included
Marine biodiversity	Not relevant	Included

Air quality, noise, biodiversity and water issues received additional focus as these are areas where potential impacts were found to be significant – which led to particular focus on the definition of appropriate mitigation throughout the SEIA Addendum development study.

7.2.2 *Definition of buffer areas for avoidance of impacts*

As Project-wide commitment to environmental mitigation, GAC proposes to develop the mining plan using pre-defined buffers between the Project activities and the environment, to limit direct footprint and nuisance impacts on the environment. Buffers will be defined as follows:

- 50 m from any water body;
- 300 m along headwaters that sustain forest galleries ;
- 100 m from the Tinguilinta river (the main river in the mining area);
- 250 m from water abstraction sites and wells used by communities;
- 100 m from any sensitive ecological site;
- temporary buffer zone of up to 800 m from blasted areas during blasting operations (depending on specific blasting parameters); and
- 50 m from mangrove areas (at the port).

7.2.3 *Air quality*

7.2.3.1 *Mine*

Ambient air quality monitoring data collected at various receptor points within the Project area indicates low levels of background concentrations of air pollutants, suggesting that the airshed in Project area can be considered as of reasonably good quality. Occasional elevated levels of air pollution may occur locally, due to local community activities – mainly from slash and burn agriculture, domestic woodstoves, and emissions from poorly maintained vehicles. Such elevated levels were not measured during the monitoring campaign undertaken as part of this SEIA Addendum.

The Project at the mine area will primarily generate dust emissions from blasting, vehicle traffic on unpaved haul roads and other unpaved road surfaces, and from ore handling infrastructure. Fossil fuel combustion emissions will also result from power generation at the mine site (anticipated to be of limited significance), and also, more importantly, from the exhausts of the mine vehicle fleet composed of haul trucks, front-end loaders, and other vehicles.

A computer model has been used to predict the effect of the Project on air quality and the predicted levels were compared to IFC EHS guidelines and WHO air quality interim targets. The mining activities and processing plant was simulated using three operating scenarios across the lifetime of the mine to address the variability of the mine works, covering different time horizons.

The results from the assessment of the emissions concentrations levels were compared to the applicable standards. The results show that the Project may cause elevated ambient concentrations of nitrogen oxide (NO₂), sulfur dioxide (SO₂) and particulate matter (PM), above applicable guidelines, albeit only at some receptor points located within close proximity of emissions sources. In reality, most receptors (i.e. community settlements) located adjacent to the mining areas will be resettled to allow for access to the bauxite resource and will not be receptors during the mine operation.

Impacts will mostly be during the operation phase. As part of the construction phase, the Project will however develop specific measures in the management of air quality emissions, based on international good practices. It will cover topics such as the avoidance of exposed surfaces soil and cleared areas re-vegetation, prohibition of open burning of cleared vegetation and waste or implementation of permanent dust suppression systems.

In addition of implementing good international practices for the use and the maintenance of the equipment as operational mitigation measures, GAC will take into account the air emission rates of the equipment at its purchase step.

Dust resulting from vehicle traffic on unpaved surfaces (only a risk during the dry season) will be reduced through standard dust controls, including water spraying with the possible use of dust suppression additives.

An air quality monitoring program will be developed and implemented to confirm the modeling results and measure the Project compared to the applicable targets. If impacts are determined to exceed World Health Organization (WHO) criteria the option to relocate and compensate additional affected people will be considered. With the measures presented above and the accompanying monitoring program the Project will ensure air quality standards are met.

7.2.3.2 *Port*

The context of the port varies from the mine area as Port Terminal is surrounded by urban developments (city of Kamsar), industrial facilities (CBG bauxite processing, storage and export complex) and natural habitats (mangroves). Air quality monitoring data indicates that the airshed around the port area may be classified as “undegraded” for NO_x and SO₂ but “degraded” (using the terminology of the IFC EHS Guideline) for airborne breathable particulate matter concentrations.

The main sources of airborne dust during the operation of port terminal will be the handling of ore in the terminal, the transportation of the ore by means of conveyors, the loading of the ore on ships, and the wind blow from exposed surfaces. NO_x and SO₂ emissions will be mostly related to power generation at the site.

The impacts associated with atmospheric pollution from the operation of the GAC port terminal, including NO_x, SO₂ and particulate matters, were observed to be limited over most of the area of influence, including the Kamsar urban area. The implementation of international best practice measures to reduce dust generation and exhaust emissions, including installation of wind breaks and water suppression or chemical dust suppressant, and appropriate maintenance of generators, equipment and vehicles, will keep impacts within acceptable levels.

7.2.4 *Greenhouse gas emissions*

Greenhouse gas (GHG) emissions are of concern globally because of their contribution to global climate change. It is good practice for any major project that results in significant quantities of GHG emissions to calculate these and identify measures that can be taken to minimize the potential contribution to climate change.

GHG emissions from the Project will primarily be associated with power generation at the port and the mine, bauxite haulage within the mine area, as well as the transport of material by train between the mine and the port terminal. The total carbon footprint of the Project has been estimated at approximately an average of 220 kt of CO₂e per year during twenty years, or 4.4 Million tCO₂e over the project lifetime (see *section 7.2.11*).

Deforestation activities during land clearing operations will also represent a large contributor to the overall inventory representing 1.8 Million tCO₂eq over the project lifetime, or 40% of Project total GHG emissions.

GAC aims at developing a credible and robust GHG emissions inventory with respect to the proposed bauxite mine, including deforestation associated with site clearance and preparation, as well as at determining the recovery of sequestration potential after reforestation as part of the rehabilitation of the mined areas. The recovery of carbon sequestration potential associated with reforestation activities shall enable GAC to remove more than 350 ktCO₂e from the atmosphere (8% of total project emissions) and mitigate part of the project impact on climate change.

Measures for limiting GHG emissions have been built into the design of the project, focusing on actions to reduce its impacts on climate change that includes:

- considering the energy efficiency in the purchase criteria of the equipment;
- ensuring energy and fuel consumption is precisely metered and reported;
- identifying areas for energy efficiency assessment;
- reducing energy and fuel consumption;
- considering incorporating renewable energy sources into the Project's energy supply, where possible;
- setting carbon reduction targets;
- implementing a monitoring plan for reforestation activities; and

- developing a robust carbon offset strategy to mitigate the potential project impacts on climate change.

7.2.5 *Noise*

7.2.5.1 *Mine*

The baseline acoustic environment in the mine area does not show any critical situations in terms of noise levels, except for receptors in the vicinity of the existing railway. The noise levels recorded during the monitoring campaign are relatively low and typical of rural areas of Guinea.

As presented in the Project description, mining operations will be 24 hours, seven days a week but blasting will only be undertaken during daylight hours. The main source of impact related to the Project activities are associated with the processing plant, the operations at the mine pits as well as the vehicle movements along the haul roads from the mine sites to the processing plant.

Modeling has been used to predict the effect of the project on the noise levels in receptors surrounding the mine and these have been compared with thresholds derived from international standards for day-time and night-time noise levels defined by the IFC and the WHO.

Construction noise impacts, mostly associated with site preparation / civil engineering work, were found to be most likely confined to the immediate vicinity of the works, therefore not likely to affect any nearby community settlements.

Noise generated by mine operation and ore transportation is predicted to cause limited impacts as most nearby human receptors identified in the mining area will need to be resettled to allow for access to the bauxite resource. Other settlements such as the village of Wossou, located on plateau 33 and surrounded by known bauxite resource, will be particularly sensitive to the nuisances generated by the Project, including noise, dust and vibrations. The possibility of designing the future mining plan to avoid disturbances to Wossou settlement and of a re-routing of the haul road currently planned near Wossou will be evaluated as a mitigation measure as the Mining Plan is further developed. Alternatively, as part of GAC's Resettlement Action Plan and Community Engagement Strategy, GAC proposes resettling the affected village. Note that the Mining Plan does not envisage starting mining activities near Wossou until 15 years from start of operations, therefore leaving time to refine the impacts mitigation plan specifically for this settlement and other settlements in the eastern half of the mining area.

GACGAC proposes reducing noise impacts from the Project by:

- considering noise levels in selection of equipment;
- providing noise shielding and barriers where possible;
- restricting noisy activities to daytime as much as possible; and

- implementing appropriate traffic management rules to limit the occurrence of noisy vehicle traffic activities at night and in the close vicinity of community settlements.

The Project activities at the mine area will also generate vibrations from blasting, mine and process plant as well as road transportation. Blasting was found to constitute the main source of vibrations from the Project. It was found that significant impacts on human receptors were unlikely to occur, given GAC's proposed blasting policy. This will be in line with internationally accepted practice, and will include a limited blasting frequency (once to twice per week), as well as maintaining a 800 m temporary buffer between blasting site and closest human presence.

7.2.5.2 *Port*

The environment around GAC's port area is noisier than the mine area, given the presence of the city of Kamsar and the industrial facilities (CBG mainly) to the north of the site.

The existing transit of CBG's bauxite trains entering the city of Kamsar to the CBG processing facility currently constitutes the major source of noise along the tracks.

The Project is not expected to significantly change the existing acoustic environment and the perception of ambient noise level, compared to the existing situation. Nonetheless, GAC will ensure that noise levels from port operations are kept as low as reasonably practicable, through equipment selection, appropriate operations and maintenance, and, if necessary, the implementation of noise barriers around key sources of noise on the site.

The Project will also result in the generation of underwater noise in the marine environment during construction of the loading trestle and berthing facility (piling work mainly), dredging, and (in the operational phase) vessels operation and periodic maintenance dredging. Of these identified noise sources, piling, typically undertaken using an hydraulic hammer, is the most significant noise generating. Piling noise impacts will be most significant within the Rio Nuñez. Noise may propagate some distance from this source but will be partially attenuated by the shallow and confined nature of the estuary. As a result, piling noise effects will be unlikely to be significant beyond the estuary and the impacts associated will be mitigated to an acceptable level by implementing measures included into the international good practice for piling operations, including a soft start/ ramp up procedures whereby piling operation ramps up gradually to full power, to allow sensitive marine fauna to move out of the vicinity of the noise source.

7.2.6 *Soils*

The construction phase will cause the disturbance of soils from construction of the mine and rail facilities, along with the mine facilities access roads. During

mine operation, there will be a progressive clearance of vegetation and soils ahead of mining. Topsoil will be set aside and stored for use in subsequent rehabilitation. Overburden and below-grade bauxite will be stored within or near the pit footprints.

In order to minimize soil loss during construction and operation of the mine the area of land to be occupied by the mine project will be kept to the minimum necessary for the works. Within this area, the productive soils will only be removed where necessary and affected land will be returned to original use as soon as possible after completion of construction or after closure of the mine.

Technical studies have shown that the bauxite and overburden formations to be mined in the Project area have low potential for the generation of acid rock drainage (ARD). The material that could generate ARD is located well below the surface and will not be disturbed.

At Kamsar, the works will take place at the existing hard standing platform and the current footprint is not planned to be extended.

7.2.7 *Integrated water management*

7.2.7.1 *Mine – surface water*

The main surface water body in the Project area is the Tinguilinta River and its various tributaries that have the potential to be directly affected by mining activities in their upper headwaters. Information on surface and groundwater flows and water quality has been collected through the SEIA process, and the uses of water resources were surveyed across a wide area focusing on both community and biodiversity receptors. Numerical models have been developed to help understand the effects of mining on the streams that emanate from the mined area.

The impacts could affect ecological receptors that are sensitive to surface water quality and flow conditions, and may also compromise the availability of water for downstream water users during the dry season. The baseline studies have established that surface water resources are used by communities throughout the project area of influence for a variety of purposes, including potable water supply, fishing and riparian agriculture.

The net effect of water abstraction from the Tinguilinta River would be more significant in the dry season, when water levels and flows will be lower, and indications of issues with water availability in some years have been identified. Therefore, GAC is committed to put in place a solution that ensures significant adverse impacts do not result from its own activities. An investigation and assessment of alternative water source and storage (and water saving) options will also be carried out prior to construction and

operation commencing. This will include supplying water to the Project from several independent sources:

- pumping of water from the Tinguilinta River, except during low flow conditions, to avoid interference with community users and adverse effects on freshwater ecosystems);
- a groundwater bore field, at a precise location to be determined through the current aquifer testing program , provided that groundwater resources are sufficient to supply water to the Project without impacting other users;
- developing a water retention dam, to be located in the northern part of the GAC concession, and already covered by the previous GAC SEIAs; and
- re-using mine water from mine retention ponds, where feasible, for certain uses on the Project site (e.g. dust controls).

In order to manage these impacts on water, the Project will develop a Mine Water Management System (MWMS) for the management of all surface water use and discharges to avoid or mitigate any significant impacts on hydrological and ecological conditions. No abstractions associated with the construction or operation of the mine will occur until sufficient mitigation is in place to safeguard against significant effects upon flow, ecology and social dependents within the zone of influence of the Project.

In order to minimize any drainage or flood related effects, a high level of flood conveyance capacity will be adopted for all drainage infrastructure, including culverts and bridges, based upon international best practice engineering methods and designs. Settlement dams will be installed in order to manage drainage from pit areas.

7.2.7.2 *Mine – groundwater*

Groundwater is used by several villages in the area particularly during the dry season. An analytical hydrogeological model of the mining concession area was developed for the SEIA.

The potential impacts on groundwater resources during mine operation are mainly due to the potential for accidental spills of fuel or maintenance chemicals. Metal leaching from overburden and ARD are considered to be a minor issue for the Project.

Impacts on groundwater quality will be mitigated through an appropriate Hazardous Materials Management Plan, covering hazardous material storage, as well as effluent and waste controls, in line with internationally accepted practices, to avoid the risk of soil or groundwater contamination. This will include, inter alia, appropriate secondary retention and bounding on fuel and chemical storage facilities. GAC will also adopt appropriate procedures for spill response planning and subsequent cleanup.

Impact on groundwater supply will mainly be mitigated during the operation phase of the mine project by developing a design program for a sequential approach to bauxite mining. This will avoid the need for large areas of the concession area to be extracted concurrently and will also allow for each plateau to be successfully rehabilitated sooner. The phased approach will also allow for greater control over monitoring groundwater levels, spring outputs and water quality in the region.

The *MWMP* will cover the groundwater aspects as well and will be continuously reviewed and updated. The overall objective will be to restore the natural baseflow regime to any streams / rivers significantly affected, as far as reasonably practicable.

7.2.7.3 *Port*

A compacted sand platform was developed by GAC over the entire port concession area in 2012, to build up the terrace level above the existing natural ground levels in the surrounding mangrove swamp.

Potential impacts on surface water and groundwater water in the port area are mostly related to surface contamination risks due to runoff or accidental spills from construction sites, fuel storage or bauxite stockpile area. A permanent port drainage and water discharge management system will be commissioned during construction to reduce the impact of the port operations. The hazardous materials management plan and spills response plans will cover all hazardous material storages, including fuels, lubricants or other chemicals.

7.2.8 *Biodiversity*

7.2.8.1 *Mine*

Biodiversity at the mine area has been identified as one of the most important environmental sensitivities requiring active management as part of the Project.

As presented, the proposed mining activities include a phased and progressive clearance of vegetation over the mining resources of the different plateaus throughout a 20 years timespan with an expected average mine life on each plateau of approximately four to six years. As mining activities progress from one plateau to another across Project life, areas already mined will undergo progressive mine closure and environmental rehabilitation.

The biodiversity of the mining area has been surveyed over the past 10 years since the start of SEIA work by GAC. Dedicated field biodiversity surveys were undertaken for this SEIA Addendum, focusing on the southern half of the GAC mining concession.

Areas with higher conservation value typically correspond to gallery forest (i.e. relatively dense forest growing along streams in the valleys between the

plateaus) and wooded savannah. Some of these have been found to host regionally significant numbers of species of specific conservation interest, including, but not limited to, some emblematic primates (as discussed hereunder). Some of the gallery forests and wooded savannah of the Project area can therefore be considered as “critical habitats” as defined under IFC Performance Standard 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources and/or the African Development Bank Operational Safeguard 3 concerning biodiversity and critical habitat..

The vegetation community that will be most affected by clearance corresponds to wooded savannah, bowal and agricultural land. Gallery forest within the GAC footprint area will be less affected as they are located at lower altitudes and below the mining levels.

To reduce direct footprint impacts on biodiversity, the Project footprint, both for infrastructure as well as mining areas, will be subject to a specific site selection criteria, in order to minimize land clearance within or adjacent to high conservation value habitats. High conservation value habitats, and undegraded natural areas will be avoided to the maximum extent practicable. Following the closure and reclamation of mined areas, GAC will also work actively on revegetation and reclamation work which will be undertaken to reinstate the area to pre-mining conditions.

The Project hosts different fauna species listed as Endangered on the IUCN Red List including a population of the West African chimpanzee and the confirmation of the presence of a Red Colobus in the area in 2013 through a single sighting. Birds of conservation interest include the hooded vulture, white-backed vulture, the Denham's bustard and the red-billed firefinch.

The three main impacts that will be limited as far as possible are: habitat loss; habitat fragmentation in the concession; and negative impacts from non-Project related human activities, such as hunting of wildlife, especially on Chimpanzees.

The loss of habitat associated with Project related land use will reduce local availability of food, security, and breeding cover for wildlife inhabiting the concession area. The larger, more-mobile species will generally move from construction activities towards adjacent habitats; whereas, smaller, less-mobile species with a smaller territory may be lost during the construction and the operation phases of the project. The Project is also likely to lead to habitat fragmentation in the concession.

The increased presence of humans and infrastructure as a result of induced immigration may also directly impact animals due to hunting, traffic accidents, etc. Noise and vibrations due to blasting activities, vehicles and machines, and the presence of humans will have specific impacts especially on sensitive species like Chimpanzee, Red Colobus or Pata monkeys, whose behavior will be modified.

Chimpanzees are particularly sensitive to all these mining impacts categories since, much like humans, they are highly sensitive to external disturbances. The high level of territoriality of the Chimpanzees may prevent them from being able to simply avoid disturbances and make them especially susceptible to human impacts. Key measures proposed by GAC based on research conducted by the Wild Chimpanzee Foundation (WCF) to reduce impacts on fauna species include:

- protecting freshwater habitats and related forest galleries through engineering design and operational planning;
- implementation of a reforestation program of already affected areas establishing fauna corridors to facilitate animals movements between forested areas located across mining plateaus, the gallery forests and forested savannah;
- direct environmental management measures including reducing noise and light emissions where possible; and
- progressive mine closure and rehabilitation of mined areas, including revegetation and progressive reforestation, taking into account natural habitat rehabilitation objectives as well as the needs and requirements of local communities and the Guinean authorities.

Broader initiatives will be explored such as continued partnership with stakeholders to control bushmeat hunting and the illegal trade in rare animals, animal products and plants.

Considering the Project's impacts on critical habitats, GAC will aim to develop a "net positive impact" approach to compensate for loss of critical habitats by specific offsets. The Project will therefore implement an Offsets Strategy to compensate for the significant residual impacts predicted to occur. Ideally, offset areas will contain similar high value habitats and species as those predicted to be impacted by the mine. Conservation programs in these offset areas will be developed and implemented in collaboration with the Government of Guinea, local communities and specialized conservation groups.

7.2.8.2 *Port area*

The terrestrial Project footprint corresponding to GAC terminal and port areas was cleared in 2005, and then developed as compacted sand platforms in 2012.

Vegetation clearance is therefore not considered to be part of the present Project in the port area and no impact associated to loss of flora and fauna communities from further development of the direct Project footprint is envisaged.

The dominant flora community present within the port and terminal surroundings corresponds to Guinean mangroves, mainly located to the south and west of the Project area, and along the Rio Nuñez estuary. Disturbance to the adjacent mangrove communities from the Project may be due to fugitive dust deposition (assessed as of low significance through the dust dispersion modeling study carried out as part of the SEIA Addendum) and accidental water contaminations from spills (mitigated through an appropriate Hazardous Materials Management Plan) which may alter distribution and abundance of the adjacent mangrove community.

The impact assessment for the marine biological environment includes both flora and fauna within the marine and intertidal environment.

The Project will have few significant interactions with the intertidal environment in either the construction or operational phases and therefore the scope for significant impacts is limited. In the wider area estuary and coastline potential interactions between the project and the intertidal environment will be limited to indirect issues such as the effects of dredge plumes or vessel bow wash. No significant effects on wider hydrodynamics such as currents, waves or sediment supply are envisaged by the Project engineering and modeling teams.

The main marine environment interactions from the Project will be related to the footprint of marine facilities on the seabed. Direct impacts over a sizeable area of seabed associated with the dredge and dredge spoil disposal footprints will be observed, but their areas will be relatively small compared to the entire estuary. Note also that dredging will take place along an already dredged channel, which can be considered as a modified natural environment already. In addition indirect impacts may occur over a wider area due to sedimentation from dredge plumes. From qualitative assessment undertaken as part of this SEIA Addendum, it is deemed likely that the dredging plume will have limited effects (beyond short-term effects) on the water quality of the Rio Nuñez, given the natural turbidity levels of the estuary in baseline conditions. Nonetheless, GAC proposes developing a specific dredge plume model as part of further studies, as the marine design and dredge program of the Project become more defined.

As outlined in the marine baseline and marine noise impact assessment, there are a number of marine mammal and turtle species potentially present within the Project area of influence, including some species of dolphins, West African manatee. All of these are considered to be of conservation importance. Interactions between the project and fish will also occur as a result of effects from plumes of suspended sediment and high levels of turbidity that will be associated with dredging and dredge spoil disposal. These activities will have potential impacts on water quality which could affect fish living within the water column and in the seabed environment whilst dredging or piling is undertaken.

A number of embedded mitigation measures are considered in the impact assessment for marine fauna including the minimization of overall project footprint, the development of a Dredging Environmental and Social Management Plan (DESMP) and the adoption of navigational controls on vessels and port operations to allow safe navigation and 'zero wake impact' operations in line with good international industry practice.

7.2.9 *Waste management*

The question of waste management is an important transversal issue in mine operations, and therefore a specific section has been developed as part of this Addendum report to present the whole process of waste generation and management during the Mine Project and associated port facility.

Both the mine and port components of the Project will generate various other waste streams including construction waste, timber waste (land clearance of the mining area), domestic waste from the workforce, office and kitchen waste, clinical waste from medical facilities, ash from the incinerator, packaging waste and various types of potentially hazardous waste from workshops, sewage treatment plants, spill clean-up and other activities.

GAC envisages the construction and operation of its own landfill site to manage the domestic waste, allowing direct control on the design and operation of the landfill. This site will be chosen to have sufficient capacity to accommodate domestic wastes from the Project over a Project life of approximately 20 years. The site will be designed, built and operated in accordance with strict international standards to ensure it has no significant impact on the environment and people in the surrounding area. Hazardous waste will not be disposed in this landfill. Within the construction site and during mine operations, careful planning for waste management will be aimed at avoiding the creation of waste as far as possible, re-using and recycling waste where possible, and only disposing of waste as a last resort.

Only a small amount of hazardous chemicals and hydrocarbon wastes is expected to be generated by Project activities; these will mainly be recycled or stored to be sent abroad in dedicated and authorized disposal channels or until appropriate facilities exist in Guinea for local disposal.

7.3 *THE HUMAN ENVIRONMENT*

7.3.1 *GAC's commitment to community engagement and social development*

Since 2004 and the signature of its concession agreement with the Government of the Republic of Guinea, GAC has been an important stakeholder in the Project area for over one decade. GAC's presence in Guinea has translated into employment for local and international staff, local and international procurement contracts, through activities such as Pioneer Camp development, operation and maintenance, geological exploration, road improvement works

at the mine area, the future refinery site, and port infrastructure development at Kamsar.

Over this period, GAC has formed a Community Team and developed specific social management processes, including the management of:

- stakeholder engagement;
- grievance procedure;
- social investment;
- resettlement and livelihood restoration;
- in-migration management; and
- code of business conduct for employees and suppliers.

7.3.2 *Giving particular attention to vulnerable groups*

As part of GAC's social management, particular attention will be given to vulnerable groups within the community, identified as those who, due to their social position, are most likely to be negatively affected by change and may experience difficulties in benefiting from positive impacts. The SEIA Addendum has identified certain vulnerable groups, including children, single women acting as household heads, the elderly, and people in poor health. These will be included specifically in GAC's stakeholder engagement and social support processes.

7.3.3 *Impact on the national and local economy*

GAC will contribute directly to the development of the economy of Guinea as a whole, as well as that of the prefecture of Boké, particularly within the mine area and at Kamsar. This will emanate from the creation of significant levels of direct and indirect employment, local procurement of goods and services, the payment of tax and royalties, as well as GAC's direct community investment activities.

In the mine area, agriculture currently represents more than three-quarters of the average household income. In the port area, the city of Kamsar is historically developed around CBG's activities, CBG being the main formal employer in the area. However, population increase and urban expansion mean that there are far more candidates for employment than CBG can employ. As a result, there are high levels of expectation in the local population for the GAC Project to act as a driver for local employment and further economic growth.

As already outlined at the start of this summary, the Project will lead to significant employment and skills uplift for Guinean workers. This will include:

- the continued creation of more than 2,200 jobs during construction, about 700 permanent jobs and 1,500 indirect jobs, the majority of which will be staffed from Guinea; and

- the integration of 200 Guineans in EGA's UAE operations for training and up-skilling for subsequent redeployment in Guinea.

Note that (also as stated at the start of this summary), some of GAC's ongoing infrastructure development such as the completion of the commercial dock at Kamsar may act as a catalyst for further economic activity in the prefecture of Boké and beyond – this may include other mining projects or export / import activities in other economic sectors.

To support a sustainable positive socioeconomic impact from the Project, GAC will work on multiple fronts of community engagement and human resources management, including preferential local hiring, professional training, employee health, safety and security.

7.3.4 *Ongoing consultation and coordination with government and traditional authorities*

Through Project activities, and by changing the socioeconomic landscape of area, the Project is likely to trigger a certain level of pressure on the prevailing social structure of the Project area, and possibly change the balance between formal government structures and traditional power structures involved in local decision-making on various aspects of community life. This is also a concern expressed by stakeholders during the stakeholder engagement process implemented as part of the SEIA Addendum.

Particular attention will be given by GAC to respecting the local administrative and traditional decision-making process, through engagement with local government and traditional chiefs and community elders. Great care will be given to questions surrounding the use of land and natural resources, given the importance of tradition and customary rights in decision making surrounding land use allocation in the mine area. For the port, the urban context and smaller Project footprint at Kamsar will shift focus towards formal authorities, but neighborhood leaders and traditional representatives, e.g. for fishermen and directly impacted families requiring relocation, will still be engaged through the stakeholder engagement plan.

Ongoing consultation and coordination with government and traditional authorities will also be used by GAC to support decision-making and consensus building on GAC's proposed social management process, including GAC's stakeholder engagement and grievance management process, social investment policy, in-migration management, and resettlement and livelihoods restoration for those stakeholders located in the footprint of the proposed Project activities.

7.3.5 *Demographics and social dynamics – In-migration*

The mining area as a whole can be considered as a rural area of Guinea with a population predominantly employed in agriculture, except for the village of

Tinguilinta and neighboring settlements along the national road, which have undergone some rapid growth and socioeconomic changes in the past 10 years. This is partly due to the presence of GAC's Pioneer Camp and the community's expectation that GAC would start development activities in the near future.

The nearest urban area is Sangarédi, approximately 20 km east of the Project mining area, a mining town whose development has been part of CBG's mining activities over several decades. The next closest urban area is the provincial capital of Boké, approximately 30 km west of the mine area.

As the Project progresses towards construction and operation, the population of the mining area will increase, due to the presence of workforce, directly employed by GAC or its subcontractors, as well as the likely in-migration of job seekers attracted by direct and indirect employment opportunities. Note that the nearby presence of mining projects by Compagnie des Bauxites de Dian Dian (COBAD) and a mining expansion project by CBG may also be an important driver for in-migration in the wider Project area.

Whilst GAC intends to partially host its mine site expatriate workforce in a camp adjacent to its existing Pioneer Camp, employees recruited locally will be encouraged to use their own accommodation. As the Project progresses into production, it is likely that an increasing number of Guinean employees will settle in their own accommodation.

Potential newcomers not directly employed by GAC, in particular prospective in-migrants, may tend to settle near the camps and future GAC infrastructure. As an example, the settlement of Tinguilinta, located near the mining camp, has seen a population growth of about 20% annually in the 10 years following the start-up of the Project in 2004. Typically, such rapid population increase generates pressure on the natural and social environment, for example with regards to water resources, access to agricultural land and forestry resources, as well as the prevailing community structures and social organization.

The primary tool for addressing the impacts of in-migration will be implementation of an In-migration Plan. This plan will be developed and implemented in partnership with an in-migration committee, including representatives of the local administration, village leaders, members of the affected communities. GAC also proposes engaging with other key mining players in the area (such as CBG and COBAD) to help define a coherent message to communities and seek alignment on each company's approach for in-migration management. The plan will aim to discourage Project-induced in-migration as far as possible through:

- appropriate communication on Project-related employment and how to apply for it;

- directing the flow of in-migrants to suitable locations by actions such as establishment of a recruitment office and a ban on recruitment “at the gate”; and
- collaborating with local authorities and community representatives to mitigate the impacts of in-migration through village planning and support for planning of infrastructure and services.

GAC’s local subcontractors will be required to comply with the specific provisions of GAC’s in-migration plan, in particular with regards to the publication and fulfillment of work opportunities.

In-migration will be monitored and GAC’s in-migration plan updated as necessary throughout the life of the Project.

7.3.6 *Managing impacts on land use and livelihoods*

7.3.6.1 *Developing a resettlement action plan and livelihood restoration framework*

GAC proposes resettling affected stakeholders as a core mitigation to address major Project impacts related to:

- Project footprint; and
- Project emissions: air, noise and vibration, for the limited number of settlements that may experience above-guideline impacts to environmental quality as a result of Project emissions – from the results of the environmental impact assessment component of the SEIA Addendum, this is expected for a limited number of settlements, located in the near vicinity of mining activities.

Resettlement will be carried out through the implementation of Resettlement Action Plan (RAP) supported by a Livelihood Restoration and Resettlement Framework (LRRF) in line with the requirements of IFC Performance Standard 5 on Involuntary Resettlement and AfDB Operational Safeguard 2. This will include developing the RAP and LRRF through an appropriate level of prior consultation with affected stakeholders, government authorities and community representatives, as an iterative process embedded in GAC’s stakeholder engagement plan. The RAP and LRRF will also make reference to GAC’s in-migration plan.

7.3.6.2 *Mine plan, associated resettlement and subsequent mine closure and rehabilitation*

The physical footprint of the mined areas on the plateaus considered in the mining plan of the Project covers approximately 52 km², hence 20% of the total area of the plateaus within the southern part of the GAC concession or 8% of the overall GAC mining concession.

The majority of the land to be physically occupied by the Project in the concession area consists of bowal (i.e. open grassland on poorly drained, ferrallitic hard ground), as well as a mosaic of wooded savanna grassland and agricultural plots and fallow areas (traditionally managed according to a plurennial rotation of slash-and-burn agriculture and fallow). The construction phase will start with the clearance of the processing facility area near the existing settlements of Filow Bowal and Pompa Kassawa. Then, the bauxite plateaus will be accessed, cleared, and mined, starting with plateaus 20, 24, 26 and 27. These Project activities will result in the utilization of land currently dedicated to other uses, such as housing, farmland, animal husbandry, as well as natural land that are currently used by local communities for hunting, firewood gathering, timber, food and medicinal plants.

Note that, thanks to GAC's proposed mine plan and progressive mine closure and rehabilitation, mine reclamation activities will start after an average initial period of three to five years of production. The proposed land reclamation and rehabilitation program will be developed in discussion with local authorities and community representatives, with a view to achieving an acceptable balance of agricultural land and natural habitats, and, where appropriate, supporting the reinstallation of communities into the area.

7.3.6.3 *Possible changes in community land management processes*

In the context of growing land pressure in the Project area, in-migration of newcomers to the mine area, and increase of salaried income from the Project and its suppliers, the traditional land ownership and transfer might be disrupted and modified. Currently land is usually allocated and managed according to family lineage, with traditional authorities involved in decision making at settlement level. Socioeconomic change triggered by the Project may increase the occurrence of monetary land transactions, and foster a phenomenon of individualization of land ownership and use. The scarcity of available plots may trigger some inflation on the price of land and housing.

7.3.6.4 *Port*

Port terminal facilities will take place over a concession that was allocated to GAC under its convention in 2004, and was prepared as a consolidated backfilled platform in 2012.

At Kamsar, at the time of issuing this SEIA Addendum report, the extent of resettlement at the GAC port area is still not confirmed, and will depend on results of engineering feasibility studies – this will be mostly driven by constraints related to the routing of the rail spur connecting the ANAIM rail line to GAC's facility. No further resettlement is expected within the actual proposed port terminal footprint.

7.3.7 *Protecting the health and safety of workers, communities and the environment*

7.3.7.1 *Maintaining a high level of leadership on health, safety and environment*

As stated in introduction of this non-technical summary, through their corporate code of conduct and HSSEC policies, EGA and GAC are committed to excellence in health and safety management, with an objective of “Zero Harm to our people, the environment and the communities”.

GAC aspires to establishing and maintaining a high level of health and safety leadership across its organization. This is supported by existing processes and procedures for health and safety management, employee awareness and training programs, as well as community awareness campaigns through GAC’s stakeholder engagement activities.

As the Project evolves towards construction, and later operation, the Project workforce will increase rapidly, and the need to execute new activities will mean that GAC’s current health and safety processes will need to be updated, to ensure that they remain fit-for-purpose and address the specific new risks associated with construction and operation activities. Particular attention will be given to community safety through safe vehicle operations, delineation of hazardous areas, preparation and delineation of hazardous activities, as well as community information and awareness on the specific health and safety risks associated with GAC’s activities.

As a rule, new recruits are required to undergo health and safety training, subsequently complemented by on-the-job refresher trainings and day-to-day sensitization. GAC’s subcontractors are required to comply with the requirements of GAC’s health and safety processes and procedures.

Similarly, GAC will ensure that it has the right processes for the management of waste and hazardous materials, to limit the risks of exposure of workers, communities or the environment to such materials. Generally speaking, the Project will make limited use of hazardous materials (except for diesel fuel and small quantities of maintenance chemicals).

7.3.7.2 *Supporting worker and community health*

In terms of community health, as highlighted during the field survey, key health issues in this region of Guinea include malaria, water-borne diseases, tuberculosis and other respiratory diseases, and tetanus. HIV/Aids prevalence in the area is reported at approximately 4.5%, which is higher than the national average, and it is a recognized fact that demographic change and increased wealth (as may be brought upon by the Project) is a factor of increased risk of HIV propagation.

As a result of underfunding, the availability of public healthcare in the Project area is low. Healthcare facilities are more developed in Kamsar compared to

the mine area. Access to health services remains however unequal and varies depending on the socioeconomic level of the population.

Where possible, GAC will implement Project controls directed towards the preservation of community health. This will include:

- limiting the risks of incidents through appropriate operational controls and area delineation, to prevent accidents involving GAC and community members;
- managing emissions and wastes to comply with relevant environmental guidelines, or, if the proximity of stakeholders mean that guidelines cannot be met, engaging into a resettlement and livelihoods restoration and resettlement process with affected stakeholders;
- avoiding the development of conditions favorable to the propagation of diseases, e.g. through avoiding the development of areas of stagnant waters (to prevent the proliferation of mosquitoes and related transmission of malaria); and
- the recent Ebola outbreak in Guinea compelled to modify behaviors to limit the propagation of the disease. GAC implemented an awareness program for its employees and put in place practical measures to keep sanitary conditions of the workers as high as possible (e.g. daily temperature test, systematic hands disinfection, new procedure to organize meetings)

Whilst GAC recognizes that the improvement of health conditions for communities in the Project area is not within its control, GAC proposes collaborating with local authorities (through the Stakeholder Engagement Plan and Local Development Plan) to support the improvement of health awareness, as well the quality of health infrastructures.

GAC also provides routine and emergency medical treatment facilities to Project workers and undertakes HIV, Ebola and malaria awareness, prevention and protection campaigns. GAC also supports the provision of better quality water in local communities through a well development program.

7.3.8 *Cultural heritage*

The cultural heritage survey covered the following in the GAC mining concession:

- all the potentially mined plateaus and valleys between them;
- a 300 m additional zone on both sides of this unit; and
- a 500 m area to the north of the ANAIM railway.

A total of 230 Cultural Heritage sites were encountered and listed. Among them:

- 156 sites are genies' residences;
- 73 are burial sites; and
- 1 site is a historic site (natural cave used during past conflicts).

Natural sites (e.g. trees, forest, rocks, streams) and cemeteries are very often considered as the place of residences of genies. Guinea has a strong tradition of living cultural heritage founded in the important role sacred sites play in community life. Trees, rocks and water are often identified as sites of spiritual significance and can be important as sacrifice sites and in rites of passage. As well as such physical sites, intangible traditions and cultural knowledge are also important cultural assets. Genies and other supernatural entities are part of the traditional animist practices and play a very important role in the life of communities and individuals.

In addition, 16 mosques and 11 almadjadas (small mosques) were inventoried. The village of Wossou (located on bauxite plateau 33, in the East of the mining area) has a unique heritage character in the area, related to its history, social influence on other villages and the presence of a mosque and scholars' cemetery that are widely revered in the Project area.

Lastly, 12 archaeological sites that would be directly impacted by planned ground disturbing activities have been identified.

At Kamsar, given that all activities onshore will take place over an existing backfilled platform, already covered by an SEIA and a resettlement action plan prior to its development in 2012, no further cultural heritage assessment was undertaken.

GAC will develop a Cultural Heritage Management Plan that will include information on the processes, procedures, and resources that will be used by the Project to manage all cultural heritages found in the area of the mine. These management measures will include integration of avoidance measures as part of the detailed design of the Project, but also provision for further study to identify and evaluate sites prior to construction.

If they cannot be preserved through avoidance, archaeological sites will be investigated and a rescue archaeology approach will be used to preserve the remains if required. For all cultural heritage sites, communities will be consulted through the Stakeholder Engagement Plan on appropriate means for relocation if possible, or for providing compensation where relocation is not practical.

During construction and mine clearance a "Chance Finds" procedure will operate to identify and if necessary protect or rescue finds encountered on the ground. There will also be on-going stakeholder engagement for the identification and conservation of cultural heritage assets.

The Project will also establish a Cultural Heritage Training Program for project management and for the construction contractors and field staff to manage potential impacts to cultural heritage sites by facilitating the identification and reporting of potential Chance Finds encountered during construction activities.

The closure phase corresponds to the end of the mining of the bauxite plateaus. As presented earlier in this non-technical summary, the mining of the available bauxite resource will be progressive, and the closure of areas will occur as each mine area within each of the plateaus is depleted.

Once a plateau has reached the mine closure phase, mining activity and ore hauling activities from this mine site on the plateau will cease, and the site will be secured to move on to the rehabilitation phase. At the end of Project life, mine closure will ultimately entail dismantling, demolition and removal of equipment and buildings, reshaping and re-contouring of land surfaces and rehabilitation of occupied areas.

Progressive pit closure and rehabilitation will include re-contouring and re-grading the pit surfaces followed by surface spreading of topsoil. The mined areas will then be re-vegetated and the land will be prepared for future use according to the Mine Closure Plan (natural area, pasture, agricultural area, residential area).

The land occupied by the mine and its infrastructure will be returned to its former land use as far as reasonably possible. Upon mine closure, the mine pits will remain as terrain of lower-than-before elevation. The closure phase will also ultimately require the management of social and environmental issues including retrenchment of the workforce and managing the implications of loss of local employment and business.

The direct sources of impact during the closure of the mine in terms of the Project's direct contributions to local economic development are linked to the termination of jobs by the Project and its subcontractors, the closure of the local development initiatives initiated and the end of the contributions to the institutional budgets dedicated to local development.

The departure of many households from the area will lead to a significant reduction in the population. The economy of the areas will go through a phase of recessions and tensions and conflict may arise between the former workers, looking for jobs and the other residents of the area.

In order to mitigate these risks associated with mine closure and in accordance to the Guinean Mining Code, the Project will develop a detailed Mine Closure Plan. The plan will be developed in consultation with relevant authorities, the workforce and local communities and will aim to leave a rehabilitated mine site behind that is stable, non-contaminating and with a sustainable water management system. GAC will also investigate post-closure economic diversification and re-skilling opportunities to mitigate the impact of job losses.

Closure planning will be a dynamic process requiring regular review during mine life to take into account changes in Project configuration, economic conditions, legal obligations, corporate requirements, community expectations and technical knowledge. The Plan will be developed conceptually prior to start of operations, and reviewed and updated regularly during operations.

Rehabilitated pits will be subject to regular environmental monitoring to verify that rehabilitation objectives are being met, and define corrective actions if not.

GAC has identified and committed itself to a large number of social and environmental measures designed to mitigate adverse impacts and ensure benefits are delivered. All mitigation measures specified in the 2015 SEIA Addendum and 2008 integrated SEIA are compiled, updated and translated into the Social and Environmental Management Plan (SEMP) for implementation of GAC bauxite export project.

The objective of the SEMP is to list and summarize all mitigation measures and social and environmental plans and procedures to be implemented by the Project and to provide a framework for monitoring or even auditing project compliance with these standards and good practices.

The SEMP is organized by topic and defines a clear statement of the actions that will be taken for each phase of the development (detailed design, construction, operation, closure), and for each component of the overall project (mine and port). It also includes commitments to further studies that will be undertaken to refine mitigation plans and to monitoring and contingency arrangements should monitoring reveal that impacts are more significant than expected.

Surveillance and monitoring of Project's social and environmental impacts are a key aspect of an effective social and environmental management system. The need for changes to measures in place will be based on social and environmental quantitative thresholds or qualitative criteria as defined in the SEIA Addendum for the Project and/or the Social and environmental Monitoring Plan.

