EGA MINES & RAFFINERIES MINING & REFINING GAC

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GUINEA BAUXITE EXPORT PROJECT

Section 11

Health, Safety, Security, Environment and Community

DOCUMENT NUMBER: A8GA-00000-01-RP-111

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GUINEA BAUXITE EXPORT PROJECT

FEASIBILITY STUDY REPORT

November 2016

Project No: A8GA

SECTION 11.0 – Health, Safety, Security, Environment and Community

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SECTION 11 - HEALTH, SAFETY, SECURITY, ENVIRONMENTAL AND COMMUNITY

A commitment of the Guinea Bauxite Export Project (Project) is to provide a safe and healthy work environment for all employees, contractors and visitors. Reviews during the FEL3 demonstrated that health, safety, security and environmental (HSSE) issues for the Project are readily managed through compliance with relevant legislation, IFC performance standards and the application of industry standard plans and procedures. The procedures to be utilised on the project are modified to suit the environment in the Republic of Guinea (Guinea). Social and environmental impact assessment (SEIA) studies were conducted by Guinea Alumina Company S.A. (GAC) in 2004, 2005, and 2006, and consolidated into an integrated SEIA in 2008 and the SEIA Addendum of 2015.

This section outlines the development of the HSSE Management strategies during the FEL3 and how the Project considered the SEIA and HSSE in its design.

Policy

The key HSSE policies developed by GAC will be enforced throughout the execution of the Project and into the future operations. The key GAC policy, which underpins the Project Execution Plan, facilities design and the management plans is the GAC Business Code of Conduct. This policy defines the way in which GAC manages the economic, social and environmental challenges of its operations. Contractual responsibilities for all aspects of health and safety in all stages of the Project will be in line with this overarching policy. Section 11.1 references the relevant statutory obligations of the Project.

Stakeholder Engagement

As part of the SEIA, a process of consultation was undertaken by GAC to inform Guinean stakeholders and communities about the Project and the development plans. Key stakeholders included local communities, port authorities, police, healthcare, the Bureau Guinéen des Etudes et Evaluations Environmentales, as well as civil society and non government organisations.

Key concerns raised by these stakeholders included:

- loss of land access
- compensation for restoration of livelihoods
- employment opportunities
- impacts on cultural heritage
- infrastructure development and access to safe drinking water
- disturbance related to Project pollution
- in-migration

These issues were taken into consideration by GAC when developing the Project HSSE strategies during the FEL3 Feasibility Study.

HSSE Approach Development

The Project is committed to providing a healthy, safe and secure workplace for all employees, contractors and visitors. The HSSE documentation developed during the FEL3 phase, which forms the basis for the contract tender documents and the contractor HSSE management plans. Fluor will further develop procedures based on OSHA standards to implement during the FEL 4 phase.

The Project HSSE Management Plan was developed during the FEL3 based on Fluor's HSE Management Plan and revised to incorporate specific GAC requirements, including those defined by the SEIA and GAC's environmental management plan. The documentation that was developed is as follows:

- HSSE Execution Plan - A8GA-00000-01-PL-004 (Appendix 11.1 HSSE Management Plans)
- Endemic Disease Management plan - A8GA-00000-01-PL-002 (Appendix 11.1 HSSE Management Plans)
- Security Management Plan - A8GA-00000-01-PL-003 (Appendix 11.1 HSSE Management Plans)
- Construction Environmental Management Plan A8GA-00000-01-PL-005 (Appendix 11.1 HSSE Management Plans)
- Marine Environmental Management Plan - A8GA-00000-01-PL-001 (Appendix 11.1 HSSE Management Plans).

The following specific Fluor standard documents will supplement the Project specific documents to be used as the basis for the HSSE execution during FEL4.

- Fluor HSE Management System Table of Content - A8GA-00000-01-PR-001

The HSSE equivalency review performed as part of the FEL3 identified GAC requirements which differed from, or were more stringent than that required by the Fluor Standard HSE Management Plan. The PMC has identified all procedures required during the FEL 4 phase; those will be developed in line with GAC requirements.

The HSSE requirements for the Project were included in the Request for Proposal documents in the bidding process, where contractors were required to adhere to the overall Project HSSE strategy. The HSSE Plans will be required to be implemented by all Project participants, including contractors and suppliers. The contractor bid submissions were evaluated and reviewed by GAC. It will be a minimum requirement that the contractors have a Project Management Contractor (PMC) approved HSSE Management File that will include relevant documents and plans, compliant with the Project requirements prior to the commencement of site mobilisation.

The PMC HSSE Manager is responsible for the successful application of the HSSE Plan for the construction phase and this responsibility will transition to the GAC Operational

Readiness Manager post plant commissioning. The PMC HSSE Manager will report back to the GAC HSSE Manager on all HSSE matters and as per the GAC reporting requirements. The PMC and GAC HSSE Managers will work closely together to ensure that all the HSSE requirements are fully met and implemented.

Although all stake holders must accept responsibility for the health and safety of employees, the protection of the communities and the environment, GAC will maintain accountability and will be responsible, supported by the PMC, to ensure overall compliance of HSSE with the requirements of the IFC and the SEIA.

During the FEL3, several Project risk assessment workshops were conducted with attendees from the Fluor and GAC Project teams. Key risks identified through these risk assessment workshops, including proposed mitigation strategies, are captured in the Project Risk Register per Appendix 16.1 – Risk Register.

11.1 Statutory Requirements

Health, safety, security environmental and community planning was an integral part of the delivery of the FEL3 Feasibility Study. The development of the FEL3 deliverables, including execution strategy, management plans and technical documentation was done with the focus on the FEL4 execution phase and future operations. However, it may be necessary to make minor changes to the documentation to incorporate new requirements that are identified as part of the final contractor and vendor contract negotiations or future risk assessments that will be performed during the next phase of the work.

As the Project will be financed with the potential participation of different international financial institutions, the Project will comply with the applicable international and social standards as well as statutory and regulatory requirements. The HSSE documentation was developed to comply with the requirements of the International Finance Corporation's Environmental and Social Performance Standards and Sustainability Framework (Jan 2012), as well as the African Development Bank's Integrated Safeguards System (Dec 2013), which are considered as a comprehensive set of standards for environmental and social management.

In summary, the HSSE strategy has been developed to incorporate the requirements of the following regulations, legal requirements and guidelines:

- African Development Bank (AfDB) Operational Safeguards System
- AfDB's Integrated Safeguards System (2013) - Construction of Fluvial and Maritime Ports
- Guinean Environment Code; Ordinance No. 045/PRG/87 of 28 May 1987, as amended by Ordinance No.022/PRG/89 of 10 March 1989 on the code of protection and enhancement of the environment)
- African Convention on the Conservation of Nature and Natural Resources (1968)
- IFC's Social and Environmental Performance Standards (2013)
- IFC Environmental, Health, and Safety General Guidelines (May 2007)

- PS1: Social and Environmental Assessment and Management Systems
- PS2: Labour and Working Conditions
- PS3: Pollution Prevention and Abatement
- PS4: Community Health, Safety and Security
- PS5: Land Acquisition and Involuntary Resettlement
- PS6: Biodiversity and Natural Resource Management
- PS8: Cultural Heritage (see "Note" below)
- IFC's and World Bank's EHS guidelines (2007)
- IFC - EHS Guidelines for Ports, Harbours and Terminals (2007)
- GAC Social and Environmental Impact Assessment (SEIA), Volume 3, Social and Environmental Management Plan and Monitoring Plan, October 2015
- GAC Marine Environmental Management Requirements; Doc No. A8GA-50000-97-PL-001
- GAC 9000-S-CGLD-00009, Environment Performance Requirements
- GAC 9000-S-CPC-00018, GAC Health and Safety Policy
- GAC 9000-S-CPC-00019, GAC Environmental Policy
- GAC 9120-S-CPD-00001 Land Acquisition, Compensation and Resettlement Framework
- MARPOL Annex I; 2008 Revised Guidelines for Systems for Handling Oily Wastes in Machinery Spaces of Ships Incorporating Guidance Notes for an Integrated Bilge Water Treatment System.
- Equator Principles (2013).

11.1.1 Land Access and disturbance

GAC has developed a land access and disturbance procedure and applicable form to be used to enable land access and approval to disturb land to be requested for the Project. Adherence to this procedure is a mandatory requirement to enable any and all work to be executed in new Project areas. The PMC will implement this procedural requirement with the contractors for all land access and disturbance requests regardless of their location, and as such will manage, in conjunction with GAC, approval for contractors to commence work in specific allocated areas and hence ensure clear delineation of all allocated land areas between contractors.

The contractors will be required to comply with all required applications, a requirement, ensuring sufficient time is allocated within their schedule for such land access requests to be issued, assessed, and appropriate approval to be granted in accordance with the overall Project and Contract requirements. The PMC will maintain a register of all such land access requests and their status and shall coordinate all requests with GAC. The PMC will formally notify approval to the contractor once obtained, along with any specific restrictions, or conditions applicable to such approval and shall then monitor the contractors' compliance

with the approval granted, its associated conditions and any general Project and contract requirements.

Compliance with this land access/disturbance procedure will provide GAC appropriate opportunity to address all resettlement and / or compensation requirements associated with granting unimpeded access to the required parcels of land in accordance with the Project schedule.

11.1.2 Permitting Strategy

Guinea Alumina Corporation S.A. is the holder of a bauxite mining concession granted by presidential decree No D/2005/053/PRG/SGG on 22 November 2005 (the Concession). GAC is also a party to a mining convention (Convention de Base) with the Republic of Guinea (Guinea) for the development and exploitation of a bauxite deposit and the construction and exploitation of an alumina refinery in Sangarédi (the "Guinea Bauxite Export Project") dated 15 October 2004, as amended from time to time (the "Basic Agreement").

Set out below is a brief overview of the GAC permitting strategy outlining:

- the permitting process currently engaged by GAC for the Guinea Bauxite Export Project, and
- GAC's permitting approach.

A. Permitting Process

1. Scope of the Guinea Bauxite Export Project

The Guinea Bauxite Export Project, like most integrated mining – port projects, requires a number of permits and authorisations. Project implementation in Guinea, as in most jurisdictions, requires a significant number of permits/authorisations/licenses allowing a company such as GAC to build the necessary Project mining and infrastructure facilities.

On the basis of the GAC Environmental and Social Impact Assessment (ESIA) document, the scope of the Guinea Bauxite Export Project includes:

- the development of the bauxite mine with an anticipated life of in excess of 20 years, with potential for further expansion
- the construction of railway spurs to join the mining site in the Tinguilinta area to the existing ANAIM railway (operated under concession by CBG), and the construction of another rail spur in Kamsar to connect the main railway to the GAC port terminal;
- the construction of the GAC port terminal, on an existing fill platform at GAC's port concession in Kamsar
- the development of offshore loading infrastructure, together with dredging works, to enable export of bauxite via Capesize vessels. These facilities may also support the export of a part of the bauxite mined by other mining companies

- the development of supporting infrastructure for the mining, rail, port terminal and marine operations.

2. Legal basis of the mine and infrastructure permitting issues

Mine permitting issues

Pursuant to the Concession, the Basic Agreement and the Guinean Mining Code, GAC is entitled to carry out all the activities required for the development of the Guinea Bauxite Export Project within the perimeter of the Concession such as the construction of the mine facilities, utilities and related infrastructure (the "Mining Activities"). Some of these Mining Activities do not require additional permits while others still require GAC to apply for specific permits.

Due to the size of the Guinea Bauxite Export Project, GAC also needs to carry out its activities outside the perimeter of the Concession, in particular the transportation activities from the mine to the port of Kamsar and all the port activities (the "Infrastructure Activities").

Relevant provisions of the Basic Agreement

Pursuant to Articles 11 (Infrastructures), 12 (Port and Industrial Equipment Facilities), 17 (Employment), 26 (Administrative, land and mining guarantees) of the Basic Agreement, the Republic of Guinea grants to GAC various general guarantees enabling the company to implement the Guinea Bauxite Export Project smoothly.

In particular, according to Article 26.4 of the Basic Agreement, all the authorisations required for the Guinea Bauxite Export Project shall be granted promptly to GAC and in the absence of an express response to GAC's application, the relevant authorisation shall be deemed granted within a period of one month from the date of the application.

B. GAC Permitting Approach

1. Guinea's new tools to overcome permitting legal challenges

An inter-ministerial committee for the follow-up of integrated mining projects (the *Comité Interministériel de Suivi des Projets Miniers Intégrés* (CISPMI)) was created by Presidential Decree D/2015/007/PRG/SGG dated 14 January 2015. The role of the CISPMI is "to facilitate and accelerate the administrative procedures required for the effective and rapid implementation of integrated mining projects".

In order to be eligible, the projects shall be at the development stage and the contemplated investment shall exceed USD one billion.

The CISPMI comprises the heads of all the Ministries involved in integrated mining projects (Mine, Economy and Finance, Transport etc.) and is due to meet once a month. It is supported by a technical committee and a permanent secretary (the "**Secrétariat Permanent**").

The Secretariat Permanent was launched on May 26, 2016. The role of the Secretariat Permanent is to facilitate and accelerate the obtaining of permits and authorizations required for the effective and accelerated implementation of integrated mining projects. The establishment of the Secretariat Permanent will allow centralising and accelerating the

obtaining of permits and authorisations for the implementation of the Guinea Bauxite Export Project.

Functioning of the Secretariat Permanent

The Secretariat Permanent has two (2) major tools: The online platform (the "Online Platform" and The Guichet Unique (the "Guichet Unique").

The Online Platform is a website (http://licences.mines.gov.gn) where investors may go to obtain information about the authorizations required for their activities and learn more about all the legal documentation surrounding those authorisations. The Secretariat Permanent has listed to date a non-exhaustive list of permits and authorizations and supporting documents and created online forms to fill up for several permits. The intention is to have a comprehensive list of permits and forms available soon.

The Guichet Unique is where, within the Secretariat Permanent, case workers will be assigned to companies to work closely towards obtaining authorisations in the most efficient way within the shortest timeframe.

The Secretariat Permanent's procedure to deliver permits and authorisations

The Secretariat Permanent has established a process for obtaining permits and authorisations through the Guichet Unique.
The Secretariat Permanent has created online forms for several permits and authorisations.

GAC will then receive a certificate of deposit (the "**Certificate of Deposit**") when a permit is submitted. After the issuance of the Certificate of Deposit, the Guichet Unique has 9 days to review the authorisation request.

If all the required documents are complete, the Guichet Unique delivers a certificate of completion (the "**Certificate of Completion**") which will state the time within which the Guichet Unique will issue the relevant permit or authorisation. The time varies according to the type of permits or authorisations. To date, the current targeted period for issuance of an authorisation or a permit is 7 to 10 business days for most permits or authorisations.

The Guichet Unique then liaises with the administration in order to obtain the relevant permit or authorisation. The current targeted internal process is to follow-up each request, every 48 hours. GAC also envisages to do a follow up with the Guichet Unique.

Once the permit or authorisation is issued, the Guichet Unique will deliver it to GAC. If the permit or authorisation has not been delivered within the timeframe indicated for the issuance of the authorisation, GAC will have the right to proceed to work if a certain period of time has expired since the issuance of the Certificate of Completion. This period varies according to the nature of the permit or authorisation to be issued.

GAC will also continue to rely on Article 26.4 of the Basic Agreement which provides for a tacit approval if no express answer is received within one month from the application (i.e., the issuance of the Certificate of Completion).

This tacit approval will be materialised by “interpretative letters” sent to the Guinea listing the permits which GAC will consider to have been tacitly granted and for which it can begin works.

2. GAC Defined Approach

GAC’s upfront and precise identification of the permitting requirements

GAC has prepared with its engineers and study teams, feasibility studies and schedules for the implementation of the Guinea Bauxite Export Project. These preparatory works have allowed GAC to create tables with the lists of permits and authorisations required for the implementation of the Guinean Bauxite Export Project. GAC has thus identified and listed the types of permits or authorizations required for most works and activities, the granting authorities, and the lists of supporting documents to be provided with the application.

With the recent launch of the Secretariat Permanent, GAC has compared its existing information and tables with the online information available on the Secretariat Permanent’s website and as a result has completed its existing information.

GAC therefore has quite a comprehensive understanding of the permits required for the implementation of the Guinea Bauxite Export Project.

Dedicated teams with functional tools to secure permitting rights

GAC has dedicated internal resources to its procedure for obtaining permits and authorisations:

- Each team of engineers has identified the person responsible for works requiring permits.
- A team is responsible to collect all supporting documents to accompany each permit or authorisation application.
- A government relations team is responsible for the interface between the study teams in charge of the works and the administration.

All these internal teams are enhanced by external Guinean legal counsel covering all legal aspects relating to permits and authorizations.

GAC has created an internal permitting process to secure the permitting process. A clear process has been established internally between teams that allow each team involved to understand the works to be carried out, secure and accelerate the permitting applications. A template of Description of Works Form has, for example, been put in place to facilitate the understanding of the works to be carried out. The legal team then carries out the legal analysis of these works and a list of necessary authorisations is established per activity. A template of Application Letter has also been drafted and is used to submit the permit applications.
The lists of permits will be submitted to the relevant permitting authorities through the Steering Committee, its Working Groups and the Secretariat Permanent.

A legal forum to discuss and agree on permitting issues

Despite the functioning of the CISPMI and the recent launch of the Secretariat Permanent, GAC will continue to rely on Article 5 of the Amendment No 2 to the Basic Agreement which provided for the creation of a Steering Committee and Working Groups in order to implement the project activities.

According to this provision, the Steering Committee shall comprise 3 high-level representatives of the State and 3 high-level representatives of the Investor (GAC Ltd and GAC SA). The Steering Committee shall meet on a regular basis either physically or via conference calls or video-conferences and all decisions shall be taken unanimously, recorded and approved by its members in writing. Working Groups should be also created to work on the various work streams of the Guinea Bauxite Export Project (I.e. the mine, the rail, the roads and the port working groups).

Neither the Steering Committee nor the Working Groups however, have the capacity to bind the Parties so their decisions should then be submitted to the Parties for their final sign-off. GAC has proposed to the Republic of Guinea that the minutes of the meetings of the Steering Committee and the Working Groups are submitted respectively to the Minister of Mines (or his representative) and to GAC's CEO for final sign-off before they are implemented.

GAC has actively engaged with the Republic of Guinea and the members of the Steering Committee have been appointed both by Guinea and GAC. The Steering Committee meets on a regular basis. GAC is also actively engaged with the Republic of Guinea to appoint the Working Groups and especially the permitting working group.

GAC has discussed the opportunity to create the permitting working group since the Secretariat Permanent is now in place, however, as permitting is a major delay risk for all construction activities, GAC considers relying on both structures to begin with.

Indeed, at this stage, GAC would rather continue capitalizing on the permitting work achieved until now and is considering establishing and keeping the permitting working group going until the Secretariat Permanent becomes fully functioning and operational. This strategy will maintain the pressure on the permitting discussions via multiple stakeholders and should therefore expedite the permitting process until the Secretariat Permanent is fully operational.

An expeditious permitting process is key to the success of the Guinea Bauxite Export Project given the production date target.

11.2 SEIA and SEMP

GAC's ambitions for development in Guinea extend beyond the Guinea Bauxite Export Project. They include the development of additional bauxite mines within the GAC mining concession, possible further infrastructure upgrades, as well as the potential development of bauxite-to-alumina refining facilities and related alumina export infrastructure.

This overall plan was subject to initial SEIA studies, carried out by GAC and approved by Guinean authorities in 2004, 2005 and 2006. The results of these SEIA studies were compiled in an integrated social and environmental impact assessment (SEIA) in 2008

(*Knight Piésold, 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.

The SEIA Addendum that has been developed for the Project aims at completing the previous SEIA studies by concentrating the effort in the southern half of the concession and to update (where applicable) the previous SEIA studies undertaken by GAC.

As part of the SEIA, impacts of the Project on the social, biological and physical components of the environment and were assessed and mitigation and /or compensation measures were developed. These measures were grouped in one specific Chapter of the SEIA Addendum under a comprehensive Social and Environmental Management Plan (SEMP).

The SEMP is therefore not only an outcome, but an integral part of the SEIA Addendum specifically developed for GAC's Bauxite Export Project. The SEMP was developed with a view to aligning with the requirements of applicable Guinean regulations, in particular the Environment Code (*Ordinance No. 045/PRG/87 of 28 May 1987, as amended by Ordinance No. 022/PRG/89 of 10 March 1989 on the code of protection and enhancement of the environment)* and related regulations on social and environmental impact assessments in Guinea. It has also been developed in consideration of international good practices applicable to social and environmental management, in particular the requirements of the IFC's Environmental and Social Performance Standards (2012) and the Policy Statement and Operational Safeguards (2013) from the African Development Bank's operational safeguards.

The SEMP provides a framework for the social and environmental management of the Project, compiling the mitigation measures specified in the 2015 SEIA Addendum and 2008 integrated SEIA into a plan for implementation of GAC bauxite export Project. Consequently, the SEMP:

- lists mitigation measures and social and environmental plans and procedures to be implemented by the Project, with the aim of complying with Guinean regulations and international standards and good practices;
- provides a framework for monitoring or even auditing Project compliance with these standards and good practices.

Social and environmental monitoring activities are an important element of the Project's SEMP. The Monitoring Plan, also part of the SEIA Addendum aims at verifying whether the predictions made in the impact assessment studies for both social and environment aspects are correct, as the Project processes– therefore allowing to document the effectiveness of mitigation and enhancement measures, and allowing to work on the adjustment or definition of additional mitigation measures, if required. The Management Plan presents general guidance and protocols for collecting the information, data and samples required to meet the monitoring commitments, along with guidance on monitoring procedures, indicators and data management. Where possible, specific monitoring locations are indicated, or to the least the strategy for defining them when the infrastructure construction details and the mining plan will be defined.

The SEIA Addendum, including the SEMP and Monitoring Plan were officially accepted by the Government of Guinea in February 2016 and a Certificate of Authorisation for the Project was issued.

11.2.1 Consideration in Design

The FEL3 mine facility and port terminal facilities are designed to meet the requirements of the Social and Environmental Impact Assessment (SEIA) addendum for:

- The Guinea Bauxite Export Project, Guinea, Volume 3 Social and Environmental; Management and Monitoring Plan, October 2015
- The Environmental Design Criteria 25332-Z000-3DR-H01-00001 produced in the FEL2 in 2014.

The design considers the following:

- air quality (point and non point source control)
- water management (quality and quantity)
- noise and vibration
- soil
- acid rock drainage
- waste management
- surface water
- biodiversity
- social and economic issues
- cultural heritage issues.

Air quality, noise, biodiversity and water issues required additional focus, as the SEIA identified these as areas with a potential impact. In order to mitigate environmental risks, the SEIA requires that the following clearances are maintained where possible, with respect to the location of facilities/operations activities and environmentally sensitive areas:

- 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)
- 50 m from mangrove areas (at the port).

At the mine facility, the 50 m buffer zone is labelled as the environmental limit line, shown on the Mine Area plot plan A8GA-10000-55-PP-002 (Appendix 20.9 General Arrangement Drawings) to ensure facilities do not encroach upon this buffer. However river crossings are required to access the site.

The mine facility is more than 300 m from the gallery locations and more than 100 m from the Tinguilinta River. There are two possible raw water abstraction sites, i.e. Tinguilinta river intake and the raw water dam, which were identified by GAC and provided to the PMC for incorporation into the design. A burial site has been identified, and the facilities including haul road alignment have been positioned to maintain the required 100 m clearance.

At the port facility, the reclamation of the port terminal and conveyor causeway was established as part of a separate Project. The Project will not extend the existing platform beyond the foot print already established, and therefore disturbance of existing mangroves will be limited to the area where the jetty structure meets the land abutment. The design and construction of the jetty structure will be via driven piles and headstock thereby minimising ground disturbance.

A. Air Quality

1. Mine Facility

The mine area air emission sources will include dust from blasting, vehicle traffic and the materials handling infrastructure. Primary sources of NOx and SO_2 emissions will be from diesel combustion engine emissions from light vehicles, mine mobile equipment and the power stations.

Dust resulting from vehicle traffic on unpaved surfaces during operations (only a risk during the dry season) will be managed via water dust suppression on all haul roads and access roads. Similarly dust suppression of the construction areas, particularly while performing the earth works, will be managed through preconditioning of the soils and water dust suppression. During construction the contractor will be required to comply with the requirements of the Project environmental management plan.

For the process facilities, local dust control measures will be provided for at the run of mine (ROM) dump hopper via water dust suppression. Dry fog type dust suppression will be provided at the receipt and discharge points of the crushed ore transfer conveyor and mist water sprays at the radial stacker discharge chute. The dust suppression systems will operate primarily in the dry season, when most of the dust emission is expected.

Emissions from combustion engines will be controlled by equipment specifications which require compliance with the IFC guidelines. Maintenance will be carried out in accordance with original equipment manufacturer (OEM) recommendations and monitoring of fuel quality to defined KPIs. The FEL3 specifications assumed 2000 ppm sulphur content fuel, however

negotiations with the Build, Operate, Own, Transfer (BOOT) fuel contractor during the FEL4 will evaluate the opportunity for sourcing 500 ppm sulphur fuel.

Air quality monitors for the mine will be installed prior to construction to monitor site works by the contractors. GAC included provision for an environmental engineering consultant to provide independent air quality monitoring of the site works to confirm the modelling results and measure the Project emissions compared to the applicable targets. During operations a monitoring system will be installed, maintained and reported to GAC in accordance with GAC Environmental Management Plan

2. Port Terminal

The context of the port varies from the mine area, as the port terminal is surrounded by an urban development (city of Kamsar), industrial facilities Compagnie des Bauxite de Guinée (CBG bauxite processing, storage and export complex) and natural habitats (mangroves). Air quality monitoring data indicates that the air at the port area may be classified as "un-degraded" for NOx and SO_2, 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 the port terminal will be the off loading of ore in the terminal, the transportation of the ore by means of conveyors, the loading of the ore on barges/ships, and the wind blowing from exposed surfaces, such as a stockpile. NOx and SO_2 emissions will be due to diesel power generation at the site.

All roads and lay down areas at the port terminal will use water sprays for dust suppression and dry fog systems will be used for dust suppression at the wagon tippler area and transfer points of conveyors, as well as the stacker/reclaimer and ship loader. The dust suppression system will operate primarily in the dry season.

3. Airborne emissions

Airborne emissions from the Project will be primarily associated with power generation at the mine facility and port terminal, bauxite haulage within the mine, mine facility the handling of the bauxite at the port terminal. At the port, ore handling will be the main source of particulate emissions, as identified in the SEIA Addendum (2015) as discussed above.

The SEIA Addendum (2015) includes recommendations based on the predicted levels when compared to IFC guidelines and World Health Organisation (WHO) air quality interim targets. From the simulation conducted as part of the SEIA (2015) studies, it was noted that the Project may cause elevated ambient concentrations of nitrous oxide (NO_2), sulphur dioxide (SO_2) and particulate matter, above the guidelines at some receptor points. It was also identified that the impacts will mostly be during the operations phase.

As part of the FEL3, the infrastructure design was completed, which considered the Project's potential to exceed the IFC and WHO guidelines and aimed to reduce emissions. Some of the design considerations are included below:

- The footprints of the mine facility and port terminal are minimised by co-locating infrastructure facilities, such as road and rail access, and the use of common maintenance and administration facilities. This provides the combined benefit of

reducing dust emissions by reducing footprint and reducing the surface area requiring deforestation and thus the Project's carbon footprint.

- Mine and plant vehicles, selected as the basis for the Project, were selected based on compliance to emissions levels, as set out in the Environmental Design Criteria.
- Electrical diesel generators specifications and contract performance requirements adhere to the minimum standard as part of the IFC.
- The mine areas, including the mine facilities and mine design, have been designed to comply with the clearances, as defined in section 11.2.1 above, to minimise impact on water ways, flora and fauna.
- Fuel consumption will be metered and reported by the fuel BOOT Contractor with fuel efficiency performance targets established for the power stations and mobile plant.
- Implementation of a monitoring plan for reforestation activities by GAC.
- The diesel quality standard for the Project was set to limit the gaseous emissions.

Importantly, the African Refiners Association (ARA) created a set of fuel specification and is currently lobbying government stakeholders to formally adopt cleaner fuel standards. The target is to reach AFRI-4 standards (50 ppm (w) sulphur content in diesel) by year 2020.

Currently, the countries of the Gulf of Guinea, are generally at AFRI-1(8000 ppm(w)sulphur content in diesel) and rarely at AFRI-2 (3500 ppm(w)sulphur content in diesel) or AFRI 3 (500 ppm(w)sulphur content in diesel). However, the scenario may change and if the diesel specification changes in the country, the relevant equipment design will be required to incorporate the change. Refer to Table 11.2-1 below for diesel quality specifications.

Table 11.2-1: Diesel Quality

Parameter	Unit	Specification
Density @ 15°C	kg/m^3	833 – 837
Colour ASTM	-	3
Cetane number	-	45 (min.)
Sediment content	wt%	0.01 (max)
Ash content	wt%	0.01 (max)
Flash point	°C	61 (min.)
Conradson carbon residue	wt%	0.15 (max)
Kinematic viscosity @ 40°C	mm^2/s	5.9 (max)
Water content	ppmv	500 (max)
Sulphur	ppmv	2000 (max)
Total acidity	mg KOH/ g	1 (max)

Where final equipment selection remains the responsibility of the contractors, the specific Project requirements are included as performance requirements in the respective contracts and will be key evaluation criteria to achieve final acceptance of the facilities.

B. Water Management (Quantity and Quality)

The main surface water body in the Project area is the Tinguilinta River, which has the potential to be directly affected by mining activities. The SEIA process collected information on surface and ground water flows and water quality and the uses of various water resources were surveyed. The information showed that the net effect of water extraction from the Tinguilinta River is more significant in the dry season, when water levels and flows are lower. To address this, the FEL3 scope of facilities includes provision for a new raw water storage dam to minimise water harvesting from the Tinguilinta River. Refer to Section 6 for details of the raw water collection and storage facilities included at the mine.

The mine facility and port terminal plant storm water containment strategy is to capture first flush storm water for treatment through polishing ponds, in accordance with the Environmental design criteria, prior to release to the environment. Similarly, sewage collected will be treated to meet the requirements as set in the Environmental Design Criteria before release into the natural water courses. During the dry season, treated effluent will be recovered for dust suppression use.

1. Mine Facility

As part of the FEL4 phase, a Mine Water Management System will be developed that describes the operating requirements including mitigation strategies to limit the impact on hydrological and ecological systems. In order to reduce any drainage or flood related effects, a high flood level conveyance capacity is incorporated into the FEL3 design. The design and specification related to structures impacted by high water, including culverts, bridges and other drainage infrastructure align with international best practice for the particular locations. Settlement dams are allowed for in the design to manage drainage from mine pit areas and site run off.

The main source of water will be the new raw water dam which will be located in the northern area of the lease, as shown in Figure 11.2-1 below. The water supply is supplemented from the Tinguilinta River as a backup only and the water will be used as both potable and raw water. The water collected from the above sources is treated to meet potable water demand. Since the total dissolved solids (TDS) of the raw water is fairly low, untreated raw water is used for firewater and service water. The water is mainly used for dust suppression purposes. Separate retention facilities, a storm water collection pond and a polishing pond for dirty storm water runoff are also provided.

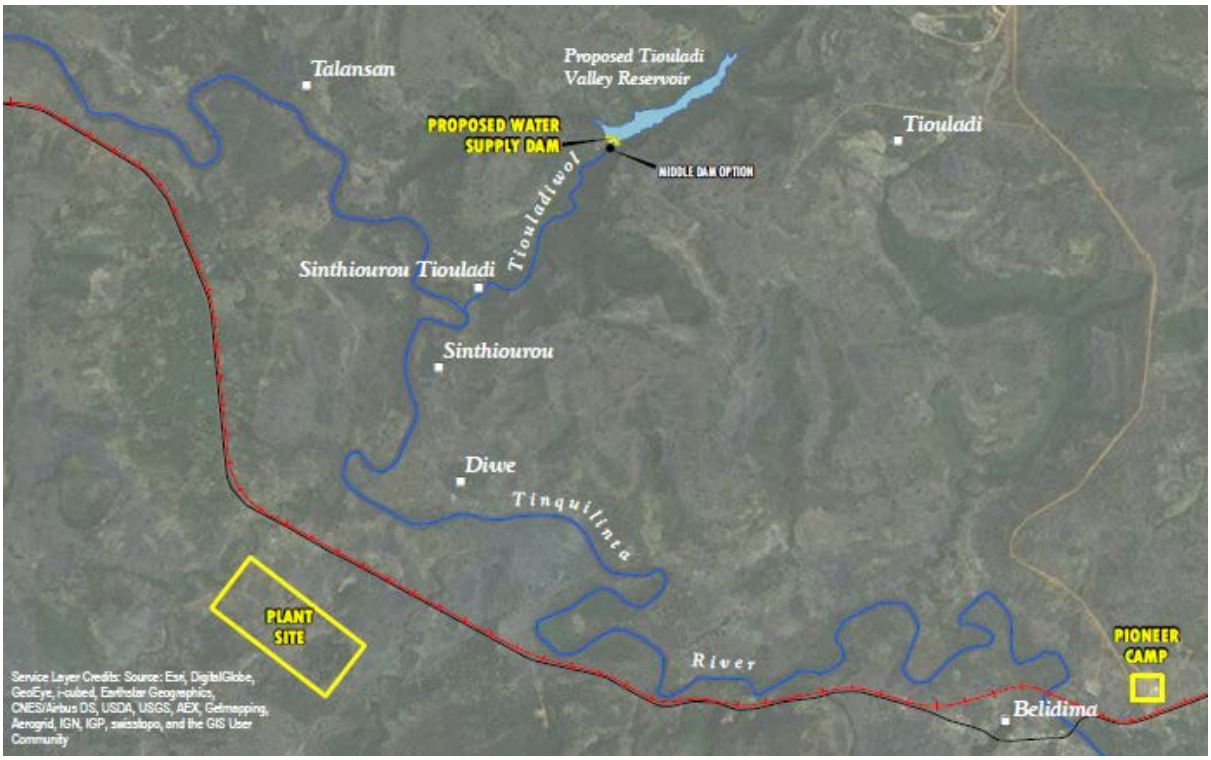

Figure 11.2-1: Raw Water Dam Location

For detail of the water infrastructure and facilities including consumption rates and key design assumptions for the mine refer to Section 6 – Mine. For an overview of the main water infrastructure locations, refer to Figure 11.2-2.

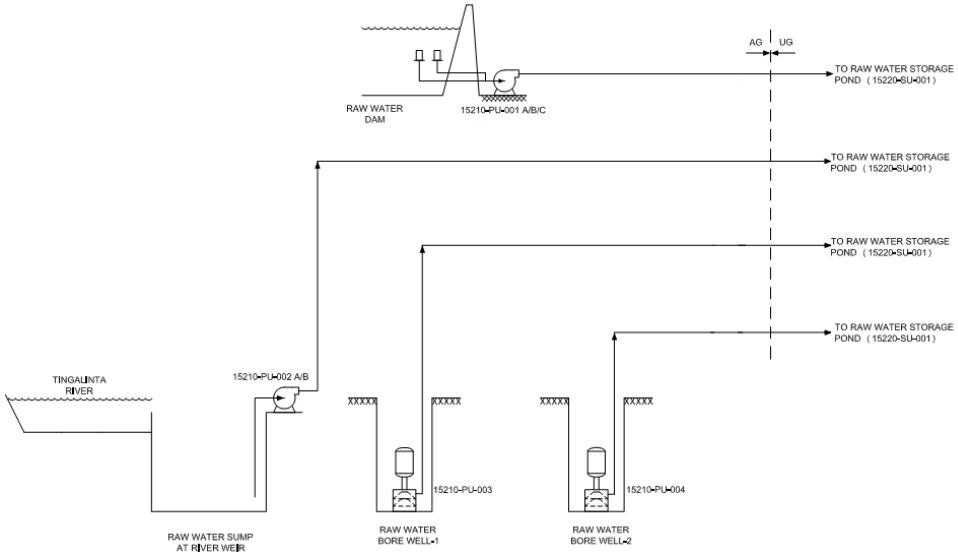

Figure 11.2-2: Mine Water Sources, Pumps Stations and Pipeline

2. Port Terminal

The raw water for the site is sourced from Dougoufissa Creek from the eastern side of the port terminal. The saline water is pumped through a sea water desalination plant for treatment to a potable water standard. Refer to Figure 11.2-3 for water facilities process flow diagram.

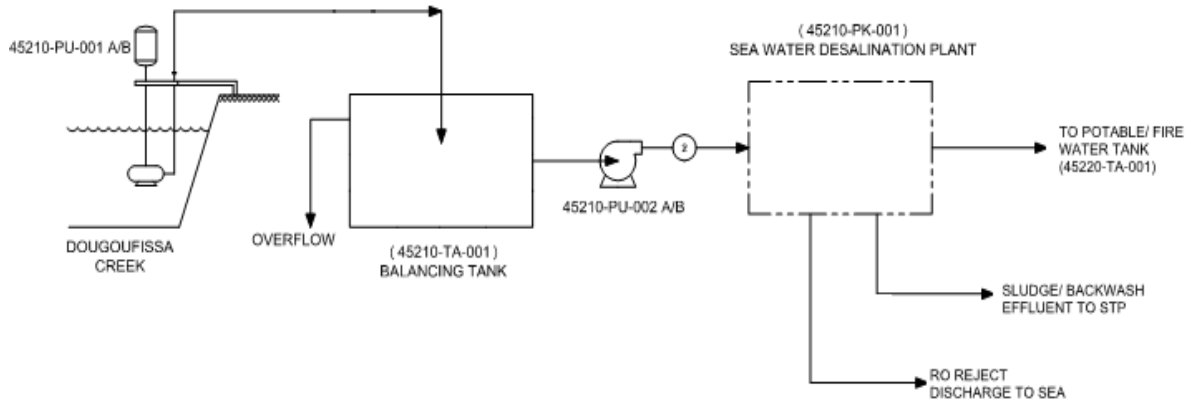

Figure 11.2-3: Port Reverse Osmosis Unit

The potable water will comply with IFC guidelines that meet WHO requirements for drinking water (Appendix 20.22 Water Analysis, Potable Water Quality and Effluent Discharge Standard) for potable water quality. The potable water is used during construction and operations as site wide potable water, fire suppression water, wash down water and for dust suppression.

Waste water from the buildings and other facilities is transferred to a sewage treatment plant for treatment prior to discharge to Dougoufissa Creek. Separate retention facilities, a storm water collection pond and a polishing pond, are provided for dirty stormwater runoff.

For detail of the water infrastructure and facilities including consumption rates and key design assumptions for the port terminal refer to Section 8 – Port Terminal.

C. Noise and Vibration

1. Mine Facility

The baseline acoustic environment in the mine facility area is low and typical of rural areas of Guinea. The main source of noise and vibration from the Project will be due to the mine processing plant, the mine pit operation, vehicle movements along haul roads, and shunting of rail cars from the mine to the processing facility and rail maintenance facility.

It is required that all process equipment supplied by contractors and suppliers comply with noise and vibration requirements. In areas where personnel work or require access, the noise of the equipment running at design conditions shall be below 85 dB at a distance of 1 m.

GAC conducted noise level modelling to predict the effect of the Project on the noise levels in receptors surrounding the mine and these were compared with thresholds derived from international standards for day-time and night-time noise levels defined by the IFC and the WHO. It was found that construction noise impact, predominantly associated with civil works and site preparation, were likely to be confined to the immediate vicinity of the works and thereby not likely to affect nearby community settlements.

Noise generated at the mine facility is predicted to have limited impact as most communities in the vicinity of the mine facility will be resettled to allow access to the bauxite resource.

In summary, the FEL3 study reduces noise impacts from the Project by the following measures:

- The noise of the equipment, running at design conditions, shall be below 85 dB at a distance of 1 m where personnel require regular access.
- All equipment from contractors and suppliers comply with noise and vibration requirements.
- Noise shielding or barriers will be specified if equipment exceeds requirements.
- Contractors are required to restrict noisy construction activities to daytime.
- The administration building is positioned to be upwind from plant equipment most likely to generate noise, i.e. sizers, conveyors and rail maintenance yard.

During the GAC SEIA studies, blasting was identified as the main vibration source for the Project, but significant impacts are unlikely, given GAC's proposed blasting policy, which will be adhered to by the Blasting Contractor. The blasting policy complies with internationally accepted practice, and includes a limited blasting frequency, as well as maintaining a 800 m temporary buffer between blasting site and the closest human presence.

2. Port Terminal

At the environment at the Port of Kamsar noise pollution mitigation is considered more important than the mine facility location, given its proximity to the city of Kamsar and the industrial facilities already in operation at the port terminal. The current main source of noise is the CBG trains travelling through the city of Kamsar and the Project is not expected to significantly alter the existing acoustic environment or perception of ambient noise level when compared to the current baseline environment.

GAC will aim to keep noise levels as low as reasonably practicable through equipment selection, use of noise barriers and appropriate operations and maintenance.

The FEL3 study reduces noise impacts from the Project by implementing the following measures:

- The noise of the equipment running at design conditions shall be below 85 dB at a distance of 1 m where personnel require regular access.

- All equipment from contractors and suppliers comply with noise and vibration requirements.
- Noise shielding or barriers will be specified if equipment exceeds requirements.
- Contractors are required to restrict noisy construction activities to daytime.

As per the SEIA (2015), underwater noise will occur in the marine environment during construction of the loading trestle and berthing facility, dredging and later the vessels and maintenance dredging during operational phase. Piling noise impacts will significantly impact the Rio Nuñez estuary and may propagate some distance, but will be partially attenuated by the shallow and confined nature of the estuary. Piling noise will be unlikely to be significant beyond the estuary and the impact will be mitigated by good practice for piling operations and soft start/ramp up procedures where piling ramps up gradually to full power, thus allowing sensitive marine fauna to move out of the vicinity of the noise source. The marine contractor, as part of their contractual obligations will be required to develop an environmental management plan for approval by the PMC prior to commencing the works.

The contractors will do monitoring of noise during the construction phase.

D. Soil

Soil disturbance will occur at the mine facility prior to construction of the facilities. At the port terminal, the works will occur at the existing hard stand platform and the current footprint is not planned to be extended as part of the Project.

To minimise soil loss during construction, the footprint at the mine facility has been rationalised by co-locating infrastructure facilities, such as road and rail access.

Surface areas to be disturbed during mining, will be progressively cleared of vegetation using track dozers. Top soil, which is removed as part of pre stripping, will be stockpiled separately and reused as part of the rehabilitation process. The mine plan includes provision for progressive rehabilitation as mining moves from one plateau to another over the life of mine. For further details of the mine rehabilitation plan refer to Section 5 Mine Plan.

E. Acid Rock Drainage

The SEIA (2015) and technical studies indicated that bauxite and overburden formations have low potential for the generation of acid rock drainage (ARD), and as such, the design did not consider this as it is unlikely to be encountered.

F. Waste Management

The Project allows for a site with sufficient capacity to accommodate domestic waste for a Project life of approximately 20 years. Waste planning during construction and mine operations is aimed at avoiding the creation of waste, re-using and recycling waste wherever possible. Waste management is described in the mine facility (Section 6) and port terminal section of this report (Section 8), where the waste management strategy for each area is described. The following waste management topics discussed are:

- inert materials
- construction and demolition (C and D) Waste
- timber, dunnage, packaging
- general and domestic waste
- re-usable and recyclable materials
- organic waste and composting
- medical
- incinerator/ash from the burn pit
- bio solids from the sewage treatment plant
- waste oil
- solvents
- site generated sediments in the storm water discharge

The Project waste management strategy aligns with the Waste Management and Disposal requirements set out by the 'Social and Environmental Impact Assessment (SEIA) Addendum for GAC's Bauxite Export Project, Guinea, Volume 3 Social and Environmental; Management and Monitoring Plan, October 2015.

The SEIA makes reference to the existing EGA-GAC Waste Management Plan (WMP) that defines the objectives, methodology and management system components to control waste generation during the early works phase of the Project currently in progress in Guinea.

G. Surface Water

1. Mine

The nature of the mine pit development at each plateau and hydrological design allows for control of surface water on the plateau to minimise the environmental impacts of areas below the plateaus including areas where chimpanzee habitats have been identified. The following methodology for surface water control has been incorporated into the preliminary mine design and is further discussed in Section 5 Mine Plan:

- Separation of surface water runoff into contact and non-contact runoff. Non-contact runoff will be diverted into existing stream channels prior to entering the pit areas. Contact runoff will be collected for treatment. Diversions will be channels, swales, and berms. Haul roads will also have channels for collection of surface water runoff.
- Contact runoff from mining areas, where the primary pollutant of concern is sediment, will be diverted into a sedimentation basin located on the plateau downgradient of the first mine pit on the areas to be mined on the plateau. As the mine pits are developed and disturbance areas increase, storage will be allowed inside the mine pits. The original sedimentation basin will be operational throughout the operational life of the pit. Figure 11.2-4 illustrates the proposed initial development of sedimentation basins.

Figure 11.2-5 illustrates the proposed surface water management plan during subsequent mining years.

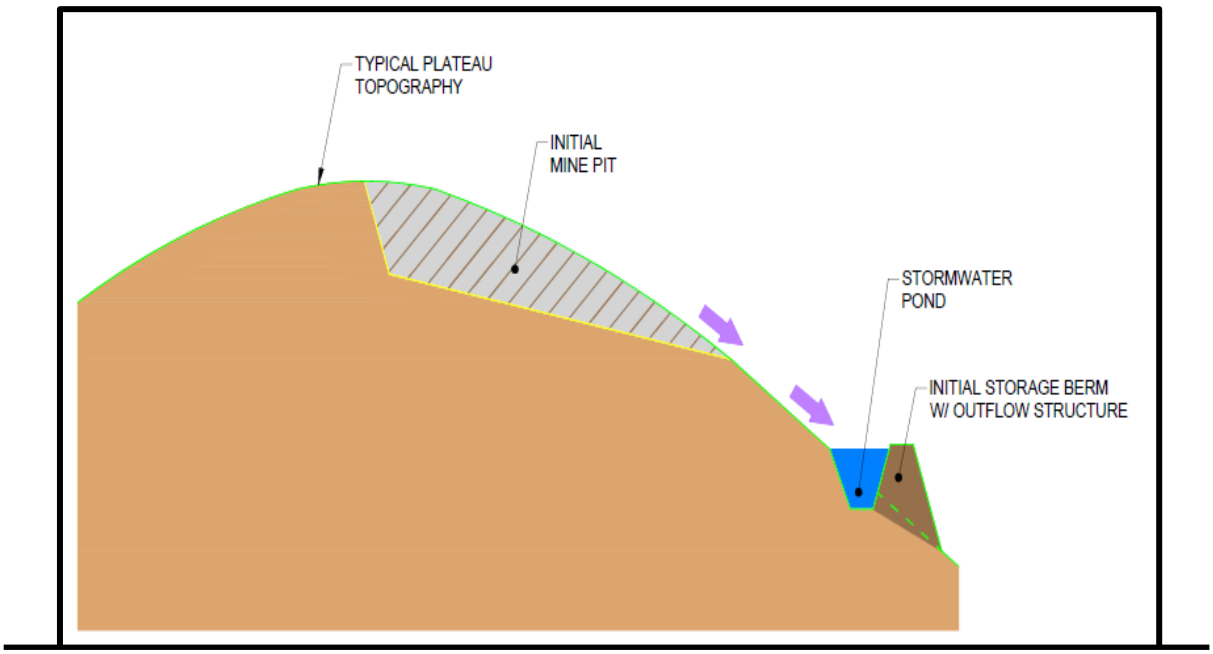

Figure 11.2-4: Conceptual Surface Water Management Plan for Mine Area Runoff during the Initial Year

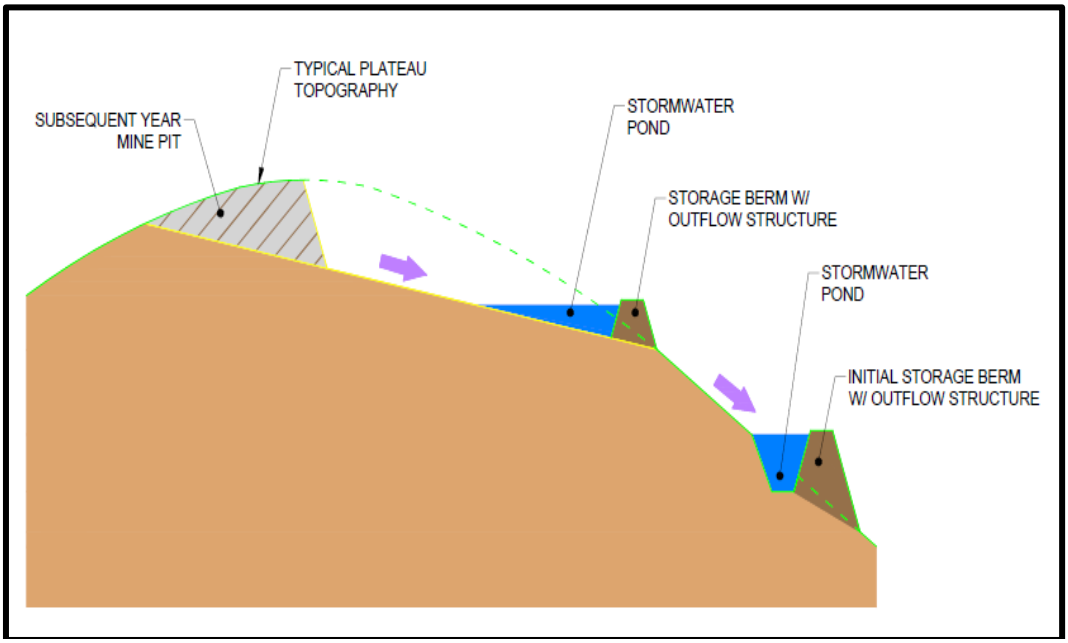

Figure 11.2-5: Conceptual Surface Water Management Plan for Mine Area Runoff during Subsequent Years

2. Port Terminal

The SEIA requires that a sediment control system is installed to remove bauxite fines from the storm water discharge. The port terminal facility allows for a single gravity fed polishing pond that treats the first flush of 50 mm of plant surface storm water run-off to remove bauxite fines before discharge into the natural water system from the stockpile and car dumper area only. All other storm water is not collected and treated as it is assumed to be no dirtier than the current storm water discharge.

The compacted sand port terrace was developed over the concession area in 2012 in order to build the terrace level above the existing ground levels and the surrounding mangrove areas. The design of the port terrace levels and drainage strategy considers the different operating areas and their potential for contaminated release of storm water to the surrounding environment. The design considers the following:

- Areas containing bauxite storage and handling - storm water is collected and transferred via gravity surface drains to a settling and polishing system prior to release. The systems proposed will require ongoing monitoring, testing and analysis of particle size distribution and maintenance and enhancement of the plant filtration systems to ensure water quality discharge requirements are met.
- Fuel storage, refuelling areas and wash down bays are bunded and storm water treated through oil/water separators prior to release.
- Non process areas, where risk of storm water contamination is considered low, is collected separately from the process areas and released as clean water into Dougoufissa Creek.

3. Marine

The risk of spillage and water contamination from the facilities located on the marine structure was addressed in a separate risk assessment. Key design features incorporated into the marine structure to ensure compliance with the SEIA and mitigate risk of uncontrolled environmental releases include:

- areas of potential high spillage, such as the transfer towers, have a graded slab to capture spills into a sump pit for collection by sucker type truck
- transformers have been specified as dry and therefore do not contain oil
- jetty conveyor includes conveyor covers to minimise dust emissions
- jetty conveyor includes additional belt protection which will be interlocked to the control system to provide early warning of pending failure
- all vehicle access areas will be via concrete roads
- diesel unloading/transfer area will be bunded
- diesel pipeline will be double bunded using a concrete inverted channel.

Further details are included in Section 8 Port Terminal and document A8GA-41400-55-RP-001 Wharf Facility – Operations and Maintenance Requirements.

H. Biodiversity

Biodiversity at the mine area is identified as one of the most important environmental sensitivities, it requires particular emphasis and the Project design takes cognisance of its importance. The mine biodiversity was surveyed over a 10 year period, as part of the work supporting the SEIA. For the SEIA Addendum 2015, dedicated field biodiversity surveys were undertaken, which focused on the southern part of the GAC mining concession.

The areas of significant conservation value correspond to the gallery forest and wooden savannah, which hosts a regionally significant number of species of specific conservation interest. Thus this area is considered as critical habitats, as defined under the 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 Project hosts different fauna species, listed as Endangered on the International Union for Conservation of Nature (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 fire finch.

The design considers international best practices to ensure that the conservation of species of concern, e.g. Chimpanzees, marine turtles and manatees, are protected and their habitats in and around the Project sites were integrated into the design process.

The FEL3 aimed to reduce the potential for displacement of species of conservation concern. The design also aimed not to impede on the species' use of their habitat and migration routes. The design considered the following, based on recommendations contained in the SEIA Addendum (2015):

- placement of mine facility infrastructure to minimise habitat loss and fragmentation of high value habitats for the chimpanzee population
- location of roads and rail lines away from habitats of high biodiversity value, where feasible
- limitation of the number and width of access roads at points of high chimpanzee activity
- minimisation of the site footprint to reduce land clearance within high value habitats
- noise and vibration impact will be addressed by specifying equipment to minimise the impact on sensitive species such as the chimpanzee, Red Colobus and Pata Monkeys, whose behaviour may be modified
- dust control to minimise the impact on the surrounding mangrove community.

Following the closure and reclamation of mined areas, GAC will work actively on re-vegetation and reclamation work, which will be undertaken to reinstate the area to pre-mining conditions.

GAC proposed the following key measures, as indicated in the SEIA Addendum 2015, based on research conducted by the Wild Chimpanzee Fund (WCF) to reduce impacts on fauna species:

- Protecting freshwater habitats and related forest galleries through engineering design and operational planning. This has been achieved through compliance with the clearance zones as discussed in paragraph 12.2.1 Design Considerations.
- 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.
- Progressive mine closure and rehabilitation of mined areas, including revegetation and progressive reforestation, taking into account natural habitat rehabilitation objectives, including the needs and requirements of local communities and the Guinean authorities.

The Project FEL3 design aims to minimise the footprint of the marine design on the ocean bed which is achieved by using piled structures and not extending the existing terminal platform beyond the current footprint. The extent of dredging has been rationalised through the location of the wharf which is aligned with the existing channel.

It is expected that the water quality impact on the Rio Nuñez estuary by the Project will be limited, as discussed in the SEIA.

I. Social and Economic

The design and specification considers the use of locally sourced materials, where reasonably possible, to minimise transport distances. In particular, the port uses dredged reclamation material to build the port terminal platform. Worker camps are placed within close proximity of the Project sites to enable workers to be home based.

As part of the FEL3 risk analysis, the impact of the design on the health and safety of the affected community was reviewed and risk action plans with associated Risk Owners were identified to implement preventative and mitigation measures. Particular emphasis was placed on issues that address public access and separation of the site and maintenance from existing public areas and design measures that reduce traffic through densely populated areas such as Kamsar.

As part of the FEL3 scope of work the key strategies relating to HR and IR of the future operations were developed and are discussed in Section 12. This section addresses strategies relating to the following:

- on boarding
- remuneration and benefits
- classification and grade structure
- rosters
- recruitment and staffing
- expatriate employment and mobilisation
- localisation planning
- training and training management standard
- cultural heritage
- industrial relations
- disciplinary codes
- grievance process
- accommodation standards.

J. Cultural Heritage

A total of 230 cultural heritage sites were encountered and listed:

- There are 156 sites which are Guineans' residences.
- There are 73 burial sites.
- One site is a historic site.

The positioning of the mine facility is placed clear of the identified burial sites. Additionally, a Cultural Heritage Management Plan will be developed by GAC during the FEL4, which will include processes, procedures and resource to be used by the Project to manage cultural heritage sites found at the mine.

During construction and mine clearance, a "Chance Finds" procedure will be used to identify, and if necessary protect or rescue finds encountered on the ground.

11.3 HSSE Management Plan

Protection of the health, security and safety of all employees, the community and the environment is critical to the overall success of the Project. The Project key objective of a "zero incident rate" is embraced by both GAC and the PMC and strategies to achieve this, involve the use of Project and contractor HSSE management systems, aligned to GAC's corporate HSSE policies. It is expected that all Project participants will meet the Project's HSSE expectations and this is specified in the respective contracts.

The key HSSE policies developed by GAC, which will be enforced throughout the overall Project and to which all policies (PMC, contractors and CANARAIL) should be aligned, are highlighted in Section 11's introductory section.

The HSSE Management Plan is discussed in the following sections:

- Section 11.3.1 – Health and Safety
- Section 11.3.2 – Security
- Section 11.3.3 – Environmental and Community

11.3.1 Health and Safety

The GAC's Health and Safety (HS) Policy is the executive document detailing the commitment to implementation of the Project's HS management. Awareness and implementation of the health and safety management systems will be ensured as the PMC Project team promotes a culture in which all employees and contractors share a commitment to the health and safety of employees.

The standards, health and safety guidelines, and accompanying documentation will be provided to contractors and support service providers for implementation. The standards will be supplemented with operational risk controls that will provide standard practices, procedures, work instructions and risk assessments to control the operational activities. The operational risk controls will be established and maintained by the operational health and safety working group.

The purpose of the HS Plan is to define the discharge of responsibilities in relation to managing health and safety and to provide the framework for the safety culture. The management plans describe elements of the management system and provide direction for both the PMC and the contractors. Plans have been developed in accordance with the statutory requirements and policies and guidelines in Section 11.1.

The plan identifies all the HSSE processes, procedures, practices and policies that need to be implemented during the FEL4 execution phase. The following factors were considered during the development of the HSSE plan:

- objective of the plan
- scope of work
- GAC, IFC, SEIA and SEMP requirements
- Project HS Goals
- site specific written procedures for execution
- HS meetings and communication
- certification process
- HS training
- new employee development program

- contractors and subcontractors
- HS incentive program
- emergency preparedness and evacuation
- medical services
- work permit requirements
- process HS management
- hazard analysis
- HS audits and inspection program
- incident and injury management
- safety and personal protective equipment.

The HSSE Plan is a live document and will be reviewed every six months during the Project and, or when, changes or previously unidentified items arise as a result of the execution of the Project.

11.3.2 Security

The Security Plan (SP) specifies the integration of people, procedures and technology, to protect the PMC, GAC and contractor staff, assets and operations in Guinea, from the negative impacts of armed conflict, terrorism, crime, civil disturbances and other identified security threats while respecting the law, culture and human rights of all stakeholders.

The Security Plan (Appendix 11.1 HSSE Management Plans) addresses the following:

- personnel security requirements
- facility security requirements
- security incident and emergency response.

The Project Security Manager will be responsible for:

- compiling, implementing and managing the Project Security Plan and Procedures
- compiling, managing and implementing a journey management system
- managing an incident management system
- the response to, reporting, recording and investigating all security related incidents
- developing a local intelligence network for early warning and crisis response
- conducting staff induction and training
- supporting, guiding and managing security focal points for each facility.

A. Security Alert Levels

The PMC will implement a three tiered Security Alert Level (Table 11.3-1) with the following levels:

Table 11.3-1: Security Alert Levels

Level	Description	
1	Awareness	Normal baseline state of security required to maintain an operational capability within the present security climate.
2	Alert	There is a potential threat from external/internal sources that is above the normal state of security for the location
3	Threat	There is an actual or highly probable threat from external/internal sources

Note: This Alert level may be changed to cater for site specific needs.

Security is managed at a Project level, but supported by the PMC's corporate security for Project and PMC personnel. Contractors will be responsible for their own security on site, supported by the PMC Security Manager.

The security level may be elevated by the PMC, by recommendation from GAC or Corporate Security. If the security level is raised by the PMC, Corporate Security and GAC will be notified of the increased security level at the earliest possible time.

The Project Security Manager will exploit and develop sources of information to ensure early warning of criminal trends and tendencies, immanent terrorist threats and impending civil disturbance and will facilitate the implementation of the appropriate Security Alert Level.

B. Security communication

Communication is vital for the routine day to day administration of Project security, as well as to ensure that all vested parties are notified of security matters in a timely manner, facilitating the initiation and implementation of an appropriate response, to events that could impact the security and safety of personnel.

A single point for reporting security related information will be established and maintained by the Security Manager. The security representative is responsible for verification of all information obtained.

Relevant security information will be cleared for release by Project management and distributed as soon as possible via email, mobile phone and in some instances mobile phone messaging apps.

Security communications can be classified as follows:

- routine security communications
- security flash notifications
- security incident reporting.

Scheduled security meetings will be conducted at agreed intervals during execution of the Project, while emergency security meetings will be conducted on a case by case scenario.

11.3.3 Environmental and Community

The Project will be undertaken in an environmentally sensitive area. GAC's aim is to conduct the Project in an efficient and environmentally and socially responsible manner, meeting the expectations of its community, shareholders and relevant government agencies. It is recognised that environmental and social responsibilities go beyond those required under statutory requirements and include social obligations, leadership in sustainable development and conserving biodiversity as per the SEIA (2015).

Environmental and social leadership and adherence to the environmental and community policies, is the responsibility of all Project participants, including GAC, the PMC and the contractors.
As part of the FEL3 deliverables, an Environmental and Community Management plan was developed (Appendix 11.1 – HSSE Management Plans). The plan focuses on how the Environmental and Community Management system will be established on the Project in order to deliver a high level of environmental and social performance. During FEL4 this plan will be replaced by the Construction Environmental Management Plan for use during the construction phase.

1. Community Themed Management Plans

In addition to the environmental specific management plans, several specific themed social management plans will be developed in addition to the existing ones.
Social or community specific management plans are:

- Employment Conditions And Awareness Management Plan
- Local Development Plan
- Cultural Heritage Management Plan
- Stakeholder Engagement Plan
- Grievance Mechanism And Resolution Plan
- Land Acquisition, Compensation and Resettlement Framework
- Resettlement Action Plan
- In-migration management plan.

These plans must be developed, managed and integrated by GAC. It will be designed to be adaptable to the various Project phases, in order to remain relevant to the specific issues arising in each phase. The PMC will support GAC in these efforts and will measure contractor compliance during site audits.

A. Objectives and Key Performance Indicators

Objectives and targets for health, safety and environmental management improvement will be established annually by the PMC in consultation with GAC, and progress towards achievement of these objectives and targets shall be monitored. Appropriate objectives and targets will be agreed with GAC and should focus on both leading and lagging indicators. The contractors may develop their own objectives and targets, but these must be in line with PMC and GAC targets, and must be approved by the PMC. The contractors' management plans will also be established in such a manner that they enhance GAC and the PMC's ability to achieve the set Project environmental and community objectives and targets.

Action plans or programs for achieving objectives and targets will include designation of responsibilities, at relevant functions and levels of the organization, the means and the due dates by which they are to be achieved. These action plans will also be logged as part of the Corrective and Preventative Actions (CAPA) process for easy tracking.

The PMC Environmental performance assessments shall be conducted to identify and correct problems and create improvement plans to ensure compliance with objectives, targets and other requirements. These performance measurements will include activities of contractors and improvements may take the form of small step ongoing continual improvement or strategic breakthrough Projects.

B. Roles and Responsibilities

GAC is responsible for providing the PMC with all relevant environmental and community information pertinent to the Project, e.g. previous environmental investigations, previous assessments, including baseline studies, etc, and is responsible for obtaining all regulatory approvals and permits for the Project and for liaising with Government as necessary. GAC will provide the PMC with the relevant environmental data to assist in work planning and will monitor and audit the plans to verify to what extent GAC's Environmental requirements have been met by the PMC and contractors.

The PMC has overall responsibility for overseeing that the SEIA is fully implemented for the duration of the construction works and for auditing the implementation of the Environmental Management Plan (ECMP), to verify that agreed environmental and community objectives are achieved. The PMC will be responsible for verifying that all contractors are complying with the requirements stipulated in the plan and will regularly report on performance to GAC.

The contractors shall provide sufficient nominated individuals responsible for ensuring compliance to Environmental and Community requirements. The contractors shall regularly report to the PMC, in the required format, on performance.

The contractors shall provide details on the number of environmental advisors on site, document the Environmental and Community responsibilities for key Project personnel (Project Manager, Supervisory personnel, Environmental and Community personnel and general personnel), maintain an organisational chart and communicate any changes in key roles to the PMC.

All contractors and their sub contractors are responsible for understanding and meeting the environmental and social requirements associated with their scope of work. Contractors will

be fully knowledgeable of, and responsible for, complying with the applicable environmental and communities' requirements, procedures, restrictions and guidance provided in the ECMP. Contractors are required to cooperate fully in implementing applicable environmental and communities procedures, and will be held contractually responsible for failing to do so.

C. Environmental and Community Management System Framework

The Environmental and Community Management System encompasses the construction, operation and closure phases of all Project activities.

The Environmental and Community System and its documentation are subject to regular reviews and continual improvement to ensure management plans and activities are current, and incorporate relevant approval and licence conditions.

Prior to commencement of the FEL4 and as the Project progresses, documentation will be revised as appropriate. The Environmental System is overseen by the PMC HSSE Manager and the GAC environmental team provides technical support and training in EMS implementation. It is intended that the EMS will be aligned with and complement other GAC operational management systems. GAC Community team will take care of the community related systems and involve the PMC where needed, however the PMC do not have resources to manage these activities and functions.

1. Measuring and Monitoring

Contractors will monitor noise, dust and other impacts during construction phase and make those reports available to the project and implement mitigations to high levels of exposure as per IFC performance standards requirements.

2. Non-conformance and Incident Management

The hazard identification, risk assessment and management processes will be effectively implemented across all the entire Project operations to prevent the occurrence of incidents. An effective process to report and investigate all incidents, non-conformances and other related losses to establish root causes, shall be implemented as part of the Environment and Community risk management process and in accordance with the GAC, IFC and Government of Guinea requirements.

3. Corrective and Preventive Action (CAPA)

The PMC and contractors will adopt a proactive approach to Environment and Community management action. A deliberate drive to identify and implement preventive actions will be promoted to minimise the number of corrective or reactive actions.

In order to ensure that a program exists to address deviations from set objectives, targets, standards, procedures and other requirements from all sources within the Environment and Community management system, corrective and preventive action management processes shall be established. Progress on the completion of corrective and preventive actions shall be monitored, and the effectiveness of such actions reviewed regularly. Contractors will be required to establish an action management system that satisfies the provisions under this section.

D. Permits and Approval

GAC is responsible for obtaining all Regulatory Approvals and Permits and for liaising with the Government of Guinea. The PMC will assist, in provision of information to support permitting and in delivering and demonstrating compliance with permit conditions, Guinean regulations and any other obligation.

The PMC is responsible for:

- undertaking permit requirements training to PMC staff and oversee that contractor personnel implement similar processes, for permits issued to GAC
- updating the Legal and Other Requirements Register (LAORR) for management of Project commitments
- oversee the management of change in conditions through management of change process
- supporting GAC in accompanying Ministry Representatives on site visits
- generating information on:
  - design and schedule
  - scope of works
  - schedule
  - design details

Contractors are responsible for:

- Identifying legal and other requirements relevant to their scope of works. The Contractor can seek assistance from the PMC in identifying legal and other requirements. However this shall remain the responsibility of the Contractor.
- Understanding the conditions of permits related to their work.
- Understanding the conditions of other requirements related to their work and ensuring compliance to them. Other requirements include but are not limited to IFC, SEMP, SEIA and Environmental Performance Standards,
- Clearly communicating requirements and ensure they are understood by personnel accountable for compliance.
- Holding copies of all relevant documentation (e.g. licenses and approval applications) relevant to scope of works.
- Supplying to the PMC copies of registrations / licenses or permits required under legislation, and providing reasonable assistance to the PMC in relation to regulatory and other legal requirements.
- Where required by the Project, developing and implementing procedures for the monitoring of resources extracted and/or released into the environment, this includes but

is not limited to groundwater extraction and authorized releases to the environment resulting from the related works. The frequency of monitoring shall be determined from risk assessment outcomes or legal and other requirements but may be increased at the discretion of the PMC.

- Where required by the Project, monitoring the extraction, discharge, movement of material, storage as set out in relevant Environment and Community license, permits or approval documents.

E. Environmental and Community (EC) Risk Management

The PMC and all Contractors will have an overall understanding of all significant environmental and community aspects to be encountered on the Project, by using the hazard identification, risk assessment and risk control processes approved for the Project.

In order to minimise losses and maximise opportunities, Environmental and Community risk management will be an integral part of Environmental and Community management practice.

- Job safety analyses (JSAs) will be performed and management plans established and approved before the commencement of any construction work.
- Prevention of harm to the community and the environment will form the basis for Environmental and Community management for all PMC and contractors' activities on the Project. Hazard Identification, Risk Assessment (HIRA) and risk control processes are the foundation for Environmental and Community management and shall be carried out as proactive measures, rather than reactive ones. Opportunities will also be identified in the HIRA processes, and beneficial or positive impacts enhanced through proactive management action.
- All new, revised activities or procedures will be subjected to the risk assessment process in accordance with the established management of change process. Risk assessments will also be reviewed whenever a significant incident occurs. Any necessary risk reduction and control measures that are identified will be subjected to the HIRA process prior to being implemented, again in accordance with the management of change process.
- Environmental and social risks and controls will be identified and documented within the environmental and community risk register to be maintained by GAC and PMC will oversee contractor implementation of mitigations.
- GAC will verify that their Environmental and Community management systems address as a minimum the hazards identified. The risks associated with each of these hazards will be addressed through the means of an Environmental and Community work procedure (also known as operational control procedures).
- Each contractor will develop (or adopt the PMC's) Construction Environmental Management Plan mitigations as well as the GAC Community procedures for their scope of work. Procedures will be developed or adopted to address identified significant risks as well as legal and other requirements. These procedures will be submitted to the Project Environmental and Community Representative or nominated delegate for approval before commencement of work.

- A general description of the Environmental risk assessment process is described within the Safe Work Procedure referenced in the PMC Construction Environmental Management Plan for Guinea Bauxite Export Project and GAC Community requirements and SEMP.
- Environmental and Community risks and associated management strategies shall be identified prior to any work being conducted. Such strategies will be reflected in the relevant Environmental and Community management plan(s).

F. Disaster Management and Recovery

A preliminary desktop review of major community and environmental incident scenarios for early works and the construction phase were conducted as part of FEL3. The scenarios reviewed included:

- major loss of hydrocarbon containment to land, wetland, watercourses or groundwater
- major loss of hydrocarbon containment to sea
- contamination of watercourses, groundwater, soils, vegetation and marine waters due to accidental release of hazardous or biologically active materials
- hydrocarbon fire leading to release of polluting firewater to sensitive receptor
- contamination of non-hazardous landfill or loss of containment from landfill leading to contamination of soil or groundwater
- forest fire
- flooding
- serious harm or fatality affecting protected species (e.g. chimpanzees)
- public protests
- labour unrest
- road, water or marine vessel accidents with significant community safety consequences
- disruption to roads
- disruption to food supply and security
- increase in malaria or waterborne diseases.

As part of the FEL4, emergency response plans will be developed by contractors to outline how the above listed incident scenarios shall be managed and will be updated every time a major incident scenario is identified or when deficiencies in the plans are identified. These plans will be supported by an Environmental and Community risk assessments to identify other possible major incident scenarios as the Project progresses.

Response operations training will be conducted with Environmental and Community, and oil spill response personnel to ensure that the personnel are familiar with spill prevention requirements, spill report processes, and oil spill equipment storage and operation.

Operational control procedures have been established to reduce the probability of these scenarios materializing, such as oil spill to land, oil spill to water, fire, etc. The contractors are required to:

- identify potential emergency scenarios within their scope of work through the risk assessment process and establish response plans and submit these to the PMC for approval
- conduct or participate in emergency response training arranged by the PMC
- have appropriate EC emergency response equipment available on site relevant to the scope of work
- ensure up to date emergency contact numbers are supplied to the PMC.

G. Marine Environmental Impact

GAC regards environmental stewardship, as well as protection of employee and public health, as corporate commitments of the highest priority. Impacts of the Project on the marine environment were highlighted in the SEIA (2015) as a key concern and the Project's mitigation strategies are discussed in more detail below.

1. Marine Specific Impacts

Marine activities, particularly dredging, have the potential to cause environmental impacts, including:

- impact on water quality that potentially disturb coastal and benthic flora and fauna
- increase in sediment loads in the water column, with secondary impacts on the marine ecosystem
- impact associated with noise, vibrations and shock waves with effects on marine mammals and birds as well as potential impacts on port and surrounding structures
- increase in shipping traffic due to interruptions in regular ship movements, as well as increased risks of collisions between barges transporting dredge material and regular shipping traffic
- interference with local fishermen and
- blockage of local people's access to the shoreline.
- air emissions from marine construction engines such as barges, tugs, dredging and marine construction vessels, and dust during operations
- introduction of invasive foreign species to local waters in ballast water exchanges
- restriction of access to waterway for access to the abutment at the shoreline and trestle construction
- visual impacts related to construction equipment, materials, and lighting
- disturbance to marine mammals from jetty construction, pile driving, and dredging
- disturbance to marine flora and fauna and local artisanal fishermen due to increased and suspended sediments in water column from dredging and dredge spoil disposal activities

- generation of construction waste and human municipal garbage
- potential fuel spills into waterway from marine vessels
- security breaches at jetty from marine vessels and
- noise and vibration from construction activities such as dredging and pile driving.

2. *Recommended Mitigations*

Implementation of the mitigation measures discussed in Appendix A of the Marine Environmental Management Requirements (Appendix 11.1 Marine Environmental Management Plan) will effectively reduce the potential environmental impact to temporary or less-than significant level. The mitigation measures include:

- utilisation of air quality management procedures applicable to ship operators
- maintaining emissions of NOx and SOx within the limits established by international regulations where possible
- utilisation of low-sulphur fuels in port, or as required by international regulations if feasible
- utilisation of directional lights pointing inwards and downwards
- maintaining equipment and materials in an orderly manner during the works
- high machinery, including cranes, will be demobilised from site as soon as they are not needed for construction work
- barriers and vegetation to lower visual effects of port infrastructures
- vessels shall operate in accordance with appropriate industry and equipment noise and vibration standards
- development of an Emergency Response Plan for accidental spills and discharges
- appropriate methods and dredgers that will potentially reduce the development of sediment plumes
- sediment control measures for limiting suspended solids in the river to the extent practical
- forbiddance of ballast in coastal waters for boats related to GAC's operations
- establishment of ballast water management procedures for all Project vessels and monitor compliance or breaches of procedures
- utilisation of planned location(s) for dredge spoil disposal (areas with lower density of benthic communities and in low current areas to limit remobilization and sedimentation of spoil)
- alignment with Harbour Master and affected populations to implement a boat traffic plan for construction and dredging work in the estuary
- measures to prevent accidents and the risk of discharging effluents in the natural setting and reduce the cause of these dangers

- sensitive marine life, such as feeding, breeding, calving, and spawning areas are identified in the SEIA Volume 3 and requirements of the SEIA shall be adhered to
- all vessels shall strictly adhere to Port controls
- large vessels shall travel more slowly and under pilotage in shallow or confined marine areas where susceptible marine fauna are more commonly found.

H. Endemic Disease

An Endemic Disease Plan (EDP) has been developed for the Project and provides a streamlined approach in handling medical health-related cases as in:

- threat of a medical health crisis on the Project in the form of an epidemic or pandemic
- medical health crisis in the form of epidemic or pandemic, affecting employee health and welfare in the community or work site
- threat of business operation disruption due to medical and health concerns.

The plan aims to maintain a healthy, safe, and productive working environment for all GAC, PMC and contractor personnel as they continue to deliver quality services. Infection prevention and control measures are adopted to limit or minimise risk of exposure.

All contractors will be required to prepare an Endemic Disease Management Plan (EDMP) for their scope of work which addresses, as a minimum, the requirements of this EDMP. The contractor's plan will be submitted to the PMC for review and approval prior to commencing work.
GAC will establish an onsite clinic for the execution phase of the Project, where monitoring and screening for endemic or epidemic diseases and general medical support will be provided in addition to other general first aid facilities to be provided by contractors for their employees and subcontract employees. Initial emergency response and first aid for all site based personnel, including contractors, will be provided by GAC at the provided medical facilities, however this does not relieve the contractor of their responsibility to manage all first aid and medical issues concerning their employees, including emergency evacuation and longer term management if required.

The Project clinic will also have the responsibility to manage and assist the Project in maintaining up to date information on endemic or epidemic diseases that might affect the Project or its employees. The contractors will have the responsibility to be self sufficient in the management of the general health and well being of their employees in addition to endemic or epidemic diseases not limited to but including HIV, Ebola and Malaria.

The contractor shall establish mandatory monitoring and screening procedures, where identified as applicable for the prevention and management of the disease, and shall conduct screening of all personnel, as applicable. It should be noted that daily screening is required for management of Ebola when there is likelihood of employees contracting the disease and as per the Project Condition Level matrix in Table 11.3-2.

All Project employees will adhere to their company's monitoring and screening protocols and shall comply with the Project wide requirements as applied to the site. Hand sanitation methods must be implemented as a permanent routine on all Project sites, camps and Project facilities. The contractors will be required to conduct training for their employees and provide required PPE and prevention merchandise for their employees.

Where there is an outbreak of an epidemic or endemic disease and it is classified as a Condition level 3, in accordance with the Condition level matrix in Table 11.3-2, the contractor shall prepare and present a plan to evacuate employees safely if required. This plan will also form part of the contractors' Endemic and Epidemic Management plan, but can be updated if and when situations change.

Table 11.3-2: Condition Level Matrix

Condition Level	Description	Operations Management	Travel Management	Additional actions
5	Employee was transferred to an EDV screening center and is a confirmed Ebola case	• Stop operations • Management internal risk assessment to determine if operations continue	Stop all incoming travels to affected area	• Isolate direct contacts in camp / at home • Start decontamination cleaning process
4	Employee is an Ebola suspect (Not Confirmed) Diagnosed at work / in the camp - Medical risk assessment by HLO to investigate and treat or immediate referral to EVD screening facility	• Stop operations of affected department have employees go through sanitation procedures • Internal risk assessment / review of possible contacts to determine if operations continue	• Limit access to at-risk areas • Remove all non-essential personnel from affected area • Travel to area affected to be managed with extreme caution.	• Referred to WHO / ETC facility for diagnosis Ebola screening • Quarantine until WHO / ETC takes over care
3	Employee reports signs / symptoms while at work, in camp or transport - Medical risk assessment by HLO to investigate	• Normal operations with monitoring of medical results • Medical informs H&S and operations of case with signs and symptoms	No restrictions on movement	• Initiate quarantine of patient in accordance to isolation for assessment procedure and Medical examination conducted • If examination and questionnaire indicate at-risk employee – move to next level while sample analyzed .
2	Employee reported ill telephonically and is referred to either a local medical facility for diagnosis and treatment or to an Ebola screening facility based on medical risk assessment	Normal Operations	No restrictions on internal movement, but protect against incoming movement from affected areas	Internal risk assessment of possible contacts, pending final diagnosis from local medical facilities or ETC.
1	Healthy local employee in any of the three GAC locations in guinea on Ebola Community or in WHO contact list	Normal Operations	No restrictions on internal movement	Close monitoring of the person in quarantine and risk assessment of who he or she had contact with.

11.4 Closure Plan

The Project is committed to restore and rehabilitate all temporary project locations after completion. To ensure that closure of the Project complies with the requirements of the SEIA, a Project closure plan will be developed, reviewed and approved for the FEL4 execution phase of the Project. The Plan will be developed and periodically updated in consultation with the GAC HSSE department. Closure and salvage costs have been allowed for in the capital cost estimate for the Project HSSE closure, with the final mine closure as part of the Owner's cost.

PMC Project management, GAC and the PMC's HSSE department will collaborate in identifying pertinent Project HSSE related information, achievements and lessons learnt that requires capturing in the Closure Plan and the close out reports. Closure planning will be a dynamic process requiring regular review during Project life to take into account changes in Project configuration, legal obligations, GAC requirements, community expectations and technical knowledge.

The aim of the closure plan for the execution phase of the Project will be to:

- relinquish the temporary Project site in a condition that minimises risks to human health or safety and to the natural environment
- relinquish a stable and uncontaminated site
- deliver required reports, test results and sample reports taken or conducted during the execution of the Project
- comply with the Closure requirements of the SEIA and any other requirements related to site closure.

Project close out reports will be developed for Engineering and Field, and will cover requirements as set out below.

11.4.1 Engineering

Engineering will cover the following as a minimum in their close out reports:

- Report and findings on health and safety engineering studies
- HSE engineering deliverables including environmental strategies
- HSE engineering scope of work and scope of services
- Key HSE roles and responsibilities
- HSE engineering opportunities
- HSE engineering recommendations
- Final conclusion.

11.4.2 Field

Site close out reports will cover the following as a minimum:

- HSSE Program Elements
- SWOT (Strength, Weakness, Opportunities and Threats)
- Achievements and remarkable milestones
- Audit results
- Awards
- Final HSSE Statistics for the Project
- Final conclusion.

11.4.3 HSSE Project Closure

All contractors will be required to comply with the agreed HSSE Closure Plan. Areas such as lay down areas and establishment areas will be inspected after contractors have completed their scope of work. Final payments to contractors will not be paid until a copy of the site closure checklist has been signed and approved by all agreed signatories.

All reports, including environmental monitoring reports will be submitted and accepted by the PMC and GAC prior to the final payment being made to contractors.

When necessary, contractors may be requested by the PMC or GAC to rehabilitate the disturbed areas. Taking into account future land use, such rehabilitation may take the following forms:

- restoration of vegetation, which may take the form of hand seeding
- restoration or establishment of sediment control devices or making sure the area is self draining
- restoration of natural drainage patterns and no impacts on drainage or flooding following site rehabilitation
- landscaping or final contouring which may require re-spreading subsoil and top soil
- decontaminating soils or ensuring that other contaminated materials are collected and properly managed
- in some cases, the rehabilitation may be done in accordance with land owners' requirements.

Each contractor will be responsible for the rehabilitation of the areas such as temporary sites, land, borrow pits, laydown areas, site establishment areas and any other area that was used for the execution of the Project.

11.4.4 Mine Closure Planning

The Mine Plan is based on progressively mining various plateaus. The mine rehabilitation plan includes stockpiling topsoil, re-grading the affected area, removing ore stockpiles, reinstating natural drainage conditions, re-vegetating affected areas, placing stockpiled topsoil, dismantling mine roads, and removing surface water controls. The rehabilitation of the mine site will start a year after mining is completed in each pit.

Regrading the affected area will involve reducing pit high wall slopes that are not backfilled during mining. Regrading will require drilling, blasting, and the material movement of an estimated 2.76 Mbcm.

Removal of ore stockpile pads will include export-grade bauxite ex-pit stockpiles. The stockpiles will be removed after mining for each plateau, assuming the refinery-grade bauxite will remain on the plateaus. The total area of ex-pit stockpiles for the mine plan is 56.5 hectares.

Drainage channels will be created to reinstate the natural drainage. This will require drilling, blasting, and material movement of an estimated 449 000 bcm.

Re-vegetation is planned for all affected areas including re-graded pit walls, pit floor, in-pit and ex-pit overburden and interburden storage areas, and previous ore stockpile locations. The re-vegetation will be over an estimated area of 2 886 ha.

The placement of topsoils will be done prior to re-vegetation and only to areas where topsoil existed before mining activates. The total amount of topsoil in the mine plan is 386 000 bcm.

The mine roads will be used during the rehabilitation plan; when they are no longer necessary they will be dismantled. The total length of mine roads in the mine plan is 157 km.

The mine water controls will be necessary during the rehabilitation plan and will be dismantled as the final stage of rehabilitation. This will involve filling in the diversion ditches and removal, or re-grading the impoundment berms, which totals an estimated 563 000 bcm of material movement.

The final mine closure plan will correspond to the end of the life of mine, when mining the bauxite plateaus will cease. Dismantling, demolition, removal of equipment and buildings, reshaping and re-contouring of land surfaces and rehabilitation of occupied areas will be managed by GAC.

It is required that the land occupied by the mine and its infrastructure will be returned to its former land use as far as reasonably possible and the closure phase will also require the management of social and environmental issues such as retrenchment of work force and managing the social and economic implications associated with local employment and business loss. GAC will develop a Mine Closure plan in consultation with relevant authorities, the work force and local communities to leave behind a rehabilitation mine site, which is stable, non-contaminating and with a sustainable water management system. The Mine Closure Plan will be developed prior to the commencement of operations and will be reviewed and updated regularly during operations. GAC will investigate post closure diversification of the economy and re-skilling the workforce to mitigate the impact of mine closure.

11.4.5 Port and Marine Closure Plan

It is expected that the port terminal and marine facilities will be used by GAC or handed over to the Guinean government for use to the benefit of the country, as the Marine facilities has a 50 year life of mine, whereas the Project has a 20 year life of mine.

11.5 Appendices

Appendix 11-1 HSSE Management Plans
Appendix 11-2 GAC HSSE Policies
Appendix 11-3 Social Environmental Impact Assessment Summary