

**ENVIRONMENTAL IMPACT ASSESSMENT OF THE PROPOSED
DEVELOPMENT OF ATLANTIC PRIVATE SCHOOL**

SCOPING REPORT

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EXECUTIVE SUMMARY

Atlantic Private School appointed Karnataka Environmental Services CC/2016/10849, to conduct an Environmental Impact Assessment (EIA) for the development of Atlantic Private School. Such a development has been necessitated by the growing demand for education need and economic development. Located on the East of Oshakati-Omungwelume road, at Latitude: - 17.709420/S1742'33.913", Longitude: 15.655401/E15'39'19.442" Atlantic Private School covers a surface area of 80000m² has been earmarked for the project.

The EIA aimed to assess the potential environmental and social impacts of the Atlantic Private School Development Project. As part of the assessment, the applicable legal framework, policies and international conventions were also identified and listed. The EIA particularly looked at the environmental impacts of the development on the land and biological environment, and the impact of the resulting pollution (air, water, land, and noise) on the environment; both during the construction and operation phases. The EIA also considered the impact of the development on the socio-economy. Both the positive and negative impacts were considered, and mitigation measures for potential negative impacts were proposed.

The assessment revealed an anticipated potential damage to the land environment, as well as an alternation of topography and geomorphology, which was result from clearing of the land for construction. In the process, loss of vegetation and mini-fauna species will also be experienced. However, none of the valuable plant and faunal species was be lost. This finding was reveal the scoping study on the fauna that is found in the area, which was also look at the vegetation species. The scoping assessment further revealed that land degradation was be a potential indirect consequence in the long-term.

Pollution in form of air, water, solid and noise will be experienced, both during the construction and operation phases. These will further have negative impacts, related to health, environment integrity and human physiology. However, the severity of impacts can be avoided by implementing the mitigation measures that have been proposed.

In terms of social impacts, the development will contribute to the development of Namibia at large, as it will bring about affordable quality education, create job and business opportunities, and was present opportunities for accessing basic facilities such as educational, recreational and small business entities as a result of increasing population. In addition, it is anticipated that the local markets, businesses, banks and revenue institutions was potentially benefit from this development, both during the construction and operation phases.

Despite the potential negative impacts of the proposed development on the environment, although significant, their worst consequences can be prevented, particularly if the proposed mitigation measures are implemented. Most importantly, the positive impacts of this development seem to weigh more compared to the negative impacts. This benefit, and the fact that mitigation measures have been proposed to address the potential negative impacts, suggests that the development

should rather proceed and not stopped. Therefore, this assessment recommends that an Environmental Clearance Certificate (ECC) should be awarded for the development to go ahead, on condition that the mitigation measures should be implemented. In addition, the Environmental Management Plan (EMP) which should accompany this report should be implemented in order to avoid the worst environmental impacts.

ACRONYMS AND ABBREVIATIONS

CBD: Convention on Biological Diversity

BID: Background Information Document

ECC: Environmental Clearance Certificate

EIA: Environmental Impact Assessment

EMP: Environmental Management Plan

HPP: Harambee Prosperity Plan

IAPs: Interested and Affected Parties

ILO: International Labour Organization

NDP: National Development Plan

SDGs: Sustainable Development Goals

UNFCCC: United Nations Framework Convention on Climate Change

UNCCD: United Nations Convention to Combat Desertification

WHO: World Health Organization

1. BACKGROUND

Over the past years, particularly after Namibia's independence, Oshakati has been experiencing a high demand for educational institution most especially junior primary and economic empowerment. This is particularly due to the increasing town population, which can be attributed to the uncontrolled movement of people from other towns and from rural areas, in search for employment opportunities, business opportunities and better living conditions. Recently, Atlantic Private School has identified land suitable for construction of a private school, which could also offer business and other socio-economic opportunities to the residents of Oshakati. The identified area is currently in-tact, but was be transformed into a multiple-use area comprising of classrooms, recreational facilities, office spaces and facilities for public use.

The proposed development is of essence, as it was not only present an opportunity for education provision and economic empowerment in Oshakati and nearby areas, but was contribute to the development of Namibia at large. According to the Fifth National Development Plan (NDP 5) of Namibia, economic infrastructure and social development are sub-pillars of economic progression and social transformation, which was contribute to inclusive, equitable and sustainable economic growth; and to capable and healthy human resources. Ultimately these will contribute to poverty eradication and reduction of inequality.

Despite the valuable opportunities that the proposed development was present, the proponent has to adhere to the applicable legislations, the Environmental Management Act No. 7 of 2007, and the Environmental Impact Assessment (EIA) regulations of 2012, which state that any land-use change and developmental activities for commercial purposes cannot be undertaken without an Environmental Clearance Certificate (ECC). This means that environmental and social impacts of the proposed activities needed to be identified, along with their mitigation measures. However, the development can only go ahead if an ECC is awarded by the Ministry of Environment, Forestry and Tourism (MEFT).

Given the above background Atlantic Private School appointed Karnataka Environmental Services CC to conduct an EIA for the proposed development. The overall aim of the assessment was to identify the potential environmental and social impacts of the development project (Atlantic Private School). The EIA has taken into consideration the positive and negative impacts associated with the development of the proposed area, and has made efforts to identify and propose mitigation measures. It paid particular attention to all the activities that was be involved, both during the construction, and the operational phases, and their associated impacts.

This background document presents the detailed nature of the project conducted as part of the EIA of the proposed development.

2. PROJECT AREA DESCRIPTION

2.1. Description

The proposed site is located in Onanime village alongside the Omungwelume - Oshakati road, approximately 7 km out of Oshakati. The area covers approximately 8ha as indicated in the map (Map 1)



Map 1 a. Proposed site location and its relative distance from the central business district (CBD) Oshakati

The proposed project area is located in a Savanna area covered in few Mopane and Bitter bushes, it is relatively flat, without any possible water runoff. Given its Savanna and roam soil nature, the landscape within the site has created zero possibility of storm water runoff streams. Nevertheless, the area has been estimated to accommodate different-sized houses, a sport field for the school, administration block and classrooms.



Picture 1: Show part of available vegetation at construction site.

2.2. Vegetation

The proposed development site is covered by vegetation; predominantly grass, shrubs, mopane trees; and has never been developed for any use before. The grass and shrubs are poorly developed due to poor soils quality. Noteworthy, there is no range-restricted habitat within the development site.

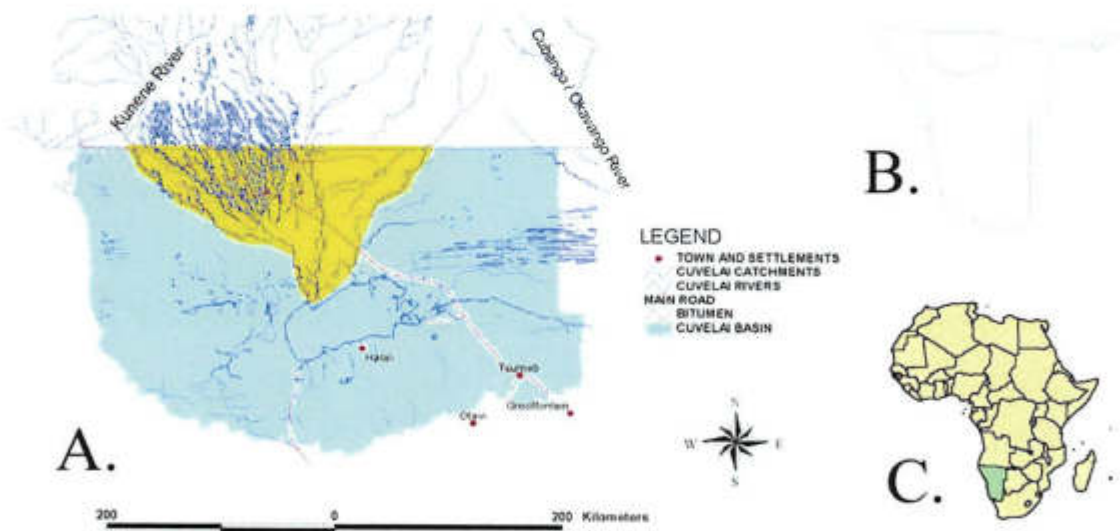
2.3. Water/hydrology

This section presents the groundwater and surface water conditions on the site, as well as the general hydrological context of the Oshakati area. The site lies roughly 1 km north east of the perennial runoff Oshakati - Calueque canal Catchment area, within the Cuvelai basin, whereby the surface water preferential flow is influenced by the presence of rain water during the rainy season in the area.

2.3.1. Groundwater

In terms of groundwater, no utilized aquifer has been reported in the area or in the direction of the proposed site. Groundwater contamination potential therefore only exists in these geological features. Faults play a significant role by increasing the fracture density of the fissile schist, and providing links between the surface and the aquifer below. It is therefore critical to closely monitor all sewage pipes, filling stations, dump sites, including cemeteries, to protect the groundwater from pollution.

Note should also be taken that apart from the mapped geological faults, more similar structures are not likely present in the area, as well as a result of the proposed project. Additionally, it is important to note that the mapped features might also well extend beyond their mapped ends.



Map 2: Oshakati - Calueque Canal Catchment area of the Cuvelai basin.

2.3.2. Surface water

The average annual rainfall in Oshakati is 528 mm, while the average evaporation rate is 3200 mm/a. Although the proposed project is relatively flat, a degree of potential flooding does not exist. The soil type which is roamy and the non-existent of water runoff channel make it difficult for future flooding and as a result of the project.



Figure 4: Show the type of soil and plants available of the proposed site

3. SCOPE OF WORK

The proposed development involves a transformation of the virgin land portion of Onanime Village communal grazing area into a residential, education and recreational area. This particular scoping study focused on assessing the environmental and social impacts of the proposed development, taking into consideration all the technical aspects that was be involved. Scoping is considered as being a critical process of the EIA that identifies the major issues and impacts of concern, which was ultimately guide the decision making by the competent authority, whether an ECC for the project was be awarded or not.

As indicated earlier, the proposed site is currently intact open space and is covered by minimal vegetation; therefore, it will be required that the vegetation in the area be first cleared in order to make space for the development. Further to that, the fact that the area was be used for multiple purposes (residential, education and recreation) as part of the school necessitating fencing off the land and clearing it. The construction will be done for the educational, recreational activities.

The development will further involve electrical supply, however, the source of electrical supply has not yet been identified at this stage. In addition, water was need to be supplied; for houses, and other general uses, especially at the educational facilities. Furthermore, waste needs to be managed all over the site. Therefore, skip containers need to be placed at different construction phases, and be well maintained, to ensure safe storage and disposal of all waste that was be generated during the construction process, both general waste and building rubbles. It is important to note that more and larger quantities of mainly general and domestic waste are expected to be generated once the construction of the proposed facilities is completed. Thus it was essential for the scoping study to take a view into the management of activities and the

potential impacts, as highlighted in this paragraph.

The assessment therefore aimed to establish the social and environmental impacts that may result from the development activities, both prior and during the project operation. As part of the assessment process, the public has informed about the project, and the main stakeholders have been identified. The most important part of the assessment is the EMP, which was form part of this EIA. The EMP documents the management actions for various aspects of concern with respect to the development.

Overall, this scoping study aimed to:

- Document the relevant information on the development/project which was be submitted to the Ministry of Environment and Tourism (MET);
- Comply with the Environmental Management Act No. 7 of 2007 and the EIA Regulations of 2012;
- Inform the public about the proposed development;
- Identify the main stakeholders to the proposed development;
- Identify and document the positive and negative impacts of the project;
- Determine the issues and impacts that would require further study;
- Document the concerns and values of the IAPs;
- Define the appropriate and practical alternatives to be considered; and
- Determine the boundaries for the Environmental Assessment in time, space and subject matter.

In summary, the aspects presented in Table 2 have been considered by this scoping study.

Table 2. Aspects of consideration during the scoping study

Focal Area	Aspect
Assessment	<ul style="list-style-type: none"> • Project justification • Project feasibility • Project alternatives
Project implementation	<ul style="list-style-type: none"> • Planning phase • Construction phases (4 phases) • Operation phase
Activities	<ul style="list-style-type: none"> • Project & non-project activities • Direct and indirect environmental & societal impacts • Cumulative impacts • Context
Factors	<ul style="list-style-type: none"> • Geographic • Environmental • Societal • Economic • Legal • Developmental • Temporal & permanent • Spatial

4. LEGAL REQUIREMENTS

This section presents the relevant legislations, policies and guiding frameworks to the proposed development. It further highlights specific provisions under some legislations that of relevance to the development are highlighted.

The Namibian Constitution is the fundamental law that has guided the formulation and implementation of the listed legislations. Specifically, Article 95 of the Constitution is promoting the welfare of the people, and has emphasized that "the state shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at:

- Ensuring that every citizen has a right to fair and reasonable access to public facilities and services in accordance with the law; and
- Maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future."

Further to the Namibian Constitution, a policy framework for the long-term development of Namibia has been developed to improve the quality of life of all Namibians, with a goal to take the country to another level by the year 2030. Such a policy framework is referred to as Vision 2030, and is promoting the fair and equitable distribution of land among all users, based on a comprehensive land redistribution and resettlement program that aims to avoid confrontation and conflict, while preventing environmental degradation, and is promoting equity and cooperation amongst all stakeholders. Furthermore, Vision 2030 is promoting considerable poverty reduction through improved social service delivery to the poor; equitable income distribution through employment creation and small-scale enterprise development, and minimized disparity. It also seeks to ensure that rural and urban development is integrated to an advanced level, and that full national coverage of infrastructure is achieved. Overall, rural upliftment through implementing initiatives for poverty reduction is emphasized by this policy framework.

When it comes to addressing environmental issues in Namibia, there is a document known as "the Green Plan", that specifically deals with them. This document provides guidance regarding decision-making around environmental-related projects. Based on the Green Plan, EIAs should be conducted for major projects which can be detrimental to the environment. Furthermore, this plan aims to secure a safe and healthy environment for the present and future generations, while at the same time contributing positively to their economy.

Apart from the guiding documents highlighted above, there are a various of legislations and policies that have been identified to be of significance to the proposed development, which are listed below. In addition to those legislations, the international conventions of relevance to the proposed project have also been listed.

Table 3 below presents the relevant legislations.

Table 3: Relevant legislations to the proposed development

Law/Act	Description
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Environmental Management Act No. 7 of 2007	<p>The Environmental Management Act No. 7 of 2007 was enacted "to promote the sustainable management of the environment and the use of natural resources by establishing principles for decision making on matters affecting the environment, to establish the Sustainable Development Advisory Council, to provide for the appointment of the Environmental Commissioner and environmental officers, to provide for a process of assessment and control of activities which may have significant effects on the environment, and to provide for incidental matters". The proposed development should seek to comply with this Act.</p> <p>The implementation of this Act is strengthened by the EIA Regulations of 2012, which have listed the activities that cannot be undertaken without an ECC. As part of the listed activities, land use and development activities for commercial use cannot be undertaken without ECCs. The proposed project is not an exception to this, hence this scoping study.</p>
Forestry Act No. 12 of	<p>This Act has been enacted "to provide for the establishment of a Forest Council and the appointment of certain officials to consolidate the laws relating to the</p>

2001	management and use of forests and forest produce, to provide for the protection of the environment and the control and management of forest fires, to repeal the Preservation of Bees and Honey Proclamation No. 1 of 1923, Preservation of Trees and Forests Ordinance No. 72 of 1968, and to deal with incidental matters". In the view of the proposed development, this Act is promoting the conservation of soil, biological diversity, and the natural environment at large, as clearing of forests for infrastructure development is a threat to the environment. Nevertheless, through the scoping study, the possible negative environmental impacts have been identified.
Soil Conservation Act No. 76 of 1969	The Soil Conservation Act has been enacted "to consolidate and amend the law relating to the combating and prevention of soil erosion, the conservation, improvement and manner of use of the soil and vegetation, and the protection of the water resources in Namibia, and to provide for matters incidental thereto". Under this Act, the prevention of soil erosion, disturbance of land, and destruction of vegetation that may possibly result from the development have been provided for.
Hazardous Substances Ordinance No. 14 of 1974	This ordinance was developed "to provide for the control of substances which may cause injury, or ill-health or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the division of such substances into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances; and to provide for matters connected therewith". With reference to the proposed development, the use of hazardous substances, for example, paints, oils and cement, particularly during the construction operation should be controlled.
Public Health Act No. 36 of 1919	The Public Health Act provides for the control of anything that may affect public health. It emphasizes that no person shall cause nuisance or shall suffer to exist on any land or premises owned or occupied by him or her of which he is in charge of any nuisance or other condition liable to be injurious or dangerous to health. It is thus essential that the proposed development should not by any chance cause nuisance that may affect public health.
Water Resource Management Act No. 24 of 2004	This Act was enacted "to provide for the management, development, protection, conservation, and use of water resources; to establish the Water Advisory Council, the Water Regulatory Board, and to provide for incidental matters". Given the fact that the construction of the planned development was use a large amount of water, it is important that water is used sparingly, that the water resources should be protected, and that water pollution should be prevented, as guided by the Water Resource Management Act.
Nature Conservation Ordinance No. 4 of 1975	The Nature Conservation Ordinance was developed "to coordinate, amend the laws relating to the conservation of nature, the establishment of game parks and nature reserves, the control of problem animals, and to provide for matters incidental thereof. In the view of the proposed development, this ordinance is relevant when it comes to the conservation of the natural resources within the area where the envisaged development was take place. In case there are specially protected plants (indigenous species of community importance) at the construction site, recommendations will be made to shift the construction area, to ensure that such plants are not removed. This ordinance was guide the conservation of the natural environment at large.
Electricity Act No. 4 of 2007	This Act was enacted "to establish the Electricity Control Board, and provides for its powers and functions, to provide for the requirements and conditions for obtaining

	licenses for the provision of electricity, to provide for the powers and obligations of licenses and to provide for incidental matters". The supply of electricity for this development should therefore abide by the provisions made under this Act.
Local authorities Act No. 23 of 1992	This Act provides for the determination, purposes of local government, of local authority councils; the establishment of such local authority councils; and to define the powers, duties and functions of local authority councils; and to provide for incidental matters. A Local Authority Council has the power - to supply water, electricity, and public transport service; provide, maintain and carry on a system of sewerage and drainage for the benefit of the residents in its area, to the residents in its area for household, business or industrial purposes. It has further been enacted to provide, maintain and carry on services to such residents for the removal, destruction or disposal of rubbish, slop water, garden and stable litter, derelict vehicles, carcasses of dead animals and all other kinds of refuse or otherwise offensive or unhealthy matter, of which all these are of extreme importance since the area of development falls under the Oshakati city and the city is required to extend these services to this area.
Pollution Control and Waste Management Bill	The Pollution Control and Waste Management Bill is still in preparation, however, it makes provision for a framework for governing the control of pollution as well as the management of the waste. It further makes provision for the prevention and regulation or the discharge of pollutants into the air, water and land. In addition, it is meant to regulate noise, dust and odor pollution. Of particular importance to the proposed development is the management of waste disposal on land. A significant amount of solid waste is likely to be generated during the construction, which was need to be well managed. Furthermore, waste (especially general) was be generated almost on a daily basis after the construction of all the proposed facilities. An effective approach to deal with such waste was therefore be necessary.

In addition to the legislations, there are a number of policies that are considered relevant to the proposed development, as listed in Table 4 below.

Table 4: Policies that are relevant to the proposed development

Policy	Description
Environmental Assessment Policy	The Environmental Assessment Policy emphasizes the importance of environmental assessments.
Land-use Planning Policy	The Land-use Planning Policy defines the land form, among which is the communal state land. It emphasizes the sustainability of the natural resources and essential ecological processes.
National Land	The National Land Policy promotes community involvement in environmentally sustainable land use practices.

Policy	
National Land Tenure Policy	The National Land Tenure Policy promotes sustainable utilization of land and other resources.
Regional Planning and Development Policy	The Regional Planning and Development Policy promotes soil conservation strategies.

The international law is integrated into domestic law as per Article 144 of the Namibian Constitution. In such respect, a few international laws that are considered as being of relevance to the development are listed in Table 5, as follows:

Table 5: Relevant international laws

International laws	Description
Convention on Biological Diversity (CBD)	The Convention on Biological Diversity is promoting the sustainable use of biodiversity components.
United Nations Framework Convention on Climate Change (UNFCCC)	This convention is promoting the avoidance of climate change to the point that sustainable development can be affected.
United Nations Convention to Combat Desertification (UNCCD)	This convention aims at combating desertification and its effects while at the same time contributing to sustainable development. This convention seeks to ensure public participation in relevant decision making processes.

5. PUBLIC CONSULTATION

The Environmental Management Act of 2007 is promoting the participation of all interested and affected parties (I & APs). Based on this Act, decisions to be made around any development should take into account the interest, needs and values of interested and affected parties. For this reason, this assessment was meant to involve a consultation with the public, particularly the residents from Oshana region, where Onanime Village is located.

In efforts to engage the I & APs, the following was done:

- A document presenting the background information on the proposed project was compiled, and made available for distribution to the I & APs (Annex 1). Such a document is referred to as the Background Information Document (BID).
- A notice was placed on the Republikein newspaper dated 2nd and 16th of March 2022, informing the public on the proposed development, and giving clear guidance on how to ensure that their inputs are considered (Annex 2). As part of the notice, a call was made for the public to register as I & APs.
- A4 posters were placed at the Oshana Regional office, Okatana Constituency Office, Oshakati Town Council Office, Directorate of Education, Oshana Region and at various places, and announced by the Regional Councilor of Okatana Constituency over the local Oshiwambo radio calling for public participation.
- A meeting with the affected stakeholders was scheduled to take place on the 12th March 2022, in order to obtain their views regarding the development. Although the initial meeting on the 12th March 2022 no one turns up, another meeting was scheduled and advertised for 26th March 2022 and photos of those attended can be seen below. No objection to the project was raised during the meeting. The attendance register and comments forms are attached on this report.

Figure 5: Photos below show the meeting venue with interested parties in attendance.



6. IMPACT ANALYSIS AND MITIGATION MEASURES

This section describes the anticipated impacts of the proposed project on the environment and the possible mitigation measures been identified, both during the construction and the operation phases of the development. The potential impacts are categorized into three categories, namely: direct, indirect or cumulative. The Category 1 impacts are those impacts that was directly result from the development, referred to as 'direct'. Category 2 impacts are the foreseeable impacts that was potentially result from the project, but was occur at a different time or place; and are:

6.1. Land Environment

The development of Atlantic Private school will involve construction, i.e. administration block, classrooms, hostel, teacher houses, recreation facilities and any other facility of necessity. The fact that the proposed area is currently in its natural state, and that the land has to be prepared prior construction, it is obvious that damage was be made to the land environment, which is a direct negative impact. Apart from the land damage, there was be loss of vegetation in the process of clearing the land for construction. Nevertheless, there was not be any loss of some minimal valuable plant species. Similarly, there was be no significant loss of faunal species (Irish, 2017).

In addition to the direct impacts on the land environment, indirect impacts will be experienced too, as a result of the construction activities. It is anticipated that soil erosion was result due to vegetation and top soil removal, since the land has to be cleared before the actual construction commences. Moreover, land degradation could as well be an indirect consequence of land

clearing. Furthermore, there was a change of land-use from being an ecosystem to a multi-purpose urban residence. However, the area mainly consists of **minimal r-selected species** i.e. those species that have a high growth rate and mature fast. This means they have the ability to recover after development. Noteworthy, no endangered species has been detected within the frame of the development.

The worst negative impacts of the development, both during the construction and the operational phases have to be avoided. For this reason, some mitigation measures for the potential impacts have been proposed, and are presented in the next table.

Table 6. Impacts of the construction and operational activities on the land environment at Atlantic Private School

Construction Phase		
Direct Impacts	Indirect Impacts	Cumulative Impacts
Land damage	Soil erosion (increasing surface run off), land degradation	Land degradation
Loss of vegetation (insignificant)	<ul style="list-style-type: none"> Land degradation in the vicinity of the development site Soil erosion Land-use change 	Loss of natural beauty
Loss of fauna species (insignificant)	Loss of local faunal species diversity (however, not significant)	Loss of local faunal diversity
Alteration of the topography and geomorphology	Land-use change i.e. from an ecosystem to commercial area	Land degradation
Operational Phase		
None	Soil erosion	Land degradation

The identified impacts are all negative, however, they are considered to be of less significance, and can be rated as **moderate to low**. This can also be attributed to the fact that the area is of less conservation importance, as it is not functional at the ecosystem level.

Box 1. Mitigation measures for addressing the impacts of construction and operational activities on the land environment

- To mitigate increasing surface runoff, vegetation clearing must not go beyond the extent of the development. The remaining vegetation should be maintained.
- Further disturbance on the remaining vegetation in the close proximity of the development should be avoided or kept minimal after the construction.
- Site disruption must be avoided by minimizing the movements of the earthmoving equipment or sticking to selected routes.
- A professional construction design must be in place and implemented by qualified builders and civil engineers.
- Qualified engineers must be contracted to supervise the construction process, and ensure the application of environmentally sound principles.
- The removed top soil layer should be made good use of and should not be allowed to pileup.
- Due to its hilly nature, culverts must be constructed to allow an easy flow of water within the Suburb.

6.2. Biological Environment

Vegetation removal at the site is necessary for the purpose of land preparation before the actual construction commences. However, by removing all the plant species available at the site was directly contribute to the reduction of species diversity in the local area. The few trees at the construction site are all mainly naturally used for minimizing the impact of water runoff and natural beauty. Conservation measure shall be implemented to only remove trees which was directly prevent the erection of buildings and roads and save those lying outside such spaces.

It is however an advantage that the trees that was be removed from the area are already sparsely distributed and the construction site is not so densely populated, hence there is no significant reduction in these species. Overall, there was not be complete loss of indigenous tree species.

Nevertheless, it possible that the mini-fauna, lizards and small insects that use the present trees and the available thorn bush as their ecological habitats was be negatively impacted. Therefore, it is anticipated that many of them was die or find it difficult to survive in the process, while the fortunate and vigilant ones will migrate to the nearest available trees and shrubs. No large mammal or any other large animal has been observed or reported to be living permanently in the construction area. It is recommended that planting of more plants should be part of the long-term plan to renew the natural beauty after development of the site.

The anticipated indirect impacts of the construction activities on the biological environment may be soil erosion, as a result of vegetation removal. This was potentially result in land degradation in the long term. Given the fact that the removal of trees may result in the loss of the mini-fauna species, the construction activities might indirectly result in the reduction of local biodiversity. However, the direct and indirect impacts are **short-term**, and can be rated as **low**. Such impacts may potentially lead to land degradation in the long term. Nevertheless, the significance of this cumulative impact can be rated as **very low**. Advantages can be noted on the soil type of the construction site which is mainly rocky and difficult to erode especially if good construction standards and procedures have been followed through supervision by competent engineers. Table 7 below summarizes the anticipated direct, indirect and cumulative impacts of the construction and operational activities on the biological environment.

Table 7. Impacts of the construction and operational activities on the biological environment

Construction Phase		
Direct Impacts	Indirect Impacts	Cumulative Impacts
Loss of plant species	Soil erosion	<ul style="list-style-type: none"> • Land degradation • Loss of natural beauty • Loss of important ecological processes
Loss of mini-fauna species	Reduction of mini-fauna species richness and diversity	Reduction of local species diversity
Operational Phase		
None	None	Land degradation

The proposed mitigation measures for the construction and operational activities impacts on the biological environment are presented in Box 2.

Box 2. Mitigation measures for addressing the impacts of construction and operational activities on the biological environment

- Plants that was not be directly affected by construction activities should not be removed.
- Disturbance of the existing vegetation around the site should be kept minimal.
- No animal (either reptiles or birds) within the construction should be killed during the land clearing / construction process.

6.3. Pollution, Solid Waste Generation and Disposal

There is no doubt that construction was result in environmental pollution. It is anticipated that four types of pollution will be experienced, namely: air pollution, water pollution, land pollution and noise pollution. There is a high possibility that these may have significant impact on the environment at the construction site, and in the surrounding areas. The different types of pollution that may result are described below.

6.3.1. Air Pollution

A number of activities that was be involved, such as land clearing, earthwork, operation of diesel earthmoving equipment, and working with toxic materials can potentially cause air pollution. Clearing of land, earthwork and concrete mixing in particular can generate dust, which can be carried over long distances, over a long period of time before it subsides. The type of dust generated from construction activities is classified as PM10, which is defined as particulate matter less than 10 microns in diameter. Such type of dust is invisible, and is said to have negative impacts on human bodies compared to other pollutants. It can cause damage on the respiratory and cardiovascular systems. In addition, air pollution as a result of dust (from sand and rocks) and smoke from construction vehicles was be experienced.

The proposed development is meant to serve the society in many ways, including provision of proper sanitation facilities and a reliable sewerage system. Nevertheless, it is an advantage that Atlantic Private School is very close to an already existing municipal sewerage system, therefore sewer waste will be easily transported to the municipal sewer dam. Given the fact that the sanitation and sewage facilities was be used both by the potential suburb inhabitants and visitors, there is a high possibility that air pollution was be experienced, as a result of odor accumulating from the ablution facilities and connector points. Additionally, in cases of pipe blockage, accumulation of odor should be expected.

There is no doubt that, air pollution can have direct negative impacts on the general environment. To be specific, during the construction phase, air pollution can change the visibility, and can cause damage to the vegetation in the surrounding areas. Air pollution can also have direct impacts on human health, particularly those at the construction site, as well as those in the surrounding areas. Apart from the direct impacts, air pollution can indirectly affect people who may get into close contact with the already affected people, through transmission of diseases, particularly those related to the respiratory system (Table 8). It is therefore essential that mitigation measures be put into place, otherwise cumulative impacts such as psychological disorders and cardiovascular problems was result in the long-term.

In general, the direct impacts of air pollution can be considered as significant, while their significance can be rated as **moderate**. Fair enough, they are rather **short-term**, particularly because they are more likely to be experienced during the construction phase than the

operational phase. Nevertheless, the fact remains that the direct impacts of the operational phase was last for the long-term, but can be rated as **low**. The indirect and cumulative impacts can be rated as **moderate**, and can have lasting impacts if no mitigation measures are implemented.

Table 8. Impacts of air pollution from the construction and during operational activities, on the environment and on human health

Construction Phase		
Direct Impacts	Indirect Impacts	Cumulative Impacts
Exposure to dust	<ul style="list-style-type: none"> • Eye irritation • Skin irritation • Dust inhalation (resulting in coughing and sneezing, hay fever and asthma attacks) • Lung infection and human respiratory diseases 	<ul style="list-style-type: none"> • Long term eye irritation • Allergies • Psychological and physiological disorders • Health risks for construction workers
Odour nuisance	<ul style="list-style-type: none"> • Quality of life impacts (discomfort) depending on the concentration • Eyes, nose, throat and lung irritation • Dizziness 	Human health problems
Human health problems		
Operational Phase		
Odor nuisance	Discomfort	None

The proposed mitigation measures for air pollution from the construction activities are presented in Box 3 below.

Box 3. Mitigation measures for air pollution impacts resulting from the construction activities
<ul style="list-style-type: none"> • Dust must be regularly settled using water during construction. • The construction teams must be provided with dust masks, which are able to block dust particles. • Open stockpiles of cement bags must be avoided, and must be covered at all times. • The sewerage system should be regularly maintained to avoid smell nuisance from the septic tanks. • No burning of waste should be done at the site or elsewhere. • Construction should be stopped in days of heavy windblows. • Bitumen standard roads should be used on busy sections during the operational phase as much as possible.

6.3.2. Water Pollution

There is no doubt that water will play an essential role throughout the construction process, as well as the operation phase of the proposed development. It is obvious that large amounts of water will be needed during the construction process, particularly to settle dust, for compaction, curing, mixing of concrete, and washing of construction equipment. In addition, water will be used on site by workers for bathing, drinking and cooking; and for the routine activities at large. Equally important is sufficient water availability during the operation phase. Nevertheless, when used in an uncontrolled manner, water may result in pollution. Other sources of water pollution at the site may be diesel and oil from the construction equipment, paint, solvents, cleaning and other harmful chemicals, sewage as well as the construction materials.

Before the construction process commences, land needs to be cleared, which will involve top soil removal. As a consequence, continuous use of water at the site will presumably result in soil erosion, further leading to sedimentation. Therefore, when water is uncontrollably used, surface water run-off may have severe negative environmental impacts, as it can be contaminated by pollutants such as diesel and oil, toxic chemicals and building materials. Such pollutants can cause turbidity in the water run-off, and may contaminate the water sources, which often supply drinking water to animals, and to human in some cases; thus making it unsafe to drink. The same pollutants can also potentially infiltrate into the soil and pollute the ground water, which is the source of drinking water for animals and human. Furthermore, interaction between water and contaminated soil (by the same pollutants) may also result in water pollution.

Apart from the highlighted impacts of water pollution, there are others too, which could be direct or indirect, such as: plant deaths as a result of accumulating pollutants from the polluted water, absorption of pollutants by plants, which can be passed up the food chain, and acquisition of waterborne diseases (rashes, skin infections, cholera, damage to the nervous system, liver and kidney damage and many others). Consequently, mitigation measures need to be put in place and be implemented. If not, adverse impacts such as severe plant losses, animal and human diseases and deaths may be the long-term impact. In terms of significance, the direct impact of water contamination can be rated as **moderate** to **low**. The same applies to the indirect and cumulative impacts, which can be rated **low**.

The anticipated impacts of water pollution from the construction activities are summarized in Table 9.

Table 9. Impacts of water pollution from the construction activities on the environment and on human, and during the operation phase

Construction Phase		
Direct Impacts	Indirect Impacts	Cumulative Impacts
Water contamination	<ul style="list-style-type: none"> • Plant deaths • Animal deaths • Waterborne diseases 	<ul style="list-style-type: none"> • Severe plant losses • Animal deaths • Human health problems and deaths • Reduction in biodiversity
Soil contamination	<ul style="list-style-type: none"> • Absorption of soil contaminants by plants (bioaccumulation) in the vicinity • Plant deaths 	Human health problems and deaths
Operational Phase		
<ul style="list-style-type: none"> • Water contamination • Soil contamination 	<ul style="list-style-type: none"> • Waterborne diseases • Human health problems • Animal health hazards 	Human and animal health problems

The proposed mitigation measures for water pollution impacts from the construction activities are listed in Box 4 below.

Box 4. Mitigation measures for water pollution impacts resulting from the construction activities
<ul style="list-style-type: none"> <input type="checkbox"/> Water should be used sparingly, and use of too much water unnecessarily during the construction must be avoided. <input type="checkbox"/> The water used for curing should be sprayed on the concrete structures. <input type="checkbox"/> Ponds should be constructed using cement and sand mortar to prevent water from flowing away from the surface while curing. <input type="checkbox"/> Wastewater should not be allowed to spill on the open environment, but should be safely Disposed by channeling it through the existing municipal sewerage system. <input type="checkbox"/> Paint and cleaning products must be safely disposed to prevent excessive water pollution. <input type="checkbox"/> Potable water should not be allowed to get into contact with contaminated water from the recreational and business areas. <input type="checkbox"/> Recreational water facilities use should be well managed and regularly disinfected to prevent the spread of infectious diseases among users. <input type="checkbox"/> Waste water will be disposed to existing Oshakati municipal waste water dam.

6.3.3. Land Pollution

The biggest form of land pollution is solid waste, which was be generated both from the construction and operational activities. Of the solid waste to be generated, the largest volumes will be accumulated during soil excavation, which precedes the laying of foundation. With the numerous houses (and other infrastructure) to be constructed, solid waste in form of excavated soil was be generated in abundance, hence requiring sound management. Apart from soil excavation, other sources of land pollution or solid waste will be the construction materials, including: cement sacks, paint containers, oil containers and many other containers for the items to be used, and building rubbles.

Furthermore, procurement of materials and material handling are other sources of solid waste, both during the construction and operation phase. During the two phases a large number of packaging waste materials, papers and plastics are likely be accumulated at various construction sites. Nonetheless, in spite of the identified sources, waste generation occurs at any stage of construction, with potentially **low** impact.

In addition to the waste that was be generated during the construction phase, more waste should be expected to be generated during the operation phase. It is very much likely that the biggest source of solid waste during the operation phase was be the procurement of stock, particularly in the business area, whereby the stock containers was end up being waste materials. Thus, a significant amount of solid waste in form of plastics, glasses, boxes, tins/cans and papers are likely to be accumulated during the operational phase. Moreover, at least 50% or more of the household and hostel waste was be solid waste, which was require proper and regular management.

Looking at the direct impacts of solid waste at the development sites, both during the construction and operation phases was mainly be soil and water contamination, as well as pollution of the land environment in many ways, including littering. As a consequence, such kind of pollution will alter the visual appeal, both at the sites and the surrounding areas. It is anticipated that the biggest negative impact of solid waste on the land environment was be reduced visual appeal / anesthetic view. Soil contamination can further lead to deaths of soil inhabiting species. Further to the direct impacts, indirect impacts are anticipated too, which are likely to result when the solid waste such as paper and plastic containers get washed or blown away, causing the entire site and surrounding area to be less visually appealing. The wind- blown or washed-away waste was also presumably result in the contamination of water resources (creating breeding sites for mosquitoes) as well as pollution of the land environment in the close proximity of the development sites. It is also anticipated that solid waste can indirectly contribute to the loss of important ecological cycles.

In view of the cumulative impacts, land degradation is likely to result in the long-term if solid waste on the land environment is not well managed. Waste can also deplete space in the landfill sites if waste carelessly disposed of. Reduced aesthetic views due to uncontrolled waste was further lead to the deterioration of landscapes and could tarnish the image of the environment in the long-term. If not controlled, it

could further lead to a reduction of potential visitors to the suburb. More details on the management of waste was be presented in the EMP.

Noteworthy, waste can have both positive and negative impacts on the economy. Looking at a broader picture, additional construction costs can be accrued as waste generation increases. This is particularly because some materials can be inappropriately used or end up being wasted, which can cause them to be replaced. According to some studies, the total cost of waste is made up by approximately 30% of the material cost. In addition to the negative impacts, waste can contribute positively to the economy, particularly through recycling. Recyclable waste materials can be re-used or sold to be renewed or used for another valuable purpose, bringing economic benefits in return.

Although solid waste is anticipated to be the biggest form of pollution on the land environment, liquid waste is likely to be experienced too. Liquid construction pollutants such as oils, paints, cement and detergents may be washed away/off, spill or leak, and may run off along with water during construction activities or other activities such as cleaning. This can even be worsened by rainfall.

Overall, the significance of the impacts of waste can be rated as **high**, as waste generation is inevitable, especially for this type of development.

The direct, indirect and cumulative impacts of waste both during the construction and operational phases are summarized in Table 10.

Table 10: Impacts of solid waste during the construction and operational phases on the environment

Construction Phase		
Direct Impacts	Indirect Impacts	Cumulative Impacts
<ul style="list-style-type: none"> • Soil contamination • Death of soil inhabiting species e.g. microorganisms and insects 	<ul style="list-style-type: none"> • Water resources contamination • Loss of important ecological cycles 	Land degradation
Water contamination	Land pollution	Land degradation
Destruction of the visual looks at the site	Destruction of visual looks in the neighboring areas	<ul style="list-style-type: none"> • Deterioration of landscape/tarnished image of the environment • Reduction of potential visitors
Accumulation of waste materials	Destruction of visual looks	Depletion of space in the landfill sites
Accumulation of waste	Accrual of construction costs	Need for increased budget
Recycling opportunities	Income generation	Long-term partnership with recycling companies
Operational Phase		

Destruction of the visual looks at the sites	Destruction of the visual looks in the neighboring areas	Land degradation
Soil contamination and water contamination	Land pollution	<ul style="list-style-type: none"> • Land degradation • Groundwater pollution • Biodiversity loss • Human health hazards
Accumulation of waste	Accrual of construction costs	Need for increased budget

It is anticipated that none of the listed impacts can be considered as a major risk to the development. Nevertheless, mitigation measures need to be implemented to avoid the long-term negative impacts.

Box 5 below presents the proposed mitigation measures for solid waste negative impacts on the environment.

<p>Box 5. Mitigation measures for the solid waste impacts from the construction and operational activities</p> <ul style="list-style-type: none"> <input type="checkbox"/> Educate the contractors and the community on the basic wastemanagement practices. <input type="checkbox"/> Waste should be minimized as much as possible. <input type="checkbox"/> Where possible, waste generation must be eliminated/avoided. <input type="checkbox"/> Useful waste materials must be re-used. <input type="checkbox"/> Unlawful deposit of waste on open land should be avoided. <input type="checkbox"/> Enough and well distributed waste bins should be made available both during the construction and the operational phases. <input type="checkbox"/> A temporary disposal site must be constructed to ensure safe disposal of waste. <input type="checkbox"/> The existing Oshakati municipal disposal site should be utilized during the operational phase to ensure safe disposal of waste. <input type="checkbox"/> An environmentally sound sewage system e.g. eco-toilets for the construction workers should be constructed prior the actual construction. <input type="checkbox"/> Recycling of waste materials should be promoted. All recyclable materials such as papers, cans, plastics and glasses can be separated and be placed in different well labelled containers, to be transported to the recycling companies within Oshakati. <input type="checkbox"/> All household must be provided with refuse bins and awareness on waste segregation should be created as much as necessary for easy waste collection and recycling.

6.3.4. Noise Pollution

The proposed development, Atlantic Private School, is located in Onanime Village just a few meters from the undeveloped residential communal areas. For this reason, construction and operational activities are presumed to be some of the sources of noise pollution. It is anticipated that noise was be caused by the construction vehicles and earthmoving equipment, and was result from the actual construction, and from the people at the site. During the operation phase, the movement of vehicles to and from the development site and the use of recreational and sports facilities will potentially be the cause of noise. Although noise pollution was have negative impacts on the environment, its significance is rated as **low**

Table 11: Impacts of noise pollution during the construction and operational phases on the environment

Construction Phase		
Direct Impacts	Indirect Impacts	Cumulative Impacts
Noise disturbance	Increased stress	None
Operational Phase		
Noise disturbance	Increased stress Sleeping disturbance	None

Noise pollution from the development site is not considered as being significant. Nevertheless, the proposed mitigation measures for noise pollution are listed in Box 6 below.

Box 6. Mitigation measures for the noise pollution impacts from the construction and operational activities
<ul style="list-style-type: none"> • Night-time construction activities must be avoided. Construction should at least end at 18H00 to allow people to sleep without further disturbance. • Speed limit to and from the construction sites should be set. • Industrial business activities should not be permitted near the school. • Late night activities must be minimized. • Use of sport facilities should be announced to inhabitants directly affected whenever necessary. • The use and timing of heavy construction machinery which may cause disturbing vibrations should be controlled and well managed.

6.4. Socio-economic Impacts

The proposed development is expected to make a positive contribution towards the socio-economic challenges currently facing Oshakati. These include: lack of affordable and decent houses, unemployment, limited business opportunities and limited access to basic facilities such as educational and recreational, and lack of public open market space for small/micro enterprises. Therefore, with all the proposed facilities in places, it is anticipated that access to basic needs such as houses, food, and all the other needs highlighted earlier, was be met. In essence, the fact that some services required people to travel some distance to the school was brought closer to the residents of Atlantic Private School and neighboring areas. This was save on travelling costs. Furthermore, this development is that it was attract people from all walks of life which are healthy ingredients for cultural integration within the village.

Taking into consideration the magnitude of the proposed development, it is anticipated that the biggest socio-economic impact was be related to employment, especially during the construction phase. It is anticipated that up to 1 main companies and 3 Subcontractors might be contracted during the construction phase, and they will be expected to sub-contract other companies. Overall, approximately 50 people will be employed under the said contracts during the construction phase. These include the skilled, semi-skilled and unskilled people, depending on the nature of work to be done. Apart from the employment opportunities to be availed during the construction phase, approximately 40 job and entrepreneurship opportunities will be created during the operational phase. Employment through the proposed development should be acknowledged as a positive impact, particularly considering the current situation of high unemployment rate of 34% in Namibia (NSA, 2016). It should also be considered as a positive contribution to the national and international development frameworks such as Vision 2030, the Fifth National Development Programme (NDP 5), and the first Sustainable Development Goal (SDG 1), which are targeting poverty reduction.

Construction on its own has a high potential to positively impact on the performance of the local economy. Hence when it comes to the procurement of construction materials, as well as the items for the school essential materials, it is recommended that local suppliers should be used. The materials could be procured in Oshana Region if available. This was in return contribute to the local economy.

Looking at the significance in particular, the impacts of the positive impacts of the development in the socio-economy can be rated as **high**. Although **short-term** during construction, it will be **long-term** during the operation phase.

The anticipated direct, indirect and cumulative socio-economic impacts of the construction and operational activities of the development are presented in Table 12.

Table 12: Socio-economic impacts of the construction and operational activities

Construction Phase		
Direct Impacts	Indirect Impacts	Cumulative Impacts
Employment creation	Local economic empowerment	Urban development
Operational Phase		
Employment creation	Local economy upliftment	Urban/city development
Entrepreneurship opportunities	Local community empowerment	Community economic development and sustainable development
Availability of affordable Education	Quality education	Sustainable skills development
Access to basic facilities (educational, recreational and business)	<ul style="list-style-type: none"> • Reduced pressure on income • Increased sources of income 	Sustainable development
Social Empowerment	Poverty reduction	Increase in local income generation

The proposed mitigation measures for the socio-economic impacts are presented in Box 7.

Box 7. Mitigation measures for the socio-economic impacts resulting from the construction and operational activities

- High priority should be given to Namibian companies in the following disciplines: architecture, civil engineering, structural engineering, electrical engineering, mechanical engineering, town planning, land surveying and quantity surveying to ensure the success of the proposed development.
- Construction materials and all goods should be procured from Namibia, if possible Oshana region.
- The majority of the people to be employed both during the construction and the operational phases should be from Oshana region or at least from nearby areas. Where skill deficit exists, a few supporting (experienced) staff should be sourced externally, however, priority given to the local, then regional levels.

7. ALTERNATIVE TECHNOLOGIES

In this section, the available options and alternative materials and technologies that could be considered during construction and operation phases are presented.

7.1. Construction of the school and other infrastructure

With the increasing pressure on the environment, which results in detrimental effects such as climate change and land degradation, it is essential to consider environmental ethics in all forms of development. Therefore, as part of planning for the construction activities, it is essential that the proponent should consider placing the integrity of the environment as a priority. For this reason, it is recommended that the proponent should consider using environmental practices, and should if possible make use of materials and technologies that was contribute to environmental management and conservation. One of such practices is constructing what is referred to as 'green buildings', whereby the materials to be used should be environmental friendly.

The following can therefore be put into practice:

- Making use of environmentally friendly building materials or recycled materials;
- Making use of non-toxic materials;
- Constructing different materials in one single erven;
- Using water efficiently during the construction and operation phases;
- Making use of energy efficient equipment;
- Making use of renewable energy; and
- Maximizing construction activities during rain.

7.2. Waste Management

Generation of waste both during construction and the operation phases is inevitable. Considering its impacts as stated earlier, it is essential that waste should be effectively managed. For this reason, it is recommended that the technologies that was promote sound waste management should be considered throughout the construction phase, and during the operation phase. Below are some of the approaches or technologies that could be put into practice in efforts to ensure sound waste management.

- Re-using waste building materials / building rubbles and any other possible usable waste materials generated.
- Minimizing the construction waste through re-using and recycling of waste materials.
- Putting recycling into practice through developing a system of collecting the recyclable materials from the source.
- Taking away the disposable waste materials to approved disposal sites.
- Installing septic tanks for the purpose of managing sewage.
- Placing garbage bins and skip containers in various places within the development.

7.3. Energy Conservation

One of the environmental management practices is energy conservation. Such a practice entails placing significant efforts in the reduction of energy consumption through the efficient use of energy. When it comes to construction of mass houses, in many cases the sources of electricity are non-renewable (e.g. coal and nuclear energy), and often costly. However, for the long-term

purpose of ensuring energy conservation in the planned buildings long term, it is essential to adopt energy efficient technologies that depend on renewable energy sources. Therefore, as a recommendation, the proposed development (especially the houses) should consider making use of alternative energy conservation technologies, such as use of the solar energy (including solar geysers) as much as necessary. In addition, energy saving LED bulbs are recommended to be installed in the houses, as they are considered to be energy efficient.

It is worthwhile to note that the increasing electricity tariffs in Namibia has led the Ministry of Mines and Energy (MME) to recommend the use of solar power. The solar energy supply technology is generated from a renewable energy source, and is environmental friendly. Noteworthy, Namibia has a sufficient source of solar supply. Nevertheless, the proponent should compare the costs of using the solar generated power and the other sources.

8. TECHNICAL SPECIFICATIONS

The proposed development will consist of a residential area, business area, a school, shop houses, public open space and a recreational area. These will provide services to new residents, local residents, neighbors, and road users, and visitors to the area, including tourists. However, the envisaged development will be done in four (4) phases: Phases 1 – 2 was entirely be the construction of the administration and classroom blocks while,

Phase 3 - 4 was be the construction of the hostel and teacher houses, recreational facility. The overall construction will involve the following:

- Land preparation: clearing the vegetation to create space;
- Zoning of the area and fencing off according to the phases;
- Earthwork (filling) of the area (in phases);
- Construction according to the phases
- Installation of water pipes;
- Installation of electrical pipes;
- Erection of a transformer station or a solar power grid;
- Installation of street lights;
- Installation of sewage pipes and development of a sewerage system;
- Installation of waste bins along the streets; and
- Construction of roads

9. POTENTIAL IMPACTS

The following are potential impacts, both positive and negative have been identified:

9.1. Positive impacts

- Aesthetic (visual) impact;
- Socio-economic;
- Urban development (including an increase in business activities);
- Increased access to services (educational);
- Expansion of residential and commercial facilities was benefit the region revenue inflow; and
- Sales and income to be generation from the available services was boost tax revenue.

9.2. Negative impacts

- Environmental destruction / landscape damage;
- Biodiversity reduction (both local flora and fauna);
- Destruction of ecological balance;
- Possible impacts of activities associated with liquid, solid and air pollution;
- Increased noise pollution (especially from construction activities and vehicles on the road);
- Excessive use of water (a scarce commodity in Namibia);
- Increased possibility of water runoff (from road pavements);
- Increased solid waste pollution.

10. SUMMARY, CONCLUSION AND RECOMMENDATIONS

The assessment has anticipated both positive and negative impacts of the construction and operational activities on the environment and on the socio- economy. Along with the identified impacts, mitigation measures have been proposed to avoid the worst consequences. Further to that, alternative technologies have been recommended, which could contribute to the environmental integrity.

Looking at a broader picture, the proposed development is essential, and was be highly beneficial, considering the current socio-economic challenges facing Namibia at large, and Okatana Constituency. The overall positive impact of this development was be urban development, which includes employment creation and economic upliftment, availability of affordable education, access to basic education. However, the major socio-economic impact was mainly being felt in the operational phase.

Despite the positive impacts, there are anticipated negative environmental impacts, which if mitigated was not have worse consequences. The envisaged development was bringing about a transformation in Oshana Region, as it will expend the provision of education in the region, making more schools available to those currently in need. In other words, it was take Oshana region to another level of economic development.

The land environment will be negatively impacted by land degradation as a consequence of land clearing, which was cause a reduction of few plant and animal species (min-fauna) diversity in the area. Nevertheless, there is a high possibility for plants to grow in the area, as the area is nominated by species with high growth rate. Good enough, no endangered species are found in the area. Most importantly, mitigation measures have been proposed, which should be implemented by all means. Overall, the direct and indirect impacts are short-term, and of low significance.

Pollution is inevitable, especially during the construction phase. Air pollution, water pollution, land pollution and noise pollution are anticipated to be experienced during the construction phase to a greater extent, and minimally during the operation phase. All types of pollution have negative consequences, including health and environmental impacts, hence their effects need to be mitigated by all means. The direct impacts of air pollution are considered to be significantly moderate, however, short term during the construction phase. Similarly, they are likely to be moderate during the operation phase, but may have long-term impacts if not mitigated. In the same vein, water pollution is anticipated to have moderate to low impacts, both during the construction and operation phases. In terms of land pollution, the anticipated impact is likely to be low during the construction phase and high during the operation phase. Nevertheless, it needs to be mitigated to avoid the worst consequences in the long term. Positive impacts of waste have been identified, as it can contribute to economic development, hence the recommended need to invest in waste management. Apart from the rest of the type of pollution been discussed earlier, noise pollution is likely to be experience, however, with low significance.

The proposed development will not only have negative impacts; it will have positive impacts too. Through this development, major socio-economic challenges such as lack of affordable and decent education, job opportunities and access to basic facilities such as educational and recreational, and lack of public open market space for small/micro enterprises was be partly addressed. The development was also make a significant contribution to the attainment of various development frameworks, such as the HPP, NDP 5, Vision 2030 and the SDGs. In terms of impacts, the contribution of the proposed development to the socio- economy was be high, and long-term during the operation phase. Moreover, depending on affordability, in order to contribute to the environmental integrity, the use of alternative technologies is highly recommended.

Although the development will have negative impacts on the environment, some of which may be significantly moderate, it is strongly recommended that the proposed mitigation measures be implemented. However, looking at socio-economic impacts, the benefits of the development can already be confirmed, meaning it will be highly beneficial to the Onanime Village and Okatana Constituency community, and to Oshana Region at large. It is therefore strongly recommended that an ECC should be awarded for the proposed development to go ahead. This scoping assessment has not recommended a full EIA, as there was be no need for special studies. For that reason, this scoping report is accompanied by an EMP, presented in Section 8.

11. ENVIRONMENTAL MANAGEMENT PLAN

11.1. Aim

The EMP presented in this section aims to ensure that all the identified mitigation measures are implemented in order to avoid the worst environmental and social impacts. As a requirement of the Environmental Management Act of 2007, and of the EIA regulations of 2012, every environmental assessment report should be accompanied by an EMP.

11.2. Approval

This particular EMP seeks approval from the Office of the Environmental Commissioner under the MEFT in order to become implementable. Upon approval from the MET, the proponent will be issued with an ECC, for the development to go ahead. It will be expected that the proponent Atlantic Private School], the contractors and every contributor to the development, both the construction and operational activities, should stick to the terms and conditions that was be presented in the ECC.

11.3. Roles and responsibilities

The overall responsibility for the implementation of the EMP was be in the hands Atlantic Private School. This is due to the fact that the proposed development has many potential negative environmental impacts, which are likely to be experienced both during the construction and operational phases. Therefore, Atlantic Private School, the proponent should make sure that the EMP is implemented during both phases. However, it can work together with the contractors or operational managers such as the construction company managers, business managers, school managers, entrepreneurs and the managers for the recreation facilities or anyone else involved in the development. This will ensure that the worst impacts are avoided.

11.4. EMP in details

The EMP is presented in form of a matrix, indicating the key activities of concern, which are have potential impacts in the development. Under the matrix are the major aspects of concerns for the construction and operational activities, the anticipated impacts of such aspects, required management actions, responsibility for action, as well as the timeframe for each of the action.

11.4.1. Administrative aspects

Aspect	Impact	Management Action	Responsibility for Action	Time frame
Implementation and monitoring	Ensure compliance with mitigation measures	<ul style="list-style-type: none"> All key aspects of the EMP should be implemented, both during the construction and the operational phases. Conduct regular site inspections during the construction phase. Hold regular meetings with workers both during the construction and operational phases to discuss key issues related to the EMP. 	<ul style="list-style-type: none"> Atlantic Private School Project managers (Construction Phase) All managers (Operation Phase) 	<ul style="list-style-type: none"> Short-term (entire construction phase) Long-term (entire operation phase)
Communication	Ensure sound communication with the Onanime Community or IAPs	Open communication should be maintained between the proponent and the Onanime Community and IAPs with regards to the environmental and social issues throughout the construction and operational phases.	Atlantic Private School	Long-term (as from project inception)
Grievance Procedure	Social performance Environmental protection	<ul style="list-style-type: none"> A mechanism for dealing with grievances should be developed The IAPs should be informed about the Grievance Mechanism All key concerns for the IAPs should be recorded and addressed 	Atlantic Private School	Long-term (as from project inception)
Training, awareness creation and induction	<ul style="list-style-type: none"> Social performance Environmental protection 	<ul style="list-style-type: none"> All the construction workers should be inducted and trained. All the operational workers should be inducted and trained. Sign boards should be erected for any general awareness needed to be created where possible. 	<ul style="list-style-type: none"> Atlantic Private School Contractor (Construction Project Manager) 	<ul style="list-style-type: none"> Prior to construction and during construction Before and during the operation

	<ul style="list-style-type: none"> Road signs should be erected anywhere driving awareness is needed. Further awareness can be raised through meetings and presentations. 		phase
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11.4.2. Construction activities

Aspect	Impact	Management Action	Responsibility for Action	Time frame
Site preparation	<ul style="list-style-type: none"> Re-location of 3x25mm pipe line and diversions outside the construction site. Land damage Loss of vegetation (insignificant) Loss of fauna species Alteration of topography and geomorphology 	<ul style="list-style-type: none"> Relocation of existing pipeline for three (3) households will be carried out by Atlantic Private School cost. No land clearing should be allowed beyond the proposed construction area. Remaining vegetation should be preserved. The site should be clearly demarcated. No animal must be killed or injured at the construction site rather assisted migration shall be employed where necessary. Off-road driving beyond the construction area by earthmoving equipment should be minimized. Professional construction designs must be in place and be implemented by qualified engineers. Erection of the buildings must comply with the National Building regulations. Qualified Civil Engineers must be contracted as per the Engineering 	Construction contractors (Project managers)	Pre-construction and during construction

		<p>Council to supervise the construction process, and to ensure the application of the environmentally sound principles.</p>		
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Pollution, solid waste generation and disposal		<ul style="list-style-type: none"> • The removed soil layer should be used wisely and should not be allowed to cover vegetation in the vicinity. • Culverts must be constructed to aid the flow of water and minimize water erosion as a result of the hilly and slope nature of the construction site. 		
	Air pollution	<ul style="list-style-type: none"> • Dust must be settled using water during the construction period, regularly. • The entire construction team must be provided with dusk masks, to prevent the inhalation of dust particles. • Open stockpiles of cement bags must be avoided, and must be covered at all times. • The sewerage system should be regularly maintained to avoid smell nuisance from the septic tanks. • Burning of waste at construction site is not allowed, instead the municipal waste sites must be utilized, and waste must recycle, re-used and its generation must be reduced. • Construction of temporal bitumen roads must be implemented on busy sections of construction sites, where necessary. 	Project Manager Construction workers	Regularly (continuous/ongoing)
	Water pollution	<ul style="list-style-type: none"> • Water should be used wisely, and use of too much water during construction must be avoided. • The water used for curing should be sprayed on the concrete structures. • Ponds should be constructed using 	<ul style="list-style-type: none"> • Project Manager • Contractors • Construction workers 	Regularly (continuous/ongoing)

	<p>cement and sand mortar to prevent water from flowing away from the surface while curing.</p> <ul style="list-style-type: none"> • Waste water should not be poured on the vegetation, or allowed to spill on them, but should be safely disposed. • Paint and cleaning products must be safely disposed to prevent excessive water pollution. • Hazardous liquids should be professionally disposed to prevent both surface and underground water pollution. • Recreational water facilities must be recycled and disinfected to prevent the spread of waterborne infections. • Biological water treatment mechanism must be employed to prevent next hierarchical level pollution such re-use through gardening. 		
<p>Land pollution</p>	<ul style="list-style-type: none"> • Basic waste management practice education to the contractors can help with anti-land pollution campaign during and after construction. • Waste generation must be minimized and where possible waste must be eliminated. • Adequate waste collection facilities should be well placed at construction site. • Useful waste materials must be re-used. • Unlawful deposit of waste on open land should be avoided and disposal shall be done according to national and 	<ul style="list-style-type: none"> • Construction (Project Manager) • Contractors 	<p>Pre-construction and during construction</p>

	<ul style="list-style-type: none"> international standards and regulations. An environmentally sound sewage system should be in place e.g. eco-toilets for the construction workers should be constructed prior the actual construction. Recycling of waste materials should be promoted. All recyclable materials such as papers, cans, plastics and glasses can be segregated (use waste segregation bins) and marketed to local recycling companies. No burning of waste should be done on land. 		
Noise pollution	<ul style="list-style-type: none"> Noise pollution should be kept minimal during construction should be kept minimal. Night time construction activities must be avoided. All construction activities should not go beyond 18h00. Use of construction equipment with noise generation beyond the World Health Organizations' (WHO's) permissible noise level limit must be communicated to nearby residents before schedule. Speed limit to and from the site should be set. Use of sport and recreational facilities should be communicated to inhabitants where necessary before schedule. 	<ul style="list-style-type: none"> Project Manager Contractors Construction workers 	Pre-construction and during construction

11.4.3. Safety and Security, Occupational Health and Working Conditions

Aspect	Impact	Management Action	Responsibility Action	for Time Frame
Presence of construction teams and equipment	Community and construction workers' safety and security	<ul style="list-style-type: none"> Construction companies should be ISO 14001:2016 certified (using ISO 14001:2016 can provide assurance to company management and employees as well as external stakeholders that environmental impacts are being measured and improved as per the EMP. A Construction Safety and Security Plan should be developed and implemented according to ISO 14001:2016. All personnel at the construction site must be made aware, and comply with the Construction Safety and Security Plan. Fence off the construction site where necessary to prevent accidents. Avoid unauthorized and other daily visitors at the construction site during the construction phase. 	Construction Project Managers	Pre-construction and during construction
Health of the workers	Construction workers' performance	<ul style="list-style-type: none"> Namibia's health and safety regulations should be adhered to, as per the Labour Act No. 11. of 2007, which is being implemented according to the International Labour Organization (ILO) guidelines. Training on occupational therapy should be provided to all construction employees. First Aid kits should be made available 	Contractors (Health and Safety)	Pre-construction and during construction

		<ul style="list-style-type: none"> at the construction sites. All employees should be provided with protective materials (e.g. dust masks, hand gloves and overalls). Examinations for the specific type of work which require employees' medical examinations certificates should be done before hiring the personnel. 	
Labor and working conditions	Construction workers' performance	<ul style="list-style-type: none"> Namibia Labour Act No. 11 of 2007 shall be adhered to and specific reference to international labour organizations. guidelines shall be taken in consideration. The Grievance Mechanism should be implemented in line with the Namibian Employment and Labor Act of 2018. 	Atlantic Private School
			Duration of construction activities

11.4.5.. Socio-economic aspects

Aspect	Impact	Management Action	Responsibility for Action	Time Frame
Employment creation	<ul style="list-style-type: none"> Poverty reduction Local economic upliftment 	<ul style="list-style-type: none"> High priority should be given to Namibian companies involved in architecture, civil engineering, structural engineering, electrical engineering, mechanical engineering and quantity surveying when it comes to the project design. Namibian construction company construct the proposed developments e.g, School 	<ul style="list-style-type: none"> Atlantic Private School Contractor 	Pre-construction and before the actual operation

		<ul style="list-style-type: none"> • Construction materials should be procured from local supplier and surrounding areas. • The majority of people to be employed both during the construction and the operational phases should be from Oshana Region and surrounding areas while few of the supporting (experienced) staff should be sourced externally (regionally or nationally) 		
<p>Urban development</p> <p>Housing provision</p> <ul style="list-style-type: none"> • Housing shortage problem partly addressed • Increase in rates and taxes for the Windhoek council 	<p>Infrastructure development</p> <ul style="list-style-type: none"> • Housing shortage problem partly addressed • Increase in rates and taxes for the Windhoek council 	<p>The integrity of the infrastructure should be well maintained</p> <ul style="list-style-type: none"> • High priority should be given to the Workers without local accommodations. • Rates and taxes for the developments was be in accordance with the council rules and regulations. 	Atlantic Private School	Ongoing

11.4.6. Waste Management

Aspect	Impact	Management Action	Responsibility for Action	Time Frame
Solid Waste	<ul style="list-style-type: none"> • Soil pollution • Water contamination • Aesthetic view 	<ul style="list-style-type: none"> • Awareness raising on: avoiding waste generation, waste reduction, re-use and repair. • Littering must be avoided by all means. • Sufficient provision of materials/equipment to dispose waste, placed at reasonably distances and at strategic areas. • Solid waste must be disposed in the provided waste bins/containers. • Full waste bins should be emptied on time and should not be left to overflow. • A temporary disposal site should be put in place during the construction phase. • All general waste should be disposed of at Oshakati Town Council landfill site, during the operational phase. • Building rubbles should be disposed of at the nearest satellite site. • Re-use of waste materials should be promoted. • Recycling should be promoted. • Frequent monitoring of waste handling at the site. 	<ul style="list-style-type: none"> • Atlantic Private School • Contractors 	During the construction and the operational phases
Liquid waste	<ul style="list-style-type: none"> • Underground water contamination • Soil contamination 	<ul style="list-style-type: none"> • Unused paints and other liquids should not be discarded on the ground. • All finished and unfinished 	<ul style="list-style-type: none"> • Project manager (during construction) • Atlantic Private School 	During the construction and operation phases

<ul style="list-style-type: none"> • Odour 	<p>containers must be kept tightly closed at all times, be disposed in a proper manner at Oshakati town council landfill site</p> <ul style="list-style-type: none"> • A good sewer system should be constructed to cater for the total sewer from all ablation facilities. • Leakages should be constantly monitored. • Septic tanks should be regularly monitored and managed. • Regular soil sampling to monitor any possibility of soil contamination. 	<ul style="list-style-type: none"> • Contractors 	
<p>Hazardous waste</p>	<ul style="list-style-type: none"> • Soil and contamination • water <p>Hazardous waste such as paint, cleaning chemicals, and used oil should be stored in safe containers and safely be disposed of at Oshakati Town Council landfill site</p> <ul style="list-style-type: none"> • None should be exposed to the open environment. 	<ul style="list-style-type: none"> • Contractors • Atlantic Private School 	<p>During construction and during the operational phases</p>
<p>Smoke</p>	<p>Air pollution</p>	<ul style="list-style-type: none"> • Construction employees • Onanime Village residents 	<p>Smoke must be avoided at all costs.</p> <p>During construction and during the operational phases</p>

11.4.7. Monitoring and Reporting Plan

The following plan will be implemented for the purpose of monitoring and reporting, both during the construction and operational phases. Reports should be submitted to the MEFT.

Aspect	Implication	Frequency	Responsibility for Action
Implementation of the EMP	Environmental protection and social performance	<ul style="list-style-type: none"> • Bi-weekly during construction • Every six months during the operation phase 	<ul style="list-style-type: none"> • Atlantic Private School • External Auditors

12. ANNEXURE

12.1. ANNEX 1: Background Information Document

1. PURPOSE OF THE BACKGROUND INFORMATION DOCUMENT

The purpose of this Background Information Document (BID) is to provide the interested and affected parties (IAPs) with information on the proposed project. It has briefly provided information on the following:

- Background information on the proposed development of Atlantic Private School;
- Environmental Impact Assessment (EIA) process to be undertaken; and
- Registration for the public as I & APs, and how to participate in the EIA process.

2. INTRODUCTION

Atlantic Private School would like to transform the virgin land of Atlantic Private School into a multiple-use area, comprising of residential areas, educational facilities, recreational facilities. The whole idea has been motivated by the major and urgent Education need in Oshana region, and the fact that there are countless number of people who are not in positions to afford better education elsewhere. Consequently, Atlantic Private School has planned to invest resources in the construction of affordable educational institution in the said area. Along with the teachers' houses was be other facilities, namely: educational and recreational.

The nature of the proposed development requires that an EIA is/be conducted, to ensure that the possible environmental and social impacts of the proposed activities are identified, and that possible mitigation measures are in place/identified. This is in line with the provisions in the Environmental Management Act No. 7 of 2007 and its regulations of 2012, which emphasize that land use and developmental activities for commercial purposes cannot be undertaken without an Environmental Clearance Certificate (ECC).

Given the above background, Atlantic Private School has appointed Karnataka Environmental Services CC to conduct an EIA for the proposed development. The overall aim is to identify the potential impacts of the Project. The EIA was take into consideration the positive and negative impacts associated with the development of the proposed area. It was pay particular attention to all the activities that was be involved, both during the construction, and the operational phases, and their associated impacts.

3. PROJECT AREA DESCRIPTION

Covering a surface area of approximately 80000 m², the proposed development site, is located along Oshakati-Omungwelume road at Onanime Village of Okatana Constituency, the residential area that is currently in the development process, with some nearby private schools already been constructed. It is further situated in close proximity of an Oshakati Town boundary



Map 2: Map of construction site location from Oshakati CBD.

The proposed development site is currently pristine, and is covered by vegetation; predominantly grass, shrubs and bushes; and has never been developed for any use before. As a result, the development of such a site was require a wide range of expertise from various disciplines (Land surveyors, civil engineers, quantity surveyors, land surveyors, electrical engineers, water engineers, builders among others) before it can be transformed into a habitable area.

Although located in a Savanna area, the surface area is relatively flat, without possible water runoff on the periphery. Therefore, given its nature, the landscape within the site does not create storm water runoff streams. Nevertheless, the area has been estimated to classrooms, administration blocks, teachers' houses, a sport field for a school, a school and several facilities.

4. TECHNICAL SPECIFICATIONS

The intended development of Atlantic Private School was entail the construction of various facilities, as follows: classrooms, administration blocks, teachers' houses, a sport field for a school, a school and several facilities. To ensure success of this project, the following was be taken into consideration:

- Land planning;
- Land surveying and quantity surveying;
- Land preparation (transformation of virgin land into a habitable area);
- Fencing off the construction zones (operating in 4 different phases);
- Construction of the facilities (in phases)
- Water supply (including connection to the rural water supply system);
- Electrical supply and electrical engineering);
- Development of the sewerage system.
- Waste management (solid waste- collection schedule, liquid waste and air pollution);
- Construction of roads (civil engineering).

5. THE EIA PROCESS

The Environmental Management Act No. 7 of 2007 and the EIA Regulations of 2012 require environmental assessments to be conducted for all activities that may potentially impact the environment and the society at large. As it is the case with any environmental assessment, the EIA process for development of Atlantic Private School was involve the following steps.

- Identification of IAPs;
- Undertaking an environmental scoping study to identify environmental and social issues of concern and assess their significance;
- Undertaking a full EIA to assess the possible environmental and social impacts;
- Proposal of possible mitigation measures for negative environmental impacts; and
- Compilation of an Environmental Management Plan (EMP).

6. POTENTIAL IMPACTS

The following are the potential impacts of the development:

6.1. Positive impacts

- Aesthetic (visual) impact;
- Socio-economic (employment creation; affordable education, job/income opportunities etc.);
- Urban development (including an increase in business activities);
- Increased access to services (housing, education, recreation, at community's door steps);
- Expansion of residential and commercial facilities was benefit region revenue inflow;

- Sales and income to be generation from the available services was boost tax revenue; and
- Community empowerment.

6.2. Negative impacts

- Environmental destruction / landscape damage;
- Soil surface alternation;
- Biodiversity reduction (loss of both local flora and fauna);
- Destruction of ecological balance;
- Possible impacts of activities associated with liquid, solid and air pollution;
- Increased noise pollution (especially from construction activities and vehicles on the road);
- Excessive use of water (a scarce commodity in Namibia); and
- Increased possibility of water runoff (from road pavements).

7. PUBLIC CONSULTATION PROCESS

The Environmental Management Act of 2007 and the EIA Regulations of 2012 require that the public / IAPs should be involved in the EIA process. The aim is to provide the public / IAPs an opportunity to:

- raise any issues of concern regarding the proposed project/development;
- provide essential information and opinions that should be considered during the EIA process;
- identify relevant IAPs;
- support or appeal against the proposed development;
- propose possible mitigation measures for the potential negative environmental and social impacts;
- recommend alternative project sites or other options of consideration.

As a requirement by the Environmental Management Act No. 7 of 2007, public/stakeholder consultation should be conducted in order to ensure transparency in the EIA process. The public can be consulted through one-on-one meetings, focus group meetings, or through public meetings to obtain people's views regarding the development. The information gathered through public consultation should in all cases be taken into consideration, and should therefore be included in the scoping and in the final EIA reports. Such reports should be shared with the public for comments and further input.

Further to the scoping and full EIA report, an EMP was be developed, presenting possible mitigation measures for the identified negative environmental impacts. The public is also expected to identify/propose possible mitigation measures, which should be included in the EMP.

The public were hereby invited to register as IAPs, by completing the form below. The meeting attendance register is attached herewith.

**ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED
DEVELOPMENT OF ATLANTIC PRIVATE SCHOOL**

INTERESTED AND AFFECTED PARTIES (IAPs) QUESTIONNAIRE

PERSONAL PARTICULARS

Name:	
Organization:	
Postal address:	
Telephone No:	Email address:
Fax No:	Cell phone no.:

INTEREST IN THE PROJECT

Kindly highlight your interest in the project below.

STAKEHOLDER CONSULTATION

Please indicate whether you would like to attend the public meetings

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
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COMMENTS AND ISSUES OF CONCERN

Kindly provide below, the comments or issues of concern that you may have at this stage.

Signature:		Date:	
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13. ENVIRONMENTAL PRACTITIONER

Atlantic Private School appointed Karnataka Environmental Services cc/2016/10849) to facilitate the application for an Environmental Clearance Certificate (ECC) with the Ministry of Environment, Forestry and Tourism (MEFT), to be issued upon approval of the EIA Report. IEMS is represented by: **Mr. Lineekela Haiping**.

Mr. Lineekela Haiping, hold a Bachelor of Science Degree in Environmental Science (Gold Medal) from the JSS University in India. He also holds an Advanced Certificate in Education from the University of North-West, and a Basic Education Teachers Diploma from Ongwediva College of Education. Lineekela also holds an Advanced Diploma in Intellectual Property and Competition Law and Business Law. He is further certified in ISO 1400:2015 (Environmental Management System), in ISO 9001:2015, (Quality Management Systems) and in ISO 45001:2018 (Principles of occupational Health and Safety Management Systems. Lineekela also has a Diploma in Legal Studies (Law), a Diploma in Project Management Practice, a Diploma in Workplace Safety and Health, Occupational Health and Industrial Hygiene, and an Advanced Diploma in Legal studies and Business (Business Law). Lineekela has valuable experience in research, environmental assessment, environmental and resource management, editing, design, environmental education, curriculum development and education management. While at JSS University, Lineekela did an internship at Karnataka State Control Board where he did a project on advanced water treatment column design. Lineekela has worked as a teacher, an environmental consultant and Marketing manager at IEMS, At the moment, he is a Safety Officer at SUSPECO Trading CC/Jiangsu Zhengtai Construction Group PTY and EIA Consultant at Karnataka Environmental Services CC.

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