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ENVIRONMENTAL IMPACT ASSESSMENT

SCOPING REPORT

Expansion of Katima Mulilo UNAM Campus

December 2018

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Environmental Compliance Consultancy CC
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TITLE AND APPROVAL PAGE

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ENVIRONMENTAL COMPLIANCE CONSULTANCY

DECLARATION OF INDEPENDENCE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

I, **Stephan Bezuidenhout**, declare that –

General declaration:

- I act as the independent environmental practitioner in this application/tender
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- All the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations

1st January 2018

SIGNATURE **DATE**

EXECUTIVE SUMMARY

UNAM has identified the need to create a facility for the Department for Wildlife Management and Ecotourism (DWME) at its Katima Mulilo Campus that will offer wildlife-related higher education for the SADC Region. In order to accommodate the students and provide sufficient training facilities for the program, the campus at Katima Mulilo needs to be extended. The original extension proposal was to provide additional facilities on the existing campus site. However, due to the nearby brick factory and associated noise and dust levels, the area was not deemed suitable. In addition due to prone flooding the area was not deemed fit to extend the Campus in the easterly direction and rather to establish a mini Botanical garden. A site opposite the existing campus has been identified as the preferred location, as it offers an opportunity to develop a dedicated Campus, well suited for educating students on all aspects related to the natural environment.

The campus extension structures are designed to foster and protect the immediate environment. This includes integrating the campus into the site environment (e.g. existing vegetation and wetlands) and linking the different nodes of the campus by boardwalks that weave around the natural vegetation. The dedicated campus for the DWME will comprise lecture halls, office space, a boardroom, a library, a multipurpose hall, jetty boat launch, workshop, laboratories (both wet and dry), administrative storerooms, student accommodation, visiting lecturer/staff accommodation, seminar rooms, boat house, ablution facilities and common areas and an exhibition facility to name a few. The nodes/modules will be raised off the ground to allow continued access for fauna and to limit flora disturbance, and will be connected via elevated boardwalks. This raised design also protects the campus from potential flooding.

This report summarises the statutory environmental assessment procedures undertaken to date, which are also included in the Appendices. The need for the project is evaluated, and design and site alternatives investigated. The envisaged project schedule, costs, employees, equipment, site preparation, materials/resources and waste management for the construction and operational stages of the campus are addressed. Decommissioning and reinstatement of the environment are also included should the campus need to be shut down in the future, although this is unlikely.

All construction projects cause an environmental impact to the receiving environment. This report is aimed at equipping the Ministry of Environment and Tourism (MET) with sufficient information which will allow them, after due consideration, to decide whether the proposed campus construction will have a significant environmental or social impact and whether an Environmental Clearance Certificate can be issued. All relevant aspects related to the campus extension project are reviewed, evaluated, and a considered opinion on the potential environmental and social impacts are provided. The details of these evaluations can be perused in the report but, in summary, the overall environmental impact is negative and of low significance while the social impacts are considered to be positive and significant, aligned to Namibia's Vision 2030 and the 5th National Development Plan of Namibia.

The negative impact that poses the biggest potential threat to the environment, if not addressed in the design and best building practices, is as follows:

- The proposed extension of the UNAM Katima Mulilo campus is located only marginally higher than the 941m asl contour which marks the 1-in-50 year extrapolated floodwater mark. The proposed development has an effluent/wastewater transfer network incorporated into its design that links to the Municipal wastewater treatment system. Should this network not be designed or constructed to withstand extreme rainfall conditions and flooding, untreated sewage could spill from the network/sumps into the environment.

  This can affect the wetlands and the Zambezi River downstream of the campus, resulting in contamination and human health risk issues. This also applies to the chemical storeroom and any fuel storage facilities located on the campus. If the design and budget constraints are able to prevent effluent or chemical spills, and ensure containment during severe weather or flooding events, then there is minimal risk of significant environmental or social impacts exists with the proposed campus development.

No other potentially significant environmental impacts were identified during the scoping evaluation or impact assessment. A summary of the effects for all factors considered is given in Table 9. Recommendations for potential further investigation are also provided should they be deemed necessary by DEA/MET. No significant cumulative environmental effects were identified in this scoping study and assessment.

Two positive impacts have been identified, namely;

1) New, well-trained environmental science students can be employed at the numerous parks and reserves as well as in the hospitality sector (established Lodges that focus on the ecotourism industry) of / in Namibia, Zambia, Zimbabwe and Botswana

2) Providing a world-class environmental education facility in the Katima Mulilo area will be positive for the Zambezi Region in terms of economic, social and environmental improvements.

The Environmental Management Plan (EMP) (Appendix A), which forms an integral part of this report, lists all the environmental aspects that must be monitored throughout the construction and operation of the proposed campus in detail.

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DEFINITIONS AND ABBREVIATIONS

CBNRM	Community based Natural Resource Management in Namibia
DEA	Directorate of Environmental Affairs
DWME	Department of Wildlife Management and Ecotourism
ECC	Environmental Compliance Consultancy
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
ESMP	Environmental and Social Management Plan
IFC	International Finance Corporation
I&AP	Interested and affected parties
KAZA	Kavango Zambezi Trans-frontier Conservation Area
NAMPAB	Ministry of Urban and Rural Development
MAWF	The Ministry of Agriculture, Water and Forestry
MET	Ministry of Environment and Tourism
SADC	Southern African Development Community
UNAM	University of Namibia

1. INTRODUCTION

1.1. PROPOSED PROJECT

UNAM has identified the need to create a new facility for the Department for Wildlife Management and Ecotourism at its Katima Mulilo Campus (which is an extension to the already existing UNAM Katima Mulilo Campus), that will offer wildlife-related education programmes at BSc (Hons), and MSc and PhD level for the SADC Region. Through providing this education, skills will be developed which will contribute to the conservation management and wildlife protection in the SADC region; thereby supporting the overall management of trans-frontier conservation areas as well as the implementation of landscape-level conservation approach.

In order to accommodate the students and provide sufficient training facilities for the program, the campus at Katima Mulilo needs to be extended. The original extension proposal was to provide additional facilities on the existing campus site. However, due to the proximity of a brick factory and the associated noise and dust levels, as well as prone flooding in this low lying area the site/the area was not deemed suitable. A site opposite the existing campus, see Figure 1, has been identified as the preferred location as it offers an opportunity to develop a dedicated new campus well suited for educating students on all aspects related to the natural environment. The design will be integrated into the natural surroundings, and due care will be given to the environment, thus reflecting the syllabus taught by the Department for Wildlife Management and Ecotourism (DWME) UNAM.

While the planned extension to the campus is currently at the stage of preliminary design development where the proposed concepts on how to construct the campus in an environmentally friendly manner are implemented. For example, the nodes/modules used to create these facilities will be grouped into nodes designed to resemble tree branches. The modules will be raised off the ground to allow continued access for fauna and to limit flora disturbance, and will be connected via elevated boardwalks. This raised design also protects the structures from potential flooding. The surrounding nature and environment will be integrated into the syllabus to provide outdoor learning experiences, and the lecture halls will act as viewing platforms into the environment. The campus master plan and the campus structures are designed to foster and protect the immediate environment. This includes integrating the campus into the site environment (e.g. existing vegetation and wetland areas) and linking the different nodes of the campus by boardwalks that weave around the natural vegetation. The campus will be composed of lecture halls, office space, boardroom, a library, a multipurpose hall, jetty boat launch, workshop, laboratories (wet and dry), administrative storerooms, student accommodation, ablution facilities and common areas, visiting lecturers/staff accommodation, and an exhibition facility to name a few.

Despite best practices and environmental considerations, all construction projects have an environmental impact. This Scoping Report plus environmental assessment, and the supporting EMP will evaluate the scope and magnitude of these impacts, whether they can be mitigated or not, and how to best monitor potential environmental damage during the building and operation of this institute. Some of the monitoring activities during the operational phase can even be incorporated into the syllabus for senior classes as part of their practical tuition. This report is aimed at equipping MET with sufficient information which will allow them, after due consideration, to decide whether the proposed campus construction will have a significant environmental impact and whether or not an Environmental Clearance Certificate can be issued.

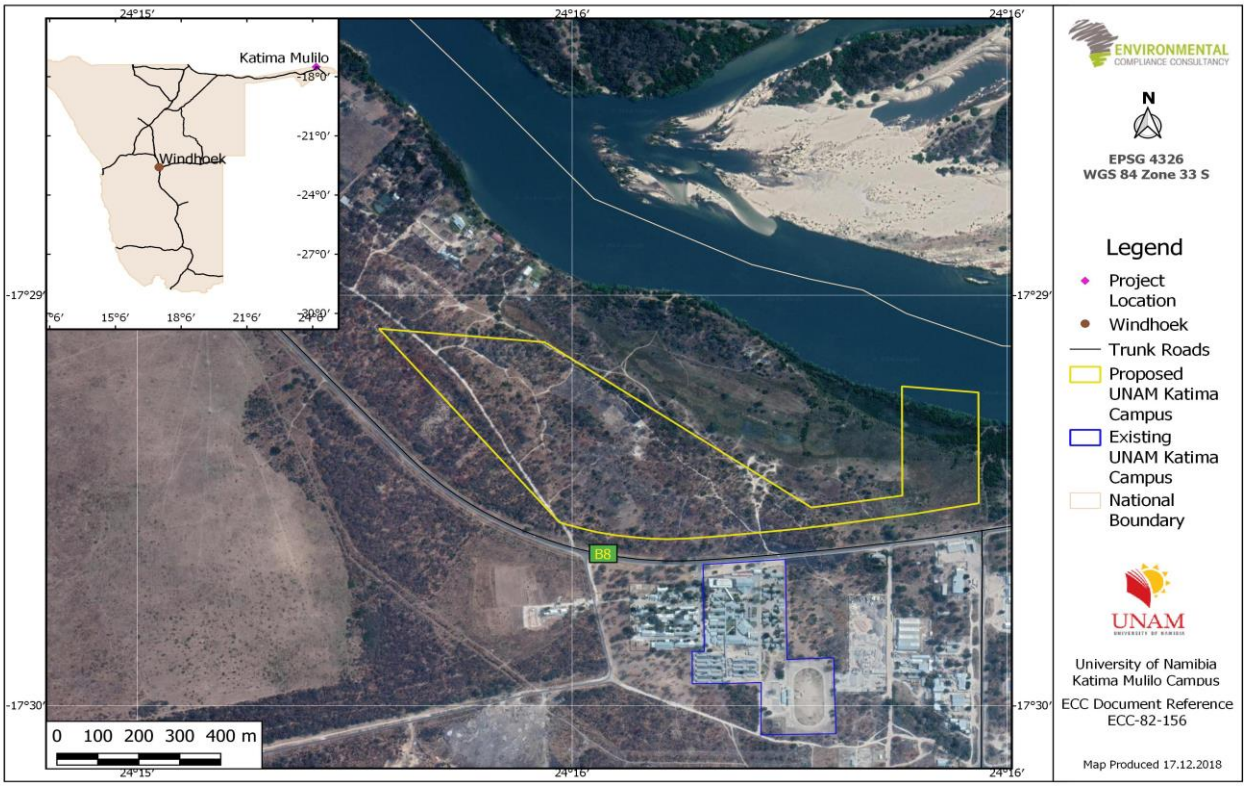

Figure 1 – Location of proposed project for the construction of facilities for the DWME.

1.2. Environmental Requirements

The Environmental Management Act, 2007 (Act No. 7 of 2007) stipulates that an Environmental Clearance Certificate is required to undertake Listed Activities under the Act and associated Regulations. Listed activities that are triggered by the project include:

Screening: Considered and triggered

LISTED ACTIVITY	SCREENING FINDING
WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES (2.1) The construction of facilities for waste sites, treatment of waste and disposal of waste.	– While the proposed project is not a dedicated facility for waste management, treatment or disposal, sewerage waste shall be produced on site and will be connected to the municipal sewerage network. – General waste shall be generated during operations, which shall be collected and removed from the site for reused, recycling or final disposal at an appropriate facility.
WATER RESOURCE DEVELOPMENTS (8.8) Construction and other activities in water courses within flood lines.	– The proposed Jetty shall be constructed on the banks of the Zambezi River. – The proposed extension of the KM Campus is next to and in some areas over laps with a 1 in 50-year flood level area. The rest of the site is within a 1 in 100-year flood level area (flood lines).
MINING AND QUARRYING ACTIVITIES (3.2) Other forms of mining or extraction of any natural resources whether regulated by law or not.	– The project will require additional soil or sand material for the construction of the project – Materials (sand and soil) will be sourced within the project footprint or locally as far as reasonable possible.

Screening: Considered but not triggered

LISTED ACTIVITY	SCREENING FINDING
FORESTRY ACTIVITIES (4) The clearance of forest areas, deforestation, afforestation, timber harvesting or any other related activity that requires authorization in term of the Forest Act, 2001 (Act No. 12 of 2001) or any other law.	– imited vegetation clearing may be required in order to allow the construction of the proposed project. It shall be limited as the concept of the project is to provide a campus that is integrated into the surrounding environment and provide lectures and programs within the natural environment. The project foster the philosophy that no large trees will be removed. Vegetation clearing (if any – shurbs only) will be less than 15ha and shall not be cleared within 100m of the river. – **This Listed Activity is therefore not triggered by the proposed project;** however, ECC shall consult with the Ministry of Agriculture, Water and Forestry and assist the client in obtaining all relevant permits.
LAND USE AND DEVELOPMENT ACTIVITIES (5.1) The rezoning of land from – (d) use for nature conservation or zoned open space to any other land use.	– The proposed extension of the Katima Campus is permitted under Institutional Consent Use of Nature Reserve Zoning as per the Katima Mulilo Town Planning Scheme Clause 8.11 and Zoning Map. – **This Listed Activity is therefore not triggered by the proposed project,** however ECC shall consult with Ministry of Urban and Rural Development to register titles.
INFRASTRUCTURE (10.1) The construction of – (b) public roads.	– An access junction off the B8 shall be constructed, in addition to limited internal roads leadinginto the campus. – The access road shall be commonly used by the students to access the campus, however does not offer thoroughfare (road connecting one location to another). – **Whilst this Listed Activity is not triggered by the proposed project,** ECC shall consult with the Roads Authority as per the request from NAMPAB made correspondence dated 14th May 2018, in order to obtain approval for the access junction. As part of this consultation, and to ensure a suitable access junction is designed.

1.3. PURPOSE OF THIS REPORT

The findings of the Environmental Impact Assessment (EIA) undertaken for the proposed project are presented in this Report. This report has been undertaken in accordance with the requirements of the Environmental Management Act, 2007 and the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2011) gazetted under the Environmental Management Act, (EMA), 2007 (Act No. 7 of 2007) (referred to herein as the EIA Regulations). This Report and Appendices will be submitted to the Directorate of Environmental Affairs (DEA) at the Ministry of Environment and Tourism (MET) for review as part of the Environmental Clearance Certificate application.

This report has been prepared by Environmental Compliance Consultancy (ECC). ECC's terms of reference for the assessment is strictly to address potential effects, whether positive or negative, and their relative significance, and to explore alternatives for technical recommendations and identify appropriate mitigation measures for the proposed project.

The report has been prepared to provide information to authorities, the public and stakeholders to aid in the decision-making process for the proposed project. The objectives of this report are to:

- Provide a description of the proposed activity and the site on which the activity is to be undertaken, and the location of the activity on the site
- Provide a description of the environment that may be affected by the activity

- Identify the laws and guidelines that have been considered in the assessment and preparation of this report
- Provide details of the public consultation process
- Describe the need and desirability of the activity
- Provide a high level environmental and social impact assessment on feasible alternatives that were considered;
- Report the assessment findings, identifying the significance of effects, including cumulative effects, and
- Conclude if further investigation is required, and if not required, provide DEA due justification for the approval and issuing of an Environmental Clearance Certificate.

In addition to the EIA, an Environmental Management Plan (EMP) (Appendix A) is also required under the Environmental Management Act, 2007. An EMP has been prepared to provide a management framework for the planning and implementation of construction activities and provides construction and operational standards and operating arrangements so that potential environmental and social impacts of the proposed project are mitigated, prevented and minimised as far as reasonable practicable, and that statutory requirements and all necessary legal obligations are fulfilled.

1.4. The Proponent of the Proposed Project

The proponent for the project is the University of Namibia (UNAM) as set out in the table below:

Table 1 - Proponent

UNIVERSITY OF NAMIBIA (UNAM)
Private Bag **13301** **340 Mandume Ndemufayo Ave** **Pionerspark** **Windhoek** **Telephone (+264-61) 206 3111**

1.5. Environmental Consultancy

Environmental Compliance Consultancy (ECC), a Namibian consultancy (registration number Close Corporation 2013/11401), has prepared this Scoping Report on behalf of the proponent. ECC operates exclusively in the environmental, social, health and safety fields for clients across Southern Africa in the public and private sector. ECC is independent to the proponent and has no vested or financial interested in the proposed project, aside from fair remuneration for professional services rendered.

All compliance and regulatory requirements regarding this assessment document should be forwarded by email or post to the following address:

CONSULTANT
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PO BOX 91193
Klein Windhoek, Namibia
Tel: +264 81 262 7872 or Tel: +264 81 653 1214
Email: info@eccenvironmental.com

The CVs of the authors of this EIA are contained in Appendix B.

1.6. REPORT STRUCTURE

The EIA Scoping Report is structured as per the contents set out in Table 2.

Table 2 - EIA Report Sections

SECTION	TITLE	CONTENT
-	Executive Summary	Executive summary of the EIA
-	Acronyms	A list of acronyms used during the report
1	Introduction	This section introduces the EIA and provides background information on the proposed project, proponent and purpose of the report
2	Regulatory Framework	This chapter describes the International and Namibian environmental regulatory framework applicable to the project and how is has been considered in the EIA and the EIA Scoping Report and EMP.
3	Project Description	Presents a technical description of the proposed project, alternatives considered and the context of the surrounding environment, and how the proposed project will be constructed and operated.
4	Consultation	This chapter outlines the public participation undertaken for the proposed project and presents stakeholder feedback.
5	Impact Assessment and Mitigation	This chapter presents the predicted potential environmental and social effects arising from the proposed project, and the mitigation and management strategies to be applied to avoid or reduce the effects.
6	Conclusions	Concludes the findings of the EIA
7	References	A list of reference used for this report
-	Appendices	Appendix A – EMP Appendix B – Authors CV's Appendix C – Project Registration with DEA/MET Appendix D – Letter from Roads Authority Appendix E – Letter from the Department of Urban and Rural Development Appendix F – Letter from NAMPAB Appendix G – Site vegetation study in relation to proposed construction sites Appendix H – Support for proposed project from DEA Appendix I – EIA Methodology Appendix K – Copy of the Site Notice

2. REGULATORY FRAMEWORK

2.1. INTRODUCTION

The Constitution of the Republic of Namibia, 1990, clearly defines the country's position in relation to sustainable development and environmental management. The Constitution refers that the State will actively promote and maintain the welfare of the people by adopting policies aimed at the following:

"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…."

The Constitution of the Republic of Namibia Article 95 (l)

This section of the report outlines the regulatory framework applicable to the proposed project. The proponent holds their responsibilities and commitments made in line with this framework in the highest regard and provides their commitment to comply with the provisions of the regulatory framework set out below.

2.2. INTERNATIONAL CONVENTIONS APPLICABLE

International, national statutes and environmental regulations, which are applicable to the proposed project or have been considered in the assessment are summarised in Table .

Table 3 – International Regulatory Regimes

INTERNATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
SADC Protocol on Shared Watercourse Systems (1998)	• The Revised Protocol on Shared Watercourses of the Southern African Development Community repeals and replaces the 1995 Protocol on Shared Watercourse Systems. This Protocol recognises international consensus on a number of concepts and principles related to water resource development and management in an environmentally sound manner. • The policy acknowledges the Helsinki Rules, the UN Convention on the law of the Non-Navigational Uses of International Watercourses and Agenda 21 concepts and facilitates the establishment of shared water agreements. • The Protocol states that member states have to take all appropriate measures to prevent the causing of significant harm to a watercourse.	The design specifications for the wastewater network are not yet finalised. The site will connect into the Municipal wastewater system, however, if the site determines that a site specific wastewater treatment plan is needed, a permit will be required to allow discharge of treated waste into shared waters during the operational phase.

2.3. NATIONAL POLICIES

Table 4 – National Regulatory Regimes

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
Vision 2030	Vision 2030 sets out the country's development programmes and strategies to achieve its national objectives. It sets out eight themes to realise the country's long-term vision. Vision 2030 states the following with regard to the growth of	One of the key driving forces for realising the objectives of Vision 2030 is education, science, and technology. The proposed project meets the objectives of Vision 2030 and will

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
	education: *'Capacity enhancement: the development of our country is in our hands, and our people are the most important resource of the country; therefore, we consider investing in people and our institutions to be a crucial precondition for the desired social and economic transformation. This calls for increasing investments in institution-building, in education and training (including, promotion of science and technology), and implementing health/ population and related programmes and policies. '*	contribute to the overall development of an investment in education and training facilities that will prepare Namibians (and other students from abroad) and transform Namibia into a knowledge-based society.
Fifth National Development Plan (NDP5)	The NDP5 is the fifth in the series of seven five-year national development plans that outline the objectives and aspiration of Namibia's long-term vision as expressed in Vision 2030. The NDP5 is structured on the following pillars: economic progression, social transformation, environmental sustainability and good governance. The goal of improved education falls under the pillar of social transformation. The desired outcome is that by 2020, Namibia has put in place an education system that responds to industrial needs. The strategy and desired outcome for higher education are: • Widen access to high education through equity and inclusion. Increase the number of Higher Education Institution students from rural areas and marginalised groups by increasing public awareness and availability of student financing. • Improve the quality of teaching and learning in universities. Develop quality assurance systems and raise learning outcomes by providing professional development to lecturers. Involve employers to enhance the relevance of programmes to meet the labour market needs. • Strengthen research capacity at Higher Education Institutions. Implement a national research development programme, which encourages locally relevant research and promotes entrepreneurship. Build laboratories, research libraries and networks to support research activities.	The proposed project supports meeting the objectives of the NDP5 through the provision of educational facilities, which will support the management, and conservation and ecotourism within the SADC's environment.
National Policy on Climate Change (September 2010)	Provides the legal framework and overarching national strategy for the development, implementation, monitoring and evaluation of climate change mitigation and adaptation activities. The policy promotes the enhancement of synergies amongst sectors and stakeholders for effective and efficient mitigation and adaptation responses to climate change in Namibia. This is specified in the following objective: • To develop and implement appropriate adaptation strategies and actions that will lower the vulnerability of Namibians and various sectors to the impacts of climate change. Guiding principles are proposed in the strategy to guide the planning, development, implementation and monitoring and evaluation of climate change response activities.	The proposed project site is near to the Zambezi River and adjacent to the 1-in-50-year flood line. Due to climate change, the risk of flooding in the area is likely to increase with time. The proposed design has taken this into consideration by building above ground level.

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
The Environmental Assessment Policy	Approved by Cabinet in 1994, the Policy obliges Namibia to place a high priority on maintaining ecosystems and related ecological processes and to uphold maximum biological diversity. The Policy recognises that environmental assessments are a key tool towards implementing integrated environmental management. The policy has also gained legislative support through the EMA.	Part of the proposed project's vision is to maintain the ecosystems found on the proposed site by integrating the facilities into the natural environment. An environmental assessment has been undertaken as required under the EMA; the findings of which are presented in this report.
Draft Wetland Policy	Set out to manage national and shared wetlands wisely by protecting their vital ecological functions and life-support systems for the current and future benefit of people's welfare, livelihoods and socio-economic development. The objectives of the policy are to: • Protect and conserve wetland diversity and ecosystem functioning • Support basic human needs • Provide a framework for sustainable use of wetland resources • Promote the integration of wetland management into other sectoral policies, and • Recognise and fulfil Namibia's international and regional commitments concerning shared wetlands and wetlands of international importance.	The proposed project site is adjacent to the Zambezi River. Flood areas and wetland areas are in proximity to the proposed project development area, therefore this Policy has been considered in the assessment of the wetland area where applicable. Measures to protect the wetland areas are included in the EMP.

2.4. NATIONAL STATUTES

Table 5 – National Statutes

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
Environmental Management Act, 2007 (Act No. 7 of 2007) and associated regulations, including Environmental Impact Assessment Regulation, 2007 (No. 30 of 2011)	The Act aims to promote sustainable management of the environment and the use of natural resources by establishing principles for decision-making on matters affecting the environment. It sets out the principles of environmental management as well as the functions and powers of the Minister. The Act requires certain (listed) activities to obtain an Environmental Clearance Certificate prior to project development. The Act states an EIA may be undertaken and submitted as part of the Environmental Clearance Certificate application. The MET is responsible for the protection and management of Namibia's natural environment. The Department of Environmental Affairs under the MET is responsible for the administration for the EIA process.	This report (and EMP) documents the findings of the EIA process undertaken for the proposed project, which will form part of the Environmental Clearance Certificate application. The EIA and report have been undertaken in line with the requirements under the Act and associated regulations.

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
Water Act, 54 of 1956	The Water Resources Management Act 24 of 2004 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force and states: • Prohibits the pollution of underground and surface water bodies (S23(1)). • Liability of clean-up costs after closure/ abandonment of an activity (S23(2)). • Protection from surface and underground water pollution	The Act stipulates obligations to prevent pollution of water. The proposed project will have elements of the development positioned on the Zambezi River. Pollution prevention measures have been considered in the assessment and incorporated into the EMP.
National Heritage Act 27 of 2004	The Act provides for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. It also makes provision for archaeological 'impact assessments'.	Should archaeological sites or objects be uncovered during the campus construction then appropriate measures will need to be implemented as described in the EMP.
Forest Act, 2001 (12 of 2001) and associated Regulations	This Act provides for the establishment of the Forestry Council, and presents laws relating to the management and use of forests and forest produce. It also presents provisions for the protection of the environment and the control and management of forest fires.	Ecological impacts may occur as a result of the proposed project due to some site clearance requirements. The project will ensure the Act is complied with, in particular: • Clearing the vegetation on more than 15 hectares on any piece of land, or several pieces of land situated in the same locality, which has predominantly woody vegetation requires a permit (S23 (1) (b)). • Tree species and any vegetation within 100m of a watercourse may not be removed without a permit (S22(1) (a)). Protected species will be identified prior to construction works and measures to protect them, as set out in the EMP, will be implemented. Permits for protected species under the Act must be obtained from MAWF prior to any disturbance.
Soil Conservation, 1969 (Act 76 of 1969) and the Soil Conservation Amendment Act (Act 38 of 1971)	Makes provision for the prevention and control of soil erosion and the protection, improvement and conservation of soil, vegetation and water supply sources and resources. The Minister of Agriculture, Water & Forestry may issue directives to landowners in respect of, amongst others: • The prevention of erosion, the denudation, disturbance or drainage of land; and • Any other disturbance of the soil, which creates or may create conditions, which cause or may cause any form of erosion or pollution of water by silt or drift sand.	Whilst minimum vegetation disturbance will occur on site during construction, the potential exists that some soil may be removed or disturbed. The construction methods have been considered in the design of the proposed project and thus the potential degradation of soil is kept to a minimum.
Nature Conservation Ordinance No. 4 of	One of the major biodiversity-related laws in Namibia is the legislation governing the conservation of wildlife and	It is likely that small fauna (rodents, lagamorphs, herps, amphibians, birds,

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
1975	protected areas. Chapter III of the Ordinance on wild animals, *inter alia*, regulates hunting of specifically protected game, birds, exotic game and other wild animals. Chapter VI aims at the protection of indigenous plants. The Schedules of the Ordinance lists specially protected game, protected game, huntable game, birds, and protected plants, amongst others.	arthropods) in the area could be disturbed during construction and possibly during operation. Given the nature and purpose of the proposed campus, all efforts should be made to live in harmony with both the fauna and flora. The EMP will stipulate strict measures to prevent the hunting or trapping of game. The proposed construction above ground level is aimed at minimising destruction of flora and protected plant species.

3. METHODOLOGY

3.1. PURPOSE OF AN EIA

The EIA process in Namibia is governed and controlled by the Environmental Management Act, 2007 and the EIA Regulations No. 30 of 2012, which is administered by the Office of the Environmental Commissioner through the DEA of the MET.

An EIA is a process of identifying, predicting, evaluating and mitigating the potential effects of a proposed project on the natural (faunistic and floristic) and human environment. The aims of the EIA process and subsequent report are to apply the principles of environmental management to proposed activities; reduce the negative and increase the positive effects arising from a proposed project; provide an opportunity for the public to consider the environmental impacts of a proposed project through meaningful consultation; and to provide a vehicle to present the findings of the assessment process to Competent Authorities for decision making.

The EIA process can aid the design development process through incorporating design changes into the project planning early on so as to avoid or reduce environmental impacts, as well as design aspects such as site selection, technology and scale. Mitigation measures and recommendations are identified through a collaboration between the EIA team and the proponent's team (UNAM), including engineers, architects and project managers.

3.2. THE ASSESSMENT PROCESS

The EIA methodology applied to this EIA has been developed using the International Finance Corporation (IFC) standards and models, in particular Performance Standard 1, *'Assessment and management of environmental and social risks and impacts*' (International Finance Corporation, 2017)(International Finance Corporation, 2012); Namibian Draft Procedures and Guidance for EIA and EMP (Republic of Namibia, 2008); international and national best practice; and over 25 years of combined EIA experience. ECC's methodology is presented in Appendix I.

3.3. THE ASSESSMENT PROCESS FOLLOWED BY ENVIRONMENTAL COMPLIANCE CONSULTANCY

This section describes the process of the EIA undertaken by ECC, as summarised in Figure 2. The subsequent sections provide further detail of each step and what has been or will be undertaken for each one.

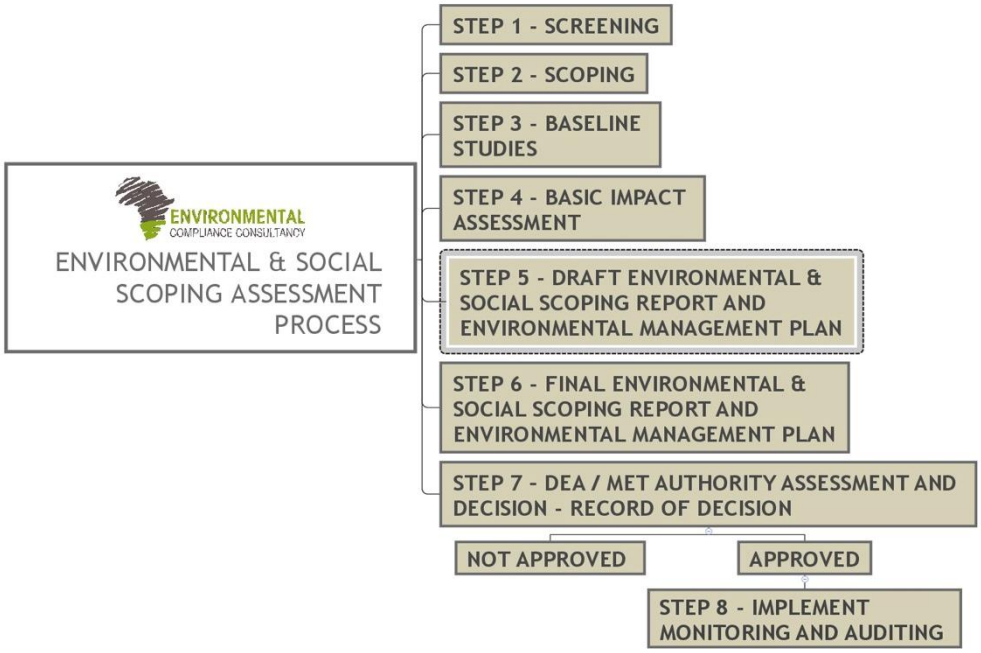


Figure 2 – Environmental Scoping Process

3.3.1. SCREENING OF THE EIA

STATUS: COMPLETE

The first stage of an EIA process is to register the project and undertake a screening exercise to determine whether it is considered as a Listed Activity under the Environmental Management Act, 2007 and associated Regulations and if significant impacts may arise from the project.

The screening exercise concluded that the proposed project triggers Listed Activities (see Section 1.2). Other Listed Activities were also considered, due to the nature of the proposed project, however upon assessment it was determined that the campus development project did not trigger those activities. To ensure transparent engagement is undertaken with the Competent Authorities regarding these Listed Activities the Ministry of Agriculture, Water and Forestry (MAWF), Ministry of Urban and Rural Development (MURD), Roads Authority and NAMPAB were consulted with during the EIA process. Correspondence with the Ministry of Urban and Rural Development (land issue consent) and the Roads Authority (permission for a road access point) are included in Appendices D and E.

A vegetation study in relation to the proposed buildings is included in Appendix F and NAMPAB correspondence and resolutions provided in Appendix G. Reports such as the 2009 WCE Katima Mulilo Flood Report were also reviewed during this assessment.

The scoping assessment evaluated the potential effects and suitable mitigation measures, and whether there are any significant issues and/or effects that require further investigation. This approach was considered acceptable as it was deemed unlikely that significant environmental or social effects are likely to be caused as a result of the proposed project.

3.3.1. AVAILABLE DATA

A desktop review of available baseline data was undertaken during the second half of 2018. The aim of this activity was to identify what, if any, data are missing to formulate a robust baseline to be used in the assessment. The aim is to assess potential significant environmental and social impacts associated with the project, and to determine if

additional specialist studies are required. Given the considered evaluation of the baseline data obtained, in conjunction with the proposed campus design and feasibility reports, it was assessed that no additional specialist studies were required.

3.3.2. SCOPING OF THE EIA

STATUS: COMPLETE

As part of the EIA process a scoping stage was undertaken. The purpose of the scoping stage in the EIA process is to identify the scope of assessment; undertake a high-level assessment to identify potential effects; confirm if further investigation is required to assign the severity of potentially significant effects and appropriate mitigation; and if not, determine if an Environmental Clearance Certificate should be granted.

To ensure the assessment was concise and focussed, a scoping exercise was undertaken to identify environmental and social receptors that may be affected by the proposed project. This exercise was undertaken through a preliminary high-level assessment of the proposed project against the receiving environment. A source-pathway-receptor model was applied:

- Source of potential impact - where does the impact come from, e.g. ground excavation, which emits dust.
- The potential pathway – how can the impact travel through the environment e.g. wind direction and speed.
- The receptor and effect – what can be affected and how e.g. water body, sedimentation, water quality.

In determining a potential effect, a link between each element needs to be identified. Where a link was found to be absent, the topic or receptor was scoped out and was not taken forward for further consideration in the assessment. Where links are present, that topic or receptor was taken forward for assessment where there was potential for the effect to be significant.

The following environmental and social topics were considered during the scoping phase:

- Soils and Geology
- Topography
- Land use
- Built environment
- Infrastructure and waste management
- Socio-economics (employment, local businesses, community, relocation, demographics & tourism)
- Sense of place (landscape and visual amenity, residential and recreational views, lighting)
- Air Quality
- Noise and vibration
- Climate and meteorology
- Flood risk and drainage
- Ecology (Flora and Fauna)
- Ground and surface water, and
- Heritage.

Through the consideration of each topic, receptors were identified and assessed against the activities. Only effects that could have the potential to be significant were taken forward for further consideration and assessment.

3.3.3. CONSULTATION

STATUS: COMPLETE

One of the objectives of the EIA process is to provide an opportunity for stakeholders, including the public, to consider the proposed project and potential environmental and social impacts. Through the provision of meaningful consultation, the proposed project could benefit in various ways, for example, environmental or social receptors of importance to the local community could be identified; the proposed designs could be enhanced, and environmental or social impacts could be avoided or minimised. The consultation that was undertaken for the proposed project, details and the outcome are presented in Chapter 6.

3.4. EIA ASSESSMENT

3.4.1. ASSESSMENT METHODOLOGY

The evaluation and prediction of environmental impacts require the assessment of the proposed project characteristics against the baseline environmental and social characteristics, and ensuring all potentially significant impacts are identified and assessed.

The impact assessment methodology is presented in Appendix I. The determination of significance and how mitigation is used in the assessment is summarised in the following sections.

3.4.2. DETERMINATION OF SIGNIFICANCE

The significance of an impact was determined by taking into consideration the combination of the sensitivity and importance/value of environmental and social receptors that may be affected by the proposed project; the nature and characteristics of the impact; and the magnitude of potential change. The magnitude of change (the impact) is the identifiable changes to the existing environment which may be direct or indirect; temporary/short term, long term or permanent; and either beneficial or adverse. The significance of impacts was derived using professional judgment and applying the identified thresholds for receptor sensitivity and magnitude of change as presented in Appendix I.

Significance is not defined in the Namibian EIA Regulations, however the Draft Procedure and Guidance for EIA and EMP states that the significance of a predicted impact depends upon its context and intensity. Accordingly, definitions for each level of significance have been provided in Table These definitions were used to check that the conclusions for the assessment of receptor sensitivity, nature of the impact, and magnitude of impact were appropriate. Further information is presented in Appendix I.

Table 6 – Significance Description

SIGNIFICANCE OF IMPACT	DESCRIPTION
Major (negative)	Impacts are considered to be key factors in the decision-making process that may have an impact of major significance, or large magnitude impacts occur to highly valued/sensitive resource/receptors. Impacts are expected to be permanent and non-reversible on a national scale and/or have international significance or result in legislative non-compliance.
Moderate (negative)	Impacts are considered within acceptable limits and standards. Impacts are long term, but reversible and/or have regional significance. These are generally (but not exclusively) associated with sites and features of national importance and resources/features that are unique and which, if lost, cannot be replaced or relocated.
Minor (negative)	Impacts are considered to be important factors, but are unlikely to be key decision-making factors. The impact will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value. Impacts are considered to be short term, reversible and/or localized in extent.
Low	Impacts are considered to be local factors that are unlikely to be critical to decision-making.

(negative)	
Low – Major (Beneficial)	Impacts are considered to be beneficial to the environment and society.

Where significant impacts are predicted, further investigation may be required to identify the type of effects and appropriate mitigation, no significant impacts were identified for the proposed project.

3.4.3. Environmental Mitigation

Mitigation comprises a hierarchy of measures ranging from preventative environmental effects by avoidance, to measures that provide opportunities for environmental enhancement. The mitigation hierarchy is: avoidance; reduction at source; reduction at receptor level; repairing and correcting; compensation; remediation; and enhancement.

Mitigation measures can be split into three distinct categories, broadly defined as:

1. **Embedded Mitigation:** Actions undertaken by the EIA process that influence the design, through implementing design measures that would entirely avoid or eliminate an impact, or modifying the design through the inclusion of environmental features to reduce the magnitude of change.
2. **Best Practice Mitigation:** Standard construction practices and other best practice measures for avoiding and minimizing environmental impacts.
3. **Additional Mitigation:** Specified additional measures or follow-up action to be implemented to further reduce adverse impacts that remain after the incorporation of embedded mitigation.

Embedded mitigation and good practice mitigation have been taken into account in the assessment. Additional mitigation measures have been identified when the significance of impact requires this, thus causing the impact to be further reduced. Where additional mitigation has been identified, a final assessment of significance of impacts (residual impacts) was carried out taking into consideration the additional mitigation.

3.4.4. Environmental Scoping Report

This report presents the findings of the scoping process and basic assessment for scoped-in topics. In all projects of this nature, there will be those aspects that have the potential to cause significant environmental damage if not designed, managed and monitored properly and those that do not pose a significant environmental or social threat. For example; chemicals and human waste products being discharged into the Zambezi River due to floods have the potential for significant environmental impact. While construction of an access road has far less potential for significant environmental damage (provided best practice construction methods are used). While all environmental and social factors need to be considered, those with higher potential for significant damage should receive commensurate levels of attention.

3.5. Limitations, Uncertainties and Assumptions

The assessment of environmental impact is dependent on the detail and accuracy of the information supplied to the consultant undertaking the EIA. Every effort is made to ensure that all aspects are covered, but in certain instances, design plans are changed once the project is underway, due to circumstances on the site. Should these be of such a nature that the environmental criteria change significantly then an application must be made to DEA/MET stipulating these changes and asking for an amendment to the Environmental Clearance Certificate. The EMP is also a live document and should be assessed, and if necessary modified, annually to incorporate any changes that might impact the environment.

4. PROJECT DESCRIPTION

4.1. NEED FOR THE PROJECT

Key considerations for the "no go" option mainly revolve around whether there is a need for an extended campus if students educated at the campus will find subsequent employment, and whether this proposed project fits into the greater Namibian development goals (NDP5). The following brief review examines these factors.

The Katima Mulilo Campus was established in 1996 when the Katima Mulilo Teachers' Training Centre (Caprivi College of Education) moved to the site. The College merged with the Faculty of Education of the University of Namibia and the campus was improved. The campus now houses the Faculty of Education and the Faculty of Agriculture and Natural Resources (Wildlife Management and Eco-tourism and Animal Health Departments). Other Departments housed at the campus include the Confucius Institute, the English Access Course, as well as the Centre of Open, Distance and e-Learning, that provides academic and administrative support to students on the distance mode of study (http://www.unam.edu.na/katima-mulilo-campus). The campus currently has a population of approximately 1,450 students and provides five programmes and qualifications (http://www.unam.edu.na/katima-mulilo-campus). It is the 4th largest in terms of student intake in the UNAM family of 12 campuses.

UNAM Katima campus already offers a range of courses and programmes, however, a need to provide additional programmes in Wildlife Management and Eco-tourism was identified in order to provide effective and efficient management of larger wildlife management areas such as national parks, trans-frontier conservation areas and game reserves in the SADC region with an additional focus on the eco-tourism sector.

Since 1999, Namibia pursued the idea of a trans-boundary conservation approach in order to promote migratory corridors for wildlife across international boundaries and to reduce human-wildlife conflict. The biggest and one of the most important trans-frontier conservation areas is the Kavango Zambezi (KAZA), of which Namibia is part. The trans-frontier conservation area encompasses approximately 520,000km^2 and includes 36 formally proclaimed National Parks and a host of game reserves, forest reserves, game management areas, and conservation and tourism concession areas designated for use of natural resources within Angola, Namibia, Botswana, Zambia and Zimbabwe.

There are currently insufficient skilled and experienced personnel to provide conservation management and wildlife protection in the SADC region. In particular, there are challenges with the management of trans-frontier conservation areas, as well the implementation of a landscape level conservation approach, which requires major change and the collaboration of institutions within a country and across countries.

A pre-feasibility study was carried out in 2014 to determine the best approach of implementing measures to address this issue, focused on the proposed UNAM Department for Wildlife Management and Ecotourism (DWME) at the Katima Mulilo Campus. The study indicated a need for training of new and practicing professionals in the area of wildlife management and ecotourism in the southern African region. The study identified that within the wildlife and conservation sector there were about 900 vacant positions requiring BSc (Hons) to PhD qualified candidates in the region in government, institutions, non-government organisations and private companies (Feasibility Study, 2013).

A second study was undertaken in 2014 that focussed on the infrastructure and equipment required to successfully deliver the proposed programmes offered by the DWME. The study concluded that the current Katima Mulilo campus offers limited infrastructure and there is a need to invest in infrastructure, including e.g. lecture halls, boardroom, offices, laboratories, storerooms, student hostels and exhibition facility (specimens of fauna and flora) (Nott, 2014).

The feasibility study was undertaken to provide details of the proposed extension to the Katima Mulilo Campus and determine the necessities required to successfully implement the proposed Department and educational programmes. The Feasibility Report presents compelling information surrounding the need; proposals for the infrastructure; sustainability, business and networking concepts; an implementation plan; cost analysis; and the results of a risk and impact analysis.

NDP5 and Vision 2030 are both aimed at building the Namibian nation through various initiatives. Included are those that offer employment, education and the development of new opportunities for previously disadvantaged people to allow them to forge an acceptable life for themselves and their dependents. An extended campus at Katima Mulilo that will offer courses that could provide employment is well aligned with these policies.

In conclusion, considering Namibia's policies (Vision 2030 and NDP5) and using the information available in the feasibility reports, an extension to the Katima Mulilo Campus is considered beneficial to the developmental goals of Namibia and also the success of the DWME.

4.2. Alternatives And Design Evolution

4.2.1. Alternative Sites

NATIONAL POSITION

"Given our strategic geographical location, in the heart of central southern Africa, where Namibia borders four countries – Angola, Zambia, Zimbabwe and Botswana – we offer a truly southern Africa experience to our students. Apart from the cultural diversity, we sit in the middle of the biggest trans-frontier wildlife conservation corridors in the world, the KAZA Trans-Frontier Conservation Area. This gives our staff and students alike opportunity to visit major tourist attraction destinations in the close proximity of the campus, such as the many National Game Parks and Conservancies in the Zambezi Region of Namibia, but also the Okavango Delta, the Chobe National Park in northern Botswana, and the renowned Victoria Falls in Zimbabwe" (http://www.unam.edu.na/katima-mulilo-campus).

The campus is close to the Namibian North Eastern Parks, the Chobe National Park in Botswana, the Hwange National Park in Zimbabwe, the Ngweze – Sioma National Park in Zambia and the Luiana National Park in Angola, as well as newly emerging CBNRM initiatives and wildlife corridors in Zambia and Namibia. Furthermore, all of the above form part of the KAZA. These opportunities need to be captured within the design of the DWME training programs.

LOCAL POSITION

Expanding the local northern UNAM Katima Mulilo campus to house the new facilities was considered as an option. However, the area where the campus extension could be located is close to a brick factory, and the dust and noise associated with the daily operations of this factory were not considered conducive to lecturing, studying or the health of students. The area was also to prone flooding and too small to accommodate the envisioned scale of the campus extension and for the scale of the investment. It was therefore decided that this option was not suitable.

Other areas of Katima Mulilo were also considered but were dependent on the availability of suitable land, cost factors and also proximity to the existing campus. No suitable sites in other areas could be sourced.

It was considered beneficial to locate the proposed educational facility in close proximity to the existing campus. This strategy has benefited from a town planning, logistical, administrative and general practicality standpoint. The preferred site adjacent to the existing UNAM campus also offers an opportunity to provide facilities that are integrated into the environment, thereby reflecting the vision and aims of the courses on offer.

4.2.2. Alternative Designs

Various designs were investigated for the campus extension. Factors that were taken in consideration include:

1) It is a campus that teaches integrated environmental sciences and as such, must be as environmentally friendly as possible
2) With the site relatively close to the Zambezi River, there is the potential for flooding. The design has the buildings and walkways above ground level. This design also mitigates many of the potentially significant environmental impacts;

3) A sewage network connecting into the municipal sewerage system is incorporated into the design. The EMP will require regular visual inspections and monitoring of the network infrastructure. Furthermore, the network design must be able to accommodate flooding to ensure that no raw effluent reaches the Zambezi River;
4) Bushfires are also considered in the design, which keeps buildings close to nature and above the ground level. Buildings and fixtures must be constructed of fire resistant/retardant materials as far as possible. Adequate fire prevention and, in case of an accident, control measures, must be an integral part of the design. These aspects are discussed further and incorporated into the EMP;
5) The region is very hot and humid, so building materials and design must ensure airflow and promote cooling. In some cases double roof sheeting is incorporated into the design;
6) Water preservation is important and the guttering will capture and store rainwater;
7) Good natural lighting, hard wearing building materials and integration of rooms and nature are also considered in the design criteria;
8) Privacy is also an important consideration for a facility housing many students and has been taken into consideration;
9) The modular design allows for easy extension or decommissioning;
10) Solar energy alternatives are incorporated into the design as far as possible to reduce energy consumption.

Other environmentally friendly options can also be considered during final design and operation, such as building colours that reflect the heat, bio-friendly soaps and detergents, recycling, avoidance of plastic bags/wrapping/bottles and vegetable gardens for fresh produce for the kitchens. These elements are discussed and incorporated into the EMP.

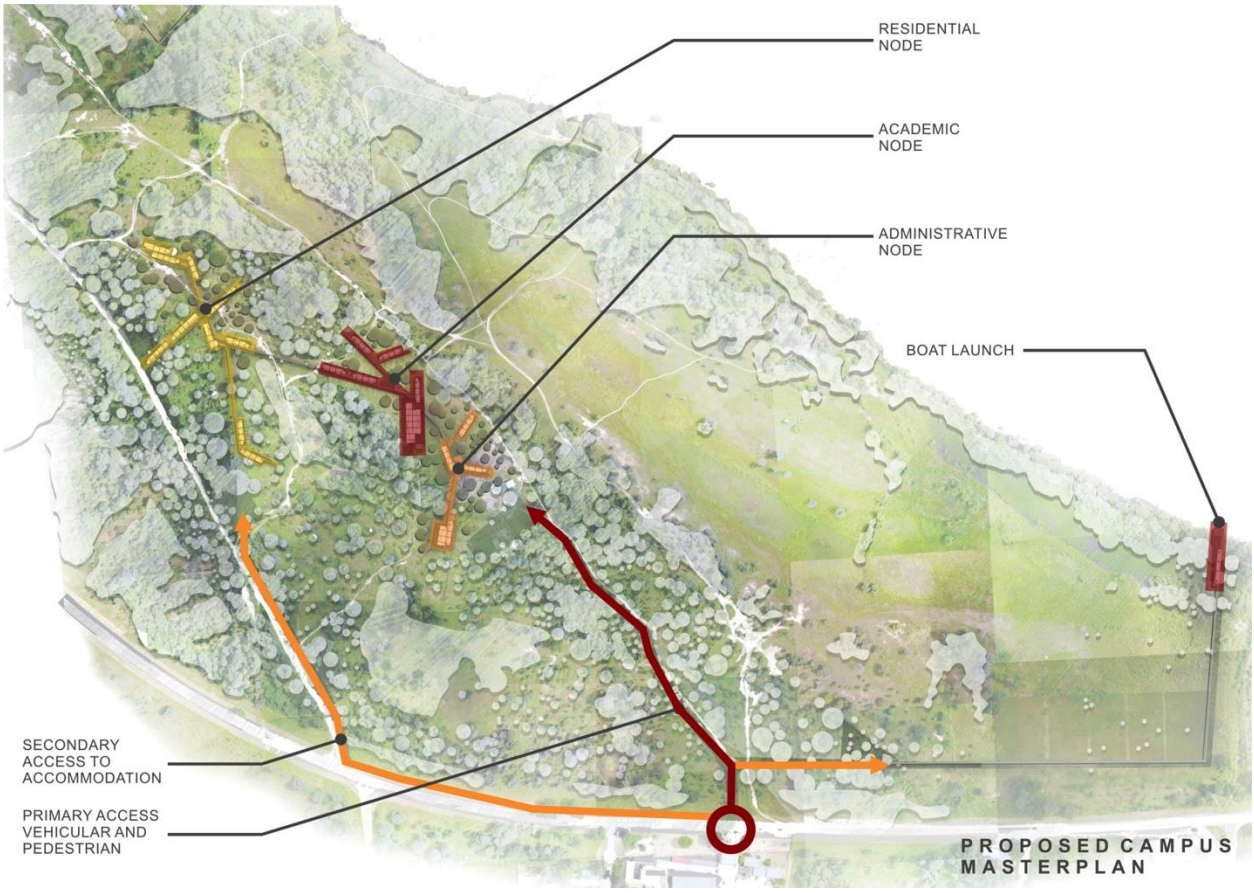
4.3. Proposed Project Site and Design

The proposed campus extension is located approximately 500m away from the existing campus towards the north (Zambezi River side). The proposed building site is currently covered with typical grassland/bushveld/savannah vegetation (Figure 4). Towards the river where the jetty is planned, it is wetter and swampier (Refer: Figure 4).

The design is planned to look like the branches of a tree and makes use of a vegetation map to place the campus nodes in areas where the least vegetation clearing will be required (Figure 5). The fact that the buildings and walkways are off the ground will further reduce the vegetation clearing environmental impact (Figure 6). However, it is most likely that some vegetation may need to be removed before construction commences. This process will need to take into account protected species. If any individual trees need to be removed, the appropriate permits will need to be obtained before proceeding.

Roads to the campus will need to be cleared to provide access from the main arterial route. However the existing tracks and secondary roads are to be used as far as possible to reduce the impact on the environment. However, these roads will carry increased traffic and will need to be properly constructed, convex-shaped roads with proper stormwater conduits to prevent uncontrolled runoff and soil erosion. Best practice construction methods will ensure these objectives are met. Dust suppression measures must be applied where necessary. These aspects are covered in the EMP.

Figure 4: Proposed site for the campus extension development showing typical bushveld savannah vegetation.



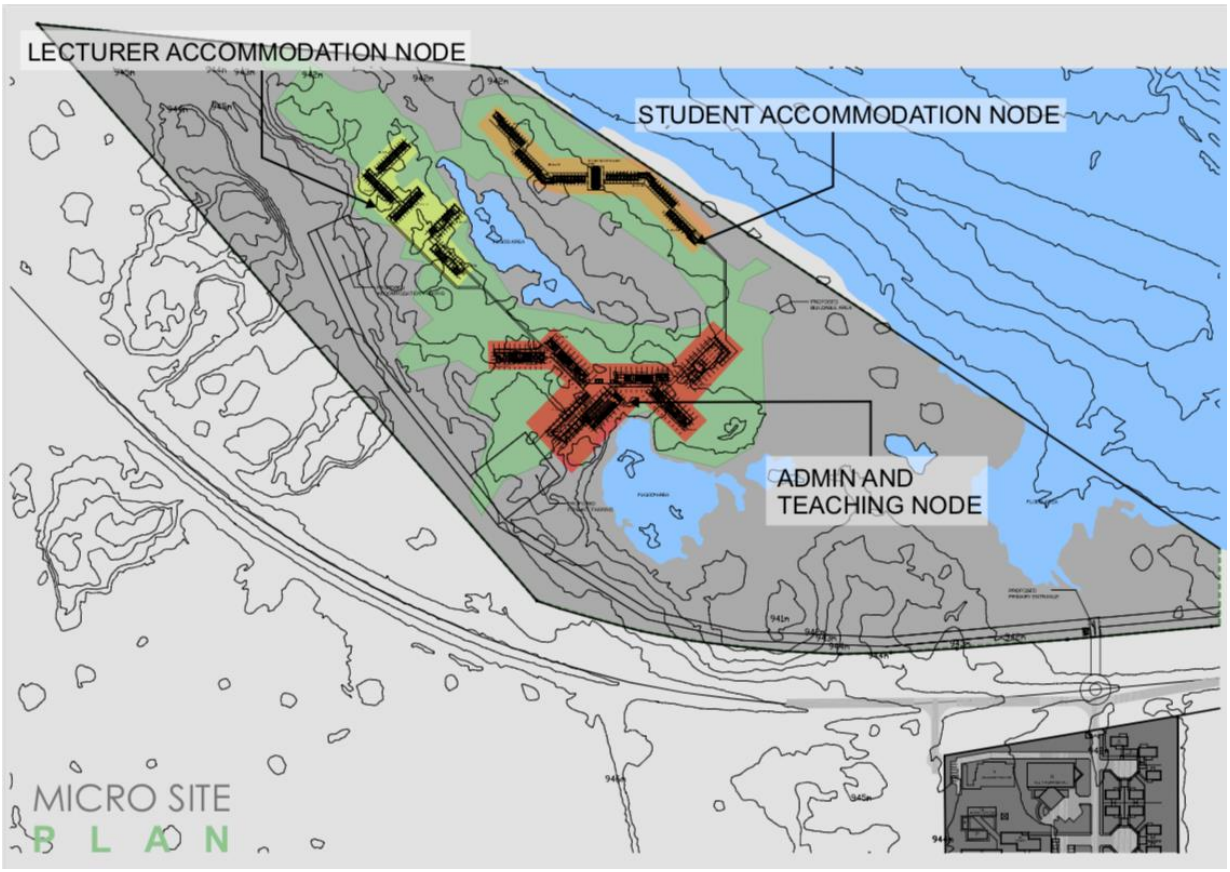


Figure 5: Proposed campus extension plans showing incorporation of the buildings into the natural environment.

Figure 6. Schematic of proposed design showing buildings above ground level.

Taking into consideration the information provided, and the proposed campus designs the environmental impact of the extended campus is unlikely to be significant, providing the proposal and monitoring outlined in the EMP is followed.

4.4. PROJECT SCHEDULE

The proposed project will be undertaken in three phases:

- **Phase 1 - Tendering/Inception Phase:** Project preparation, tendering for project implementation support, and the inception phase for the contracted project team. Set up of the project implementation plan, staffing schedule, and resource plan, as well as the final infrastructure development plan. Phase 1 will last for approximately one year (ongoing).
- **Phase 2 - Concept Development and Phase 1 Construction:** Marketing, networking, research, business/sustainability, and training will be implemented, and the first construction phase (for approx. 50% of envisaged student population) will be planned and implemented. Activities in this phase include, but are not limited to, tendering for a construction company (first construction phase), development/adaptation of curricula, development of staffing schedule/plan and recruitment of lecturers. This phase will last approximately three years.
- **Phase 3 - Piloting and Phase 2 Construction:** This will be the final phase of the project implemented, i.e. the finalised first construction elements will be opened and actively used in training, research, networking, etc. At the same time, the second construction phase will be implemented in order to complete the extension. Given the modular design, this is easily achievable. This phase has an approximate duration of two years.

The anticipated lifetime/long-term planning of the campus will be many years (i.e. beyond 2050) and is ultimately determined by the requirement and need for environmental scientists. This could be indefinite, given the necessity and drive towards protecting the environment.

4.5. CONSTRUCTION

4.5.1. CONSTRUCTION COSTS

The construction costs for the proposed project will be approximately NAD$100 million, which includes all construction material; construction contractor; surveyors; equipment to furnish residential areas, labs and teaching facilities; and general operations.

4.5.2. EMPLOYEES AND EQUIPMENT

The tender bid will give preference to local and/or Namibian contractors to benefit the local economy as much as possible. The employment of local Katima Mulilo contract workers will be encouraged. This ensures that the on-site temporary camp does not have to be too big, thus minimising environmental impact from this source and maximising the social impact. On-site camps are to be equipped with serviced portable toilets/ablution facilities, waste bins, suitable sleeping accommodation, and a kitchen and communal area for dining. No hunting/trapping or cutting down of trees for firewood is to be allowed. These aspects will be outlined in greater detail in the EMP (Appendix 1).

4.5.3. SITE PREPARATION AND CONSTRUCTION ACTIVITIES

Given the design, which has the buildings off the ground, site clearing and preparation will have less environmental impact than for a building with full/solid concrete foundations. The modular design also is conducive to offsite fabrication with less onsite construction time. None-the-less, if trees or flora beneath the buildings need to be removed, permits must be obtained. Holes for the support pillars will need to be sunk and the support beams constructed and cemented. Any holes dug for this purpose are to be covered if left overnight or for an extended period, to prevent fauna from falling in (e.g. tortoises). Existing tracks and paths should be utilised as far as possible

and no random off-road driving is to be permitted. During road construction, dust suppression methods are to be used. These aspects will be outlined in greater detail in the EMP (Appendix 1).

4.5.4. MATERIALS, RESOURCES AND WASTE

The onsite camp will use a generator for electricity or connection to the power grid. The generator is to be placed on a bunded concrete slab that is able to contain any diesel spills during refuelling or oil or diesel leaks from the generator itself. Should an onsite diesel storage tank be required, relevant permissions shall be obtained and the refuelling facility will be properly managed. Refuelling using a truck or trailer must be done in a manner that prevents spillage and impact to the environment. This operation must be overseen and monitored by the environmental officer. Appropriate signage must be in place, and all health and safety best practice adhered to.

The building is designed to be "water wise", capturing water off the roof to be inserted into a grey water system. Effluent and wastewater will be transported off the site via a sewer network to the Municipal sewerage treatment plant. A sewerage treatment facility will not be installed on the site. During construction, these facilities will not be in place. The contractor will required potable water and will either drill a borehole or drive water to site in a truck and store it in a tank for drinking water purposes. The appropriate permits for the drilling of a borehole and lying of pipes must be obtained before drilling commences. Should water need to be abstracted from the Zambezi River for construction activities of the project, an abstraction permit will need to be obtained from the Ministry of Agriculture Water and Forestry.

A materials storage area may need to be constructed onsite. The environmental officer shall demarcate an area that will cause minimal environmental impact and not be prone to flooding. This area is to be fenced, and no excess items are to be randomly stored on the site. That is, bring items to site as and when needed. Any chemicals, hydrocarbons and other toxic substances are to be kept in sealed watertight containers/location. This storage area is to be locked and access controlled. An inventory must be kept.

Glass, plastic, tins, paper and landfill waste are to be stored in appropriate recycle bins in a fenced off area that is kept clean. Recyclables and waste should be collected and disposed of weekly at an appropriate municipal dumpsite in Katima Mulilo. These aspects will be outlined in greater detail in the EMP (Appendix 1).

4.6. OPERATIONS

4.6.1. EMPLOYEES AND EQUIPMENT

It is fortunate that a large number of employees at this facility will be integrated environmental scientists teaching students the importance of protecting the environment. As such, the awareness of environmental impact will be very high and activities will be focussed on teaching and implementing environmental awareness. Academic assignments can, in part, be based on environmental monitoring of the campus. Likewise, the equipment used will be environmentally focused. This is a unique positive situation for this project and a great learning experience for the final 4th year students during the construction phase.

4.6.2. OPERATIONAL ACTIVITIES

The daily running of a centre for environmental education is a relatively "clean" operation, from an environmental point of view. Waste generated is mainly restricted to kitchen waste and that from the students and lecturers. The sewage/wastewater network may require some maintenance and monitoring. This task can be completed by a suitably qualified and trained campus maintenance employee. Rainwater catchment tanks, the solar energy generation system, dust suppression and fire control measures can also be incorporated into employees work schedules. Other environmental monitoring tasks can be undertaken by assignments, conducted by the students under the supervision of lecturers.

4.6.1. MATERIALS, RESOURCES AND WASTE

In the Katima Mulilo area cooling of buildings will be more prevalent than heating, and the building design should consider double roof sheeting and ample airflow are incorporated into the various building nodes to avoid/minimise the use of air-conditioners. The campus design should incorporate natural light as far as possible to reduce energy usage. Solar energy should also be incorporated into the design as far as possible. However, a backup generator will need to be installed in case of emergency. This generator should be on a properly sealed concrete slab designed according to best building practice and capable of catching any spills, leaks and other wastes that could impact the environment including events caused by flooding of the Zambezi River (i.e. higher than the 941m contour). The diesel tank should be installed in a bunded area that can contain the diesel should the tank rupture. Appropriate permits must be obtained for the installation and running of this diesel storage tank. The generator should be installed downwind (i.e. predominant wind direction) from the campus to minimise emission related health impacts, at a distance that will not cause noise pollution. The generator maintenance will be monitored (EMP) to ensure minimum possible emission.

The proposed campus design incorporates rainwater capture. A borehole may be necessary for emergencies. If this is the case a permit to drill a borehole will need to be obtained. If water is to be extracted from the Zambezi River for dust suppression on the access road or any other purpose then an abstraction permit will need to be obtained from the Ministry of Agriculture, Water and Forestry.

General waste (including laboratory waste) will be generated on campus. Dedicated recycling bins (i.e. paper, plastic, tins, glass and landfill waste) should be distributed throughout the campus. Single use plastic bottles and bags should be discouraged and preferably banned from the campus. Recycle bins should be emptied regularly and can be transferred to larger skips that are kept in a dedicated, fenced off area that has best building practice criteria applied to ensure no scavenging by animals or birds, and no leakage and contamination of the environment even in the case of heavy rainfall or flooding. These skips can be transferred to the nearest recycling or municipal landfill facility. Bio-degradable food waste can be macerated and used in worm farms or for compost. A vegetable garden for growing fresh produce for the kitchens is encouraged and processed waste can be used as organic compost.

These operational factors and monitoring procedures are discussed in detail in the EMP.

4.7. DECOMMISSIONING AND REINSTATEMENT

University campuses in various parts of the world have been in existence for centuries. Human population and student numbers are ever increasing globally as well as in Namibia. Integrated Environmental science is a field that has grown exponentially over the last 30 years. The need to protect the environment and our planet and to promote the ecotourism hospitality sector is more important now than ever. Therefore the need for training environmental scientists and managers is growing and is likely to continue to do so. This campus, dedicated to the training of environmental scientists and managers, is likely to be needed for decades, as the need for environmental scientists continues to increase. However, should the campus need to be shut down, for whatever reason, then a plan should be in place for the environmental restoration of the area, at the cost of the proponent. Should the campus need to be closed and UNAM can't sell the facility, then the buildings, water/effluent waste treatment plant and all other structures must be removed and the site restored to a near-original state. Before and after photos can be used for this purpose. A rehabilitation and abandonment report needs to be drafted and submitted to DEA/MET, who will inspect the restoration and issue a certificate relinquishing the environmental monitoring (as listed in the EMP) responsibility from UNAM. Under no circumstances is the site to just be abandoned, as there are legal measures that can be instituted which entail the restoration by the state, but with all the costs being borne by UNAM.

5. RECEIVING ENVIRONMENT AND ASSESSED IMPACT

5.1. SITE LOCATION

Figure 7: Katima Mulilo regional setting (*NB: draft map only, map will be updated in final report*)

The proposed campus is on the western edge of Katima Mulilo (Figure 7) just south of the Zambezi River in the Zambezi Region. National Parks and Reserves are indicated in green. The proposed campus is well located in relation to these parks, which will provide both training opportunities to the students while learning e.g. Field Excursions and Field Attachments, as well as employment once they are suitably qualified.

The site proposed and ceded by the Ministry of Land Reform for the campus extension is shown in Figure 8. Stippled areas indicate the 1-in-50 year flood level of the Zambezi River below 941m asl contour. The proposed campus buildings are not located in this potential flood zone (Figure 9), but are just above these levels posing minor risk.

EIA CONSIDERED ASSESSMENT: Site location evaluation shows potential impact is of low significance.

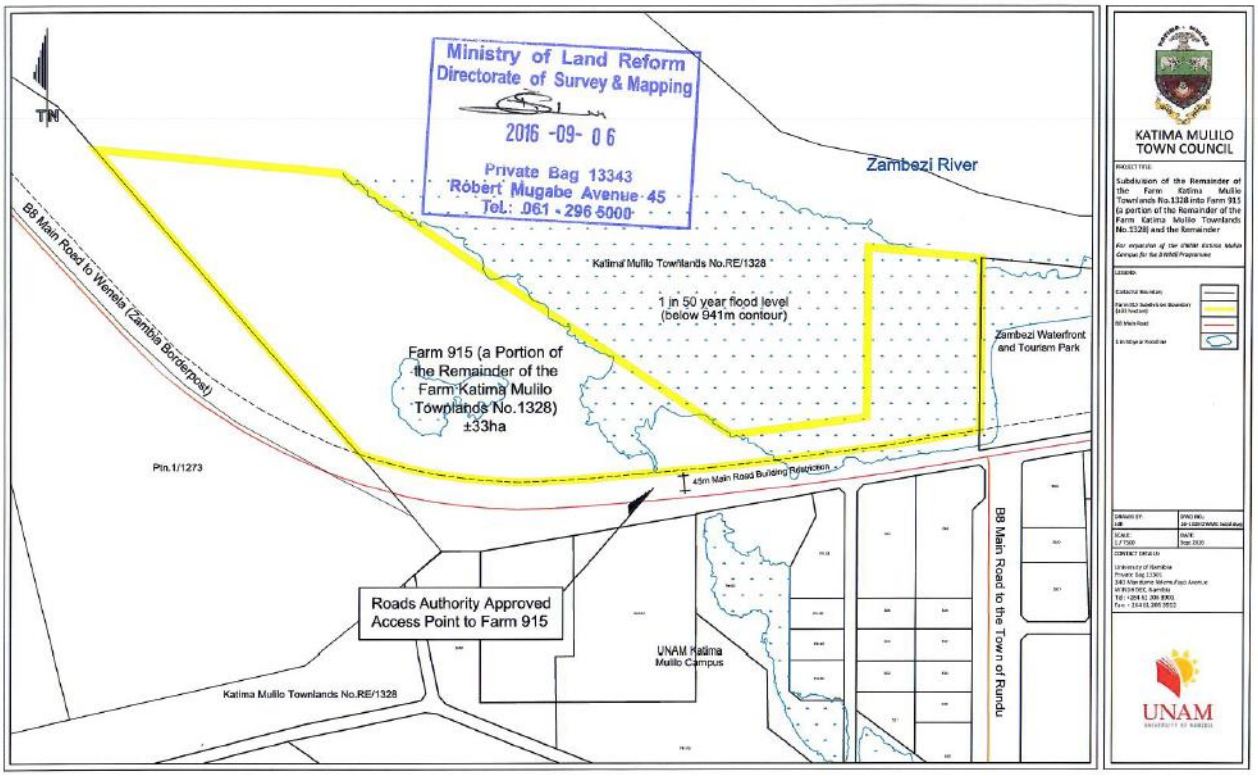


Figure 8: Site proposed for the UNAM campus extension.

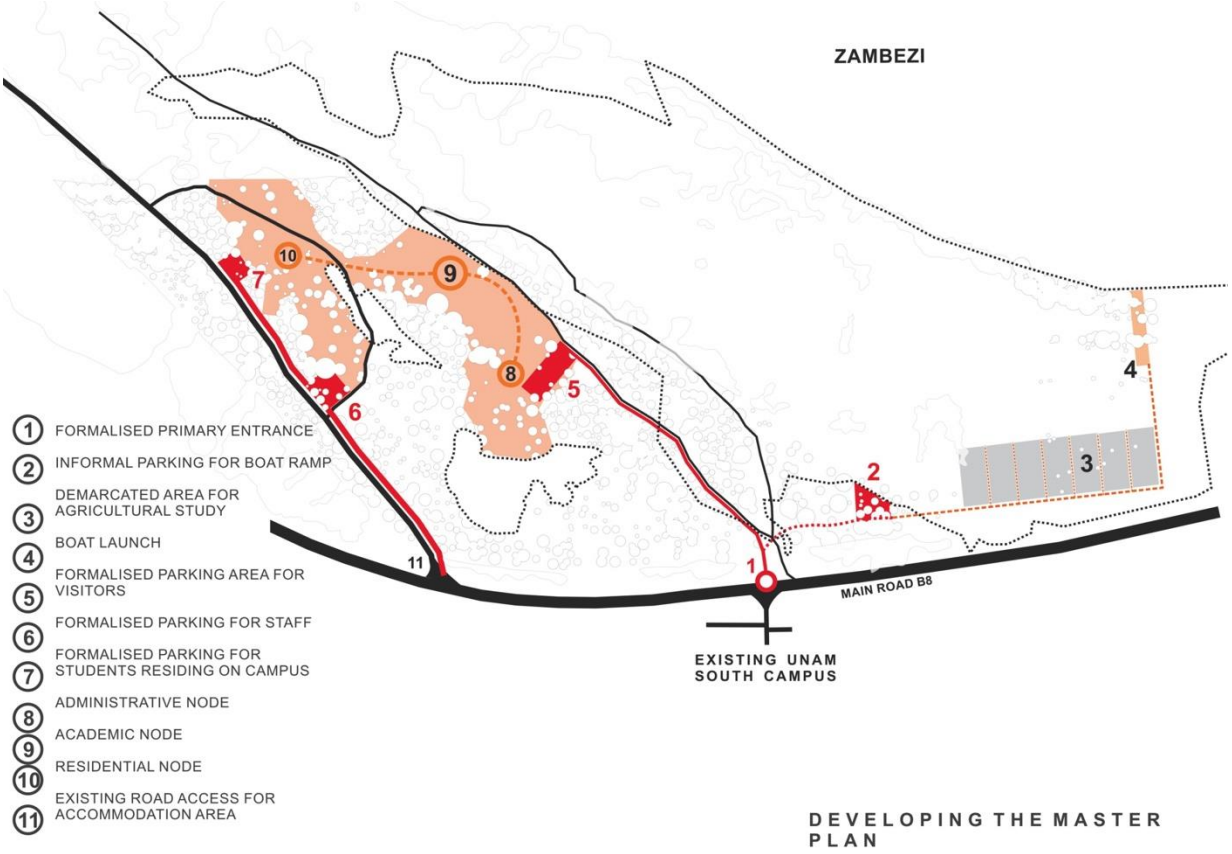


Figure 9: Schematic showing proposed areas for campus construction above 941m asl level contour.

5.2. Zambezi Region and Campus Site Location

5.2.1. National Parks

The location of three (3) national parks (one of which is a trans-frontier conservation area – KAZA TFCA) adjacent to the wider project area indicates a relatively high conservation status. The Eastern Caprivi Wetlands now referred to as the Northern Wetland Route, are classified as an Important Bird Area (IBA) covering the entire area east of the Kwando River.

The environmental importance of the region is evident in the number and density of National Parks, Forest Reserves and Conservancies (Refer: Figure 7). While the extended UNAM campus has the potential to cause an influx of people in/to the area and place some pressure on these areas, it is likely to be in the context of field trips and therefore led by environmental lecturers who can control the level of environmental impact. Students graduating and then working at these areas dedicated to conservation and in return will be a positive impact.

EIA CONSIDERED ASSESSMENT: Overall the impact is considered to be insignificant in the parks and in the long term could provide a positive moderate significance impact.

5.2.2. Geographical information

The proposed UNAM campus extension is located in the tropical Zambezi Region that covers 14,785 km^2, has high temperatures and large volumes of summer rainfall. It is the wettest region of Namibia with the terrain comprising mostly swamps, floodplains, wetlands, woodlands and savannah. The region is home to 450 animal species, including elephants, making the Zambezi Region a popular game-watching spot. The wildlife is protected by several national parks such as the Bwabwata National Park, Mamili National Park, Mudumu National Park including established Conservancies; animals travel freely across the marked border with Botswana, to and from the Chobe National Park and Angola and Zambia National Parks.. The Zambezi Region is also a prime bird-watching area, with almost 70 percent of bird species found in Namibia being recorded here. Over 90,000 people live in the Zambezi Region of Namibia, about four percent of Namibia's population. The population is mostly composed of subsistence farmers who make their living on the banks of the Zambezi, Kwando, Linyati and Chobe Rivers. According to the 2012 Namibia Labour Force Survey, unemployment in the Zambezi Region is 28.0%. In addition the Zambezi Region has 102 schools with a total of 39,808 pupils.

5.2.3. Climate

The project area receives in excess of 600 mm annually, has average maximum temperatures between 32 and 35°C (Mendelsohn, *et al*., 2009) and average minimum temperatures between 2 and 4°C. The area receives summer rainfall (October to April). Rainfall is highly variable and is often received in intense bursts characteristic of convectional rainfall.

5.2.4. Climate Change and Potential Consequences

The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 2007a) dispelled many uncertainties about climate change. Warming of the climate system is now undeniable, and mostly due to man-made emissions of greenhouse gases. Over the past century, atmospheric concentrations of carbon dioxide increased from a pre-industrial value of 278 parts per million to 379 parts per million in 2005, and the average global temperature rose by 0.74° C – the largest and fastest warming trend discerned in the history of the Earth. An increasing rate of warming has taken place, particularly over the past 25 years. The IPCC report's detailed projections for the 21st century show that global warming will continue to accelerate. The best estimates indicate that the Earth could warm by 3° C by 2100 (https://hub.globalccsinstitute.com/publications/risky-climate-southern-african-hydro-assessing-hydrological-risks-and-consequences-zambezi-river-basin-dams/climate-change-africa).

Climate change forecasts for Africa predict that the continent's weather patterns will become more variable, and extreme weather events are expected to be more frequent and severe, with increased risk to health and life

(McMichael, *et al*. 2006). This includes increased risk of drought and flooding in new areas (Few *et al*. 2004). The climate change associated increased risk of extreme rainfall and flooding events could impact the proposed campus extension which is on the banks of the Zambezi River and planned to be constructed just above the 1-in-50 year flood line contour of 941m asl. This impact assessment must therefore consider the environmental impact associated with environmental change and flooding. Factors taken into consideration are:

1) Buildings - a positive factor is that the buildings and walkways are lifted off the ground, which will reduce the likelihood of flooding of the campus buildings;
2) Waste water - the most potential impacts would be the uncontrolled release of wastewater effluent from the network due to flooding and waste potentially flowing into the flood waters and the Zambezi River, contaminating the water and posing health threats (e.g. *ecoli*);
3) Chemicals - the storeroom with paints, detergents, hydrocarbons and chemicals can be flooded and these chemicals can significantly impact the flood waters and the environment;
4) Fuel - A back-up generator is installed and the fuel storage tanks flooded, fuel can also contaminate the environment significantly; and
5) Fires associated with drought, as seen recently in California, are also a significant environmental risk for the proposed campus, as buildings are integrated into the environment. Fuel storage tanks and chemical stores could catch fire causing significant environmental impact.

EIA CONSIDERED ASSESSMENT: These are considered to be the most significant potential negative environmental impacts for the proposed project. Provided the campus design is able to isolate the water/effluent and chemical storeroom from the environment, even if flooding occurs, the impact is assessed to be negative and of low significance. However, if this "isolation" is not achieved then these factors are considered to be negative and of high significance. The EMP will address these factors in detail along with monitoring requirements.

5.2.5. Zambezi River &Basin Soils and Geology

The Zambezi River Basin is the largest in Southern Africa, with a total drainage area of approximately 1.4 million km^2. The Zambezi mainstream, with a total length of 2,574 km, originates in the Kalene Hills in northwest Zambia at an altitude of 1,500m and flows south and eastwards to the Indian Ocean. The river has three distinct stretches: the Upper Zambezi from its source to Victoria Falls, the Middle Zambezi from Victoria Falls to Cahora Bassa Gorge, and the Lower Zambezi from Cahora Bassa to the Zambezi Delta (https://hub.globalccsinstitute.com/publications/risky-climate-southern-african-hydro-assessing-hydrological-risks-and-consequences-zambezi-river-basin-dams/zambezi-river-basin}.

The waters of the Zambezi are critical to the sustainable economic growth and poverty reduction in the region. In addition to meeting the basic needs of some 30 million people and sustaining a rich and diverse natural environment, the river plays a central role in the economies of seven (7) riparian countries – Angola, Botswana, Malawi, Mozambique, Namibia, Zambia, and Zimbabwe. The Zambezi River provides important environmental goods and services to the region and is essential to regional food security and hydropower production(https://hub.globalccsinstitute.com/publications/risky-climate-southern-african-hydro-assessing-hydrological-risks-and-consequences-zambezi-river-basin-dams/zambezi-river-basin).

The UNAM campus extension, with its proposed location on the southern bank of the Zambezi River, could have an environmental impact. The following factors need to be considered:

1) The building of the jetty and support structures must be designed and run in such a way that the flow of the Zambezi River is not impacted; preferred is a floating jetty which has minimal impact to flowing waters.

2) The building of the jetty should be undertaken according to best building practices and in such a way as to prevent/minimise any building materials and related waste from going into the Zambezi River. Construction material and personnel must be housed at the main campus construction site and commute to the jetty site.

3) No permanent rubbish bins are to be located at the jetty. All waste generated at the site must be transported back to the main campus rubbish facility daily;

4) No permanent fuel storage tanks are to be located at the jetty. Refuelling of vessels is to be undertaken in such a manner that no spillage or leakage or accident will result in hydrocarbons contaminating the Zambezi River. Internationally recognised refuelling policies are to be enforced and contingent plans put in place should a spill occur;

5) Potential impacts from contamination of the Zambezi River during flooding have already been addressed and can either be of low significance or high significance depending on whether or not the campus building design can isolate the wastewater effluent network and chemical storeroom from the environment respectively. Given the importance of this consideration, the environmental clearance can be issued by the DEA with this specification as a condition.

EIA CONSIDERED ASSESSMENT: Provided the EMP is adhered to, the potential impact from the jetty construction and operations is negative and of low significance. The EMP will address these factors in detail along with monitoring required.

5.2.6. Ecology of the Region and Site

The vegetation in the study area can be considered as a highly valuable resource for people. 88% of all houses are built from wood, 78% of homes are thatched with grasses or reeds and 96% of all households use firewood for cooking (Mendelsohn & Roberts, 1997). The Zambezi is used for collecting cooking water, washing and fishing, and is critical to those living along its banks. Game and birds are plentiful, but the area is generally used for grazing cattle and subsistence farming. Wetland areas along the Zambezi River banks are important for filtering and cleaning water overflowing from the banks into the river, as well as being a habitat for animals, fish and birds.

The following ecological factors relating to the building of the extended campus have been taken into consideration:

1) While the proposed design is such that vegetation disturbance is minimised (i.e. buildings raised off the ground and campus nodes built in low vegetation density areas) permits must be obtained for the removal of any protected plant/tree species;

2) The risk of fire is a danger to the surrounding ecology and kitchens must be designed according to best building practices;

3) A dedicated fire and/or barbequing area for students must be designed to minimise fire risk. No collection of firewood on the site must be allowed and no fires outside of the designated fire hearth are to be allowed;

4) No trapping or hunting of birds or animals is to be allowed. Fishing for research purposes can be undertaken, provided the necessary permits (i.e. as necessary) have been obtained and are adhered to;

5) Contamination of the environment by hydrocarbons, chemicals etc. has been addressed in previous sections, but is also applicable here;

6) The wastewater/effluent network has also been addressed in other sections, but monitoring of processed water to prevent contamination of the soil, river, groundwater and general ecology is also relevant here;

7) Waste collection, recycling and disposal should be undertaken in such a way as to minimise impact on the ecology. Single use plastic bottles and bags should be actively discouraged (preferably banned) from the proposed campus and design criteria should strive for the abolishment of these items on campus;

EIA CONSIDERED ASSESSMENT: Provided that the EMP is adhered to, the environmental impact is considered to be negative and of low significance. The EMP will discuss these factors in greater detail and monitoring parameters will be described to ensure environmental impact is limited.

5.2.7. Bird Diversity

The Zambezi Region as a whole and its wetlands, in particular holds one of the richest diversities of bird species in Namibia. A total of 417 bird species have been recorded in the study area, representing 62% of the total number of species found in the country (Mendelsohn, J. & Roberts, C., 1997).

According to Simmons et al. (1998), the most important features of the East Caprivi Wetlands now referred to as the Northern Zambezi Wetlands, are the swampy areas and floodplains, which are important breeding habitat for a large variety of wetland birds. The wider project area is also rich in raptor species, while various other open-country species also occur.

Of the 417 bird species recorded in the study area, 28 (7%) are threatened in Namibia (Mendelsohn, J. & Roberts, C., 1997); in addition, 17 (4%) are Globally Threatened (BirdLife International 2013; Scott & Scott, 2011), including one species not yet on the Namibian Red List.

Seven percent i.e. 30 of all the bird species found in the study area are endemic or near endemic, which means that these species are restricted in their distribution throughout southern Africa. Twenty-nine percent i.e. 122 of the 417 bird species recorded are migrants for at least some period of their life and 31% i.e. 131 are nomadic at some period during their life (Scott & Scott, 2011).

Given the rich bird diversity described above for the general locality of this proposed campus extension and its locality along the southern bank of the Zambezi River, the following impacts on bird diversity have been considered:

1) Construction activities and associated noise and dust will disturb the local bird life. The modular design of the proposed campus will cause less significant impact than full/solid concrete buildings with foundations. Nevertheless, some impact will occur and the site environmental officer will need to minimise this impact, as well as record and monitor the disruption to the local bird life. It is expected that birds in the near vicinity will move away during the construction periods, but they will most likely return once the building has ceased;
2) Waste and recycling storage areas must be designed in such a way that birds cannot scavenge on the rubbish;
3) Exterior night lighting on buildings and walkways should be directed downwards and should only come on when people enter the area (i.e. motion sensors) to minimise the impact on birds in the area and reduce the potential of collision and death of birds that may become disoriented by night lights.
4) Course syllabi should encourage the identification and recording of bird species and numbers. This to make environmental students aware of the local bird species and encourage appreciation of how humans impact birds.

EIA CONSIDERED ASSESSMENT: The environmental impact on bird diversity and numbers is considered to be negative and of low significance. Factors and monitoring of birds will be covered in greater detail in the EMP.

5.3. Socio-economic - Local Social Environment

Katima Mulilo is situated in the Eastern Caprivi strip and is the capital of the Zambezi Region, Namibia's far northeast extension into central Southern Africa. Katima Mulilo, which is sometimes shortened to just "Katima", had 28,362 inhabitants in 2010, It is located on the national B8 road on the banks of the Zambezi River, in lush riverine vegetation which support tropical birds and monkeys. Table 7 shows that the town receives an annual total rainfall of 682 mm.

Table 7: Climate data for Katima Mulilo (Ministry of Works and Transport Tabulation of Climate Statistics for selected stations in Namibia 2012)

Climate data for Katima Mulilo, Namibia [hide]													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average high °C (°F)	31.3 (88.3)	30.5 (86.9)	29.8 (85.6)	29.1 (84.4)	27.4 (81.3)	24.5 (76.1)	25.0 (77)	29.1 (84.4)	33.8 (92.8)	33.0 (91.4)	30.3 (86.5)	29.8 (85.6)	29.5 (85.1)
Average low °C (°F)	19.1 (66.4)	19.1 (66.4)	18.7 (65.7)	14.6 (58.3)	10.2 (50.4)	6.1 (43)	4.6 (40.3)	8.3 (46.9)	14.1 (57.4)	17.8 (64)	19.3 (66.7)	18.8 (65.8)	14.2 (57.6)
Average precipitation mm (inches)	169.4 (6.669)	160.6 (6.323)	88.7 (3.492)	17.7 (0.697)	1.9 (0.075)	0.5 (0.02)	0 (0)	0.2 (0.008)	2.6 (0.102)	18.8 (0.74)	69.7 (2.744)	151.8 (5.976)	681.9 (26.846)
Average relative humidity (%)	68	66	70	61	53	53	62	50	42	46	49	57	56.4
Source: Ministry of Works and Transport (Meteorological Service Division)													

Katima Mulilo has an airport, run by Namibia Airports Company (NAC), which links it to Windhoek. There are three (3) shopping malls with many of the national retail chains located in the town, as well as an open market. All of Namibia's major commercial banks have branches in town. These include Standard Bank, Bank Windhoek, NedBank, First National Bank. There is also a Post Office. Medical and health facilities in Katima Mulilo are within a 10-minute drive of the proposed campus site. The town is home to the regional State Hospital, as well as state and private clinics. Based on the projected number of students on campus, it is recommended that a clinic be established on campus to deal with basic health issues. The clinic nursing sister can also be charged with assessing and monitoring the cleanliness of the kitchen, ablution and other communal areas of the campus (i.e. any aspects that can lead to illness) in conjunction with the appointed environmental officer and maintenance crew.

The town has all the facilities necessary to support the proposed campus extension. Given that the campus is designed to be relatively self-sufficient (i.e. meals and accommodation) and will attract many local people, it is considered that no significant socio-economic impact will result from the influx of new students and staff.

The Zambezi Waterfront is being developed to encourage tourism to the region, but the development of the UNAM campus extension is unlikely to impact on this development. In fact, it may benefit from the increased number of students and staff in the area.

EIA CONSIDERED ASSESSMENT: From a socio-economic point of view, the proposed campus extension will not negatively affect the current socio-economic status of the town because many students will be sourced from the area and because the campus is mostly self-sufficient (i.e. meals, accommodation and proposed clinic for minor medical ailments). The socio-economic impact on the town facilities and services will be of low significance. The impact of having a new educational facility in the region for the local students to attend is considered to be positive.

5.3.1. AFFECTED COMMUNITY

There is a member of the local community that resides on the property of the proposed project. On the 24th January 2018 the High Court of Namibia issued an eviction notice to the persons residing illegally on Farm 915 (a portion of Farm Katima Mullio Townlands No 1328). UNAM recognises the sensitivity and complexities of the matter relating to the eviction the illegal persons from the project site. Due to the fact that the High Court Order was effective as of 24th January 2018, prior to the EIA process commencing, and that UNAM has engaged extensively over a longer period of time with the individuals on the site, it was determined that UNAM is best positioned to continue liaising with the individual. The settler, through the public participation process, had an opportunity to register as an I&AP for the project however never registered. A suitable alternative arrangement is being investigated with UNAM and the individual.

EIA CONSIDERED ASSESSMENT: Social impact, prior to construction, due to the eviction of the individual is considered to be of direct significance to the individual, with a low to moderate impact.

5.3.2. Air Quality and Noise Levels

During construction and operation, air quality will be affected mainly by dust from the access road. Watering of the road to suppress and control dust must be undertaken. Should water for this purpose need to be abstracted from the Zambezi River then an abstraction permit will need to be obtained from the Ministry of Agriculture, Water and Forestry. Given the relatively isolated location of the building site and the raised modular building design, noise generated during construction should not be a significant impact. During operation noise impact should be low.

If an emergency/back-up generator is installed, it should be positioned downwind and housed at a distance and in such a manner so as to minimise noise disturbance to the campus. Best building practices should be maintained. The generator must be of a type/standard that is quiet and must be serviced and maintained according to the manufacturer's schedule.

EIA CONSIDERED ASSESSMENT: Environmental impact, during construction and operation, due to air quality and noise is considered to be of low significance

5.3.3. Surface Water and Flood Risk

Given recent international flooding events related to global warming and associated climatic change, it is possible that the campus could experience severe weather and flooding of the Zambezi River. Flooding is becoming more common as was seen with the recent flooding of the Tsondap River which has not flowed in decades (Refer inset). The site is located in a summer convection storm area where heavy downpours are common. With the building design of raised campus nodes and walkways the risk of flooding is reduced. Naturally contoured culverts that prevent the water from pooling beneath the buildings and lead it northwards into the Zambezi should be incorporated into the project design. As the campus is built only marginally above the 941m asl 1-in-50 year flood line level a risk of flooding still exists. This poses environmental as well as health and safety risks. Runoff modelling software is available to simulate extreme runoff events and water flow patterns to facilitate culvert design directions and sizes.

Most importantly flooding associated with extreme rainfall and/or the Zambezi River must not be able to cause failure or overflow of the waste water/effluent network, chemical storeroom or any fuel tanks. These items must be designed in such a manner that they are not impacted by heavy rainfall or flooding. In addition, waste storage areas must also be designed to withstand extreme weather conditions and/or flooding. That is, flooding must not result in waste storage areas being washed out and the rubbish being deposited into the Zambezi River or surrounding environment.

Access roads must be constructed according to best practice engineering design to be able to deal with heavy rainfall and flooding.

EIA CONSIDERED ASSESSMENT: Provided these factors are incorporated into the design, the potential impact from flooding is considered to be of low significance.

5.1. Project Site Environment and Cultural Heritage

The proposed site itself comprises grasslands and bushveld savannah (Figure 10). The area has been sporadically used for grazing in the past. Small game, reptiles, and birds are plentiful. Some areas are wooded (mainly acacia trees) and wetlands exist along the flanks of the Zambezi River. The proposed construction site location is mindful of the densely wooded areas and is thus positioned mainly in the grassy zones (Refer: Figures 5 and 9). The jetty will need to cross the wetland bank area causing some negative environmental impact. This impact is considered to be of moderate significance, but is very localised, thus reducing the overall significance to low. **Existing paths and tracks are present** and the campus access road construction should utilise these as far as possible to minimise the impacts of building new roads.

There are no cultural heritage or burial sites known to be present in the proposed location, but if any are unearthed during construction then the appropriate measures will be taken by the site environmental officer as described in the EMP.

EIA CONSIDERED ASSESSMENT: Any building construction project has some environmental impact on the project site. However, given the campus's raised design and layout in grassland areas, the impact is considered to be of low significance. Impact on cultural heritage sites is considered highly unlikely and of low significance.

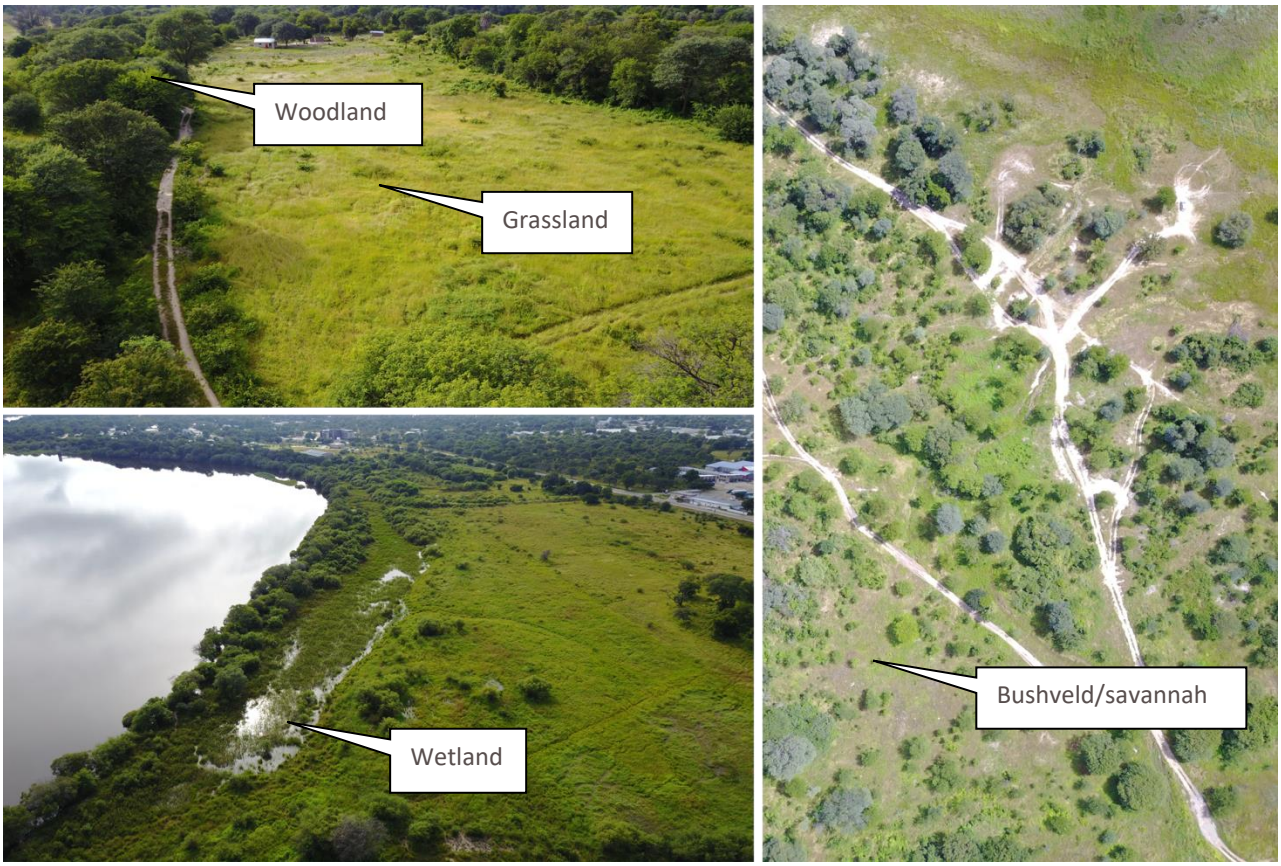


Figure 10: Aerial view of the proposed campus site and surrounds, showing vegetation, wetlands, current paths and roads.

6. CONSULTATION

6.1. CONSULTATION UNDERTAKEN

Public participation and consultation is a requirement stipulated in Section 21 of the Environmental Management Act, 2007 and associated regulations for a project that requires an Environmental Clearance Certificate. Consultation is a compulsory and critical component in the EIA process in achieving transparent decision-making and can provide many benefits.

A key aim of the consultation process is to inform stakeholders and interested and affected parties (I&AP) about the proposed project. The consultation methods undertaken for the proposed project, which are in line with the requirements of the EIA Regulations, are detailed as below.

6.2. STAKEHOLDERS

6.2.1. NEWSPAPER ADVERTISEMENTS

Notices regarding the project and associated activities were circulated in two newspapers; namely the 'Namibian' and the 'Informante'. All I&APs had the period from the 13th to the 28th September 2018 in which to engage and respond. The purpose of this was to commence the consultation process and enable I&APs to register an interest with the project.

6.2.2. BACKGROUND INFORMATION DOCUMENT

The Background Information Document (BID) presents a high-level description of the proposed project, explains the EIA process, specifies when and how consultation is undertaken and provides contact details for further enquiries. It is made available to all registered I&APs. The BID can be found in Appendix J.

6.2.3. SITE NOTICES

A site notice ensures neighbouring properties and stakeholders are made aware of the proposed project. The notice was placed at the boundary of the area and a copy of what was contained in the notice is shown in Appendix K.

6.2.4. CONSULTATION FEEDBACK

No issues or concerns were raised by I&APs during the consultation period. This is most likely because the campus is perceived by the local population to be positive for the region. Predominantly, it will offer students living in the north an alternative to having to travel to Windhoek to study environmental sciences. With so many game parks and reserves in the immediate area, including those in Botswana, Zimbabwe, and Zambia, it will also provide employment opportunities to graduate students.

7. SCOPING IMPACT ASSESSMENT FINDINGS

7.1. ASSESSMENT OF ALTERNATIVES

7.1.1. NO-DEVELOPMENT SCENARIO

International and regional trends indicate that environmental sciences, the need to protect the planet's natural resources and the requirement for personnel to do so, will all increase in the future. The commensurate need for educating future generations and equipping them to fulfil this role will grow. Therefore, the requirement for a UNAM campus facilitating this role is evident and easily justifiable. However, whether it needs to be at this site in the Katima Mulilo area must be considered. The "no-go" option rests mainly on the level of environmental impact versus the benefit of developing the campus extension. In this instance, the potential environmental impacts are considered of low significance in comparison to the potential benefits created from educating more people. Students could go to study in Windhoek, or at the proposed new infrastructure for the DWME at the existing UNAM Northern Campus. These different options are evaluated further below.

7.1.2. ALTERNATIVE SITES

Any alternative options must consider population, financial and other socio-economic aspects, as well as environmental conditions and resource availability. Although the Windhoek campus offers courses in the environmental sciences, it is far for the students from the north to travel, accommodation is expensive and limited. There are also numerous negative environmental and socio-economic aspects associated with this option including pollution associated with travel, overcrowding in the already overpopulated suburban township areas, increased strain on Windhoek's infrastructure and water supplies, social diseases related to overpopulation, and financial restraints that will preclude many potential students from even being able to consider studying further.

Building the campus as an extension of the adjacent Katima Mulilo UNAM Campus was also considered as an alternative. However due to dust and noise from a brick factory in proximity to where the expansion could take place, including that the area is prone to flooding, this alternative was rejected.

7.1.3. ALTERNATIVE DESIGNS

Campus designs that can withstand heavy rainfall and potential flooding are essential given the flat, flood plain locality of the proposed site, which is only marginally above the 1-in-50 year flood level of 941m above sea level (2009, WCE Katima Mulilo Flood Report). This is particularly important in light of global warming and the escalating frequency of extreme weather conditions globally. Current designs place campus buildings above ground level which will preclude problems associated with damp, as well as moderate the risks associated with flooding (Figure 11). Design specification must include a dedicated watertight storeroom for chemicals, fuels, oils, detergents, paints and any other substance that can significantly harm the environment should flooding occur and cause spillage of these chemicals into the flood waters. Environmental stipulations addressing this issue and monitoring procedures are presented in the EMP for this project (Appendix A). The sewage and wastewater network for the campus must also be specifically designed to be able to withstand flooding and not contaminate the flood waters and Zambezi River. This stipulation is also addressed in the EMP. These measures must to be taken into account and costed into the project by the design engineers before construction can commence. Fuel tanks and storage areas must be designed so as to withstand excessive downpours, runoff and flooding. Provided these high potential environmental risk factors can be satisfactorily addressed within the design specifications, the likelihood of significant environmental impact from excessive rainfall and flooding is low.

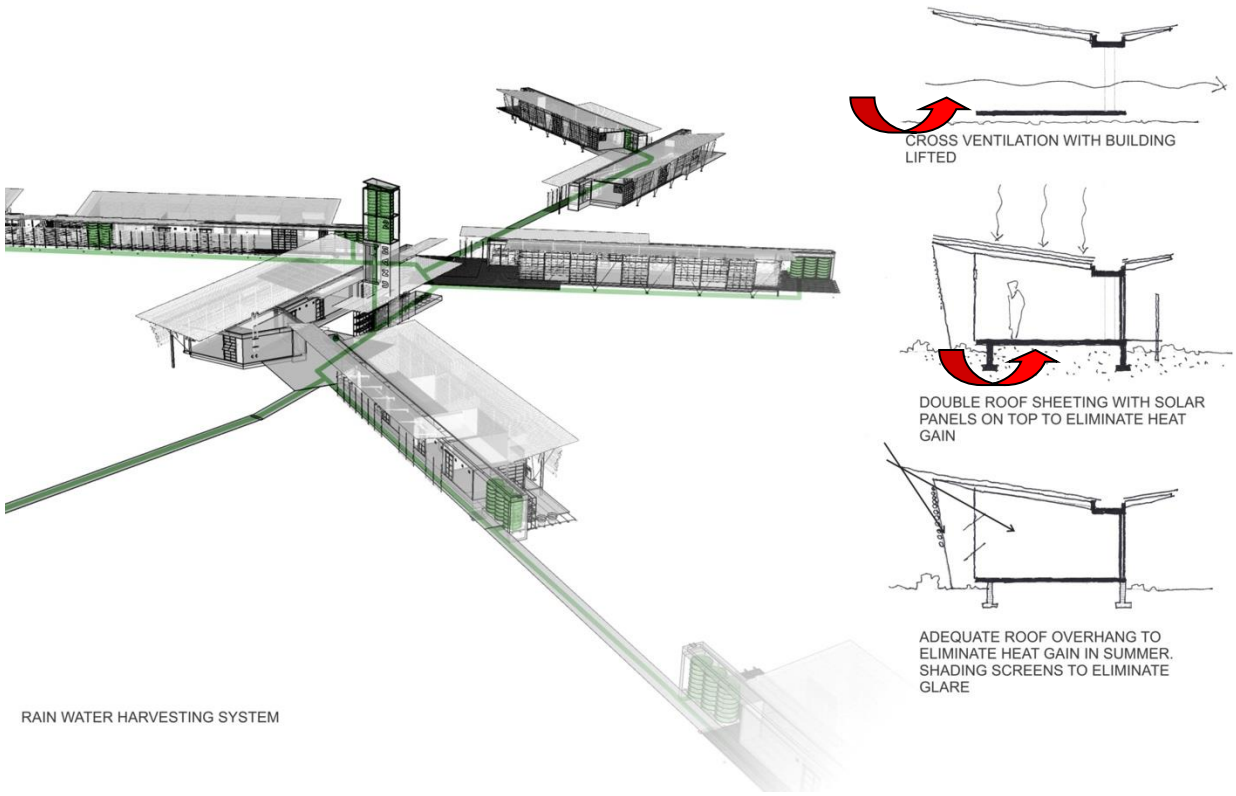


Figure 11a. Proposed campus building design lifted above ground level (Refer red arrows).

Figure 11b: Proposed campus building design lifted above ground level (Refer red arrows).

7.2. Scoping Assessment Findings

The scoping exercise considered best practice measures and the design of the proposed project, and subsequently identified where impacts may potentially occur and where further mitigation or investigation may be required.

Using the methodology summarised in Appendix I and the findings of the scoping exercise are presented in Table 8.

Decommissioning is likely to be in the distant future (unless the campus is not viable and must close down) and would necessitate the removal of all structures and restoration of the environment. Given the design structure, this should be more environmentally friendly than if the campus was built using concrete foundations. Alternately, the facility could be sold to the Katima Mulilo Town Council for another suitable use, or to a third party (e.g. a tourist lodge). Hand-over or sale options would need to obtain the necessary statutory approvals.

7.3. KEY ELEMENT - HYDROLOGICAL CONSIDERATIONS

The scoping assessment for this project shows that the most critical potential environmental impact is associated with flooding. All types of land use change will impact on the natural hydrological cycle in one way or another, and flooding is not confined to flood plains, as heavy rain falling on waterlogged ground can cause localised flooding almost anywhere. In all zones, development should not increase the risk of flooding elsewhere. Runoff from developments in these areas can, if not properly controlled, result in flooding at other locations and significantly alter the frequency and extent of floods further down the catchment. The aim should be for development not to create additional run-off when compared with the undeveloped situation, and for redevelopment to reduce run-off where possible. It is accepted that there may be practical difficulties in achieving this aim.

Appropriate mitigation measures can be incorporated within the design of the campus to ensure minimal risk to life, damage to property and disruption to people living and working on the site or elsewhere along the floodplain. The effect of flooding on water or sewerage infrastructure could have major effects on public health and the environment by resulting in the contamination of potable water, or the mixing of sewerage with flood water. Floodwater could enter the river and the combination of sewerage and floodwater would affect properties and the environment. Where such sites are inundated there is an attendant risk that certain contaminants may be mobilised and could pose a threat to surface waters or leach into ground waters. In addition, where the development involves, for example, the storage/use of oils, fuels or chemicals or the storage or handling of waste materials, there is a risk of contamination to the water should the site be inundated.

Built developments, such as roads, pavements and roofing tend to increase the surface area of impermeable ground, thus reducing percolation and increasing rapid surface run-off. This has the effect of reducing the time it takes for precipitation to enter the watercourse and consequently increases the peak discharge. The design of Sustainable Urban Drainage Systems (SuDs) play an important role in managing run-off from a site and should be implemented, wherever they will be effective in all new development proposals, irrespective of the zone in which they are located.

The site is located in a summer convection storm area where heavy downpours are common. As the building design raises the campus nodes and walkways off the ground, the risk of flooding is reduced. Naturally contoured culverts that prevent the water from pooling beneath the buildings and lead it northwards into the Zambezi should be incorporated into the project design. The campus is built only marginally above the 941m asl 1-in-50 year flood line level, so there is a risk of flooding. This poses environmental as well as health and safety risks. Runoff modeling software is available to simulate extreme runoff events and water flow patterns to facilitate the design of culvert directions and sizes (SuDs).

Most importantly, flooding associated with extreme rainfall and/or the Zambezi River must not be able to cause failure or overflow of the wastewater/effluent network, chemical storeroom or any fuel tanks. The storage facilities for these items must be designed in such a manner so that they are not impacted by heavy rainfall or flooding. Furthermore, waste storage areas must also be designed to withstand extreme weather conditions and/or flooding. That is, flooding must not result in waste storage areas being washed out and the rubbish being deposited into the Zambezi River or the surrounding environment.

Access roads must be constructed according to best practice engineering design to be able to deal with heavy rainfall and flooding. The design proposes that runoff from campus roofs is collected and used on campus which will reduce runoff associated with the building up to the point where they are full. Overflow pipes must be incorporated into the design of these storage containers that leads the water away in such a manner so as not to cause flooding or soil erosion.

Provided these mitigation measures can be compiled into the project design, the risk of significant environmental impact from flooding and excessive rainwater runoff is considered to be low.

Table 8 – Scoping Assessment Findings

TOPICS	SOURCE (ACTIVITY)	PATHWAY	RECEPTOR	EFFECT	FURTHER ASSESSMENT JUSTIFICATION
SURFACE AND GROUNDWATER	– Vegetation clearance and ground preparations for construction and access road plus operations, leading to increased runoff. – Use of wastewater /effluent network, chemical/fuel store and loss of containment, due to flooding. – Loss of containment in waste disposal and recycling area due to excessive rain and/or flooding.	– Direct changes to the topography, land use and drainage patterns from preparation of the construction site area and access roads. – Pollution entering the environment from wastewater /effluent treatment plant and equipment. – Spills and leaks from back-up generator and associated fuel tanks.	– Local drainage of the site, soil erosion, groundwater, wetlands, Zambezi River and local environment.	– Potential for changes to natural drainage leading to increased surface run off during rainfall events and subsequently localised flooding. – Loss of hydrocarbons could contaminate water/groundwater – Effluent and untreated waste water can contaminate the environment, wetlands and Zambezi River.	– If the engineering design of the wastewater/ effluent network can be such that there is no risk of contamination even during extreme rainfall and flooding then the risk of this effect occurring or impacting the environment is considered to be low. – Chemical/fuel storeroom and fuel storage tanks can be designed and installed using best building practices, after having obtained the statutory permits applicable (e.g. fuel storage) – Mitigation measures implemented through engineering design and the EMP to avoid loss of containment. – General waste and recycling storage areas must be built to be able to withstand heavy rainfall and flooding and not overflow into the environment – **If the final design and specifications of the effluent /wastewater network, chemical storeroom and fuel storage facilities are able to withstand extreme rainfall and flooding events then the impact is considered to be negative and of low significance.**
SOILS AND GEOLOGY	– Use of wastewater /effluent network, chemical/ fuel store and loss of containment, due to flooding or excessive rainfall – Minor earthworks (pits) for building support pillars – Drilling (e.g. borehole) – Vehicle movement on access roads – Culvert construction to	– Loss of containment from wastewater /effluent network, chemical/ fuel store and backup generator can lead to soils being contaminated – Surface run off from excessive rainfall events can cause	– Ground and soil contamination – Reduction of soil quality – Loss of topsoil	– Chemical & wastewater /effluent loss of containment may contribute to soil quality reduction. – Changes to the site and access road drainage may result in surface run off leading to soil quality reduction. – Heavy rainfall & flooding may lead to soil erosion.	– Mitigation measures implemented through engineering design and best building practice to allow these facilities to be able to withstand heavy rainfall and flooding together with the EMP to avoid loss of containment shall be applied. – **If the final design and specifications of the effluent /wastewater network, chemical storeroom and fuel storage facilities is able to withstand extreme rainfall and flooding events then the impact is considered to be negative and of low significance. A detailed assessment is not required, however, if design**

TOPICS	SOURCE (ACTIVITY)	PATHWAY	RECEPTOR	EFFECT	FURTHER ASSESSMENT JUSTIFICATION
	direct flood/storm water flow.	soil erosion.			**mitigation measures cannot ensure containment during heavy rainfall and/or flooding then further specialist environment studies on the environmental effects may be necessary.**
LANDSCAPE	– Change of land use from bush to educational facility	– Disruption of view. Buildings cannot be seen from the road so this should not be a problem	– Not applicable	– Changes of land use	– Views will not be affected – People using the access road are from the campus and thus not considered as sensitive. **Due to the lack of sensitive receptors, no further investigation is required.**
SOCIO-ECONOMICS	– Change of land use – Creation of educational opportunities – Potential creation of qualified workforce for surrounding lodges, game parks and reserves. – Increase in population numbers (students) which the facilities and infrastructure of Katima Mulilo will need to absorb – Eviction of settler	– Direct and indirect impact on the functioning of the region and its infrastructure	– Local community – Local and national economy – Population, urban planning and local facilities	– Beneficial effect on the local and regional economy by educating local students – New jobs and indirectly local spending. – Future workforce for local parks and reserves. – Campus self-sufficient as far as accommodation, meals and basic health care so minimal impact on Katima Mulilo infrastructure. – Relocation.	– **Court order granted for the eviction of the person residing on the plot, being treated respectfully with UNAM** – **No further assessment required, as there is a low probability of significant adverse impacts to the economy and society occurring.** – **Positive impacts include education and equipping Namibians for future employment (Vision 2030 and NDP5).**
NOISE	– Vegetation clearance, construction and access road ground preparation operations – Vehicle movements on the site and along access road – Back-up generator noise (when needed).	– Noise carrying to receptors within 200m	– People /communities are further than 500m away – Ecological receptors such as birds and game	– Birdlife is likely to be disturbed during construction phases. – It is likely that birdlife will return during operation as this educational facility will no produce excessive noise.	– Nearest human receptor is the UNAM campus to the south approximately 0.5km away. UNAM, being the proponent, will be aware of and accommodating of any noise disruption. – The Katima Mulilo community is >2km away, where perceptible noise would be minimal – Sensitive animals, birds and insects can move away from the area. This will not be a long-term biologically detrimental effect. – Short duration, isolated and small change to the baseline levels are anticipated. Birdlife and game are

TOPICS	SOURCE (ACTIVITY)	PATHWAY	RECEPTOR	EFFECT	FURTHER ASSESSMENT JUSTIFICATION
					likely to be affected during construction but are likely to return during operation. – **No further assessment required, as there is a low probability of noise emission significantly impacting sensitive receptors.**
ECOLOGY	– Vegetation clearance and ground preparations operations for campus construction and building the access road. – Use of wastewater /effluent network, chemical/fuel store and loss of containment impacting the ecology. – Fire caused by students, kitchen or fires in a location other than the approved area	– Spills can seep into the groundwater, contaminate the soil, or if associated with heavy rain runoff or flooding they can contaminate the river bank, wetlands the Zambezi River and then downstream areas. – Fires can destroy the trees and bush and cause chemical stores to burn and spill toxic fluids and gasses into the local environment	– No known protected species of flora and fauna – Bird biodiversity for this region is known to be high. – Zambezi River and downstream users	– Flora will be killed during ground preparation for building construction and for the access road. – Effluent, untreated waste water can contaminate environment, wetlands and Zambezi River. – Fires can kill fauna and flora and pose a danger to human life.	– Sensitive animals, birds and insects etc. can move away from the area during construction. – Habitat is not considered as pristine, but is in a healthy state. Unlikely for any loss of biodiversity or permanent displacement of animals. – Minimal impacts on habitat connectivity. – If protected species are identified during construction measures for conservation or removal shall be recorded and Permits applied for at MAWF. – Irrigation type sprinklers that are directed from the building to soak the bush and grass around and beneath the campus buildings should be incorporated into the design plans. Roof material must be able to withstand burning ashes. Water pressure and tank/borehole volumes must be able to support the pressure required to meet these fire control measures. Furthermore, a fire truck must be kept on site and some staff adequately trained in fire-fighting. Normal health and safety standards with respect to fire extinguishers are also mandatory for the campus. – **No further assessment required as there is a low probability of significant impacts to the ecological receptors occurring.**
AIR QUALITY AND DUST	– Vegetation clearance and ground preparation operations – Construction of access road – Vehicle movements on	– Dust limit to travel <100m – Exhaust fumes	– Students /staff – Flora & Fauna	– Dust suppression by means of watering tankers wetting the road to control the dust. Should water be abstracted from the Zambezi River the	– During construction, the nearest human receptor is the existing UNAM campus, approximately 0.5km (as the crow flies) south of proposed site. – Nearest community is Katima Mulilo which is 2km to the east and too far to be affected by dust.

TOPICS	SOURCE (ACTIVITY)	PATHWAY	RECEPTOR	EFFECT	FURTHER ASSESSMENT JUSTIFICATION
	gravel roads – Emissions from the backup generator			applicable abstraction permit will need to be applied for. – Fumes from the generator can effect human health	– No known rare, threatened or endangered species, low biodiversity. Mammals and birds can move from the area during construction. – Any dust will be localised and not affect potential receptors. – Backup generator to be placed downwind from the campus and best building practice codes followed. – **No further assessment required, as there is a low probability of aerial emission significantly impacting sensitive receptors.**
CULTURAL HERITAGE AND PALAEONTOLOGY RESOURCES	– Ground preparation activities	– NA	– No known artifacts or heritage remains.	– None identified	– Chance find procedures contained in the EMP. – **No further assessment required, as there is a low probability of significant impacting on sensitive heritage receptors.**
CUMULATIVE EFFECTS	Owing to the nature and scale of the proposed project and the absence of sensitive receptors, the predicted effects arising from the anticipated activities would most likely be localised and would not fundamentally alter the surrounding environment, and thus be considered as being of low significance. Due to the proposed design, location and general nature of the proposed project and its isolated locality in relation to other communities and/or infrastructure, the impact of cumulative effects on the environment is considered to be of low significance.				

7.4. Potential Further Investigation

7.4.1. Effects on Socio-economic Receptors

The up skilling of wildlife officers and administrators in the SADC region will lead to more effective and efficient management of smaller and larger wildlife protection areas such as national parks, trans-frontier conservation areas, game reserves, and conservancies in the SADC region, which will have positive impact on wildlife management in general, over the long-term. The extension of the UNAM campus will be relatively self-sufficient in respect of meals and accommodation. If it has its own clinic, minor medical ailments can be addressed on campus placing no additional load on Katima Mulilo's health services. Many of the students will be from the area and therefore numbers in the region are unlikely to increase to the point where infrastructure and services are overloaded. Schooling for children of staff and lecturers may place some strain on existing local schools. The campus implementation plan proposes two phases of construction/expansion as student numbers grow. This will provide opportunity to assess the effects on the local socio-economic receptors based on half capacity. Should it be noted that any particular sector is being stretched with respect to resources, this two-phase plan allows time for issues to be addressed prior to the implementation of phase two of the construction (Refer: Section 4.4)

7.4.2. Effects on Ecological receptors

The biggest potential environmental threat for the proposed campus extension project is the use of a wastewater/effluent network, the chemical storeroom and fuel tanks and the loss of containment due to extreme weather and/or flooding. Should these waste and chemical products be spilled into the environment it would constitute a significant ecological impact. Final engineering designs and specifications for this effluent/wastewater network are not yet available. Design criteria must ensure that this network is able to withstand extreme weather conditions and flooding without spilling contaminated water into the environment. Treated water quality will be monitored by the campus environmental officer. If this potential environmental impact can be mitigated through engineering design, then the proposed project as a whole can be considered to have very localised and low significance environmental impact.

7.4.3. Flood Risk

The 1-in-50 year flood contour level of 941m is only slightly below the proposed level at which building will take place. This does pose a risk of flooding as evaluated in this scoping report. Mitigation measures have been discussed and include construction of buildings and walkways above ground level allowing water to pass through under buildings if severe flooding should occur. Other mitigation measures have also been addressed to ensure that untreated effluent and/or chemicals and/or fuels do not spill into flood waters. Spill containment apparatus must be kept on site to minimise the scale of impact should there be an accident.

7.4.4. Fire Risk

One must consider the possibility of drought-related bushfires, although in this humid wetland environment they are unlikely. However, accidental fires, kitchen fires or fires made by students in a location other than the approved area can spread to and threaten the local community. Fires can destroy the trees and bush and cause chemical stores to burn and spill toxic fluids and gasses into the local environment. Irrigation type sprinklers that are directed from the building to soak the bush and grass around and beneath the campus buildings should be incorporated into the design plans. Roof material must be able to withstand burning ashes. Water pressure and tank/borehole volumes must be able to support the pressure required to meet these fire control measures. Furthermore, a fire truck must be kept on site and some staff adequately trained in fire-fighting. Normal health and safety standards with respect to fire extinguishers are also mandatory for the campus.

7.4.5. Cumulative Effects

Due to the proposed design, location and general nature of the proposed project and its relatively isolated locality in relation to other communities and/or infrastructure, the impact of cumulative effects on the environment is considered to be of low significance.

7.5. Summary of Effects

A summary of the predicted effects is provided in Table 9. The effect of most concern is flooding and/or extreme rainfall and loss of containment of the effluent/wastewater network, the chemical, paint, and detergents storeroom and fuel tanks. Flooding or loss of containment could potentially result in the spilling of raw sewage and toxic chemicals into floodwaters that would carry these toxins over the site and wetlands, into the Zambezi River and downstream. This has the potential of affecting all the wildlife and birds along the river, as well as those dependent on the river downstream from the campus. This could have serious environmental ramifications. Mitigation measures state that the sewerage network must adhere to international standards and design criteria and costing must ensure that containment is ensured in a flood event. The EMP provides a range of mitigation measures that will ensure these effects are minimised and avoided where possible.

Table 9: Summary of predicted environmental effects and their significance

IMPACT EVALUATION SUMMARY – PROPOSED CAMPUS AND ACCESS ROAD CONSTRUCTION AND OPERATION										
IDENTIFIED IMPACT		SENSITIVITY AND VALUE OF RECEPTOR	NATURE OF IMPACT	EXTENT / GEOGRAPHIC SCALE	DURATION	REVERSIBILITY	MAGNITUDE	LIKELIHOOD	LEVEL OF CERTAINTY	IMPACT SIGNIFICANCE
1	SITE LOCATION	Med	Neg - Def	On-site	Long	Per/Irriv	Min	Certain	High	Low Neg
2	NATIONAL PARKS	Med	Pos - Def	Regional	Long	Per/Rev	Mod	Likely	High	Mod Pos
3	CLIMATE CHANGE CONSIDERATIONS	High	Neg - Def	Local	Med	Temp/Rev	Neg	Unlikely	Med	Low Neg
4	ZAMBEZI - SOILS AND GEOLOGY	High	Neg - Def	Local	Med	Temp/Rev	Neg	Unlikely	High	Low Neg
5	ECOLOGY	High	Neg - Def	On-site	Med	Temp/Rev	Neg	Unlikely	High	Low Neg
6	BIRD DIVERSITY	High	Neg - Def	Local	Med	Temp/Rev	Min	Likely	Med	Min Neg
7	SOCIO-ECONOMICS	High	Pos - Def	Regional	Long	Per/Irriv	Mod	Likely	High	Low Pos
8	AIR QUALITY/ DUST	Med	Neg - Def	Local	Short	Temp/Rev	Neg	Unlikely	High	Low Neg
9	NOISE	Low	Neg - Def	Local	Short	Temp/Rev	Min	Unlikely	High	Low Neg

IMPACT EVALUATION SUMMARY – PROPOSED CAMPUS AND ACCESS ROAD CONSTRUCTION AND OPERATION										
IDENTIFIED IMPACT		SENSITIVITY AND VALUE OF RECEPTOR	NATURE OF IMPACT	EXTENT / GEOGRAPHIC SCALE	DURATION	REVERSIBILITY	MAGNITUDE	LIKELIHOOD	LEVEL OF CERTAINTY	IMPACT SIGNIFICANCE
10	SURFACE WATER & FLOOD RISK	High	Neg - Def	Local	Med	Temp/Rev	Min	Unlikely	Med	Low Neg
11	CULTURAL HERITAGE PALAEONTOLOGY	Med	Neg - Def	On-site	Short	Temp/Rev	Neg	Unlikely	High	Low Neg
12	CUMULATIVE EFFECTS	Med	Neg - Def	Local	Short	Temp/Rev	Neg	Unlikely	High	Low Neg

8. CONCLUSIONS AND RECOMMENDATIONS

This report has considered all potential environmental impacts associated with the construction of an extended UNAM Environmental Sciences Campus on the site proposed adjacent to the existing UNAM Katima Mulilo campus.

All statutory procedures have been followed and addressed. The project registration, BID, site notices, site vegetation study, letter from the roads authority and correspondence from the Ministry of Urban Development and NAMPAB relating to the project are included in the Appendices. These give substance and some background information on the evolution of the project and a foundation for this scoping report.

The evaluation of each potential impact is provided and then summarised in Table 9. Based on these evaluations, which are considered mostly negative but of low significance, it is our opinion that there is no environmental reason for the project not to go ahead provided the EMP (Appendix A) is adhered to.

The negative impact that poses the biggest potential threat to the environment, if not addressed in the design and best building practices is as follows: The campus extension is located only marginally higher than the 941m asl contour which marks the 1-in-50 year extrapolated floodwater mark. The proposed development has an effluent/wastewater network incorporated into its design. Should this facility not be designed and constructed to be able to withstand flooding and extreme rainfall conditions, untreated sewage could spill into the environment. This can affect the wetlands and the Zambezi River downstream resulting in contamination and health risk issues. This also applies to the chemical storeroom and any fuel storage facilities located on campus. Should design and costing enable engineering to mitigate and be able to prevent spills and thereby ensure containment in severe weather and flooding events, and then very little risk of significant environmental impact exists for the proposed campus development. No other potentially significant environmental impacts were identified during the scoping evaluation.

Two positive impacts have also been identified, namely; 1) New well-trained environmental science students can be employed at the numerous parks and reserves including the hospitality sector in Namibia, Zambia, Zimbabwe and Botswana and the greater SADC community; and 2) having another local education facility in the Katima Mulilo area will be good for the Zambezi Region and enhance capacity building within the KAZA TFCA.

It is recommended that when the final designs and specifications for the effluent/wastewater network, chemical storeroom and fuel storage facilities are received by the proponent that these are reviewed by the environmental consultants. They can then modify the EMP and related monitoring requirements to ensure that the environment is protected.

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