FINAL ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

NEW OPUWO AERODROME AND ASSOCIATED INFRASTRUCTURE IN OPUWO, KUNENE REGION

FINAL ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT REPORT

06 MARCH 2024

URBAN Green
SUSTAINABILITY CONSULTANTS

PROJECT INFORMATION

Project Title:	**OPUWO AERODROME**
Type of Study:	**ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT**
Study Phase:	**EIA PHASE**
Project Location:	**OTJIJARUA AND OMANDUU VILLAGES, OPUWO DISTRICT, KUNENE REGION**
Competent Authority/ies:	**DIRECTORATE OF CIVIL AVIATION** **MINISTRY OF WORKS AND TRANSPORT** **PRIVATE BAG 12003** **WINDHOEK**
Approving Authority:	**ENVIRONMENTAL COMMISSIONER** **DIRECTORATE OF ENVIRONMENTAL AFFAIRS** **MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM** **PRIVATE BAG 13346** **WINDHOEK**
Proponent:	**MINISTRY OF WORKS AND TRANSPORT** **DEPARTMENT OF TRANSPORT** **PRIVATE BAG 13348** **WINDHOEK**
User:	**DIRECTORATE OF CIVIL AVIATION** **MINISTRY OF WORKS AND TRANSPORT** **PRIVATE BAG 12003** **WINDHOEK**
Consultancy:	**URBAN GREEN SUSTAINABILITY CONSULTANTS** **ENVIRONMENTAL MANAGEMENT DIVISION** **PO BOX 11929, KLEIN WINDHOEK** **TELEPHONE: +264-61-300 820** **FAX: +264-61-401 294** **E-MAIL: urbangreen@iway.na** **WEBSITE: www.urbangreenafrica.net**

EXECUTIVE SUMMARY

I. INTRODUCTION

Urban Green cc (Urban Green) has been appointed by Conselect Engineering to undertake an environmental impact assessment (hereafter referred to as the Study) for the proposed Opuwo Aerodrome (hereafter referred to as the Project) and associated infrastructure, with the aim of obtaining an environmental clearance certificate, as provided for by section 27(2) of the Environmental Management Act (No. 7 of 2007).

During 2014 & 2015 a scoping assessment was undertaken for the Project based on triggered listed activities as defined in the *'List of Listed Activities Requiring Approval from the Environmental Commissioner'* (GN. No. 29 of 2012) promulgated under the Environmental Management Act (No. 7 of 2007). The assessment process followed was and is as per the Environmental Impact Assessment Regulations (GN. No. 30 of 2012), promulgated under the Environmental Management Act (No. 7 of 2007).

The purpose of the 2014/15 Scoping Assessment was to assess the proposed Project and the alternatives, as well as the receiving environment that may be affected by the proposed Project. Based on the aforementioned aspects, the scoping phase highlights the potential environmental impacts that may occur based on the proposed project description and sensitivity of the receiving environment, both social and natural. The 2014/15 Scoping Assessment concluded that the proposed Project would have various potential impacts of different significance and recommended that further detailed studies (i.e., underground water; archaeological; avifauna; civil aviation safety) be conducted to determine the real significance before final submission with the Authorities for decision making. Due to limited funding available, the Project and Study was put on hold during mid-2015.

Following funding allocated to the Project and Study, the detailed studies (i.e., underground water; archaeological; avifauna; civil aviation safety) were conducted during August and September 2023, and the Environmental and Social Impact Assessment Report completed during October & November 2023.

All Interested and Affected Parties (I&APs) were provided an opportunity to register and/or comment on the Study Reports (i.e., 2014/15 Scoping Report & 2023 Environmental and Social Impact Assessment Report). Comments received has been addressed and included in the respective Reports, which will be submitted to the office of the Environmental Commissioner at the Directorate of Environmental Affairs with the Ministry of Environment, Forestry and Tourism.

II. BRIEF PROJECT DESCRIPTION

The preferred site to accommodate the Opuwo Aerodrome is located 22 km east of Opuwo Village, approximately 5km east of the Alpha Village and 4 km north of the Omakange - Opuwo Main Road between (see Figure 1.4-1).

It is proposed that the Aerodrome should comply with the aerodrome reference code 2B. The proposed Project includes the construction of the following structures and infrastructure:

- Guard house with ablution facilities, water and electricity;
- Gravel access road;
- Covered veranda and rest rooms for the passengers and crew;
- Fuel storage and handling facility (future);
- Water, electricity and telecommunications;
- Drainage structures;
- Fencing;
- Parking;
- Runway marking and signage; and
- Road signs.

The proposed aerodrome consists of one runway optimally orientated least affected by crosswinds, a short taxiway perpendicular to the runway between the latter and an apron located outside the runway strip.

The existing Opuwo Aerodrome has been decommissioned and the land on which it is located will be handed over to the Opuwo Town Council, subsequent to its rehabilitation.

III. KEY IMPACTS

The following key impacts were identified and assessed:

Construction related impacts:

- Ground and surface water pollution
- Soil erosion and sedimentation
- Habitat destruction and loss of biodiversity
- Increase in traffic volumes & risk to road safety
- Construction nuisances (i.e., noise, dust and emissions)
- Heritage destruction
- Water shortage
- Potential remains of unexploded and explosive remnants of war

Operation related impacts:

- Ground and surface water pollution
- Landscape and visual aesthetics
- Noise pollution
- Air pollution
- Civil aviation safety (existing obstruction by telecommunication tower)
- Civil aviation safety (bird strikes)
- Water demand and supply

IV. PROJECT ALTERNATIVES

The following alternatives with respect to locality were identified during the March 2012 Feasibility Study that was conducted by the Windhoek Consulting Engineers (Pty) Ltd.:

Alternative 1:

The location of this alternative is situated west of the existing aerodrome close to the place called Okovingava. The design of a runway at the proposed site is discussed in section 6.4 of this Report.

Alternative 2 (preferred alternative):

This proposed aerodrome site is located 5 km east from Alpha Village and 4 km north of the Omakange - Opuwo Main road. The aerodrome has been located as close to the Omakange - Opuwo Main road as possible taking into account the obstacle limitation surfaces.

Alternative 3:

This alternative is located approximately 17 km north of Opuwo at Ovinyange just east of District Road 3700 to Ohandungu, Epembe and Epupa.

Alternative 4:

This alternative aerodrome site is located on the north-north-west of Opuwo and about 31.2 km along District Road 3700 from the town.

Alternative 5:

This alternative aerodrome site is located approximately 38 km along MR100/C41 road to the east of Opuwo. The aerodrome site is about 1.7km south of the bitumen surfaced road.

From the five alternative sites assessed, the March 2012 Feasibility Study by Windhoek Consulting Engineers (Pty) Ltd., concluded that alternative 2 is the most feasible and viable. The mentioned

March 2012 Feasibility Study is available from the office of Urban Green Sustainability Consultants and Windhoek Consulting Engineers (Pty) Ltd.

Alternative 2 was accordingly subject to a scoping assessment during 2014/15 and a detailed assessment during 2023, which is presented in detail within this report.

V. ASSESSMENT CONCLUSION

The 2014/15 Scoping Assessment concluded that that the proposed Project would have various potential impacts of different significance and recommended that further detailed studies (i.e., underground water; archaeological; avifauna; civil aviation safety) be conducted to determine the real significance before final submission with the Authorities for decision making.

- Civil aviation –
    - Considering the locality of an existing mobile telecommunication tower within the legal perimeter of the proposed aerodrome, it was required by the Civil Aviation Act that an ICAO Annex 14 assessment be done to establish if the existing mobile telecommunication tower holds any potential danger to the proposed aerodrome.
    - Considering the potential existence of birds holding a flight risk and bird strike risk, a specialist avifauna assessment had to be undertaken.
- Archaeological and heritage –
    - Given the very limited baseline information available on archaeological and heritage remains within the area, it was required to have an archaeological assessment done by a specialist for approval by the NHC.
- Groundwater –
    - Considering the limited groundwater available from existing boreholes within the area, a specialist had to undertake a hydrological baseline assessment to establish and verify the availability of sufficient ground water and identify possible locations for the drilling of two new boreholes to supply the Project.

The Detailed Environmental and Social Impact Assessment completed during October & November 2023, conclude that none of the above mentioned potential impacts are considered of such significance that it cannot be sustainably mitigated and that the proposed Project be implemented in accordance with the recommendations of the final ESIA Report (this report) and the Environmental Construction Management Plan.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

Appendix A (a): Application for Environmental Clearance Certificate with CV of EAP

Appendix A (b): Application to the Namibia Civil Aviation Authority (Competent Authority)

Appendix A (c): Application to Ministry of Agriculture, Water and Land Reform (Competent Authority)

Appendix B: Specialist Reports

- Appendix B1: Avifauna Assessment Report
- Appendix B2: Ecological Impact Assessment Report
- Appendix B3: Archaeological and Heritage Impact Assessment Report
- Appendix B4: Geohydrology Baseline Report
- Appendix B5: ICAO Annex 14 Evaluation Report (Issue 2)

Appendix C: CV of EAP responsible for the Environmental Assessment

Appendix D: Public Consultation

- Appendix D1: List of Pre-identified I&AP and Authorities 2014

1st Round of Public Consultation

- Appendix D2: Notification Email with Background Information Document sent to Pre-identified I&AP and Authorities
- Appendix D3: Background Information Document 2014
- Appendix D4: Public notices placed in the 'Namibian' and 'Republikein' Newspapers
- Appendix D5: Notification letters delivered by hand in Windhoek
- Appendix D6: Proof of notification letters hand delivery receipt
- Appendix D7: Otjijarua village public meeting presentation and agenda
- Appendix D8: Otjijarua village meeting minutes and attendance register
- Appendix D9: Correspondence received and sent during 1st round of the PPP
- Appendix D10: Registered I&AP and Authorities

Public Consultation Repeated during 2023

- Appendix D11: Environmental Commissioner`s directive letter
- Appendix D12: List of updated predetermined I&AP`s
- Appendix D13: Notification Email with updated Background Information Document sent to Pre-identified I&AP`s and Authorities
- Appendix D14: Updated Background Information Document

CHAPTER 1 : BACKGROUND INFORMATION

1.1 INTRODUCTION

This Environmental and Social Impact Assessment Report (hereafter referred to as the Study) has been compiled as part of the Environmental Impact Assessment (EIA) conducted for the proposed New Opuwo Aerodrome (hereafter referred to as the Project), situated at Opuwo Town within the Kunene Region, Namibia.

This Study Report presents information on the Environmental Assessment Practitioner (EAP) and specialists; the study approach and methodology of the EIA; legislation applicable to the EIA and the proposed Project; baseline information on the affected environment, both social and natural; description of the proposed Project and related activities; alternatives considered with respect to possible locations; the complete public consultation process; an assessment of the nature and extent of the potential impacts (environmental and socio-economic) identified and mitigations; as well as a conclusion with recommendations to the Authorities.

This chapter of the report provides background information and a motivation (need and desirability) to the proposed Project; the motivation for an EIA; an overview of the study area; the study's terms of reference; the assumptions and limitations of the Study; and an outline of the remainder of the report.

1.2 BACKGROUND AND MOTIVATION TO THE PROJECT

The current Opuwo Aerodrome, which has not been used for many years, is an unregistered state owned aerodrome situated within the boundaries of Opuwo Town. The Opuwo Aerodrome has been encroached by urban development, making it unsafe for use from both a civil aviation perspective and a resident perspective. The security fence of the existing aerodrome has been vandalised and removed; which has resulted in the free movement of locals and livestock within the premises.

As the custodian of the aerodrome, the Department of Transport (Ministry of Works and Transport) has realised the need for the relocation of the Opuwo Aerodrome to an alternative site due to increasing safety and security concerns in the current location.

Under Cabinet Decision No. 19th/30.10.12/005, the Ministry of Works and Transport was directed to –

(i) Relocate Opuwo Aerodrome to Alternative Site 2; and

(ii) Handover to the Local Authority the land on which the existing aerodrome stands.

The Opuwo Aerodrome was officially approved by Cabinet in 1997 as part of Namibia's National Aerodrome Network, which consists of three aerodrome classes:

- Class A Aerodromes - having infrastructure capable of handling large aircraft and a relative high volume of domestic and international traffic;

- Class B Aerodromes capable of handling aircraft used on domestic commuter services and regional flights; and
- Class C Aerodromes providing basic access by air.

At the time (1997), the Opuwo Aerodrome was categorized as a Class C Aerodrome, which was in the meantime cancelled and does not form part of the list of registered aerodromes in Namibia.

Considering the well-established and growing tourism sector within the Northern parts of Namibia and especially within the north-western parts of the Kunene Region, the need and demand for an alternative aerodrome has become ever important and needed. With an ever increasing demand for fly-in safaris and no available aerodrome, the Opuwo Aerodrome has become an important logistical and economic choice.

The Opuwo Aerodrome is expected to have various socio-economic spin-offs to both the formal and informal tourism and business sectors of Opuwo Town and larger surroundings. The Aerodrome would also reduce traveling time for tourists not having to drive to the north-western parts, which again contributes to longer stay-over times at tourism facilities, i.e., increased expenditure and profits.

The Opuwo Aerodrome is strategically located and supports the larger aerodrome network to facilitate improved distribution of goods and services, as well as tourist and local flyers. During the environmental impact assessment, Fly Namibia indicated interest to make use of the Opuwo Aerodrome as one of their potential destinations in the future.

1.3 MOTIVATION FOR AN EIA

The proposed Project as presented in this Report contains a variety of 'listed activities' (GN. No. 29 of 2012) requiring that an environmental clearance certificate be obtained from the Environmental Commissioner, Directorate of Environmental Affairs, Ministry of Environment, Forestry and Tourism, before commencement of these listed activities.

On instruction by the Proponent and pursuant to the requirements stipulated by Section 27(2) of the Environmental Management Act No. 7 of 2007, Urban Green Sustainability Consultants, an independent environmental consultancy has been appointed by the Proponent to conduct an EIA for purpose of applying for an environmental clearance certificate.

1.4 THE STUDY AREA

The preferred site to accommodate the Opuwo Aerodrome is located 22 km east of Opuwo Village, approximately 5km east of the Alpha Village and 4 km north of the Omakange - Opuwo Main Road as indicated by Figure 1.4-1.

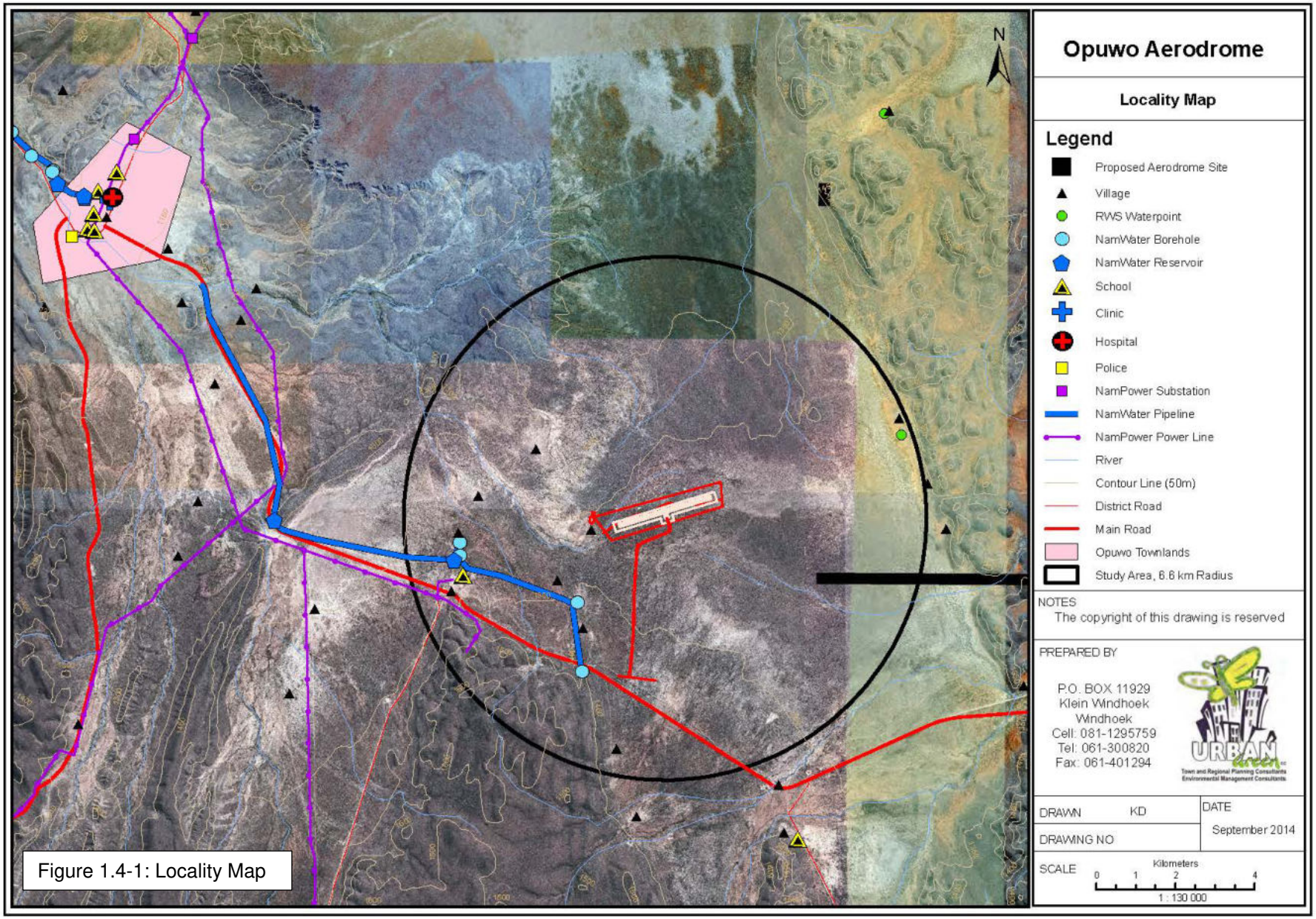

Figure 1.4-1: Locality Map

1.5 TERMS OF REFERENCE

No formal Terms of Reference (ToR) were provided, but were rather inferred from the requirements of the applicable legislation (see Chapter 4) and the aims of an environmental assessment as presented by the Environmental Management Act, No. 7 of 2007 and EIA Regulations (GN. No. 30 of 2012).

1.6 STUDY ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations apply to this Study:

- ✓ It is assumed that all the information provided by the Proponent, the Project Team, specialists and authorities consulted is accurate;
- ✓ Figures provided and impacts assessed are based on the entire project once in full operation as presented by the different project consultants;
- ✓ Meteorology and climate data were not available for the Project Site itself and information available from the closest recording station (i.e. Opuwo) was accordingly used;
- ✓ It is assumed that there will be no significant changes to the proposed Project (see Chapter 6) or affected environment (see Chapter 5) between the time of undertaking the assessment and implementation of the proposed Project that could substantially influence findings, recommendations with respect to mitigation and management, etc.;
- ✓ The Study involved the assessment of impacts on the current conservation value of affected land and not on either the historic or potential future conservation value; and
- ✓ This assessment is based on the prevailing environmental context.

1.7 PURPOSE OF THIS ESIA REPORT

The purpose of this ESIA Report is to provide the office of the Environmental Commissioner and Competent Authorities with all necessary and relevant information pertaining to the proposed Project, the receiving environment and the Study, which has the aim of ensuring an informed decision making as per the requirements of the EIA Regulations (GN. No 30 of 2012).

This Final Environmental and Social Impact Assessment Report (FESIAR) have been compiled as part of an assessment that has been undertaken for the proposed establishment to replace the existing Opuwo Aerodrome, in the Kunene region. This FESIAR summarises the process followed to date, provides a description of the Project and addresses the issues raised by Interested and Affected Parties (I&APs) during both consultation opportunities. It further provides an assessment of the social impacts of the proposed Project along with mitigation measures and recommendations.

The Draft version of this Report was made available for public review and comment from 20 to 29 February 2024, as required by section 23 of the Environmental Impact Assessment Regulations (GN. No. 30 of 2012). Comments received were included into this Final Environmental and Social Impact Assessment Report (FESIAR) submitted with the Ministry of Agriculture, Water and Land Reform and the Namibia Civil Aviation Authority (i.e. Competent Authorities) and the Directorate of Environmental Affairs (i.e. Approving Authority) with the Ministry of Environment, Forestry and Tourism for decision-making.

After the DEA has reached a decision, all registered I&APs on the project database will be notified of the decision and the requirements of the statutory Appeal Period.

1.8 STRUCTURE OF THE REPORT

This report consists of ten chapters and a reference list, as outlined below.

Table 1: Structure of the Report

SECTION	CONTENTS
Executive Summary	**Executive Summary** Brief overview of the Study, findings and recommendations.
Chapter 1	**Background Information** Provides an introduction, background and motivation to the Project; motivation for an EIA; locality of the study area; terms of reference; study assumptions and limitations; purpose of the detailed assessment report; method of submitting comment on the detailed assessment report; and outlines the structure of the report.
Chapter 2	**Project Team and Specialists** Provides information about the role players in the project and the expertise of the EAP and EIA specialists.
Chapter 3	**Study Approach and Methodology** Summarise the framework for environmental management in Namibia, the EIA process and methodology followed as part of the in-detail Assessment Study with particular attention to the associated public participation.
Chapter 4	**Legal Framework** Provides an overview of the key legislation having an implication of various

	activities associated with the Project.
Chapter 5	**Baseline Information** Describes the details pertaining to the site locality and urban characteristics of the surrounding area, the existing biophysical, socio-economic and cultural-historic environment of the study area.
Chapter 6	**Description of the Proposed Project** Provides a description of the physical appearance of the Project, the technology intended to be used, resources use, and waste generated, service infrastructure, and construction activities.
Chapter 7	**Alternatives Considered** This chapter provides for alternatives considered in terms of the site location and infrastructure to be developed.
Chapter 8	**Public Consultation** Explains in detail the entire public consultation process followed as part of this study. Feedback received from registered Interested and Affected Parties and Stakeholders are listed as well.
Chapter 9	**Assessment of Impacts** Describe and assess the potential impacts associated with the Project. Mitigation measures relevant to the planning, design, construction and operational phases of the Project as appropriate, are recommended
Chapter 10	**Conclusions and Recommendations** Provides conclusions to the impact assessment and evaluates the overall suitability of the Project. Recommendations for implementation during the further planning, design, construction and operation of the Project are also provided, as appropriate.
References	Lists the References used in this Report

CHAPTER 2 : PROJECT TEAM AND ENVIRONMENTAL SPECIALISTS

This chapter of the Report presents the project team members that were directly involved in the Study.

2.1 PROJECT TEAM AND SPECIALISTS

The Project Team consists of a multidisciplinary group of Consultants (i.e. engineers, architects, ecologist and the environmental impact assessment practitioner). Brand van Zyl, representing Urban Green Sustainability Consultants, has been appointed by the Proponent, The Ministry of Works and Transport, as the Independent Environmental Impact Assessment (EAP) responsible for undertaking the environmental impact assessment and related processes for this Project.

Table 2.1-1: Project Role Players

ORGANISATION	PROJECT ROLE
Ministry of Works and Transport	Project Proponent
Directorate of Environmental Affairs Environmental Commissioner	Decision-making Authority for Environmental Clearance Certificate
Conselect Engineering	Project Manager
Urban Green Sustainability Consultants	Environmental Assessment Practitioner
Conselect Engineering	Project Engineers
Ben Kathindi Architects	Project Architects
Richard Frankle and Partners Quantity Surveyors	Quantity Surveyors

2.2 EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER AND ENVIRONMENTAL SPECIALISTS

The qualifications and expertise of the EAP and other environmental specialists involved in the Study is briefly summarised in **Table 2.2-1: Qualifications and expertise of the environmental consultants**2.2-1 below. The curriculum vitae documentation of the Principal EAP is attached as Appendix A (a).

Table 2.2-1: Qualifications and expertise of the environmental consultants

NAME	**Urban Green cc (Mr B van Zyl)**
RESPONSIBILITY ON THE PROJECT	EAP Public consultation, impact assessment and mitigation formulation, reporting, and application for Environmental Clearance
QUALIFICATIONS	M. Degree in Environmental Management; M. Degree Town and Regional Planning; Bachelor of Arts Urban Geography
PROFESSIONAL REGISTRATION	Namibian Council for Town and Regional Planners Member of the Green Building Council of South Africa
EXPERIENCE IN YEARS	17
EXPERIENCE	Brand van Zyl has been involved in various Environmental Impact Assessment studies throughout Namibia and of different kind.
NAME	**Anne and Mike Scott**
RESPONSIBILITY ON THE PROJECT	Avifauna specialist
QUALIFICATIONS	Doctor Technologiae: Nature Conservation (Applied Ornithology); Bachelor of Arts; University Education Diploma; Post-

	graduate Diploma in Special Education: Remedial
PROFESSIONAL REGISTRATION	Environmental Assessment Professionals of Namibia (EAPAN; Ordinary Member practitioner, #71 HA Scott & #72 RM Scott) Full member of Namibia Chamber of Environment (NCE)
EXPERIENCE IN YEARS	Environmental impact studies - avifauna: 10 years
EXPERIENCE	Nature conservation: 40 years
NAME	**ESM Archaeological and Cultural Heritage Consultants (Dr. E. Mowa)**
RESPONSIBILITY ON THE PROJECT	Heritage impact assessment and on – site assessment, reporting and application for Heritage Consent
QUALIFICATIONS	• B. ed Education. (UNAM) • Maritime Archaeology (University of Bristol). • PhD. Archaeology (University of Pretoria).
PROFESSIONAL REGISTRATION	National Heritage Council of Namibia, Member of ASAPA
EXPERIENCE IN YEARS	12
EXPERIENCE	Dr E. Mowa is an experienced archaeologist and heritage practitioner who has been working in the museum and heritage sector for almost 12 years, carried out heritage impact assessment on behalf of national heritage council seven years ago on the oil terminal construction project in Walvis Bay. Since then, he has been involved in various Heritage Impact Assessment studies throughout Namibia. He further attended international meetings as a

	Namibian representative as well as training activities in heritage.
NAME	**Dynamic Water Resources Management (Otto van Vuuren)**
Responsibility on the Project	Assessing the hydrogeological environment and the potential groundwater development area(s) for water supply to the proposed New Opuwo Aerodrome project.
Qualifications	B. Sc (Geological sciences); B. Sc (Hons) (Hydrology and Geohydrology)
Professional Registration	Awaiting registration as Senior Geoscientist at the Geosciences Council of Namibia. (Application submitted, see attached confirmation)
Experience in years	35
Experience	Otto van Vuuren has more than 30 years' experience in the groundwater sector and related services in Namibia.

CHAPTER 3 : STUDY APPROACH AND METHODOLOGY

This chapter of the report presents the Study process followed as prescribed by the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (GN. No. 30 of 2012). This Study's approach and methodology was guided by the requirements of the relevant legislation (Chapter 4).

The Study undertaken is a planning, design and decision making tool use to demonstrate to the responsible Authorities and the project Proponent what the potential consequences of their decisions will be in biophysical and social terms. As such, the Study identifies potential impacts (negative and positive) that the intended Project may have on the social and natural environments; as well as identifying potential opportunities and constraints the social and natural environments may pose to the proposed Project, for purpose of avoidance and/or design change to adopt to the challenges.

The Study process consists of three phases, namely the Screening Phase, Scoping Phase and in-detail Assessment Phase, also referred to by some as the EIA Phase. A flowchart indicating the EIA process is presented by Figure 3.1-1 below.

3.1 SCREENING AND APPLICATION FOR ENVIRONMENTAL CLEARANCE

The first phase undertaken was the *'determination of the proposal'* or screening whereby the potential environmental impacts of the Project were identified, discussed and rated by the EAP and specialists. This screening phase was undertaken in June 2014 before commencement of the scoping phase assessment.

During the initial screening conducted, various *listed activities* (see Section 4.1.3) associated with the Project were identified as requiring environmental clearance from the Environmental Commissioner (Section 27 of the Environmental Management Act, No. 7 of 2007). Potential environmental impacts identified at the time included the following, but not necessarily limited to the below:

- ✓ Potential impact on fauna as well as flora occurring on the proposed project site;
- ✓ Impact of avifauna on air traffic safety (i.e. possibility of bird strikes);
- ✓ Increase in soil erosion as a result on the increased runoff during the operational phase of the project;
- ✓ Noise during both the construction phase and operational phase;
- ✓ The structural appearance may have a visual impact; and
- ✓ Possible increase in dust levels due to the nature of the activities involved in the construction and operation.

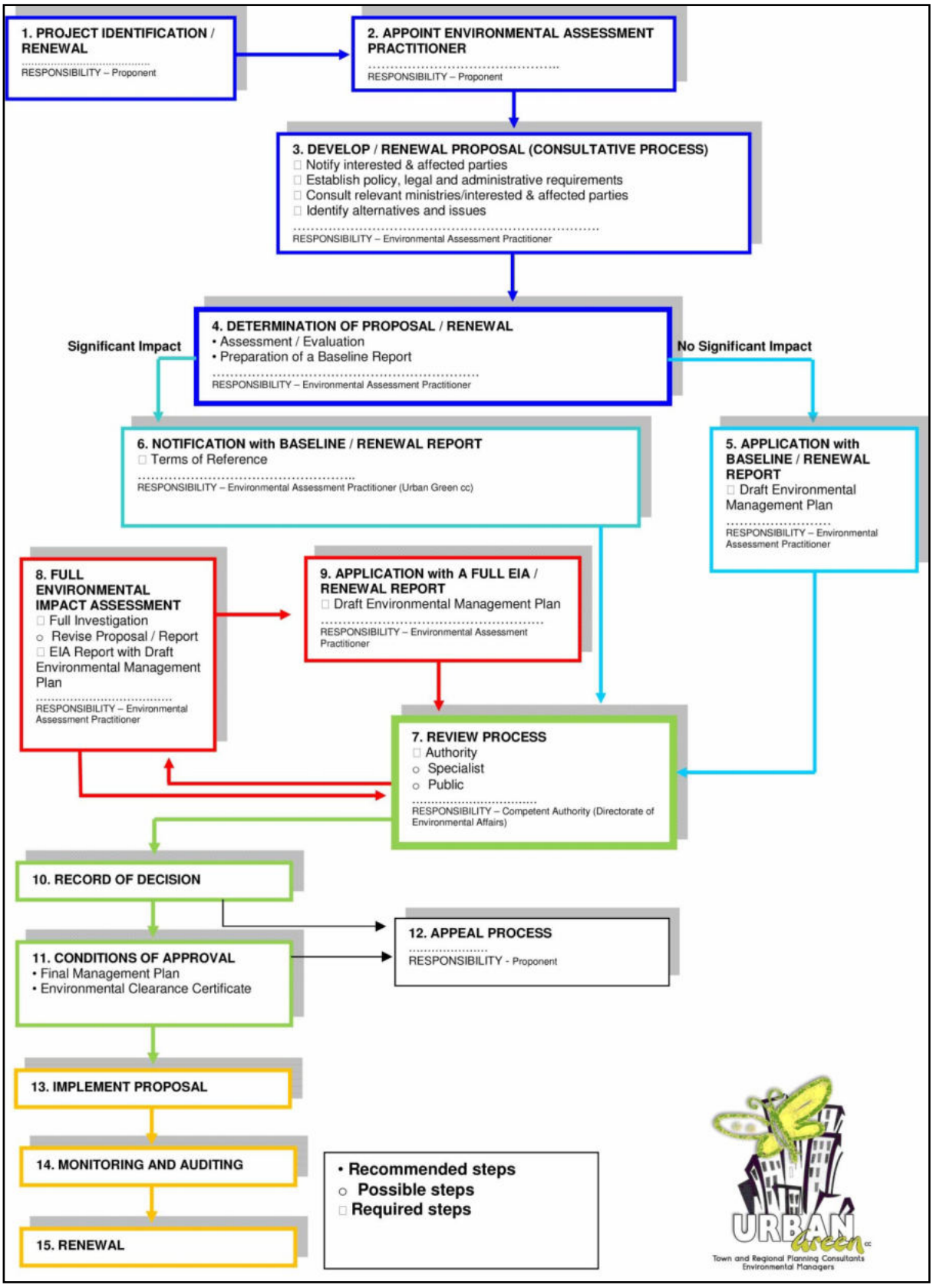

Figure 3.1-1: The EIA Process

Following the screening phase, an application for Environmental Clearance was submitted on 14 August 2014 with the Environmental Commissioner (Appendix A), as prescribed by Regulation 6 (Form 1 of Annexure 1) of the EIA Regulations (GN. 30 2012) as provided for under Section 56 of the Environmental Management Act, No 7 of 2007.

3.2 SCOPING STUDY PHASE

Scoping is a critical, early step in the preparation of an EIA and has strong emphasis on public involvement, as prescribed by Regulation 21 to 24 of the EIA Regulations (GN. No. 30 of 2012). The scoping process, in essence, identifies the issues that are likely to be of most importance during the EIA and eliminates those that are of lesser concern.

This phase, which began in August 2014 and concluded during March 2015, set out to collect baseline information and professional/public opinion with regards to the proposed Project and the receiving social and natural environments; determine the manner in which and to what extent the proposed Project may affect the natural and social environment (geographical, physical, biological, social, economic and cultural aspects); establish the need and desirability of the proposed Project; compare advantages and disadvantages and available alternatives; highlight the potential significant effects that are likely to be of most importance and to develop or recommend mitigation measures for implementation as part of the Project and/or during construction and operation of the Aerodrome.

3.2.1 Methodology

The methodology followed during the Scoping Phase was as per regulation 8 of the Environmental Impact Assessment Regulations (GN. No. 30 of 2012), which included –

- Giving notice to all potential interested and affected parties of the application (environmental clearance application);
- Public consultation as per Regulation 21 of the Environmental Management Act (No 7 of 2007) which included the -
    - Opening and maintaining a register of all Interested and Affected Parties (I&APs) as per Regulation 22;
    - Receiving of all objections and representations received from I&APs following the public consultation process;
- Prepare a scoping report (Regulation 8) by subjecting the proposed application to a scoping assessment by -
    - Assessing the potential effects of the proposed listed activities on the environment;
    - Assessing whether and to what extent the potential effects identified can be mitigated and whether there are any significant issues and effects that require further investigation;

- Identifying feasible alternatives related to the proposed project;
- Setting the Terms of Reference for further investigations;
- Informing the way forward in the EIA process;
- Ensuring informed, transparent and accountable decision-making by the relevant authorities; and
- Inviting all registered I&APs to comment on the scoping report as per Regulation 23.

A detailed explanation of the activities undertaken to involve the Interested and Affected Parties is presented in Chapter 8 of this Report. For purpose of the Scoping Study, specialist involvement was limited to providing baseline information (i.e., desk based studies) and to provide general advice to the EAP.

3.2.2 Issues and Concerns Identified/Raised

During the scoping phase of the EIA certain issues of concern or of importance were raised by I&APs and Authorities, which are briefly outlined below and discussed in more detail in Chapter 9 of this Report.

- Benefits for the immediate local communities.
- Removal of trees of historical and financial value to the community.
- Loss of land for grazing.
- Locality of an existing base transmitter station to the south-west of the proposed aerodrome.
- Limited capacity of the existing water source (i.e. boreholes) and infrastructure (i.e. dams, pipelines) to supply in the increased demand.
- Danger of over abstraction from existing boreholes (especially during the construction phase) and negative social implications on the community and their livestock.

3.2.3 Scoping Assessment & Outcome

The proposed Project and receiving social and natural environments were subject to a scoping assessment from August 2014 to March 2015, which included site visits by the EAP, baseline desktop studies by specialist.

The 2014/15 Scoping Assessment concluded that that the proposed Project would have various potential impacts of different significance and recommended that further detailed studies (i.e., underground water; archaeological; avifauna; civil aviation safety) be conducted to determine the real significance before final submission with the Authorities for decision making.

- Civil aviation –
    - Considering the locality of an existing mobile telecommunication tower within the legal perimeter of the proposed aerodrome, it was required by the Civil Aviation Act that an ICAO Annex 14 assessment be done to establish if the existing mobile telecommunication tower holds any potential danger to the proposed aerodrome.
    - Considering the potential existence of birds holding a flight risk and bird strike risk, a specialist avifauna assessment had to be undertaken.

- Archaeological and heritage –
    - Given the very limited baseline information available on archaeological and heritage remains within the area, it was required to have an archaeological assessment done by a specialist for approval by the NHC.

- Groundwater –
    - Considering the limited groundwater available from existing boreholes within the area, a specialist had to undertake a hydrological baseline assessment to establish and verify the availability of sufficient ground water and identify possible locations for the drilling of two new boreholes to supply the Project.

3.3 DETAILED SPECIALIST STUDIES / EIA PHASE & REQUEST FOR ECC

The detailed specialist phase focusses on specific concerns that were raised during the detailed Assessment Phase, requiring further and more in-depth research and assessment, which involves on-site verification and research. As required by Regulation 21 to 24 of the EIA Regulations (GN. No. 30 of 2012), this Phase has an equal strong emphasis on public involvement.

This phase, which commenced during August 2023, set out to collect detailed information and professional/public opinion on those concerns identified during the detailed Assessment Phase as of potential significant concern towards the Project and/or social and natural environments. For this purpose, the following specialist was appointed to undertake detailed assessment –

- Avifauna specialist;
- Heritage specialist; and
- Hydrogeologist.

Each of the mentioned specialist focussed in on the applicable receiving environment (i.e., social and natural) with the aim to determine the manner in which and to what extent the proposed Project may affect the particular natural and/or social environment; highlight the potential impacts and develop mitigation measures for implementation as part of the Project and/or during construction and operation of the Aerodrome.

3.3.1 Methodology

The methodology followed during the detailed Assessment Phase was as per regulation 15 of the Environmental Impact Assessment Regulations (GN. No. 30 of 2012), which included –

- Giving notice to all potential interested and affected parties of the application (environmental clearance application);
- Public consultation as per Regulation 21 of the Environmental Management Act (No 7 of 2007) which included the -
    - Opening and maintaining a register of all Interested and Affected Parties (I&APs) as per Regulation 22;
    - Receiving of all objections and representations received from I&APs following the public consultation process;
- Prepare an assessment report (Regulation 15) by subjecting the proposed application to a detailed assessment by -
    - Assessing the potential effects of the proposed listed activities on the environment;
    - Assessing whether and to what extent the potential effects identified can be mitigated and whether there are any significant issues and effects that require further investigation;
    - Identifying feasible alternatives related to the proposed project;
    - Setting the Terms of Reference for further investigations;
    - Informing the way forward in the EIA process;
    - Ensuring informed, transparent and accountable decision-making by the relevant authorities; and
    - Inviting all registered I&APs to comment on the draft assessment report as per Regulation 23.

A detailed explanation of the activities undertaken to involve the Interested and Affected Parties is presented in Chapter 8 of this Report.

3.3.2 Issues and Concerns Identified/Raised

During commencement of the EIA phase, the following issues of concern in addition to those raised during the Scoping Phase (see section 3.2.2) were raised by I&APs and Authorities -

- Closeness of the proposed Aerodrome to peoples' villages and heritage remains (i.e., holy fires);
- Possible existence of unexploded and explosive remnants of war within the footprint of the aerodrome; and
- Civil aviation safety as a result of larger birds.

These are discussed in more detail in Chapter 9 of this Report.

3.3.3 EIA Assessment & Outcome

The EIA assessment, i.e., detailed specialist studies were undertaken during August and September 2023, which focussed on the following issues -

- Civil aviation –
    - Considering the locality of an existing mobile telecommunication tower within the legal perimeter of the proposed aerodrome, it was required by the Civil Aviation Act that an ICAO Annex 14 assessment be done to establish if the existing mobile telecommunication tower holds any potential danger to the proposed aerodrome.
    - Considering the potential existence of birds holding a flight risk and bird strike risk, a specialist avifauna assessment had to be undertaken.

- Archaeological and heritage –
    - Given the very limited baseline information available on archaeological and heritage remains within the area, it was required to have an archaeological assessment done by a specialist for approval by the NHC.

- Groundwater –
    - Considering the limited groundwater available from existing boreholes within the area, a specialist had to undertake a hydrological baseline assessment to establish and

verify the availability of sufficient ground water and identify possible locations for the drilling of two new boreholes to supply the Project.

In addition to the mentioned specialist studies, the demining and de-bushing of the Project site by the Namibian Police Force is a pre-requisite which should be done before any construction can commence (see Appendices D23 & D28).

The Environmental and Social Impact Assessment completed during October & November 2023, conclude that none of the above mentioned potential impacts are considered of such significance that it cannot be sustainably mitigated and that the proposed Project be implemented in accordance with the recommendations of the ESIA Report (this report) and the Environmental Construction Management Plan.

3.4 WAY FORWARD IN THE EIA PROCESS

The following steps are envisaged for the remainder of the EIA process:

- This Draft ESIA Report is made available to all registered Interested and Affected Parties and Authorities for a 7-day comment period as per Regulation 23;
- After closure of the comment period (29 February 2024), all comments received will be reviewed and if necessary, discussed with the I&AP, after which it will be included into the Final ESIA Report;
- This Final ESIA Report will be submitted to the Ministry of Agriculture, Water and Land Reform; the Directorate of Civil Aviation (Competent Authorities) and the office of the Environmental Commissioner, Directorate of Environmental Affairs (Approving Authority) for consideration and decision-making;
- Once the Final ESIA Report has been reviewed by the Competent Authorities and the Approving Authority and a decision taken (Regulation 14), all I&APs and Authorities on the Study database will be notified of the outcome of the application, as appropriate; and
- A statutory appeal period in terms of Section 50 of the Environmental Management Act, No. 7 of 2007 will follow the decision from the Environmental Commissioner.

CHAPTER 4 : LEGAL FRAMEWORK

For the purpose of environmental protection and sustainable renewable resource management to the benefit of all, legislation from different spheres under control of various Ministries have been adopted and enacted by Parliament. In support to the goal of sustainable renewable resource management, various International Treaties and Conventions have also been agreed to by Namibia.

There are a number of sectoral laws that fall under the general rubric of environmental laws. Sectoral laws are generally specific and apply to sectors such as civil aviation, forestry, water, mining and so forth. Any development, such as the proposed Opuwo Aerodrome, having certain impacts would therefore have to comply with some or other legislative requirement/s before commencement.

This chapter provides an overview to the legislation that is applicable to both the assessment process and the various activities making up the Project. It is accordingly divided into: (i) the legal framework for environmental management in Namibia; (ii) national sectoral legislative requirements applicable to the activities of the proposed Project; and (iii) other relevant legislation and approvals required for the establishment and development of the proposed Opuwo Aerodrome.

4.1 NAMIBIAN LEGAL FRAMEWORK

4.1.1 The Constitution of the Republic of Namibia 1990

Namibia's environmental policies are based on the requirements of the Namibian Constitution to endorse the concept of sustainable development. The Constitution of the Republic of Namibia (1990) is the principal and guiding supreme legislation whereby the country commits itself to sustainable development through environmental protection and wise resource management.

Article 95 (1), Promotion of the Welfare of the People, puts forward this intention:

> *"…the State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at… maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of natural resources on a sustainable basis for the benefit of all Namibians both present and future.*"

In accordance with the Constitution, the National Government of Namibia has formulated policies, development plans (such as Vision 2030, NDP's and etc.) and legislation directed at sustainable development.

Article 100 of the Constitution further provides that all natural resources (i.e. water, soils, plants and wild animals), vest in the state, unless otherwise legally owned. The use of such resources is only allowed within reasonable limits and beyond such limit's permission should be obtained from a competent authority (for instance a line ministry) responsible for the use and governance of the concerned natural resources.

In accordance with the Constitution it is thus necessary and important that the Project support these national goals.

4.1.2 Environmental Assessment Policy 1995

Namibia's Environmental Assessment Policy, endorsed by Cabinet (August 1994) and published in 1995 (MET 1995), was the first formal effort in the Country's history to guide environmental impact assessments striving towards sustainable development and environmental conservation.

The Policy provides for the procedure to be followed in conducting an environmental assessment, as well as a list of policies, programs and projects for which an environmental assessment is required (Annexure B of the Policy) whether initiated by the government or the private sector.

Of relevance to the proposed Opuwo Aerodrome are the following:

- Abstraction of ground or surface water;
- Any Government policy, programme or project on the use of natural resources;
- Industrial installation for bulk storage of fuels; and
- Infrastructure developments.

The Policy stipulates that once approval has been issued by the Commissioner, the proponent (whether Government or Private Enterprise) shall enter into a binding agreement based on the procedures and recommendations contained in the Environmental Assessment Report. This will help ensure that the mitigations and other measures recommended in the Environmental Assessment Report, and accepted by all parties, are complied with. This agreement should address the construction, operational and decommissioning phases as applicable, as well as monitoring and auditing.

The mentioned Policy has been superseded with the commencement of the Environmental Management Act (Act No. 7 of 2007), and the promulgation of the *'List of Activities requiring Environmental Clearance'* and Environmental Impact Assessment Regulations (Government Gazette No. 4878) on 6 February 2012.

4.1.3 Environmental Management Act No. 7 of 2007

The Environmental Management Act (No. 7 of 2007) (EMA) was promulgated in December 2007 and commenced on 6 February 2012 (GN. No. 28 of 2012). It is administered by the Directorate of Environmental Affairs (DEA), under the auspices of the Ministry of the Environment, Forestry and Tourism.

Its main objectives capture the essence and importance of this particular legislation, which are to:

- Ensure that the significant effects of activities on the environment are considered in time and carefully;
- Ensure that there are opportunities for timeous participation of interested and affected parties throughout the assessment process; and
- Ensure that the findings of an assessment are taken into account before a decision is made in respect of activities.

In Section 3(2) of the EMA, a set of principles are established which give effect to the provisions of the Constitution for integrated environmental management. Although these principles are not enforceable, it is incumbent upon decision makers to take them into account when deciding on the approval of a project.

The EMA stipulates that no party, whether private or governmental, can undertake a listed activity without an environmental clearance certificate obtained from the Environmental Commissioner (Section 27.3). Depending on the type of activity/ies being applied for, the Environmental Commissioner may request that an Environmental Impact Assessment be conducted. Section 27(1) refers to the *List of activities* (GN. No. 29 of 2012) that may not be undertaken without an Environmental Clearance Certificate.

The following listed activities, as listed in Government Gazette No. 29 of 2012 are applicable to the proposed Project.

Table 4.1.3-1: Listed activities as per GN. No. 29 of 2012 applicable to the proposed project

Activity No.	Activity Description
ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES	
Annexure, Section 1(a)	The construction of facilities for the transmission and supply of electricity
WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES	
Annexure, Section 2.1	The construction of facilities for waste sites, treatment of waste and disposal of waste.
MINING AND QUARRYING ACTIVITIES	
Annexure, Section 3.2	Other forms of mining or extraction of any natural resources

	whether regulated by law or not.
FORESTRY ACTIVITIES	
Annexure, Section 4	The clearance of forest areas, deforestation, afforestation, timber harvesting or any other related activity that requires authorisation in term of the Forest Act, 2001 (Act No. 12 of 2001) or any other law.
WATER RESOURCE DEVELOPMENTS	
Annexure, Section 8(1)	The abstraction of ground or surface water for industrial or commercial purposes
Annexure, Section 8(6)	Construction of industrial and domestic wastewater treatment plants and related pipeline systems.
HAZARDOUS SUBSTANCE TREATMENT, HANDLING AND STORAGE	
Annexure, Section 9(5)	Construction of filling stations or any other facility for the underground and aboveground storage of dangerous goods, including petrol, diesel, liquid, petroleum, gas or paraffin
INFRASTRUCTURE	
Annexure, Section 10 (1)	The construction of- (d) airports and airfields; (f) cableways; (g) communication networks including towers, telecommunication and marine telecommunication lines and cables.

The Environmental Management Act (No. 7 of 2007) also regulates the assessment process through the Environmental Impact Assessment Regulations (GN. No. 30 of 2012). The EIA Regulations provides for the process to be followed in undertaking an environmental assessment, stipulating particular requirements with regards to public consultation, the identification of impacts and establishing the significance thereof, as well as the content of an in-detail environmental impact assessment report.

4.2 NAMIBIAN SECTORIAL LEGISLATIVE REQUIREMENTS

A number of Namibian legislation and policies have environmental considerations in respect of operations to be carried out in most development initiatives in Namibia as listed below.

4.2.1 Aviation Act No. 74 of 1962 (as amended)

The Aviation Act No. 74 of 1962 (as amended) aims to consolidate the laws enabling effect to be given to certain International Aviation Conventions and making provision for the control, regulation and encouragement of flying within Namibia and for other matters incidental thereto.

The act was assented to on 21 June 1962 and commenced on 21 July 1962. The Act was subsequently amended by the Aviation Amendment Act No. 12 of 1965, the Expropriation Act No. 55 of 1965, the Aviation Amendment Act No. 83 of 1969, the Civil Aviation Offences Act No. 10 of 1972, the General Law Amendment Act No. 62 of 1973, the Expropriation Act No. 63 of 1975, the Executive Powers (Transport) Transfer Proclamation A. G. 14 of 1978, and the Aviation Amendment Act No. 10 of 1991.

The Directorate of Civil Aviation (DCA) is a regulatory body in the Ministry of Works and Transport and is tasked with enforcing the Act. The goal of the DCA is to assure a safe, secure and efficient civil aviation system which contributes to Namibia's national economy by fostering the planning and development of air transport so as to secure the safe and orderly growth of civil aviation, development of airways, aerodromes and air navigation facilities, and to meet the needs of the public for safe, secure, efficient, and economical air transport. The DCA also honours Regional and International obligations and conventions.

The definition of an "aerodrome" in Section 1 of the Aviation Act, 1962 is as follows:

> *"aerodrome" means a defined area on any land or water or building intended to be used either wholly or in part for the arrival, departure or movement of aircraft, and includes and building, installation or equipment within any such area which is intended to be so used*.

Section 6 of the Act further stipulates that the Minister may utilise moneys appropriated by Parliament to establish and maintain aerodromes.

4.2.2 Civil Aviation Regulations, 2001 (Government Notice No. 1 of 2001)

To give effect to Section 22 of the Aviation Act, 1962, the Minister of Works, Transport and Communication enacted Civil Aviation Regulations, 2001 that came into operation on 2 March 2001.

The Namibian Civil Aviation Regulations (GN. No. 1 of 2001) were promulgated to update the Aviation Act of 1962. There are two main reasons for updating the aviation legislation, namely, the current legislation does not adequately reflect the policies of Namibia for the aviation sector and does not reflect recent developments within SADC.

The Civil Aviation Regulations, 2001 provide comprehensive indications guiding personnel requirements, general operating rules and guidelines on the formulation of organisations amongst numerous other sections. The regulations expand on the definition of an aerodrome, in part, to accommodate the inclusion of heliports.

The charter of International Civil Aviation Organization (ICAO) is the Convention on International Civil Aviation, to which each ICAO contracting state is a party. Namibia is a contracting state obliged to ensure civil aviation safety in accordance with the prescribed Standards and Recommended Practices. ICAO creates and modernises Standards and Recommended Practices on international aviation to ensure the safe, efficient and orderly evolution of international civil aviation. Annex 14 to the Convention defines the airspace around aerodromes to be maintained free from obstacles so as to permit the intended aeroplane operations at the aerodromes to be conducted safely, to prevent the aerodromes from becoming unusable by the growth of obstacles around the aerodromes. This is achieved by establishing a series of obstacle limitation surfaces that define the limits to which objects may project into the airspace.

In accordance with Part 139 of the Namibian Civil Aviation Regulations, as regulated by the Aviation Act (No. 74 of 1962), no obstacle higher than 45.7 m above the mean level of the landing area and fall within a distance of 8 km (measured from the aerodrome reference point of any aerodrome), shall be erected without the written approval from the Director of the Directorate of Civil Aviation.

Of special importance to the project is –

- Part 139.02.18 of the Civil Aviation Regulations, 2001 specifically outlines the licensing and operational procedures for aerodromes and heliports; and
- Part 139.02.02 which indicate the circumstances under which a license applies and also stipulates design requirements for aerodromes.

Considering the existence of a mobile communication tower located to the south-west of the proposed aerodrome, an ICAO Annex 14 assessment was undertaken as part of this Study to establish the potential infringement to the daily operations and registration of the structure on the NCAA database.

For purpose of local civil aviation safety an avifauna study was undertaken to identify the existence of larger birds classified as having a high risk collision potential and propose mitigations to avoid any such incidents.

4.2.3 National Water Act No. 54 of 1956

It was promulgated by the previous South African Government during the time when Namibia (then South West Africa) was under South African administration. Only certain Articles in the Act relevant to Namibia were made applicable in the Country according to Article 180 of the Act. The Act was repealed by the recently enforced Water Resource Management Act (No. 11 of 2013) by an Act of the Namibian Parliament.

This existing Water Act in Namibia is expected to be repealed by the Water Resources Management Act, No. 11 of 2013, promulgated by Parliament in November 2013, but not yet enforced.

The Water Act makes provision for a number of functions pertaining to the management, control and use of water resources, water supply and the protection of water resources. A distinction is made between private and public water in terms of ownership, control and use. The Act recognises the natural environment as a water user.

Of importance to the Project, the Water Act of 1956, as amended, requires approval from Government for (i) abstraction of public waters; and (ii) purification and disposal of industrial water and effluents, apart from various others.

This Act, along with the Water Resources Management Act, No 11 of 2013 requires the Proponent and Project team to investigate and implement measures to ensure sustainable use of water resources and ensure that no pollution of any above or below ground water takes place.

4.2.4 Water Resources Management Act No. 11 of 2013

The Act has been promulgated by Parliament in 2013 (GN. No. 332 of 2013) and brought into force on 29 August 2023, which now repeal the Water Act (No. 54 of 1956) and various amendments to the Water Act.

The Act provides for the management, development, protection, conservation, and use of water resources; to establish the Water Advisory Council, the Water Regulatory Board and the Water Tribunal; and to provide for incidental matters.

Of particular importance to the proposed Opuwo Aerodrome is the abstraction of water of ground or surface water. In line with the Water Act, this Act requires that the Proponent applies for the following licences from the Directorate of Law Administration with the Ministry of Agriculture, Water and Land Reform:

- Licence to abstract and use water (section 44); and
- Licence to discharge effluent or construct or operate wastewater treatment facility or waste disposal facility (section 72).

Subject to the Water Resources Management Act, 11 of 2013, the General Guidelines (July 2008) developed by the Department of Water Affairs addresses treatment of wastewater by means of different systems. It includes design information and strives to present information that may be helpful to owners and operators of a particular system.

Water pollution control in general and waste water discharge in specific will be important issues requiring proper management from the side of the Proponent to ensure that no surface- or ground water is polluted in such a way that it becomes less fit for purposes for which it would ordinarily be used. Part 12 of the Act requires that efficient water management practises be applied by each and every person or organisation and organ of state.

It is important to take note of the requirements with regards to the disposal of sewage, construction and operation of a waste water treatment plant, disposal of waste, the prevention of surface and groundwater pollution, and the sustainable use of water resources. It is thus important that the Proponent and Project Team provide for the necessary planning and technology to prevent any potential pollution of groundwater and that water usage be done on a sustainable basis.

For purpose of complying to the Act, a hydrogeological baseline assessment was undertaken to establish the vulnerability of the underground resource to potential pollution. In addition a remote sensing and geophysical profiling was done with the aim to select a drill site/s for sinking of boreholes for use by the Opuwo Aerodrome, during both the construction and operational phases.

4.2.5 Forest Act No. 12 of 2001 (as amended)

The Act deals with forests in general and matters incidental thereto, but also protection of the natural environment in general, similar to the Nature Conservation Ordinance of 1975. It allows for the declaration of protected areas in terms of soils, water resources, plants and other elements of biodiversity. This includes the proclamation of protected species of plants and the conditions under which these plants can be disturbed, conserved, or cultivated.

Section 22(1) of the Act stipulates that no living tree, bush or shrub within 100m from any river, stream or watercourse may be removed. Section 22(2) provides for the opportunity to apply to a licensing officer for a licence to either cut or remove trees, bushes or shrubs, or any indigenous plants.

In the event that any protected species (i.e., Mopane trees & other) are to be removed from the project site approval would be required from the Forestry Department with the Ministry Environment, Forestry and Tourism.

4.2.6 Soil Conservation Act No. 76 of 1969 (as amended)

Partially similar to the other acts and ordinances mentioned, this Act addresses the issues of vegetation and ground water, but also includes the matter of soil. In specific, the Act focuses on combating and preventing soil erosion, the conservation, protection and improvement of soil, vegetation and water sources and resources. The Second Soil Conservation Amendment Act applies the Soil Conservation Act to Namibia and deals mainly with soil conservation, soil stabilisation and fire protection.

This Act thus duplicates most of the legal requirements stipulated in the Water Act, Water Resources Management Act, Nature Conservation Ordinance and Forest Act.

4.2.7 Atmospheric Pollution Prevention Ordinance, No. 11 of 1976 (as amended)

This Ordinance generally provides for the prevention of the pollution of the atmosphere. Part IV of the Ordinance deals with control of dust and provides for the proclamation of dust control areas. The entire area of Namibia, with the exception of the east Caprivi Strip is classified as a controlled area, as laid out in section 4(1)(a) of the Ordinance (GN. 309 of 1976).

Dust and other mentioned nuisances are expected to be generated during the construction and operation phase. Care should be taken to limit the dust pollution as a result of excavations and areas cleared of vegetation, as it could be categorised as causing a public nuisance under common law.

4.2.8 The National Heritage Act, No. 27 of 2004

The act provides for the protection and conservation of places and objects of heritage significance and the registration thereof, as all archaeological and paleontological objects belong to the state.

In line with the Act, a heritage impact assessment was undertaken to determine the existence of any heritage remains and/or resources currently used by the local people.

4.2.9 Draft Pollution Control and Waste Management Bill, July 1999 (Third Draft September 2003)

The Bill aims to promote sustainable development and relates to preventing and regulating the discharge of pollutants to the air (Part 2), water and land (Part 3); integrated pollution control (Part 4) and to regulating noise, dust and odour pollution (Part 5); and to establishing a system of waste planning and management (Part 6). Reference is also made to hazardous substances (Part 7) being a parcel duplication of what is covered in the Hazardous Substances Ordinance (No 14 of 1974).

The Bill has relevance to the proposed Opuwo aerodrome considering the aspects of potential water and dust pollution, as well as solid waste management. With regards to waste management, Section 55(1) of the Bill stipulates that *'No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment'.* It is further stipulated that '*no person shall collect, transport, store, treat, recover or dispose of waste or hazardous waste except under and in accordance with the provisions of a waste management licence issued under section 62*' and '*every person who owns a waste site, shall hold and comply with a waste site licence issued under section 62'*.

The Bill amalgamates a variety of Acts and Ordinances, mainly inherited from the South African administration, which provides protection for particular species, resources or components of the environment. This Bill will be rewritten, and it is widely accepted that the draft Bill will change substantially.

4.2.10 Public Health Act, No. 36 of 1919 (as amended)

This Act makes provision for the prevention and control of infectious diseases, venereal diseases and epidemics. It also regulates sanitation, food and public water supplies.

Section 119 of this Act prohibits the existence of a 'nuisance' on any land owned or occupied by any person. The term 'nuisance' is important for the purpose of this Project, as it is specified, where relevant in Section 122 as follows:

> *Section 119 - Nuisances prohibited:*
>
> *No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.*

4.2.11 Labour Act, No. 11 of 2007

Under this Act, the issue of occupational exposures to employees are covered under the regulations relating to the Health and Safety of Employees (Chapter 4 of the Act) at work. Of particular importance is Section 39 of the Act dealing with the employer duties to employees.

4.2.12 Communal Land Reform Act, No. 5 of 2002

The Act provides for the allocation and administration of all communal land and makes provision for the prevention of negative impacts to the natural environment The Act gives certain rights to traditional authorities, and states that future regulations will address issues pertinent to the conservation and sustainable management of water and watercourses, of woods and to the combating and prevention of soil erosion, the protection of pastoral resources, such as the grazing of stock, and any other matter as the Minister may consider necessary or expedient.

Section 45 of the Act addresses issues pertinent to the conservation and sustainable management of certain natural resources. The Minister may make regulations in relation to watercourses, woods and the use of water (Section 45 (g)) and to the combating and prevention of soil erosion, the protection of the pastoral resources and the limitation and control of the grazing of stock.

The study area is situated with Namibia's Communal Area and cognisance should be taken thereof during negotiations, construction and operation of the proposed Project.

4.2.13 Traditional Authorities Act, No. 25 of 2000

The Namibian parliament enacted the first version of the Traditional Authorities Act in 1995. The Act was amended in 1997 and a fully revised version was enacted in 2000. In pursuance of the 1995 Act, a process of recognition of traditional authorities began. To date, 49 traditional authorities have been

gazetted in the Government Gazette of Namibia. All 49 traditional authorities are represented in the Council of Traditional Leaders, established under the Council of Traditional Leaders Act.

Section 3 of the Traditional Authorities Act gives certain powers, duties and functions to traditional authorities and members thereof. Section 3(2)(c) of the Act is about the environmental responsibility of traditional authorities. The provision stipulates that the members of the traditional authority shall ensure that the members of his or her traditional authority use the natural resources at their disposal on a sustainable basis and in a manner that conserves the environment and maintain the ecosystem for the benefit of all persons in Namibia.

Involvement from the side of the applicable traditional authority becomes necessary to ensure buy-in from the affected community and sustainable development to the benefit of the larger community.

4.3 OTHER RELEVANT LEGISLATION AND APPROVALS REQUIRED

This section of the chapter discusses legislation indirectly relevant, as well as permits and approvals required for the proposed Opuwo Aerodrome.

4.3.1 Other Relevant Legislation and Policies

Other legislation and policies relevant to the EIA and Project include, but are not limited to, the following:

- National Waste Management Policy, July 2012 - The National Waste Management Policy is complementary to the National Environmental Health Policy, which was launched in 2003, and is one of the governing tools for waste management in the country. It also takes into consideration the international objectives of environmental protection and rational use of energy and resources.
- Hazardous Substances Ordinance (No. 14 of 1974), as amended - Provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances.
- Petroleum Product and Energy Act (No. 13 of 1990), as amended, provides for specific standards for the storage of petroleum products, and in this case Diesel. It further provides general duty with regard to fires, explosions as well as possible spills and leakages.
- Namibia’s Green Plan - Aims at securing - for present and future generations - a safe and healthy environment and a prosperous economy. The Green Plan recognises that “the health of individuals, society and the economy are inextricably linked to the health of the environment.

- Explosives Act (No. 26 of 1956), as amended – Provides for the consolidation of the laws relating to the manufacture, storage, sale, transport, importation, exportation and the use of explosives. It also takes into consideration the process of removing land mines from an area by demining or mine clearing and de-bushing vegetation for access and land mine clearance, risk education, victim assistance, advocacy and stockpile destruction. It aims to clear land off the threat of explosive hazards and restore peace and security at the community level.

4.3.2 Permits, Licences and/or Approvals Required

The following approvals (Table 4.3.2-1) may also be required:

Table 4.3.2-1: Approvals required

Activity	Permit / Licence / Approval	Legislation / Institute
Electricity supply	Approval	NORED
Road access from the C41/MR100	Approval	Roads Authority
Construction and operation of waste water treatment facility Treatment of effluent and discharged of treated effluent and to make it available for re-use Quality of treated effluent	Permits for: Abstraction Waste water discharge Reuse	Water Act No. 54 of 1956 Water Quality Standards for Effluent (Annexure, June 2012) Water Resources Management Act (Act 11 of 2013) Department of Water Affairs, Ministry of Agriculture, Water and Land Reform
Removal of protected and indigenous species	Permit	Forest Act (No. 72 of 1968) Nature Conservation Ordinance (No. 4 of 1975) Ministry of Environment, Forestry and Tourism
Abstraction of surface or ground water	Approval	Water Act No. 54 of 1956 Directorate of Resource Management, Division of Law Administration, Ministry

		of Agriculture, Water and Land Reform
Operation of the Opuwo Aerodrome	Licence	Civil Aviation Regulations, GN. No. 1 of 2001 Directorate of Civil Aviation
Storage of more than 600 litres of petroleum on site (if applicable)	Consumer Installation Certificate	Petroleum Product and Energy Act (Act No. 13 of 1990), as amended Ministry of Mines and Energy
Demining and de-bushing of the Opuwo Aerodrome Project Area (± 74 hectares)	Explosives Ordnance Clearance	Explosives Act (Act No. 26 of 1956), as amended Ministry of Home Affairs, Immigration, Safety and Security

4.4 INTERNATIONAL TREATIES AND CONVENTIONS

4.4.1 Vienna Convention for the Protection of the Ozone Layer (1985)

This convention aims to protect human health and the environment against adverse effects resulting from modifications of the ozone layer. Parties undertake to cooperate in research concerning substances and processes that modify the ozone layer, on human health and environmental effects of such modifications, and on alternative substances and technologies; and in systematic observation of the State of the ozone layer. Furthermore, parties commit themselves to cooperate in formulation and implementation of measures to control activities that cause adverse effects through modification of the ozone layer, and, particularly, the development of protocols for such purposes, and to exchange scientific, technical, socio-economic, commercial and legal information relevant to the Convention, and cooperate in the development and transfer of technology and knowledge.

4.4.2 The United Nations Convention to Combat Desertification (UNCCD)

This convention focuses on land degradation in the dry lands where some of the most vulnerable ecosystems and people in the world exist. The 10-year strategic plan and framework adopted to enhance the implementation of the Convention for 2008-2018 include the strategic objective to generate global benefits through effective implementation of the UNCCD. The expected impact of this objective is that land management and combating desertification/land degradation will contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change.

4.4.3 Convention on Biological Diversity

In 1992 in Rio de Janeiro, at the United Nations Conference on Environment and Development, Namibia signed this convention, and this was ratified in 1997.

Under article 7 Namibia is obliged to:

- Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use.

- Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings.

Under article 14 of the convention, EIAs must be conducted for projects that may negatively affect biological diversity.

4.4.4 Stockholm Declaration on the Human Environment, Stockholm (1972)

Namibia adopted the Stockholm Declaration on the Human Environment on 28 August 1996. It recognizes the need for: "*a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment*". Among the proclamations are, in short:

- Natural resources must be protected.
- Wildlife must be protected.
- Pollution must not exceed the environment's capacity to clean itself.
- Oceanic pollution that is damaging must be prevented.
- Rational Planning must prevent or resolve conflicts between environment and planning.

CHAPTER 5 : BASELINE INFORMATION

This chapter describes the details pertaining to the larger Study area with reference to ownership and administrative history, governance and land use, socio-economic profile, biophysical characteristics, cultural, archaeological and heritage characteristics, and visual characteristics.

This provides the basis for assessing the likely negative and positive impacts that the Project might have on the receiving environment (e.g. natural and social), as well as the significance thereof. This again will inform the applicable mitigating measures to be applied during construction and operation, as well as design changes to the proposed Project.

5.1 OWNERSHIP

The area identified for the proposed Project and subject to this Study is under jurisdiction of the Otjindjerese Traditional Authority, as provided for by the Traditional Authorities Act, No. 25 of 2000.

5.2 GOVERNANCE AND LAND USE

The Kunene Region, located between Angola and the Erongo Region, to the north-western part of Namibia is governed by the Kunene Regional Council, as provided for under the Regional Councils Act (No. 22 of 1992).

This Region consists of the Skeleton Coast Park, the Kaokoland, parts of the Etosha National Park, commercial farming areas around Outjo, Kamanjab and east of Khorixas and the communal area around Khorixas. The Kunene Region comprises seven constituencies namely Epupa, Kamanjab, Outjo, Khorixas, Sesfontein, Opuwo Rural and Opuwo Urban, hosting the Regional Capital Town.

The uppermost parts of the Region are generally hilly to mountainous areas with sandy and rock scattered plains in places. Sand dunes occur over some areas further to the west close to the Skeleton Coast Park. The Kunene River flows along the north-western parts of Namibia forming a border with Angola. The Epupa and Ruacana waterfalls are major tourist attractions along this river. Manmade springs and wells are dominant in this Region as the nearby rural communities depend on groundwater.

5.3 SOCIO-ECONOMIC PROFILE

The Kunene Region is seeing more investments in sectors such as agriculture, tourism and mining. Adventure tourism is one of the fastest-growing sectors. As the Region is rich in natural resources, processing these resources locally would lead to job creation throughout the vast region.

Another area of potential for investors is the construction of an aerodrome facility (Namibia Investment Centre). The ICT sector in the Kunene Region is not fully developed, and the region also has huge potential for cattle farming, but the lack of a regional abattoir hampers the development of this sector.

Tourism forms the economic base of the Region with the Epupa and Ruacana waterfalls, Van Zyl's pass and the Marienfluss valley in the north, the Skeleton Coast Park in the west, the Etosha National Park in the east, the Petrified Forest, Organ Pipes, Burnt Mountain and the Twyfelfontein rock engravings west of Khorixas and the Rock Finger between Khorixas and Outjo, as the major tourist attraction sites. - Subsistence farming is the second most dominant economic activity in this Region with crop and livestock farming activities.

5.3.1 Population Demographics

The Kunene Region has a surface area of 115,923 km with the population density of 0.68 and 0.8 as per the 2001 and 2011 census respectively (Population and Housing Census Regional Profile, Kunene Region, 2011).

A population of 86,856 was recorded in 2011 of which 43,253 were women and 43,603 were men and only 27,272 of the population was from Opuwo as per the 2011 Census. As measured in 2011, most of the population is rural (75.3 %) with 40.9% of the total population not having any formal tertiary education. Of the total population, 64.9% was recorded as literate. The literacy rate was higher in urban areas (85.2%) compared to 56% in rural areas (Population and Housing Census Regional Profile, Kunene Region, 2011).

Table 5.3.1-1: Population of the Kunene Region

Population and Housing Census Regional Profile, Kunene Region		
Census 2001		**Census 2011**
Total Population		
	68 735	86 856
Urban	17 004	22 898
Rural	51 731	63 958
Opuwo Constituency		
20 892		27 272

The Kunene Region has a greater proportion of males (Male: 50.2%, Female 49.8%) with more females in the urban areas (Male: 47.1%, Female 52.9%) and males dominating in rural areas (Male: 51.3%, Female 48.7%) as measured in 2011. The largest proportion of the population (51.3%) is

between the ages of 15 – 59 years, which represents the economically active population. Of this, 61.2 % of individuals were living in urban areas (Population and Housing Census Regional Profile, Kunene Region, 2011).

The Namibia National Planning Commission indicates to the Namibian population as young. 30 percent of the household population are below 10 years of age, 43 percent are below 15 years of age, 55 percent are below 20 years of age and 71 percent are below 30 years of age. About half of the Namibian population are in working ages i.e. in the age group 15 - 64. The rate is somewhat lower in rural areas and evidently higher in urban areas. Only 5 percent of the Namibian population is 65 years or older. About 60 percent of the Namibian households are headed by males. Males are in the majority as heads of household in most regions. But females are in the majority in certain regions such as Ohangwena, Omusati and Oshana. The percentage of male headed households in urban areas is about 70.

There are many languages spoken in the Namibian private households and many Namibians are multilingual. The most common main language is Oshiwambo, which is the main language for half of the Namibian population. Afrikaans, Damara/Nama, Rukavango and Otjiherero are main languages for about 9 – 12 percent of the Namibian population respectively. The Otjiherero language is the main language spoken in the Opuwo constituency.

On the national level the percentage of female headed households having a food consumption rate of 60 percent or more is 41 percent while it is 36 percent for male headed households. This indicates that poverty is somewhat more common in female headed households than in male headed households. The local inhabitants surrounding the project area comprises of 9 percent male headed households and 1 percent of female headed households.

5.3.2 Economic Activities

Subsistence farming with both crop and livestock rearing is dominant in the Kaokoland and forms the economic base of the Opuwo area as well.

The Region is classified as a prime tourist destination due to its rugged landscapes and ancient traditional diversity and practices. Tourism has been identified as a key economic sector for the Region, predominated by wild animals in national parks and conservancies. The potential for further tourism development is very high due to its scenic beauty, wildlife and the culture of its inhabitants. With over thirteen conservancies contributing to wildlife conservation, the number of endangered species such as the black rhino and the Hartmann zebra is managed and conserved. These conservancies include the Epupa and Ruacana waterfalls, Van Zyl's pass and the Marienfluss valley in the north, the Skeleton Coast Park in the west, the Etosha National Park in the east, the Petrified Forest, Organ Pipes, Burnt Mountain and the Twyfelfontein rock engravings west of Khorixas and the Rock Finger between Khorixas and Outjo.

There are a number of accommodation establishments within Opuwo town and within the Kunene Region, especially along the Kunene River, the Hoanib River and further south. The establishment of lodges and bed and breakfasts both in rural and urban areas was as a result in the increase of

tourism activities in the Region. There are also small scale mining activities such as the mining of dioptase and sodalite.

Rock formation presents some mining potential that could benefit the Region economically. The mining sector is rising significantly, particularly with minerals such as iron ore at Orumana, copperat Otuani, diamonds at Otjinungua and rare earth at Khorixas. A large number of concessions and claims for small-scale mining are registered, but many remain unexplored. Currently, small-scale mining activities in the Region are operating in Opuwo rural, Epupa and Khorixas constituencies.

The private sector plays a major role in bridging services within the Region geared towards economic development and growth. The spin-offs are upliftment of the inhabitants' living conditions. The sector includes the necessary institutions within finance, insurance, medical services, retail and wholesale. Financial institutions are found in urban centres such as Outjo, Opuwo and Khorixas.

Despite a poverty reduction of 13 percentage points between 2001 and 2011 (Namibia index of multiple deprivation, National Planning Commission, 2015), an estimated one quarter of the Kunene population is still classified as severely poor.- In the Opuwo constituency, nearly (28 percent) of the population is classified as severely poor, with the Otjindjerese communal area having a 6% unemployment rate.

The economically active population is estimated at 67 percent of the population in Opuwo. Of these, 36 percent are unemployed, according to the unemployment statistics of the Kunene Regional Development Profile of 2015. More than half (56 percent) of the employed population is in the agricultural sector, with tourism and manufacturing accounting for about 4.2 and 4.3 percent, respectively, of employment in the region.

The main economic activity in Opuwo Constituency is agriculture – communal farming and crop production. 77 percent of the population depends on farming as their main source of income. The Government also contributes to the source of income in the constituency, and it has been recorded that Opuwo has 81 percent employment rate and 19 percent unemployment rate. 8 percent derive their income from pensions while 6 percent derive their income from wages and salaries (source: Kunene Regional Development Profile of 2015).

In comparison to the above, local inhabitants located within the surrounding areas of proposed project, represents subsistence farming at 40 percent in the households. Among the remaining 21 percent of the households, 20 percent are dependent on pensions or grants, 0,1 percent depend on business as a source of income, while 39 percent have no household income, due to unemployment compared to a total of 23,8 percent of the region's unemployed labour force.

In Namibia, About 45 percent of the population 15 years and above or about 360 000 are not economically active i.e. they do not belong to the labour force. The labour force participation rate is lower for females than for males. This pattern prevails over all the age groups but the difference between females and males in the labour force participation rate is lower in the younger age groups. The labour force participation increases up to the age group 35-39, where it reaches the peak value for both females and males.

The labour force participation in the rural areas is low compared to the urban areas. The labour force participation of females is less than the labour force participation of males in both rural and urban areas. The female and male participation rates show a greater difference in the urban areas than in the rural areas. The labour force participation of females in the older age groups is much higher in the rural areas compared to the urban areas.

The combined rate of unemployment and underemployment is about 60 percent in Namibia which is a very high figure. This means that about 60 percent of the Namibian labour force is available and looking for more work. About one third of this group is unemployed i.e. without any work while the other two thirds have some employment, but they are underemployed and want more work.

5.3.3 Social Services and Public Infrastructure

a. Housing

Under the Decentralization Policy, the Kunene Regional Council and Local Authorities were mandated to coordinate and construct Decentralized Build Together Programme (DBTP) houses in their respective jurisdiction. Many inhabitants living in towns and settlement areas benefited from this programme.

The DBTP created many temporary employment opportunities for the youth, in each locality. The demand for housing has increased, especially in towns such as Opuwo, which is the capital of the Kunene Region, however the lack of serviced plots poses one of the major challenges for the region.

The most common type of house of the households in the Kunene Region (Opuwo constituency), is the traditional house with hut(s) and kraal(s). About 50 percent of the Namibian households live in such houses. More than 35 percent live in modern housing i.e. in detached or semi-detached houses or in flats.

About four quarters of the households have no electricity or gas for cooking. The same frequencies of households have no electricity for lighting. Almost 90 percent of the households use the bush or a bucket as toilet. About 40 percent have no pipe or well for drinking water within 5 minutes' one-way walking distance from the house.

The regional housing challenges includes -

- Expensive building costs and there is a mismatch between home loans allocated vs. the cost of construction material;
- Low repayment rates, especially from beneficiaries employed by private sectors and self-employed persons;
- Vastness of the region in terms of supplying building materials to settlement areas; and
- Un-serviced plots in settlement areas and urban areas.

Potential regional housing sector investments are listed as –

- Servicing of land for residential, business and industrial purposes;
- Construction of houses under the mass housing programme;
- Mortgage financing schemes through private banking systems; and the
- Production and supply of concrete products and construction services

b. Roads

Road networks play a major role in the transportation of goods and services between centres and rural areas of the Region. Kunene Region has coverage of 545 kilometres of tarred road connecting all major towns such as Outjo, Khorixas, Kamanjab and Opuwo.

The Kunene Region has spent over N$ 33 million from its initial allocated N$ 200 million for the 2022/23 financial year, due to funds that were virement on given projects such as N$ 175 million towards the construction of the new 412 kilometre-long Swakopmund-Henties Bay-Kamanjab road.

The proposed Site is located approximately 4 km north of the Omakange - Opuwo Main Road (main road no. 100) providing ideal access. Omakange connects to the eastern, central, coastal and northern parts of the country and is located on Main Road 67 (a section of road on Route C35) between Kamanjab and Ruacana connecting through Opuwo.

District Road 3700 approximately 197 km from Opuwo, starting at the junction with MR100/C41 and District Road 3703 running southwards to Sesfontein at a distance of approximately 135 km. Opuwo is situated at the road intersections that connect all parts of the Kunene Region.

c. Aerodromes

The present Opuwo Aerodrome, which is not in use anymore, is the largest of the 14 unlicensed landing strips throughout the Region. The closest runway of bitumen surface standard is at Ruacana.

There are no standardised airports in the Region, with only small chartered planes available, that are not conducive for air transportation of goods and service, or larger scale tourism.

d. Water Supply

The Kunene Region`s natural mountainous and rocky terrain makes it comprehensively difficult to supply potable water to communities in the region (source: Kunene Regional Development Profile of 2015).

Due to a shortage of potable water within the Region, community boreholes are the major source of potable water for both human and animal consumption, as well as crop cultivation. A potable water

pipeline network system from Ruacana via Omakange to Opuwo was implemented by the Ministry of Agriculture, Water and Land Reform (MAWLR), which benefits communities within a 10 km radius of the pipeline.

Within close proximity to the Site, a water pipeline exists south of the MR100/C41 towards Omakange, as well as a water reservoir in the Alfa settlement about 16 km east of Opuwo with water pipelines leading from Alfa to Mopane Village.

e. Electricity

A large part of the Kunene Region is not covered by on-grid power network, as a result there is a high potential for off-grid (renewable energy) power generation. The northern part of Kunene is negatively affected by the lack of on-grid networks due to the physical terrain making infrastructure provision difficult and expensive.

The Ruacana hydroelectric power station, which feeds into the national grid, is located at the border with Angola at the Kunene River. The Baynes Site situated in the Kunene Region has the potential to be Namibia's largest hydropower plant.

Bulk overhead transmission lines (33kV & 66kV), passing along the MR100/C41 is located within close proximity of the Site, to which a connection is possible.

f. Telecommunications

Kunene Region has network coverage of all (mobile and landline) major telecommunication network providers such as Mobile Telecommunication Network (MTC) and Telecom Namibia. The Region is linked to the external world through the existing telecommunication systems e.g. voice, data and mail.

During 2015 fifty percent (50%) of the Kunene Region had radio and television coverage; while MICT planned to increase the coverage to 65%. MICT through the Namibian Broadcasting Cooperation aimed to reach 100% coverage through satellite transmission of radio and television signals.

One such communication tower is located 5.2 km south-west of the most western boundary of the proposed Aerodrome (), which requires consultation with the Director of the Directorate of Civil Aviation, as provided for by Part 139 of the Namibian Civil Aviation Regulations, as regulated by the Aviation Act (No. 74 of 1962). For this purpose an ICAO Annex 14 Assessment (Appendix B5) was undertaken during October 2023, which concluded that the communication tower structure in question would penetrate the Conical Obstacle Limitation Surface and require registration of the communication tower with the Aerodrome Obstacles section of the AIP for the proposed Opuwo Aerodrome as seen in figure 5.3.3-1.

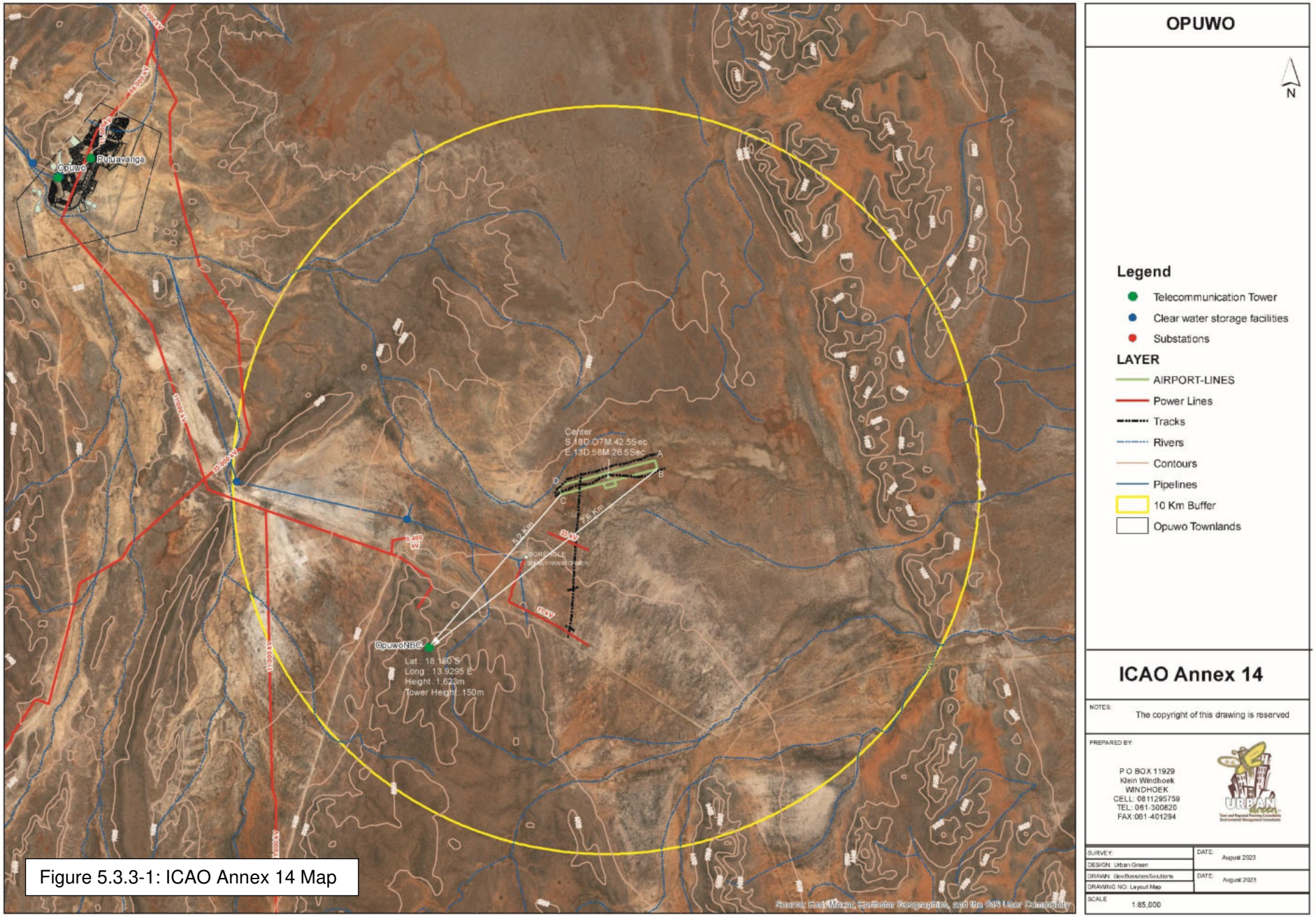

Figure 5.3.3-1: ICAO Annex 14 Map

5.4 BIOPHYSICAL PROFILE

5.4.1 Meteorology and Climate

The climate of the Region is dry for most of the year and characterized by dust storms especially from August to October. The terrain is semi-arid and gradually becomes desert land towards the Skeleton Coast forming the western border. Climate change observations in the region are indicative of on-going natural variability. Changes in rainfall patterns in the last few years have had great impact on the livelihood of the inhabitants.

a. Wind

Wind speeds and direction is greatly determined by the varying landscape of the Kunene Region. Wind speeds mostly differ between 0 km to 25 km/h, with seasonal storm strength wind speed. Direction is predominantly south-west and north-east, according to which the runway of the Aerodrome has been planned.

The data collected from the wind-rose for Outapi suggests a runway bearing of 75 degrees east of true north. Wind velocities of zero to 19.7 km/h occurred during 98,7% of the period analysed. The utilisation of the runway by aeroplanes for wind velocities of up to 24.0 km/h is 99,8%. A runway bearing of 75 degrees plus or minus 10 degrees would also provide a utilisation factor above 95% for aeroplanes with an aeroplane reference field length of less than 1 200 m.

b. Temperature

The Region's temperature is determined by the landscape, which range from 17 °C along the coastline to 30 °C inland, with seasonal temperatures up to 35 °C in summer. Dominant day temperatures during winter time are around 25 °C, while minimum temperature is around 7 °C.

c. Rainfall

The area experiences a strong seasonal summer rainfall with highest rainfall recorded in January (109.3 mm) and February (117.1 mm), while winters are generally dry. Average rainfall for Opuwo and surroundings is 300 mm to 350 mm per year.

d. Altitude

The Region's topography, i.e., altitude, differs greatly from the coastline (0 m above sea level) to the mountainous areas of 1,600 to 1,800 m above sea level.

The runway at Opuwo has an altitude of 1,146 m above mean sea level.

5.4.2 Air Quality

Considering the very low population number and density, as well as limited economic activities throughout the Region, specially manufacturing and large scale industry, the Region's air quality is very good. Air quality deteriorates during the windy months of August, September and October.

5.4.3 Geology and Soils

The local geology in the area of the proposed Opuwo Aerodrome is shown in Figure 5.4.3-1. The predominant geology comprises dolomites of the Tsumeb Subgroup (mainly of the Maieberg and Elandshoek Formations) to the south and east, with Dwyka Group tillite, boulder shale, shale, and mudstone of the Karoo Supergroup. Over large parts, the hard-rock geology is covered by Quaternary sediments.

There are no significant geological structures, such as faults or major joint systems mapped to occur in the area. There is though one (limited in length) fault mapped in the Hüttenberg Formation dolomite some 9 km east of the Site. A syncline axis forms the north-south axis of the Maieberg- and Elandshoek Formation dolomites to the southwest of the airstrip.

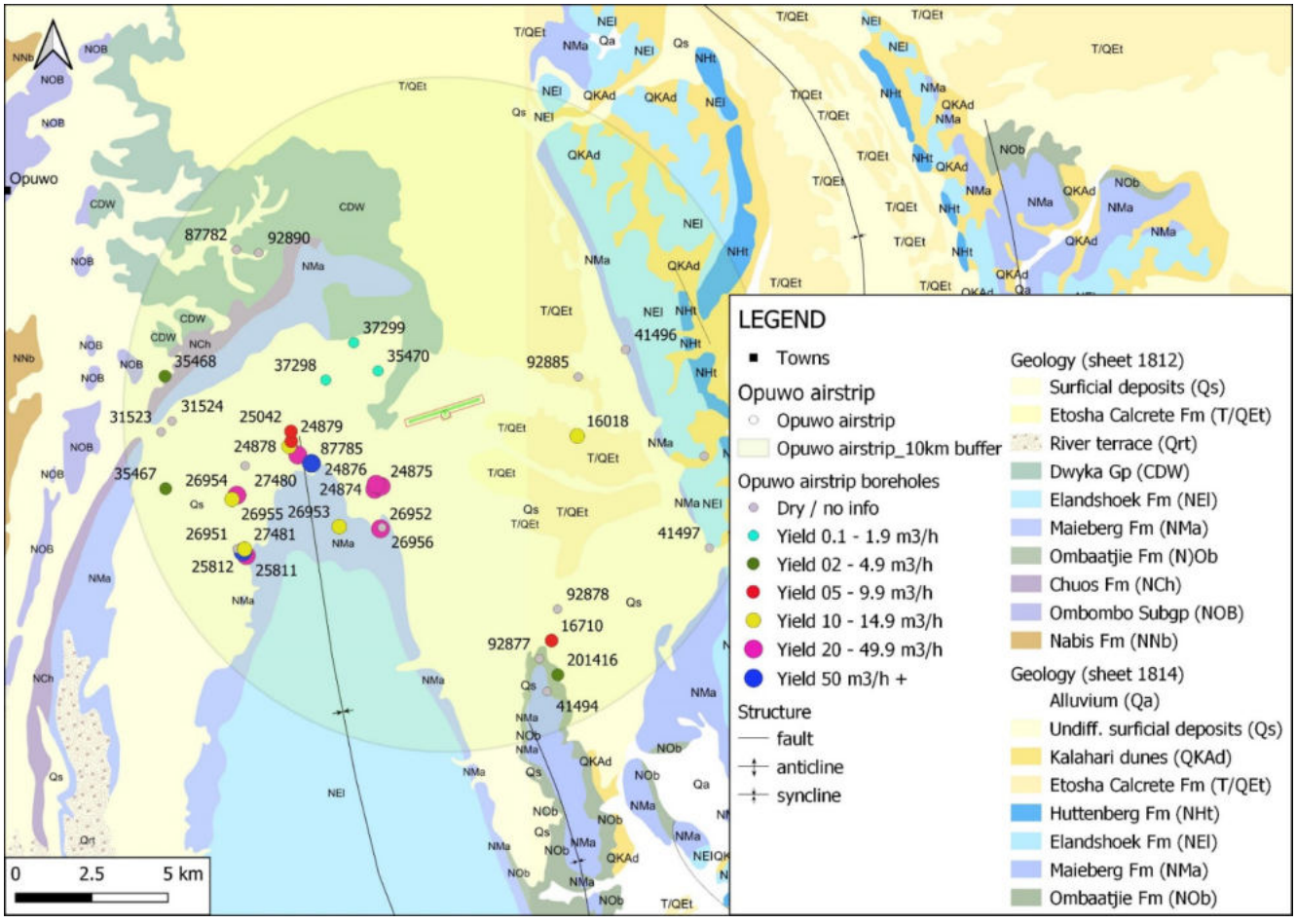

Figure 5.4.3-1: Geological characteristics

The dominant soil types of the proposed study site are ferralic Arenosols and eutric Regosols. The Arenosol group of soils consists of sandy soils. This covers soils developed in residual sands (i.e. old, usually quartzite-rich soils or rock) as well as soils developed in recently deposited sands (i.e. those that occur in deserts and beaches). Arenosols are defined by World Soil Information (www.isric.org) as:

- Having a texture which is loamy sand or coarser either to a depth of at least 100cm from the soil surface, or to a plinthic, petroplinthic or salic horizon between 50 and 100cm form the soil surface;
- Having less than 35 percent (by volume) of rock fragments or other coarse fragments within 100cm of the soil surface; and
- Having no diagnostic horizons other than an ochric, yermic or albi horizon, or a plinthic, petroplinthic or salic horizon below 50cm from the soil surface.

Ferralic Arenosols are usually sandy soils that have been intensely weathered and are found to have high levels of iron. As such, it is known that some iron mines occur in the region of the proposed site.

Regosols, on the other hand, are defined by World Soil Information (www.isric.org) as being a taxonomic rest group. They are known to be weakly developed mineral soils in unconsolidated material that appear to only have an ochric surface horizon. According to the European Soil Portal (http://eusoils.jrc.ec.europa.eu), they are, however, noted to be extensive in eroding lands and particularly so in arid and semi-arid regions, which is typical of the Namibian landscape.

5.4.4 Topography and Surface Drainage

The landscape along the upper most part of the Region is characterised by hills and mountains, with patches of sands and sand dunes covering the western parts of the Region. The hills and mountains surround the western parts and a highland surrounding the eastern part of Opuwo.

The topography in the immediate vicinity of the airstrip can be described as mostly flat with the elevation about 1,350 masl. Some 5 km to the southwest of the airstrip, the dolomites of the Tsumeb Subgroup form a mountain range with elevations up to 1,560 masl. The airstrip is located on a flat area of a watershed between westward and eastward draining rivers respectively. Figure 5.4.4-1 shows the topography by means of contours.

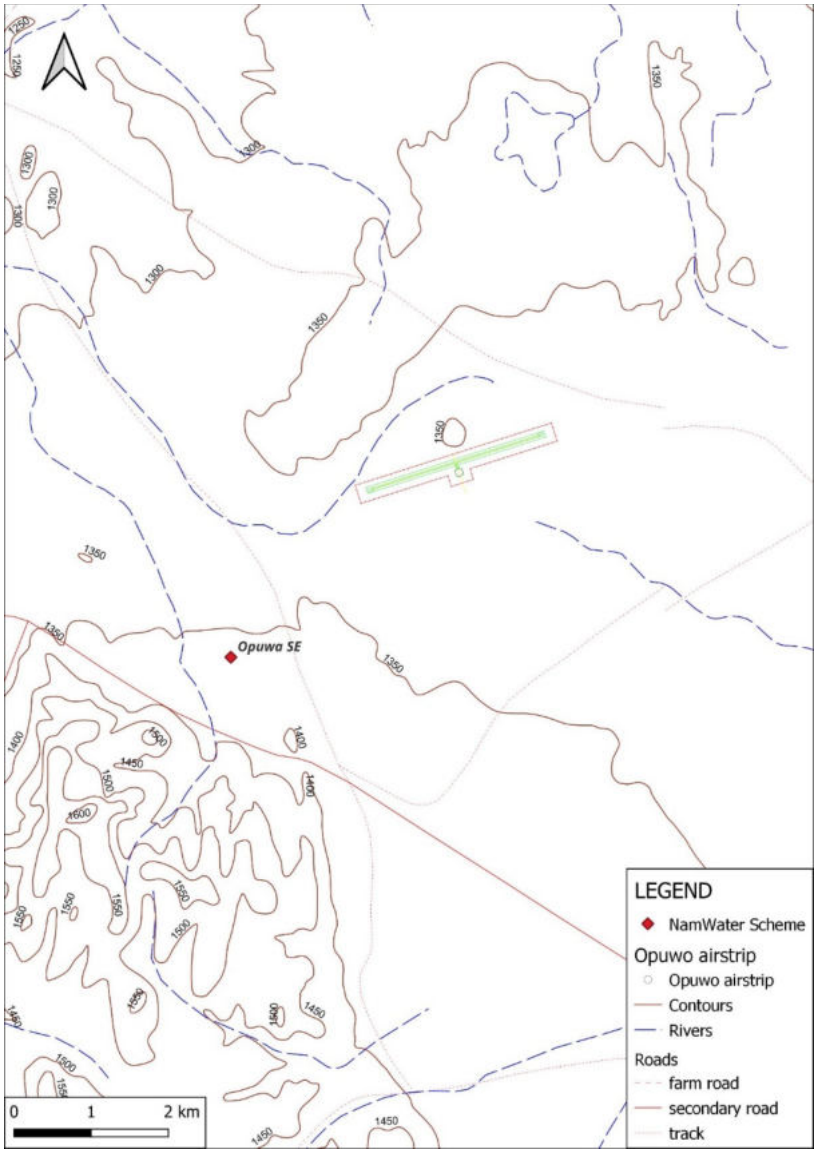

Figure 5.4.4-1: Elevation map with contours

5.4.5 Flood Plains and Catchment

The Kunene River is the only perennial river which flows between the Ruacana and forms a natural border between Namibia and Angola. The Epupa and Ruacana waterfalls are major tourist attractions along this river.

5.4.6 Groundwater Potential & Existing Boreholes

The characteristics and behaviour of the geohydrological environment is hugely influenced and dictated by the prevailing geology, and that the predominant rock types determine the geological formations' capacity to host groundwater. It also determines if groundwater can move "easily" through the rock types or not, i.e., it determines the presence and yield of a groundwater resource. Of the various rock types present in the area, the dolomites are the ones with the better groundwater potential.

The NamWater production boreholes of the Opuwo-SE wellfield exploits the Maieberg dolomites.

The locations and yields of the existing boreholes within a radius of 10 km from the proposed Opuwo Aerodrome are shown on the satellite image in Figure 5.4.7-1, while the borehole information as recorded in the GROWAS database of the Ministry of Agriculture, Water and Land Reform is summarised in Table 5.4.7-1.

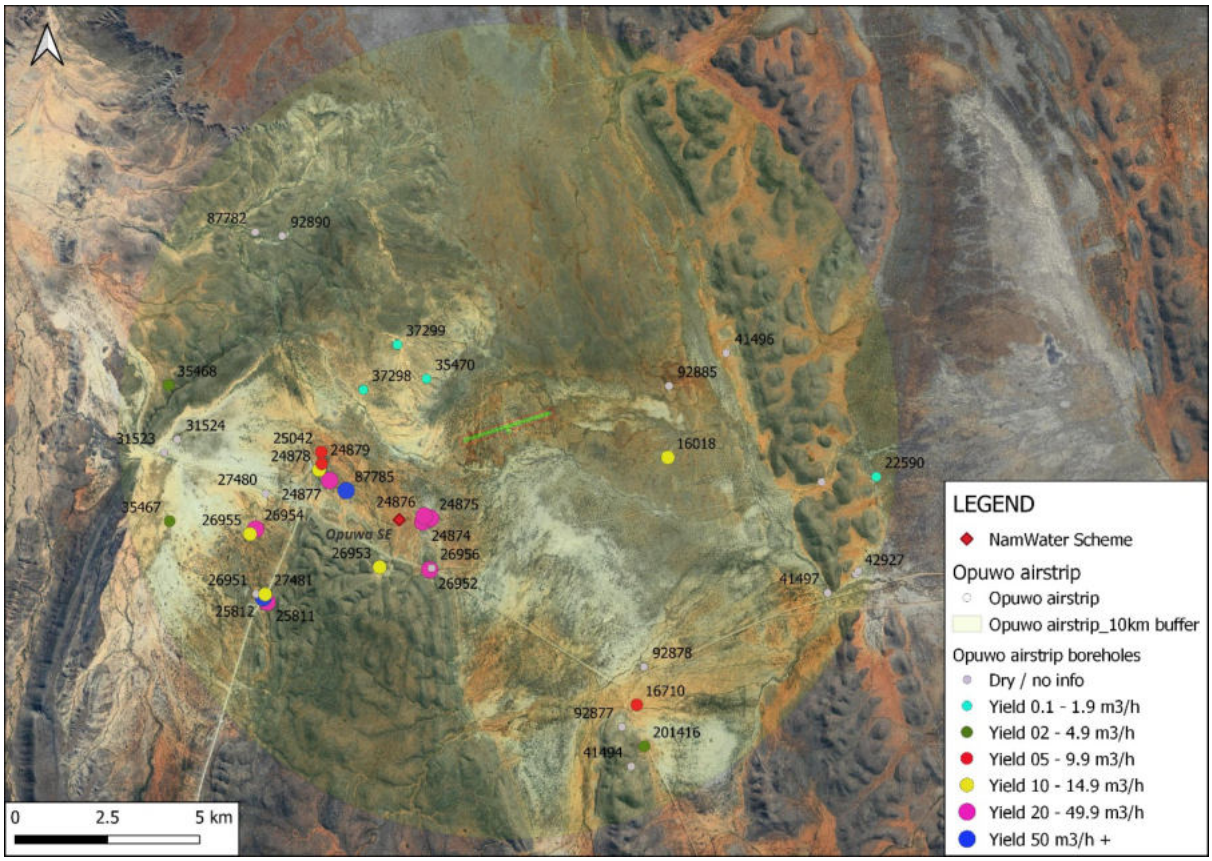

Figure 5.4.7-1: Locations of the existing boreholes in the Opuwo airstrip area

As can be seen in Figure 5.4.7-1 and Table 5.4.7-1, borehole yields vary significantly. A few boreholes are dry, while the highest recorded yield is 70 m^3/h. It is important to note that all the higher yielding boreholes are located either on dolomite outcrops, or in areas where the dolomite are covered by the Quaternary sediments. Boreholes that are located on / near the Dwyka shales generally have lower yields.

Table 5.4.7-1: Static borehole information

Location	Borehole number	Latitude (°S)	Longitude (°E)	Depth (m)	Blow yield (m^3/h)	RWL (m)	Drilled (date)
Osondeka	WW016018	-18.1346	14.0152	75	10	50.6	30/01/1972
Otjerunda	WW016710	-18.1952	14.0069	88.2	6.8	61.6	28/11/1973
Otjivelo	WW022590	-18.1396	14.0686	95	1.5	24	26/01/1978
Opuwo	WW024874	-18.1501	13.9523	42	36	11	05/11/1979
Mandu	WW024875	-18.1492	13.9543	56	40	10.15	07/11/1979
Mandu	WW024876	-18.1486	13.9527	60.5	40	10.25	14/11/1979
Alfa Basis	WW024877	-18.1398	13.9285	50	22.5	11.32	12/12/1979
Alfa Basis	WW024878	-18.1372	13.9258	90	12	10.49	01/12/1979
Alfa Basis	WW024879	-18.1357	13.9265	60.5	6.25	10.72	30/11/1979
Alfa Basis	WW025042	-18.1328	13.9264	60	6.25	22.3	15/12/1979
Alfa Basis	WW025811	-18.1695	13.9123	60	45	46	28/02/1984
Alfa Basis	WW025812	-18.1684	13.9113	66	70	33.5	27/02/1984
	WW026951	-18.1675	13.9095	84	0		01/03/1984
	WW026952	-18.1618	13.954	107	20	18	05/03/1984
	WW026953	-18.1611	13.9412	123	10	21	07/03/1984
	WW026954	-18.1516	13.9095	66	20	22	12/03/1984
	WW026955	-18.1528	13.908	66	10	16.4	08/03/1984
	WW026956	-18.1614	13.9545	60	0		15/03/1984
Alfa Basis	WW027480	-18.1429	13.9121		0		
Alfa Basis	WW027481	-18.1676	13.9118	100	10	33	24/02/1984
	WW031523	-18.1327	13.8861	54	0		24/11/1989
	WW031524	-18.1295	13.8895	70	0		28/11/1989
Ondore	WW035467	-18.14953	13.8874	91	2.9	28.6	06/11/1995
Ondore	WW035468	-18.1162	13.8874	102	3.5	29.6	15/11/1994
Orokapare	WW035470	-18.115	13.9535	73	1	33.87	24/11/1995
Omuramba East	WW037298	-18.1176	13.93727	71	1.7	42.48	15/02/1999
Omurambo East	WW037299	-18.10658	13.94605		0.35	58.86	12/02/1999
Otjerunda	WW041494	-18.2103	14.0054		0		
ohangaipuira	WW041496	-18.1091	14.0303		0		
okatumba	WW041497	-18.168	14.056		0		
Okatumba	WW042927	-18.1634	14.0633		0		
	WW043091	-18.16262	14.06385				
	WW043095	-18.14078	14.05455				
	WW087782	-18.0788	13.9098		0		
	WW087785	-18.1423	13.9327		50	7.8	04/06/1905
Otjerunda	WW092877	-18.2006	14.0031		0		
Otjerunda	WW092878	-18.1859	14.0088		0		
	WW092885	-18.1171	14.0156		0		
	WW092890	-18.0798	13.9167		0		
Otjoninda	WW201416	-18.20536	14.00878	206	3		08/03/2010

The area most feasible for further groundwater resource exploration and development should also be in, or associated with, the dolomites of the Tsumeb Subgroup (see Figure 5.4.7-2).

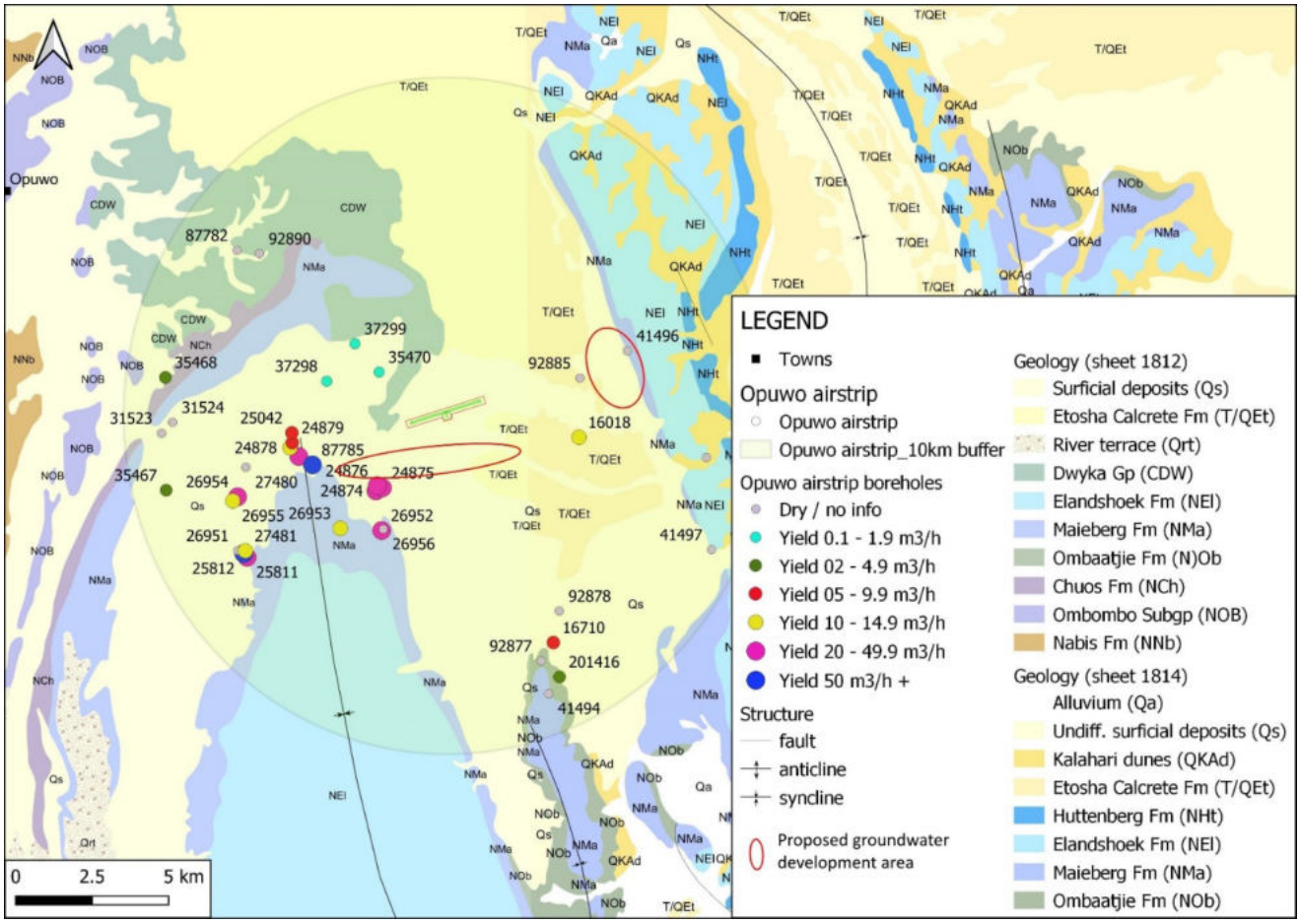

Figure 5.4.7-2: Potential groundwater development areas in the Opuwo

Considering this, the following two localities holds potential -

1. To the south of the airstrip (about 3 km away), BUT this area already hosts a bulk water supply scheme that supplies water to the town of Opuwo.

This area hosts numerous high yielding boreholes, and is the better option to further explore and develop, but the risk of over-abstraction is real if large volumes are required. This being said, the airstrip's water demand, and thus the abstraction rate, is not expected to be very high, and additional abstraction from another borehole in a relatively small area, may not necessarily have a significant impact on the groundwater resource.

2. To the east of the airstrip (about 7 km away).

In this specific area there are only three existing boreholes recorded, two being dry (or with no borehole information recorded), and one that had a blow-yield on 10 m^3/h. Depending on the

thickness of the sediments covering the dolomite, and the dip angle of the dolomite, it is likely that groundwater exploration can be done (a lot) closer to the airstrip.

5.4.7 Biodiversity

a. Fauna

A desktop study of the flora which is expected to occur in the general area associated with Quarter Degree Grid Cell (QDGC) 1813BB was conducted during February 2015 (Appendix B1). Faunal habitat in the study area consisted of the *Colophospermum mopane* woodland with no grass cover, and although a seasonal drainage line was observed, it was dry at the time of the survey.

Photo 5.4.6-1 & 2 – View of Faunal habitat within the study area was limited and consisted of mopane woodland with no grass cover (a) and a dry seasonal drainage line (b).

(i) Avifauna

The area has a high avifaunal diversity with approximately 357 bird species confirmed within QDGC 1813DD and in the region of the study area according to Roberts Multimedia version 7 (2011). Twenty four avifaunal species were recorded in the study area and immediate surroundings during the field survey, none of these were of conservation concern (Appendix B1 of Appendix B to this Report).

Thirty two species of conservation concern have been recorded in QDGC (Appendix B1 of Appendix B to this Report) and although none of these were confirmed during the field survey, six species were given a high likelihood of using the study area and immediate surroundings for foraging.

Considering the possible existence of birds that pose a potential strike risk, an avifauna specialist study was undertaken during September 2023 (Appendix B1). The study recorded three species (2%) within the study area that are threatened in Namibia (Simmons *et al.* 2015, Brown *et al.* 2017),

representing 4% of the 78 species that are on the Namibian Red List. Two of the species are also Globally Threatened (IUCN 2023).

The threatened, terrestrial species are as follows -

- Lappet-faced Vulture (Endangered, also Globally Endangered; raptor)
- Bateleur (Endangered, also Globally Endangered; raptor)
- Rüppell's Parrot (Near Threatened)

In Namibia, one species is fully endemic and 15 species are near endemic (with >90% of their populations in this country). Many more species are endemic or near endemic to the greater southern African region.

The specialist study recorded at least three priority species (2%) that show migrant behaviour; and other migrant species are also included (Appendix B1 to Appendix B of this Report). Although some bird movements are likely to be associated with the Etosha National Park (also an Important Bird Area) 100 km to the south-east, no confirmed bird migration routes (e.g. between wetlands) are known to occur in the study area.

Many species are also nomadic for at least some stage of their lives. The migrant species, all raptors, are as follows:

- Common Buzzard Eagle (Palearctic migrant)
- Yellow-billed Kite (intra-African migrant)
- Osprey (Palearctic migrant; aquatic)

Very little evidence of breeding activity was recorded during the site visit, owing to the prevailing dry conditions. Suspected (past) breeding for:

- White-browed Sparrow-Weaver: old nests
- Red-billed Buffalo Weaver: old nests in trees and pylons
- Potential breeding sites for cavity breeders were noted, e.g. in mopane *Colophospermum mopane* trees; this could include breeding by near endemic species, including Monteiro's Hornbill, Damara Red-billed Hornbill, Rüppell's Parrot, Carp's Tit

Bird flight paths and flyways are likely to vary, depending on current environmental conditions, and are not always easily predicted. Aquatic habitats may become important at different times, especially if and when these systems hold water. Existing data for recorded power line incidents do provide an indication that bird flight paths intersect power line servitudes, although it is unlikely that these are the only routes used. However, no confirmed bird migration or movement routes (e.g. between wetlands)

are known to occur in the study area, although the proximity to Etosha National Park 100 km to the south-east is a potential concern in this respect.

An analysis of vulture movements in relation to aircraft flight corridors in Namibia (Hauptfleisch *et al*. 2020) has identified collision risk hotspots over three national parks: Etosha (100 km south-east of the present study area), Waterberg and the Pro-Namib portion of the Namib-Naukluft.

Available SABAP data indicate few vulture sightings in the study area, limited to Lappet-faced Vulture, pre-1992. However, vulture movements over the study area are possible, given the potential availability of small-stock carcasses.

The specialist study provides a list of 29 priority bird species potentially at higher risk from the proposed aerodrome and the power line development (Table 4 of Appendix B1 of this Report), and summary of bird species groups that present a potential risk (Table 5 of Appendix B1 of this Report).

Bird strike records in Namibia have shown that Crowned Lapwing and Helmeted Guineafowl were the most frequently struck birds at the two main airports in Namibia of which both occur in the study area.

The groups at higher risk to air strikes are as follows:

- Birds of prey
- Lapwings
- Ground foragers (larger species, e.g. Helmeted Guineafowl)
- Pigeons and doves
- Hornbills
- Swifts (and swallows)
- Songbirds or perching birds (Passerines), including crows
- Ostrich (low risk if aerodrome site is fenced)
- Owls, nightjars (low risk unless night flying of aircraft takes place)
- Aquatic birds: (low risk unless new open-water aquatic habitats are created)
- Korhaans
- Turacos (Go-away-birds)

(ii) Mammals

Approximately 82 mammal species are expected to occur within the geographical area associated with the study site based on species distribution ranges of the IUCN (2013). Thirty three species

were given a high likelihood of occurring in the study area based on the presence of suitable habitat (Appendix B1 of Appendix B to the Report). Many of the larger faunal species which are generally restricted to formally protected areas, still roam freely in northern Namibia, including *Loxodonta africana* (African Elephant) (Leggett et al., 2004). In addition to this, Community-Based Natural Resource Management Programmes (CBNRM) in Namibia have received international recognition for conservation and poverty relief (Hooles and Berkes, 2010).

The CBNRM allows for conservation on a landscape level in which wild animals are allowed to roam freely in rural areas and communities can benefit from the income generated through ecotourism. Of the 33 species which were considered highly likely to occur in the study area, three were of conservation concern, namely *Loxodonta africana* (currently listed as Near Threatened), *Rhinolopus denti* (Dent's Horseshoe Bat; regionally listed as Near Threatened) and *Pipistrellus rusticus* (Rusty's Pippistrelle; regionally listed as Near Threatened).

(iii) Amphibians and reptiles

Approximately 18 amphibian species are expected to occur within the geographical area associated with the study site based on species distribution ranges of the IUCN (2013) (Appendix B1 of Appendix B to this Report). This includes at least one species of conservation concern, *Pyxicephalus adspersus* (Giant Bullfrogs; regionally listed as Near Threatened). Since no surface water was available in the study area or immediate surroundings, none of the amphibians are considered likely to occur in the study area.

No reptile database for QDGC 1813DD could be found. However, since the vegetation in the study area and immediate surroundings was natural, it is likely that a variety of reptiles will be present. This includes species such as *Acanthocercus atricollis* (Tree Agama), *Chameaeleo* spp. (Chameleons), various *Trachylepis* spp. (Skinks), *Python natalensis* (Southern African Python), *Dispholidus typus* (Boomslang), *Lycophidion* spp. (Wolf Snakes) and various *Naja* spp. (Cobras) and *Bitis* spp. (Adders).

b. Flora

The escarpment extending inland from the Namib Desert to the plateau east of Opuwo is covered by savannah woodland. This eco-region contains mopane savannah, savannah transition and dwarf savannah. Towards the west the mopane is limited to the dry river beds.

A desktop study of the flora which is expected to occur in the general area associated with Quarter Degree Grid Cell (QDGC) 1813BB was conducted during February 2015 (Appendix B1). At least 70 trees and shrubs which are known, or expected to occur in QDGC 1813BB (Curtis and Mannheimer, 2005). Only one vegetation unit, namely *Colophospermum mopane* woodland, was recorded in the study area.

At the time of the survey, the graminoid and herbaceous layers were completely absent although one succulent species, *Aloe littoralis* (Protected in terms of the Nature Conservation Ordinance No. 4 of 1975) was recorded. A sparse or absent graminoid and/or herbaceous layer is common in

Colophospermum mopane woodland/Bushveld (Mucina and Rutherford, 2006). Nine woody species were recorded in the study area which included *Colophospermum mopane* (Protected in terms of the Forestry Ordinance No. 37 of 1952), *Acacia senegal, A. karroo, Combretum hereroense, Commiphora glaucescens, Dichrostachys cinerea, Grewia flava, Lycium cinereum* and *Ziziphus mucronata* (Photo Plate 5.4.6-3 & 4). The low number of species associated with the *Colophospermum mopane* woodland is consistent with other vegetation studies which have been conducted in the same vegetation type in which an average of 10.1 woody species was recorded in *Colophospermum mopane* veld (Jordaan 2004; Rutherford et al., 2012). Although a seasonal drainage line was observed in the study area, the vegetation associated with this drainage line was not different to the surrounding *Colophospermum mopane* woodland, mostly likely due to the fact that there is insufficient moisture for riparian vegetation to become established. Table 5.4.6-1 summarizes the floral species recorded within the *Colophospermum mopane* woodland which covered the entire area.

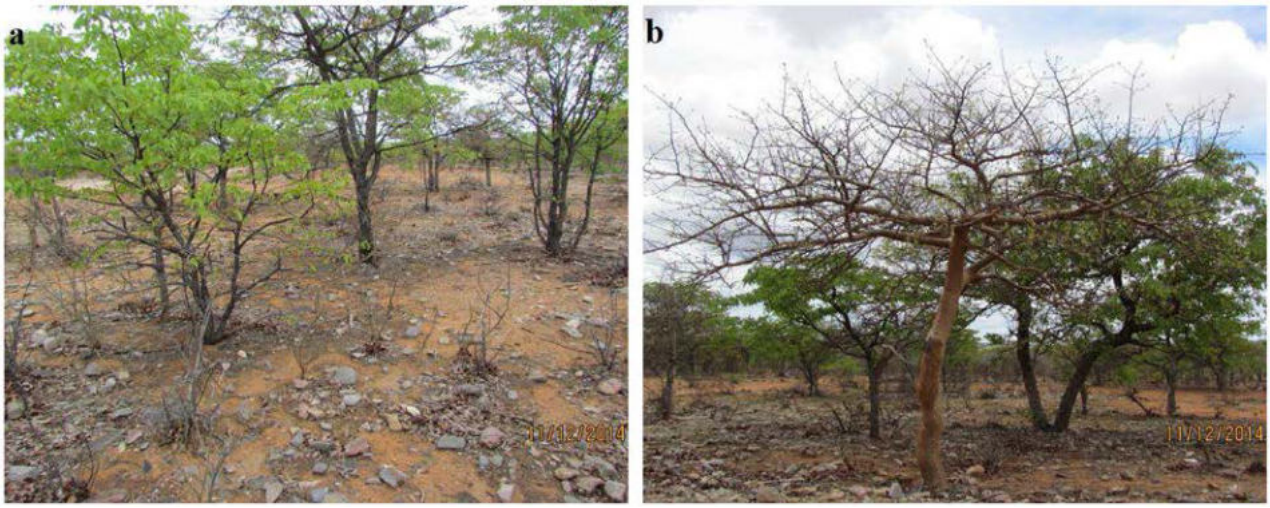

Photo plate 5.4.6-3 & 4: *Colophospermum mopane* woodland in the study area with no herbaceous or graminoid (a) and other woody species such as *Commiphora glaucescens* (b)

Table 5.4.6-1: Summary of the species recorded in the *Colophospermum mopane* woodland in the study area

Indigenous species at the time of the survey	Succulent species: *Aloe littoralis* Trees and shrubs: *Colophospermum mopane* *Combretum hereroense* *Commiphora glaucescens* *Dichrostachys cinerea*

	Grewia flava *Lycium cinereum* *Ziziphus mucronata*
Plants of conservation concern confirmed to occur	None
Plants of conservation concern for which suitable habitat was observed	None
Nationally protected plants confirmed to occur	*Aloe littoralis* *Colophospermum mopane*
Nationally protected plants for which suitable habitat was found	*Eulophia* spp. *Ansellia africana*
Alien species	None

A number of plant species in Namibia are classified as protected in terms of the Forestry Ordinance No. 37 of 1952 and the Nature Conservation Ordinance No. 4 of 1975. According to Curtis and Mannheimer (2005), at least eighteen protected species have been recorded in QDGC 1813DD, these are listed in Table 5.4.6-2, together with the legislation under which these species are protected and likelihood of occurring in the study area. A permit will be required from the Department of Forestry and/or the Department of Conservation to destroy or relocate any of the protected species within the study area.

Table 5.4.6-2: Protected plant species which have been confirmed or that are likely to occur in QDGC 1813DD

Scientific Name	Forestry Ordinance No. 37 of 1952	Nature Conservation Ordinance No. 4 of 1975	Likelihood of occurring in the study area
Acacia erioloba	X		Low
Acacia sieberiana	X		Low
Aloe littoralis		**X**	**Confirmed**
Ansellia africana	X		High

Albizia anthelmintica	X		High
Boscia albitrunca	X		Medium
Burkea africana	X		Low
Colophospermum mopane	**X**		**Confirmed**
Combretum imberbe	X		High
Ficus sycomorus	X		Low
Orchidaceae		X	Medium
Peltophorum africanum	X		High
Philenoptera nelsii	X		Low
Pterocarpus angolensis	X		Low
Salix mucronata subsp. *mucronata*	X		Low
Schinziophyton rautanenii	X		Low
*Securidaca longependuncula*ta	X		Low
Sclerocarya birrea	X		Low
Strychnos cocculoides	X		Low

5.5 PROTECTED AREA STATUS

The Site and surroundings do not fall within an officially protected area proclaimed under the Nature Conservation Ordinance of 1975. The closest such areas are the Etosha National Park (100 km to the south-east) and the Skeleton Coast Park (160 km to the west). Several communal conservancies are contiguous in the study area, including Otjindjerese in the north, Okongoro in the south and Ombatero (emerging) in the south-west, which increases the conservation value of the area.

The Bird Life International Important Bird and Biodiversity Area (IBA) Programme aims to identify, monitor and protect a global network of IBAs for the conservation of the world's birds and other wildlife (Simmons *et al.* 1998; Simmons *et al.* 2001; Kolberg 2015; Marnewick *et al*. 2015). These areas were initially known as Important Bird Areas. IBAs are thus sites of international significance

for the conservation of birds at the Global, Regional (Continental) or Sub-regional (southern African) level, selected according to a set of four criteria based on globally threatened species, restricted-range species, biome-restricted species and congregations (Kolberg 2015). However, not all IBAs receive official protection. Namibia has 21 IBAs. The nearest IBAs to the study site are the Etosha National Park and Hobatere area to the south-east (~100 km away).

5.6 CULTURAL, ARCHAEOLOGICAL AND HERITAGE

Rock art, although widely known from numerous areas in Namibia, is surprisingly absent from the areas in North-western Namibia. Lenssen-Erz and Vogelsang (2005) indicate that the nearest known rock shelter providing evidence for rock paintings in the Opuwo area is the Omungunda research site, located approximately 40 km northwest of the village of Opuwo, close to the road to Epupa. This long ridge of black limestone is a noticeable landmark, and the limestone forms a ridge that surrounds a basin in which several caves and rock shelter formations are found. The paintings found in this rock shelter were found to be largely finger paintings characterised by non-representational depictions comprising largely of parallel lines. Radiocarbon dating of the sites suggest an age of approximately 700 BP (before present) and younger.

Considering very limited information available on the archaeological/heritage baseline of the area, an archaeological and heritage impact assessment was undertaken during September 2023.

Previous archaeological surveys in the Kunene Region have indicated similarity between archaeological site location and the landscape. Viewed as a simplified land system, according to Kinahan (2013) the northern Kunene Region includes five component landscape units. Steep hillslopes with exposed rock and skeletal soils make up 11% of the area; colluvial footslopes with outwash fans and small isolated hills comprise 72% of the area; seasonal streams with associated bush make up a further 13%; the riparian zone of major drainage lines such as the Omuhonga, the Ombuku and the Oheuva accounts for 4% of the area. All of these environmental components are of importance to the OvaHimba, so that although the colluvial foot slopes are essential grazing areas, the riparian zone forms a vital resource base in times of drought, as well as a prime area of cultivation when soil water levels are high enough to sustain maize and millet through the growing season.

The archaeological and heritage impact assessment recorded three heritage sites associated with the holy fire religious practice or worship (Muharukua pers.comm 2023) at a village named Otjijarua (Appendix B3). The archaeologist reports that within Ovahimba/Herero culture, there is a provision for relocation of the holy fire if need be. According to the archaeologist the community asserted that there are no heritage resources of significant value along the proposed road linking the main bitumen road between Omakange and Opuwo with proposed aerodrome.

5.7 VISUAL AESTHETICS

5.7.1 Landscape Character

Landscape Character can be classified as elements, components and features within a landscape that individually and collectively define the landscape's characteristics. These characteristics include the following:

Topography and Hydrology:

The study area is situated on a plateau that can be described as flat (0% - 1% incline) with a gradual slope towards the west. The plateau is surrounded by various mountain ranges. There are no perennial rivers in the study area, but a flat valley occurs to the east of the site (approximately 4 km away).

Vegetation Cover:

The escarpment extending inland from the Namib Desert to the plateau east of Opuwo is covered by savannah woodland. This eco-region contains mopane savannah, savannah transition and dwarf savannah.

Land Use and Built Environment:

Land in the study area is mainly used for subsistence farming (maize and cattle grazing). A few kraals and homesteads are located to the east as well as the west of the proposed aerodrome site. The small village Otjijarua is situated to the west of the proposed site.

5.7.2 Visual Character

The description of the visual character includes an assessment of the scenic attractiveness regarding those landscape attributes that have aesthetic value and contribute significantly to the visual quality of the views, vistas and/or viewpoints of the study area.

The landscape within the study areas can be viewed as being intact and relatively free from visual encroachment with exception of a few unsurfaced tracks, small villages, kraals and the C41/MR100 surfaced road. The landscape within the study area is joined together by landscape elements such as the soil and vegetation to form a coherent, harmonious visual pattern. The surrounding mountain ranges also form a dramatic backdrop which increases memorability of the visual impression received from the contrasting landscape elements as they combine to form a striking and distinctive visual pattern. A feeling of remoteness can be experienced when moving through the space and the study area therefore offers a strong sense of place.

5.7.3 Visual Receptors

The following visual receptors (viewers) were identified:

- **Tourists**: who can be classified as visual receptors of ***exceptional sensitivity*** due to their appreciation of the landscape which they choose to visit.
- **Residents (farmers)**: who are classified as visual receptors of ***high sensitivity*** due to their sustained visual exposure to the proposed project as well as their attentive, long-term interest in their living environment.
- **Motorists**: who are classified as visual receptors of ***low sensitivity*** due to their momentary view and experience of the proposed development. As a road user's speed increases, the sharpness of lateral vision declines, and the road user tends to focus on the line of travel.

5.7.4 Visual Exposure

The visual envelope demarcates the zone of visual influence (ZVI) and includes the area within which views to the proposed aerodrome is expected to be of concern.

In order to assess the extent of visual exposure in the area a view shed analysis was created by utilising a Google Earth image (figure 5.7.7-1). The main building of the Aerodrome may be visible to areas shaded in green; however, the Visual Absorption Capacity of the landscape will mitigate this impact to an extent.

Figure 5.7.7-1 – Extent of visual exposure

5.7.5 Visual Absorption Capacity

Visual Absorption Capacity (VAC) is the inherent ability of a landscape to accept change or modification to the landscape character and/or visual character without diminishment of the visual quality or value, or the loss of visual amenity. A high VAC rating implies a high ability to absorb visual impacts while a low VAC implies a low ability to absorb or conceal visual impacts. VAC is dependable on three characteristics: slope, vegetation height and visual pattern.

The proposed study area can be described as predominantly flat (0% to 1%), which means that any change or modification to the landscape would not be absorbed very well in terms of topography. The VAC in terms of slope is therefore ***low*** (Figure 5.8.5-1).

Figure 5.8.5-1: The VAC in terms of slope

Vegetation height in the study area is mostly between 1 and 5 meters high, which means that any changes or modifications to the landscape will be moderately screened by the natural vegetation. The VAC in terms of vegetation is therefore ***moderate*** (Figure 5.8.5-2).

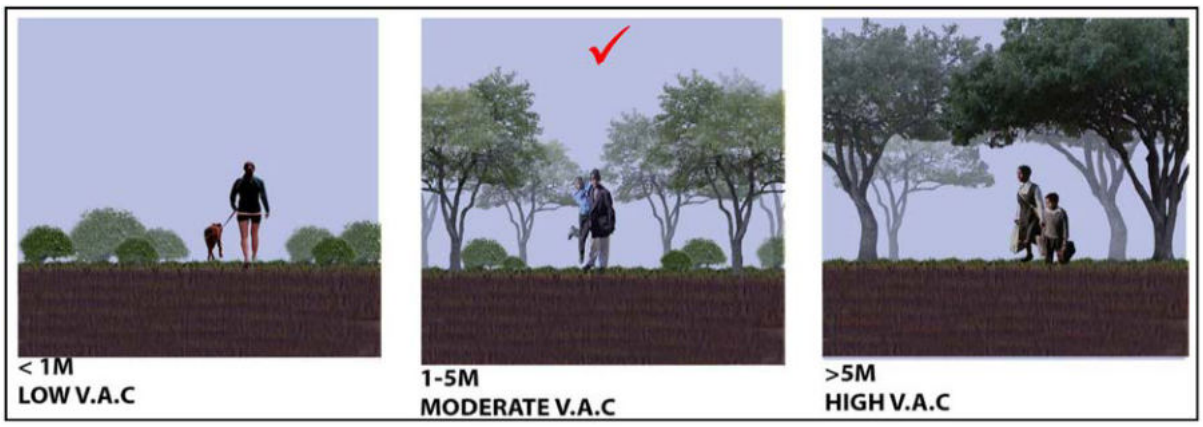

Figure 5.8.5-2: The VAC in terms of vegetation

Diversity in terms of visual pattern in study area is ***moderate*** due to the influence of various types of farming activities (kraals) and gravel roads and scattered vegetation (Figure 5.8.5-3).

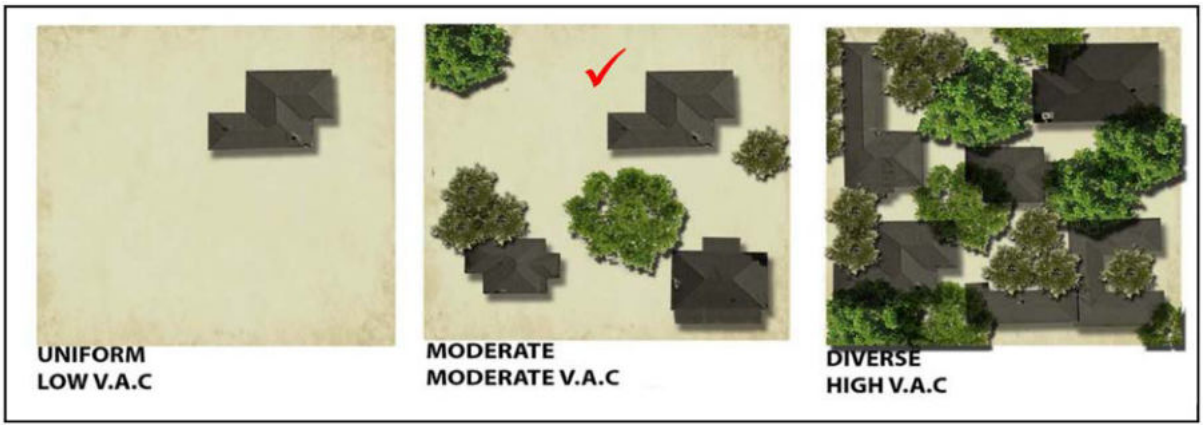

Figure 5.8.5-3: The VAC in terms of activities

Scenic value can be described as the reaction to aesthetics of the environment as perceived by an individual or a group and therefore it is a very subjective perception. The proposed aerodrome is located within a flat valley with the formal part of the town immediately to the west thereof.

There are informal settlements to the south and east of the aerodrome and within the narrow strip between Opuwo Town proper and the aerodrome (Windhoek Consulting Engineers, 2013). Although the Kaokoland area is considered to be one of the least populated areas in Namibia, the Opuwo area as the regional capital probably has the greatest volume of visual receptors. The area is considered to be a tourism draw card due to its wilderness and remoteness. Thus the additional visual receptors in the area could include self-drive tourists. The aerodrome itself is, located outside of the small town of Opuwo and would not necessarily be considered to fit into the rural landscape. In this regard, the design of buildings and infrastructure should be such that they blend into the natural surroundings.

CHAPTER 6 : DESCRIPTION OF THE PROPOSED PROJECT

6.1 PROJECT ORIGIN AND CONCEPT

The present Opuwo Aerodrome is an unlicensed facility owned by the State and has, over the years, increasingly become a security risk due to the location of the aerodrome within the town and surrounded by formal and informal settlements.

This has led to people cutting through the security fence and using the area as a thoroughfare between the settlement and the town for people as well as vehicles and livestock. Due to this and other socio-economic and environmental concerns, a feasibility study was commissioned by the Namibian Ministry of Works and Transport in 2012. The results of this feasibility study (undertaken by Windhoek Consulting Engineers) recommended that the new aerodrome locality be considered based on the availability of bulk services (power and water), the proximity of the proposed site to the bitumen surfaced MR100/C41 to Omakange and the positive implication of the new site on its accessibility to also serve the village of Omakange (which is situated about 38km to the east of the proposed study site).

Subsequent to the recommendations of the March 2012 Feasibility Report, the Ministry of Works and Transport has appointed Conselect Engineering to proceed with the required engineering designs and construction supervision of the new Opuwo Aerodrome.

6.2 SITE LOCALITY AND SIZE

The preferred site to accommodate the Opuwo Aerodrome is located 22 km east of Opuwo Village, approximately 5km east of the Alpha Village and 4 km north of the Omakange - Opuwo Main Road as indicated by Figure 1.4-1.

The area to be disturbed by the proposed Project, i.e., entire fenced-in area is ±75 ha and 2.6 ha by the access road off the C41/MR100 to the Aerodrome.

6.3 ARCHITECTURAL DESIGN

The layout of the aerodrome is presented by Figure 6.3-1, which consists of the following buildings and infrastructure:

- Guard house with ablution facilities, water and electricity;
- Gravel access road with road signs;
- Covered veranda and rest rooms for the passengers and crew;
- Fuel storage and handling facility (future);

- Water, electricity, sewage and telecommunications infrastructure;
- Drainage structures;
- Fencing;
- Parking area; and

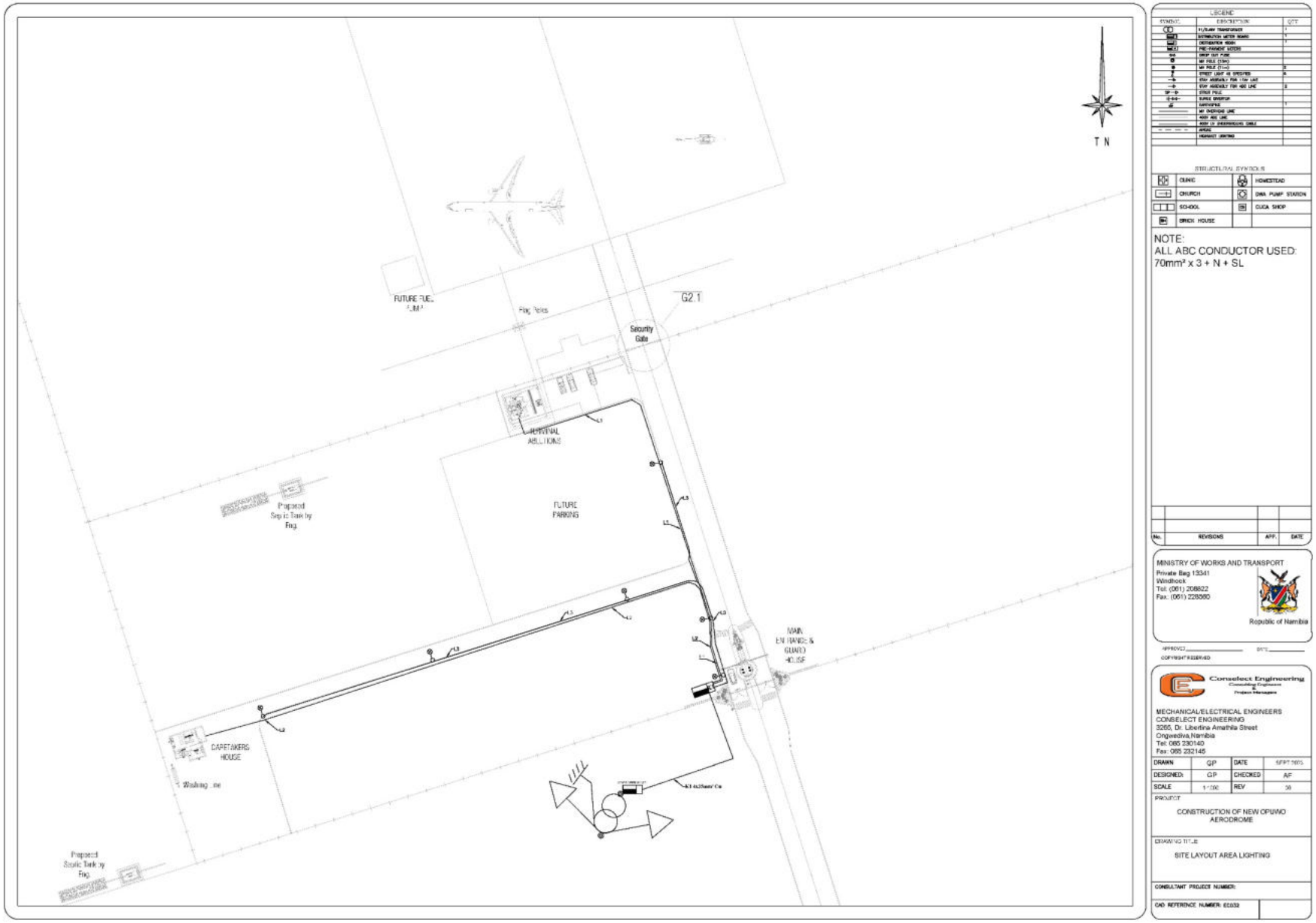

Figure 6.3-1 – Aerodrome Layout

- Runway.

Detail designs and specifications are available from the Project Engineer and Project Architect.

6.3.1 Buildings and Parking Area

All buildings to be constructed will be single storey buildings constructed with brick and plaster, with steel roof structures.

A parking area will be provided for public use, which will be covered with interlock paving.

6.3.2 Potable Water

For purpose of supplying potable water to the Aerodrome two boreholes will be drilled in close proximity to the Site from where the water shall be stored within two (2) PVC tanks (each having a capacity of 5,000 l) on an elevated tank stand (10.2 m) to provide 1.0 bar pressure for the various facilities.

The remote sensing and geophysical profiling done identified two potential drill sites for sinking of boreholes to supply in potable water for the Opuwo Aerodrome, during both the construction and operational phases (Appendix B4).

The first borehole which is to be drilled within the Aerodrome site area will cater for the construction and operational phases, while the second borehole which is to be drilled outside the Aerodrome site area will cater for the access road construction works. Upon completion, the second borehole would be handed over to the local community.

6.3.3 Electricity

Electricity will be supplied to the proposed Aerodrome from tapping off the available NORED power network located in close proximity to the south and extending the OHTL.

6.3.4 Sewage

A collector sewer network will comprise of 110mm PVC Class 51 pipes will receive liquid waste from each of the buildings and will discharge into the proposed septic tank at a point near the gate. Sewage will be channelled to an on-site septic tank, which will be emptied when needed.

6.3.5 Access Road

Access from the C41/MR100, located south of the Site, to the proposed Aerodrome will be obtained via a gravel road (8.0 m wide and 4.1 km long) to be constructed. The particular road is classified as

an access road and the design speed will be 60 km/hr. The design of the access road will provide for surface stormwater runoff and free flow drainage systems.

Approval for the construction of a Type A access onto MR100/C41 was obtained from the Roads Authority (Appendix D11).

6.3.6 Fire Water

The size of the aerodrome buildings does not warrant the provision of an independent fire water supply system. Therefore, only fire hose reel take-off points are provided for the building.

6.3.7 Stormwater Drainage

In order to mitigate the potential flooding problems, buildings will be raised between 150 mm to 300mm.

Culverts are introduced near the centre and extreme ends of runway to cater for storm water cutting across the runway. The storm run-off from runway strip shall be collected and conveyed to the outfall disposal channel.

6.4 AERODROME & RUNWAY DESIGN & SPECIFICATIONS

The design of the Aerodrome is governed by the requirements and recommendations given by the International Civil Aviation Organisation to the Convention on International Civil Aviation, Volume 1 Aerodrome Design and Operations (Windhoek Consulting Engineers, 2013). The runway will be designed as per the Aerodrome Design Manual, Part 1 Runways.

6.4.1 Aircraft Compatibility

Based on the findings of which aircraft/s have made use of the runway at the existing aerodrome since 2005 and the aeroplanes used by the government air transport services, it was recommended that the aerodrome be designed for the B1900 aircraft as per ICAO reference Code 2B aerodrome (Windhoek Consulting Engineers, 2013).

Other aircrafts that would be able to make use of the new aerodrome included the following:

- Beech 1900 (B1900);
- Pilatus PC-12 (PC12);
- Learjet (LJ31);
- Cessna 208 Grand Caravan (C208);
- Turbo Commander 690 (AC90);

- Cessna 210 (C210);
- Cessna 310 (C310); and
- Cessna 402 Business Liner (C402).

6.4.2 Runway Design & Length

It will be 2,300 m in length and 23 m wide, with gravel surface. Touch down areas on either end of the runway (200 m), as well as the apron and taxi way will be concrete pavers (Windhoek Consulting Engineers, 2013).

6.4.3 Runway Bearing

According to the data obtained from the wind-rose in Outapi, it is recommended that the runway should have a bearing of 75 degrees east of true north. Wind velocities of zero to 19.7 km/h occurred during 98.7% of the period analysed. The utilisation of the runway by aeroplanes for wind velocities of up to 24.0 km/h is 99.8%. A runway bearing of 75 degrees plus or minus 10 degrees would also provide a utilisation factor above 95% for aeroplanes with an aeroplane reference field length of less than 1,200 m (Windhoek Consulting Engineers, 2013).

6.4.4 Runway Pavement Design

Design of the pavement will follow the Aircraft Classification Number – Pavement Classification Number (ACN-PCN) method as given in ICAO Doc 9157 Part 3.

6.5 BORROW PITS

Two potential sites for construction material have been identified, the first an existing borrow pit located northwest of Otjouye and about 300m from the C41/MR100 road. The total expected are to be disturbed is about 80,500 m² of which about 23,300 m² has been disturbed already.

The second borrow pit also existing, is located north of Otjouye, about 600m from the C41/MR100 road. The total expected area to be disturbed is about 44,000 m², of which 28,900 m² is yet to be borrowed.

6.6 SAFETY AND SECURITY

The aerodrome property will be physically guarded to control access onto the aerodrome, to prevent unauthorized persons from crossing the runway and taxiway and to safeguard the aerodrome's infrastructure, especially the perimeter fence.

The perimeter of the Aerodrome (6 km) will be fenced with a 2.25 m razor mesh fence with lockable gate. A guard house with ablution facilities and water will be constructed for the security guard.

6.7 MAINTENANCE

The proposed Aerodrome will comprise of a handling facility for the repair and maintenance of aircrafts, this will ensure that the aircrafts and machinery are always in a good working condition.

6.8 OWNERSHIP AND MANAGEMENT

The proposed Aerodrome will become the property and responsibility of the Ministry of Works and Transport, as part of their national network of aerodromes.

6.9 THE NEED AND DESIRABILITY

The need for the relocation of the existing aerodrome was triggered by the increasing level of safety and security concerns experienced with the existing aerodrome located within the build-up urban area of Opuwo. The Minister of Works and Transport has, in the past, tried to maintain the acceptable level of security on site by installing a perimeter fence. The effect of the above undertakings was short-lived as the security fence has been cut in many places providing uncontrolled access over the aerodrome, which acted as an obstruction between the eastern and western parts of town. There is presently no control over access to the aerodrome and motor vehicles, people and cattle move onto and across the aerodrome and runway at free will. Broken bottles and other unwanted objects are found on the aerodrome site.

It is therefore very important to relocate the site to a more secure site where access will be adequately controlled and maintained, yet accessible to the public and operator.

In addition to the above, the existing aerodrome is preventing the expansion of the town towards suitable developable area to the east. The relocation of the aerodrome will, therefore, also allow the eastward development of the Opuwo town.

6.10 EXPECTED SOCIO-ECONOMIC BENEFITS

This project will result in the creation of jobs during construction and operational phase of the project. As far as possible, labour based technology will be used. This is of particular significance in the construction of the required road. The project will also result in the increase in economic growth for the local and regional node.

6.11 CONSTRUCTION ACTIVITIES

The proposed project includes the construction of the following structures and infrastructure**:**

The required works for the construction of the Opuwo Aerodrome is expected to include the use of light machinery for excavation, piling, landscaping, concreting, etc. for the purpose of constructing the service infrastructure (e.g. roads, reservoirs and water network, electricity infrastructure) and associated buildings and structures.

The key construction activities will include:

- Installation of a 2.25 m high razor mesh perimeter fence;
- Blading of the runway;
- Bush clearing;
- Construction of an apron;
- Installation of a wind direction indicator circle;
- Foundation works for buildings, structures, etc.;
- Digging of trenches and construction of infrastructure;
- Surfacing of walkways;
- Access to and from the site by construction vehicles;
- Daily commuting of labour force and daily accommodation on site;
- Dumping of unsuitable material;
- Usage of water for daily construction activities; and
- Generation of waste water and building rubble.

6.12 DEMINING ACTIVITIES

Demining is a pre-requisite which is to be done before any construction activities can commence (see Appendices D23 & D28).

Demining and de-bushing activities include –

- Safely chopping and or cutting and clearing of vegetation to enable ground accessibility;
- Detection and clearance of landmines, unexploded explosive ordnance, and other explosive remnants of war; and
- Includes activities related to the furnishing of education, training, and technical assistance with respect to explosive safety, the detection and clearance of landmines, unexploded explosive ordnance, and other explosive remnants of war.

6.13 OPERATIONAL ACTIVITIES

Maintenance and operational activities include –

- Daily management and maintenance where required to structures and infrastructure;
- Cleaning of runway;
- Vegetation maintenance within the perimeter of the fenced-in area;
- Access control to the aerodrome;
- Removal of waste to the Opuwo Municipal dump site;
- Removal of sewage to Opuwo Municipal sewage works;
- Ensuring the availability of water; and
- Arrival & departing of tourists/people and aeroplanes.

CHAPTER 7 : ALTERNATIVES CONSIDERED

7.1 PROJECT ALTERNATIVES DURING THE FEASIBILITY STUDY PHASE

The following alternatives with respect to locality were identified during the March 2012 Feasibility Study that was conducted by the Windhoek Consulting Engineers (Pty) Ltd. The Feasibility Study report is available from the office of Urban Green Sustainability Consultants and/or Windhoek Consulting Engineers.

a. Alternative 1

Location

This location is situated west of the existing aerodrome close to Okovingava settlement.

Design of Aerodrome

The design of a runway at the proposed site is discussed in section 6.4. It is proposed that the aerodrome should comply with the aerodrome reference code 2B. The proposed aerodrome consists of one runway optimally orientated to be least affected by crosswinds, a short taxiway perpendicular to the runway between the latter and an apron located outside the runway strip (Windhoek Consulting Engineers, 2013).

Orientation

The proposed site can accommodate a runway with a 75 / 255 degrees bearing with respect to True North which would provide a utilization factor of over 98% (Windhoek Consulting Engineers, 2013).

Obstacle Limitation Surfaces

There are no obstacles within the transitional, inner horizontal, conical, approach and take-off surfaces of the runway at this proposed site. There are also no obstacles within the extended approach and take-off surfaces (Windhoek Consulting Engineers, 2013).

The communication masts within Opuwo are all below the elevation of the aerodrome. The top of the 135 m high NBC mast at Alpha is approximately 415 m above the elevation of this proposed site. This mast is located 15.2 km to the south of the proposed aerodrome site and, bearing in mind the runway's orientation, does not affect the operations of the aerodrome (Windhoek Consulting Engineers, 2013).

Settlements

There are very few homesteads on the plateau according to the topographical map and none within one kilometre of the aerodrome. The area is also sufficiently large for future expansion of the aerodrome (Windhoek Consulting Engineers, 2013).

Access

A new access road will have to be constructed up to the plateau. This access road could commence on the bitumen surfaced road approximately 4.0 km from the intersection of MR100/C41 and District Roads 3700 and 3703. The length of the access road to be built is approximately 11.4 km and the total distance by road from Opuwo is 15.4 km (Windhoek Consulting Engineers, 2013).

The proposed design speed of the access road is 100 km/h, equivalent to the speed limit applicable to national gravel roads, but which could be reduced to 80 km/h along very hilly to mountainous sections. The proposed width of the wearing course is 8 m (Windhoek Consulting Engineers, 2013).

Guardhouse and Rest Rooms

It is strongly recommended that the new facility be guarded to prevent vandalism. The general feeling during the consultations held with local residents and with the regional and local authorities was that fences will be cut, and that the aerodrome will be used for the grazing of livestock. A guardhouse consisting of a small office and toilets, including the associated services, has therefore been allowed for in the cost estimate (Windhoek Consulting Engineers, 2013).

Also provided in the cost estimate is an amount for the provision of rest rooms and a covered veranda for passengers and crew. The cost of the services required for this basic facility is included in the amount provided for the guardhouse (Windhoek Consulting Engineers, 2013).

Services

There are no power lines or water pipelines on the plateau in the vicinity of the proposed site. Water will have to be obtained from boreholes or pumped from Opuwo a distance of approximately 7 km and a height difference of about 200 m. Similarly electricity will have to be provided from the main grid at Opuwo. A telephone service could either be provided by means of a wireless system or by means of an overhead line. The cost for the provision of power and a communication link to the site and for the provision of water has been included in the estimate of the guardhouse (Windhoek Consulting Engineers, 2013).

b. Alternative 2

Location

This proposed aerodrome site is located east and 5 km from Alfa village and 4 km from the bitumen surfaced MR100/C41 between Omakange to the east and Opuwo to the west. The aerodrome has been located as close to the bitumen surfaced road leading to Opuwo as possible taking into account the obstacle limitation surfaces (Windhoek Consulting Engineers, 2013).

Design of Aerodrome

The design of a runway at the proposed site is discussed in section 6.4. It is proposed that the aerodrome should comply with the aerodrome reference code 2B. The proposed aerodrome consists of one runway optimally orientated to be least affected by crosswinds, a short taxiway perpendicular to the runway between the latter and an apron located outside the runway strip (Windhoek Consulting Engineers, 2013).

Orientation

A runway orientation of 75 / 255 degrees relative to true north is possible. A slight deviation from this orientation may be considered should this reduce the number of drainage structures providing the runway usability factor remains above 95% (Windhoek Consulting Engineers, 2013).

Obstacle Limitation Surfaces

There are no obstacles within the transitional, inner horizontal and conical surfaces or within the approach / take-off climb surfaces of the runway at this proposed site. The runway is as close as possible to the mountains to the south-west without these becoming obstacles while the mountain range to the east does not pose a problem (Windhoek Consulting Engineers, 2013).

The runway has been so positioned for the approach / departure to miss the 135 m NBC 'Alpha' mast on top of the mountain to the south-west of the aerodrome. This mast is approximately 3 km from the extended approach / take-off path of aircraft. The mast, although located outside the conical surface, is a hazard requiring aircraft to avoid that sector. The imposition of operational procedures in the case of this alternative will be necessary (Windhoek Consulting Engineers, 2013).

Settlements

Alfa village is located approximately 5km to the west south-west of the aerodrome's centre and located immediately north of the bitumen surfaced road between Opuwo and Omakange. Mopane village is about 3 km to the south-south-west from the aerodrome's centre (Windhoek Consulting Engineers, 2013).

Access

An 8.0 m wide gravel access road between MR100/C41 to Opuwo and the aerodrome must be provided. Fortunately this 4.1 long gravel road traverses relatively flat terrain requiring few culverts and low fills. This site is 22.1 km by road from Opuwo (Windhoek Consulting Engineers, 2013).

Guardhouse and Rest Rooms

A guardhouse consisting of a small office and toilet has been allowed for in the cost estimate. This estimate includes the provision of power, telecommunication and water. Also provided in the cost estimate is an amount for the provision of rest rooms and a veranda for passengers and crew. The cost of the services required for this basic facility is included in the amount provided for the guardhouse (Windhoek Consulting Engineers, 2013).

Services

The aerodrome is within 4 km of the power line running parallel to and north of the road reserve of MR100/C41. There is a reservoir at Alfa village about 5.5 km from the centre of the aerodrome which could be tapped into for the provision of water. The reservoir is about 17 m lower than the natural ground at the aerodrome. There are also water installations at the small village called Mopane village approximately 2.5 km from the aerodrome and pipelines running between Mopane and Alfa villages and from Mopane village towards MR100/C41 (Windhoek Consulting Engineers, 2013).

c. Alternative 3

Location

This alternative aerodrome site is located approximately 17km north of Opuwo at Ovinyange just east of District Road 3700 to Ohandungu, Epembe and Epupa (Windhoek Consulting Engineers, 2013).

Terrain

The site seemed to be suitable for an aerodrome taking into account the slope of the natural ground and the object limitation surfaces. On closer inspection using Google Earth it was established that the runway lies partially within a wide drainage pattern having a catchment area of at least 28 square kilometres. This site may have potential drainage problems unsuitable for the location of an aerodrome and has therefore been abandoned (Windhoek Consulting Engineers, 2013).

d. Alternative 4

Location

This alternative aerodrome site is located on the north-north-west of Opuwo and about 31.2 km along District Road 3700 from the town. The centre of the runway is 1.5 km from and on the southern side of the road (Windhoek Consulting Engineers, 2013).

Terrain

The terrain is flat with a natural slope of less than 1%, and there are no distinct drainage channels crossing the area of the runway. Unfortunately the runway's bearing is approximately parallel to the contour lines indicating the necessity of culverts under the runway to accommodate the natural drainage of the area. There are mountains 4km to the west of the runway, 4km to the south and 5km to the north of the runway (Windhoek Consulting Engineers, 2013).

Obstacle Limitation Surfaces

There are no obstacles within the transitional, inner horizontal and conical surfaces or within the approach/take-off surfaces of the runway at this proposed site. The top of the mountains is below the extended approach and take-off surfaces (Windhoek Consulting Engineers, 2013).

Settlements

There are a few homesteads along the gravel road but not within the area of this alternative aerodrome site (Windhoek Consulting Engineers, 2013).

Access

A 1.5 km long and 8 m wide gravel access road between District Road 3700 and the aerodrome must be provided. The relatively flat terrain will require the minimum of drainage structures and low fills (Windhoek Consulting Engineers, 2013).

Services

There are no power lines and water pipelines in the vicinity of the aerodrome. Electricity, if needed in the future, will have to be supplied by overhead line from Opuwo or elsewhere. There is a 60 m high guyed mast of Telecom Namibia on top of a mountain about 19 km to the north west of the site. Water, if required, will have to be obtained from boreholes as there is no water pipeline in the vicinity (Windhoek Consulting Engineers, 2013).

Distance from Opuwo

The distance of this alternative site from Opuwo is beyond the maximum distance envisaged by the stakeholders. The distance is also such that the provision of aviation fuel to aircraft will become a logistical problem. This site has therefore not been investigated any further being too far from Opuwo and knowing that there are alternative sites closer to the town (Windhoek Consulting Engineers, 2013).

e. Alternative 5

Location

This alternative aerodrome site is located approximately 38 km along MR100/C41 road to the east of Opuwo. The aerodrome site is about 1.7 km south of the bitumen surfaced road (Windhoek Consulting Engineers, 2013).

Terrain

This alternative is located on the plateau east of Opuwo, drainage of the area is not expected to be a problem. The maximum slope of the natural ground is about 0.5. It will therefore be easy to meet the requirements of ICAO in respect of runway and runway strip slopes (Windhoek Consulting Engineers, 2013).

There is a mountain range 4,2 km to the west of the aerodrome and another mountain range running north-south commencing 3- km to the north-east of the eastern most threshold (Windhoek Consulting Engineers, 2013).

Orientation

A runway orientation of 75/255 degrees relative to true north is possible (Windhoek Consulting Engineers, 2013).

Obstacle Limitation Surfaces

There are no obstacles within the transitional, inner horizontal and conical surfaces or within the approach/take-off surfaces of the runway at this proposed site. There are no masts within the vicinity of the aerodrome which could be a problem. The 135 m high NBC mast at Alfa is some 20 km to the west of this alternative aerodrome site (Windhoek Consulting Engineers, 2013).

Settlements

There are a few homesteads along the bitumen surfaced main road to Opuwo.

Access

It is proposed to connect the aerodrome to MR100/C41 with a 1.4 km long and 8 m wide gravel road. A few nominal drainage structures will have to be constructed as the access road crosses the natural slope of the ground over which it passes (Windhoek Consulting Engineers, 2013).

Services

The aerodrome is within 1.7 km of the power line running parallel to and north of the road reserve of MR100/C41. The closest communication masts are the NBC mast at Alf and the 48 m freestanding MTC mast at Omakange about 21 km to the east of the site. Water will have to be obtained from boreholes or from Omakange (Windhoek Consulting Engineers, 2013).

This is a suitable aerodrome site but too far from Opuwo. This alternative aerodrome site will therefore not be considered any further.

7.2 FEASIBILITY RESULTS AND RECOMMENDATIONS

As per the feasibility study, the following are recommended**:**

- Alternative 2 was identified as the most suitable of all the alternatives considered and accordingly recommended as the site to accommodate the new Opuwo Aerodrome;
- Security guards be employed to guard the facility day and night;
- Notice boards be displayed at the entrance to the Opuwo Aerodrome, whether the existing aerodrome is retained or a new aerodrome is constructed, making it known that the aerodrome is a Government facility for which the Ministry of Works and Transport is responsible. The noticeboards should also warn the public that unauthorized entry onto the aerodrome is prohibited and that trespassers will be prosecuted. These notice boards should be in the official as well as the local language;
- A public awareness campaign should be held to sensitize the community about the aerodrome and air traffic safety; and
- Watering of livestock at the sewage oxidation ponds should be taken up with the appropriate authorities.

CHAPTER 8 : PUBLIC CONSULTATION

Public consultation and community participation are an important aspect of an EIA in order to involve the affected parties and distribute information on the proposed development, but also to obtain the opinion and information from the affected parties, which assist with the identification of potential impacts that the Project may have on the natural and/or socio-economic environments. Consultation with I&APs and relevant Authorities enables transparent decision-making and continues communication, during both the construction and operational phases of the project, which is essential for long term sustainable operations.

Public consultation for the purposes of this Project was done as prescribed by Regulations 21 and 22 of the Environmental Impact Assessment Regulations (GN. 30 of 2012), for both the 2014/15 Scoping Assessment Phase and the 2023 Environmental and Social Impact Assessment Phase. Details with regards to the time frames of this consultation are presented in Chapter 3.

This section below describes the full extent of the public consultation followed to date. The first round of the public engagement process concluded on 9 December 2023.

8.1 PUBLIC ENGAGEMENT

8.1.1 2014/15 Scoping Assessment Phase

Engagement with the public and authorities commenced on 18 September 2014 and concluded on 9 October 2014.

8.1.1.1 Activities of Public Engagement

Activities undertaken to ensure effective and adequate public involvement are as follows:

- A preliminary list of I&APs and Authorities was compiled, consisting of a total of 65 I&APs (Appendix D1);
- A notification and invitation email (Appendix D2) with Background Information Document (BID) (Appendix D3) was sent to all pre-identified I&AP`s and Authorities (Appendix D1) on 18 September 2014
- Public notices announcing the commencement of the scoping assessment and an invitation to register as an I&AP and notice of the public consultation meeting were placed in 'Die Republikein' and Namibian on the 18th and 25th of September 2014 (Appendix D4);
- Notification letters (Appendix D5) with BID (Appendix D3) was hand delivered on 18 September 2014 (Appendix D6) to all applicable Line Ministries & State-owned Enterprises situated in Windhoek (Appendix D1)

- A public announcement of the scoping assessment and an invitation to comment was broadcast on the 19th, 23rd, 25th of September 2014 and 1st and 7th October (twice a day on each day) on the NBC's Otjiherero radio service;
- A public notice board was displayed at the site of the Project along the Main Road 100;
- A public meeting was held on 21 September 2014 at Otjijarua Settlement. The BID distributed at the meeting is attached as Appendix D3, as well as the meeting presentation, agenda, minutes of the meeting and attendance register attached as Appendix D7 and D8.

8.1.1.2 Comments Received

All comments and feedback received from stakeholders and I&APs are attached in Appendix D9. A total of three I&AP was registered (Appendix D10).

8.1.1.3 Issues and Concerns Raised

All comments and issues of concern that was raised by I&AP's are detailed in Table 8.1.1.3-1 below.

In addition, a consultative meeting was held on 21 September 2014 by the Otjijarua community and the Kunene Regional Council representatives, which was chaired by Mr Gerson Tjondu, a senior traditional councillor of Otjindjerese. The following points were raised during the meeting of 21 September 2014:

- The community demanded that more emphasis be place on the loss of land at the village due to the new development. They asked that the government consider the fact that the residents of that area need to be compensated for the loss of grazing land, rather than just concentrating on the compensation of loss of property. It should, however, be noted that the communal land belongs to the Government and that the residents are the custodians of the land on behalf of the Government.
- The participants at the meeting agreed on the construction of the Aerodrome by the Government at Otjijarua Village, without any alterations, but the following requests were made to the Kunene Regional Council for consideration:
    - It was requested that job opportunities, both at the initial sampling stages, and the actual construction phase and the permanent opportunity phase, be given to villagers from the affected areas, where possible, except for categories in which specialist technicians or experts are needed.
    - The construction of the Aerodrome has affected the existing road to Ohengapuire and therefore a new road from the new linkage to the proposed Aerodrome must be linked to an old road to Ohengapuire. This road should be the same standard of the road to the Aerodrome and should be interlinked.

- The community further requested that the employment committee for the project must come from the residents of the areas which will be affected by the proposed development.
- The residents also requested that the villages be supplied with water and electricity from either Government or the Project.
- The residents also requested three (3) earth-dams at Ohengaipuire, Omanduu and Omuramba and one (1) borehole at Otjijarua.
- It was noted that five maize fields and three homesteads (kraals) will be directly affected by the proposed development. These land owners should be compensated justly, according to the national compensation norms to allow the owners to build afresh.

Table 8.1.1.3-1: Comments received from Interested and Affected Parties during 2014

NO.	NAME	COMMENTS	NAME	RESPONSE
1.	Ministry of Education – Private Secretary Ms. Lizelle Williams (19/09/2014)	Good morning Sir, Please find the attached for your attention. Regards, Ms. Lizelle Williams Private Secretary Office of the Permanent Secretary Ministry of Education Tel: +264 61 293 3524 Fax: +264 61 253 671 Email: Lizelle.Williams@moe.gov.na	Urban Green cc (19/09/2014)	Dear Lizelle, I take that the attached document is for the attention of the other people cc`d into your email? Kind Regards Brand van Zyl
	Ministry of Education – Private Secretary Ms. Lizelle	Good morning Brand, I cc`d you in the email as proof that the document is send to the said Regional Director as it was delivered	Urban Green cc (19/09/2014)	Dear Lizelle, The above mentioned subject refers.

NO.	NAME	COMMENTS	NAME	RESPONSE
	Williams (19/09/2014)	at our Head Office instead of the Regional Office in Khorixas. Regards, Ms. Lizelle Williams Private Secretary Office of the Permanent Secretary Ministry of Education Tel: +264 61 293 3524 Fax: +264 61 253 671 Email: Lizelle.Williams@moe.gov.na		Thank you. Kind regards Brand van Zyl
2.	Directorate of Civil Aviation Ms Chrizelda George (22/09/2014)	Dear Brand, Hope this message finds you well. We have received your letter dated 16 September on the above mentioned subject matter. As per your request, DCA would like to be registered as an I&AP to provide Urban Green comment on the proposed project. Kind Regards, Chrizelda George	Urban Green cc (22/09/2014	Dear Mrs George, Thank you. The DCA has been registered and we are awaiting your comments. Should there be any questions, please contact us. Kind Regards Brand van Zyl
	Directorate of Civil Aviation Ms Chrizelda George	Dear Mr van Zyl, Hope this message finds you well. I am following up on our last	Urban Green cc (08/10/2014)	Dear Mrs George, Thank you, we will consult Part 139 and come back to you should there be any questions.

NO.	NAME	COMMENTS	NAME	RESPONSE
	(07/10/2014)	email. I am not very clear on what comments you might still need. The DCA at this stage would advise that you will have to review Part 139 of the Namibian Civil Aviation regulations so as to govern the whole process. Please advise if you require more clarity, I`m however not in office until the 16th Oct. but you can reach me via e-mail. Kind Regards, Chrizelda George		Kind regards Brand van Zyl
3.	Ministry of Regional and Local Government, Housing and Rural Development – Permanent Secretary Mr Nghidinua Daniel (08/10/2014)	Dear Mr B. Van Zyl, SUBJECT: PROPOSED ESTABLISHMENT OF THE NEW OPUWO AERODROME AND ASSOCIATED INFRASTRUCTURE IN OPUWO, KUNENE REGION We refer to your letter dated 16 September 2014 with regards to the abovementioned subject matter. The Ministry have limited knowledge of the area and cannot be the potential Interested and Affected Party (I&AP) in the project and register for that purpose. In general we do not foresee any negative impact on the environment by this project. Yours faithfully,	Urban Green cc	Mr. Nghidinua Daniel Thank you and noted. Should there be any questions, please contact us. Kind Regards Brand van Zyl

NO.	NAME	COMMENTS	NAME	RESPONSE
		Mr. Nghidinua Daniel Permanent Secretary		

8.1.2 Repeat 2023 Environmental and Social Impact Assessment Phase

Repeat engagement with the public and authorities commenced on 11 September 2023 and concluded on 10 December 2023. During January 2024, a representatives briefing meeting was held with the Regional and Traditional leadership representatives. This meeting was one of several means to provide feedback on previous concerns, processes and way forward as part of the engagements regarding the public consultation meetings held during August and December 2023. A committee consisting of three representatives from the Kunene Regional Council and Traditional Authority was established at the January 2024 briefing discussions, and would take the lead in matters regarding community expectations and or compensation related matters, with the proponent and applicable Ministries and or Authorities, while the ESIA is being finalized.

8.1.2.1 Activities of Public Engagement

Activities undertaken during 2023 to ensure effective and adequate public involvement are as follows:

- Environmental Commissioner directive letter to repeat the public consultation (Appendix D11)
- Lists of the predetermined I&APs and authorities were compiled. A total of 108 I&APs were included on the database (Appendix D12);
- Email notifications (Appendix D13) with updated Background Information Document (Appendix D14) was send to all pre-identified I&APs and authorities on 06 September 2023;
- Public notices announcing the commencement of the detailed phase and an invitation to register as an I&AP were placed in the ‘Namibian’ and ‘New Era’ Newspapers on 06 September 2023 and 13 September 2023 (Appendix D15);
- Notification letters (Appendix D16) with updated BID (Appendix D14) was hand delivered (Appendix D17) on 06 September 2023 to line ministries and State Owned Enterprises situated in Windhoek;
- Notification letters (Appendix D18) with updated BID (Appendix D14) was couriered (Appendix D19) to the Regional Institutions on 05 September 2023;
- A notice board (with the dimensions 60cm x 42cm) was placed at the Kunene Regional Council office notice board, and an on-site notice was placed at the Otjijarua/Omanduu proposed Aerodrome site area (Appendix D20);

- A representative's briefing meeting was held on 25 August 2023 at the Kunene Regional Council office (Appendix D21);
- A public meeting attended by more than 200 people were held at Otjijarua Village on 27 August 2023 (Appendix D22);
- A representative`s feedback and information session meeting was held on 08 December 2023 at the Kunene Regional Council office (Appendix D23);
- A public feedback and information session meeting was held with the community at Otjijarua village on 09 December 2023 (Appendix D24); and
- A Regional leadership representative`s meeting was held on 10 January 2024 at the Kunene Regional Council office (Appendix D25).

8.1.2.2 Comments Received

All comments and feedback sent to and received from stakeholders and I&APs are attached in Appendix D26. A total of six I&AP was registered (Appendix D27).

8.1.2.3 Issues and Concerns Raised

All comments and issues of concern that was raised by I&AP's are detailed in Table 8.1.1.3-1 below.

Table 8.1.2.3-1: Comments received from Interested and Affected Parties during 2023

NO.	NAME	COMMENTS	NAME	RESPONSE
1	NamPol Kunene Region – Chief Inspector R. Nghiilwamo (11/09/2023)	Good day. Thanks for the email pertaining the new Opuwo Aerodrome. Regards, Ruben Nghiilwamo NamPol Chief Inspector (Kunene Region)	Urban Green cc	
2	Ministry of Health and Social Services – Acting PA to	Dear Julia, I acknowledge receipt of this email.	Urban Green cc (18/09/2023)	Dear Lydia, The above mentioned subject refers.

NO.	NAME	COMMENTS	NAME	RESPONSE
	ED Ms Lydia Haufiku	Kind regards, Lydia Haufiku Acting Personal Assistant to Executive Director Ministry of Health and Social Services		We take note, thank you. Kind regards Julia L. Bashir
	Ministry of Health and Social Services Executive Director Mr Ben Nangombe (25/09/2023)	Dear Ms Bashir, REQUEST FOR SUBMISSION OF INPUTS AND COMMENTS WITH REGARDS TO THE PROPOSED NEW OPUWO AERODROME IN THE KUNENE REGION The MoHSS acknowledges receipt of your email dated 11 September 2023 with regards to the above mentioned subject. The MoHSS hereby register its comments as follows: The concerns are with regards to Water availability in the area and the impact on the existing community or NamWater boreholes in the proximity. There are existing villages around the proposed area, they may be affected in terms of grazing land being reduced, noise and grazing pollution as well as inconveniencing as they may need to be relocated. Thank you for your understanding.	Urban Green cc	

NO.	NAME	COMMENTS	NAME	RESPONSE
		Sincerely, Ben Nangombe Executive Director		
3	Fly Namibia - Managing Director Andrè Compion (14/09/2023)	Good morning, Fly Namibia is interested in the proposed new aerodrome to be constructed at Opuwo. We currently offer scheduled domestic services and may consider the inclusion of Opuwo on one of our routes. We currently service a number of small unmanned aerodromes such as Mokuti, Ongava, Twyfelfontein and Sesriem with scheduled flights. Opuwo Aerodrome would need basic firefighting capacity in order to receive scheduled flights. The provision of fuel will be most welcome; both avgas and jet A-1 would be required. Has any thought be given to who would be responsible for supplying the fuel? Would the Namibia Airports Company be responsible for the management of the aerodrome? You are welcome to contact me if I can be of any assistance. Regards, Andrè Compion Managing Director – Fly	Urban Green cc (18/09/2023)	Dear Mr. A. Compion, Your email communication below with reference to the above refers. Fly Namibia has been registered as an Interested and Affected Party and will be kept informed throughout the study and project. Your comments have been included into the study and will be presented to the Ministry of Works and Transport, the Proponent. I will revert back to you on the matters with regards to fuel and management of the planned Opuwo aerodrome. Regards Brand van Zyl

NO.	NAME	COMMENTS	NAME	RESPONSE
		Namibia W +264 833 390 011 C +264 811 240 480 andre.compion@flynamibia.com.na		
	Fly Namibia - Managing Director Andrè Compion (18/09/2023)	Dear Mr Van Zyl, Noted, with thanks. Regards, Andrè Compion Managing Director – Fly Namibia W +264 833 390 011 C +264 811 240 480 andre.compion@flynamibia.com.na	Urban Green cc	
4	Desert Air – Chief Executive Officer Willem de Wet (15/09/2023)	Good day, From Desert Air side we recommend that the airfield width be minimum 20m to accommodate the bigger planes. Regards, Willem de Wet Desert Air – Chief Executive Officer +264 228 101 +264 811 291 601	Urban Green cc (18/09/2023)	Dear Mr. W. de Wet, Your email communication below with regards to the above refers. I will include your comment into the documentation for submission with the Ministry of Works and Transport. Regards Brand van Zyl
5	Aircraft Owners and Pilots Association	Please add me as an I&AP for the new airstrip being planned at Opuwo. I would	Urban Green cc	Dear Mr. P. Scaturro, Your email communication

NO.	NAME	COMMENTS	NAME	RESPONSE
	(AOPA) Namibia Executive Committee Pasquale (PV) Scaturro (12/09/2023)	like to receive all future information. Thank you. PV Pasquale (PV) Scaturro AOPA Namibia Executive Committee +264-81-143-6166 pv@pvscaturro.com www.aopa.org.na	(18/09/2023)	refers. The AOPA Namibia has been added as an I&AP and will be kept informed. Regards Brand van Zyl
6	Namibia Civil Aviation Authority (NCAA) PA to ED Ms Hambeleleni N. Shafa (18/09/2023)	Good afternoon, Kindly receive the attached document for Mr. Brand van Zyl's attention. With kind regards, Hambeleleni N. Shafa Personal Assistant Office of the Executive Director | Namibia Civil Aviation Authority (NCAA) (Tel) +264 83 235 2102 | (Mobile) +264 81 6582702| (E-mail) EDPA@ncaa.na	Urban Green cc (18/09/2023)	Dear H. N. Shafa, Your email communication below refers. The approval has been well received. Regards Brand van Zyl
	Namibia Civil Aviation Authority (NCAA) Executive Director Ms Toska Sem (13/09/2023)	Dear Mr van Zyl, SUBJECT: ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED NEW OPUWO AERODROME AND ASSOCIATED INFRASTRUCTURE IN OPUWO, KUNENE REGION	Urban Green cc	

NO.	NAME	COMMENTS	NAME	RESPONSE
		I refer to your letter dated 06th September 2023 on the above captioned matter. I wish to inform you that the review of the information provided in your Environmental Scoping Assessment report, was found to be acceptable. The Namibia Civil Aviation Authority (NCAA), has no objection to the granting of an Environmental Clearance Certificate for the construction and operation of the New Opuwo Aerodrome. Pursuant to NAMCARs Part 139, the applicant for the construction and operation of the New Opuwo Aerodrome must consult the Executive Director prior to the construction and operation of the aerodrome. I trust you find the above in order. Yours sincerely, Ms Toska Sem Executive Director		
7	Namibian Environment and Wildlife Society Mr Ndelimona Iipinge (13/09/2023)	Dear Urban Green I hereby request to be registered as an I&AP for the EIA: - New Opuwo Aerodrome, as issued in your public notice in The Namibian newspaper on the 6th of September 2023.	Urban Green cc (21/09/2023)	Dear Ndelimona, The above mentioned subject refers. The BID was sent to your organisation (Namibian Environment and Wildlife Society) at the following email: Information@NEWS-Namibia.org kindly see

NO.	NAME	COMMENTS	NAME	RESPONSE
		Please would you please also forward me the Background Information Documents (BID) and the site coordinates? Regards Ndelimona Iipinge EIA Tracking and Monitoring in Namibia Namibian Environment and Wildlife Society 0814138822 ndeliimonachox@gmail.com		attached the proof of successful mail delivery report, in this regard. Thank you. Kind regards Julia L. Bashir
	Namibian Environment and Wildlife Society Mr Ndelimona Iipinge (21/09/2023)	Hi Thank you I have received it Ndelimona	Urban Green cc (21/09/2023)	Noted, thank you. Kind regards Julia L. Bashir
8	Namibian Police Force Inspector General LT. GEN. J.S Shikongo (21/09/2023)	Dear Mr Brand van Zyl ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED NEW OPUWO AERODROME AND ASSOCIATED INFRASTRUCTURE IN OPUWO: KUNENE REGION 1. I present my compliments to your esteemed office and would like to acknowledge with honour receipt of your letter dated 6 September 2023. Your company requested the	Urban Green cc	

NO.	NAME	COMMENTS	NAME	RESPONSE
		Namibian Police Force to give comments/concerns/input prior the commencement of the construction of new proposed Opuwo Aerodrome and Associated Infrastructure in Kunene Region. 2. In that respect, I would like to inform you that, your request is receiving attention, a feasibility study will be conducted and your office will be notified of the assessment results. 3. For further enquiries, kindly do not hesitate to contact the Head of Explosives Control Division, Dep. Comm. T.H. Nghiyoonanye at mobile number 0812461740. Dear Mr Brand van Zyl, please accept the assurance of my highest consideration. Yours Sincerely, LT.GEN. J.S.Shikongo Inspector General – Namibian Police Force		
	Namibian Police Force Inspector General LT. GEN. J.S Shikongo (05/10/2023)	Dear Mr Brand van Zyl ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED NEW OPUWO AERODROME AND ASSOCIATED INFRASTRUCTURE IN OPUWO: KUNENE REGION 1. I present my	Urban Green cc	

NO.	NAME	COMMENTS	NAME	RESPONSE
		compliments to your esteemed office, and have the honour to refer to my office letter dated 21 September 2023 regarding the request of comments/concern/inputs from the Namibian Police Force prior the commencement of the new proposed Opuwo Aerodrome and Associated Infrastructure in Kunene Region. 2. Kindly be informed that, on 26 September 2023, members from the Explosives Control Sub-Division in the Kunene Region accompanied by Ministry of Works and Transport staff, and the Headman of Otjijarua Village visited the proposed area for assessment for possible existence of Unexploded Ordnances (UXOs) and Explosives Remnants of War (ERW). During the assessment the team found the following; 2.1 The area in question is covered by		

NO.	NAME	COMMENTS	NAME	RESPONSE
		thick bushes, located within the war zone (former military area) and believed to be highly contaminate with sub-surface metals and war debris; 2.2 Additionally, an indication of possible existence of UXOs/ERW in the proposed area is that the Namibian Police Force has attended several reports, of which they were disposed off. 3. Based on the above findings, the team recommended that, the entire proposed area covering a distance of one point two kilometre (1.2km) width and three point five kilometre (3.5km) length be cleared from possible		

NO.	NAME	COMMENTS	NAME	RESPONSE
		existence of UXOs/ERW. 4. Your office is therefore, advised to liaise with the Ministry of Works and Transport to request for explosives ordnance clearance of the proposed area prior construction. Dear Mr Brand van Zyl, please accept the assurance of my highest consideration and esteem. Yours Sincerely, LT.GEN. J.S.Shikongo Inspector General – Namibian Police Force		

8.2 SECOND ROUND OF CONSULTATION

Engagement with the public and authorities as part of the second round of public consultation commenced on the 20th of February 2024 and concluded on the 29th of February 2024. During the second round of consultation, I&APs and authorities were given an opportunity to submit comments for consideration and inclusion.

(i) Activities of Public Engagement

Activities undertaken to date to ensure effective and adequate I&AP involvement, are as follows:

• A notification email (Appendix D28) informing all affected authorities and registered I&APs of the availability of the Draft Environmental and Social Impact Assessment (ESIA) Report and request for comment was distributed on 20 February 2024.

(ii) Comments Received and Responses Provided

Requests for the draft ESIA Report were submitted with the EAP as part of the 2nd round of public consultation. A total of five requests were received from stakeholders and/or I&AP`s. A copy of the email correspondence is attached as Appendix D29, while the proof of the draft ESIA notification email read receipts is attached as Appendix D 30.

All comments requesting the draft ESIA Report by the stakeholders and I&AP's are detailed in Table 8.1.1.3-2 below.

Table 8.1.2.3-2: Comments received the Draft ESIA Report

NO.	NAME	COMMENTS	NAME	RESPONSE
1	Fly Namibia - Managing Director Andrè Compion (20/02/2024)	Dear Ms Bashir, Kindly forward an electronic copy of the ESIA Report to me. Regards, Andrè Compion Managing Director – Fly Namibia W +264 833 390 011 C +264 811 240 480 andre.compion@flynamibia.com.na	Urban Green cc (20/02/2024)	Dear Mr Compion, Your email below refers. Find attached the electronic copy of the draft ESIA Report (without appendices) for the proposed establishment of the New Opuwo Aerodrome to replace the existing Opuwo Aerodrome, in the Kunene Region. Please confirm receipt of the draft ESIA Report. Thank you. Kind regards Julia L. Bashir
	Fly Namibia - Managing Director Andrè Compion (20/02/2024)	Dear Ms Bashir, Draft ESIA Report received, thank you. Regards, Andrè Compion Managing Director – Fly Namibia W +264 833 390 011 C +264 811 240 480 andre.compion@flynamibia.com.na	Urban Green cc	
2	Kunene Regional Council –	Well received, thanks. Regards,	Urban Green cc	

NO.	NAME	COMMENTS	NAME	RESPONSE
	Senior Private Secretary Ms Alexandrine Shilongo (20/02/2024)	A. Shilongo KRC – Senior Private Secretary		
3	Ministry of Health and Social Services Martin Mukulu (20/02/2024)	Dear Bashir Thank you for the notification, it is well received. Kindly share with us the soft copy of the ESIA report to read through. Kind regards Martin Mukulu Ministry of Health and Social Services	Urban Green cc (20/02/2024)	Dear Mr Mukulu, Your email below refers. Find attached the electronic copy of the draft ESIA Report (without appendices) for the proposed establishment of the New Opuwo Aerodrome to replace the existing Opuwo Aerodrome, in the Kunene Region. Please confirm receipt of the draft ESIA Report. Thank you. Kind regards Julia L. Bashir
4	Namibia Airports Company – Executive Secretary Liz Jacobs (20/02/2024)	Good afternoon Julia May you kindly share the ESIA Report with NAC electronically, for consideration. Best regards Liz Jacobs Executive Secretary Tel : +264 (0)61 295 5011 | Mobile : +264 81 143 3988 | Office : Office of the CEO | E-Mail : jacobsl@airports.com.na | www.airports.com.na	Urban Green cc (20/02/2024)	Dear Liz, Your email below refers. Find attached the electronic copy of the draft ESIA Report (without appendices) for the proposed establishment of the New Opuwo Aerodrome to replace the existing Opuwo Aerodrome, in the Kunene Region. Please confirm receipt of the draft ESIA Report. Thank you. Kind regards Julia L. Bashir

NO.	NAME	COMMENTS	NAME	RESPONSE
5	Opuwo Town Council – Chief Executive Officer Ms M. Tjihuura (21/02/2024)	Good day. Good to hear that, please assist with the report soft copy. Regards Matjandjara Tjihuura Opuwo Town Council CEO	Urban Green cc (21/02/2024)	Dear Tjihuura, Your email below refers. Find attached the electronic copy of the draft ESIA Report (without appendices) for the proposed establishment of the New Opuwo Aerodrome to replace the existing Opuwo Aerodrome, in the Kunene Region. Please confirm receipt of the draft ESIA Report. Thank you. Kind regards Julia L. Bashir

CHAPTER 9 : ASSESSMENT OF POTENTIAL IMPACTS AND MITIGATIONS

This chapter provides a description and assessment of the key issues of concern and potential impacts associated with the construction of the proposed Opuwo Aerodrome (i.e. the Project). Mitigation measures relevant to the planning, design, construction, operational and decommissioning phases of the Project as appropriate are recommended. These measures are aimed at avoiding, minimising, or rehabilitating negative impacts or enhancing potential benefits. The significance of potential impacts without and with mitigation is also provided.

This section has been derived from the input of selected specialists consulted on the project, the EAP and the public engagement undertaken as part of the EIA process.

Given the nature of the proposed Project, measured against the sensitivity of the receiving natural and social environments, as assessed by the EAP and specialists, certain issues of concern and potential impacts (positive and negative) were identified. Some impacts are considered to be of greater potential significance and others less so.

For this assessment's purpose the issues and impacts identified are grouped into those associated with the Construction Phase and those with the Operational Phase. The sections below give a broad overview of each expected impact and the associated mitigation measures. The impact assessment has been confined to the construction and operational phases as the planning phase is considered to have been the phase in which the feasibility report was undertaken. The feasibility report is also deemed to have provided an appropriate overview of the environmental and socio-economic concerns of the present aerodrome and consequently, the positive and negative aspects of the proposed aerodrome were highlighted.

9.1 CONSTRUCTION-RELATED IMPACTS

The construction activities which have been considered (e.g. buildings, infrastructure, engineering services and access roads) were based on the information provided by the project team.

Construction impacts are viewed as being temporary in nature, but have the potential to result in permanent damage if not dealt with timeously and effectively. The section that follows provides details of the potential impacts of construction-related activities. Together with each identified impact is a table detailing the assessment of the impact and thereafter, follows a recommended mitigation measures that are to be considered in relation to the impacts.

9.1.1 Ground and Surface Water Pollution & Abstraction

It is expected that a contractor's camp will be laid down for the duration of the construction phase. The associated construction activities provide a number of pollution sources that could lead to

numerous direct and indirect pollution impacts. For purpose of the construction of the aerodrome, water would be required, which is not readily available within the area.

Hydrocarbons (oil, petrol and diesel) and other chemicals/liquids will be required during the construction phase. Spills and/or leakages could occur from construction vehicles and/or equipment. These spills could contaminate the ground water should they occur simultaneously with a heavy rainfall event and could adversely affect surrounding landowners who utilise groundwater resources.

In addition, the current preferred alternative highlighted in the feasibility stages indicates that the runway would be situated between two small water courses that flow north and south of the proposed runway. The feasibility study also highlighted two drainage channels crossing the proposed runway. Given that there would be an influx of construction vehicles on site during the construction phase, there exists the probability of spills and leaks from these vehicles.

With appropriate mitigation measures implemented, the risk of contamination of ground and surface water, as well as water abstraction would be greatly reduced.

Impact Description	Ground and Surface Water Pollution & Abstraction
Nature	Negative – will be harmful to the environment
Extent	Small
Duration	Temporary
Intensity	Medium
Probability	Probable
Degree of Confidence	Probable / medium
Impact Pre-mitigation	Moderate
Impact Post-mitigation	Low

Proposed Mitigation:

- Mobile biological treatment toilets should be provided on site within walking distance (100m) to daily construction activities. These should be maintained in a clean and tidy state and emptied at the nearest waste water treatment facility, i.e., Opuwo wastewater works.
- All material storage should be situated as far away as possible from the sensitive riparian zones of the watercourses found on site.

- Vehicle and plant servicing areas and wash bays should be located, as far as is possible, within roofed areas. The drainage in these areas should be connected to a waste water tank to be emptied on a regular basis at the nearest registered waste treatment facility.
- Cement should be covered entirely by impervious sheeting or placed in an area that is sheltered at the top and around the sides.
- All construction vehicles should be kept in good working condition.
- All construction vehicles should be parked in demarcated areas when not in use and drip trays should be placed under vehicles to collect any spillages/leaks.
- An appropriate stormwater management plan must be implemented prior to construction.
- If hydrocarbon spills occur these should be cleaned using an appropriate spill kit and the contaminated soils removed from site and disposed of at an appropriate registered landfill site.
- Fuel tanks and chemical storage should be locked at all times when not in use. The storage areas should be bunded with a capacity equal to 110% of the storage capacity of the largest tank.
- Further site specific recommendations are made in the associated Environmental Management Plan, and this should be strictly adhered to.
- New boreholes will have to be drilled for the purpose of supplying water to the aerodrome, for both the construction and operational phases.

9.1.2 Soil Erosion and Sedimentation

Given the dimensions of the buildings and associated infrastructure proposed for the new Opuwo Aerodrome, it stands to reason that a significant portion of land will need to be cleared to make way for the new infrastructure. The topography of the area appears to have a maximum slope of under 1%, which is considered flat with a gentle slope.

Subsequent to clearing, large areas of soil are exposed, and this could lead to the degradation of top soils and the further sedimentation of drainage channels. Should appropriate mitigation measures not be implemented, the consequences include the loss of valuable top soil, loss of habitat and vegetation, the formation of erosion gullies, turbidity increases in the associated water bodies and the sedimentation of drainage channels. Soil erosion and siltation may have dire effects on the flow regime of watercourses and the water quality of the watercourse, which has an effect of downstream water users.

In the case of the construction of new access roads and indeed in the sourcing of construction material (e.g. sand for cement making) for infrastructure, material is sourced locally to reduce the costs of transport. The mining of such sand from riverbeds in the vicinity could lead to a degradation of the riparian habitat. Erosion should also be considered in relation to the time of year in which

construction activities take place. Construction taking place in the wetter months of the year may result in greater levels of erosion and require more stringent countermeasures.

Impact Description	Soil erosion and sedimentation
Nature	Negative – will be harmful to the environment
Extent	Small
Duration	Temporary
Intensity	Medium
Probability	Highly probable
Degree of Confidence	Probable / medium
Impact Pre-mitigation	Moderate
Impact Post-mitigation	Low

Proposed mitigation:

- If possible, construction activities must be scheduled for the dry winter months to decrease the risk of erosion during heavy storms.
- Apply acceptable Best Management Practices (BMPs). Structural BMPs typically include sediment ponds or traps, stabilised construction entrances, filter fences, check dams and riprap. Managerial BMPs include preserving the natural vegetation, leaving buffer zones and providing dust control.
- An appropriate Erosion and Sedimentation Management Plan should be drafted prior to construction.
- Disturbed areas must be re-vegetated with indigenous species found within the vegetation zone of the site.
- Clearance boundaries are to include footpaths between the construction camp and the construction areas. These areas are to be pegged and maintained at a width of 1.5 m wide.

- Open stockpiles of construction material (e.g. aggregates and sand) should be covered with tarpaulin or similar fabric during rainstorms. Sand must be stockpiled away from drainage channels and low berms should be placed around sand heaps.
- The contractor must provide method statements for the "stockpiling" prior to construction taking place.
- Storm water run-off from the stockpile sites and other related areas must, where directed into the storm water system, be fitted with the necessary pollution prevention measures such as silt traps and may not run freely into the immediate and surrounding environments.
- Soils from different horizons must be stock piled such that topsoil stockpiles do not get contaminated by sub-soil material.
- A plan should always be in place for adequate surface protection before the arrival of a storm.
- Unnecessary clearance of vegetation must be avoided.
- Areas prone to erosion should be monitored and the necessary mitigation measures such as sand bags, earth berms, soil saver blankets and temporary vegetation should be initiated on site if necessary.
- The appointed contractor should draft a suitable Rehabilitation Plan or Method Statement for Rehabilitation for the re-vegetation of cleared areas once construction has concluded.
- Further site specific recommendations are made in the associated Environmental Management Plan, and this should be strictly adhered to.

9.1.3 Habitat Destruction and Loss of Biodiversity

The clearance of large areas of land to make way for the proposed aerodrome and the associated infrastructure will inevitably result in the loss of some level of biodiversity. This is of particular concern in areas such as Opuwo which is situated in the very sparsely populated North-western Namibia. Although the initial considerations with regards to the upgrading of the aerodrome did consider upgrading the existing aerodrome, the negative impact of the current aerodrome necessitated a physical move to ensure that the aerodrome itself is able to be maintained appropriately and is out of the direct line of passage between the town and informal settlements.

The placement of the aerodrome in a low disturbed environment will invariably lead to habitat loss for local floral and faunal species. Limiting this discussion only to the loss of habitat that would occur during the construction phase of the project, it is understood from the baseline ecological report that there exists the possibility of 18 floral species that are protected in terms of the Forestry Ordinance No. 37 of 1952 and the Nature Conservation Ordinance No. 4 of 1975 occurring on site. It is considered unlikely that the area supports a high level of mammal diversity due to its proximity to human settlements, apart from elephants that roam the area freely. It is important that the movement of these elephants be considered and their behaviour in the instances of tracks fenced off.

The north-western region of Namibia is considered to be a largely untouched landscape with a sparse population and, as such, is a draw card for tourism opportunities. The proposed change of land use will present a change in the character of the landscape and will, to some extent, result in the displacement of vegetation and faunal populations. Secondary impacts of construction-related activities should also be given due consideration; these include the generation of noise, dust and erosion.

Construction activities must be properly planned and responsibly undertaken to avoid the unnecessary removal of vegetation and to be especially considerate of protected species. Should the removal of protected species be unavoidable, it is highly recommended that a full ecological study including field survey, as well as search and rescue be conducted.

Impact Description	Habitat loss and loss of biodiversity
Nature	Negative – will be harmful to the environment
Extent	Medium
Duration	Medium term
Intensity	Medium
Probability	Probable
Degree of Confidence	Probable / medium
Impact Pre-mitigation	High
Impact Post-mitigation	Moderate

Proposed Mitigation:

- All construction workers must be informed that the intentional killing of animals is not permitted. This should be covered as part of induction programmes and talks held on site for construction staff.
- It is recommended that a pre-construction vegetation survey be undertaken to confirm the probability of occurrence of fauna of conservation concern and to confirm the presence or absence of protect floral species that may require permits for the removal or relocation.
- Clear-felling must be avoided, i.e. removal of all the indigenous trees, shrubs, grasses of the area prior to the start of construction.

- The construction area should be scoured for nests, dens or other habitats prior to the start of construction.
- Avoid development in and the destruction of drainage lines in the area. Some of this will be unavoidable due to the current preferred alternative having two drainage lines crossing through it. However, the remainder of the site should be developed with caution.
- Areas of high or endemic biodiversity should be marked a “No-Go” areas. Fences should be erected where practical along the boundary of the construction site.
- All tree and natural vegetation outside of the construction zone should be clearly demarcated such that these areas are not destroyed unintentionally.
- An alien invasive eradication and monitoring plan must be compiled and implemented.
- Locally indigenous plants must be used in the rehabilitation and landscaping of the site.
- In the case of a problem animal, e.g. snakes, a specialist should be called in to safely relocate the animal.
- Further site specific recommendations are made in the associated Environmental Management Plan, and this should be strictly adhered to.

9.1.4 Increase in Traffic Volumes

During the construction phase, there is anticipated to be an increase in the number of vehicles using the local road network due to an influx of construction vehicles. The proposed preferred site of the new Opuwo Aerodrome is located close to the surface MR100/C41 between Opuwo and Omakange. The proximity of the site to the road is one of the main deciding factors that lead to the preference of the proposed site. The proximity of the site to the MR100/C41 allows for a length of only 4.1 km of gravel road to be constructed. Nevertheless, the proposed construction of the new aerodrome will result in an increase of vehicular traffic during the construction phase. Heavy-duty vehicles carrying large loads are also known to cause a more pronounced degradation of the road surface. This has a further effect in terms of the emissions released into the atmosphere from an increased number of vehicles.

Impact Description	Increase in traffic
Nature	Negative – will be harmful to the environment
Extent	Small
Duration	Short term

Intensity	Medium
Probability	Probable
Degree of Confidence	Probable / medium
Impact Pre-mitigation	Low
Impact Post-mitigation	Very Low

Proposed Mitigation:

- Considering that a new gravel will need to be constructed for the operational phase of the aerodrome, it is recommended that the same road be used for construction access.
- Appropriate signs should be place along the MR100/C41 to suitably notify road users of the construction activity and the use of the road for load-bearing vehicles.
- Further measure such as a reduced speed limit nearer to intersections should be implemented and flagmen should be used in times when work is adjacent to or along heavy-trafficked routes.
- The local constituency should be engaged to seek out collaborative projects for the improvement of the roads.
- All vehicles to be making deliveries or picking up material should adhere to the speed limits.
- Normal pick-ups and deliveries should be restricted to working hours (8:00 to 17:00).
- Construction vehicles should be in a roadworthy condition, and they should be appropriately maintained throughout the construction period.
- Heavy equipment should be transported early in the morning (12:00 to 5:00) with proper pilotage.
- Raw materials such as sand should be appropriately covered to prevent any material escaping in transit.
- All vehicles should park in demarcated areas on site until they are offloaded.

9.1.5 Construction Noise

Although the effect of construction noise on a construction site is inevitable, this impact is considered to be of lower consequence than other impacts due to the proposed site of the activities being further away from possible receptors. However, the surrounding landscape is rural in nature and therefore is

more sensitive to noise impacts. The nearest receptors would be the residents of Otjijarua Village situated a few hundred meters from the proposed Site and those in Alfa Village approximately 5 km.

Impact Description	Construction Noise
Nature	Negative – will be harmful to the environment
Extent	Small
Duration	Short term
Intensity	Low
Probability	Probable
Degree of Confidence	Probable / medium
Impact Pre-mitigation	Low
Impact Post-mitigation	Very Low

Proposed Mitigation:

- Consideration should be given to the use noise-reduction devices such as mufflers for heavy vehicles. Appropriate directional and intensity settings are to be maintained on all hooters and sirens.
- All construction vehicles should be in good working order to reduce possible noise pollution.
- All construction equipment or machinery should be switched off when not in use.
- Sound amplification equipment should only be employed on site in the event of an emergency.
- Noise generating equipment should be operated during working hours (i.e. 8:00 – 17:00) to reduce the potential of creating a nuisance.
- Construction workers who operate noise generating machinery ≥80 dBA (decibels) continuously for 8 hours or more should use ear muffs. Workers experiencing prolonged noise levels (70 – 80 dBA) should wear ear plugs.
- Further site specific recommendations are made in the associated Environmental Management Plan, and this should be strictly adhered to.

9.1.6 Dust and Emissions

The air quality of the area is currently considered to be very good considering the rural setting of the proposed site and the limited sources of air pollution in the vicinity. Opuwo town is approximately 22.1 km from the proposed site by road. As such, the sources of other pollution from industries are very limited.

During the construction phase of the development, dust and emissions are of concern. From present observation of wind direction, the wind generally blows from the east in a westerly direction. Otjijarua Village is located in very close proximity to the Site. With this in mind, there is the possibility of dust emissions becoming an issue to the nearby communities during the construction phase. Therefore, appropriate dust suppression measures need to be implemented to limit the negative impact.

Impact Description	Dust and Emissions
Nature	Negative – will be harmful to the environment
Extent	Moderate
Duration	Short term
Intensity	Low
Probability	Probable
Degree of Confidence	Probable / medium
Impact Pre-mitigation	Low
Impact Post-mitigation	Very Low

Proposed Mitigation:

- The appointed contractor must provide and maintain a method statement for “dust control” prior to the start of construction. This method statement must also detail the proposed source of water to be utilised and the details of permits acquired for such usage.
- A wind monitoring station should be set up to indicate the direction and strength of daily winds. During period of high wind, construction activities should be limited.
- In high wind conditions, the handling of highly erodible materials should also be avoided. And materials such as sand should be adequately covered.

- Cement should be covered entirely by impervious sheeting or placed in an areas sheltered on the top and around the sides.
- Effective dust screens, sheeting or netting should be provided to restrict dust from being blown toward the nearby road or to the floodplain areas.
- The construction camp should be watered during dry and windy conditions to control dust fallout. As far as is possible, potable water must NOT be used as a means of dust suppression. The use of “grey”, “brown” or raw water must be investigated as an alternative.

9.2 OPERATION-RELATED IMPACTS

These impacts are usually more permanent in nature and as a result have long-term impacts or at least until decommissioning of the particular project, which is not envisioned at this point. Different from the construction related impacts, no Operational Management Plan is provided as this is the function of the Project’s Business Plan. Recommendations are however made to specific Plans to be compiled by the Proponent/Management to provide for adequate planning, implementation and monitoring of certain activities and to incorporate specific impacts and related mitigations.

Given the nature of the operational phase of the proposed Opuwo Aerodrome, some issues are of greater concern than others. The largest concern to the general public who reside in close proximity to any new aerodrome is the noise produced by larger aircrafts on take-off and landing. In recent years, people have been made increasingly aware of the effects of modern activities on air pollution. And this is becoming a greater concern as a contributor to greenhouse gases. These impacts and others are discussed in the section that follows.

9.2.1 Ground and Surface Water Pollution & Abstraction

The on-site storage of fuel for the aircrafts creates the potential for leaks and spillages that could lead to a contamination of ground and nearby surface water resources. The increased number of impermeable surfaces will also increase run-off that could lead to enhanced pollutant transportation. Stormwater from site could potentially contain contaminants that could enter the nearby water resources. This could have dire effects on the downstream habitat and users.

Although this Site (Alternative 2) is considered to be ideal in terms of its proximity to Opuwo town and its access to a main road, the location of the proposed runway will fall between known watercourses. This puts both watercourses at risk of contamination from any pollutants that may occur on the Aerodrome site. The North-western region of Namibia is also very sparsely populated and there are very little activities that presently have a negative effect on the watercourses. Thus the significance of any potential spillage on site will be great.

Another potential source of ground and surface water pollution is waste water (sewage) generated on site. Sewage from the guard house and rest room facilities (including ablution) for passengers and crew will be temporarily stored in septic tanks and emptied at the Opuwo Town sewage works.

Leakage of effluent from the septic tanks on site or spillages during handling is of concern and this should be appropriately addressed.

Impact Description	Ground and surface water pollution & abstraction
Nature	Negative – will be harmful to the environment
Extent	Moderate
Duration	Medium Term
Intensity	Low
Probability	Probable
Degree of Confidence	Probable / medium
Impact Pre-mitigation	Moderate
Impact Post-mitigation	Very Low

Proposed Mitigation:

- Consideration should be given to a small scale biological treatment plant on site that will be able to treat waste or effluent generated on site, rather than septic tanks that require pumping.
- Should a small scale waste water treatment facility be considered for the site, neither the plant nor any pipes should not be located within any of the drainage lines.
- None of the proposed septic tanks should be located within any of the drainage lines.
- It is recommended that a surface and ground water monitoring programme be compiled and implemented. Measurements should be taken before the start of construction which can be used a baseline data and regular monitoring events should be scheduled.
- It is further recommended that a solid waste management plan be compiled and implemented. This should focus on reducing the amount of solid waste produced by the facility as well as the proper handling and disposal of hazardous material.
- Any proposed sewage system must be regularly inspected for leaks and any leakages must be attended to immediately.
- All waste material should be stored in appropriate storage vessels that are clearly demarcated.

- Waste material should not be allowed to remain on site for prolonged periods of time and under no circumstances is waste to be landfilled on site.
- The discharge of herbicides and pesticides in harmful quantities should be prevented.
- Herbicides and pesticides should not be used in periods of heavy rainfall; and biodegradable herbicides and pesticides with shot half-lives of three days or less should be used.
- It is highly recommended that a landscape plan is compiled that will use indigenous flora for the landscaping of areas subsequent to construction.
- New boreholes will have to be drilled for the purpose of supplying water to the aerodrome, for both the construction and operational phases.

9.2.2 Erosion and Sedimentation

Although erosion and sedimentation are not considered with the same severity as in the construction phase, it is however a concern when development occurs on or near watercourses. When it does occur, it is usually attributed to improper rehabilitation subsequent to construction or large portions of land left without adequate vegetation cover. The area surrounding the town of Opuwo is known to have large sections of land that are prone to dust storms, indicating an already great volume of loose surface soil. The topography of the area appears to have a maximum slope of under 1%, which is considered flat with a gentle slope.

Erosion and sedimentation in the operational phase are usually due to an increase in the number of impermeable surfaces promoting increased surface runoff from roofs and roads. Should there be large tracts of non-vegetated land, the runoff at higher velocities increase erosion. Improper or insufficient stormwater planning further exacerbates the problems. The preferred study site also has two small drainage channels that are positioned to cross the proposed runway. It is anticipated that low-height box culverts be provided to ensure cross drainage with headwalls beyond the runway strip. Side drains along and within the runway are also planned.

Apart from the loss of valuable topsoil, vegetation and habitat, uncontrolled stormwater will also result in the formation of erosion gullies, turbidity increases in water bodies and sedimentation accumulation in the drainage channels. The Soil Conservation Act No. 76 of 1969 requires the prevention and combating of soil erosion; the conservation, protection and improvement of soil, vegetation and water sources and resources.

Impact Description	Erosion and Sedimentation
Nature	Negative – will be harmful to the environment
Extent	Moderate

Duration	Medium Term
Intensity	Medium
Probability	Probable
Degree of Confidence	Probable / medium
Impact Pre-mitigation	Moderate
Impact Post-mitigation	Low

Proposed mitigation:

- It is essential that the proposed measures outlined in the feasibility report are carried forward in the design of a proper stormwater management plan. This will include the insertion of low-height box culverts to encourage cross drainage with headwall beyond the runway strip. Banks and drains will have to be designed accordingly to allow for stormwater to be directed to the upstream culvert headwalls. Side drains should be constructed alongside the runway and within the runway strip where the natural ground falls away toward the runway.
- Apply acceptable Best Management Practices (BMPs). Structural BMPs typically include sediment ponds or traps, stabilised construction entrances, filter fences, check dams and riprap. Managerial BMPs include preserving the natural vegetation, leaving buffer zones and providing dust control.
- Newly constructed manholes should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system.
- Avoid unnecessary and excessive vegetation clearance and disturbance of top soil. Earthworks final surfaces should be well compacted, and the subsequent permanent work or surface protection should be carried out as soon as practical after the final surfaces are formed to prevent erosion caused by rainstorms.
- The appointed Contractor should draft a Rehabilitation Plan and revegetate exposed areas once construction at the particular area ceased. The mitigation for the slope cutting should include slope landscaping and minimisation of the areas affected by slope cutting. The Rehabilitation Plan should provide for a phased approached ensuring that no area is exposed to natural elements (e.g. wind, water).
- It is essential that the appointed Contractor prepare and implement a contingency plan to respond to the event of failure of the Erosion and Sedimentation Control Plan.
- Unpaved surfaces should be revegetated with local trees, grasses and shrubs.

- The Construction Environmental Management Plan (Part 3 – Environmental Specifications) provides detail specifications and requirements to avoid any potential impacts.

9.2.3 Landscape and Visual Aesthetics

In a rural landscape, the development of a new and modern structure is seen to be in contrast with the natural environment. The remoteness of the area and the relatively untouched rural landscape is currently a tourism draw card for people wanting to get a real sense of life in Africa. The Opuwo area is considered to be a gateway for tourists to the attractions of the Epupa Falls, the Marienfluss, Van Zyl's Pass, and to the traditional villages of the Himba, Herero and Dhimba peoples. The area is considered to be an unspoilt region of Namibia. Thus, the design and build of the proposed Aerodrome should take this into consideration and the development should represent the uniqueness of the area.

The preferred site of the aerodrome is situated on a plateau east of the town of Opuwo. The topography of the area appears to have a maximum slope of under 1%. The proposed location of the runway is approximately 3.2 km from the mountains to the south south-west and a mountain range about 5.5 km running north to south in the east of the site.

Visually, the mountains are thought to shelter the sight of the aerodrome from local visual receptors, although not being an obstacle in itself to the use of the aerodrome by low flying aircrafts. The architectural design, which has the aim of being functional, should also not detract from the natural surroundings. Of prime importance will be appropriate landscaping to be implemented such that it complements that natural landscape and utilised local tress, grasses and shrubs. It is important that the Project architect, engineer and environmentalist combine and coordinate their efforts in ensuring a development that complements the natural setting and beauty of the immediate and surrounding area.

Impact Description	Landscape and Visual Aesthetics
Nature	Negative
Extent	Site specific
Duration	Long term
Intensity	High
Probability	Probable
Degree of Confidence	Probable / medium
Impact Pre-mitigation	Moderate

Impact Post-mitigation	Low

Proposed Mitigation:

- A Landscape Master Plan should be developed and implemented to ensure that all bare areas are appropriately rehabilitated and revegetated. The aim of the plan should also be to preserve as much of the natural vegetation as possible.
- The landscaping of the site will contribute immensely to the maintaining a natural atmosphere in the operational phase. This will be key in reducing the visual impact. Landscaping will also reduce the noise impacts, glare and heat.
- As tall trees are not entirely feasible in the immediate vicinity of the development, local trees, grasses and shrubs should be used for landscaping.
- Steelwork should be finished with a matt paint that will limit reflection.
- The developer needs to be sensitive to the use of glass or materials with a high reflective capability to avoid glare form shiny surfaces.
- Tines and tints of selected complimentary colours that fir the setting should be considered. Subdued and complimentary natural shades and tints blend easily into a landscape setting and should be used.
- All lighting should be carefully considered with regard to the extent of illumination, the intensity and colour of lights and the luminaire.
- Roofs are usually most visible, and the finishes need to be chosen to reduce the visual impact from elevated positions.

9.2.4 Loss of Biodiversity

A major concern of most airports is the risk that the aircrafts pose to the fauna, and in particular, avifauna of an area. Aircrafts that take-off at great speed give birds little time to react and result in many collisions of birds with aircrafts.

Twenty bird species of conservation concern are known to occur in the general area of the QDGC 1813DD. The presence of these species on site can only be confirmed with a detailed ecological assessment which includes a field survey. During the brief field survey 24 avifaunal species were recorded, with 6 species of conservation importance being likely to occur.

Different airports have different conditions that lead to a varying degree of biodiversity loss. Most accidents occur when birds fly into the windscreen or the engine of an aircraft. With larger commercial airlines, this does not usually result in the loss of human life but it does cause some measure of

damage to the aircraft. In the case of smaller aircrafts, serious damage could be done by a large bird flying into the windscreen of an aircraft. Bird strikes are known to occur most often during take-off and landing, and as such, airports/aerodromes are the sites of the most casualties.

Impact Description	Loss of Biodiversity
Nature	Negative – will be harmful to the environment
Extent	Moderate
Duration	Long Term
Intensity	Medium
Probability	Probable
Degree of Confidence	Probable / medium
Impact Pre-mitigation	High
Impact Post-mitigation	Moderate

Proposed Mitigation:

- It is essential to know at the start of the project which species in the area are most at risk. It is therefore imperative for a detailed ecological assessment to be undertaken with an emphasis on avifauna.
- Consideration should be given to employing a wildlife manger to assess and manage any incidents involving faunal species on site.
- The appointed ecologist can provide some measure of mitigation in the form of an avifaunal avoidance programme for the Aerodrome. This should include the following:
    - Retention of natural vegetation where possible
    - Rehabilitation of areas disturbed during construction
    - Maintenance of infield areas to avoid attracting undesirable species including the use of trained dogs and mowing of areas next to the runways to ensure a grass height of at least 13cm (depending on the species present post-construction)
    - Appropriate fencing should be erected and this has to be appropriately maintained through the operational phase of the project in order to dissuade any terrestrial fauna (including small fauna such as tortoises and mongoose) from the aerodrome locality

- Carcasses of animals which have been struck by aircraft should be removed immediately to prevent large congregations of scavenger birds (crows, kits, eagles, vultures etc.)

- A permit will be required by the Department of Forestry and by the Department of Nature for protected species which will be destroyed during the construction of the aerodrome. It is recommended that Aloe litteralis is relocated and used for landscaping around the aerodrome or replanted into adjacent areas.

9.2.5 Noise Pollution

Noise is considered to be one of the major impacts generated from the development of a new aerodrome. The noise generated by aircrafts is most pronounced during take-off and landing. Residents living in some proximity to the proposed aerodrome may experience some disturbance and general levels of discomfort.

Of significant concern is the effect of the noise of aircrafts on the breeding and feeding habits of birds and other faunal species. The desktop ecological study revealed that approximately 269 bird species are confirmed to occur in the Quarter Degree Grid Cell (QDGC) 1813 BB, which is the region in which the study site occurs. Of these, twenty species are of conservation concern.

The nearest noise receptors will be those residents of Mopane Village which is located approximately 3km to the south south-west of the aerodromes centre. In addition, the larger settlement of Alfa Village is approximately 5km to the west south-west of the aerodrome's centre.

The noise range in typical rural communities is usually in the range of 30 decibels (dB). The noise range of jet engines is known to be in the region of 140dB in the region of 25m from the aircraft. However, it should be noted that the proposed Opwuo Aerodrome will be classified as a Class 2B Aerodrome. The largest aircrafts, or the aircrafts that require the greatest runway length, will be the Falcon 7X and the Learjet 31 of the Government Air Transport Services. A Learjet 31 generates a noise level of approximately 80dB on take-off (jetsales.com). The range of 80dB is not considered to be damaging to the hearing of an individual. However, ear protection should be employed when levels increase to 85dB. As such, ground staff at the proposed aerodrome would be at some risk of increased noise impacts. As the aerodrome will not be designed to accommodate larger jet aircrafts, the surrounding residents at a distance of 3.5km will not be at any serious risk of hearing damage or other negative effects of noise pollution.

Impact Description	Noise Pollution
Nature	Negative – will be harmful to the environment
Extent	Moderate
Duration	Permanent

Intensity	Medium
Probability	Definite
Degree of Confidence	Probable / medium
Impact Pre-mitigation	High
Impact Post-mitigation	Moderate

Proposed Mitigation:

- Consideration should be given to the creation of a buffer area of some medium – tall trees on the south south-west side boundary of the aerodrome to buffer any potential noise from the closest residential developments. It should however be noted that vegetation is not an impervious barrier to high levels of noise and cannot be used to screen the noise completely.
- Structural barrier walls or earth berms may be considered as a noise buffer.
- Noise levels should be monitored regularly and records should be kept on site, especially if complaints are received from surrounding residents.

9.2.6 Air Pollution

The pollution of the atmosphere in the area surrounding any proposed aerodrome is a point of concern. The combustion of aviation fuel produces nitrogen oxides (NOx), carbon monoxide (CO), sulphur oxides (SOx), hydrocarbons and particulates. This is at its greatest during take-off and landings. It is known that a certain amount of kerosene is released when engines are working inefficiently on approach as they only use about 30% of their available power.

The release of pollutants may have consequences for the health and safety of people, plants and animals. Although technology is now improving within the industry to utilise greener technologies, this is a transition and will not have a measurable effect in the near future.

Considering the rural setting of the proposed Opuwo Aerodrome, an increase in air traffic at a newly aerodrome may have a measurable effect on the air quality of the region. Due consideration should also be given to the Atmospheric Pollution Prevention Ordinance No. 11 of 1976.

Impact Description	Air Pollution
Nature	Negative – will be harmful to the environment

Extent	Moderate
Duration	Permanent
Intensity	Medium
Probability	Definite
Degree of Confidence	Probable / medium
Impact Pre-mitigation	Moderate
Impact Post-mitigation	Moderate

Proposed Mitigation:

Although greener technologies are being employed by aircraft operators, there is little recommendation for the mitigation of the impacts of the take-off and landing of aircrafts. An air quality assessment may be conducted prior to the start of construction to establish baseline air quality conditions and a monitoring program may be instituted thereafter.

CHAPTER 10 : CONCLUSIONS AND RECOMMENDATIONS

10.1 CONCLUSION

This section provides a summary of the key findings of the detailed Environmental and Social Impact Assessment. This section also provides a reasoned opinion as to whether an environmental clearance certificate for the proposed Project should or should not be granted.

The proposed Project has the potential to contribute positively to the Country's economic development, through ensuring improved accessibility to and from the Region for both locals and tourists, as well as the import and export markets. Given the nature of the proposed Project evaluated against the sensitivity of the receiving environment, it seems inevitable that the proposed Opuwo aerodrome will have an impact on its receiving socio-economic and biophysical environment, some of greater potential significance and others of less, as presented in Chapter 9, above.

The project will have significant positive economic impacts for the local economy. This will be through the creation of temporary job opportunities for the construction industry and the permanent jobs that will be created during the operational phase. These jobs should be earmarked for members of the local community.

Negative impacts expected as a result of the proposed Project is a loss in vegetation and disturbance to fauna habitats. Considering the scale of the Project it can be concluded that the Project will have a permanent impact of a 'medium' significance given that the Aerodrome design specifications are governed by the requirements and recommendations given by the ICAO to the Convention on International Civil Aviation, Volume 1 Aerodrome Design and Operations. Mitigation measures and recommendations have been prescribed in this report (and the EMP – Appendix E) to reduce the significance of impacts (among others) to acceptable levels. As the proposed Project would be implemented in phases namely: Phase 1A, which entails the access road works, Phase 1B which entails the buildings and fences, and Phase 2 which entails the runway and ancillary services, the impact on avifauna is expected to be high, reduced to medium with mitigation.

Demining is a pre-requisite which is to be done before any construction activities can commence (see Appendices D23 & D28). The demining and de-bushing process would be executed in kilo-meter phases to enable the issuance of the required certificate to the Proponent upon the completion of each phase, in order to avoid Project construction delays should the ECC have been issued before the demining is finalized. The overall demining exercise is expected to be completed towards the end of April 2024.

Based on the baseline information as provided by the Environmental Specialists and information provided by the Project Team and Proponent, the nature and extend of the Project, setting the sensitivity of the receiving environment, this detailed impact assessment study concludes that there is currently no evidence indicating that any of the potential impacts identified (see sections 9.1 to 9.2) are of such significance that it cannot be reasonably mitigated and that the proposed Project, as presented in this report, should not be allowed to continue. It is however required that the mitigations

and recommendations as presented in this report and the EMP first be approved by the Environmental Commissioner before the Project can commence.

Given this, it is not to say that there will be no further impact/s and potential threats as highlighted by the study. Construction, operations and project related activities need to be strictly controlled by the Proponent and Contractor/s, and monitored by the appointed specialist and applicable Competent Authorities to ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed in an effective manner.

10.2 RECOMMENDATIONS

It is the conclusion and recommendation of the EAP that this Project be granted an ECC, subject to the following recommendations and final approval by the Environmental Commissioner as per the Environmental Management Act, No. 7 of 2007.

1. All required permits, licenses and approvals (see section 4.3.2) for the Project be obtained before commencement.

2. All mitigations listed in sections 9.1 and 9.2 of this Report and those included in the Environmental Management Plan (Appendix E) be implemented, as applicable.

3. An Environmental Control Officer should be appointed for the construction phase of the Project to make sure all the requirements within the detailed Environmental and Social Impact Assessment Report and Environmental Management Plans (Appendix E) are strictly adhered to.

4. An Environmental Site Manager should be appointed during the course of the construction phase to make sure that all the requirements as listed within this ESIA report and the EMP (Appendix E) are adhered to.

5. Continued on-site monitoring and evaluation be conducted during the construction and operational phases to be authorised by the DEA.

10.3 ENVIRONMENTAL STATEMENT

Based on the information presented in this ESIA report, the Environmental Assessment Practitioner is of the opinion that the immediate and larger environment will not be significantly affected if the above recommendations as proposed in this Report are implemented and monitored, and responsible environmental practises are applied by the Developer, Proponent, appointed contractors and sub-consultants.

Urban Green cc, the independent environmental assessment practitioner, recommends to the relevant authorities that the application for the listed activities associated with the New Opuwo Aerodrome be approved on condition that the above recommendations (Section 10.2) are met and that continuous monitoring be conducted in accordance with the Environmental Management Act (Act No. 7 of 2007), its EIA Regulations and this Environmental and Social Impact Assessment report.

It is important that proof of monitoring is submitted to the office of the Environmental Commissioner to be used as part of the review process pertaining to the 3-yearly ECC renewal.

REFERENCES

Legislation

- Constitution of the Republic of Namibia, 1990
- Environmental Assessment Policy 1995
- Environmental Management Act No. 7 of 2007
- Aviation Act No. 74 of 1962 (as amended)
- Civil Aviation Regulations, 2001 (Government Notice No. 1 of 2001)
- National Water Act No. 54 of 1956
- Water Resources Management Act No. 11 of 2013
- Forest Act No. 12 of 2001 (as amended)
- Soil Conservation Act No. 76 of 1969 (as amended)
- Atmospheric Pollution Prevention Ordinance No. 11 of 1976 (as amended)
- Draft Pollution Control and Waste Management Bill, July 1999 (Third Draft September 2003)
- Public Health Act No. 36 of 1919 (as amended)
- Hazardous Substances Ordinance No. 14 of 1974
- Labour Act, No. 11 of 2007
- National Heritage Act No. 27 of 2004
- Communal Land Reform Act, No. 5 of 2002
- Traditional Authorities Act, No. 25 of 2000

Literature

Curtis, B. and Mannheimer, C. 2005. *Tree Atlas of Namibia*. National Botanical Research Institute, Windhoek, Namibia.

Hoffman, Paul. J. 2011. *Strange bedfellows: glacial diamictite and cap carbonate from the Marinoan (635 Ma) glaciation in Namibia*. In Sedimentology: Volume J8, Issue 1, pg. 57 -119

Kunene Census Regional Profile. 2011. *Population and Housing Census.* Namibia Statistics Agency, Windhoek. Namibia.

Kunene Regional Development Profile 2015.

Mendelsohn, J.M., Jarvis, A.M., Roberts, C.S., and Robertson, T. 2002. *Atlas of Namibia*. Compiled for the Ministry of Environment and Tourism, David Philip, Cape Town.

Lenssen-Erz, T. and Vogelsang, R. 2005. *Populating No-Man's Land: Rock Art in Northern Namibia*. South African Archaeological Society Goodwin Series 9: 54-62

Windhoek Consulting Engineers (2012): Feasibility study for the Opuwo aerodrome (volume 1 of 2 volumes).

IUCN (2013): IUCN Red List of Threatened Species, Version 2013.2: www.iucnredlist.org

Southern African Birding cc. (2011): Roberts VII Multimedia, Birds of Southern Africa, Computer Software.

Harrison JA, Allan DG, Underhill LG, Herremans M, Tree AJ, Parker V, Brown CJ (eds). 1997. The atlas of southern African birds. Vol 1: Non-Passerines, and Vol 2: Passerines. BirdLife South Africa, Johannesburg.

Hauptfleish M. 2009. Impact Assessment (IA) to solve Aircraft-Wildlife Collisions. IAIA09 Conference Proceedings, Impact Assessment and Human Well-Being. 29th Annual Conference of the International Association for Impact Assessment,16-22 May 2009, Accra International Conference Center, Accra, Ghana (www.iaia.org).

Hauptfleisch ML. 2014. The use of ecosystem parameters in predicting the risk of aircraft-wildlife collisions at Namibian airports. PhD thesis, University of the Free State, South Africa.

Hauptfleisch ML, Dalton C. 2015. Arthropod phototaxis and its possible effect on bird strike risk at two Namibian airports. Applied Ecology and Environmental Research 1394): 957-965.

Hauptfleisch ML, Avenant NL. 2016. Actual and perceived collision risk for bird strikes at Namibian airports. Ostrich - Journal of African Ornithology. May 2016.

Hauptfleisch M, Knox NM, Heita P, Aschenborn O, Mackenzie ML. 2020. An analysis of the risk of collisions between aircraft and vultures in Namibia. *Namibian Journal of Environment 4 A: 41-49*.

Hockey PAR, Dean WRJ, Ryan PG (eds). 2005. Roberts Birds of Southern Africa, 7th Edition. The Trustees of the John Voelcker Bird Book Fund, Cape Town.

IUCN 2023. The IUCN Red List of Threatened Species. Version 2022.2. <www.iucnredlist.org>. Downloaded on 18 August 2023.

Kolberg H. 2015. Namibia's Important Bird and Biodiversity Areas 1: Introduction and Overview. Lanioturdus. 48.

Kolberg H. 2022. Tracked vultures. Lanioturdus 55(4).

Simmons RE, Brown CJ, Kemper J. 2015. Birds to watch in Namibia: red, rare and endemic species. Ministry of Environment and Tourism and Namibia Nature Foundation, Windhoek.