ENVIRONMENTAL SCOPING ASSESSMENT

TOWNSHIP ESTABLISHMENT FOR TSES EXTENSIONS 1, 2, 3 AND SOUTPUT NORTH AND SOUTPUT SOUTH TSES VILLAGE, //KARAS REGION

ENVIRONMENTAL SCOPING REPORT

MARCH 2024

URBAN Green cc
Town and Regional Planning Consultants
Environmental Management Consultants
Water and Wastewater Treatment Consultants

PROJECT INFORMATION

Project Title:	**TOWNSHIP ESTABLISHMENT FOR TSES EXTENSIONS 1, 2, 3 AND SOUTPUT NORTH AND SOUTPUT SOUTH, TSES VILLAGE, //KARAS REGION**
Type of Project:	**ENVIRONMENTAL SCOPING ASSESSMENT**
Project Location:	**PORTIONS OF THE FARM TSES TOWNLANDS NO. 425, TSES VILLAGE – //KARAS REGION (NAMIBIA)**
Project Number:	**APP-002106**
Competent Authority:	**MINISTRY OF URBAN AND RURAL DEVELOPMENT** **NAMIBIA PLANNING AND ADVISORY BOARD / TOWNSHIPS BOARD** **PRIVATE BAG 13289** **WINDHOEK** **NAMIBIA**
Approving Authority	**DIRECTORATE OF ENVIRONMENTAL AFFAIRS** **MINISTRY OF ENVIRONMENT AND TOURISM** **PRIVATE BAG 13306** **WINDHOEK**
Proponent/Client:	**TSES VILLAGE COUNCIL** **PO BOX 9** **TSES**
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A	Ampére
BID	Background Information Document
BMP	Best Management Practices
°C	Celsius
dB	Decibel
DEA	Directorate of Environmental Affairs
DR	District Road
DSR	Draft Scoping Report
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
ESP	Environmental Structure Plan
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMA	Environmental Management Act
EMP	Environmental Management Plan
ESP	Environmental Structure Plan
FSR	Final Scoping Report
Ha	Hectare
I&AP	Interested and Affected Party
Km	Kilometre
Km/h	Kilometres per hour
kVA	Kilowatts Ampère
L	Litre

MAW	Ministry of Agriculture and Water
MAWF	Ministry of Agriculture, Water and Forestry
MAWLR	Ministry of Agriculture, Water and Land Reform (former)
MET	Ministry of Environment, Forestry and Tourism
MET	Ministry of Environment and Tourism (former)
m^3	Cubic meters
mg	Milligram
mm	Millimetre
No	Number
Ptn	Portion
PPP	Public Participation Process
Re/	Remainder
RoW	Right of Way
SA	South Africa
SABS	South African Bureau of Standards
SANS	South African National Standards
ToR	Terms of Reference
TDS	Total Dissolved Solids
VIP	Ventilated Improved Pits
WWTP	Waste Water Treatment Plant

GLOSSARY OF TERMS

Activity	The physical work that a Proponent proposes to undertake.
Alternatives	A possible course of action, in place of another, that would meet the same purpose and need, but which would avoid or minimize negative impacts or enhance project benefits. These can include alternative locations/sites, routes, layouts, processes, designs, schedules and/or inputs. The “no-go” alternative constitutes the ‘without project’ option and provides a benchmark against which to evaluate changes; development should result in net benefit to society and should avoid undesirable negative impacts.
Assessment	The process of identifying, predicting, and evaluating the significant effects of activities on the environment; and the risks and consequences of activities and their

	alternatives and options for mitigation with a view to minimise the effects of activities on the environment.
Audit	Regular inspection and verification of construction activities for implementation of the EMP.
Bulk Supply	The wholesale supply of i.e. water on a business-orientated basis, in large quantities, whether in treated or untreated form, for any utilisation purpose to a customer for own use or for subsequent supply by the customer to consumers.
Bund	An enclosure designed to hold at least 120% of the contents of a liquid storage vessel, tank, or drums to contain any spillage.
Business building	A building designed and/or used as offices, warehouses, medical or dental consulting rooms, laboratories or other business purposes but does not include other buildings specifically defined or mentioned elsewhere in this Scheme with the exception of offices.
Competent Authority	A body or person empowered under the local authorities act or Environmental Management Act to enforce the rule of law.
Contaminated Water	Water contaminated by the Proponent's activities, e.g. polluted runoff from plant/personnel wash areas.
Coverage	The total percentage of the area of an erf that may be covered by buildings.
Critically Endangered (IUCN)	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V of the IUCN Red List Categories and Criteria), and it is therefore considered to be facing an extremely high risk of extinction in the wild.
Cumulative Impacts	In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
Emergency Situation	An incident, which potentially can significantly impact on the environment, and which, could cause irreparable damage to sensitive environmental features. Typical situations entail amongst others the: • Spill of petroleum products and lubricants into the aquatic system; • Potential damage, erosion and slumping of unstable river embankments or drainage channels; • Potential event of impeding the continuous flow of water to downstream water user's dependant on the flow; and • Dangerous situation where livestock and children can be injured by any activity emanating from the construction or rehabilitation of the project

	implementation.
Endangered (IUCN)	A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V of the IUCN Red List Categories and Criteria), and it is therefore considered to be facing a very high risk of extinction in the wild.
Environment	As defined in the Environmental Assessment Policy and Environmental Management Act - "land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values".
Environmental Impact Assessment (EIA)	The process of examining the environmental effects of a development as prescribed by the Environmental Impact Assessment Regulations (GN. No. 30 of 2012) for activities listed as List of Activities which may not be undertaken without an Environmental Clearance Certificate from the Environmental Commissioner (GN. No. 29 of 2012).
Environmental Management Plan (EMP)	A working document on environmental and socioeconomic mitigation measures, which must be implemented by several responsible parties during all the phases of the proposed project.
Environmental Site Manager (ESM)	It is a suitably qualified environmental officer appointed by the Proponent who oversees the on-site daily environmental responsibilities.
Evaluation	The process of ascertaining the relative importance/significance of information, in light of people's values, preference and judgements in order to make a decision.
Groundwater potential	The volume of water which can be abstracted over a period from an aquifer without adversely affecting the quantity and quality of the water or the environment above the aquifer.
Hazardous Substance	A substance that, in the reasonable opinion of the Engineer and/or ECO, can have a harmful effect on the environment.
Independent Environmental Officer (IEO)	A suitably qualified professional independent from the Proponent who ensure that all environmental specifications and EMP obligations are met. The IEO will be responsible for the monitoring, reviewing, and verifying of compliance with the EMP by the Proponent.
Infiltration area	The area lying within a 1 in 50 year flood area or within a strip of land measured 5 metres outwards on both sides from the outer edges of the seasonally active bed (gravel bed) or the visually identifiable banks of a watercourse which is further than

	500 metre from its bounding watershed, or as may be assessed by a hydrogeological study as being an area within which surface water percolates into the groundwater in above average quantities, whichever is the larger.
Interested and Affected Party (I&AP)	Any person, group of persons or organisation interested in, or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.
Invasive Species	It refers to a non-indigenous plant, animal or micro-organism; or an indigenous plant, animal or micro-organism, translocated or intended to be translocated to a place outside its natural range of nature, that does not normally interbreed with individuals of another kind, including any subspecies cultivar, variety, geographic race, strain, hybrid or geographically separate population.
Listed Activity	An activity listed in terms of section 27(2) of the Environmental Management Act and the List of Activities which may not be undertaken without an Environmental Clearance Certificate from the Environmental Commissioner (GN. No. 29 of 2012).
Mitigate	The implementation of practical measures to reduce adverse impacts.
Monitoring	Regular inspection and verification of construction activities for degree of compliance to the EMP.
No-Go Areas	Areas identified as being environmentally sensitive in some manner and demarcated on plan, and on the Site with pegs or fencing and which are out of bounds to unauthorised persons. Authorisation must be obtained prior to entry.
Petroleum	Includes petrol and diesel
Proponent	Any person who has submitted or intends to submit an application for an authorisation, as legislated by the Environmental Management Act no. 7 of 2007, to undertake an activity or activities identified as a listed activity or listed activities; or in any other notice published by the Minister or Ministry of Environment, Forestry & Tourism.
Public	Citizens who have diverse cultural, educational, political and socio-economic characteristics. The public is not a homogeneous and unified group of people with a set of agreed common interests and aims. There is no single public. There are a number of publics, some of whom may emerge at any time during the process depending on their particular concerns and the issues involved.
Public consultation	The process of engagement between stakeholders (the proponent, authorities and I&AP) during the planning, assessment, implementation and/or management of proposals or activities. The level of stakeholder engagement varies depending on the nature of the proposal or activity as well as the level of commitment by stakeholders to the process.

Red Data List (IUCN)	The IUCN Red Data List of Threatened Species is widely recognised as a comprehensive, objective global approach for evaluating the conservation status of plant and animal species.
Residential unit	A room or suite of rooms, other than a dwelling unit, which is designed as a dwelling for a single household or for one or more single persons.
Scoping Process	Process of identifying: issues that will be relevant for consideration of the application; the potential environmental impacts of the proposed activity; and alternatives to the proposed activity that are feasible and reasonable.
Service station	A building used for the purpose of profit or gain for one of the following purposes, namely to maintain or repair motorbikes and motor vehicles or to supply fuel and for related purposes which also includes the parking or storage of motor vehicles, the sale of parts, accessories, fuel and lubrications for motor vehicles, but does not include panel-beating, spray painting and the dismantling of motor vehicles and motorbikes (except for minor repair works).
Sewage works	Any reservoir, tank, strainer, filter bed, engine, pump, machinery, land, building or such other works (except sewers) as may be necessary to treat and dispose of sewage.
Significant Effect/Impact	Means an impact that by its magnitude, duration, or probability of occurrence may have a notable effect on one or more aspects of the environment.
Site	In relation to a building includes the area of any appurtenances, outbuildings, yard, court or garden occupied or intended to be occupied in conjunction therewith.
Solid Waste	All solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food, and domestic waste.
Stormwater drain	A conduit acquired or constructed by a local authority council for purposes of conveying stormwater, and includes anything connected therewith.
Street	Any road, thoroughfare, pavement, sidewalk, lane or other right of way set apart for the use and benefit of residents in a local authority area.
Sustainable Development	Development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs and aspirations.
Topsoil	The top 150 mm of soil (topsoil) and root material of cleared vegetation.
Townlands	The land within a local authority area situated outside the boundaries of any approved township, which has been set aside for the mutual benefit of the residents

	in its area, and for purposes of pasturage, water supply, aerodromes, explosive magazines, sanitary and refuse deposits or other public purposes or the extension of such township or the establishment of other approved townships
Waterworks	Any weir, well, borehole, watercourse, dam, pumping station, reservoir, tank, sluice, pipeline, machinery, building, land or such other works as may be necessary to take, impound, discharge, store, treat or filter water or to maintain or carry on any such waterworks.
Vulnerable	A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable and it is therefore considered to be facing a high risk of extinction in the wild.
Warehouse	A building used or intended to be used for the storage of goods other than goods which will be used on or sold by retail from the premises on which they are stored.
Water Resource	A natural source or occurrence of water, which is not artificially confined.

1 INTRODUCTION TO THE PROJECT AND THIS REPORT

This chapter of the report provides a background and motivation to the proposed Project; the study's terms of reference; study approach and methodology, the assumptions and limitations, the purpose of this report and an outline of the remainder of the report.

1.1 PROPOSED PROJECT

The Tses Village Council (hereafter referred to as the Proponent), is of the intention to establish and/or proclaim new townships within the Tses Village jurisdictional area, namely Tses Extensions 1, 2 & 3 as well as Soutput North and Soutput South (future Tses Extensions 4 & 5). Tses is located in the north-central part of the //Karas Region in the southern part of Namibia. Refer to Fig. 5.1 in Section 5.1 for the locality map of Tses within Namibia.

The proposed Townships Establishment involve certain activities that are listed as "Listed Activities" according to Government Notice No. 29 of 6 February 2012 which requires that an Environmental Clearance Certificate (ECC) be obtained from the office of the Environmental Commissioner, thus requiring that an Environmental Assessment (inclusive of an Environmental Management Plan) be conducted.

In accordance with the Environmental Management Act, (Act No. 7 of 2007) and within the framework of the Environmental Impact Assessment Regulations (2012), Urban Green cc (the Environmental Assessment Practitioner) has been appointed by the Proponent to undertake an Environmental Scoping Assessment and apply for an Environmental Clearance Certificate for the township development.

1.2 MOTIVATION TO TOWNSHIP ESTABLISHMENT AND FORMALISATION

The motivation for the development of these townships is based on the need to provide formal erven with proper municipal services, enabling land tenure and acceptable living standards, as per the goals of Vision 2030.

Once the informal areas are formalised and proclaimed as proper townships, the occupier of a property has the option to buy the property and claim ownership according to the Local Authority Act No. 23 of 1992, as amended.

This Environmental Scoping Assessment is undertaken for the listed activities associated with the proclamation of Tses Extensions 1, 2 and 3 as townships, as well as for the formalisation and proclamation of Soutput North and Soutput South (future Extensions 4 & 5) west of the B1.

1.3 TERMS OF REFERENCE

No formal Terms of Reference (ToR) were provided, but rather were inferred from the requirements of the applicable legislation, namely the Environmental Impact Assessment

Regulations (Government Notice No. 30 of 2012), to enable an application for an Environmental Clearance Certificate with the Environmental Commissioner, as required by Section 27(3) of the Environmental Management Act (No. 7 of 2007).

The purpose of this Study (i.e. content of this Report) is to apply for an ECC for the townships formalisation and proclamation only. All other permits and/or licenses (see Section 3.4) required for the operation of the formalised Tses Extension Townships still need to be applied for by the Proponent.

1.4 STUDY APPROACH AND METHODS

This EA process was carried out in accordance with provisions for EA, as prescribed by the Environmental Impact Assessment Regulations (GN. No. 30 of 2012), provided for by Section 56 of the Environmental Management Act (No. 7 of 2007).

The study's approach and methods were guided by the Terms of Reference (as mentioned in Section 1.3) and the relevant legislation (addressed in Chapter 3).

The EA process is a planning, design and decision-making tool used to inform the relevant authorities and Proponent on what the consequences of their decisions will be in biophysical and social terms. As such, it identifies potential impacts (negative and positive) that the Project may have on the natural and social environments; as well as identifying potential opportunities and constraints the natural and social environment may pose to the development.

The steps followed as part of this EA process, are (i) registration of application for an ECC, and (ii) execution of a scoping assessment (content of this report). A flowchart indicating the process being followed is presented by Figure 1.4 below.

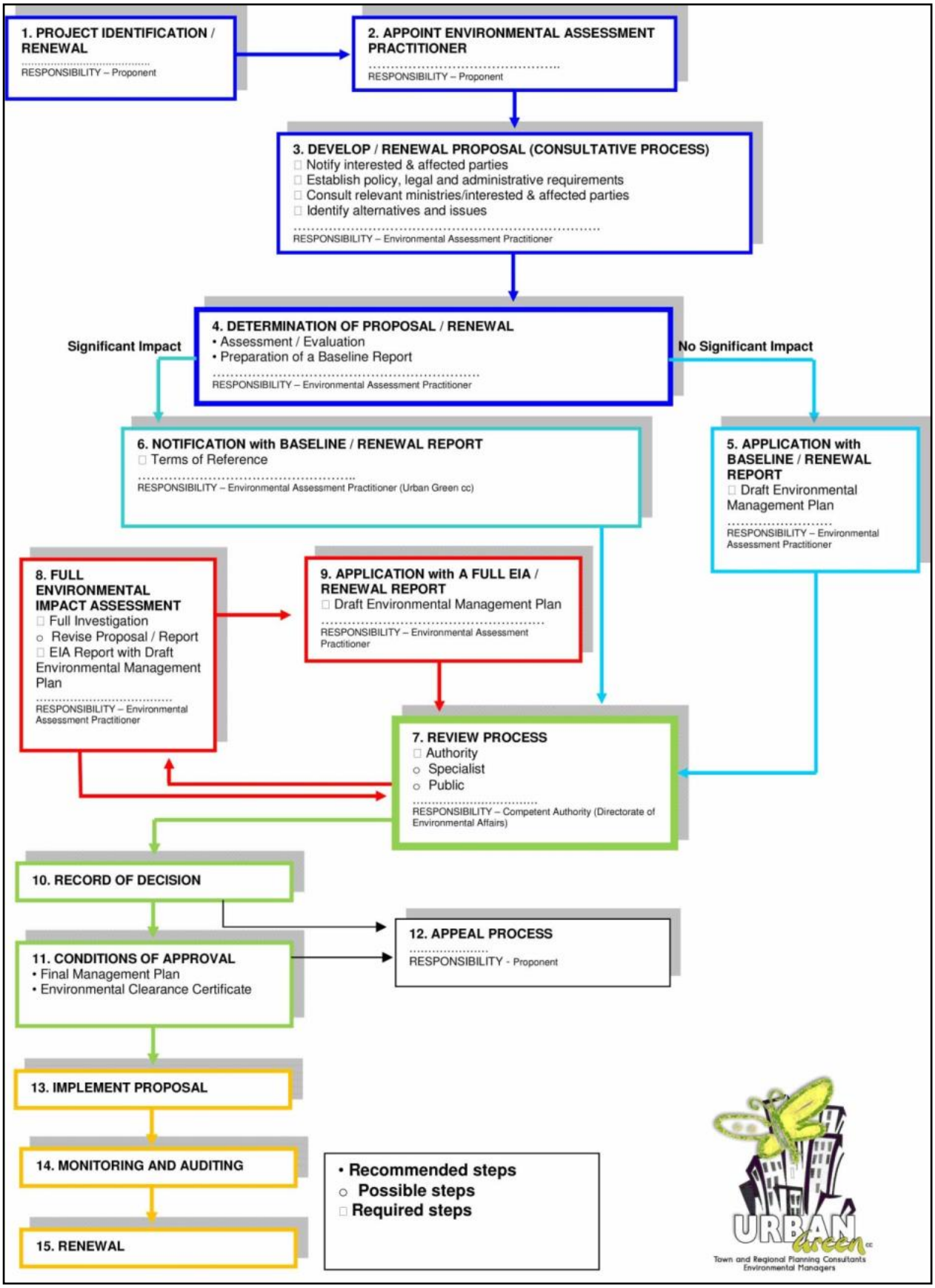

Figure 1.4: *Diagrammatic representation of Namibia's Environmental Assessment process*

1.4.1 Registration of Application for ECC

The first step followed, as part of this EA process was to identify the listed activities potentially associated with the Project, as stipulated in the '*List of Activities that may not be undertaken without an Environmental Clearance Certificate'* (GN. No. 29 of 2012) and register the mentioned with the Office of the Environmental Commissioner.

The listed activities for which an ECD was applied for are:

ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES

The construction of facilities for -

1(b) the transmission and supply of electricity;

FORESTRY ACTIVITIES

4 Removal of species protected under the Forest Act, 2001 (Act No. 12 of 2001) or any other law.

LAND USE AND DEVELOPMENT ACTIVITIES

5.2 The establishment of land resettlement schemes.

WATER RESOURCE DEVELOPMENTS

8.6 Construction of industrial and domestic wastewater treatment plants and related pipeline systems.

INFRASTRUCTURE

10.1 The construction of –

(a) bulk water supply pipelines,

(b) public roads.

In accordance with Section 32 of the EMA, Applications for an ECC should be submitted with the relevant Competent Authority. The Competent Authority is defined as that authority having the jurisdiction to approve or permit a particular listed activity in accordance with the relevant national legislation.

For this Project the Ministry of Urban and Rural Development (as provided for by the Urban and Regional Planning Act, No. 5 of 2018) was identified and informed in writing on 15 September 2023 of the Proponent's intention to apply for an ECC with the Environmental Commissioner. A copy of the application was also submitted with the Office of the Environmental Commissioner with the Ministry of Environment, Forestry and Tourism for reference (Appendix A).

1.4.2 Scoping Stage Aims

The next step followed, as part of this assessment process, was the scoping assessment (content of this report). The identification of potential impacts and their significance, as well as public consultation (as prescribed by Regulation 21 to 24 of the EIA Regulations (GN. No. 30 of 2012) are important elements of the scoping stage of a study. During the scoping stage issues/impacts that are likely to be significant are identified and those that are less significant are evaluated and if warranted, eliminated.

1.4.3 Scoping Stage Method

The method followed during the scoping stage was as per the requirements set by the Environmental Impact Assessment Regulations (GN. No. 30 of 2012), which included –

- Giving notice to all potential interested and affected parties (I&APs) of the application (ECC application);
- Public consultation as per Regulation 21 which included the -
  - Opening and maintaining a register of all I&APs;
  - Receiving and recording of all comments and representations received from I&APs following the public consultation processes;
  - Public meeting held at Tses Community Hall on 8 October 2023.
- Preparing a scoping report by subjecting the proposed application to scoping by -
  - Assessing the potential effects of the proposed listed activities on the environment (specialist studies also formed part of this stage);
  - 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 Project;
  - Setting the Terms of Reference for further investigations (if required);
  - Informing I&APs of the way forward in the EA process;
  - Ensuring informed, transparent and accountable decision-making by the relevant authorities; and
  - Inviting all registered I&APs to comment on the scoping report.
- Informing all registered I&APs of the decision of the office of the Environmental Commissioner.

1.4.4 Issues and Concerns Raised, Identified and Assessed

General impacts associated with township developments include the following:

1.4.4.1 Biophysical Impacts:

1.4.4.1.1 Negative

- Habitat Destruction and Loss of Biodiversity;
- Erosion and Sedimentation;
- Ground and Surface Water Pollution;
- Natural Resources (water and electricity use);
- Visual Aesthetics and Sense of Place;
- Heritage/archaeological Resources; and
- Dust & Emission.

1.4.4.1.2 Positive:

- Better municipal services will cause less pollution;
- Better municipal services will cause less wastage of natural resources (water and electricity) and
- Better municipal services will enable proper Environmental Management.

1.4.4.2 Social Impacts:

1.4.4.2.1 Could be Negative or Positive

- Land tenure;
- Possible relocation of informal structures;
- Change in land use and resulting impact on value;
- Increased development potential and unlocking of land;
- Employment creation for people involved in construction and service delivery;
- Nuisance (dust; noise);
- Visual impact;
- Health, safety and security; and
- Traffic Safety.

This Scoping Study focused on issues and concerns associated with the formalisation and proclamation of the already developed informal townships (Tses Extention 1, 2 and 3) as well as the establishment, formalisation and proclamation of the already occupied other two Townships (Soutput North and Soutput South) west of the B1 main road.

During the 1st round of Public Participation and Screening Stage the following issues for further investigation were raised:

- People were mostly concerned whether they will have to move or whether temporary or permanent structures will have to move.
- Possible Surface- and Groundwater pollution of the drainage line towards the Fish River that passes between Soutput North and Soutput South.
- Possible impact on Natural Resources (especially water).

The issues listed in this section are discussed in Chapter 7 of this Report. Mitigation measures and recommendations are provided in Section 7.4.

1.5 STUDY ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations applied to this Study:

- It is assumed that the information provided by the Proponent and applicable authorities, is accurate and that those aforementioned have disclosed all necessary information available;
- No alternative site or township layout for assessment was provided;
- It is assumed that all permit or licence requirements associated with the Project, other than the ECC for the township formalisation and proclamation, will be addressed as separate investigations and are not included in this EA process;
- It is assumed that there will be no significant changes to the project (see Chapter 4) or the affected environment (see Chapter 5) between the compilation of this report and implementation of the project that could substantially influence findings, recommendations with respect to mitigation and management, etc.;
- The EA process 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
- The assessment is based on the prevailing environmental (social, physical and biophysical) and legislative context at the time of writing this report;
- Should an Interested and Affected Party or Authority not provide his/her written comments to the EAP or contact the office of the EAP, it is assumed that the I&AP and/or Authority do not have any comment.

1.6 PURPOSE OF THIS FINAL SCOPING REPORT

This Final Scoping Report (FSR) has been compiled as part of the Environmental Assessment that has been undertaken for the formalisation and proclamation of Tses Extensions 1, 2, 3 and Soutput North and Soutput South (future Tses Extensions 4 and 5). This FSR 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 the consultation opportunities. It further provides an assessment of the possible social and environmental impacts that the township formalisation and proclamation would have along with mitigation measures and recommendations.

The Draft version of this Report was made available for public review and comment from 21 February to 4 March 2024, as required by section 23 of the Environmental Impact Assessment Regulations (GN. No. 30 of 2012). Comments received were included into this FSR to be submitted to the Ministry of Urban and Rural Development (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 (in terms of Part X, Section 50 of the EMA).

1.7 STRUCTURE OF THE REPORT

This Environmental Scoping Report presents the information on the Development (i.e. Formalisation and Proclamation of Tses Township Extensions, the Property (i.e. the relevant Portions of the farm Tses Townlands no. 425) and its surroundings; the EA approach and methodology followed; legislation applicable to the study conducted and the development to be undertaken; the sensitivity of the receiving environment; public consultation conducted; nature and extent of potential impacts (environmental and social) and required mitigations; further studies required (if any) and a conclusion and recommendation based on the findings.

The report consists of nine chapters as outlined below.

***Table 1.7** – Structure of the Report*

SECTION	CONTENTS
Chapter 1	**Introduction** Provides a brief overview of the proposed project, background and motivation to the Development; study terms of reference; the study approach and methodology, the study assumptions and limitations; purpose and structure of the Report.
Chapter 2	**Project Team and Expertise** Provides an overview of the role-players participating in the project as well as their experiences.
Chapter 3	**Legislation Applicable to the EA and Project** Provides an overview of the key legislation of relevance to the environmental assessment process and activities associated with the proposed development.
Chapter 4	**Description of the Proposed Development** Provides a description of the township layout and different land uses; as well as

	the required resources and municipal services, and the socio-economic contribution.
Chapter 5	**The Affected Environment** Describes the details pertaining to the existing physical and biophysical environment of the surrounding area, urban and site build-up environment, the socio-economic characteristics and cultural-historic environment as well as visual aesthetics and sense of place of the study area.
Chapter 6	**Details of the Public Participation Process** Explains in detail the entire public consultation process followed as part of this study. Feedback received from registered Interested and Affected Parties are listed as well.
Chapter 7	**Assessment of Environmental Issues, Potential Impacts and Mitigations** Describes and assesses the potential impacts of the proposed development. Mitigation measures relevant to the planning; design, construction and operational phases of the development as appropriate and recommended.
Chapter 8	**Conclusions and Recommendations** Provides conclusions to the impact assessment and states the overall suitability of the development. Recommendations for implementation during the further planning, design, construction and operation of the development are also provided, as appropriate.
Chapter 9	**References** Provides information on the information referenced in the document.

2 PROJECT TEAM AND EXPERTISE

2.1 ROLE PLAYERS

The role players on this Project are set out in Table 2.1.

Table 2.1 *The Role Players*

ORGANISATION	PROJECT ROLE
Ministry of Urban and Rural Development	Competent Authority at Central Government Level
//Karas Regional Council	Competent Authority at Local Government Level
Ministry of Environment, Forestry and Tourism	Competent Authority
Department of Environmental Affairs	Decision-making authority for environmental authorisation
Tses Village Council	Proponent
Urban Green cc	Environmental Assessment Practitioner (EAP)

2.2 EXPERTISE OF THE EAP

The qualifications and expertise of the independent environmental consultant, as required by section 8(a) of the EIA Regulations, are set out in Table 2.2 below. A detailed CV of the Environmental Assessment Practitioner (EAP) is attached as Appendix B.

Table 2.2 – *Qualifications and expertise of the environmental consultants*

NAME	Mr Brand van Zyl
Responsibility on the Project	EAP; project management; public & stakeholder 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	18

Experience	Brand van Zyl has been involved in various Environmental Impact Assessment studies throughout Namibia and of different kind.
NAME	**Mrs Christina Tromp**
Responsibility on the Project	EAP, Ecologist, Impact assessment and mitigation formulation; reporting and application for Environmental Clearance
Qualifications	M. Phil Degree in Environmental Management and Bachelor of Science Degree in Agriculture, majoring in Nature Conservation
Professional Registration	Environmental Assessment Professional Association of Namibia (EAPAN)
Experience in years	14
Experience	Christina Tromp is an educated environmentalist with work experience in the Namibian environment in Rural Development, Agricultural and Environmental sectors. She is a registered Environmental Assessment Practitioner. Her work experience was gathered in most regions of Namibia.
NAME	**Julia Bashir**
Responsibility on the Project	Application for Environmental Clearance Public Participation Process
Qualifications	Experience in Public Participation and Community Development
Professional Registration	N/A
Experience in years	10
Experience	Julia joined Urban Green cc as part of its empowerment programme and was since involved in all environmental impact assessment projects.
NAME	**Vasana Kaviua**
Responsibility on the Project	Administrative Officer Authorities Liason

Qualifications	Bachelor of Town and Regional Planning from the University of Science and Technology
Professional Registration	N/A
Experience in years	3
Experience	Vasana is a qualified Town and Regional Planner and joined Urban Green cc in 2021 as a Junior Assistant Town and Regional Planner. She has since been involved in environmental projects, mainly responsible for the administrative duties applicable to the environmental impact assessment studies undertaken.

3 LEGAL AND REGULATORY REVIEW

For the purpose of environmental protection and sustainable renewable resource management to the benefit of all, legislation from different spheres under control of different Government Ministries have been adopted and enacted by the Namibian 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 urban developments, water, forestry, and so forth. Any development, such as this, is expected to have certain impacts and 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 development. 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 development; (iii) international treaties and conventions and (iv) other relevant legislation and approvals/permits required for the commencement of the Development.

3.1 NAMIBIA LEGAL FRAMEWORK FOR EIA

Several Namibian legislation and policies have environmental consideration with respect to the proposed development. The instruments accounting for the legal framework for conducting an environmental assessment is listed in Table 3.1 below:

Table 3.1 *Legal Framework for Environmental Management in Namibia*

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
ENVIRONMENTAL ASSESSMENT LEGAL FRAMEWORK		
The Namibian Constitution (1990)	Article 95 (1) states that "*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"* Article 100 stipulates that all natural resources are vested in the state, unless otherwise legally owned. The use of such resources is only allowed within reasonable	The development should support the provisions of the Namibian Constitution

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
	limits and beyond such limits, permission should be obtained from a competent authority responsible for the use and governance of the concerned natural resources.	
Environmental Management Act (No 7 of 2007)	Section 3(2) of the EMA provides a set of principles that give effect to the provisions of the Namibian Constitution for integrated environmental management. Section 27(3) stipulates that no party, whether private or governmental, can conduct a listed activity without an ECC obtained from the Environmental Commissioner. Section 40(1) stipulates that an ECC remains valid for a period not exceeding three years, subject to cancellation or suspension.	The development should adhere to the principles provided in the EMA. An ECC should be obtained for the Development. The Proponent should renew the ECC (if granted) every three years.
EIA Regulations 2012 (GG No. 4878 GN No. 29 and 30)	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 environmental scoping report.	The EA process should be undertaken as prescribed in the EIA Regulations. Transfer of the ECC should be done as per the requirements, at the time when so required.

3.2 NAMIBIAN SECTORAL LEGISLATIVE REQUIREMENTS

A number of Namibian legislation and policies have environmental considerations with respect to this township development. The sectoral legislation applicable to the development is listed in Table 3.2, below:

Table 3.2 *Cross-sectoral legislation applicable to the Development*

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
NATIONAL SECTORAL LEGISLATION		
Water Act No. 54 of 1956, as amended and	Makes provision for a number of functions pertaining to the management, control and	The Proponent should ensure that water use during any

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
Water Resource Management Act No. 11 of 2013	use of water resources, water supply and the protection of water resources. Of importance is that the Act - • Prohibits the pollution of underground and surface water bodies. • Provides that local authorities are responsible to provide, manage and operate systems for the conveyance, treatment and disposal of wastewater produced in its area. • Liability of clean-up costs after closure / abandonment of an activity.	construction is as sustainable as possible and that no pollution of any above and/or below ground water resource takes place.
Forest Act No. 12 of 2001, as amended	Provision for the protection of various plant species. Section 22(1): It is unlawful for any person to "*cut, destroy or remove"* any living tree, bush or shrub growing within 100 metres from a river, stream or watercourse on land that is not part of a surveyed erf or a local authority area without a licence. Prohibits the removal of and transport of various protected plant species.	Protected vegetation should be incorporated as part of the Development. Vegetation in watercourses and 100m on either side is to be protected from damage. Intended removal of such vegetation would require a permit.
Nature Conservation Ordinance No. 4 of 1975, as amended	Protects wild animals and indigenous plants. Prohibits disturbance or destruction of the eggs of huntable game birds or protected birds without a permit. Requires a permit for picking (the definition of "picking" includes damage or destroy) protected plants without a permit. Prohibits the removal of and transport of various protected plant species.	
Soil Conservation Act No. 76 of 1969, as amended	Prevention and combating of soil erosion; conservation, improvement and manner of use of soil and vegetation, and protection of water sources.	
Hazardous Substances	The Ordinance applies to the manufacture,	During the construction and

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
Ordinance No. 14 of 1974, as amended	sale, use, disposal and dumping of hazardous substances, and is administered by the Minister of Health and Social Services. Its primary purpose is to prevent hazardous substances from causing injury, ill health or the death of human beings.	operation phases, any hazardous waste needs to be handled, stored and disposed of in a responsible manner and at appropriate waste sites.
Atmospheric Pollution Prevention Ordinance No 11 of 1976, as amended	Provides for the prevention of the pollution of the atmosphere. Part IV of this ordinance deals with dust control and provides for the proclamation of dust control areas.	Excessive dust emissions should be avoided as it could be categorised as causing a public nuisance under common law.
Public Health Act No. 36 of 1919, as amended Health and Safety Regulations GN 156/1997 (GG 1617)	Section 119 states that "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."	The Proponent has a general obligation not to cause any nuisance, which may have an implication on human health.
Labour Act No. 11 of 2007, as amended	The Labour Act (No. 6 of 1992), the New Labour Act (no. 11 of 2007) and Government Notice 156 of 1997: Labour Act, 1992: Regulations Relating to the Health and Safety of Employees at Work, governs working conditions of employees. These regulations are prescribed for among others safety relating to hazardous substances, exposure limits and physical hazards. Special consideration must be given to: • Chapter 3: Welfare and Facilities at Work-Places • Chapter 4: Safety of Machinery • Chapter 5: Hazardous Substances • Chapter 6: Physical Hazards and general provision	The Proponent (including their appointed contractors) needs to comply with health and safety regulations pertaining to the health and safety of employees during construction. Operational activities should not result in any potential negative health implications to the residents and/or larger community.
Road Traffic and Transport Act 52 of 1999 and its 2001 Regulations, as amended	Provides for the control of traffic on public roads and the regulations pertaining to road transport, including the licensing of vehicles and drivers. Part 5 of the 2001 Regulations lays out	All personnel and vehicles active during the construction phase should be appropriately licensed. Construction materials

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
	detailed provisions pertaining to vehicle loads – i.e. types of loads and the appropriate manner in which loads for different vehicle classes should be carried.	transported/delivered to the construction site should adhere to the requirements of the 2001 Regulations – i.e. should not exceed limits stipulated and should be transported in a safe manner.
National Heritage Act (Act 27 of 2004), as amended	The Act requires the identification of cultural and archaeological sites within the study area, registration and protection thereof.	All protected heritage resources (e.g. human remains etc.) discovered, need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before they may be relocated. Heritage resources need to be considered by a heritage specialist.
Townships and Division of Land Ordinance No. 11 of 1963, and the Amendment Act, No. 28 of 1992, as amended	Provides for the legal process to be followed in the instance of township establishments.	Statutory approval is required from the competent authority, namely the Ministry of Urban and Rural Development.
LOCAL SECTORAL LEGISLATION		
Local Authorities Act No. 23 of 1992, as amended	The Act provides for the determination and establishment of local authority council and matters incidental to that, as well as the management council and chief executive officer; specific requirements with regards to service delivery (i.e. water supply, sewerage and drainage, cemeteries, streets and public places, electricity supply, public transport services and housing schemes); municipal valuations, rates and taxes. In general, the Act thus regulates the responsibilities of the particular local authority in delivering certain services to the residents of their particular urban area (i.e. municipality, town and/or village).	Permission for construction of water works, sewerage and drainage, streets, public places, culvert crossings, electricity supply and housing schemes is granted to local authorities. This Act does not refer to environmental protection. Environmental requirement of the Constitution is thus only transferred into the Traditional Authorities Act and not into the Local Authorities and Regional Councils Acts.

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
		Environmental protection within urban areas is thus a result regulated by Council Policies or other plans (i.e. Town Planning Scheme), which are customary to the particular local authority. The Tses Village Council does not have any policies or plans currently regulating and managing sustainable urban development, apart from regulating land uses.
Town Planning Ordinance No. 18 of 1954, as amended	This Ordinance makes provision for the preparation and carrying out of town planning schemes and for matters incidental thereto. Every local authority to which the provisions of this Ordinance have been applied (which includes the Tses Village Council) on the day of commencement is obligated to have a town planning scheme in place. As per this Ordinance – *Every town planning scheme shall have for its general purpose a co-ordinated and harmonious development of the local authority area, or the area or areas situated therein, to which it relates (including, where necessary, the re-construction and re-development of any part which has already been sub-divided, whether there are or are not buildings thereon) in such a way as will most effectively tend to promote health, safety, order, amenity, convenience and general welfare, as well as efficiency and economy in the process of development and the improvement of communications.*	In essence, a town planning scheme regulates land uses and activities within urban areas with the aim to achieve the general purpose, as outlined above. These land uses and activities are decided and implemented by way of a Town Planning Scheme, being a statutory document in accordance with the Town Planning Ordinance No. 18 of 1954, as amended. Any variations in the land uses are to follow a statutory procedure as prescribed by this Ordinance and the particular Town Planning Scheme (i.e. Tses Town Planning Scheme).
Solid Waste Management Policy	Set out the waste goals for waste management in urban areas.	Waste management solution to be in line with these goals.
General Health Regulations, 1969	Provisions for setting standards for conditions that promote health in urban	Activities within the Development should be

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
	areas.	undertaken as per these Regulations.

While it has been set out to list all those laws and regulations, which regulate the healthy functioning of the environment, it is not necessarily complete and the Proponent has the responsibility to make themselves aware of all applicable legislation and permit requirements applicable to the Development. Regulations such as trade and business licences are excluded here.

3.3 INTERNATIONAL TREATIES AND CONVENTIONS

The international treaties and conventions applicable to the project and affected environment worth taking note of are listed below in Table 3.3 below.

Table 3.3 *- International treaties and conventions applicable to the development*

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
Convention to Combat Desertification 1994	Focuses on land degradation in the dry lands where some of the most vulnerable ecosystems and people in the world exist.	The Development should adhere to land management, which contributes to the conservation and sustainable use of biodiversity and the mitigation of climate change.
Convention on Biological Diversity 1992	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.	Removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimised.
Stockholm Declaration on the Human Environment 1972	Recognises 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"*. The following are among the proclamations made under	The Proponent should strive to adhere to the proclamations made under this declaration.

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
	the declaration: • Natural resources must be protected; • Wildlife must be protected; • Pollution must not exceed the environment's capacity to clean itself; • Rational planning must prevent or resolve conflicts between environment and planning.	

3.4 AGREEMENTS, PERMITS, LICENCES AND/OR APPROVALS REQUIRED

The following permits and/or licenses (Table 3.4) should be obtained for Tses Township Development.

Table 3.4 – *Permits, licenses and/or approvals that may also be required*

Activity	Type of Permit / License	Legislation / Institute
Electricity provision	Approval required	Electricity Control Board (ECB)
Water provision	Approval required	NAMWATER
Access from existing road network of the larger townships	Approval required	Tses Village Council Local Authorities Act 23 of 1992
Removal of protected and indigenous species	Permit required if protected trees will be removed	Forest Act (No. 27 of 2004) & Nature Conservation Ordinance No. 4 of 1975, as amended. Ministry of Agriculture, Water and Forestry; Directorate of Forestry.
Storage of more than 600 litres of diesel on site (if applicable)	Consumer Installation Certificate	Petroleum Product and Energy Act (Act No. 13 of 1990), as amended.

	required of the particular volume that will be stored on-site	Ministry of Mines and Energy
Solid waste removal system (if applicable)	Approval required if private waste management system applies	Tses Village Council Local Authorities Act 23 of 1992
Change in land use	Approval required	Urban and Regional Planning Act, No. 5 of 2018 Ministry of Urban and Rural Development
Special permission for erven smaller than 300m²	Approval required	Urban and Regional Planning Act, No. 5 of 2018 Ministry of Urban and Rural Development

4 DESCRIPTION OF THE DEVELOPMENT

This chapter provides a description of the Development, required resources and expected waste, engineering services, construction activities and expected socio-economic contributions.

4.1 OVERVIEW

The Project entails the formalisation and/or proclamation of new townships within the Tses Village jurisdictional area. The development involves 5 townships, namely Tses Extensions 1, 2 & 3 as well as Soutput North and Soutput South (future Tses Extensions 4 & 5). Refer to Fig. 4.1 for the town lay-out plan.

Tses originated as a missionary station that was officially founded in 1927. The village formed part of the Namaland Reserve that was set aside for Nama people during 1980 – 1990. In 1995 the establishment of a township was proposed in the process of eventual proclamation of the village as a local authority. The application then consisted of Tses Township, Tses Township Extension 1 and Tses Township Extension 2.

In 1999 only Tses Proper was proclaimed as a formal township and the other extensions (Extensions 1 & 2) withdrawn. Despite the withdrawal of Extensions 1 & 2, the townships were surveyed and constructed as per the township layout plans. As a result, Extensions 1 & 2 was occupied by people, who constructed permanent structures on the surveyed erven. The townships of Extensions 1 & 2 thus have a formal layout, but were never formally proclaimed as townships.

During 2022, Extension 3 was planned and now requires proclamation. Soutput North and Soutput South are two informal townships that have grown to the extended requiring planning and eventually proclamation (future Tses Extensions 4 & 5).

Please refer to Figures 4.1 – Figures 4.4 for the lay-out of the mentioned townships, i.e. Tses Extensions 1, 2 & 3 and the locality of Soutput North and Soutput South.

4.2 FORMALISATION

‘Formalisation’ refers to the process whereby an ‘informal township’, which is an un-proclaimed township is subject to a legal process of establishing a formal township. Informal townships do not provide for land tenure and is usually also not provided with municipal services, mainly because of a lack of collateral and non-legal existence.

Formalisation of an informal area entails a statutory process, which includes a planning phase being done by the town planner (i.e. designing of a formal township layout and obtaining of the statutory approvals), a land surveying phase done by the land surveyor (i.e. registering of the townships general plan), the official proclamation of the township and lastly the registering of ownership.

After proclamation each occupier will have the opportunity to buy the erf from the Tses Village Council and the property will be transferred into the new owner's name according to the Local Authority Act No. 23 of 1992, as amended.

The other component to this process entails the physical construction of services, i.e. roads, water network, electricity network, the sewerage and wastewater network and waste removal management. It is also this component that pose the real impact, which need to be assessed and managed to ensure the least possible environmental and socio-economic impact/s.

4.3 DEVELOPMENT

Tses Extensions 1, 2 and 3 will be an extension to the existing Tses Proper and the town planning- and land surveying phase has been completed. The official proclamation of the townships and registering of ownership must still be undertaken as part of the development.

For this development the existing bulk infrastructure will be expanded to accommodate the additional extensions. No major new infrastructure developments are thus envisaged for this purpose, but only extensions of existing infrastructure.

Soutput North and Soutput South, were occupied by people in an informal way, constructing temporary as well as formal dwellings with some infrastructure. These two informal areas (future Tses Extensions 4 & 5) still require lay-out planning, formalisation and eventual proclamation.

Future Tses Extension 4 and 5 is located on the western side of the B1 and the necessary expansion of services must extend across the B1 main road from Tses Village. Some of these extensions have been undertaken already.

Please refer to Figure 4.2, 4.3 and 4.4 for the lay-out of the mentioned townships, i.e. Tses Extensions 1, 2 and 3 as extension to Tses Proper. Soutput North and Soutput South on the western side of the B1 Main Road can be seen in Fig. 4.1 below.

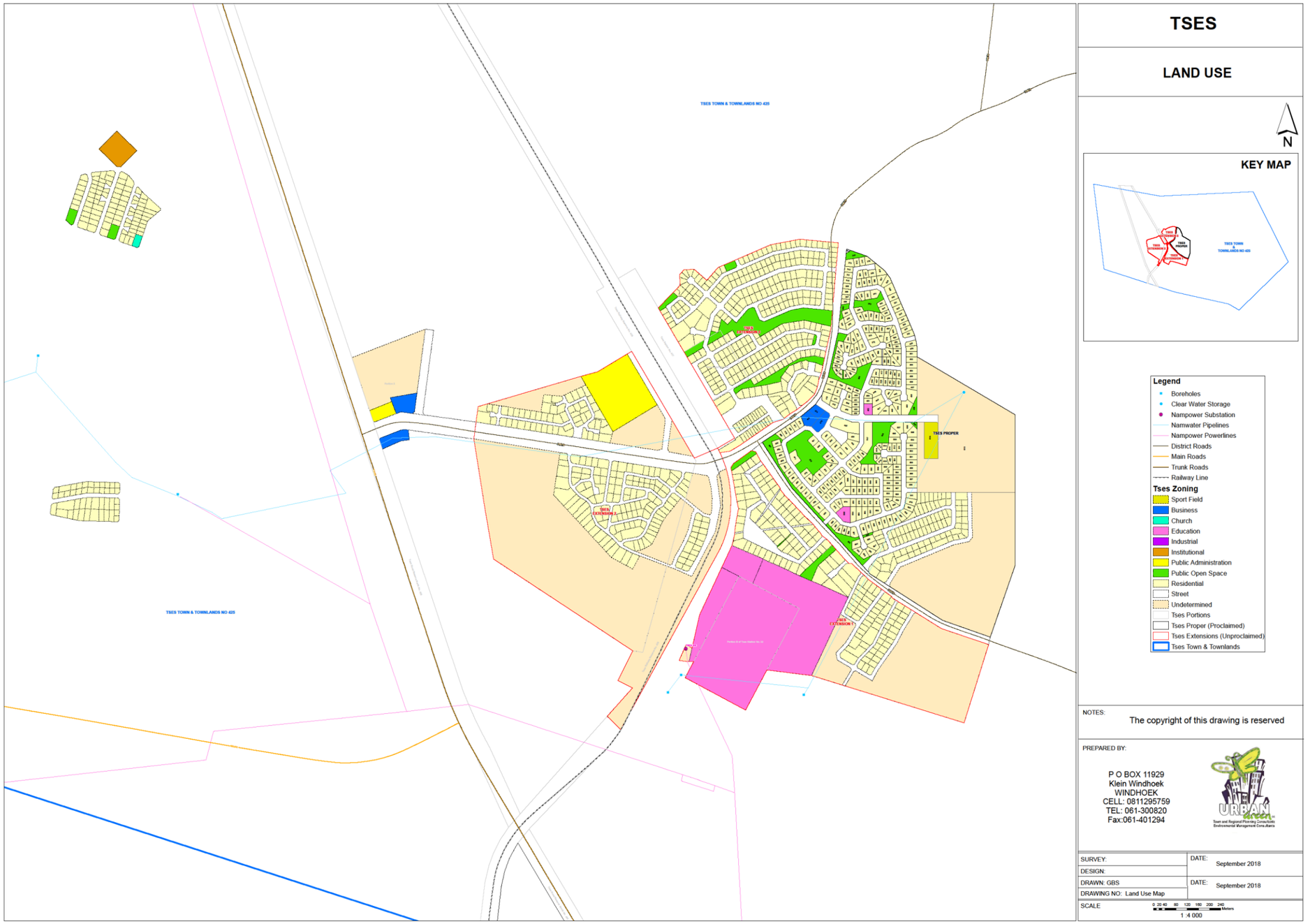

Figure 4.1 – Tses Township Lay-out Plan

4.4 TOWNSHIP LAYOUT & LAND USES

The Development comprises of three extensions to Tses Proper, consisting of 95 erven in Extension 1, 24 erven in Extension 2 and 340 erven in Extension 3 respectively. These erven consist of a variety of land uses, but mainly residential. Land uses within Tses Proper consist of mainly residential, but other land uses such as business, office, industrial, institutional, private and public open spaces are also present. Refer to Fig. 4.2, 4.3 and 4.4 for the respective township layouts and land-uses for Tses Extensions 1, 2 and 3.

The township layout was done with the aim to minimize social disturbance within the existing informal lay-out. Where possible, the design considers existing informal and formal structures and property fences, as well as the existing bulk electricity, water supply and street networks to minimise relocation and associated social disturbance and financial loss.

Soutput North and Soutput South (future Extensions 4 and 5) still require lay-out planning in the process of formalisation and eventual proclamation.

In the event that some erven might be too small (i.e. smaller than 300m²), special permission must be obtained for these. Residents that might have to relocate, will have to be accommodated at other available erven forming part of the larger townships. These people must be assisted by the Tses Village Council.

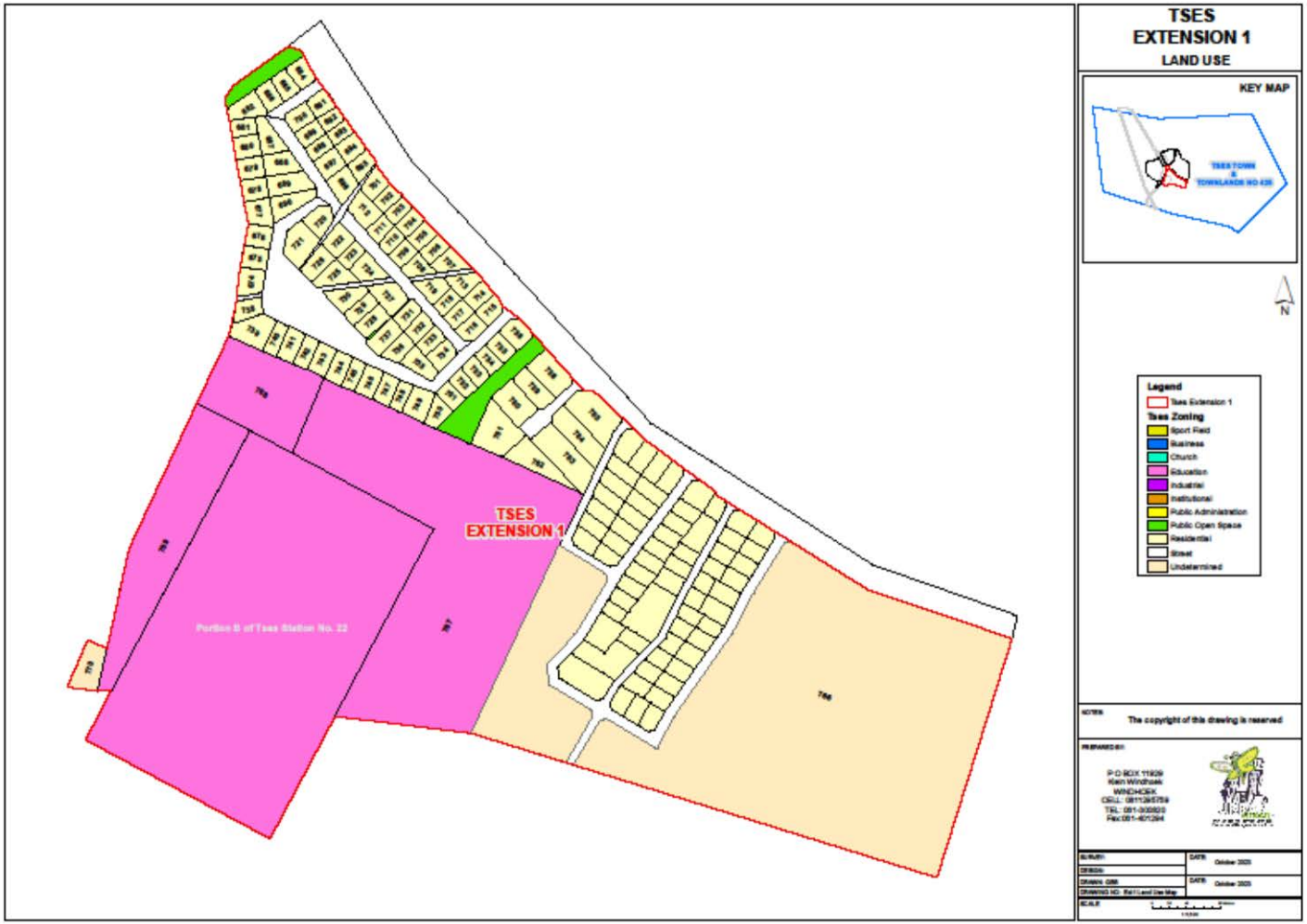

Figure 4.2 – Tses Extension 1

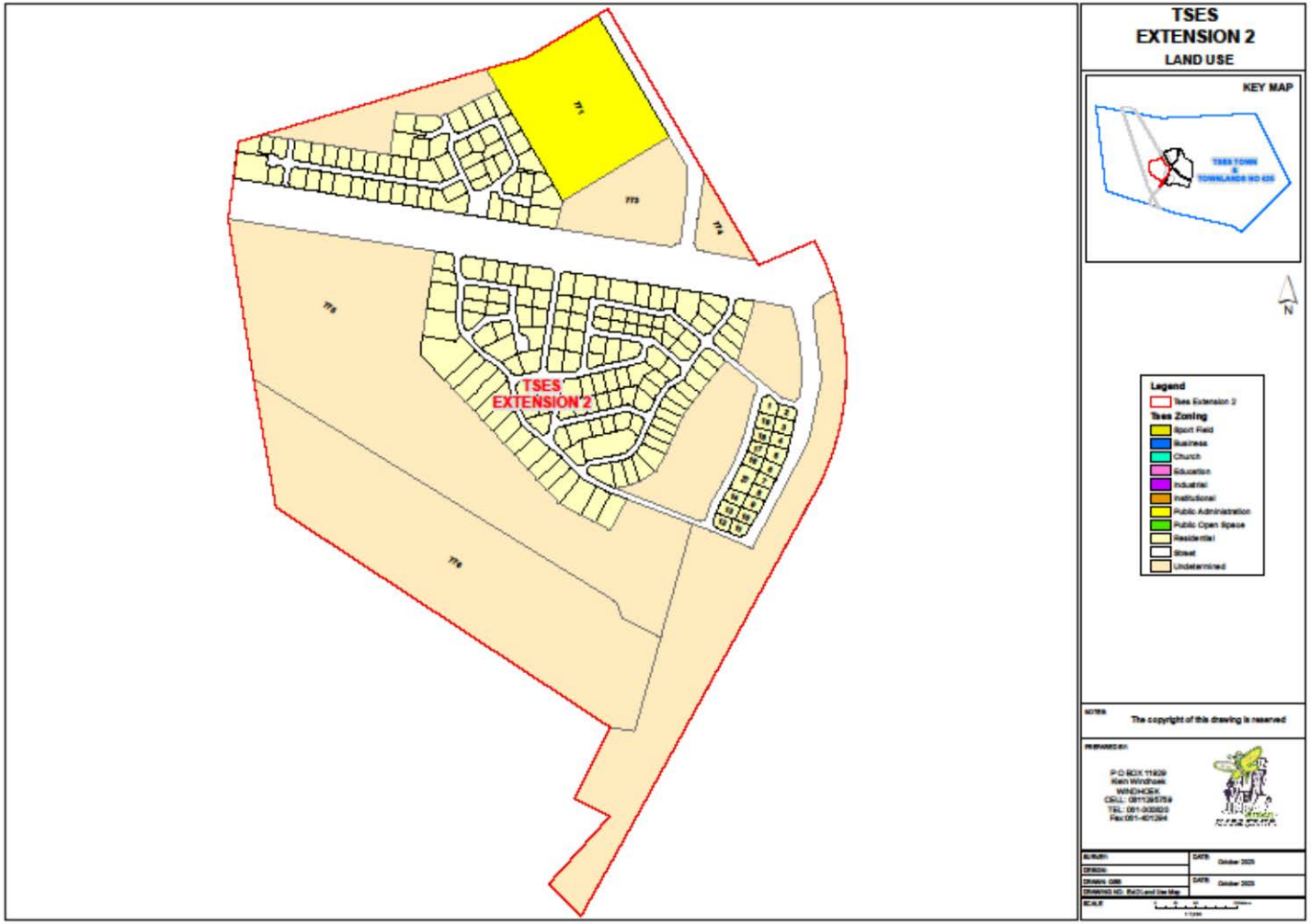

Figure 4.3 – Tses Extension 2

Figure 4.4 – Tses Extension 3

4.5 RESOURCE DEMAND AND MUNICIPAL SERVICES

The existing bulk infrastructure of Tses Proper was already expanded to Extension 1 and 2 with some informal expansion to Extension 3, Soutput North and Soutput South. No major new infrastructure developments are thus envisaged for this purpose, but only extensions of existing infrastructure to accommodate the additional development.

Refer to Figure 4.5 for the bulk infrastructure lay-out of the development.

4.5.1 Road Infrastructure & Access

Tses can be reached via the B1 main road connecting Windhoek with Keetmanshoop and South-Africa.

The access road to Tses Proper and Tses Extension 1, 2 and 3 on the eastern side of the B1 as well as the access road to Soutput North and Soutput South on the western side of the B1 was recently re-constructed, according to Roads Authority instructions, to move approximately 100 m to the north of the old existing access roads.

Access to the Tses Extensions 1, 2 and 3 townships will be obtained via the existing road network of the larger township. Roads within the formal townships are gravel and are such to form one larger integrated street network providing access throughout the larger Village (Refer to Figure 4.5).

4.5.2 Water Infrastructure

Water infrastructure for Tses Proper, Tses Extensions 1, 2 and 3 is already in place and pipeline extensions will be done from the NamWater pipelines that run through Tses into the formalised areas. Informal and some permanent water infrastructures are already in place to provide Soutput North and Soutput South with water. Refer to Section 5.4.3.2 of this report for the existing bulk water supply infrastructure as well as Fig. 4.5 for the location of the boreholes, pipelines and water storage facility.

Past and current water demand has been met successfully (refer to Section 5.4.3.2). If the development will increase water demand substantially, Namwater will have to be consulted again, since increase demand will affect the blending ratio of the water into the water storage facility and might mean a lower quality supply of water (*NamWater, 2023*).

In accordance with the Water Resources Management Act 11 of 2013 PART 7, the management of rural water supply should fall under the jurisdiction of appointed water point committees and local water committees (*MAWRD, 2013*). Such a committee must be established and implemented for the management of Tses Village water supply (*NamWater, 2024)*.

4.5.3 Electricity Supply & Infrastructure

Provision of electricity to the Tses Village and Townlands is done by NamPower from the national grid. Electricity is supplied to Tses Substation situated on the southern edge of Tses and from here most of the network expansion into Tses Proper and Extensions 1, 2 and 3 as well as into Soutput North and South was already completed. Refer to Section 5.4.3.3 and Fig. 4.5 for a description of the electricity infrastructure in Tses Village.

In line with the Electricity Act No. 4 of 2007, proposed township layout should accommodate existing electrical networks and servitudes should be designed to accommodate already developed infrastructure. Should the existing electrical networks be altered or moved, the cost implications should be considered in the project budget.

4.5.4 Household Waste System

The types of waste that will be generated in the townships are mostly of a household nature (i.e. residential activities), as well as that associated with businesses. A variety of dry- (i.e. paper, plastic, tins and glass) and organic waste (i.e. kitchen waste) will be generated.

Hazardous waste, defined as ‘those substances which may cause injury or ill-health to or death of human beings’ will be limited to that of a residential nature in terms of type (i.e. cleaning liquids) and volume.

Waste removal from the formal townships will be the responsibility of the Tses Village Council. The Village Council should collect household waste from each erf on a weekly basis and dispose at the Council`s dump site. Refer to Section 5.4.3.4 for a description of waste removal in the village.

4.5.5 Sewerage

Sewer services in the form of a water born sewer systems are in place for Tses Proper and it is envisaged that the existing sewer network will be extended to which the developed erven can be connected.

Tses Extensions 1, 2 and part of Extension 3 have already been connected to the water born sewer system and in other areas of Extension 3 french drains are provided for.

Long drops are still used in Soutput North and Soutput South and a sewer network system must still be put in place for these erven.

During the interim development period, sewerage from Tses Extensions will have to be pumped by the Local Authority when needed on an ad hoc basis. Sewerage is disposed of at the existing oxidation ponds west of Tses Proper.

4.5.6 Stormwater

No prominent rivers run through Tses Proper or Tses Extension 1, 2 or 3 on the eastern side of the B1 and only small ephemeral drainage channels passes around this area during heavy rains to combine in a prominent drainage line towards the Fish River. This drainage line runs westwards from Tses and passes between Soutput North and Soutput South. These two extensions thus lie on both sides of this drainage channel to the Fish River. Refer to Figure 5.4 in Section 5.2.4 for a view of the drainage of the area.

Due to the area's dry climate and topography and drainage being effective and efficient, no flooding is expected in Tses Proper, Tses Extension 1, 2 or 3, apart from a few puddles that might remain after heavy rains. Consequently, stormwater infrastructure would be limited to stormwater culverts next to the tar road and ducts next to the gravel roads.

In Soutput North and Soutput South precaution must be taken to take the flood line of the drainage line into consideration if further construction is envisaged here.

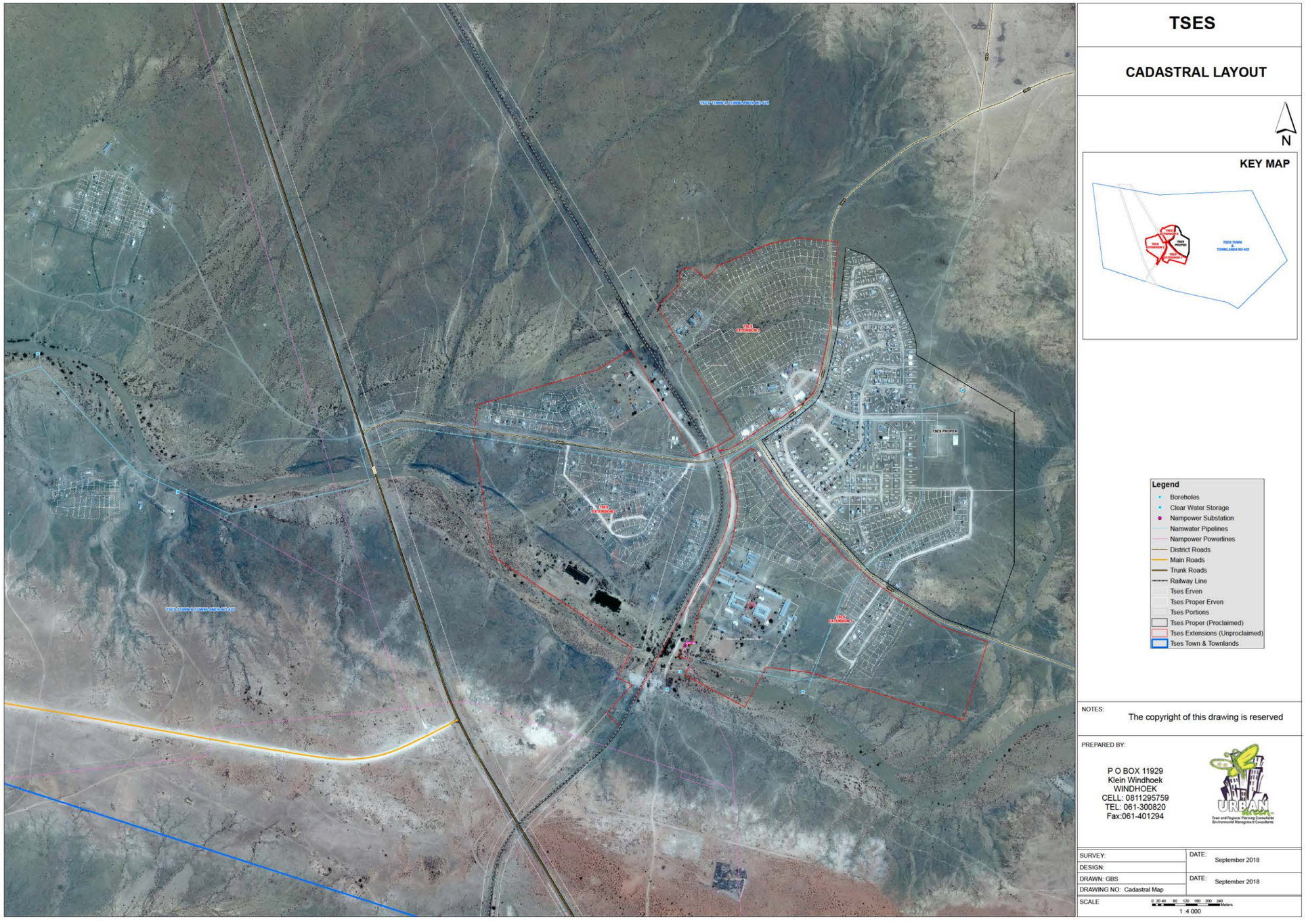

Figure 4.5 – Tses Bulk Infrastructure Lay-out

4.5.7 Telecommunications

Telecommunication is available either by way of fixed lines (Telecom Namibia/Partatus) and/or mobile network (MTC/Paratus).

4.6 CONSTRUCTION AND OPERATIONAL ACTIVITIES

Township development is generally associated with the following activities during both the construction phase and the operational phase:

4.6.1 Construction Activities

Activities associated with the construction phase, both during bulk infrastructure and construction of buildings, but not necessarily limited to, are:

- Setting-up of a temporary –
    - construction yard;
    - site office and parking area;
    - workshop and stores;
    - batching area;
    - ablution facilities;
    - solid waste disposal facility;
    - stockpile area; and
    - area for the handling of hazardous substances, wash bays, bulk storage and dispensing of fuel.
- Demolition of existing structures.
- Clean up of existing dumpsites and smaller points of pollution currently on-site.
- Clearance of vegetation, stockpiling and removal from site.
- Removal of topsoil and storage.
- Dumping of large quantities of unsuitable material.
- Access to and from the site by construction and delivery vehicles.
- Daily commuting of labour force to and from the site.
- Digging of trenches and construction of infrastructure (i.e. roads, electricity, water and wastewater).
- Generation of construction waste, temporary storage and removal from site.
- Usage of water for daily construction activities and generation of wastewater.

The impacts expected to occur during the construction phase are to a certain extent similar to that of the operational phase, although some impacts are exclusive to the construction phase and is short-lived. These impacts, the assessment therefore and the mitigations recommended (see Section 7.4.1) are also listed in much detail within the attached Construction Environmental Management Plan (CEMP) in Appendix G.

4.6.2 Operational Activities

Activities associated with the operational phase, but not necessarily limited to, are:

- Traffic movement to and from the Townships.
- Generation of dry and wet waste, the temporary storage thereof and removal.
- Street lighting.
- Noises associated with the residential and business activities.
- Resource consumption (i.e. electricity; water).
- Use of pesticides and herbicides; paint, petrol & diesel spillages.
- Routine maintenance on bulk and internal services and servitude maintenance.

4.7 SOCIO-ECONOMIC CONTRIBUTION

The Township Development is expected to have a direct and indirect positive socio-economic impact, especially in this rural area with current poor economic conditions. These positive impacts can briefly be summarised as:

- Supplying in the demand for developable land within the Tses Village.
- Enabling land ownership and economic empowerment.
- Employment and skill transfer during both the construction phase and the operational phase.
- Economic Benefit to the Construction Industry.
- Additional rates and taxes to the local authority.

The Development is expected to have a general Socio-Economic uplifting impact, which is much required in the //Karas Region.

5 THE AFFECTED ENVIRONMENT

This chapter describes the details pertaining to the Development's locality, the existing physical and bio-physical environment of the surrounding area, urban as well as socio-economic and cultural-historic characteristics. The description has been compiled based on a site visit, secondary information received as well as studies and EIAs conducted by Urban Green cc in the //Karas Region.

This chapter provides the basis for assessing the likely negative and positive impacts that the Development might have on the receiving environment (e.g. biophysical and social).

5.1 LOCALITY

Tses Village is located in the north-central part of the //Karas Region, 80 km north of the Region's Administrative Capital, Keetmanshoop (see Figure 5.1).

Tses Extensions 1, 2 and 3 are located within Tses Village, forming part of the informal settlement developments to the south, west and north of Tses Proper. Soutput North and Soutput South is located to the western side of Tses Village beyond the B1 Main Road. Please refer to Figure 4.1 in Section 4.3 for the locations of the townships within Tses Village.

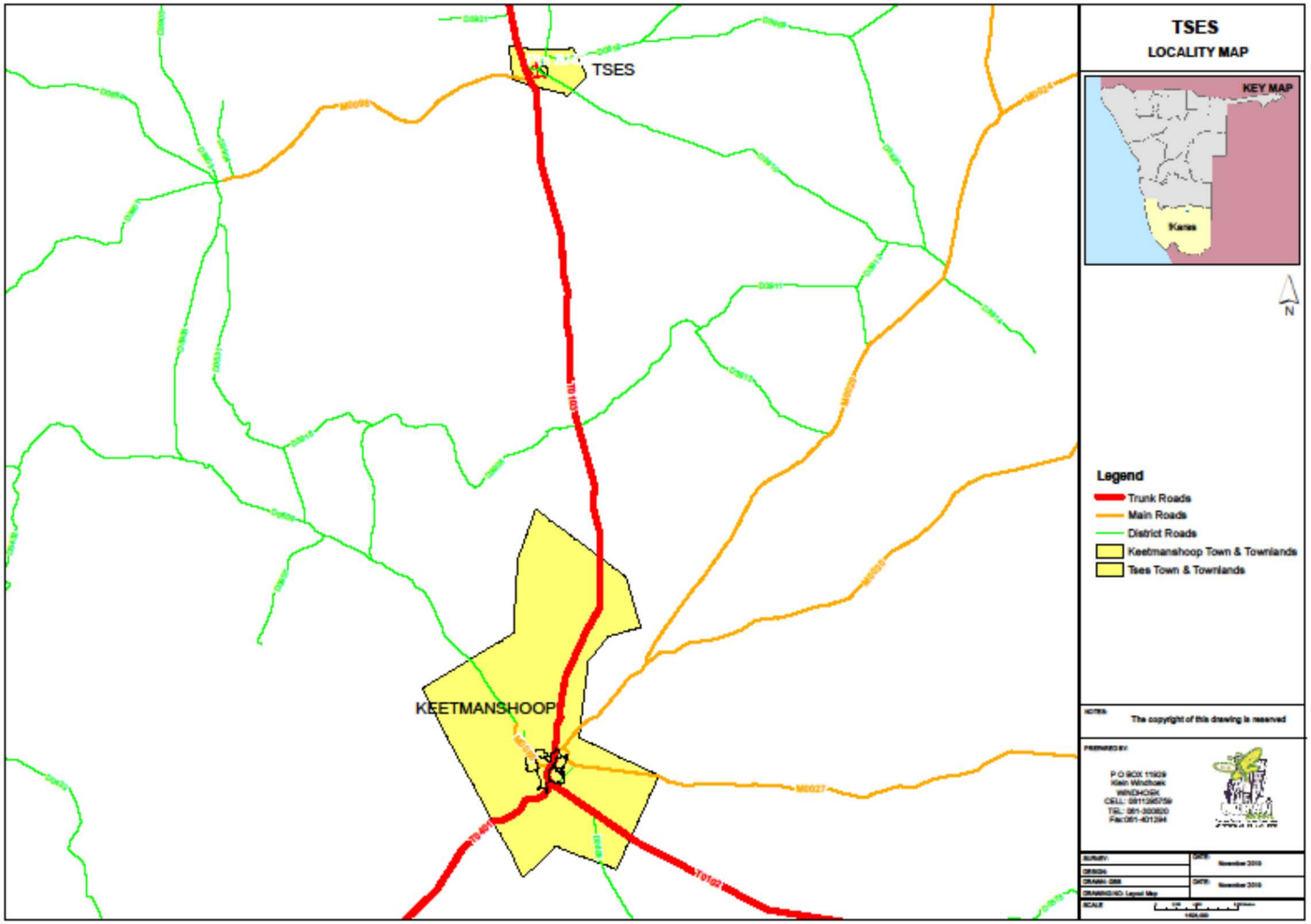

Figure 5.1 – *Locality Map of Tses Village*

5.2 PHYSICAL ENVIRONMENT

Tses falls within the *Nama Karoo Basin* and the natural environment is typical of the *Nama Karoo* that dominates much of southern Namibia, with extensive, flat landscape.

5.2.1 Climate

The climate of the arid southern Namibia is typified by hot summers and dry, cold winters.

5.2.1.1 Rainfall

Summer rain is experienced in this area with mean annual rainfall recorded as a mere 100 - 150 mm and an annual evaporation rate of more than 2660 mm/year. Rain is highly variable in terms of amount and its distribution (*Jarvis et al. 2022*).

5.2.1.2 Temperature

The *Nama Karoo* experience extreme temperature fluctuations with average maximum summer temperature between 34-36 C° and average minimum winter temperatures between 6-8 C° resulting in a temperature range of 26-28 C° (*Jarvis et al. 2022*).

5.2.1.3 Wind

The predominant wind experienced at Tses is a southern wind. Northern wind also prevails followed by north-eastern winds (*www.meteoblue.com*).

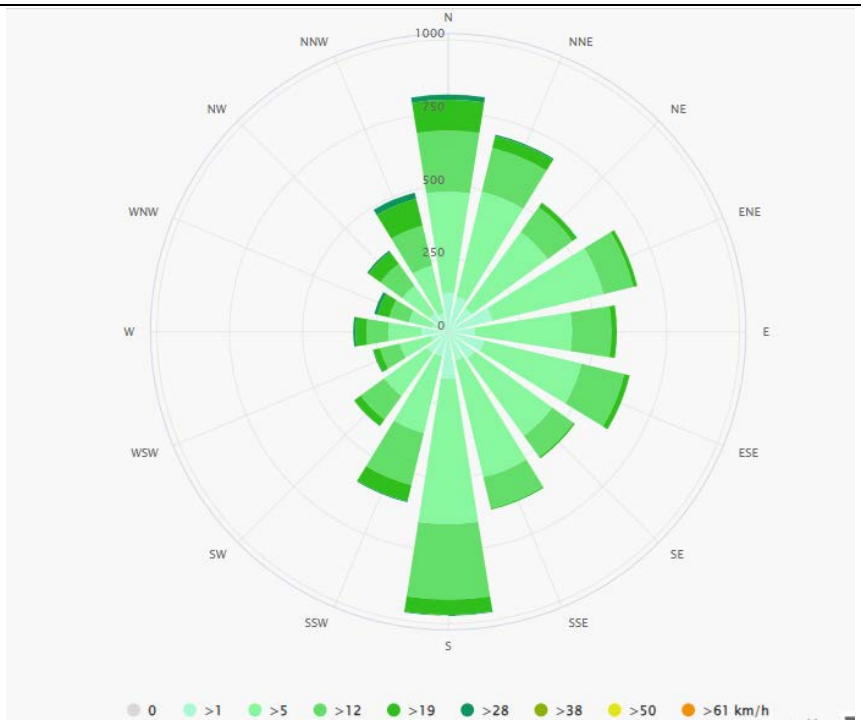

Figure 5.2. – Windrose for Tses (*source www.meteoblue.com*)

5.2.1.4 Solar

Sunshine hours and radiation in the Tses area is of the highest in the country with more than 10 hours sunshine per day and an average direct solar radiation of 8.00-8.25 kWh/m^2/day (*Jarvis et al. 2022*). Investment in renewable energy generation through solar should be considered in this ideal environmental conditions.

5.2.2 Air Quality

Given the rural character of the larger area and absence of any large-scale industries, the air quality is regarded as very good. The informal townships within Tses that depend on wood fuel, is expected to cause some pollution, but is regarded as of no significance given the small amount of households that depend on this resource. Vehicle emissions and dust are expected to be confined within the vicinity of the B1, gravel and dirt roads, but increase in vehicle movement will contribute to general pollution levels of the surrounding area.

5.2.3 Geology and Soils

The Tses area falls in the Karoo Supergroup formed during the Gondwana period. The flat landscape of southern Namibia is underlain by horizontal layers of sediments. Most rock formations stem from glacial and alluvial sediments. The area is relatively low in minerals (*Mendelson, 2002*).

At some places sills of dolerite pushed through the sediment to form spectacular extrusion of igneous rock, such as Brukkaros Mountain approximately 40 km west of Tses and the Giant's Playground approximately 80 km to the south, near Keetmanshoop.

The dominant soil type is *Eutric Leptosols*. *Leptosols* are shallow soils over continuous rock and can be extremely stony, with less than 20 % fine earth (soil particles < 2 mm in diameter). Heavy rainfall events cause sheet flooding that removes topsoil, even on gentle slopes, which exposes the underlying unweathered parent material. The stoniness and shallowness of *Leptosols* decrease their water holding capacity and mean that they have poor agronomic properties. However, shallow-rooted grasses and forbs effectively utilise these soils (*Coetzee, 2021*).

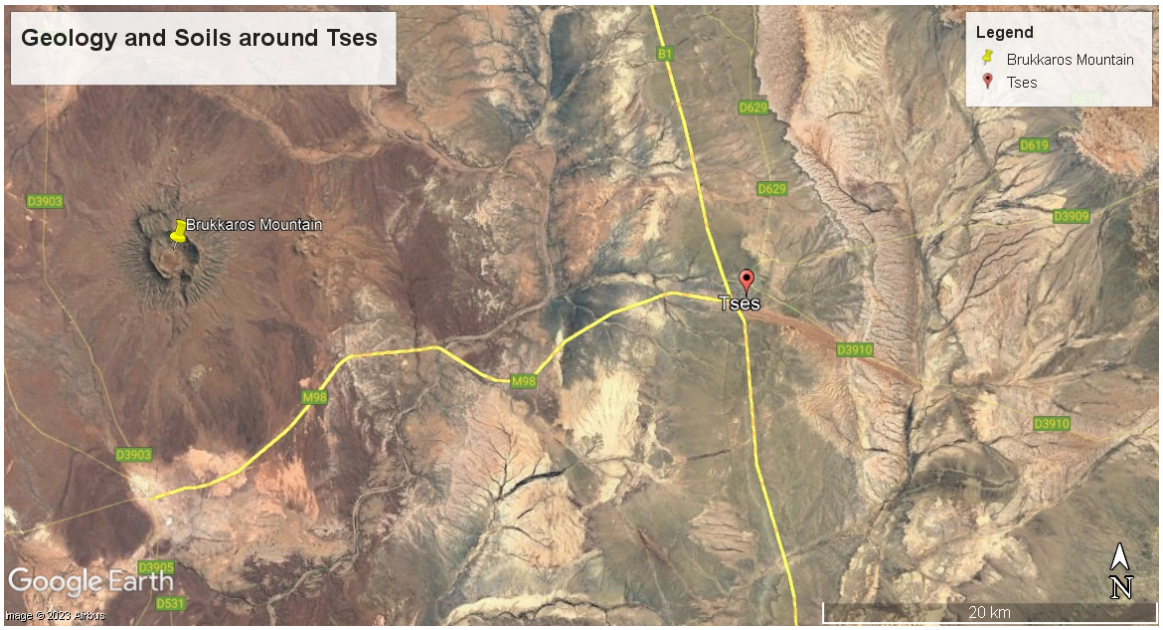

Figure 5.3. – Geology and Soils around Tses Village

5.2.4 Topography & Drainage

Tses lies within the catchment area of the Fish River that drains south-westwards towards the Orange River. Refer to Fig. 5.4 where the drainage lines are visible in a north-east to south-west direction around Tses Village to join in a drainage line towards the Fish River to the south-west thereof.

The ephemeral drainage lines are viewed as sites of ecological importance due to the increase in biotic richness along these lifelines in an arid area.

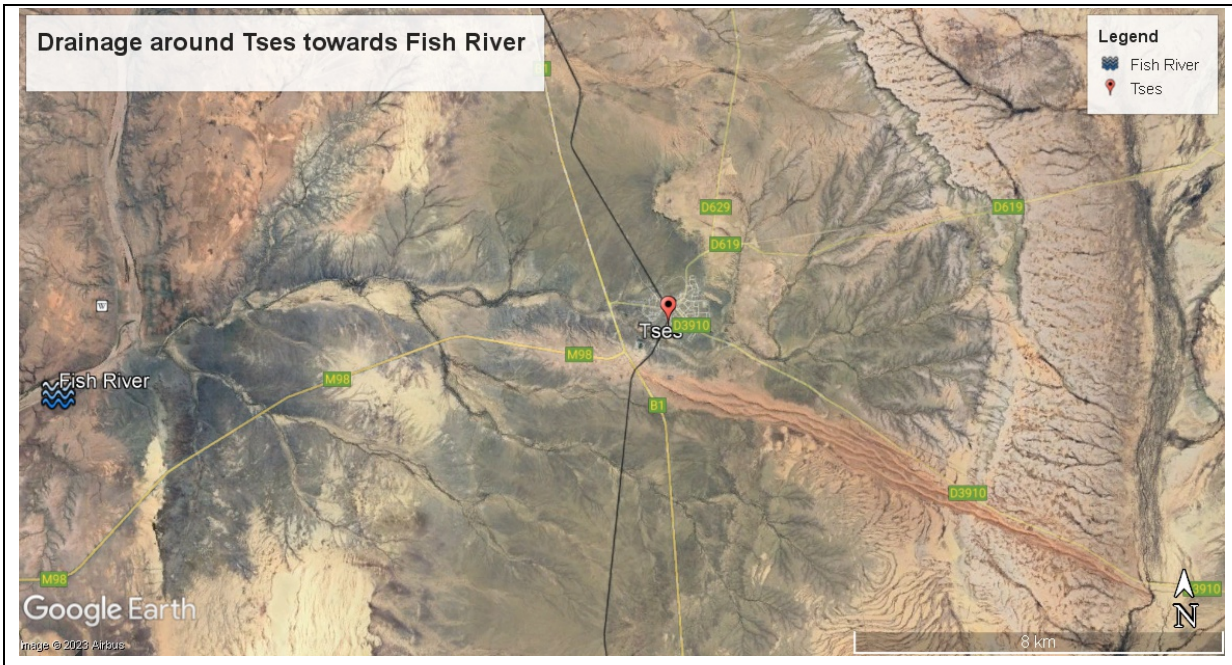

Fig 5.4 - Topography and Drainage around Tses Village

5.2.5 Hydrogeology & Water Quality

Groundwater flow in the Mariental, Tses and Keetmanshoop area, are southwards bound towards the Orange River basin. It flows through rock body and the groundwater potential is predicted to be low to moderate, enough to cater for small settlements and livestock (*Jarvis et al., 2022*). Water quality is classified in the following manner:

Class A - is fit for human consumption;

Class B – is safe for farms and small communities;

Class C - is usable for animals;

Class D – is not suitable for any drinking (*Jarvis et. al. 2022*).

The laboratory results on the seven boreholes that pump water to Tses (refer to Section 5.4.3.2) indicate a quality range between Class A to C. This water is blended in the water storage reservoir east of Tses Proper to ensure that water of Class A or B is available, depending on circumstances (*NamWater, 2023)*. Refer to Appendix D for the laboratory results that show water suitable for human consumption.

5.2.6 Archaeology

The proposed project site is situated on the Karoo Basin to the west of the Weissrand plateau, which was formed by recent calcareous deposits on top of the Karoo Super group sediments. It is located on relatively featureless sloping plains characterized by shales and other sediments forming the lower parts of the Dwyka and Ecca formations, while dolerite outcrops occur within the surrounding area at Brukkaros and near Keetmanshoop.

In the precolonial era the general area was not suitable for permanent fixed settlement due to its aridity. Low density shifting settlement has ensured that the archaeological signature of human occupation is both meagre and subtle.

During the colonial era, a railway was established at the start of the 20th century. Regular communication between the coast at Lüderitz and interior centres such as Keetmanshoop sustained a series of small farming and mercantile enterprises. The remains of railway settlement and limestone-processing dominate the visible heritage-related character of the area today (*Nakale, 2022*).

5.3 BIO-PHYSICAL ENVIRONMENT

The Tses area lies within the Karas Dwarf Shrubland with a sparse layer of grass and low sparse shrubs the dominant vegetation type. Vegetation is sparse as a result of the arid climate.

South-central Namibia is regarded as “low” in overall terrestrial diversity and “low to average” in terrestrial endemism. The area is thus not viewed as a site of special ecological importance in Namibia (*Cunningham 2022*).

5.3.1 Flora

The vegetation of the area can be described as *Sparse shrubland* or *Karas Dwarf Shrubland (Mendelson 2002)*. The average plant production is “low to very low” with “medium to high” variation in green vegetation biomass depending on the location. The overall plant diversity in the general area is “low” with an estimated 100-149 species. Plant endemism is very low with 2-5 species expected from the general area (*Cunningham, 2022*). The area is home to the endemic and protected Quiver tree (*Aloe dichotoma*) (*Curtis and Mannheimer 2005*).

Compared to other regions the Tses area is not viewed as floristically important and has the lowest species/area ratio of all the regions with very few endemic species. Grazing and browsing is thus “average” in the general area.

Most part of the Tses Extensions 1, 2 and 3 that is already occupied has been cleared of natural vegetation with only a few planted shade trees and shrubs. The alien invasive *Prosopis* tree occur in the village and this species will have to be replaced with indigenous shade trees.

Soutput North and Soutput South is situated both sides of a prominent drainage line of the Fish River. In this riverbed are more prominent trees and the ephemeral drainage lines are viewed as sites of ecological importance due to the increase in biotic richness. Protected trees such as *Acacia erioloba* and *Tamarix usneoides* occur along these drainage lines.

Refer to Appendix E for the flora species lists and their conservation status.

5.3.1.1 Grass Diversity

Up to 67 types of grasses (22-47 species depending on reference used) are expected in the general area of which no species is viewed as endemic/near endemic. *Eragrostis* (13 species)

and *Stipagrostis* (8 species) species are the dominant grasses expected to occur in the general area (*Cunningham 2022*).

5.3.1.2 Tree and Shrub Diversity

At least 64 species of larger trees and shrubs are known and/or expected to occur in the general area of which 4 species are classified as endemic (6.3%), 9 species classified as near endemic (14.1%), 12 species are protected by the Forest Act No. 12 of 2001 (18.8%), 1 species are protected by the Nature Conservation Ordinance No. 4 of 1975 (1.6%) and 5 species are classified as CITES Appendix 2 species (7.8%). 25 species (including endemic and near endemic) have some form of conservation status (39.1%) (*Cunningham 2022*).

Bush encroachment of *Rhigozum trichotimum* may occur in the area.

5.3.1.3 Other Species of special concern

Aloes

Aloes are protected throughout Namibia and 4 aloe species may potentially occur in the Tses area. These are *Aloe claviflora*, *A. hereroensis*, *A. littoralis* and *A. variegata* (*Cunningham, 2022*). These may not be damaged or removed without relevant consent (Forest Act No. 12 of 2001, as amended).

Ferns

Ferns in the general area include at least 8 indigenous species (*Cheilanthes marlothii, Marselia aegyptiaca, M. coromandelina, M. farinose, M. macrocarpa, M. unicornis, M. vera and Ophioglossum polyphyllum* and 2 endemic species (*Isoetes giessii and Marsilea burchellii)*. (*Cunningham, 2022*)

Lichens

Lichen diversity is related to air humidity and generally decreases inland form the Namibian coast. There is a possibility that Lichens might occur on the Project Site, mostly on rocky outcrops (*Cunningham, 2022*). Disturbance in these areas should be kept to a minimum.

Lithops

Lithops species – all protected (See Nature Conservation Ordinance No. 4 of 1975) – are also known to occur in the general area and often difficult to observe, especially during the dry season when their aboveground structures wither. At least one species of Lithops is expected to occur in the general area (*Lithops vallis-mariae*) and is viewed as important. (*Cunningham, 2022*)

Other

Other species with commercial potential that could occur in the general area include *Harpagophytum procumbens* (Devil's claw) harvested for medical purposes and often over-exploited and *Citrullus lanatus* (Tsamma melon) which potentially has a huge economic benefit.

5.3.2 Fauna

The overall abundance of large herbivorous mammals (big game) is viewed as “low to average” with 1-4 species, while the overall density of large carnivorous mammals (large predators) is also “low” determined at 2 species (leopard and cheetah) at “low” densities. The area is thus not viewed as a site of special ecological importance in Namibia (*Cunningham, 2022*).

Refer to Appendix E for the fauna species list and their conservation status.

5.3.2.1 Reptile Diversity

At least 65 species of reptiles are expected to occur in the general area with 24 species being endemic – i.e. 36.9% endemic. All the endemics are classified as “secure”.

The 65 species expected to occur in the general area consist of at least 25 snakes (2 blind snakes, 2 thread snakes, 1 pythons, 2 burrowing snake & 18 typical snakes), 7 of which are endemic (28%) to Namibia, 4 worm lizards, 3 tortoises, 34 lizards (11 gecko, 9 skink, 7 old world lizard, 2 girdled, 2 agama, 1 monitor & 1 chameleon), 17 (50%) of which are endemic to Namibia.

Lizards (24 species with 17 species being endemic) and snakes (25 species with 7 species being endemic) are the most important groups of reptiles expected from the area. Geckos expected and/or known to occur in the general area have the highest occurrence of endemics (81.8%) of all the reptiles in this area (*Cunningham, 2022*).

5.3.2.2 Amphibian Diversity

At least 4 species of amphibians can occur in suitable habitat in the general area. The area is under represented, with 1 rubber, 1 platanna, 1 caco and 1 sand frog known and/or expected (i.e. potentially could be found in the area) to occur in the area. Of these, 1 species is endemic (*Phrynomantis annectens*) - i.e. 25% of amphibians of conservation value from the general area. Although *P. annectens* is viewed as the most important species occurring in the area, it occurs widespread in Namibia and not exclusively associated with the area in particular (*Cunningham, 2022*).

5.3.2.3 Mammal Diversity

At least 60 species of mammals are known and/or expected to occur in the general area of which 2 species (3.3%) are classified as endemic and 2 species as rare (*Cistugo seabrae*, *Felis nigripes*). The Namibian legislation classifies 1 species as specially protected game, 7 species as protected game, 7 species as vulnerable, 4 species as insufficiently known, 1 species as indeterminate, 3 species as huntable game, 4 species as problem animals, 1 species migrant and 6 species as peripheral. At least 36.7% (22 species) of the mammalian fauna that occur or are expected to occur in area are represented by rodents of which 1 species (4.5%) are endemic. This is followed by carnivores 28.3% (17 species) of which 6 species (35.3%) are vulnerable.

The most important species expected to occur in the general area are viewed as those classified by the IUCN (2021) as vulnerable (*Acinonyx jubatus*, *Panthera pardus*, *Felis nigripes*) and near

threatened (*Eidolon helvum*) and the species classified as rare by the Namibian legislation (*Cistugo seabrae*, *Felis nigripes*) (*Cunningham 2022*).

5.3.2.4 Avian Diversity

At least 146 species of terrestrial ("breeding residents") birds occur and/or could occur in the general area. Only 2 endemic species – Rüppell's Korhaan and Rosy-faced Lovebird – (14.3% of all Namibian endemic species or 1.4% of the species expected to occur in the area) is expected or is likely to occur in the general area.

The most important species expected to occur in the area are the two endemic species (Rüppel's korhaan and Rosy-faced Lovebird) and those species classified by the IUCN (2021) and/or Simmons et. al. 2015 as:

- critically endangered (White-backed Vulture),
- endangered (Ludwig's Bustard, Lappet-faced Vulture, Black Harrier, Martial Eagle, Secretary Bird, Booted Eagle, Black Stork)
- vulnerable (Tawny Eagle)
- near threatened (Kori Bustard, Verreaux's Eagle, Peregrine Falcon, Marabou Stork).

None of the unique birds are expected to be exclusively associated with the Tses area. The area does not fall within any of the Important Birding Areas (IBA's) as determined for Namibia (*Cunningham, 2022*).

5.4 BUILD-UP ENVIRONMENT

5.4.1 Overview

Tses Village is situated on the Farm Tses No. 425 in the district registration division T. The Farm Tses No. 425 was subdivided into portions on which the townships of Tses Proper (Portion 1 of Farm Tses No. 425) and Tses Extension 1 and Tses Extension 2 (Portion 2 and 3 of Farm Tses No, 425) was established (see Fig. 4.1). The area of local authority is 3350, 3011 ha.

Tses (meaning place of daylight) originated as a missionary station that was officially founded in 1927. The village formed part of the Namaland Reserve that was set aside for Nama people during 1980 – 1990. The village thus originated and developed as a township for Nama people from its original existence.

5.4.2 Proclaimed Village and Townships

In 1995 the establishment of a township was proposed in the process of eventual proclamation of the Tses Village as a local authority. The application then consisted of Tses Township, Tses Township Extension 1 and Tses Township Extension 2 in the following manner:

- Tses Township (Proper) consisting of 302 erven, 2 streets and 11 public places (numbered 301-614);

- Tses Township Extension 1 consisting of 148 erven, 2 streets and 5 public places (numbered 615 – 770); and
- Tses Township Extension 2 consisting of 6 erven and 1 street (numbered 771 – 776).

In 1999 only Tses Proper was proclaimed as a formal township and the other extensions (Extensions 1 & 2) withdrawn. Despite the withdrawal of Extensions 1 & 2, the townships were surveyed and constructed as per the township layout plans. As a result, Extensions 1 & 2 were occupied by people, who constructed permanent structures on the surveyed erven. The townships of Extensions 1 & 2 thus have a formal layout, but were never formally proclaimed as townships.

During 2022, Extension 3 was planned and now requires proclamation. Soutput North and Soutput South are another two informal townships that have grown to the extend requiring planning and eventually proclamation to become Tses Extensions 4 & 5 in the future.

The Village's administrative responsibility vests with the Tses Village Council since Nov, 2001, as provided for by the Local Authorities Act, No. 23 of 1992, as amended.

5.4.3 Bulk Infrastructure and Services

Infrastructure in the //Karas Region, such as roads, telecommunication and electricity networks exist and are well developed, especially towards the more prominent Keetmanshoop urban centre, 80 km south of Tses.

Basic infrastructure, i.e. potable water, electricity and sewer, are available to most of the townships (i.e. Tses Proper; Tses Extensions 1, 2 & 3), while some infrastructure (central located water points electricity and long drops) was provided to Soutput North and Soutput South.

5.4.3.1 Access and Road Infrastructure

Accessibility is regarded as very good, since Tses is located next to the B1 Main Road connecting Windhoek with Keetmanshoop and South-Africa. It can be reached by turning east from the B1, opposite the turn to Berseba and Brukkaros Mountain.

The access road to Tses from the B1 is a tar road and was recently construction to move approximately 100 m to the north of the original access. The street network within Tses Village are gravel and dirt roads.

Refer to Appendix D for the aerial maps of Tses Proper, Tses Extension 1, 2 and 3 to view the street lay-out.

5.4.3.2 Potable Water Infrastructure

Bulk water infrastructure of Tses resorts under the jurisdiction and management of Namwater. Tses Village receives water abstracted from 7 boreholes in the area. Two boreholes are located approximately 20 km away on the Berseba gravel road close to the Fish River, three within the Tses village and two between Southput North and Soutput South (*NamWater, 2023.*). Water is transported via a NamWater pipeline to the town and townlands area. A clear water storage

facility is situated on an elevated area east of Tses Proper. Refer to Fig. 4.5 in Section 4.5.2 for the location of the boreholes, pipelines and clear water storage facility.

Water quality is suitable for human consumption and livestock (*NamWater, 2023.*). Refer to Section 5.2.5 and Appendix D to see water quality results from the 7 boreholes and reservoir.

Water demand was a total of 100,299 m^3 for the year 2022 and in the following distribution:

- Highest demand was 11,333 m^3 in November 2022
- Lowest water demand was in 6581 m^3 in July 2022
- With an average demand of 8358.25 m^3.

Refer to Fig. 5.5 below for the diagram provided by NamWater for water consumption in Tses for 2022.

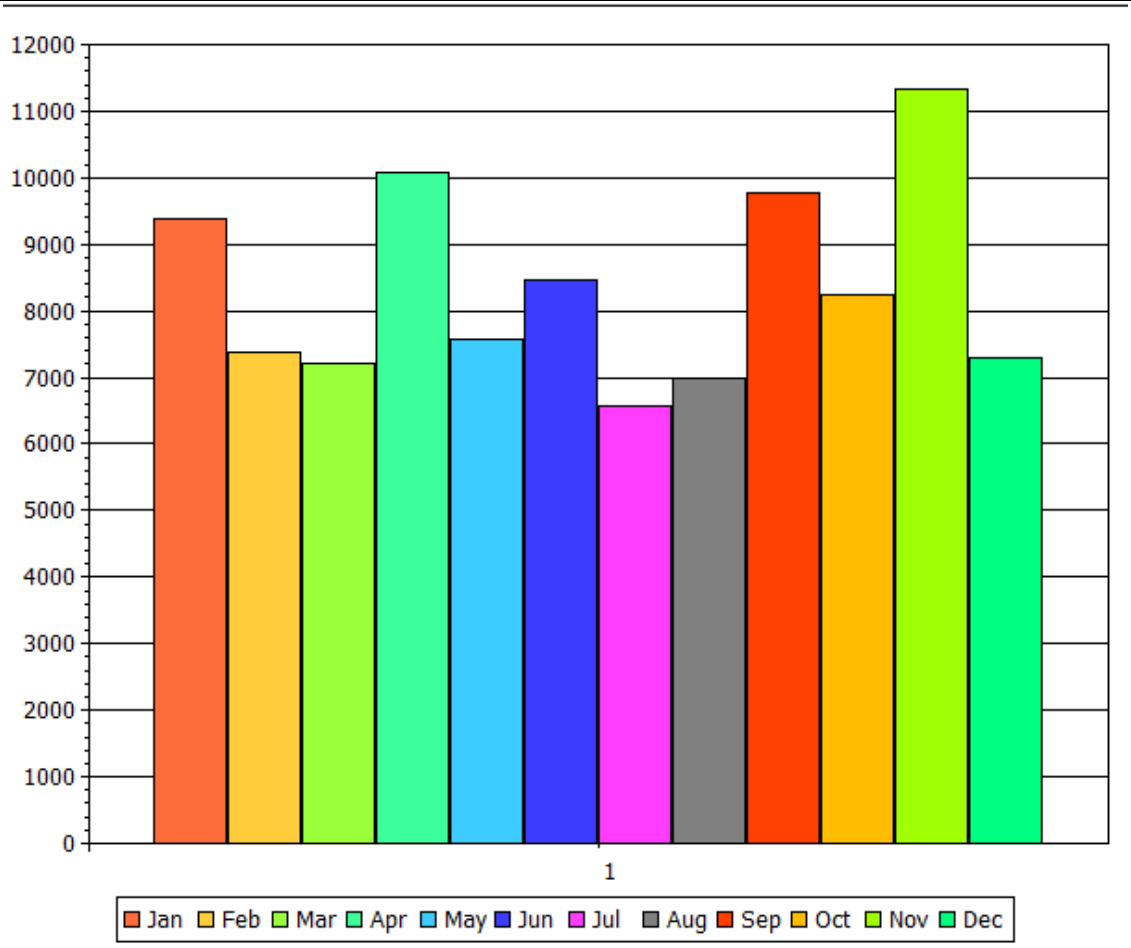

Figure 5.5. – Tses Water Consumption for 2022

Past and current water demand has been met successfully. If future water demand will increase substantially Namwater will have to be consulted again, since increase demand will affect the blending ratio of the water into the water storage facility and might mean a lower quality supply of water (*NamWater, 2023*).

In accordance with the Water Resources Management Act 11 of 2013 PART 7, the management of rural water supply should fall under the jurisdiction of appointed water point committees and

local water committees (*MAWRD, 2013*). Such a committee must be established and implemented for the management of Tses Village water supply.

Photo 5.4.1– *Borehole with windpump, tank and dam in Soutput North*

5.4.3.3 Electricity Infrastructure

A well-developed network of transfer stations and electricity lines exists within the //Karas Region, especially around Keetmanshoop, where the Kokerboom substation is located.

Electricity supply to the Tses Village is done from the national NamPower grid to the Tses Substation south of Tses Village and the townships are serviced along an overhead electricity grid. The electricity grid has been extended to Tses Proper, Extensions 1, 2 and 3 as well as Soutput North and South. Refer to Fig. 4.5 for a map of the bulk services supply to Tses Village.

Photo 5.4.2 *– NamPower Substation south of Tses*

Photo 5.4.3 *– View of Electricity grid in the townships*

5.4.3.4 Solid Waste Management

Inadequacies regarding waste disposal exist in Tses Village, due to lack of proper management and monetary resources. The solid waste removal and treatment system is not functioning properly according to the Environmental Management Act, (Act No. 7 of 2007) and its Regulations, February 2012 No. 4878.

The responsibility of solid waste management lies with the Tses Village Council and the formalisation and provision of proper municipal services for the townships can contribute towards proper solid waste management to avoid potential impact on the surrounding environment and below ground water resources. Both of which are vulnerable.

Photo 5.4.4 *- View of Tses Dump Site*

5.4.3.5 Sewerage Infrastructure

Sewer services in the form of water born sewer systems are used for Tses Proper and a combination of the water born sewer system and french drains are provided for Tses Extension 1, 2 and 3. Long drops are still used in Soutput North and South and a sewer network still have to be constructed for these areas west of the B1 from Tses Proper. Sewerage is disposed of at the existing oxidation ponds west of Tses Proper.

Photo 5.4.5 *- View of a long drop sewer system in Soutput North*

Photo 5.4.6 *- View of Sewer Pump Station in Tses Village*

Photo 5.4.7 *– View of Oxidation Ponds south-west of Tses Extension 2*

Photo 5.4.8 – *View of Entrance to Oxidation Ponds*

5.4.3.6 Stormwater Infrastructure

Stormwater drainage systems are limited to culverts next to the tar and upgraded gravel roads of Tses Proper and Tses Extension 1, 2 and 3.

5.4.3.7 Telecommunication Infrastructure

Telecommunication services in the area and Tses Village is provided by Telecom Namibia or Paratus (fixed line telecommunication) as well as MTC (mobile telecommunication).

5.5 SOCIO-ECONOMIC ENVIRONMENT

5.5.1 Regional Demographic

The //Karas Region is the southernmost region of Namibia's 14 political regions. With a total land area of 161,086 km², the region is the largest, in terms of land, in the country (*NPC, 2007*). It is, however, sparsely populated and relatively underdeveloped when compared with Namibia's other regions.

With approximately 77,421 people residing in the region, it means a density of 0.5 persons per km². The population annual growth rate of 1.1% is lower than the national growth rate of 1.4%. Rural to urban migration has increased, mainly due to young adults in search of job opportunities.

Tses is situated in the Berseba Constituancy which also includes the Brukkaros crater and settlements of Snyfontein, Hermeringhausen, Bethanie and Goageb. The Tses Village has a population of approximately 1000 people in 2011 (*NSA, 2012*).

5.5.2 Regional Economic Activities

The //Karas Region that borders the Atlantic Ocean on its western border is diverse in terms of economic activity with mining, agriculture, fisheries and tourism making up the largest economic sectors in the Region. The economy is largely primary sector oriented. This is mainly as a result of the arid nature of the region within the western and southern parts which makes human habitation and animal husbandry (inclusive of commercial farming) difficult to achieve (*NPC, 2007*).

Economic activities in towns and villages around the Project Area are mostly related to agriculture. Extensive farming with small stock is the predominant, widespread rural economic activity around Tses.

Significant irrigation schemes are associated with the Hardap and Naute dams. The newly developed Neckartal Dam is also in the //Karas Region and a third irrigation scheme is planned for development.

The main source of income for households in the //Karas Region is from Wages and Salaries (72%), Pension (9%) and farming (5%). The main employment industry in the region is the Agriculture industry (32.4%) followed by the Mining Industry (8.9%). Wholesale and retail trade employed 6% of the workforce. The private sector provided the majority of jobs in the region

(49.9%), with the government sector employing 15.8%, the parastatal sector 13.5% and commercial farming sector 8.3% (*NSA, 2012*). Spin-off benefits also come from trade and normal traffic to and from South Africa.

Unemployment within the Region (32.2%), being slightly lower than the National average (36.9%), increased with 11% since 2001 *(NSA, 2012*).

5.6 SURROUNDING LAND USES AND DENSITY

The land use in the surrounding area is typical of a rural area in relatively close proximity to a small urban centre, with infrastructure concentrated towards and around Keetmanshoop. Land use activities in the rural area comprise livestock and game farming, tourism ventures and some mining.

5.6.1 Agriculture

The risk of farming is generally viewed as “average to high” with the carrying capacity viewed as 30-40kg/ha (Mendelsohn *et al.* 2002) or 12-15LAU/ha (*Mendelson, 2002*).

Sheep farming is the dominant farming activity in the general area with between 90-100% of stock farmed with being sheep and 0-10% being goats and recently extensive cattle farming has also been introduced. The region is also suitable for wildlife farming and hunting and is known for these activities.

The communal farming sector and the commercial resettlement sector are steadily growing in the region with a total of 66 commercial farms bought under the Resettlement Scheme in 2010.

Apart from the livestock farming sector, the irrigation sector at the Orange River, Hardap (near Mariental) and Naute Dam (55 km to the south-west of Keetmanshoop) also contributes significantly to the economy of the region. The upcoming irrigation scheme at the Neckartal Dam promises to add further to the economic livelihood in the region. (*SPC, 2011*)

5.6.2 Tourism

The //Karas region is known for its tourism attractions such as the Fish River Canyon, Ai-Ais Hot springs, Orange River and the Sperrgebiet. Keetmanshoop, the administrative capital of the region 80 km to the south of Tses, is geographically well located within the region and on the main route to and from South Africa.

Brukkaros crater is approximately 30 km west of Tses.

Approximately 14 km north-east of Keetmanshoop is the Quiver Tree Forest Rest Camp, associated with the Quiver Tree Forest that was declared as a National Monument of Namibia in 1995. Other tourist attractions near Keetmanshoop are the Mesosaurus fossils and Giant’s Playground dolomitic features as well as various hospitality service providers.

5.6.3 Protected Areas

Tses falls within the !Khob !Naub communal conservancy that was registered in July 2003 and covers approximately 2,747km². The major wildlife resources in this communal conservancy include springbok, kudu and oryx. (*Cunningham, 2022*).

The nearest protected area in the //Karas Region is the Naute National Park, located approximately 130 km to the south of Tses.

5.6.4 Urban

The town of Keetmanshoop is located approximately 80 km south of Tses and is the regional capital of the //Karas Region. The town has an approximate population of 19,447 and is the biggest town in the region in terms of population and townlands. *(SPC, 2015*) Keetmanshoop is a fully autonomous Municipal Council administered through the Local Authorities Act of 1992 (Act 23 of 1992). It is the only municipal council in the //Karas Region. Keetmanshoop is thus also the administrative capital of the //Karas Region, as well as the commerce, educational and healthcare hub.

5.6.5 Infrastructure

Service infrastructure is concentrated around Keetmanshoop. The town is situated in an important geographical location as it is on the Trans-Orange Corridor that links the harbour of Lüderitz with the eastern provinces of South Africa, via road and railway.

5.6.5.1 Electricity

The electricity network of the //Karas Region is well distributed to provide in the electricity needs of the region.

5.6.5.2 Roads

Keetmanshoop is well positioned within the Namibian transport corridors, namely the B1 main tarred road, the B4 main tarred road, the C16, C17 and M29 gravel roads and various farm roads. Tses is located next to the B1, the only main transport route from South Africa to Windhoek and the rest of the country. This means that all traffic to and from South Africa has to pass through along the B1.

5.6.5.3 Airport

The nearest airport is located at Keetmanshoop and caters mainly for chartered flights as commercial flights do not fly there anymore. It is located approximately 70km south of Tses Village.

5.6.5.4 Railway

A railway station is situated in Keetmanshoop and the railway line runs parallel to the B1 road through Tses Village. The railway line links up with the north of Namibia, Lüderitz harbour and also links with South Africa through Karasburg, Upington to Johannesburg and Pretoria.

5.6.5.5 Water Infrastructure and Reservoir

Tses' bulk water is supplied by NamWater from seven boreholes in and nearby Tses. A clear water storage facility is situated on an elevated area east of Tses Proper. Refer to Fig. 4.5 and Section 4.5.2 for the water infrastructure around Tses.

5.7 CULTURAL, ARCHAEOLOGICAL & HERITAGE

Tses originated as a missionary station that was officially founded in 1927. The village formed part of the Namaland Reserve that was set aside for Nama people during 1980 – 1990. In 1995 the establishment of a township was proposed and in 1999 Tses Proper was proclaimed as a formal township.

Tses Village and surroundings thus have some historical significance and role to play towards the present day history of Namibia. However, the village itself does not have any registered historical significance. A graveyard is located next to the Village that is fenced in maintained by the Village Council.

Photo 5.7.1. *– View of the Graveyard near Tses*

Photo 5.7.2 *– View of Graveyard near Soutput South*

The closest sites of archaeological interest were identified by palaeontologists approximately 14 km north-east of Keetmanshoop along the C17. These include fossil remains of Mesosaurus, the well-known Giant's Playground as well as the Kokerboom forest.

5.8 VISUAL AESTHETICS & SENSE OF PLACE

The natural landscape in and around the Tses Village is typical of the southern parts of Namibia, which can be described as sparse vegetation defining the rural-like sense of place as flat and very arid. Refer to Photo 5.8.1 for the visual aesthetics and natural sense of place of Tses.

The sparse natural vegetation within the Tses Village has been disturbed by development and are limited to singular shade trees and shrubs.

Photo 5.8.1. *– View of Tses Village*

6 PUBLIC PARTICIPATION PROCESS

Public consultation and participation are an important aspect of an EA process. During public consultation, potential impacts that the proposed project may have on the natural and/or socio-economic environments, were identified. Consultation with Interested and Affected Parties (I&APs) and relevant Authorities enables transparent decision-making.

This chapter describes in detail the full extent of the public consultation process that was followed and the I&APs and authorities that were notified of the study being undertaken. It also includes the main issues and concerns raised during the public consultation process and comments received on the Background Information Letter (BIL) distributed during the first round of public consultation.

Public consultation for the purposes of this project was done as prescribed by Regulations 21 to 24 of the Environmental Impact Assessment Regulations (GN. 30 of 2012).

6.1 PUBLIC ENGAGEMENT

6.1.1 First Round of Consultation

Engagement with the public and authorities as part of the first round of public consultation commenced on the 15th of September 2023 and concluded on the 06th of October 2023. During the first round of consultation, I&APs and authorities were given an opportunity to register and submit comments and/or concerns on the proposed project.

6.1.1.1 Activities of Public Engagement

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

- A list of predetermined I&APs and authorities was compiled. A total of 40 I&APs were included on the database (Appendix F1).
- A notification email (Appendix F2) with Background Information Letter (BIL) (Appendix F3) was send to all pre-identified I&APs and authorities (Appendix F1) on 15 September 2023.
- BIL notification letters (Appendix F4) were hand delivered on 15 September 2023 (Appendix F5) to line ministries (Appendix F1) and State Owned Enterprises situated in Windhoek.
- BIL notification letters (Appendix F6) was sent via courier (Appendix F7) to the Regional and Local Authorities (Appendix F1) outside Windhoek on 14 September 2023.
- Public notices announcing the commencement of the ESA and an invitation to register as an I&AP were placed in ‘The Namibian’ and ‘The New Era’ newspapers on 15 September 2023 and 22 September 2023 (Appendix F8).
- A notice board (with the dimensions 60cm x 42cm) was placed at the //Karas Regional Council and at the Tses Village Council office notice board (Appendix F9). An On-site notice was placed at the Tses Extension 1 and 2 areas (Appendix F10).

- A public meeting was held at the Tses community hall with the communities of Tses Extensions 1; 2 & 3 and Soutput North and Soutput South, on 08 October 2023. The meeting was attended by 19 people as per the attendance register (Appendix F11), while the meeting minutes are attached as Appendix F12.

6.1.1.2 Comments Received and Responses Provided

All comments and feedback received from I&APs and Authorities are summarised in Table 6.1 below, while a copy of the original correspondence is attached as Appendix F13 and Appendix F14. Three I&APs have registered.

Table 6.1: *Comments received during the first round of public consultation*

NO.	NAME	COMMENTS	NAME	RESPONSE
1.	NamWater Petite Spall (19/09/2023)	Dear Brand, Be so kind as to contact me with the complete layouts to see if all NamWater infrastructure and pipelines are accommodated to NamWater's satisfaction before submitting the applications to the URPB. Kind regards Petite Spall	Urban Green cc (19/09/2023)	Dear Petite, Your email communication below refers. I will send to you before going to the Planning Board. Can you please email me NamWater's infrastructure at Tses in .dwg and indicate the dimensions of the pipes. I will then overlay the data and then send the maps to you for input. Regards Brand van Zyl
2.	NAMWATER – Acting Environmental Manager Jolanda Kamburona (04/10/2023)	Dear Julia Please register NamWater as an I&AP with the following contact details: Jolanda Kamburona Kamburonaj@namwater.com.na +264 81 144 1528 Fillemon Aupokolo Aupokolof@namwater.com.na +264 81 325 3301 Regards, Jolanda	Urban Green cc (04/10/2023)	Dear Jolanda, Your email communication below refers. NamWater has been registered as an I&AP and will be kept informed. Kind regards Julia L. Bashir
3.	Ministry of Education, Arts and Culture Executive Director	Dear Mr Van Zyl RE: APPLICATION FOR AN ENVIRONMENTAL CLEARANCE CERTIFICATE FOR THE LISTED	Urban Green cc	

NO.	NAME	COMMENTS	NAME	RESPONSE
	Sanet L. Steenkamp (05/10/2023)	ACTIVITIES ASSOCIATED WITH THE TOWNSHIP ESTABLISHMENT FOR TSES EXTENSIONS 1, 2, 3 AND SOUTPUT NORTH AND SOUTPUT SOUTH, TSES VILLAGE, //KARAS REGION I refer to your letter dated 19 September 2023 on the above mentioned subject matter. I wish to indicate that the Ministry has read the submission and has no objection to it. Trusting that you will find the above in order. Yours in sincerely, Sanet L. Steenkamp Executive Director		

6.1.2 SECOND ROUND OF CONSULTATION

Engagement with the public and authorities as part of the second round of public consultation commenced on the 21th of February 2024 and concluded on the 04th of March 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 F16) informing all affected authorities and registered I&APs of the availability of the Draft Scoping Report and request for comment was distributed on 21 February 2024.

(ii) Comments Received and Responses Provided

No concerns were submitted with the EAP as part of the 2nd round of public consultation.

Table 6.2: *Comments received during the second round of public consultation*

NO.	NAME	COMMENTS	NAME	RESPONSE
1.	NamWater Fillemon Aupokolo (22/02/2024)	Dear Julia, Please forward all documents to me and Mrs. Kamburona CCD in this email. Regards, Fillemon Aupokolo NamWater	Urban Green cc (22/02/2024)	Dear Aupokolo & Jolanda, Your email below refers. Find attached the electronic copy of the draft ESA Report (without appendices), for the proposed establishment and/or proclamation of new townships, namely Tses Extensions 1, 2 & 3 as well as Soutput North and Soutput South (future Tses Extensions 4 & 5) within the Tses Village jurisdictional area, in the //Karas Region. Please confirm receipt of the draft ESA Report. Thank you. Kind regards Julia L. Bashir
	NAMWATER Fillemon Aupokolo (28/02/2024)	Dear Bashir, Please see the comments below for your consideration. 1. Resource consumption – please provide potential water demands for the new area per annum. 2. Water Classification – please refer to the latest WRM Act regulations, 3. Wastewater management plan – please include a detailed wastewater distribution from the proposed development to the mentioned	Urban Green cc (28/02/2024)	Dear Fillemon, Your email communication below refers. Please see my feedback within your email below. Regards Brand van Zyl

NO.	NAME	COMMENTS	NAME	RESPONSE
		sewage ponds. 4. Discharge Permits – Will the new development require a discharge permit? or is it part of the current Tses village permit? Regards, Fillemon Aupokolo NamWater		
	NamWater Fillemon Aupokolo (28/02/2024)	Dear Brand, 1. Water Classification – please refer to the latest WRM Act regulations, this was a comment, that the water classifications mentioned/listed in the text for water quality should reference the latest promulgated WRM Act. Thank you for the clarifications. Regards, Fillemon Aupokolo NamWater	Urban Green cc (28/02/2024)	Dear Fillemon, Noted, thank you. Regards Brand van Zyl

7 ASSESSMENT OF ENVIRONMENTAL ISSUES, POTENTIAL IMPACTS AND MITIGATIONS

This chapter provides a description and assessment of the key issues of concern and potential impacts associated with the establishment and formalisation of the existing informal townships. Mitigation measures relevant to the planning, design, construction, operational and decommissioning phases of the Development 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.

Given the nature of the Project and that of the receiving environment, the development is expected to have impacts on the immediate and surrounding receiving socio-economic and biophysical environment. An understanding of these impacts together with effective mitigation measures can however minimise such impacts, even avoid impacts in certain instances.

The Environmental Assessment Process consisted of two phases, the first being the screening phase and the second the scoping phase, as explained below.

7.1 SCREENING PHASE METHODOLOGY

Each of the potential impacts identified during public consultation and the scoping assessment was screened according to a set of questions (Figure 7.1), which resulted in highlighting the key impacts requiring further assessment.

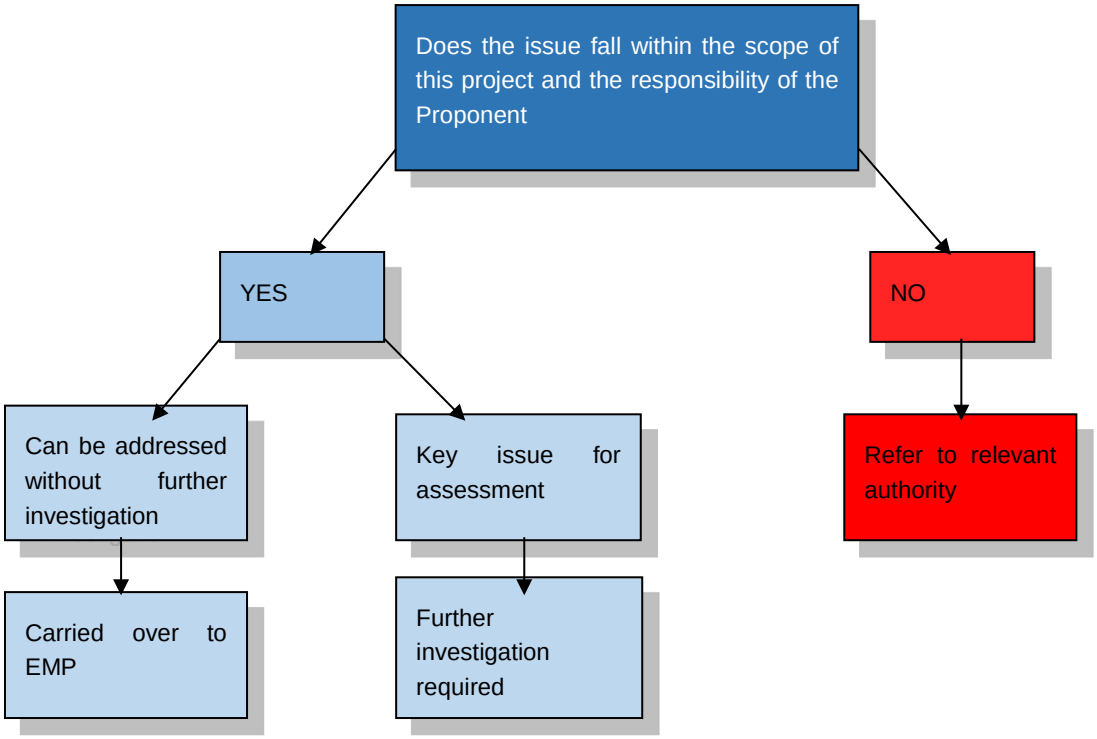

Figure 7.1: *Screening process for determining key impacts*

7.1.1 Positive Impacts

7.1.1.1 Socio-Economic

7.1.1.1.1 Supply in demand for developable land and enabling land ownership within Tses Village

The formalisation and proclamation of Tses Extension 1, 2 and 3 and establishment and formalisation of Soutput North and Soutput South (future Extensions 4 and 5) will supply in the need for formal erven with proper municipal services. It will enable land tenure and acceptable living standards for the residents of these townships, as per the goals of Vision 2030.

7.1.1.1.2 Income Generation & Skills Transfer (Employment)

Construction makes use of larger numbers of unskilled labour, as well as skilled labour although to a lesser extent, which does not only contribute to income generation and a security of better livelihoods, but contributes to skills transfer as well.

Considering the socio-economic standing of the Region (see section 5.5) and in specific that of Tses, a serious need for employment opportunities and improved living conditions exists, which would contribute to achieve the socio-economic goals set by Vision 2030.

It is important that local people be employed and that the necessary opportunities exist for unskilled labour to undergo on the job training and skills enhancement.

7.1.1.1.3 Economic Benefit to the Construction Industry

The construction of the bulk and internal services, as well as buildings (dwellings and businesses) will have a direct positive implication on the currently struggling construction industry, which is one of the most important employers.

It is crucial that local contractors be appointed and that as many as possible of the locally available construction material be used throughout the Development.

7.1.1.1.4 Additional rates and taxes

Rates and taxes paid to the local authority will enable Tses Village Council to provide much needed services and manage waste properly.

7.1.1.1.5 Improve public hygiene

Formal sewerage and waste management systems will provide for better public health in the community which would contribute to the National Sanitation Strategy (*MAWF, 2009*).

7.1.1.2 Environmental

7.1.1.2.1 Judicious use of Natural Resources

Formal infrastructure for water and electricity can be better managed and wastage prevented.

7.1.1.2.2 Prevention of Pollution of Ground and Surface Water

Formal sewerage and waste management will prevent uncontrolled pollution of groundwater.

7.2 SCOPING ASSESSMENT METHODOLOGY

The list of impacts that were subjected to a scoping assessment is presented in Table 7.2 and 7.3, as per the evaluation criteria presented in Table 7.1 below.

The potential impacts identified were evaluated in terms of extent (spatial scale), duration (time scale), intensity (magnitude) and probability. The means of arriving at the different significance ratings is explained in Table 7.1 below.

These criteria are used to ascertain the *significance* of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The significance of an impact is derived by taking into account the temporal and spatial scales and magnitude. Such significance is also informed by the context of the impact, i.e. the character and identity of the receptor of the impact.

***Table 7.1** - Criteria for Impact Evaluation*

CRITERIA	CATEGORY
Impact	This is a description of the expected impact.
Nature	Describe the type of effect. **Positive** – environment overall will benefit from the impact **Negative** – environment overall will be adversely affected by the impact **Neutral** – environment overall will not be affected
Extent	Describe the scale of the impact. **Site Specific:** Expanding only as far as the activity itself *(onsite)* **Small:** Restricted to the site's immediate environment within 1 km of the site *(limited)* **Medium:** Within 5 km of the site *(local)* **Large:** Beyond 5 km of the site *(regional)*
Duration	Reviews the lifetime of the impact. **Very short** – days, <3 days **Short** - days, <1 month) **Medium** - months, <1 year **Long** - years, 1 -10 years **Permanent** - >10 years
Intensity	Describe the magnitude (scale/size) of the Impact. **None** (No environmental functions and processes are affected); **Low** (Environmental functions and processes are negligibly affected); **Medium** (Environment continues to function but in a noticeably modified manner); **High** (Environmental functions and processes are altered such that they temporarily or permanently cease and/or exceed legal standards/requirements).
Probability of Occurrence	Considers the likelihood of the Impact actually occurring. **Improbable:** Not at all likely.

	Probable: Distinctive possibility. **Highly probable:** Most likely to happen. **Definite:** Impact will occur regardless of any prevention measures.
Significance **(no mitigation)**	The impact on each component is determined by a combination of the above criteria. **No change:** A potential concern which was found to have no impact when evaluated**.** **None** (A concern or potential impact that, upon evaluation, is found to have no significant impact at all) **Low** (Any magnitude, impacts will be localised and temporary. Accordingly, the impact is not expected to require amendment to the project design) **Moderate** (Impacts of moderate magnitude locally to regionally in the short term. Accordingly, the impact is expected to require modification of the project design or alternative mitigation) **High** (Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly, the impact could have a "no go" implication for the project unless mitigation or re-design is practically achievable).
Mitigation	Description of possible mitigation measures
Significance (with mitigation)	**None** (A concern or potential impact that, upon evaluation, is found to have no significant impact at all) **Low** (Any magnitude, impacts will be localised and temporary. Accordingly, the impact is not expected to require amendment to the project design) **Moderate** (Impacts of moderate magnitude locally to regionally in the short term. Accordingly, the impact is expected to require modification of the project design or alternative mitigation) **High** (Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly, the impact could have a "no go" implication for the project unless mitigation or re-design is practically achievable)
Degree of Confidence	State the degree of confidence in predictions based on availability of information and specialist knowledge. **Low** (based on the availability of specialist knowledge and other information) **Medium** (based on the availability of specialist knowledge and other

	information) **High** (based on the availability of specialist knowledge and other information)

The decision as to which combination of alternatives and mitigation measures to apply lies with the proponent, and their acceptance and approval ultimately with the relevant Competent Authority.

7.3 MITIGATION APPLICATION METHODOLOGY

There is a hierarchy of actions, which can be undertaken to respond to any development or activity, i.e. avoidance, minimisation and compensation. It is possible and considered sought after to enhance the environment by ensuring that positive gains are included in the development. If negative impacts occur then the hierarchy, as a guiding philosophy, recommends the following steps.

- **Impact avoidance:** This step is most effective when applied at an early stage of project planning. It can be achieved by:
    - not undertaking certain actions or elements that could result in adverse impacts;
    - avoiding areas that are environmentally sensitive; and
    - putting in place preventative measures to stop adverse impacts from occurring.
- **Impact minimisation:** This step is usually taken during impact identification and prediction to limit or reduce the degree, extent, magnitude or duration of adverse impacts. It can be achieved by:
    - scaling down or relocating the project;
    - redesigning elements of the project; and
    - implementing mitigation measures to manage the impacts.
- **Impact compensation:** This step is usually applied to remedy unavoidable residual adverse impacts. It can be achieved by:
    - rehabilitation of the affected site or environment, for example, by habitat enhancement;
    - restoration of the affected site or environment to its previous state or better; and
    - replacement of the same resource values at another location (off-set), for example, by wetland engineering to provide an equivalent area to that lost to drainage or infill.

7.4 POTENTIAL IMPACTS IDENTIFIED AND ASSESSED

For this assessment's purpose, the issues and impacts identified are grouped according to the main project phases – i.e. the construction phase and operational phase. Sections 7.4.1 and Section 7.4.2 give a broad overview of each potential impact expected during the two phases, as well as an assessment outcome with mitigations.

7.4.1 Possible Impacts during Construction Phase

The construction activities, which have been considered, include those activities applicable to both the construction of buildings (i.e. houses & businesses) and the construction of bulk services (i.e. roads; potable water; sewer; stormwater; and electricity).

Construction impacts are, apart from a few, mostly temporary in nature, but may have a permanent and lasting result if not addressed in time and in an effective manner. Details with regards to the potential impacts expected during the construction phase are briefly discussed below.

Detailed mitigation measures and environmental requirements having direct relevance to the expected construction impacts are presented in the tables in this section and in the Construction Environmental Management Plan (Appendix G).

Table 7.2 below presents the potential impacts expected to occur during the construction phase of the Development, while Table 7.2.1 to Table 7.2.10 present the assessment and outcome of each of the key impacts, with mitigations.

Table 7.2 *- Key issues and potential impacts expected during the Construction Phase*

IMPACT	CAUSE
Erosion & Sedimentation	Vegetation clearance
	Trenches & excavated areas
Ground and Surface Water Pollution	Solid waste disposal
	Sewerage
	Hazardous material & liquid disposal
Habitat Destruction and Loss of Biodiversity	Vegetation clearance & removal of trees
	Erosion & sedimentation
	Poaching
Visual Aesthetics and Sense of Place	Vegetation clearance
	Poorly planned construction sites
	Insensitive infrastructure design and scale
Socio-Economic	Dust nuisance
	Noise and vibration nuisance
	Traffic safety

IMPACT	CAUSE
	Health, safety and security
Heritage and Archaeological Resources	Removal and/or disturbance
Natural Resources (water & energy)	Unacceptable high levels of consumption
	Wastage

7.4.1.1 Erosion and Sedimentation

Erosion and sedimentation will take place in the event that soils are exposed to the natural elements (i.e. winds and rains) through clearing of vegetation or excavations, which in turn could result in seasonal (rain season) degradation of habitats and visual downgrade. The amount of erosion and sediment transport is directly related to what time of the year the construction activities occur and the duration thereof. If clearing and grading activities take place during the wetter months of the year (November to March), substantially more erosion would result.

The Soil Conservation Act 76 of 1969 requires the prevention and combating of soil erosion; the conservation, improvement and manner of use of the soil and vegetation; and the protection of water sources.

Considering the natural conditions (i.e. soil composition, topography and vegetation cover) (see sections 5.2.3, 5.2.4 and 5.3.1) and the Township's layout over drainage lines (see section 4.4), minor erosion and sedimentation can be expected but can be effectively managed and mitigated.

Table 7.2.1 – *Erosion and sedimentation significance*

Impact Description	**Erosion and sedimentation**
Nature of Impact	Negative
Extent	Site specific
Duration	Short Term
Intensity	Low within flat areas
Probability	Highly Probable
Significance Pre-mitigation	Low

Mitigations	Apply acceptable engineering standards and design, or Best Management Practices (BMP). BMPs are defined as physical, structural, and/or managerial practices, that when used singly or in combination, prevent or reduce the expected impact/s. Structural BMPs typically include sediment ponds or traps, stabilized construction entrances, filter fences, check dams, and riprap. Managerial BMPs include preserving the natural vegetation, leaving buffer zones, and providing dust control. Plan the timing of construction to avoid clearing and grading during erosive high rainfall months of the year. Avoid unnecessary and excessive vegetation clearance and disturbance of top soil. Contractor should draft a Rehabilitation Plan and re-vegetate exposed areas once construction at the particular area ceased. The Rehabilitation Plan should provide for a phased approached ensuring that no large area is exposed to natural elements (e.g. wind, water). Part 3 – Environmental Specifications of the Construction Environmental Management Plan provides detail specifications and requirements to avoid any potential impacts.
Significance Post-mitigation	Very Low
Legal Implications	Soil Conservation Act 76 of 1969 (see section 3.2)
Degree of Confidence	High

Given the environment's natural characteristic and scale of future infrastructure to be constructed, the potential occurrence of erosion and resulting sedimentation is rated as ***low*** before mitigations and ***very low*** following proper mitigation measures.

7.4.1.2 Ground and Surface Water Pollution

Construction activities are associated with a variety of potential pollution sources (i.e. cement, oils, diesel, chemicals, paints, etc.), either having a direct and immediate impact or indirect and longer-term impact. As a single incident, in order for the downstream ground water to be contaminated, very large quantities of pollutants will have to be released into the environment, of which volumes are not associated with this type of Development (i.e. construction of streets and other infrastructure). Although, however small these potential sources of pollution might be, it still requires special attention (i.e. planning, control and management) to avoid any potential pollution of the immediate environment and contributing to the cumulative pollution impacts on downstream resources.

The geological, soil and hydrogeological characteristics (see Sections 5.2.3 and 5.2.5) of the Development area and surroundings characterise a sensitive status, which in turn indicate a moderate impact to downstream resources in the event that large quantities of pollutants are released into the natural environment.

Soutput North and Soutput South are located on both sides of a drainage line that feeds into the ephemeral Fish River. Prevention of any form of pollution here is thus essential in the interest of all downstream resources. A proper waterborne sewerage system is still required for these two extensions and it is recommended that no industrial erven are developed within these two extensions. It is further recommended that no expansion of Soutput North and Soutput South takes place while erven are available in Tses Extensions 1, 2 and 3.

Table 7.2.2 *– Surface and ground water pollution significance*

Impact Description	**Groundwater and surface water pollution**
Nature	Negative
Extent	Local
Duration	Medium
Intensity	Low
Probability	Probable
Significance Pre-mitigation	Moderate
Mitigations	Draft and implement a Construction Waste Management Plan to be maintained for the duration of the construction phase. Waste should be stored in appropriate containers in an appropriately constructed area protected against exposure to high intensity rainfall. Waste should be frequently disposed of at the approved dump site. Storage of any material or substance that may cause pollution to water sources should be safely handled and stored in accordance with appropriate legislation. Contractor should submit a Method Statement for the purpose of handling and storage of hazardous materials on-site. A Storm Water Management Plan should be drafted to be

	maintained for the duration of the construction time frame. Ensure proper maintenance of all construction vehicles and equipment, and conduct continues maintenance and check-ups. Draft and implement a Detailed Preparedness and Emergency Plan for all construction related spillages. Ensure that oil/ fuel spillages from construction vehicles and machinery are minimised and that where these occur, that they are appropriately dealt with. Polluted soil and building rubble must be transported away from the site to an approved and appropriately classified waste disposal site. Polluted soil must be remediated where possible. Drip trays must be placed underneath construction vehicles when not in use to contain all oil that might be leaking from these vehicles. All fuel tanks must be bunded to 120% of the capacity of the tank in order to contain any spillages that might take place. Washing of personnel or any equipment should not be allowed on site. Should it be necessary to wash construction equipment these should be done at an area properly suited and prepared to receive and contain polluted waters. These polluted waters should be transported and disposed at a waste site for hazardous materials. Appointing qualified and reputable contractors is essential. Proper training of construction personnel would reduce the possibility of the impact occurring. 'Best' practice measures should be applied to minimise the potential discharge of pollutants onto open soil especially near drainage lines. 'Part 3 – Environmental Specifications' of the Construction Environmental Management Plan provides detail specifications and requirements to avoid any potential impacts.
Significance Post-mitigation	Low
Legal Implications	Water Act No. 54 of 1956, as amended /Soil Conservation Act 76 of 1969 / Hazardous Substances Ordinance No. 14 of 1974, as amended / Public Health Act No. 36 of 1919, as amended (see section 3.2)
Degree of Confidence	High

Given the environment's natural characteristics, construction pollution is expected to have a ***moderate*** impact before mitigation and a ***low*** impact following proper mitigation measures and continues monitoring. With the proper precautionary measures in place, it is unlikely that groundwater contamination will occur and therefore the proposed construction phase is not likely to have any detrimental impacts on the groundwater resources of the area.

7.4.1.3 Habitat Destruction and Loss of Biodiversity

Removal of the natural vegetation cover to make way for the roads, other infrastructure and buildings is inevitable, although in the case of the township extensions most of this have already been done.

Any further clearance for purpose of infrastructure construction should be done within a properly planned and responsible manner to avoid unnecessary removal of ground cover and especially protected species, as per the Forest Act (No. 12 of 2001, as amended).

Considering that the larger part of the Development has been in existence in an informal manner, habitat destruction and loss of biodiversity, has already taken place to a large extend. Construction of bulk services that might pass through virgin portions of land or the drainage line between Soutput North and Soutput South should consider the receiving environment and adapt accordingly, either through realignment or minimising the expected impact. Larger trees should be protected at all costs.

Table 7.2.3 – *Habitat destruction and loss of biodiversity significance*

Impact Description	**Habitat destruction and loss of biodiversity**
Nature	Negative
Extent	Site specific
Duration	Medium
Intensity	Low
Probability	Probable
Significance Pre-mitigation	Low
Mitigations	Construction activities should be subject to well-coordinated planning to avoid unnecessary removal of vegetation particularly protected plant species.

	During the planning phase of the construction period, the appointed contractor should identify areas for lay down areas and construction vehicle sites within areas that are already cleared or disturbed. Restrict construction vehicle movement to the site and restrict movement into the No-Go areas or beyond the construction site boundaries. Only prominent gravel tracks should be utilised during the construction phase, to avoid track proliferation. Off-road driving should be strictly prohibited. Unnecessary destruction of habitats within the footprint of the construction site and along the pipeline route alignment should be avoided. Direct involvement of the Environmental Site Manager is a prerequisite in determining the locality of the construction site and final alignment. Conduct a Pre-construction Vegetation Survey to establish protected/endangered species to be marked and incorporated into the Development. Identify and mark trees or other vegetation that should be protected and that should not be removed during construction. Avoid clear felling i.e. removal of indigenous trees/shrubs and grasses of the area prior to development. If required to remove indigenous trees introduce a policy of re-establishing (i.e. planting) 5 indigenous tree species for each indigenous species removed. Permits should be obtained for protected plant species that unavoidably need to be removed. Incorporate the protected species as well as some of the other bigger tree/shrub specimens in the overall final landscaping of the area. The bigger tree/shrubs often serve as habitat to a myriad of indigenous fauna – e.g. loose bark, cavities, etc. Indigenous species also require less maintenance and water than exotic species. Show overall environmental commitment by adapting a minimalistic damage approach. A Rehabilitation Plan as proposed in the CEMP should address all aspects of the natural environment on completion of construction and prior to operation. Eradicate and remove the invasive alien species, especially *Prosopis* and *Cactus* species. No hunting, trapping, setting of snares or any other disturbance of any fauna species.

	'Part 3 – Environmental Specifications of the Construction' of the Construction Environmental Management Plan provides detail specifications and requirements to avoid any potential impacts.
Significance Post-mitigation	Very low
Legal Implications	Forest Act No. 12 of 2001, as amended / Nature Conservation Ordinance No. 4 of 1975, as amended / Soil Conservation Act No. 76 of 1969, as amended (see section 3.2)
Degree of Confidence	High

Given the directly affected environment's natural characteristic (i.e. severely disturbed) and expected scale of destruction (i.e. minor infrastructure construction), the impacts are expected to be ***low*** before mitigations and ***very low*** following proper mitigation measures and continuous monitoring.

7.4.1.4 Visual Aesthetics and Sense of Place

Construction activities are known to have a visual impact owed to the nature of the activity, although temporary in lifespan. The significance of this impact is directly linked to the topography and vegetation occurrence within the affected environment, as well as the scale of the construction activities and the distance between the impact and the receptor.

Table 7.2.4 – *Visual aesthetics and sense of place significance*

Impact Description	**Visual aesthetics and sense of place**
Nature	Neutral
Extent	Local
Duration	Medium
Intensity	Low
Probability	Definite
Significance Pre-mitigation	Low
Mitigations	Keep as much natural vegetation on site as possible to screen

	construction site and activities. Restrict the amount of structures on site and restrict the height to a maximum of 3 meters, where possible. If required, structures should be painted in natural colours to lessen the visual impact. Keep the construction site tidy and clean of any construction waste, especially over weekends. Limit construction vehicle movement in the area to a minimum and use designated pre-demarcated routes having the least possible impacts on residents. 'Part 3 – Environmental Specifications of the Construction' of the Construction Environmental Management Plan provides detail specifications and requirements to avoid any potential impacts.
Significance Post-mitigation	Very low
Degree of Confidence	High

Tses Township Exstensions are located on flat topography with low sparse vegetation that will be visible from the B1, although from some distance. However, given the existence of infrastructure and informal structures within a disturbed urban environment and the expected scale of construction activities, the visual impact during the construction phase is expected to be ***low***. By applying the proposed mitigations, the impacts during construction can be reduced to ***very low***.

7.4.1.5 Socio-economic Implication

The township layout was done with the aim to minimize social disturbance within the existing informal lay-out. Where possible, the design considers existing informal and formal structures and property fences, as well as the existing bulk electricity, water supply and street networks to minimise relocation and associated social disturbance and financial loss.

However, construction activities are associated with a variety of other impacts that has either a direct or indirect implication on the surrounding residents' living conditions and/or socio-economic status, as covered below. Positive Socio-economic benefits are discussed in Section 4.7 and 0.

7.4.1.5.1 *Dust & Emissions*

The air quality in the area is considered very good (see Section 5.2.2), based on the potential impact that current activities in the area are likely to have on air quality.

Dust and emissions are associated with construction activities (i.e. digging; clearing; excavating; transport of materials) of which the severity is directly related to the extent of the Development and

the nature of the receiving environment. Given the activities within the immediate surroundings, dust is expected to be more of a nuisance than emissions, as a result of construction activities.

The prevailing southern and northern wind directions and strength may decrease or increase the impact of dust blown from Tses Extensions in the direction or away from Tses Proper and other Extensions (see Section 5.2.1.3). Mitigations should be adapted accordingly.

Table 7.2.5 – *Dust and emissions significance*

Impact Description	**Dust and emissions**
Nature	Negative
Extent	Site specific
Duration	Very short
Intensity	Low
Probability	Highly probable
Significance Pre-mitigation	Low
Mitigations	Regular dust suppression, if required, during times of strong winds, should minimise dust impacts mainly with respect to the contractor's staff. Dust suppression by means of wetting should only be done with treated wastewaters. Removal of vegetation should be restricted to the minimum and what is necessary. Construction activities during high winds should be limited to those activities not generating dust. Handling and transport of erodible materials should be avoided under high wind conditions. Where possible, topsoil stockpiles should be located in sheltered areas and covered. Appropriate dust suppression measures should be used when dust generation is unavoidable particularly during prolonged dry periods in summer. Such measures shall also include the use of temporary stabilising measures. No fires should be allowed on-site for any what purpose and construction waste are not allowed to be burned on-site.

	It is imperative that all machinery and vehicles on site is road worthy and do not give rise to excessive smoke or emissions. The contractor's personnel are to be provided with access to dust masks. 'Part 3 – Environmental Specifications' of the Construction Environmental Management Plan provides detail specifications and requirements to avoid any potential impacts.
Significance Post-mitigation	Very low
Legal Implications	Atmospheric Pollution Prevention Ordinance No 11 of 1976, as amended / Public Health Act No. 36 of 1919, as amended / Labour Act No. 11 of 2007, as amended (see section 3.2)
Degree of Confidence	Definite

7.4.1.5.2 *Construction Noise & Vibration*

Noises and vibrations are synonymous with the construction phase, as heavy construction vehicles and machinery operates. The scale of the construction activities and type of construction activity, as well as the locality of the surrounding receptors determine the significance to the particular construction activity.

The severity of these impacts is likely to be more significant to those receptors living close by, compared to those further away from a construction site.

The prevailing wind direction and strength may increase or decrease the impact-radius of construction noises, which will either be in the direction of or away from Tses Proper and the other extensions (see Section 5.2.1.3). Mitigation measures must be implemented accordingly.

The predicted noise levels from construction activities are expected to be significantly ***low*** to the larger surrounding area, but definitely ***higher*** to the immediate neighbours. For the surrounding properties the impact is expected to be ***moderate-low*** in significance.

Table 7.2.6 – *Noise and vibration significance*

Impact Description	**Noise and vibration**
Nature	Negative
Extent	Small

Duration	Temporary
Intensity	Low to the larger surroundings and medium to the direct neighbours
Probability	Highly probable
Significance Pre-mitigation	Low to the larger surroundings and medium to the direct neighbours
Mitigations	Appropriate directional and intensity settings are to be maintained on all hooters and sirens. No amplified music should be allowed on Site. Inform immediate neighbours of construction activities to commence and provide for continues communication between the neighbours and Residents Engineer. The Contractor shall not use sound amplification equipment on Site unless in emergency situations. Limit construction times to acceptable daylight hours. Screen construction activities from residential, social and business entities as far as reasonably possible. The World Health Organization (WHO) guideline on maximum noise levels (guidelines for Community Noise, 1999) to prevent hearing impairment can be followed during the construction phase. This limits noise levels to an average of 70 db over a 24 hour period with maximum noise levels not exceeding 110db during the period. All construction vehicles and machinery should be kept in good working condition. If any noise-related complaints are registered the applicable construction vehicles and machinery should be fitted with noise reduction devices. Personnel working in noisy environments must be issued with hearing protectors. 'Part 3 – Environmental Specifications' of the Environmental Management Plan provides detail specifications and requirements to avoid any potential impacts.
Significance Post-mitigation	Low
Legal Implications	Public Health Act No. 36 of 1919, as amended / Labour Act No. 11 of 2007, as amended (see section 3.2)

Degree of Confidence	Definite

7.4.1.5.3 Traffic & Safety

Construction activities are associated with an increase in vehicles of different kinds (i.e. workers' busses, delivery vehicles and construction vehicles) to and from the Site, which inevitably increase risk and conflict.

Table 7.2.7 – *Traffic & safety significance*

Impact Description	**Traffic & safety**
Nature	Negative
Extent	Site specific
Duration	Medium
Intensity	Low
Probability	Probable
Significance Pre-mitigation	Low
Mitigations	Contractor's personnel should adhere to speed limits. Appropriate signs should be in place along the roads being used by construction vehicles notifying road users and residents of the construction activity and roads used by construction vehicles. Drivers of construction vehicles should have valid driver's licenses with ample experience on proper road usage and manners on-site as well as when making use of public roads. Construction vehicles' need to be in a road worthy condition and maintained throughout the construction phase. Make use of predetermined roads and refrain from creating new roads for access purpose. Provide traffic signals and road markings where necessary to ensure safe traffic movement. 'Part 3 – Environmental Specifications' of the Environmental Management Plan provides detail specifications and requirements

	to avoid any potential impacts.
Significance Post-mitigation	Very low
Legal Implications	Public Health Act No. 36 of 1919, as amended / Labour Act No. 11 of 2007, as amended / Road Traffic and Transport Act 52 of 1999 and its 2001 Regulations, as amended (see section 3.2)
Degree of Confidence	Probable

The potential pre-mitigation impact is regarded as ***low,*** which can be reduced to ***very low*** through applying proper mitigations.

7.4.1.5.4 *Health, Safety & Security*

Health and safety of both the residents and that of construction staff is essential and should be respected. Construction activities should be done in such a manner as to prevent any potential risk to the residents' safety and/or health. It is thus important that trenches be fenced-off and secured, while hazardous liquids used and stored should be done in a safe manner.

Areas within which construction activities takes place is usually associated with criminal activity, posing a security risk to those residing in the area. It is not to say that these criminal activities are as a result of the construction staff, but is known to happen in the vicinity of construction sites. Prostitution is also associated with construction activities especially where construction labourers reside in temporary accommodation near or on site/s.

Table 7.2.8 – *Health & safety & security significance*

Impact Description	**Health & safety & security**
Nature	Negative
Extent	Local
Duration	Medium
Intensity	Medium
Probability	Probable
Significance Pre-mitigation	Moderate

Mitigations	Ensure that all construction personnel are properly trained depending on the nature of their work. Provide for a first aid kit and properly trained person to apply first aid when necessary. A wellness program should be initiated to raise awareness on health issues, especially the impact of sexually transmitted diseases. Restrict unauthorised access to the site and implement access control measures. Clearly demarcated the construction site boundaries along with signage of no unauthorised access. Clearly demarcate dangerous areas and no go areas on site. Staff and visitors to the site must be fully aware of all health safety measures and emergency procedures. The contractor must comply with all applicable occupational health and safety requirements. The workforce should be provided with all necessary Personal Protective Equipment including earplugs. All affected land owners should be notified at least one month in advance who the appointed contractor is and provided with details about the proposed construction activities and timeline.
Significance Post-mitigation	Low
Legal Implications	Public Health Act No. 36 of 1919, as amended / Labour Act No. 11 of 2007, as amended (see section 3.2)
Degree of Confidence	High

These potential impacts hold ***moderate*** significance and can with appropriate mitigations reduce its impact to ***low***.

7.4.1.6 Heritage / Archaeological Resources

The informal townships of Tses Village have no known areas of cultural significance or sites with archaeological resources. No record of any cultural or historical importance or on-site resemblance was located during previous environmental studies in the village. No known heritage sites or proclaimed national monuments are located within the footprint of the development site or adjacent properties.

Table 7.2.9 – *Heritage / archaeological resources significance*

Impact Description	**Heritage / archaeological resources**
Nature	Negative
Extent	Site specific
Duration	Permanent
Intensity	Low
Probability	Probable
Significance Pre-mitigation	Low
Mitigations	Caution should be exercised during the construction phase in the event that archaeological/heritage remains are discovered during the excavations. The Environmental Site Manager should receive training by a suitably qualified archaeologist with respect to the identification of archaeological/heritage remains and the procedures to follow in the event that such remains are discovered during construction. Any archaeological materials find should be reported to the Environmental Site Manager and the National Monuments Council, and all on-site activities stopped immediately. Details with regards to the Chance Find Procedure to follow is defined in the CEMP.
Significance Post-mitigation	Low
Legal Implications	National Heritage Act (Act 27 of 2004), as amended (see section 3.2)
Degree of Confidence	Medium

The probability of locating any important archaeological heritage remains during the construction phase is likely to be ***improbable***.

7.4.1.7 Natural Resources

The construction phase requires both water and energy of which water is the source under pressure, throughout Namibia.

Given that roads will remain gravel roads, the impact on water resources are minimised. Alternative water resources (i.e. treated wastewater) should be used during the construction phase.

Table 7.2.10 – *Natural resources significance*

Impact Description	**Natural resources**
Nature	Negative
Extent	Regional
Duration	Medium to Long
Intensity	Medium
Probability	Probable
Significance Pre-mitigation	Moderate
Mitigations	There should be no tolerance towards water wastage. Treated wastewater should be obtained and used for the bulk of the construction requirements. Temporary catchment dams should be constructed to capture water if construction takes place during the rainy season.
Significance Post-mitigation	Low
Legal Implications	Water Act No. 54 of 1956, as amended / Public Health Act No. 36 of 1919, as amended (see section 3.2)
Degree of Confidence	Definite

These potential impacts hold ***moderate*** significance and can with appropriate mitigations reduce its impact to ***low***.

7.4.2 Possible Impacts during Operational Phase

These impacts are usually more permanent in nature or at least until decommissioning of the Development. Details with regards to the potential impacts expected during the operation phase are briefly discussed below. Detailed mitigation measures and environmental requirements having direct relevance to the expected operational phase impacts are presented in the tables below.

Different from the construction related impacts, no Management Plan is provided for the Operational Phase of township management, but rather recommendations are made to existing Policies or Plans (i.e. Local Authority Bylaws) to be applied.

Details with regards to the potential impacts expected during the operation phase are listed in Table 7.3 below. Mitigation measures and environmental requirements having direct relevance to the expected operational phase impacts are presented in Tables 7.3.1 to 7.3.7 below.

***Table 7.3** - Key potential impacts expected during the operational phase*

IMPACT	CAUSE
Ground and Surface Water Pollution	Solid waste disposal
	Sewerage waste disposal
	Hazardous material and liquids disposal
Erosion & Sedimentation	Vegetation clearance
Habitat Destruction and Loss of Biodiversity	Vegetation clearance
	Erosion & sedimentation
	Poaching
Visual Aesthetics and Sense of Place	Vegetation clearance / altered vegetation
	Architectural design & scale of buildings
	Land use change
Socio-Economic	Municipal rates and taxes
	Noise
	Traffic safety
Natural Resources (water & electricity)	Unacceptable high level of consumption
	Wastage
	No sustainable practises

7.4.2.1 Erosion and Sedimentation

Erosion and sedimentation during the operational phase is highly unlikely due to the topography and drainage of the area (see Section 5.2.4) During the construction phase stormwater management will be put in place where necessary, which will further reduce the occurrence of erosion and sedimentation.

It might however take place in the event that open areas along steep gradients and higher lying areas are cleared of vegetation, for whatever reason, which would then result in erosion and sedimentation, as well as seasonal (rain season) degradation of habitats and visual downgrade.

The Soil Conservation Act 76 of 1969 requires the prevention and combating of soil erosion; the conservation, improvement and manner of use of the soil and vegetation; and the protection of water sources. Open areas should be kept within a natural state and no vegetation removal should be tolerated.

Table 7.3.1 – *Erosion and sedimentation significance*

Impact Description	**Erosion and sedimentation**
Nature	Negative
Extent	Site specific
Duration	Medium or Long Term
Intensity	Low
Probability	Improbable
Significance Pre-mitigation	Low
Mitigations	The stormwater culverts and system should be well maintained. The occurrence of erosion should be monitored and mitigated.
Significance Post-mitigation	Very Low
Legal Implications	Soil Conservation Act 76 of 1969 (see section 3.2)
Degree of Confidence	High

Given that storm water management will be applied where necessary as part of the engineering designs and the flat topography, the potential occurrence of erosion and resulting sedimentation is rated as ***low*** before mitigations and ***very low*** following proper mitigation measures.

7.4.2.2 Ground and Surface Water Pollution

The geological, soil and hydrogeological characteristics (see Section 5.2.3 and 5.2.5) of the affected environment and surroundings characterise a sensitive status, which in turn indicate a moderate impact to downstream resources in the event that large quantities of pollutants are

released into the natural environment. Prevention of any form of pollution is thus essential in the interest of all downstream resources.

Sources of potential pollution include, but are not limited to hazardous liquids (i.e. diesel/petrol/cleaning liquids) stored at homes or business; leakages from sewerage and wastewater networks; herbicides and pesticides used in the community garden; improper storage of domestic waste and dumping of waste within open areas.

Increased run-off created as a result of the Development (i.e. roofs and other hard surfaces) could enhance pollutant transportation, as well as increased distance pollutants can be transported away from its source.

The greatest risk factor lies with the sewerage network where leakages go undetected and/or improper waste management. Soutput North and Soutput South are located on both sides of a drainage line that feeds into the ephemeral Fish River. Prevention of any form of pollution here is thus essential in the interest of all downstream resources.

A proper waterborne sewerage system is still required for Soutput North and Soutput South and it is recommended that no industrial erven are developed within these two extensions. It is further recommended that no expansion of Soutput North and Soutput South takes place while erven are available in Tses Extensions 1, 2 and 3.

The focus during the operational phase should be on the proper management and maintenance of the waterborne sewerage network (i.e. pipelines; septic tanks and oxidation ponds) and ensuring proper waste management with a zero waste disposal at the area to be developed.

Table 7.3.2 *– Surface and ground water pollution significance*

Impact Description	**Groundwater and Surface Water Pollution**
Nature	Negative
Extent	Local / Regional
Duration	Long Term
Intensity	Medium
Probability	Probable
Significance Pre-mitigation	Moderate to High

Mitigations	Southput North and Soutput South should be connected to the water borne sewerage system of the Village as part of its establishment and formalisation process. Draft and implement a Wastewater Management Plan that aims at monitoring the entire wastewater network and checking for any leakages, by the Local Authority. This Plan should include as a minimum the following - • Upgrading and maintenance of the oxidation ponds when required; • Investigation of all existing septic tanks and sewer pipelines for leakages and repairs where required; and • Continues monitoring plan. Continues awareness of harmful practises and keeping of hazardous liquids should be undertaken by the Local Authority. The discharge of pesticides and herbicides in harmful quantities should be prevented in the community garden. Pesticides and herbicides should not be used during periods of rainfall; and biodegradable pesticides and herbicides with short half-lives of three days or less should be used. It is recommended to rather use local indigenous flora throughout the landscaped areas and minimise any other plants, trees and lawns as part of the landscaping areas to minimise the necessity for any pesticides and herbicides. Ensure that surface water are channelled and captured through a proper storm water management system to be treated in an appropriate manner in the oxidation ponds before disposal into the environment.
Significance Post-mitigation	Low
Legal Implications	Water Act No. 54 of 1956, as amended /Soil Conservation Act 76 of 1969 / Hazardous Substances Ordinance No. 14 of 1974, as amended / Public Health Act No. 36 of 1919, as amended (see section 3.2)
Degree of Confidence	Medium

Possible pollution by way of the sewerage and wastewater network (and others) is initially considered to be ***low***, but has proven to increase in risk over the years as the infrastructure and equipment degrade. Should no management, policing and/or monitoring be done (i.e. no mitigations) from the side of the Local Authority, the risk factor can be regarded as ***high***, but can

be avoided and reduced to an expected ***low*** impact following proper mitigation measures and continues monitoring.

7.4.2.3 Habitat Destruction and Loss of Biodiversity

The most destructive disturbance to the local habitat takes place during the construction phase, when the land is prepared for the intended dwellings and businesses. The risk of further habitat destruction during the operational phase depends on the mind-set and environmental awareness of the residing community.

The introduction of human activities on a daily basis can place an increased strain on the fauna and flora species if not managed sensitively. Impacts during the operational phase are predominantly associated with the daily operations of humans and poor management practices (e.g. improper waste management, uncontrolled fires, etc.) and irresponsible behaviour (e.g. uncontrolled access to sensitive areas; collecting of plants or animals; killing of snakes, use of general poison, etc.).

The introduction of gardens and in specific non-indigenous plants will result in the greatest change to the habitat and loss of biodiversity, along with pets scarring away reptiles and other smaller fauna. Planting of invasive alien species and the creation of areas where invasive species can establish, could accelerate alien invasions.

Illegal dumping of waste and improper storm water management can also threaten them within these open areas and are also a concern that needs to be managed and regulated.

Table 7.3.3 – *Habitat destruction and loss of biodiversity significance*

Impact Description	**Habitat destruction and loss of biodiversity**
Nature	Negative
Extent	Site specific
Duration	Long Term
Intensity	Low
Probability	Probable
Significance Pre-mitigation	Moderate
Mitigations	Incorporate the protected species as well as some of the other bigger indigenous tree/shrub specimens in the overall final

	landscaping of the townships. The bigger tree/shrubs often serve as habitat to a myriad of indigenous fauna – e.g. loose bark, cavities, etc. Indigenous species also require less maintenance and water than exotic species. Show overall environmental commitment by adapting a minimalistic damage approach. Avoid introducing potential invasive alien species – e.g. *Lantana*, *Opuntia*, *Tecoma*, *Prosopis*, *Cacti* etc. species – in the eventual landscaping (i.e. ornamental plants) as these have the potential of escaping and infesting the local surroundings. Eradicate and remove the invasive alien species, especially the individual *Prosopis* and *Cactus* species located throughout the area. No hunting, trapping, setting of snares or any other disturbance of any fauna species within the open areas. Avoid unnecessary and excessive vegetation clearance and disturbance of top soil for purpose of landscaping. With regards to landscaping the following should be done – • Landscaping should be done using local and indigenous vegetation. • Lawns as part of the landscaping should be limited to the minimum. • No alien species should be used as part of the landscaping. Residents should be informed and educated not to remove any plants or animals from the open areas.
Significance Post-mitigation	Low
Legal Implications	Forest Act No. 12 of 2001, as amended / Nature Conservation Ordinance No. 4 of 1975, as amended / Soil Conservation Act No. 76 of 1969, as amended (see section 3.2)
Degree of Confidence	Medium

Given the environment's natural characteristic and expected scale of habitat disturbance, the impacts are expected to be ***moderate*** before mitigations and ***low*** following proper mitigation measures and continues monitoring.

7.4.2.4 Visual Aesthetics and Sense of Place

The operational phase will have an 'urban' sense of place with the existence of various buildings (i.e. dwellings; business buildings) and infrastructure (i.e. street lights, reservoir, etc.). The lasting

visual aesthetics is determined by the architectural design and scale of buildings, emphasized by the receiving environment's topography and vegetation cover.

Considering the existence of buildings and infrastructure, visual aesthetics and sense of place has already been established, which resembles an rural township environment. The surroundings of Extension 3, Soutput North and Soutput South still contains large open areas.

Table 7.3.4 – *Visual aesthetics and sense of place significance*

Impact Description	**Visual aesthetics and sense of place**
Nature	Negative
Extent	Local
Duration	Permanent
Intensity	Low
Probability	Probable
Significance Pre-mitigation	Low
Mitigations	Keeping as much natural vegetation within the entire Development to enable screening. Landscaping on ground level with indigenous trees and shrubs can soften the visual impact from the larger and immediate surroundings. This will increase the sense of place and make the development easier on the eye. Landscaping will further reduce noise impacts, glare and heat. Structures and buildings can be constructed or cladded with natural stone to blend with the colours of the immediate surroundings. Buildings should be painted with natural colours to promote blending with the natural environment and to lessen the visual impact. Care needs to be taken with reflective or bright surfaces so that glare is avoided. Large areas of bright colours are to be avoided although small areas of colourful accent may be used provided that the colours are chosen to compliment the environment. Generally, darker colours and neutral greys are proposed.

	Roofs are usually most visible and the finishes need to be chosen to reduce the visual impact from elevated positions. Neutral greys are generally most useful in making structures recessive. Light sources must be placed in such a way, or shielded, so as to provide light only to the area that needs to be lit. Light spillage and pollution must be minimised.
Significance Post-mitigation	Low
Degree of Confidence	Medium

Given the scale and nature of the Development adjacent to the other townships of Tses, the natural vegetation and the topography of the larger site, visual impact and change in sense of place is expected to be ***low***. Very little mitigation exists to decrease the impact apart from applying sensible and sensitive architecture (i.e. design, scale, etc.), which might not be possible, given the limiting economic resources.

7.4.2.5 Socio-economic Implication

The operational phase of any type of development is associated with a variety of impacts that has either a direct or indirect implication to the residents and surrounding residents.

7.4.2.5.1 *Noise & Disturbance*

Urban developments of this scale and nature are not associated with activities generating unhealthy noise levels, such as industrial activities or agricultural activities. The increase in vehicle movement to and from the Tses Village Townships will have a slight increase in traffic noise compared to the status, but is expected to be of low significance.

Table 7.3.5 – *Noise significance*

Impact Description	**Noises**
Nature	Negative
Extent	Site specific
Duration	Long
Intensity	Low

Probability	Probable
Significance Pre-mitigation	Low
Legal Implications	Public Health Act No. 36 of 1919, as amended (see section 3.2)
Mitigations	Consider the existence of traffic along the roads during the design and orientation of dwellings.
Significance Post-mitigation	Very low
Degree of Confidence	High

The predicted noise levels from the Development's operations and that of the nearby traffic onto the Development is considered ***very low***.

7.4.2.5.2 *Traffic & Safety*

Operational activities in this respect is associated with vehicle movement of residents' and visitors' to and from the Tses Village.

Table 7.3.6 – *Traffic & safety significance*

Impact Description	**Traffic & safety**
Nature	Negative
Extent	Local
Duration	Long
Intensity	Low
Probability	Probable
Significance Pre-mitigation	Low
Mitigations	Proper road designs (soft bends, circles, etc.) should be incorporated to limit speeding and maintained for the duration of the lifetime of the development.

Significance Post-mitigation	Very Low
Legal Implications	Public Health Act No. 36 of 1919, as amended / Road Traffic and Transport Act 52 of 1999 and its 2001 Regulations, as amended (See section 3.2)
Degree of Confidence	High

The potential pre-mitigation impact is regarded as ***low,*** which can be reduced to ***very low*** through applying proper mitigations.

7.4.2.6 Natural Resources (Demand vs Supply)

7.4.2.6.1 Water Demand

From the Scoping Assessment it is clear that water supply is limited under natural conditions (See Section 5.2.1.1, 5.2.5 and 5.4.3.2) The limitation has, however, been overcome with the development of the NamWater pipeline that connects 7 boreholes with the clear water reservoir to gather sufficient water to supply a small settlement as big as Tses Proper, Tses Extensions 1, 2 and as well as Soutput North and Soutput South.

The reliability and long-term sustainability of the boreholes will depend on the recharge that is allowed at rates equal to or greater than the rates of abstraction. Land degradation reduces aquifer potential in different ways. Loss of plants and erosion of topsoil accelerates runoff and increases soil compaction, thereby reducing infiltration and groundwater recharge.

Wastages through leaks and undetected wastages, should be addressed from the side of the Village Council.

To alleviate pressure on the scares water resources, it is recommended that sustainable practises and principles be applied during operational phase, i.e. -

- Recycling and reuse of treated wastewater for purpose of flushing of toilets and gardening, which can bring a saving of 35% of the daily potable water consumption;
- Harvesting of rainwater for purpose of household consumption;
- Restricting gardens to indigenous plants and limited in size; and
- Water wise technologies with the household.

7.4.2.6.2 Electricity Demand

From the side of the Tses Village Council and that of CENORED, sufficient electricity is available to supply in the demand of the new Townships.

7.5 DECOMMISSIONING AND CLOSURE

Developments require decommissioning and closure at a certain point within their lifetime. Township developments, however, are very seldom decommissioned and/or closed as a functioning entity, although some aspects require upgrading (i.e. decommissioning and replacement).

In such an event, the activities are 100% similar to that of the construction phase and is accordingly treated and managed in accordance with the Construction Environmental Management Plan (Appendix G).

7.6 CUMULATIVE IMPACTS

As indicated in Section 7.1. to 7.4, the introduction of any development can be expected to have both positive and negative impacts on the immediate and surrounding receiving environment (natural and social) during either the construction-, operational- and/or decommissioning phase, of which the significance is determined by the nature of the particular activity/ies and the sensitivity of the particular receiving environment.

Some of these impacts will result in having a cumulative impact along with other already existing activities. Cumulative impacts are defined as “those that result from the successive, incremental, and/or combined effects of an action or activity when added to other existing, planned, and/or reasonably anticipated future ones” (*International Finance Corporation, 2012*).

Although cumulative impacts cannot be entirely avoided, they ought to be significantly reduced by means of sustainable practises and thorough implementation of all recommended mitigation measures and implementation of this Scoping Assessment Report and the Construction Environmental Management Plan. Continues monitoring of the effectiveness of mitigations is essential in the long-term, sustainable existence and should be applied to all aspects of the Development.

Potential impacts associated with the Tses Extensions 1, 2 and 3 and Soutput North and Soutput South (Section 7 above) which is expected to have a contributing factor to existing impacts (i.e. cumulative impact), are -

- Demand for natural resources (e.g. water & electricity).
- Ground and Surface Water Pollution (e.g. wastewater; domestic waste).
- Habitat Destruction and Loss of Biodiversity
- Visual Aesthetics and Sense of Place / Land Use Change
- Load on infrastructure (e.g. water network; road infrastructure; waste dumpsite).
- Socio-economic Implication
    - Supply in demand for developable land
    - Income Generation & Skills Transfer (Employment)

- Economic Benefit to the Construction Industry
- Municipal Rates & Taxes
- Improve public hygiene
- Traffic & Safety
- Noise

Considering the medium- to low density nature and sustainable practises proposed for implementation at the Development, the pre-operational cumulative impact is considered to be ***low.*** It is however important that continues assessment be done as data become available over time, and that the necessary adjustments be made as and when required.

Assessing the full extent of cumulative impacts is not accurately possible at the scale of a single environmental assessment and should include the larger surrounding area, which should consider all other contributing activities and the sensitivity of the larger surrounding receiving environment.

7.7 NO-GO OPTION

The scenario with or without the Development can be summarised as follows:

- Socio-economic perspective:
    - With the Development, various socio-economic benefits can be expected as mentioned in Sections 4.7 and 7.1.1, which would directly and indirectly contribute to improved socio-economic conditions.
    - Without the proposed development, none of the socio-economic benefits would be applicable and the particular portion of land will remain to have very little or no economic benefit.
- Ecological perspective:
    - With the Development, an increase in ecological degradation can be expected during the construction phase, as natural habitat will make way for buildings and above ground infrastructure.
    - Without the Development, ecological degradation will be avoided, but might further deteriorate due to littering, groundwater pollution, wood harvesting, etc.
- Resource demand perspective:
    - With the Development, an increasing load will be placed on natural resources.
    - Without the Development, no additional load will be placed on the natural resource.

8 CONCLUSIONS & RECOMMENDATIONS

8.1 CONCLUSIONS

Given the nature of the Development and associated activities during both the construction and operational phases, evaluated against the sensitivity of the receiving environment, it is inevitable that the Development would have some impact on its receiving socio-economic and biophysical environment, some of greater potential significance and others of less.

During the construction phase, these would include impacts associated with vegetation clearance (e.g. loss of biodiversity, dust generation, surface runoff and erosion), construction noises, surface and groundwater pollution and increased traffic movement (e.g. safety and increased load on existing road network). Mitigation measures have been provided capable of controlling the extent, intensity and frequency of most of these impacts. A direct positive impact of the proposed development is the creation of employment during the construction phase.

Impacts expected during the operational phase are potential groundwater pollution (i.e. untreated sewage or wastewater leakages) and generation of domestic waste. Mitigation measures for these impacts are provided in Section 7.4.2. The operational phase will also cause increased demand on infrastructure and resources, which was found adequate at this stage.

The establishment and formalisation of Soutput North and Soutput South must proceed with thoughtful planning, due to the location on either side of a main drainage line towards the ephemeral Fish River and located relatively far from existing infrastructure. Establishment and Formalisation of existing land ownership here must be pursued, but it is not recommended that Soutput North and Soutput South (future Extensions 4 and 5) should be expanded if open erven are available in Extensions 1, 2 and 3. Development of future Extensions 4 and 5 will be costly and pose environmental threats to groundwater pollution if not properly developed and managed.

Mitigation measures have been provided that can control the extent, intensity and frequency of the impacts not to have any substantial negative results. The Development is also subject to certain approval, permits and licences, as reflected under Section 3.4, to which the Project must adhere too.

Based on the baseline information, as presented in this Report, this Scoping Assessment Study, after following the above evaluation, concludes that, there is currently no evidence suggesting that any of the potential impacts identified are of such significance that it cannot be mitigated and that the Tses Extensions 1, 2 and 3 formalisation and Soutput North and Soutput South establishment and formalisation, as presented in this Report, cannot be allowed to continue. It is however required that the recommendations as presented below be satisfied with approval from the Environmental Commissioner before the Establishment and Formalisation can commence.

8.2 RECOMMENDATIONS

It is therefore recommended that an Environmental Clearance Certificate be issued for the listed activities forming part of the Tses Extensions 1, 2 and 3 and Soutput North and Soutput South Development, subject to the following recommendations:

- All required permits, licenses and approvals (see section 3.4) for the Development be obtained before construction commences.
- Thoughtful planning must be executed for the establishment and formalisation of Soutput North and Soutput South taking into consideration its location next to a major drainage line and distance from existing infrastructure.
- All mitigations listed in Tables 7.2.1 to 7.2.10, and Tables 7.3.1 to 7.3.6, and the Construction Environmental Management Plan (Appendix G) be implemented prior and during construction.
- Pollutants of different sorts should be managed and treated in such a manner not to cause any pollution of the immediate and surrounding receiving environments. The necessary mitigations to achieve a zero pollution factor have been proposed within this Scoping Report and the Construction Environmental Management Plan.
- An Independent Environmental Officer or Environmental Site Manager should be appointed during the construction phase of the Development to make sure all the requirements within the Scoping Report and Construction Environmental Management Plan (Appendix G) are adhered to.
- In the event that road construction material is sourced from nearby quarries it is required that the necessary approval (i.e. environmental clearance certificate) either exists or be obtained by the appointed Contractor.
- It is recommended that alternative and renewable sources of energy be explored and introduced into the Development to reduce dependency on natural resources. Recycling and reuse of treated wastewater or rainwater should be implemented.
- Continued public participation should form part of the construction phase.
- Before construction commences it is recommended to conduct an ecological survey to ensure that all protected species be marked as no-go areas.
- Continued on-site monitoring and evaluation be conducted during the construction and operational phases to be authorised by the DEA and Tses Village Council.
- That an Environmental Audit Report be compiled once the construction phase is completed and submitted with both the Directorate of Environmental Affairs (MET).

8.3 ENVIRONMENTAL STATEMENT

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

Urban Green cc, the independent Environmental Assessment Practitioner, recommends to the relevant authorities that the application for Tses Extensions 1, 2 and 3 and Soutput North and Soutput South Development be supported on condition that the above recommendations (section 8.2) be met and adhered too, and that continues monitoring be conducted as per the Environmental Management Act (Act No. 7 of 2007), it's EIA Regulations and this Scooping Report. It is important that proof of monitoring be submitted with the office of the Environmental Commissioner for review of Environmental Clearance renewal after 3 years.

9 REFERENCES

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APPENDIX A

APPLICATION FOR

ENVIRONMENTAL CLEARANCE CERTIFICATE

APPENDIX B

CV OF EAP

APPENDIX C

AERIAL MAPS OF TSES PROPER,

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