



Socio-Economic Compliance Statement for the Proposed New Science Exploratorium, Carnarvon, Northern Cape Province

For

EnviroAfrica NC CC

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ETC has no beneficial interest in the outcome of the assessment which is capable of affecting its independence.

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LIST OF ABBREVIATIONS

Abbreviations	Description
SECS	Socio-Economic Compliance Statement
EA	Environmental Authorisation
EnviroAfrica	EnviroAfrica NC CC
ETC	Eco-Thunder Consulting (Pty) Ltd
GDP	Gross Domestic Product
GNR	Government Notice
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
km	Kilometre
LM	Local Municipality
NDP	National Development Plan
NEMA	National Environmental Management Act (No. 107 of 1998)
O&M	Operation and Maintenance
PGDS	Provincial Growth and Development Strategy
PICC	Presidential Infrastructure Coordinating Committee
PSDF	Provincial Spatial Development Framework
SDF	Spatial Development Framework
SKA	Square Kilometre Array

1 Background

1.1 Scope and Objective of the Specialist Study

Eco-Thunder Consulting (Pty) Ltd (ETC) was commissioned by EnviroAfrica NC CC (EnviroAfrica) as the lead consultant to manage the Socio-Economic Compliance Statement (SECS) for the establishment of the proposed New Science Exploratorium in Carnarvon, Northern Cape. The SECS focuses on ensuring that the socio-economic aspects of the proposed development align with local and national development goals, and that the project complies with relevant socio-economic regulations.

The project is an initiative to enhance scientific exploration and education in the region, aligning with the local developmental goals and leveraging the presence of the Square Kilometre Array (SKA) project. The Socio-Economic Compliance study considers the following:

- **Development of the New Science Exploratorium:** This includes multiple public and non-public zones such as a planetarium, community resource centres, administrative offices, and other related facilities designed to foster scientific education and exploration.
- **Socio-Economic Contributions:** The Exploratorium is expected to contribute to the local economy through job creation, tourism, and educational opportunities.
- **Community Engagement:** Active engagement with local communities and stakeholders to ensure that the development meets the needs and expectations of the local population.
- **Regulatory Compliance:** Ensuring that the project adheres to all relevant socio-economic regulations and policies, including local, provincial, and national legislation.

The SECS aims to ensure that the development of the New Science Exploratorium will be conducted in a manner that is socio-economically beneficial, sustainable, and compliant with all relevant regulations while minimising disruption to the existing social and economic fabric of the area. The specific objectives of the SECS include:

- **Understanding the Socio-Economic Context:** To gain a comprehensive understanding of the socio-economic environment within the project area, including demographic characteristics, economic activities, socio-economic infrastructure, and key socio-economic issues.
- **Ensuring Regulatory Compliance:** To ensure that the SECS is conducted in accordance with relevant legislation, guidelines, and best practices, including the principles of socio-economic sustainability.
- **Highlighting Socio-Economic Contributions:** To identify the positive contributions of the New Science Exploratorium to the local economy, education sector, and community well-being.

-
- **Community Engagement and Participation:** To outline the engagement process with local communities and stakeholders, ensuring their needs and expectations are considered.

The SECS aims to provide a clear and concise compliance statement that will review the development of the New Science Exploratorium, promoting socio-economic equity and enhancing socio-economic well-being.

1.2 Specialist Details

ETC is a privately owned company fully owned by women. We specialise in a wide range of specialised studies, including visual impact assessments, air quality impact assessments, noise impact assessments, socio-economic impact assessments, socio-economic research, economic development planning, development program design and implementation, as well as community trust management. Our expertise extends to conducting SEIAs across Africa and optimising projects in the environmental sector. Our work encompasses landscape characterisation studies, end-use studies for quarries, and computer modelling and visualisation.

2 Project Information

2.1 Project Description

ETC has been engaged by EnviroAfrica as the principal consultant to oversee the SECS for the establishment of the proposed New Science Exploratorium in Carnarvon, Northern Cape. This innovative development is set to enhance scientific exploration and education in the region, leveraging the strategic presence of the SKA project.

The New Science Exploratorium is designed to include various state-of-the-art facilities aimed at fostering scientific knowledge and community engagement. The project encompasses:

- **Public Zones:** These include a planetarium, multi-purpose auditoriums, community resource centres, retail gift shops, and interactive play areas. These spaces are intended to be accessible to the public and encourage community participation in scientific endeavours.
- **Non-Public Zones:** These comprise administrative offices, staff boardrooms, mechanical and electrical control rooms, and storage areas. These zones are essential for the operational efficiency and maintenance of the New Science Exploratorium.

The primary goal of this project is to create an educationally enriching environment that aligns with local developmental objectives while adhering to socio-economic and environmental regulations. The scope of the project includes:

- **Development and Construction:** Erecting various buildings and structures as part of the Exploratorium, designed to integrate seamlessly with the existing landscape and minimise disruption.
- **Advanced Infrastructure:** Installing necessary support infrastructure such as automated systems for lighting and climate control, as well as ensuring accessibility and safety measures are in place throughout the facility.
- **Sustainability Measures:** Implementing eco-friendly practices, including the use of renewable energy sources, sustainable building materials, and water conservation techniques to ensure the project's long-term environmental sustainability.

By integrating these elements, the New Science Exploratorium aims to provide a stable and enriching resource for scientific education and community engagement in the Carnarvon region.

2.2 Project Site and Study Area

The proposed site for the New Science Exploratorium is located on Erf 431 in Carnarvon, Northern Cape. The site is strategically positioned within the jurisdiction of the Pixley ka Seme District Municipality (PKSDM) and falls under the Kareeberg Local Municipality (KLM). This region is notable for its association with the SKA project, a key factor in the selection of Carnarvon as the site for the New Science Exploratorium.

The strategic location of the New Science Exploratorium is key for its educational and infrastructural importance, as well as for its potential impact on local communities, including residents, visitors, and stakeholders involved in the SKA project. The study area for the SECS encompasses the following key elements:

- **Socio-Economic Receptors:** These include local residents, visitors to the SKA project, commuters on nearby roads such as Mark Street, End Street, and South Street, as well as users of public facilities in Carnarvon.
- **Landscape and Visual Context:** The surrounding landscape is characterised by its open vistas and minimal obstructions, making any new development prominently visible. The design of the New Science Exploratorium aims to integrate seamlessly with this landscape, utilising materials and colours that harmonise with the natural environment.
- **Cultural and Historical Context:** The area has a rich cultural and historical background, which is considered in the design and placement of the New Science Exploratorium to ensure it complements the existing heritage of Carnarvon.

By considering these factors, the project aims to develop the New Science Exploratorium in a manner that enhances scientific education and exploration while respecting and preserving the socio-economic and cultural integrity of the Carnarvon region.

Table 1, and Figure 1 to Figure 3 provide the details of the project, including the main infrastructure components and services that will be required during the project lifecycle. These include the layout of the New Science Exploratorium, the proposed landscaping plans, and the integration of sustainable practices to provide a stable and enriching resource for scientific education and community engagement.

Table 1: Project Specifications

Component	Description/Dimensions
District Municipality	Pixley ka Seme District Municipality (PkSDM)
Local Municipality	Kareeberg Local Municipality (KLM)
Ward Number(s)	3
Affected Farm/Erff Name(s) & SG Digit Code(s)	Erf 431 (C01700010000043100000), Carnarvon, Northern Cape, South Africa.
Site Coordinates (middle point)	Latitude: 30°58'1.34"S Longitude: 22°7'25.75"E
Property Size(s) (m²)	45 154m ²
Development Footprint Size(s) (m²)	904m ²
Current Zoning	Vacant Land
Nearest Town(s)	Carnarvon
Utilities and Infrastructure	The project will require the development of utilities infrastructure, including water supply, sewage systems, and electricity. Sustainable solutions such as solar panels and rainwater harvesting systems will be incorporated.
Accessibility	The site is accessible via End Street, which connects to major roads in Carnarvon, facilitating easy access for construction and future visitors.

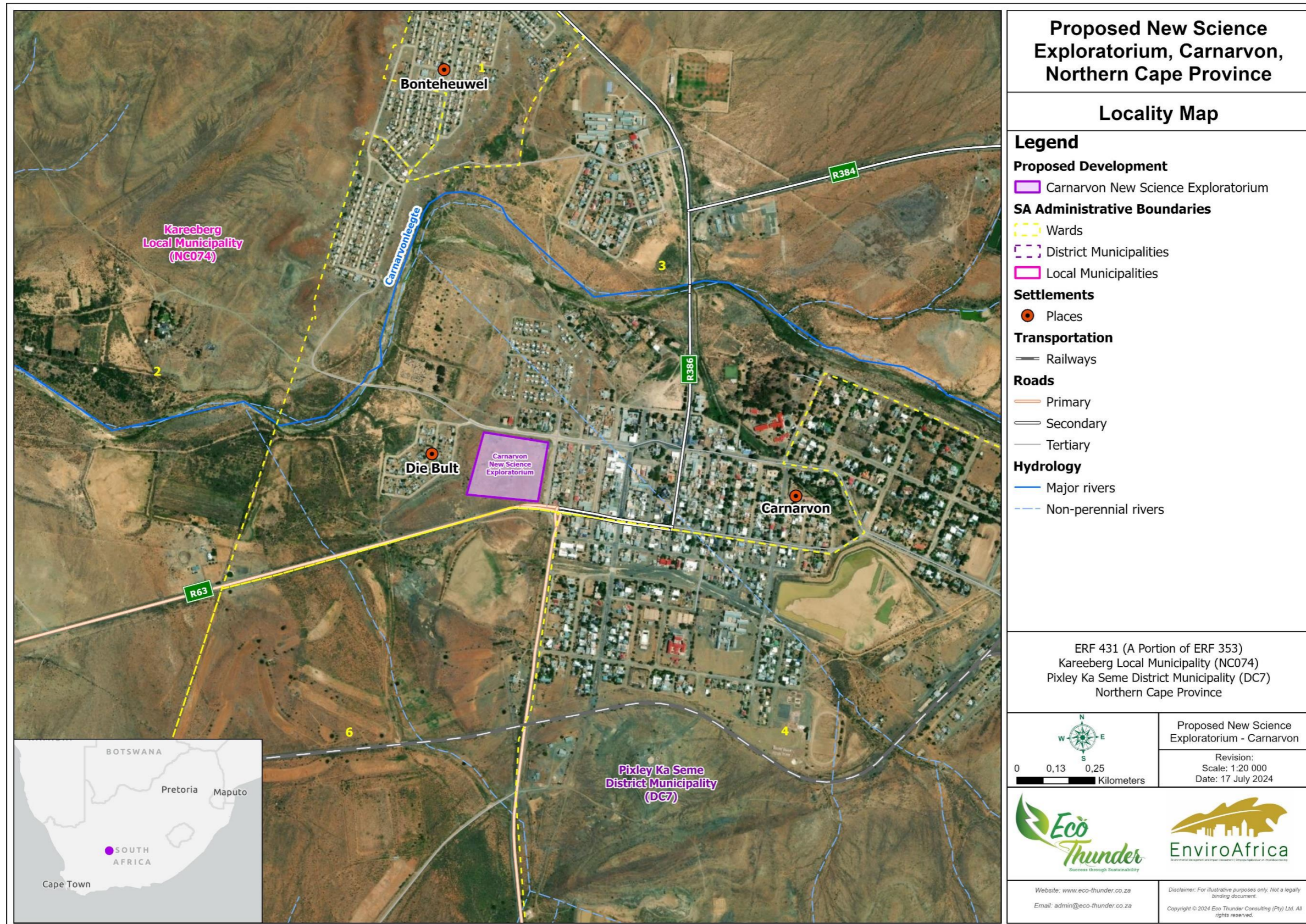


Figure 1: Locality Map



Figure 2: Master Plan of the Proposed New Science Exploratorium

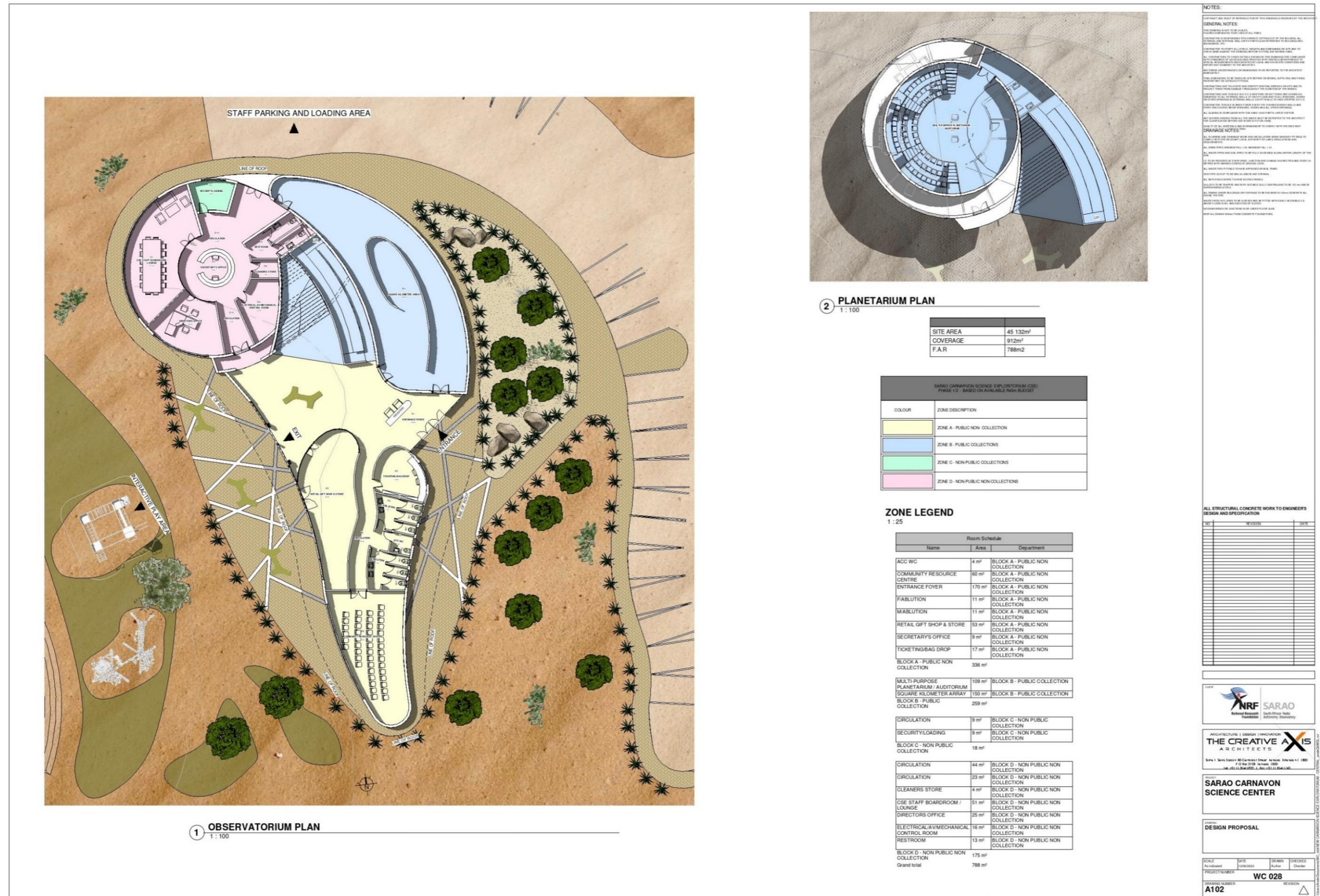


Figure 3: Design Proposal of the Proposed New Science Exploratorium

3 Legislation and Policy Review

This section introduces the relevant policies on various levels of government and their content. The legislative and policy context applicable to a project plays an important role in identifying and assessing the potential socio-economic impacts associated with the development. In this regard a key component of the SECS process is to assess a proposed development in terms of its suitability with regards to key planning and policy documents.

The following key pieces of documentation were reviewed as part of this legislation and policy review process:

3.1 International Good Practice:

The following documentation provides good practice guidelines:

- International Labour Organisation (ILO) Core Conventions (1949-1998);
- United Nations Guiding Principles on Business and Human Rights (2011);
- International Association for Impact Assessment (IAIA) Standards (2002);
- World Bank Group Environmental, Health and Safety Guidelines (2007); and
- United Nations Sustainable Development Goals (2015).

3.2 National Legislation and Guidelines

The following documentation provides national policy guidelines:

- Constitution of the Republic of South Africa (1996)
- National Environmental Management Act (No. 107 of 1998) (NEMA)
- National Development Plan (NDP) 2030 (2012)

3.2.1 Constitution of the Republic of South Africa (1996)

Section 24 of the Constitution pertains specifically to the environment. It states that everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and socio-economic development.

The Constitution outlines the need to promote socio-economic and economic development. Section 24 of the Constitution therefore requires that development be conducted in such a manner

that it does not infringe on an individual's environmental rights, health, or well-being. This is especially significant for previously disadvantaged individuals who are most at risk to environmental impacts.

3.2.2 National Environmental Management Act (No. 107 of 1998) (NEMA)

This piece of legislation is South Africa's key piece of environmental legislation and sets the framework for environmental management in South Africa. NEMA is founded on the principle that everyone has the right to an environment that is not harmful to their health or well-being as contained within the Bill of Rights.

The national environmental management principles state that the social, economic, and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.

The need for responsible and informed decision-making by government on the acceptability of environmental impacts is therefore enshrined within NEMA.

3.2.3 National Development Plan (NDP) 2030 (2012)

The National Development Plan 2030, adopted by the South African government, aims to eliminate poverty and reduce inequality by enhancing educational and scientific infrastructure. This aligns with the objectives of the New Science Exploratorium, which aims to promote scientific education and exploration in the Carnarvon region.

The New Science Exploratorium will provide state-of-the-art facilities such as a planetarium, community resource centres, and interactive educational spaces, supporting the NDP's vision of an educated and innovative society. Additionally, it incorporates sustainable practices, including renewable energy sources, sustainable building materials, and water conservation techniques, contributing to environmental sustainability and resource efficiency.

By aligning with the NDP 2030, the New Science Exploratorium advances scientific and educational opportunities while supporting national objectives of socio-economic growth and sustainable development.

3.3 Provincial Legislation and Guidelines

Relevant policy and planning documents on the provincial level include:

- Northern Cape Provincial Spatial Development Framework (NCPSTDF) (2012)
- Northern Cape Growth and Development Strategy (NCGDS) (2020-2025)
- Northern Cape Socio-Economic Review and Outlook (2021)

3.3.1 Northern Cape Provincial Spatial Development Framework (NCPSTDF) (2012)

The Northern Cape Provincial Spatial Development Framework serves as a comprehensive spatial vision and strategy for the sustainable development and management of the province. Approved in 2012 and periodically updated, the NCPSTDF aims to promote environmental, economic, and social sustainability through integrated land-use planning. Key objectives include:

- Promoting a developmental state;
- Prioritising governmental programs and projects;
- Ensuring responsible land-use management; and
- Aligning future development with the provincial vision.

Compliance with the NCPSTDF is mandatory for all development projects in the province, including the New Science Exploratorium, to ensure alignment with the provincial goals of sustainable development and resource management.

3.3.2 Northern Cape Growth and Development Strategy (NCGDS) (2020-2025)

The Northern Cape Growth and Development Strategy outlines the provincial government's strategic framework for economic growth and development from 2020 to 2025. The NCGDS emphasises the importance of sustainable development, economic diversification, and human resource development. Key areas of focus include:

- Enhancing economic infrastructure;
- Promoting industrialisation and innovation;
- Improving social services and human capital development; and
- Encouraging sustainable environmental practices.

The New Science Exploratorium aligns with the NCGDS by contributing to economic diversification through tourism and education, fostering job creation, and promoting sustainable building practices.

3.3.3 Northern Cape Socio-Economic Review and Outlook (2021)

The Northern Cape Socio-Economic Review and Outlook (SERO) provides a detailed analysis of the province's socio-economic status and future prospects. It includes data on demographics, economic performance, labour market characteristics, and human development indicators. The review highlights the province's challenges and opportunities, guiding policy and decision-making processes. Key insights include:

- Economic contributions by various sectors;
- Employment trends and labour market dynamics; and
- Human development and access to services.

The insights from this review are critical for the New Science Exploratorium project to understand the socio-economic context of the area, ensure regulatory compliance, and maximise positive impacts on local communities.

By adhering to these provincial guidelines and strategies, the New Science Exploratorium must aim to contribute positively to the sustainable development and socio-economic growth of the Northern Cape, ensuring compliance with relevant regulations and promoting an enriching resource for scientific education and community engagement.

3.4 District and Local Legislation and Guidelines

The following documentation provides local policy guidelines:

- Pixley ka Seme District Municipality Integrated Development Plan (IDP) (2022-2027) (2024/25 2nd Review)
- Kareeberg Local Municipality Integrated Development Plan (IDP) (2022-2027)

3.4.1 Pixley ka Seme District Municipality Integrated Development Plan (IDP) (2022-2027) (2024/25 2nd Review)

The Pixley ka Seme District Municipality (PKSDM) IDP outlines the strategic vision and development framework for the district, focusing on sustainable development and integrated planning. The IDP emphasises the importance of alignment with national, provincial, and local development goals and aims to address the triple challenges of poverty, inequality, and unemployment.

The New Science Exploratorium aligns with the PKSDM IDP's strategic objectives by promoting education, community engagement, and sustainable development. The project supports the district's goals of improving socio-economic conditions and enhancing infrastructure, thereby contributing to long-term regional growth and development.

Key elements from the PKSDM IDP include:

- Support for local municipalities to provide dedicated services and create inclusive communities.
- Promotion of economic growth that is shared across and within communities.
- Alignment of development initiatives with the National Development Plan (NDP).

By integrating these elements, the New Science Exploratorium will contribute to the overarching goals of the PKSDM, ensuring that the project supports both immediate and long-term development priorities.

3.4.2 Kareeberg Local Municipality Integrated Development Plan (IDP) (2022-2027)

The Kareeberg Local Municipality (KLM) IDP serves as the principal strategic planning document for the municipality, guiding planning, budgeting, management, and decision-making processes. The IDP aims to promote sustainable development, economic growth, and improved service delivery within the municipality.

The New Science Exploratorium aligns with the strategic objectives and priorities of the KLM IDP by focusing on educational development, community engagement, and sustainable infrastructure. The project supports the municipality's vision of integrated and sustainable development, contributing to socio-economic equity and community well-being.

Key objectives from the KLM IDP include:

- Promoting sustainable economic development and job creation.
- Enhancing educational facilities and opportunities for local communities.
- Ensuring environmentally sustainable development practices.
- Fostering community engagement and participation in development projects.

By adhering to these objectives, the New Science Exploratorium will support the broader goals of the KLM, ensuring that the project is aligned with local development priorities and contributes to the socio-economic upliftment of the region. These documents were reviewed to ensure that the proposed New Science Exploratorium is developed in accordance with relevant local policies and guidelines, promoting sustainable development and socio-economic benefits for the community of Carnarvon and the broader Northern Cape region.

4 Approach and Methodology

4.1 Purpose of the Study

The purpose of the Socio-Economic Compliance Statement (SECS) is to ensure that the proposed New Science Exploratorium in Carnarvon, Northern Cape, aligns with local and national socio-economic goals and complies with relevant legislation and guidelines. The SECS evaluates the potential socio-economic impacts and ensures the project's compliance with socio-economic sustainability principles.

The International Principles for Socio-Economic Impact Assessment define socio-economic impacts as changes to one or more of the following:

- People's way of life: How they live, work, play, and interact daily.
- Culture: Shared beliefs, customs, values, and language.
- Community: Its cohesion, stability, character, services, and facilities.
- Political systems: Extent of public participation in decision-making.
- Environment: Quality of air and water, food availability, level of hazard, dust, and noise, and access to resources.
- Health and well-being: State of complete physical, mental, socio-economic, and spiritual well-being.
- Personal and property rights: Economic impacts and personal disadvantages.
- Fears and aspirations: Perceptions of safety, community future, and aspirations for themselves and their children.

The purpose of this SECS process is therefore to:

- Provide baseline information describing the socio-economic environment within which the project is proposed.
- Identify, describe, and assess possible socio-economic risks and benefits associated with the project.
- Recommend ways to enhance positive impacts and minimise negative impacts.

4.2 Approach to Study

The approach to the SECS study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Socio-Economic Impact Assessment (February 2007). These guidelines are based on international best practice. The key activities in the SECS process embodied in the guidelines include:

- Describing and obtaining an understanding of the proposed intervention (type, scale, and location), the settlements, and communities likely to be affected by the proposed project.
- Collecting baseline data on the current socio-economic and economic environment.
- Identifying key potential socio-economic issues associated with the proposed development through a thorough review of existing literature, previous impact assessments, and policy documents relevant to higher education expansion and regional development.
- Assessing the potential significance of socio-economic impacts in a qualitative manner, based on the collation and interpretation of secondary data sourced during the desktop review.
- Identifying potential alternatives and mitigation measures.
- Preparation of a SECS for inclusion in the project's planning and decision-making processes.

4.2.1 Collection and Review of Existing Information

Existing desktop information that has relevance to the proposed project, project area and/or surroundings was collected and reviewed. The following information was examined as part of this process:

- Project maps and layouts.
- Google Earth imagery.
- Census Data (2016), and the Local Government Handbook (2019).
- Planning documentation such as Provincial Growth and Development Strategies (PGDSs), Local and District Municipality Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs), and development goals and objectives.
- Relevant legislation, guidelines, policies, plans, and frameworks.
- Available literature pertaining to socio-economic issues associated with the development, operations, and associated infrastructure.

This information provides a comprehensive socio-economic baseline from which to assess the potential impacts of the New Science Exploratorium. The depth and breadth of secondary information ensure a well-informed review process.

4.2.2 Definition of Socio-Economic Impacts

Socio-economic impacts are defined as the consequences to human populations of any actions (including policies, programs, plans, and projects) that alter the ways people live, work, play, relate to one another, and generally cope as members of society (Vanclay: 2002, Burdge: 1995). These effects are felt at various levels, including the individual, family, community, organisation, or society.

A SECS enables authorities, project proponents, individuals, communities, and organisations to understand and anticipate the potential socio-economic consequences of implementing a proposed project (IAIA: 2003). The SECS process informs communities and individuals about the project and its potential impacts, allowing them to assess implications and identify potential alternatives. It also alerts proponents and planners to the likelihood and nature of socio-economic impacts, enabling them to incorporate these findings into the planning and decision-making process.

The SECS takes into account the varied perspectives and experiences of people from different cultural, ethnic, religious, gender, and educational backgrounds, acknowledging that these factors shape how individuals perceive and react to changes (Vanclay: 2002, IAIA: 2003). This understanding helps ensure that the project is developed in a way that respects and benefits the diverse socio-economic landscape of Carnarvon and the broader Northern Cape region.

5 Socio-Economic Profile

5.1 Study Area Overview

This section outlines the relevant administrative context, the provincial socio-economic, and municipal contexts. It concludes with a description of the local context of the immediate surroundings of the proposed establishment of the New Science Exploratorium. The proposed development is situated within Carnarvon in the Kareeberg Local Municipality, within the Pixley ka Seme District Municipality in the Northern Cape Province, South Africa.

5.2 Northern Cape Province

The Northern Cape Province, located in the north-western part of South Africa, is characterised by its vast and sparsely populated landscape, which includes deserts, semi-deserts, and arid regions. Despite being the largest province in terms of area, it has the smallest population and the lowest population density in the country. The province covers an area of approximately 372,889 km² and has a population of approximately 1.29 million, constituting about 2% of the national population. The capital city is Kimberley, and other significant towns include Upington, De Aar, and Kuruman.

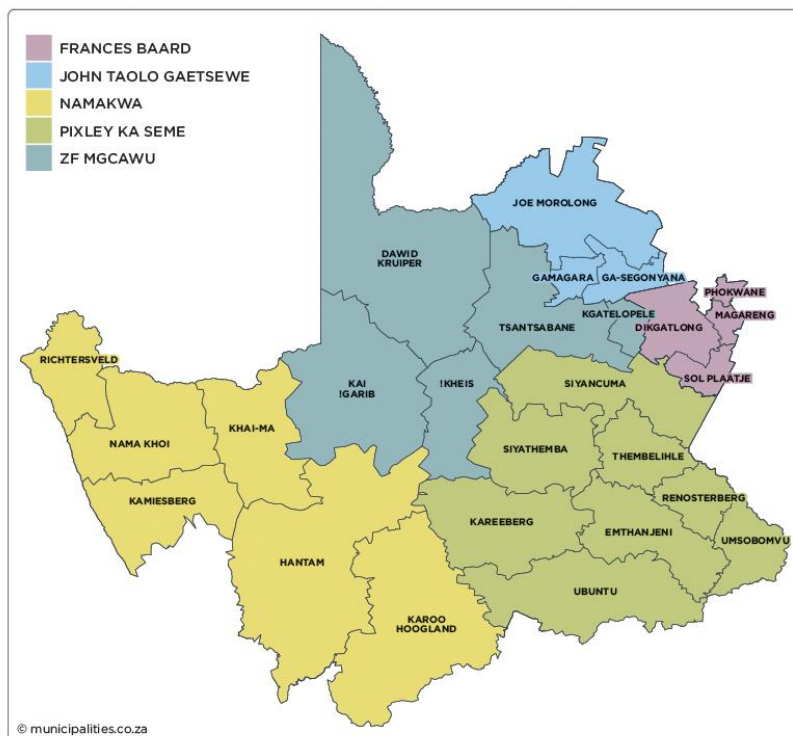


Figure 4: Northern Cape Province

The population of the Northern Cape is predominantly rural, with significant urban settlements only in a few areas. According to the latest estimates, the population has been growing at a modest rate. The total population of the Northern Cape in 2020 was estimated at 1,292,786, reflecting an ongoing trend of modest growth. The gender distribution in the Northern Cape Province shows a slightly higher number of females compared to males. The population pyramid for the Northern Cape reveals a broad base, indicating a high birth rate and a young population.

The economy of the Northern Cape is primarily driven by mining, agriculture, and community services. Mining, particularly of diamonds, iron ore, and manganese, is the largest economic sector, followed by agriculture, which includes livestock farming and crop production. The community services sector, which includes government services, is also a significant contributor to the provincial GDP. In recent years, the province has made efforts to diversify its economy by promoting tourism, renewable energy projects, and other industries. The GDP contribution from the Northern Cape has remained relatively stable over the past decade, with mining continuing to play a crucial role.

Table 2: GDP Contribution by Sector in the Northern Cape

Sector	Contribution (%)
Mining	37.6
Agriculture	14.9
Community Services	31.8

The labour market in the Northern Cape is characterised by a high unemployment rate, similar to other provinces in South Africa. The unemployment rate for the fourth quarter of 2020 was 28.7%, which is slightly lower than the national average but still concerning. Educational attainment in the Northern Cape has been improving, with a higher proportion of the population achieving secondary and tertiary education levels over the years. However, there are still challenges related to access to quality education, especially in rural areas.

5.3 Pixley ka Seme District Municipality (PKSDM)

Pixley ka Seme District Municipality (PKSDM), located in the south-eastern part of the Northern Cape Province, encompasses several local municipalities, including Kareeberg, where Carnarvon is situated. The district is characterised by its diverse economic activities, including agriculture, mining, and services.



Figure 5: Pixley ka Seme District Municipality (PKSDM)

The population of PKSDM was approximately 220,842 in 2022. The district has been experiencing steady population growth, similar to the provincial trend. The economy of PKSDM is diversified, with agriculture being a significant sector, followed by community services and trade. The district's economy is supported by various industries, including crop and livestock farming, and service-related activities.

Table 3: Key Economic Sectors in PKSDM (2023)

Sector	Contribution (%)
Community Services	36.3
Agriculture	14.9
Finance	13.5

Employment in Pixley ka Seme is primarily driven by the community services sector, followed by agriculture and trade. The unemployment rate in the district has been gradually decreasing, reflecting efforts to improve economic conditions.

5.4 Kareeberg Local Municipality (KLM)

Kareeberg Local Municipality (KLM), within PKSDM, includes the town of Carnarvon, where the New Science Exploratorium is proposed. The local municipality is characterised by its small population and reliance on agriculture and community services.

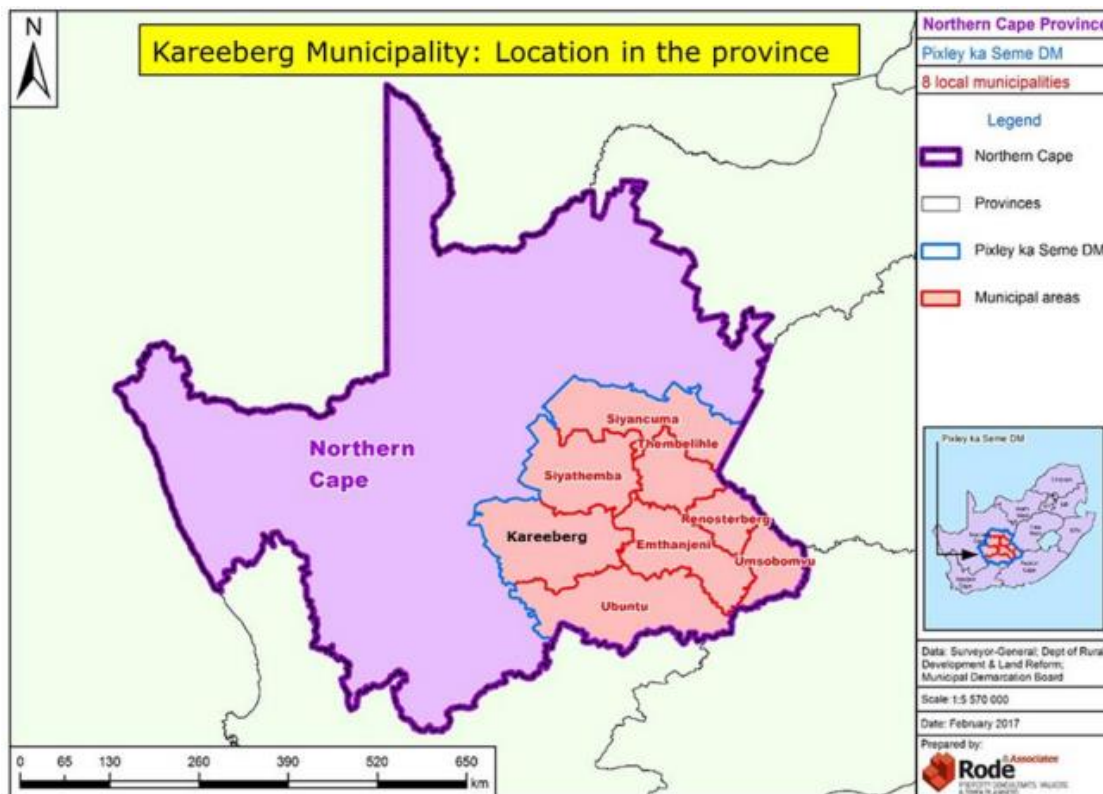


Figure 6: Kareeberg Local Municipality (KLM)

The population of KLM was approximately 15,000 in 2022, reflecting a small and relatively stable community. The economy of KLM is primarily based on agriculture, particularly livestock farming, and community services. The proposed New Science Exploratorium is expected to stimulate local economic activities and provide new employment opportunities.

Employment in KLM is dominated by agriculture and community services. The introduction of the New Science Exploratorium is anticipated to create jobs in education, tourism, and related sectors, helping to reduce the local unemployment rate.

Table 4: Employment in Kareeberg by Sector (2023)

Sector	Employment
Agriculture	1,500
Community Services	1,200
Trade	600

5.5 Socio-Economic Overview Summary

The socio-economic profile of the Northern Cape Province, Pixley ka Seme District Municipality (PKSDM), and Kareeberg Local Municipality (KLM) highlights both opportunities and challenges associated with the proposed New Science Exploratorium. The project aligns with the region's economic and demographic trends, offering potential benefits such as job creation, economic stimulation, and improved educational opportunities.

The Northern Cape Province is characterised by its vast, sparsely populated landscape and a predominantly rural population. The province's economy is heavily reliant on mining and agriculture, with efforts to diversify into sectors such as tourism and renewable energy. The New Science Exploratorium aligns with these diversification efforts by introducing a new educational and tourism hub that can attract visitors and scholars, thereby stimulating economic activity. Additionally, the project supports the province's goals of improving educational attainment and providing new job opportunities, which can help address the high unemployment rates.

The PKSDM encompasses several local municipalities, including Kareeberg, and has a diverse economy supported by agriculture, community services, and trade. The district has been experiencing steady population growth and is focused on improving economic conditions and employment opportunities. The New Science Exploratorium will contribute to these goals by creating jobs in education, tourism, and related sectors. It will also enhance the district's economic diversity and resilience, supporting PKSDM's strategic objectives of economic growth and development.

KLM, where the New Science Exploratorium will be located, is characterised by a small, stable population and an economy based on agriculture and community services. The introduction of the Exploratorium is particularly suitable for KLM as it will stimulate local economic activities, create new employment opportunities, and provide educational benefits to the community. By focusing on education and community engagement, the project will foster a culture of learning and development, aligning with KLM's goals of socio-economic upliftment and sustainable development.

The New Science Exploratorium is expected to provide a range of socio-economic benefits across the province, district, and local municipality levels. These benefits may include:

- **Job Creation:** Providing employment opportunities during both the construction and operational phases, reducing local unemployment rates.
- **Economic Stimulation:** Attracting visitors and scholars, which will boost local businesses and services, and generate additional revenue for the region.
- **Educational Opportunities:** Offering educational programs and resources that will enhance local skills and knowledge, contributing to long-term socio-economic development.

- **Community Engagement:** Encouraging community participation and involvement in the project, fostering a sense of ownership and pride among local residents.

Addressing high unemployment rates and ensuring sustainable development will be crucial for the project's success. The focus on education and community engagement will help enhance the socio-economic landscape of Carnarvon and the broader Northern Cape region, making the New Science Exploratorium a valuable addition to the region's development strategy.

6 Potential Impacts

This section aims to identify potential impacts. The potential impacts identified in this section are a result of both the environment in which the New Science Exploratorium activity takes place, as well as the activity itself. The identification of potential impacts is performed by determining the potential source, possible pathways and receptors. Key sensitive receptors in the vicinity of the proposed development include the Carnarvon Golf Course, New Apostolic Church Carnarvon, Carnarvon Cemetery South, and residential areas along Mark Street, End Street, and South Street. In essence, the potential for any change to a resource or receptor (i.e., environmental aspect) brought about by the presence of a Project component or by a Project-related activity has been identified as a potential impact.

6.1 Construction Phase

The majority of socio-economic impacts associated with the project are anticipated to occur during the construction phase of the development and are typical of the type of socio-economic impacts generally associated with construction activities. These impacts will be temporary and short-term but could have long-term effects on the surrounding socio-economic environment if not planned or managed appropriately. It is therefore necessary that the detailed design phase be conducted in such a manner so as not to result in permanent socio-economic impacts.

The positive and negative socio-economic impacts identified and assessed for the construction phase of the New Science Exploratorium include:

- Employment Opportunities through Direct and Indirect Job Creation:
- Economic Multiplier Effects.
- Potential Alteration in Local Demographics due to the Workforce Influx.
- Increased Demand on Local Infrastructure and Services.
- Disruption to Daily Life due to Construction Activities.
- Safety and Security.

To address these potential impacts, the following measures should be considered:

- Focus on employing local residents, such as those from Carnarvon, to maximise employment benefits and minimise workforce influx.
- Develop and implement a local procurement policy to maximise the economic benefit to the local economy.
- Maintain regular communication with the community about job opportunities, project progress, construction schedules, and potential impacts.

- Establish liaison and communication structures with district and local government structures to ensure effective coordination.
- Implement community liaison programs to address social concerns and facilitate positive interactions.
- Develop and implement a construction phase traffic and utilities management plan to ensure efficient use of local infrastructure.
- Coordinate with local authorities and utility providers for infrastructure usage planning and management.
- Establish noise and dust control measures to minimise environmental disturbances.
- Provide clear signage and alternative routes to manage traffic effectively and ensure safe pedestrian access.
- Implement strict site access controls and monitoring to ensure only authorised personnel are present.
- Provide comprehensive safety training to all construction workers and staff on-site.
- Conduct regular safety and security audits to identify potential risks and implement corrective actions swiftly.

6.2 Operational Phase

The operational phase of the New Science Exploratorium in Carnarvon marks the long-term functioning of the facility, bringing sustained socio-economic impacts to the region. This phase will see the realisation of the project's educational and community engagement goals, alongside ongoing economic contributions. The operational phase of the New Science Exploratorium in Carnarvon anticipates enduring impacts, which include:

- Direct and Indirect Employment Opportunities.
- Economic Multiplier Effect.
- Community Engagement and Educational Benefits
- Improved Infrastructure and Services.

To address these potential impacts and enhance positive outcomes, the following measures should be implemented:

- Focus on employing local residents to maximise employment benefits and foster community involvement.

- Develop and implement a local procurement policy to maximise economic benefits to the local economy.
- Conduct community awareness programs about the New Science Exploratorium's activities and benefits.
- Implement community liaison programs to address social concerns and facilitate positive interactions.
- Develop and implement educational outreach programs to engage local schools and community groups,
- Implement comprehensive safety and security measures to protect staff, visitors, and assets.
- Establish an emergency response plan to quickly address any incidents or accidents at the Exploratorium.

6.3 Issues Associated with the No-Go Option

The consideration of a 'No-Go' option, where the proposed establishment of the New Science Exploratorium in Carnarvon, Northern Cape, is not pursued, presents several implications for the area. This section explores the potential issues and forgone opportunities associated with not proceeding with the project.

- **Sustainable Development Opportunity:** The primary consequence of the 'No-Go' option is the loss of advancements in scientific education and community engagement for the region. The establishment of the New Science Exploratorium is projected to enhance educational resources and opportunities, promoting scientific literacy and fostering a culture of exploration and learning.
- **Socio-economic Implications:** Not establishing the Exploratorium would mean forfeiting the socio-economic stimulation anticipated from its construction and operation. This includes not only direct job creation during the construction phase but also ongoing employment opportunities once the Exploratorium is operational. Additionally, the broader economic multiplier effects would be lost. Local businesses might miss out on the increased demand for goods and services, resulting in a slower rate of economic growth and development in the region.
- **Community and Social Benefits:** The Exploratorium is designed to be a community resource, providing educational programs, community engagement activities, and social events. Without this project, the local community will miss out on these opportunities for social cohesion and community building. The project also aims to integrate local cultural and historical elements, which would help preserve and promote the region's heritage. The 'No-Go' option means these cultural and social benefits will not be realised.

In conclusion, while the 'No-Go' option avoids the immediate impacts associated with the construction and operation of the Exploratorium, it also means forgoing potential benefits in terms of scientific education, economic growth, social upliftment, environmental sustainability, and long-term regional advancement. The project presents a unique opportunity to enhance the socio-economic landscape of Carnarvon and the broader Northern Cape region, making its implementation crucial for the area's development.

7 Compliance Statement and Conclusion

7.1 Key Findings

The establishment of the New Science Exploratorium in Carnarvon, Northern Cape, is anticipated to bring socio-economic benefits to the region. Key findings indicate advancements in scientific education, economic growth, infrastructure development, and community engagement. The project is also expected to foster job creation and skill development while necessitating mindful environmental management.

- **Scientific Education and Community Engagement:** The New Science Exploratorium is projected to enhance educational resources and opportunities, promoting scientific literacy and fostering a culture of exploration and learning. It will serve as a community hub for educational programs, community engagement activities, and social events, integrating local cultural and historical elements.
- **Economic Growth:** The construction and operation of the Exploratorium are anticipated to stimulate the local economy. This includes creating jobs during construction, offering ongoing employment opportunities, and generating economic activities that benefit local businesses.

7.2 Recommendations

Recommendations for the project include a strong emphasis on community engagement, prioritisation of local employment and skills training, strategic infrastructure planning, adherence to sustainable practices, and rigorous monitoring and evaluation.

- **Employment and Economic Stimulation:**
 - Prioritise the hiring of local labour, especially for unskilled and semi-skilled roles, to maximise employment creation and economic stimulation in the study area. This approach will also mitigate potential socio-economic challenges arising from the influx of non-local workers.
 - Develop a comprehensive list of potential local suppliers and service providers, ensuring they are given priority in procurement processes. This approach will further stimulate the local economy and offer valuable income opportunities for local businesses.
- **Mitigation of Construction Impacts:**
 - Implement robust measures to address potential disruptions during the construction phase, such as noise, dust, and traffic disturbances. Regular

monitoring and timely interventions will ensure minimal inconvenience to the local community.

- Develop and implement a comprehensive safety and security plan, especially during the construction and operational phases. This plan should address potential risks and provide clear protocols for emergency situations.
- **Community and Stakeholder Engagement:**
 - Maintain open channels of communication with stakeholders and the local community through a dedicated community liaison officer. Regular updates, feedback sessions, and grievance redressal mechanisms will ensure that stakeholders and the community remain informed and engaged throughout the project's lifecycle.
 - Conduct community awareness programs about the project and its potential impacts. Implement community liaison programs to address social concerns and facilitate positive interactions.
- **Socio-Economic Best Practice Initiatives:**
 - Align the project with best practices in socio-economic development, including ensuring equitable distribution of benefits, promoting gender equality, and supporting vulnerable groups within the community.
 - Plan for workforce transition through retraining programs and job placement services to help workers move to other projects or industries during the decommissioning phase.

To maximise the positive outcomes and mitigate potential negative impacts, it is imperative to incorporate these recommendations into the project's planning and execution phases. This approach will ensure that the proposed New Science Exploratorium aligns with local needs and aspirations, contributing to the region's sustainable growth.

7.3 Conclusion

The socio-economic landscape of Carnarvon and the broader Northern Cape region stands to benefit from the establishment of the New Science Exploratorium. The project is poised to become a catalyst for scientific education, economic growth, and community engagement. By fostering a culture of learning and development, the Exploratorium will contribute to long-term socio-economic development and sustainability.

If the mitigation measures are implemented and best practices followed, there is no objection from a socio-economic specialist's perspective as to why the development should not proceed. No elements have been identified to indicate a fatal flaw. The project presents a unique opportunity

to enhance the socio-economic landscape of Carnarvon and the broader Northern Cape region, making its implementation crucial for the area's development.

8 References

- Department of Environmental Affairs (DEA). (1998). National Environmental Management Act 107 of 1998 (No. 107 of 1998). Republic of South Africa.
- Department of Environmental Affairs (DEA). (2010). National Climate Change Response Green Paper. Republic of South Africa.
- Department of Justice (DoJ). (1996). The Constitution of the Republic of South Africa (Act 108 of 1996). ISBN 978-0-621-39063-6. Republic of South Africa.
- Interorganisational Committee on Principles and Guidelines for Socio-economic Impact Assessment. (2003). US Principles and Guidelines – Principals and guidelines for socio-economic impact assessment in the USA. *Impact Assessment and Project Appraisal*, 21(3): 231-250.
- National Development Agency (NDA). (2014). Beyond 10 years of unlocking potential. Available from: http://www.nda.org.za/?option=3&id=1&com_id=198&parent_id=186&com_task=1
- National Planning Commission. (2012). National Development Plan 2030. ISBN: 978-0-621-41180-5. Republic of South Africa.
- Statistics South Africa. (2022). Census 2022 Community Profiles Database. Pretoria.
- United Nations Environment Programme (UNEP). (2002). BA Training Resource Manual. 2nd Ed. UNEP.
- United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). (2001). Guidelines for Stakeholders: Participation in Strategic Environmental Management. New York, NY: United Nations.