

**PROPOSED OBSERVATORY AND ASSOCIATED
INFRASTRUCTURE ON PORTION 2 OF THE FARM MATJES
RIVIER NO. 80, SUTHERLAND**



DRAFT BASIC ASSESSMENT REPORT

October 2025

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agriculture, environmental affairs,
rural development and land reform

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(For official use only)

File Reference Number:

Application Number:

Date Received:

Basic Assessment Report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of 07 April 2017. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of “not applicable” in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?

YES

NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. ACTIVITY DESCRIPTION

a) Describe the project associated with the listed activities applied for

The proposed development is a remote observatory comprising a modular telescope-housing facility and associated infrastructure enclosed within three separate compounds. The compounds measure 50m × 100m (0.5ha) each and will together be surrounded by a security fence (total development footprint ≈ 1.5ha).

Each of the three compounds will include the following infrastructure:

- 3 x Telescope Housing - 18m × 12m roll-off-roof on shallow concrete pad (≤ 4 m high).
- 4 x Solar Rows - 40 m × 3 m ballasted arrays (total ~ 56 kWp) with 10 kWh Li-ion storage
- 1 x generator of approximately 20kVA

The proposed site is located on Portion 2 of the Farm Matjes Rivier No. 80, Sutherland, off the R354 Regional Road and this is approximately 3.5km north-west of Sutherland.

The coordinates of the approximate centre of the proposed site are the following:

32° 21' 22.69" S; 20° 38' 51.87" E.

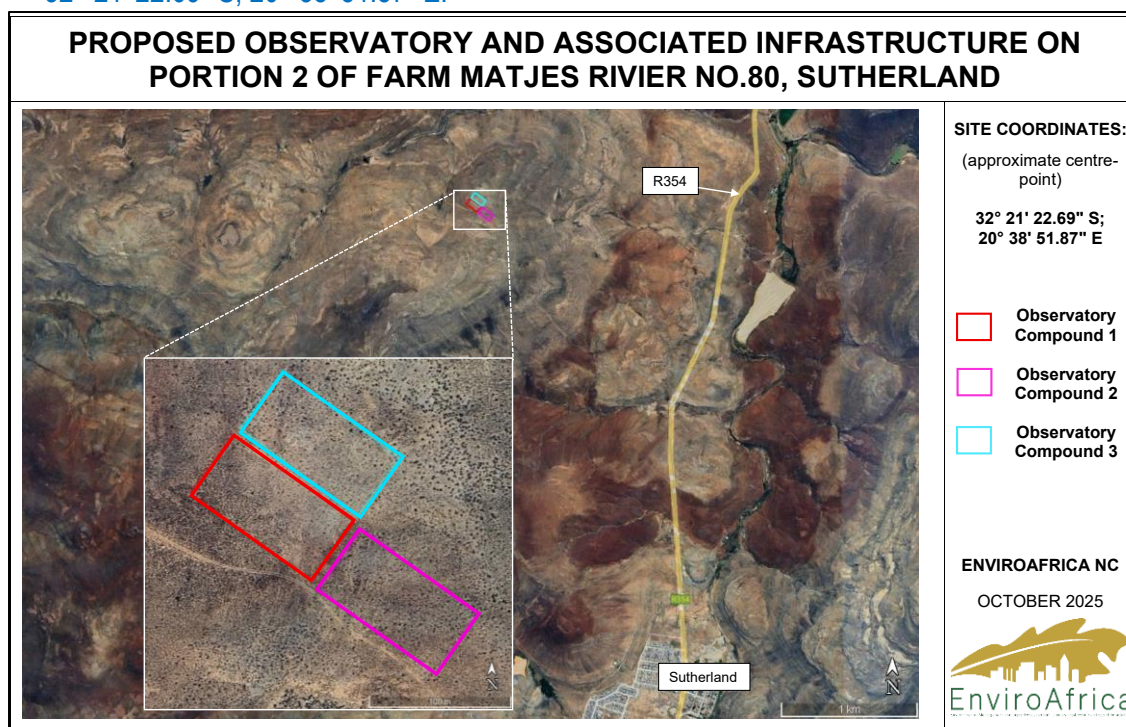


Figure 1: GoogleEarth locality map of the proposed site

- b) Provide a detailed description of the listed activities associated with the project as applied for

Listing Notice 1 (GN327)	Description of project activity
Activity 27, <i>"The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</i> <i>(i) the undertaking of a linear activity; or</i> <i>(ii) maintenance purposes undertaken in accordance with a maintenance management plan."</i>	The establishment of the proposed observatory and associated infrastructure requires that more than 1ha, but less than 20ha of indigenous vegetation be cleared.
Listing Notice 3 (GN324)	Description of project activity
Activity 12, <i>"The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i> g. Northern Cape <i>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</i> <i>ii. Within critical biodiversity areas identified in bioregional plans;</i> <i>iii. Within the littoral active zone or 100 metres inland from high-water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or</i> <i>iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning".</i>	The establishment of the proposed observatory and associated infrastructure requires that more than 300m² of indigenous vegetation be cleared on an area identified as a Critical Biodiversity Area.
Activity 28 <i>"Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:</i> <i>(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or</i> <i>(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes".</i>	The establishment of the proposed WWTW requires that more than 1ha but less than 20ha of indigenous vegetation be cleared on land zoned Agriculture.

2. FEASIBLE AND REASONABLE ALTERNATIVES

“alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Appendix 1 (3)(h), Regulation 2014. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

a) Site alternatives

The Preferred Site Alternative is the only feasible site alternative considered for the development proposal.

Alternative 1 (preferred alternative)		
The Preferred site alternative is located on Portion 2 of Farm Matjes Rivier No. 80, Sutherland.	Lat (DDMMSS)	Long (DDMMSS)
Please refer to Section 1 above for the geographic coordinates of the proposed site.		
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

In the case of linear activities:

Alternative:

Latitude (S):

Longitude (E):

Alternative S1 (preferred)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

Alternative S2 (if any)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

Alternative S3 (if any)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A of this form.

b) Layout alternatives

The Preferred layout alternative described in Section 1 above is the only layout alternative considered.

Alternative 1 (preferred alternative)		
Please refer to the description of the proposed observatory provided in Section 1 (See also Appendix A1 - Locality Map)	Lat (DDMMSS)	Long (DDMMSS)
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

c) Technology alternatives

Alternative 1 (preferred alternative)
The technology alternative employed is explained in the description of the Preferred Alternative in Section 1 above and is the only technological alternative considered.
Alternative 2
Alternative 3

d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

Alternative 1 (preferred alternative)		
N/A		
Alternative 2		
Alternative 3		

e) No-go alternative

The adoption of this alternative means that the proposed establishment of an observatory on Portion 2 of Farm Matjes Rivier No. 80, Sutherland would be abandoned, and the proposed site would remain in its current disused state.

It is noteworthy that the proposed telescope-housing facility is intended to deliver world-class dark-sky access, low-latency Southern-Hemisphere coverage for satellite operators and a turnkey platform for professional and advanced amateur astronomy. The guiding philosophy for this development is “low-impact-high-tech” by incorporating solar energy to meet approximately 100% of the on-site electricity needs and minimising disturbance to and fragile semi-arid ecosystem.

The socio-economic benefits to be gained from the proposed observatory include construction-related employment opportunities during the construction phase. The benefits to be gained during the operational phase include the boost in business that service providers such as lodges and restaurants in Sutherland will enjoy when astro-tourists visit Sutherland.

In addition, the proposed observatory and its visitation by astro-tourists will likely spark an astronomy interest in the community of Sutherland and nearby surrounding areas so that over time, the area produces a growing number of astronomers who are apt to invest significantly in the economic development of their place of origin.

In light of the above, the likely socio-economic benefits associated with establishing and operating the proposed observatory are significant.

It would therefore be undesirable to adopt the ‘no-go’ alternative, as this would cause the town of Sutherland and the nearby surrounding areas to forfeit the opportunity of gaining the socio-economic benefits mentioned above. The adoption of the ‘no-go’ alternative would be especially undesirable, considering that the potential negative impacts of establishing and operating the proposed observatory are likely to remain Medium to Low.

Paragraphs 3 – 13 below should be completed for each alternative.

3. PHYSICAL SIZE OF THE ACTIVITY

- a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:

Alternative A1¹ (preferred activity alternative)
Alternative A2 (if any)
Alternative A3 (if any)

Size of the activity:

Approximately 15 000m ²
m ²
m ²

or, for linear activities:

Alternative:

Alternative A1 (preferred activity alternative)
Alternative A2 (if any)
Alternative A3 (if any)

Length of the activity:

m
m
m

- b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:

Alternative A1 (preferred activity alternative)
Alternative A2 (if any)
Alternative A3 (if any)

Size of the site/servitude:

m ²
m ²
m ²

4. SITE ACCESS

Does ready access to the site exist?

If NO, what is the distance over which a new access road will be built

YES	NO
	m

Describe the type of access road planned:

The existing off-road track leading to the proposed site will continue to be used for access.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;

¹ "Alternative A.." refer to activity, process, technology or other alternatives.

- indication of all the alternatives identified;
- closest town(s);
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWS);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

10. ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

1. Is the activity permitted in terms of the property's existing land use rights?	YES	NO	Please explain
The proposed observatory and associated infrastructure have not yet been granted permission in terms of land use management legislation.			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES	NO	Please explain
The proposed development is too small to have any kind of significant bearing on the PSDF.			
(b) Urban edge / Edge of Built environment for the area	YES	NO	Please explain
The proposed development has no bearing on the urban edge.			
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES	NO	Please explain
Renewable energy, Opportunities for technology to fill gaps and Astro tourism – related to astronomy were highlighted as opportunities in the 2022-27 Karoo Hoogland Local Municipality Integrated Development Plan.			
The proposed observatory therefore aligns well with the IDF of the Karoo Hoogland Local Municipality, especially considering that the proposed observatory will be powered almost totally by solar energy that will be generated on the same property.			
(d) Approved Structure Plan of the Municipality	YES	NO	Please explain
The proposed development has no bearing on the approved Structure Plan of the Municipality.			

(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES	NO	Please explain
No EMF is known to exist in the area.			
(f) Any other Plans (e.g. Guide Plan)	YES	NO	Please explain
The proposed observatory is of small size and therefore is of no bearing on Policies and Plans			
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES	NO	Please explain
Renewable energy, Opportunities for technology to fill gaps and Astro tourism – related to astronomy were highlighted as opportunities in the 5th Generation Integrated Development Plan of the Karoo Hoogland Municipality 2022/2027. The proposed observatory therefore aligns well with the IDF of the Karoo Hoogland Local Municipality, especially considering that the proposed observatory will be powered by solar energy that will be generated on the same property.			
4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES	NO	Please explain
According to the Integrated Development Plan of the Karoo Hoogland Municipality 2022/2027, “new industries like the SALT, SKA, tourism and renewable energy must be supported to try and do a turnaround for the sustainability of the Karoo Hoogland Local Municipality.” In view of this, the proposed observatory is among the kinds of development proposals required in the administrative area of the Karoo Hoogland Local Municipality.			

5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES	NO	Please explain
The proposed observatory does not require any additional municipal services. The proposed development incorporates solar arrays for generating renewable energy that will meet approximately all of the on-site electricity demand. In addition, potable water will be transported to the proposed observatory in refillable containers and dry sanitation will be implemented, with sealed grey-water tanks to be transported off-site when this is required.			
6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES	NO	Please explain
The proposed observatory will be established privately and therefore does not form part of municipal infrastructure. The electricity needs of the proposed development will be met by means of on-site solar arrays. In addition, potable water will be transported to the proposed observatory in refillable containers and dry sanitation will be implemented, with sealed grey-water tanks to be transported off-site when this is required. The proposed observatory is therefore unlikely to result in any kind of significant burden on municipal infrastructure. The Karoo Hoogland Local Municipality will be requested to provide comment on the proposed development during the public consultation process.			
7. Is this project part of a national programme to address an issue of national concern or importance?	YES	NO	Please explain
8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES	NO	Please explain
The proposed site is on a farm outside Sutherland where the landscape is generally flat, light pollution is low and more than 270 clear nights are available per year. In view of this, the National Astro-Tourism Strategy & Implementation Plan 2024-2034, states that "Sutherland has a unique combination of topographical and meteorological characteristics that makes it an ideal astronomical site".			

9. Is the development the best practicable environmental option for this land/site?	YES	NO	Please explain
The proposed site is on a farm outside Sutherland where the landscape is generally flat, light pollution is low and more than 270 clear nights are available per year. In view of this, the National Astro-Tourism Strategy & Implementation Plan 2024-2034, states that <i>"Sutherland has a unique combination of topographical and meteorological characteristics that makes it an ideal astronomical site"</i>. In addition, the Applicant is committed to establishing and operating the observatory in line with the guiding philosophy of "low-impact-high-tech" by means of the following: – Renewable-First Energy Strategy – Dark-Sky & Visual Protection – Water, Waste & Pollution Control – Biodiversity Commitments The potential impacts of the proposed development are the following: - Impact to terrestrial biodiversity is of low significance, after mitigation measures, as confirmed in the Terrestrial Biodiversity Compliance Statement (Appendix D1). - Impact to freshwater is of low significance, after mitigation measures, as confirmed in the Freshwater Compliance Statement (Appendix D2). - Impact to archaeological, historical and cultural heritage is of low significance, after mitigation measures, with low paleontological impact as confirmed in the Palaeontological Compliance Statement (Appendix D3) and the Archeologically Compliance Statement (Appendix D4) The low potential negative environmental impacts of the proposed observatory are significantly outweighed by the anticipated socio-economic benefits that the community of Sutherland will enjoy in the form of employment opportunities during the construction phase as well as the boost in businesses that local service providers such as hospitality facilities will enjoy during the operational phase when astro-tourists are in town. In light of the above, the proposed observatory on Portion 2 of Farm Matjes River No. 80, Sutherland, is deemed the Best Practicable Environmental Option.			
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES	NO	Please explain
Please refer to the answer provided in Section 9 above.			
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	YES	NO	Please explain
The establishment of the proposed observatory may indeed encourage applications for environmental authorisation to be lodged with the competent authority for additional observatories in the area around Sutherland. The establishment of additional observatories of low environmental impact in the area around Sutherland would contribute towards developing the area into an astro-tourism hub and this would be desirable and well in line with the Integrated Development Plan of the Karoo Hoogland Local Municipality of 2022 to 2027.			

12. Will any person's rights be negatively affected by the proposed activity/ies?	YES	NO	Please explain
The proposed development is unlikely to negatively affect the human rights of anybody. A public participation process that meets the requirements specified in the EIA Regulations of 2014 (as amended) will be followed to ensure that people are given an opportunity to comment on the proposed development and any concerns raised will be adequately responded to.			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	YES	NO	Please explain
The proposed development has no bearing on the urban edge.			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES	NO	Please explain
The proposed development and associated infrastructure are not included in the list of Strategic Infrastructure Projects.			
15. What will the benefits be to society in general and to the local communities?	Please explain		
The anticipated socio-economic benefits that the community of Sutherland will enjoy, include employment opportunities during the construction phase as well as a boost in business during the operational phase for local service providers that include <i>inter alia</i>, hospitality facilities when astro-tourists are in town. If establishment of the proposed observatory inspires the establishment of other observatories of low environmental impact in the nearby surrounding area, the town of Sutherland may even grow into an astro-tourism hub, and this would amplify the above-mentioned anticipated socio-economic benefits.			
16. Any other need and desirability considerations related to the proposed activity?	Please explain		
No, please see the above answer to Question 15.			

17. How does the project fit into the National Development Plan for 2030?	Please explain
The establishment of the proposed observatory and associated infrastructure aligns with <i>inter alia</i>, the following objectives that are contained in the National Development Plan for 2030²: - Economy and Employment ~ The anticipated socio-economic benefits that the community of Sutherland will enjoy, include employment opportunities during the construction phase as well as a boost in business during the operational phase for local service providers that include <i>inter alia</i>, hospitality facilities when astro-tourists are in town. ~ The establishment of the proposed observatory may even encourage more applications for environmental authorisation to be lodged with the competent authority for the establishment of additional observatories in the area around Sutherland. The establishment of additional observatories of low environmental impact in the area around Sutherland would contribute towards developing the area into an astro-tourism hub. This would be in line with the Integrated Development Plan of the Karoo Hoogland Local Municipality of 2022 to 2027 and would amplify socio-economic benefits for the local community. - Environmental Sustainability and Resilience ~ The potential negative impacts of the proposed observatory will remain low as indicated in the terrestrial biodiversity impact study report, freshwater impact study report, heritage impact study report and as indicated in Appendix F of the Draft BAR.	
18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.	
The general objectives of Integrated Environmental Management, namely, to promote sustainable development through the integration of social, economic and ecological considerations as well as the maintenance of inter- and intra-generational equity have been taken into account through the following: – The actual and potential impacts of the proposed activity on the environment, socio-economic conditions, and cultural heritage, relative to the proposed site have been identified and evaluated. The proposed mitigation measures, with a view to minimising negative impacts on the environment, socio-economic conditions, and any cultural heritage, while maximising benefits and promoting compliance with the principles of environmental management, were assessed. – The potential environmental impacts of establishing the proposed observatory and associated infrastructure have been identified, assessed, and measures proposed to avoid or minimise the negative impacts. – A public participation process that meets the minimum legal requirements has been followed for the Basic Assessment application to help ensure that the decision-making process takes into account the comments of members of the public and commenting authorities. The environmental features of the proposed site have been considered and evaluated in the management and decision-making of the activity. An EMPr has been compiled (Appendix G, refers) for the proposed establishment of the observatory and associated infrastructure and in the EMPr, the potential impacts with impact avoidance and mitigation measures to be adhered to during the implementation phase are specified.	

²National Development Plan, 2030. Accessed at <https://www.gov.za/sites/default/files/Executive%20Summary-NDP%202030%20-%20Our%20future%20-%20make%20it%20work.pdf>

19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.

The principles of environmental management, as per Section 2 of the NEMA have been taken into account. The principles include:

- **Socio-economic development:** People and their needs have been placed at the forefront while serving their physical, psychological, developmental, cultural, and social interests –
The proposed development would meet a clear and growing demand for reliable Southern Hemisphere hosting for astronomical observation, technology demonstration and related optical ground activities. The proposed development would furthermore contribute directly to job creation during the construction phase. In addition, the presence of astro-tourists in Sutherland as a result of the proposed observatory during the operational phase will boost business for local service providers such as lodges and places of entertainment and this will improve job security for the workers employed at such places in the town.
- **Sustainable development:** Development must be socially, ecologically and economically sustainable –
The proposed development is guiding by a philosophy of “low-impact-high-tech” through a Renewable-First Energy Strategy, Dark-Sky & Visual Protection, Water, Waste & Pollution Control and Biodiversity Commitments. The potential negative environmental impacts associated with establishing the proposed observatory and associated infrastructure are of low significance as indicated in *inter alia*, the following:
 - The terrestrial biodiversity specialist in the specialist report attached hereto as Appendix D1
 - The freshwater specialist report attached hereto as Appendix D2
 - The palaeontological impact specialist in the report attached hereto as Appendix D3
 - The archeologically impact specialist in the report attached hereto as Appendix D4

The recommendations contained in the specialist study reports are included in the EMPr and will be implemented to help ensure that the potential negative impacts identified in the said reports are avoided or minimised. The potential impacts of the proposed observatory will be minimised further through the implementation of the impact avoidance and mitigation measures contained in the EMPr (Appendix G, refers). In this way, the benefits associated with establishing the proposed observatory and associated infrastructure that have been detailed in this BAR will be kept outweighing the potential negative impacts.

- **Transparent Public Participation Process:** The public participation process followed gives I&APs an opportunity to view and provide comment on the Draft BAR before the BAR is finalised and submitted. The decision of the competent authority will be forwarded to all I&APs so that whomsoever wishes to appeal the decision may appeal.

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act (NEMA), Act No. 107 of 1998 and the Environmental Impact Assessment (EIA), Regulations of 2014 (as amended)	Applications for environmental authorisation must comply with the requirements specified in the NEMA and in the EIA Regulations	Northern Cape Provincial Department of Agriculture, Environmental Affairs, Rural Development and Land Reform	
Northern Cape Nature Conservation Act, Act 9 of 2009	NCNCA Protected plant species located on the site	Department of Environment and Nature Conservation (DENC)	
National Heritage Resources Act (NHRA), Act 25 of 1999	A permit giving permission to develop is required according to Section 38(1) of the NHRA of 1999	South African Heritage Resources Agency (SAHRA)	
Astronomy Geographic Advantage Act, Act 21 of 2007	Approval is required for any activities capable of causing air pollution with a detrimental impact on optical astronomy	Department of Science and Technology	

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES	NO
-----	----

If YES, what estimated quantity will be produced per month?

Unknown m ³

How will the construction solid waste be disposed of (describe)?

The general solid waste produced during construction will be consolidated on the proposed site and disposed of at the nearest suitability licensed waste disposal site.

Where will the construction solid waste be disposed of (describe)?

The general solid waste produced during construction will be consolidated on the proposed site and disposed of at the nearest suitability licensed waste disposal site
--

Will the activity produce solid waste during its operational phase?

YES	NO
-----	----

If YES, what estimated quantity will be produced per month?

m ³

How will the solid waste be disposed of (describe)?

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA?

YES	NO
-----	----

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO
-----	----

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO
-----	----

If YES, what estimated quantity will be produced per month?

m ³

Will the activity produce any effluent that will be treated and/or disposed of on site?

YES	NO
-----	----

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO
-----	----

If YES, provide the particulars of the facility:

Facility name:

Contact

person:

Postal

address:

Postal code:

Telephone:

E-mail:

Cell:

Fax:

Describe the measures that will be taken to ensure the optimal reuse or recycling of wastewater, if any:

The proposed observatory will only really generate noticeable wastewater volumes during the times when astro-tourists are on the proposed site. The wastewater volumes likely to be generated at the proposed observatory are therefore too low to justify the costs of establishing, operating and maintaining a formal wastewater recycling system.

The wastewater generated at the proposed observatory will be collected in sealed greywater tanks and periodically transported for disposal at the municipal wastewater treatment works.

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?

YES	NO
YES	NO

If YES, is it controlled by any legislation of any sphere of government?

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the emissions in terms of type and concentration:

--

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?

YES	NO
-----	----

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) Generation of noise

Will the activity generate noise?

YES	NO
YES	NO

If YES, is it controlled by any legislation of any sphere of government?

Describe the noise in terms of type and level:

The proposed observatory will generate noise levels comparable to those of any construction site. The construction phase noise is unlikely to become a nuisance, as the proposed site is located on a farm that is a few kilometres away from the closest residential area. In addition, the construction noise will be limited to regular daytime working hours as explained in the EMP.

The observatory is unlikely to generate any kind of significant noise during the operational phase.

13. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

Municipal	Water board	Groundwater	River, stream, dam or lake	Other: Potable water required at the proposed observatory will be imported in refillable containers	The activity will not use water
-----------	-------------	-------------	----------------------------	--	---------------------------------

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

litres	
YES	NO

14. ENERGY EFFICIENCY

Describe the design measures, if any, which have been taken to ensure that the activity is energy efficient:

The proposed observatory includes a solar energy generation component that is designed to meet approximately 100% of the on-site electricity demand. A back-up ultra-quiet and low-sulphur generator will be used to supply electricity during extended overcast periods.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The proposed observatory development includes a solar energy generation component that is designed to meet approximately 100% of the on-site electricity demand. A back-up genset (ultra-quiet and low-sulphur generator) will be used to supply electricity during extended overcast periods.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

- For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A):

- Paragraphs 1 - 6 below must be completed for each alternative.

- Has a specialist been consulted to assist with the completion of this section?

☒ YES

☐ NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:

Province	Northern Cape
District Municipality	Namakwa District municipality
Local Municipality	Karoo Hoogland Local Municipality
Ward Number(s)	
Farm name and number	Farm Matjes River No. 80, Sutherland
Portion number	Portion 2
SG Code	C0720000000008000002

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

Current land-use zoning as per local municipality IDP/records:

Agriculture

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required?

☒ YES

☐ NO

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	1:50 — 1:20	1:20 — 1:15	1:15 — 1:10	1:10 — 1:7,5	1:7,5 — 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Alternative S2 (if any):

Flat	1:50 — 1:20	1:20 — 1:15	1:15 — 1:10	1:10 — 1:7,5	1:7,5 — 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Alternative S3 (if any):

Flat	1:50 — 1:20	1:20 — 1:15	1:15 — 1:10	1:10 — 1:7,5	1:7,5 — 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline	☐	2.4 Closed valley	☐	2.7 Undulating plain / low hills	☒
2.2 Plateau	☐	2.5 Open valley	☐	2.8 Dune	☐
2.3 Side slope of hill/mountain	☐	2.6 Plain	☐	2.9 Seafront	☐
2.10 At sea	☐				

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

	Alternative S1:		Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	YES	NO	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	YES	NO	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO	YES	NO	YES	NO
An area sensitive to erosion	YES	NO	YES	NO	YES	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

4. GROUND COVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

Please see Appendix B for Site Photographs and further descriptions of site vegetation.

If any of the boxes marked with an “E” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn’t have the necessary expertise.

5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River	YES	NO	UNSURE
Non-Perennial River	YES	NO	UNSURE
Permanent Wetland	YES	NO	UNSURE
Seasonal Wetland	YES	NO	UNSURE
Artificial Wetland	YES	NO	UNSURE
Estuarine / Lagoonal wetland	YES	NO	UNSURE

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

The proposed site is within 32m of some of the typical non-perennial drainage lines and their tributaries that exist in most parts of the Northern Cape.

6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

Natural area	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station ^H
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential	Church	Agriculture

DRAFT BASIC ASSESSMENT REPORT

Retail commercial & warehousing	Old age home	River, stream or wetland
Light industrial	Sewage treatment plant ^A	Nature conservation area
Medium industrial ^{AN}	Train station or shunting yard ^N	Mountain, Koppie or ridge
Heavy industrial ^{AN}	Railway line ^N	Museum
Power station	Major road (4 lanes or more) ^N	Historical building
Office/consulting room	Airport ^N	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam ^A	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

If any of the boxes marked with an "N" are ticked, how this impact will / be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan) The site falls within a CBA, according to SANBI BGIS map (Figure 4 below). However, as per Figure 5 below, the NC CBA map (2024) show the site being an ONA	YES	NO
Core area of a protected area?	YES	NO
Buffer area of a protected area?	YES	NO
Planned expansion area of an existing protected area?	YES	NO
Existing offset area associated with a previous Environmental Authorisation?	YES	NO
Buffer area of the SKA?	YES	NO

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain: See the Heritage Impact Assessment (**Appendix D3**)

YES

NO

The Palaeontological Impact Assessment (Appendix D3), derived the following findings:

The proposed sites on the potentially very highly sensitive Abrahamskraal Formation (Karoo Supergroup) that might preserve fossils typical of the *Tapinocephalus* Assemblage Zone. Site visit photographs provided by other specialists on the project, however, showed only low Karoo bushes, bare sands and a scatter of sandstones on the flat land. No rocky outcrops were present so no fossils are visible on the land surface. Nonetheless, a Fossil Chance Find Protocol should be added to the EMP. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, environmental officer or other designated responsible person once excavations for foundations and infrastructure have commenced. Since the impact will be low, as far as the palaeontology is concerned, the project should be authorised.

The Archaeological Impact Assessment (Appendix D4) concluded in the following manner:

The proposed development of an observatory and associated infrastructure on the Farm Matjes River No. 80/2 is not considered to pose a significant threat to local archaeological heritage because of the following:

- The combined (hard) development footprint for all three sites is 3384m².
- The 3 telescope buildings will be located close to existing access farm roads, and therefore no new roads will need to be built.
- The solar arrays will be placed on pedestals located above the ground without vegetation clearance being required.
- The site will be operated remotely with rare visits, resulting in minimal human activity/impact.
- As noted by Hart and Kendrick (2014), studies conducted suggest that pre-colonial archaeological heritage tends to occur in the valley bottoms close to watercourses and springs, which may explain why the high ridges and escarpments where the proposed ZuluAlpha Observatory is located contain little evidence of pre-colonial occupation'.
- No stone ruins/kraals/stone walling, or stone built cairns (graves) were encountered during the site visit conducted by the biodiversity specialist.
- Rocky areas will be avoided as recommended by the biodiversity specialist (Botes 2025).

On archaeological grounds, there are no objections to the development proposal. It is recommended that exemption from further specialist archaeological studies be granted, as it is considered unlikely that important archaeological resources will be impacted by the proposed activities

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

See above answer and Heritage Impact Assessment (**Appendix D3**)

Will any building or structure older than 60 years be affected in any way?

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

YES	NO
YES	NO

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

According to the 5th Generation Integrated Development Plan (IDP) of the Karoo Hoogland Municipality 2022/2027, “the labour force participation rate in Karoo Hoogland increased quite fast since 1996 till 2002 from thereon there was a steep decline till 2011 (Figure 2). The main reason for the decline is the fact that agriculture is the main job creating sector in the area. There was no other sectors that created jobs during this period. Since 2011 there is an increase in jobs over the last 4 to 5 years. This increase was mainly caused by the new SKA project that was implemented. During 1996 till 2002 there was a steep increase in the unemployment rate in the Karoo Hoogland Municipality. Since 2002 there was however a steady decline in the unemployment rate in the area. It declined from 24, 0% in 2004 to 12,1% in 2014. The main reason is the consistent contribution of the agriculture sector towards job creation in the Municipal area and the related opportunities of SALT. The related infrastructure and tourism opportunities consistently increased and absorbed local labour. Although there was a recession in 2008 it cannot be identified in terms of the statistics. As unemployment is one of the priority issues in Karoo Hoogland Municipality raised by the community, these statistics confirm that unemployment is not a huge problem in the Karoo Hoogland Municipality. The Karoo Hoogland LM's employment status consists of:

- 12.1% unemployed
- Labour force participation rate – 63,3% more or less at the same level as in 1999
- The main reason for this tendency is that the uptake of employment is steady and quick due to the fact that it is low or semi-skilled labour that is required.”

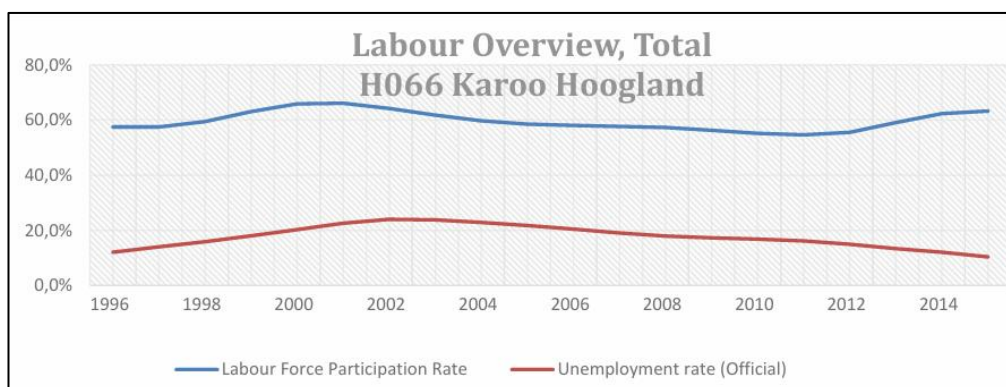


Figure 2: Total labour overview for Karoo Hoogland municipality

Economic profile of local municipality:

According to the 5th Generation Integrated Development Plan (IDP) of the Karoo Hoogland Municipality 2022/2027, “the GDP growth in Karoo Hoogland was fairly consistent over the years since 1996 till 2014. The rate ranges from nearly 2,2% in 2005 to 0.02% in 1998. The periods when droughts or other factors have played a part can be seen in the periodic declines in 1998, 2002, 2006 and 2015 (Figure 3). These effects are being felt due to the fact that the main sector contributors are agriculture and community services. On average the growth over the period\ was 0, 9% which shows

the consistent contribution by the agriculture sector over this time period. The steepest declines were experienced during 2005 and 2015 during drought years. The SALT and SKA with their related investment and spin-offs has also consistently grown and expanded the GDP base.”

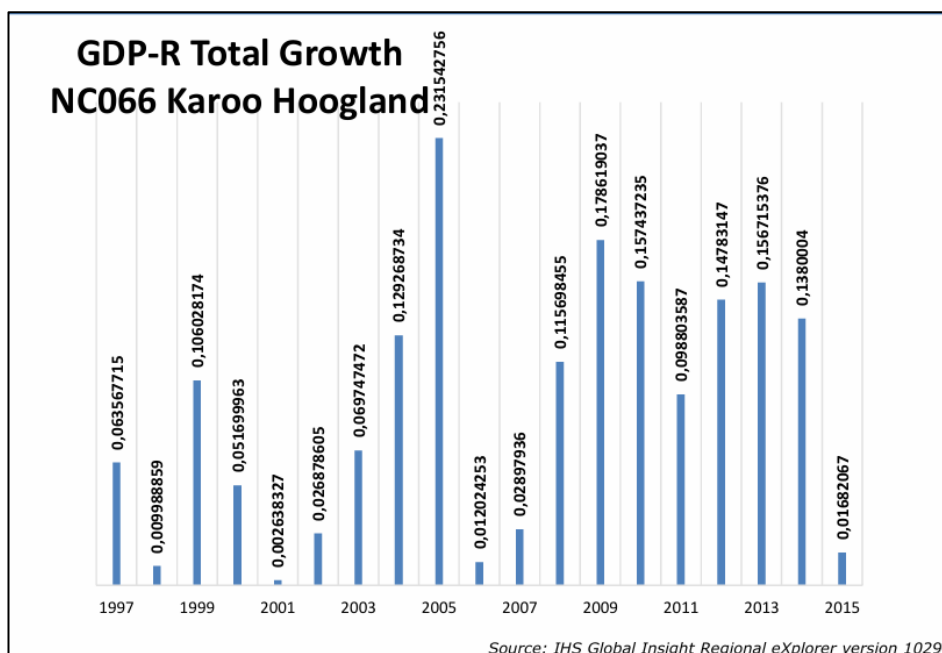


Figure 3: Total GDP growth for Karoo Hoogland municipality

The 5th Generation Integrated Development Plan (IDP) of the Karoo Hoogland Municipality 2022/2027 further specified that, “most people are employed within the Government and Community Services sector by 32%, secondly the Agriculture sector with 30% and the trade and retail sector with 14 %. If the Agriculture sector keep on declining and contribute less due to global economics and the droughts, while the Government sector started to contribute more towards grants and subsidies it can become problematic for the sustainability of the Municipality. New industries like the SALT, SKA, tourism and renewable energy must be supported to try and do a turnaround for the sustainability of the Municipality.”

Level of education:

According to the 5th Generation Integrated Development Plan (IDP) of the Karoo Hoogland Municipality 2022/2027, “There is an improvement in the level of education in Karoo Hoogland over the period 1996 to 2016, where there was a decline in the number and percentage of persons aged 20 years and above with no schooling (from 33.5% to 13.4%). There is an improvement in the number and percentage of persons with a higher education, from 5.6% in 1996 to 11.6% in 2016. There is also a significant increase observed in the proportion of persons who have Grade 12/Standard 10 (Table 1).”

Table 1: Highest level of education for persons aged 20 years and above, 1996-2016

	No schooling	Some Primary	Complete Primary	Some Secondary	Grade 12/Std 10	Higher	Total
Number							
1996	3 632	2 989	792	2 070	746	604	10 833
2001	2 273	2 868	684	2 116	956	532	9 429
2011	1 617	3 579	827	2 643	1 337	659	10 663
2016	1 161	1 227	734	2 264	2 298	1 008	8 692
Percent (%)							
1996	33.5	27.6	7.3	19.1	6.9	5.6	100.0
2001	24.1	30.4	7.2	22.4	10.1	5.6	100.0
2011	15.2	33.6	7.8	24.8	12.5	6.2	100.0
2016	13.4	14.1	8.4	26.1	26.4	11.6	100.0

*Excludes "do not know" and "unspecified"

The 5th Generation Integrated Development Plan (IDP) of the Karoo Hoogland Municipality 2022/2027 further states that, "27.7% of the Black Africans in Karoo Hoogland municipality have no schooling when compared to other population groups, followed by the Coloured population group (20%). It shows that the White population group is educated more than other population groups (Table 2)."

Table 2: Highest level of education by population group for persons aged 20 years and above,

	No schooling	Some Primary	Complete Primary	Some Secondary	Grade 12/Std 10	Higher	Total
Number							
Black African	24	40	23	-	-	-	88
Coloured	2 029	3 104	840	2 814	1 225	121	10 132
Indian/Asian	-	26	19	-	-	-	45
White	105	263	81	126	1 155	887	2 616
Percent (%)							
Black African	27.7	45.7	26.6	-	-	-	100.0
Coloured	20.0	30.6	8.3	27.8	12.1	1.2	100.0
Indian/Asian	-	57.5	42.5	-	-	-	100.0
White	4.0	10.0	3.1	4.8	44.1	33.9	100.0

*Excludes "do not know" and "unspecified"

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?

What is the expected yearly income that will be generated by or as a result of the activity?

Will the activity contribute to service infrastructure?

Is the activity a public amenity?

How many new employment opportunities will be created in the development and construction phase of the activity/ies?

What is the expected value of the employment opportunities during the development and construction phase?

What percentage of this will accrue to previously disadvantaged individuals?

How many permanent new employment opportunities will be created during the operational phase of the activity?

What is the expected current value of the employment opportunities during the first 10 years?

R1 500 000	
R600 000	
YES	NO
YES	NO
6	
R1 200 000 (inclusive of first year of operation)	
% Currently unknow	
4	
R7 000 000	

What percentage of this will accrue to previously disadvantaged individuals?

70%

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

- a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	The site falls within a CBA, according to SANBI BGIS map (Figure 4). However, as per Figure 5 below, the NC CBA map (2024) show the site being an ONA

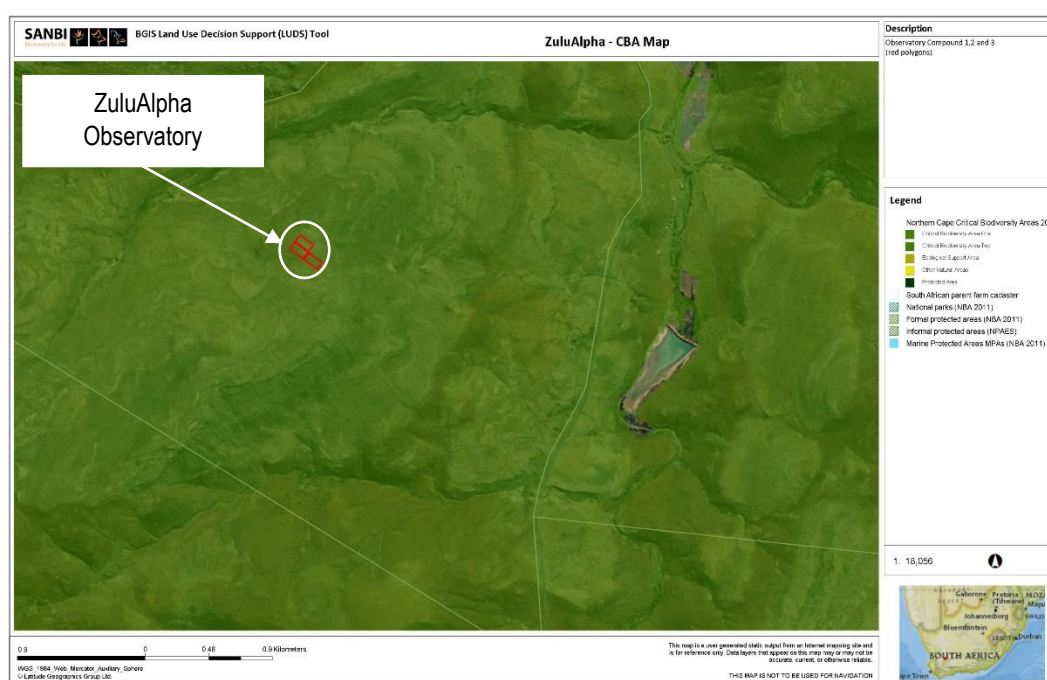


Figure 4: SANBI BGIS map showing the proposed ZuluAlpha Observatory (white circle) overlapping a CBA

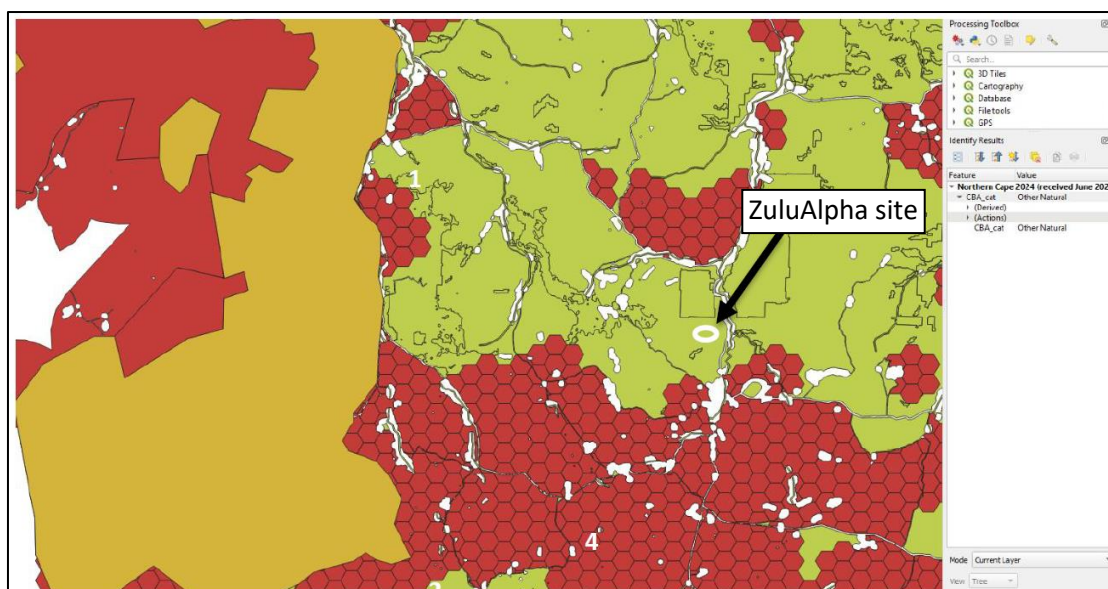


Figure 5: SANParks PAES overlaid onto the NC CBA map (2024) showing the proposed ZuluAlpha Observatory (white circle) falling within “Other Natural Areas” (light green areas) and outside of CBAs and ESAs (red octagons), CBAs within SANParks NPAES (solid red areas) are SANParks NPAES (mustard-coloured areas) (PJJ Botes, 2025)

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	100%	The vegetation on the plateau (the larger study area) can be described as a low-growing and very uniform shrubland dominated by small leaved perennial shrubs up to 0.5 m in height. Vegetation cover was between 70% – 80%. Species diversity was relatively low, likely due to the recent drought period combined with livestock grazing (with the veld only now beginning to recover). The physical disturbance footprint of project will be very small ($\pm 1500\text{m}^2$ or 0.15ha in total).
Near Natural (includes areas with low to moderate level of alien invasive plants)	%	
Degraded (includes areas heavily invaded by alien plants)	%	
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	%	

c) **Complete the table to indicate:**

- (i) the type of vegetation, including its ecosystem status, present on the site; and
- (ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems							
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)			Estuary		Coastline		
	Endangered								
	Vulnerable								
	Least Threatened	YES	NO	UNSURE	YES	NO	YES	NO	

d) **Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)****TERRESTRIAL BIODIVERSITY IMPACT REPORT**

The Terrestrial Biodiversity Compliance Statement (Appendix D1) contains the following findings:

According to the 2024 beta VEGMAP of South Africa (Figure 3), the property is expected to support Roggeveld Shale Renosterveld classified as “Least Threatened” in terms of the “*Revised List of ecosystems that are threatened and in need of protection*” (GN 2747 of 18 November 2022).

Plant Species Sensitivity: The DFFE screening report for this project gives the relative plant species sensitivity as of Medium Sensitive, because of the potential that the project might impact on several sensitive plant species, mostly succulents of the Aizoaceae and Crassulaceae families, oatgrass species or bulbs from the Iridaceae or Amaryllidaceae families.

None of these species were observed, but it might be possible that some of the smaller bulb species might be present. However, the development footprint will be so small that it is unlikely to have any significant impact on any of these species. Nonetheless, topsoil should be removed from areas to be cleared and re-used in disturbed areas in the immediate surroundings. For this project, a plant species sensitivity of Medium-Low to Low Sensitive is considered more appropriate for Plant Species Sensitivity.

Animal Species Sensitivity: The DFFE Screening report identifies the Animal Species theme as Medium Sensitive because of the potential impacts on one sensitive bird (Ludwig’s bustard), one sensitive insect (The James blue butterfly) and one sensitive mammal (the riverine rabbit).

The study area falls within the geographical distribution range for some of the species, but because of the small footprint and low operational impact, it is considered unlikely that the development will have any significant impact on the survival of any of these species. For this project an animal species sensitivity rating of Low Sensitive is considered appropriate for Animal Species Sensitivity.

Terrestrial Biodiversity Sensitivity: The DFFE Screening Tool report identifies the Terrestrial Biodiversity theme as Very High Sensitive because of the potential impacts on the National Protected Area Expansion Strategy (NPAES).

Based on the findings according to the latest GIS data (June 2025) for the SANParks PAES the development will not impact on a NPAES focus area, thus the proposed project is not likely to impact on the NPAES (Figure 5). According to the 2024, NC BSP the proposed development falls within an area demarcated as “Other Natural Areas” and will not impact on any CBA or ESA (Figure 5). In addition, the small size any impact will be almost negligible while the future landuse (low activity and no – interference) may even be beneficial in the long run for the protection of vegetation and other species (including fauna and avi-fauna). For this terrain, a Terrestrial Biodiversity sensitivity of Low Sensitive is considered appropriate.

The following recommendations have been made

The proposed locations for the three (3) telescope sites were approximate, and the landowner is very willing to adjust the final location on the recommendations of the specialist report.

From a terrestrial biodiversity viewpoint, the following recommendations should be considered:

- A suitably qualified Environmental Control Officer (ECO) should be appointed to oversee the final placement and construction phase of the project.
- The 3 telescope building sites should be located as close to the existing access road as possible, to minimize the impact of additional access roads (Refer to the updated layout plan - Figure 5 below, which addresses the findings of this study as well as recommendations from a freshwater perspective).
- The area marked in green in Figure 5, should be avoided, if possible.
- Before construction, the topsoil should be removed from the areas that will be impacted by the construction of the telescope buildings.
- Topsoil should be removed to a depth of 15cm – 20cm (which should include most of the smaller bulb species as well as its indigenous plant seed store). This topsoil should be used to rehabilitate disturbed areas in the immediate surroundings (the same vegetation type).
- The solar panels should be placed on pedestals or frame structures, away from the ground. NB blanket clearing of these sites should be avoided as much as possible.
- Recommendations should be followed for protected plant species as specified in Table 3 below.



Figure 5: Terrestrial Biodiversity Sensitivity Map showing a rocky, slightly more sensitive area (green polygon), a less sensitive area (yellow polygon) and the final layout (red, pink and blue polygon) supported by the terrestrial biodiversity compliance report

Table 3: Northern Cape protected plant species with impact minimisation recommendations.

NO.	SPECIES NAME	COMMENTS	RECOMMENDATIONS
1	<i>Aloinopsis spathulata</i> Schedule 2 protected. (All plants in this Family)	Several individuals observed, seemingly restricted to the rockier northeastern part of the study area. This is a range restricted but locally common species with a red-list status of Least Concern.	Search & rescue It is recommended that all individuals within the footprint areas are transplanted to areas that will not be disturbed (within the same property). A NCNCA Permit application must be obtained for the impacts on this species.
2	<i>Cleretum cf. lyratifolium</i> Schedule 2 protected. (All plants in this Family)	Occasionally observed and seemingly restricted to the rockier northeastern part of the study area. This is a range restricted but locally common species with a red-list status of Least Concern.	No Search & rescue proposed. Topsoil should be re-used for the rehabilitation of disturbed areas, which will allow for seed store protection). A NCNCA Permit application must be obtained for the impacts on this species.
3	<i>Brunsvigia cf. bosmaniae</i> Schedule 2 protected (All plants in this Family)	The occasional bulb (leaves only) were observed. This is a widespread and common species with a red-list status of Least Concern	Search & rescue It is recommended that all bulbs of the Amaryllidaceae observed within the footprint areas are transplanted to areas that will not be disturbed (within the same property). A NCNCA Permit application must

FRESHWATER IMPACT REPORT

The Freshwater Compliance Statement (Appendix D2) contains the following findings:

According to the DFFE screening tool, the site's sensitivity is rated as "Low" for the aquatic biodiversity theme.

No aquatic features were noted on the site, as shown on Google Earth imagery. The closest aquatic feature is a very faint drainage line more than 100m away to the northwest. The specialist is familiar with Sutherland and surrounds and confirms that the proposed development will not have any measurable effect on the aquatic environment.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	Gemsbok	
Date published	29 August 2025	
Site notice position	Latitude	Longitude
	32° 22' 37,79" S	20° 39' 47,02" E
Date placed	27 August 2025	

Include proof of the placement of the relevant advertisements and notices in Appendix E3.

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 733.

Pre-application PPP (Refer to Appendix E)

- An initial register of possible interested and affected parties ("I&APs") was compiled (Appendix E1)
- A site visit was conducted on 27 August 2025 to familiarise with the proposed site and nearby surrounding area and identify environmental sensitivities associated with the proposed site (Appendix B).
- On 27 August 2025, A2 site poster placed at the turn off to Portion 2 of Farm Matjes Rivier No. 80, Sutherland (Appendix E2).
- An advertisement was placed in a local newspaper *i.e.*, the *Gemsbok* which was published on 29 August 2025 (Appendix E3).
- On 29 August 2025 an initial notice of the intention to lodge an application with the competent authority for the proposed observatory was sent to I&APs (Appendix E4).
- The comments received in response to the initial PPP notices are included in the Comments-Responses Report, together with the responses thereto.

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 733

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E4. This proof may include any of the following:

- Electronic mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or

- or any other proof as agreed upon by the competent authority.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
Please refer to Appendix E5	Please refer to Appendix E5

4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E5.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders: [Please refer to Appendix E1](#)

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	e-mail	Postal address

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

6. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E1.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

Please refer to Appendix F for the impact assessment

Activity	Impact summary	Significance	Proposed mitigation
Alternative 1 (preferred alternative)			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
Alternative 2			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
Alternative 3			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
No-go option			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
Activity	Impact summary	Significance	Proposed mitigation
Alternative 1 (preferred alternative)			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		

Activity	Impact summary	Significance	Proposed mitigation
Alternative 2			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
Alternative 3			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
No-go option			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		

A complete impact assessment in terms of Regulation 19(3) of GN 733 must be included as Appendix F.

2. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative A (preferred alternative)

The proposed development is a remote observatory comprising a modular telescope-housing facility and associated infrastructure enclosed within three separate compounds. The compounds measure 50m x 100m (0.5ha) each and will together be surrounded by a security fence (total development footprint ≈1.5ha).

Each of the three compounds will include the following infrastructure:

- 3 x Telescope Housing - 18m x 12m roll-off-roof on shallow concrete pad (≤ 4m high).
- 4 x Solar Rows - 40m x 3 m ballasted arrays (total ~ 56 kWp) with 10 kWh Li-ion storage
- 1 x generator of approximately 20kVA

The proposed site is located on Portion 2 of the Farm Matjes Rivier No. 80, Sutherland, off the R354 Regional Road and this is approximately 3.5km north-west of Sutherland.

The proposed telescope-hosting facility is intended to deliver world-class dark-sky access, low-latency Southern-Hemisphere coverage for satellite operators and a turnkey platform for professional and advanced amateur astronomy.

The socio-economic benefits to be gained from the proposed observatory include construction-related employment opportunities during the construction phase. The benefits to be gained during the operational phase include the boost in business that service providers such as lodges and restaurants in Sutherland will enjoy when astro-tourists visit Sutherland.

In addition, the proposed observatory and its visitation by astro-tourists will likely spark an astronomy interest in the community of Sutherland and nearby surrounding areas so that over time, the area produces a growing number of astronomers who are apt to invest significantly in the economic development of their place of origin.

The guiding philosophy for this development is “low-impact-high-tech” by incorporating solar energy to meet approximately 100% of the on-site electricity needs and minimising disturbance to and fragile semi-arid ecosystem. The potential negative terrestrial biodiversity impacts of the proposed development are low (Appendix D1, refers). The potential negative freshwater ecological impacts are low (Appendix D2, refers). The potential negative heritage-related impacts are low (Appendix D3 and D4, refer) The potential negative visual impact and light pollution is low due to mitigation measures of the proposed development

In view of the above, the likely benefits of establishing the proposed telescope-hosting facility and associated infrastructure outweigh the potential negative impacts.

It is therefore suggested that the competent authority authorise the establishment of the proposed telescope-hosting facility and associated infrastructure on Portion 2 of the Farm Matjes Rivier No. 80, Sutherland in Kakamas.

Alternative B

Alternative C

No-go alternative (compulsory)

This alternative entails abandoning the proposed establishment of an observatory on Portion 2 of the Farm Matjes Rivier No. 80, Sutherland and the proposed site would therefore remain in its current disused state.

It is noteworthy that the proposed telescope-housing facility is intended to deliver world-class dark-sky access, low-latency Southern-Hemisphere coverage for satellite operators and a turnkey platform for professional and advanced amateur astronomy. The guiding philosophy for this development is “low-impact-high-tech” by incorporating solar energy to meet approximately 100% of the on-site electricity needs and minimising disturbance to and fragile semi-arid ecosystem.

The socio-economic benefits to be gained from the proposed observatory include construction-related employment opportunities during the construction phase. The benefits to be gained during the operational phase include the boost in business that service providers such as lodges and restaurants in Sutherland will enjoy when astro-tourists visit Sutherland.

In addition, the proposed observatory and its visitation by astro-tourists will likely spark an astronomy interest in the community of Sutherland and nearby surrounding areas so that over time, the area produces a growing number of astronomers who are apt to invest significantly in the economic development of their place of origin.

In light of the above, the socio-economic benefits associated with establishing and operating the proposed observatory are significant.

It would therefore be undesirable to adopt the '*no-go*' alternative, as this would cause the town of Sutherland and the nearby surrounding areas to forfeit the opportunity of gaining the socio-economic benefits mentioned above. The adoption of the '*no-go*' alternative would be especially undesirable, considering the potential negative impacts of establishing and operating the proposed observatory are likely to remain Medium to Low.

SECTION E: RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES

NO

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

The Draft BAR must first be made available to Interested and Affected Parties for public participation as per the EIA Regulations of 2014 (as amended). The comments received during the public participation process must then be responded to adequately in a Comments-Responses Report and taken into account in the BAR before the BAR can be submitted to the competent authority for a decision on the application.

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

- All construction must take place in accordance with an approved construction and operational phase Environmental Management Programme (EMPr).
- A suitably experienced ECO must be appointed to ensure compliance with the conditions of the environmental authorisation and the EMPr.
- The recommendations contained in the Terrestrial Biodiversity Impact Report attached hereto as Appendix D1 must be implemented
- The recommendations contained in the Freshwater Impact Study Report attached hereto as Appendix D2 must be implemented
- The recommendations contained in the Palaeontological Impact Report attached hereto as Appendix D3 must be implemented
- The recommendations contained in the Archeologically Impact Report attached hereto as Appendix D4 must be implemented
- All the conditions contained in the environmental authorisation must be complied with.

Is an EMPr attached?

YES

NO

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

Maboe Nthejane
NAME OF EAP

SIGNATURE OF EAP

DATE

SECTION F: APPENDIXES

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information