PRE-APPLICATION BAR FOR THE PROPOSED DEVELOPMENT OF THE KTE WATER PIPELINE AND ASSOCIATED INFRASTRUCTURE AND THE EXPANSION OF THE EXISTING KENHARDT PIPELINE INFRASTRUCTURE FROM THE ORANGE RIVER TO THE FARM UITKYK, NO.889 WITHIN THE KAI! GARIB AND HANTAM MUNICIPALITIES, NORTHERN CAPE

DENC Ref. No.: To be provided

PRE-APPLICATION BASIC ASSESSMENT REPORT

JANUARY 2025

P.O. Box 5367
Helderberg 7135
Tel: +27 (0)21 851 1616

e-mail: info@enviroafrica.co.za

Unit 7 Pastorie Park
Cnr Reitz & Lourens St.,Somerset West
CK 97/46008/23
VAT4870170513

PRE-APPLICATION BAR FOR THE PROPOSED DEVELOPMENT OF THE KTE WATER PIPELINE AND ASSOCIATED INFRASTRUCTURE AND THE EXPANSION OF THE EXISTING KENHARDT PIPELINE INFRASTRUCTURE FROM THE ORANGE RIVER TO THE FARM UITKYK, NO.889 WITHIN THE KAI! GARIB AND HANTAM MUNICIPALITIES, NORTHERN CAPE

PREPARED FOR:

Department of Environment and Nature Conservation (DENC)

90 Long Street, Sasko Building
Kimberly
8300
Tel: 053 807 7430
Fax: 053 831 3530

PREPARED BY:

EnviroAfrica cc

P.O. Box 5367
Helderberg
7135
Tel: 021 851 1616
Fax: 086 512 0154

agriculture, environmental affairs,
rural development and land reform

Department:
agriculture, environmental affairs,
rural development and land reform ,
NORTHERN CAPE PROVINCE
REPUBLIC OF SOUTH AFRICA

SASKO Building, 90 Long Street, Private Bag X6102, Kimberley 8300 Tel. 053-8077300 Fax: 053-8077328

Project applicant:	***Kotulo Tsatsi Energy (Pty) Ltd***		
Business reg. no. /ID. no.:	***2011/150005/07***		
Contact person:	***Dominic Kahre***		
Postal address:	***PO Box 423, Vanderbijlpark, 1900***		
Telephone:	[redacted]	Cell:	[redacted]
E-mail:	[redacted]	Fax:	[redacted]

Prepared by:

Environmental Assessment Practitioner/Firm:	***Clinton Geyser (Supervisor) and Bernard de Witt (Reviewer) Zandria Jordaan (Compiler)***		
Business reg. no. /ID. no.:	***CK 97 46008/23***		
Contact person:	***Zandria Jordaan***		
Postal address:	***P. O. Box 5367, Helderberg***		
Telephone:	***021 851 1616***	Cell:	[redacted]
E-mail:	***clinton@enviroafrica.co.za/ bernard@enviroafrica.co.za/ zandria@enviroafrica.co.za***	Fax:	

(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 of07 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**
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

Kotulo Tsatsi Energy (KTE) intends to expand the existing Kenhardt water pipeline system, and develop a new 750 mm KTE pipeline and associated infrastructure (Figure 1). The existing Kenhardt pipeline supplies water to Kenhardt in the Northern Cape, South Africa. The proposed 221 km pipeline development and expansion will extend from the Orange River abstraction point near Neilersdrift to Portion 5 of Farm Uitkyk No. 889, incorporating various reservoirs and supporting infrastructure along its route.

The proposed development and expansion include the following:

1. Abstraction Point and Initial Infrastructure: Water will be drawn from the Orange River at a pump station located on Portion 103 of Farm No.34 Neilersdrift. The raw water will be transported to the Lennertsville Water Treatment Plant through a 3.1 km 800 diameter pipeline.
2. Water Treatment and Storage: The Lennertsville Water Treatment Plant, with a 30 Megalitre (Ml) capacity, will include a 10 Ml storage reservoir and a booster pump station on Portion 213 of Farm No.38 Neilersdrift.
3. Clear Water Distribution:
    - Clear Water Rising Main No.1 (Upgrade of the existing pipeline): A 29 km 750 mm diatmeter pipeline will carry treated water from Lennertsville to the Piet Rooi Reservoir adjacent to the R27
    - Piet Rooi Reservoir (expansion of the existing reservoir): This 3 Ml concrete reservoir will act as a transitional storage point for further water distribution
4. Gravity and Rising Mains:
    - A 64 km gravity main (800 mm diameter) will transport water from Piet Rooi (Upgrade of the existing Kenhardt Pipeline) to a reservoir at Farm De Bakke (a new 750 mm pipeline will be developed from Kenhardt to the De Bakke reservoir)
    - A 59 km 750 mm diameter rising main will connect De Bakke to the Steyns Vley Reservoir (via the R27 & Soafsklok road reserve), on a renewable energy project site
5. Final Storage and Alternative Routes:
    - From Steyns Vley, the preferred alternative 58 km 750 mm diameter pipeline route, will lead to the final 30 Ml reinforced concrete storage reservoir on Portion 1 of Farm Uitkyk No.889
    - Internal pipelines and pump stations will distribute water from Steyns Vley and Uitkyk to 16 steel reservoirs (500 kl capacity each) at various locations

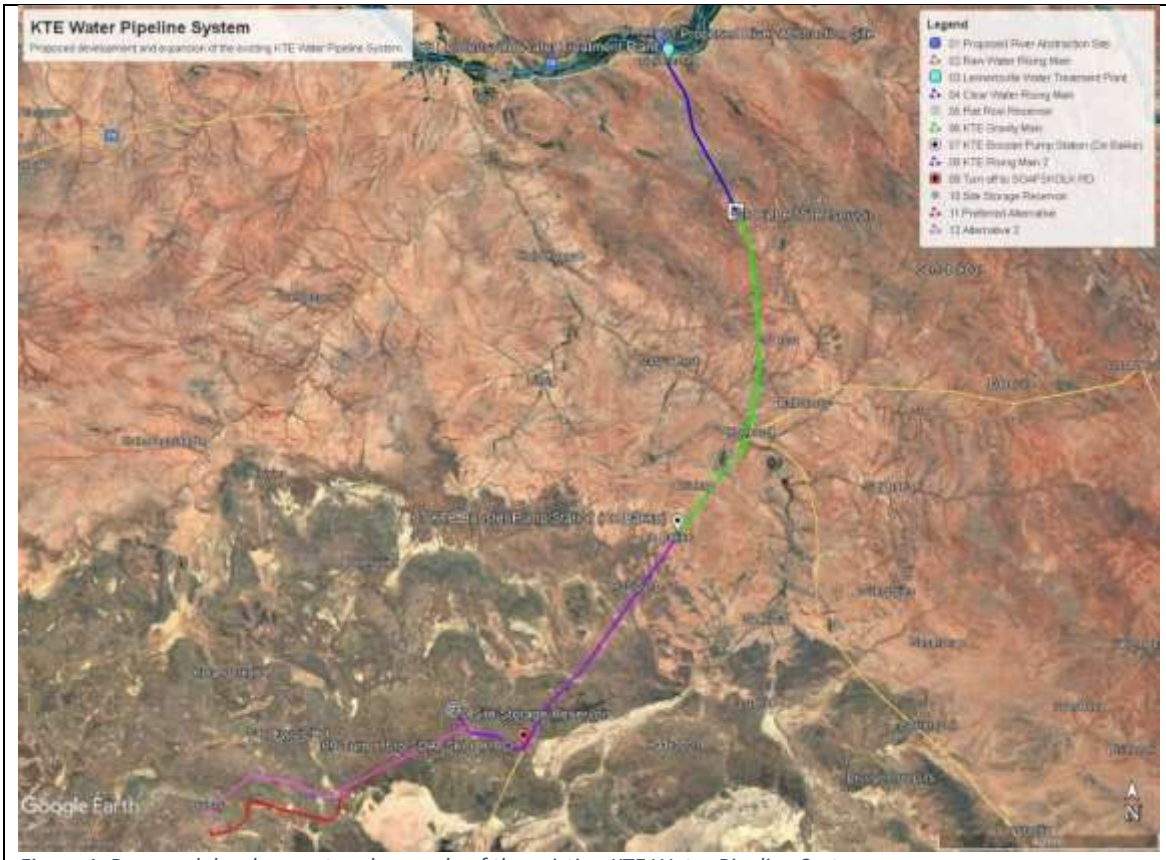


Figure 1. Proposed development and upgrade of the existing KTE Water Pipeline System.

Figure 2. Close up view of the pipeline from the Abstraction point at the Orange River to the Piet Rooi Reservoir.

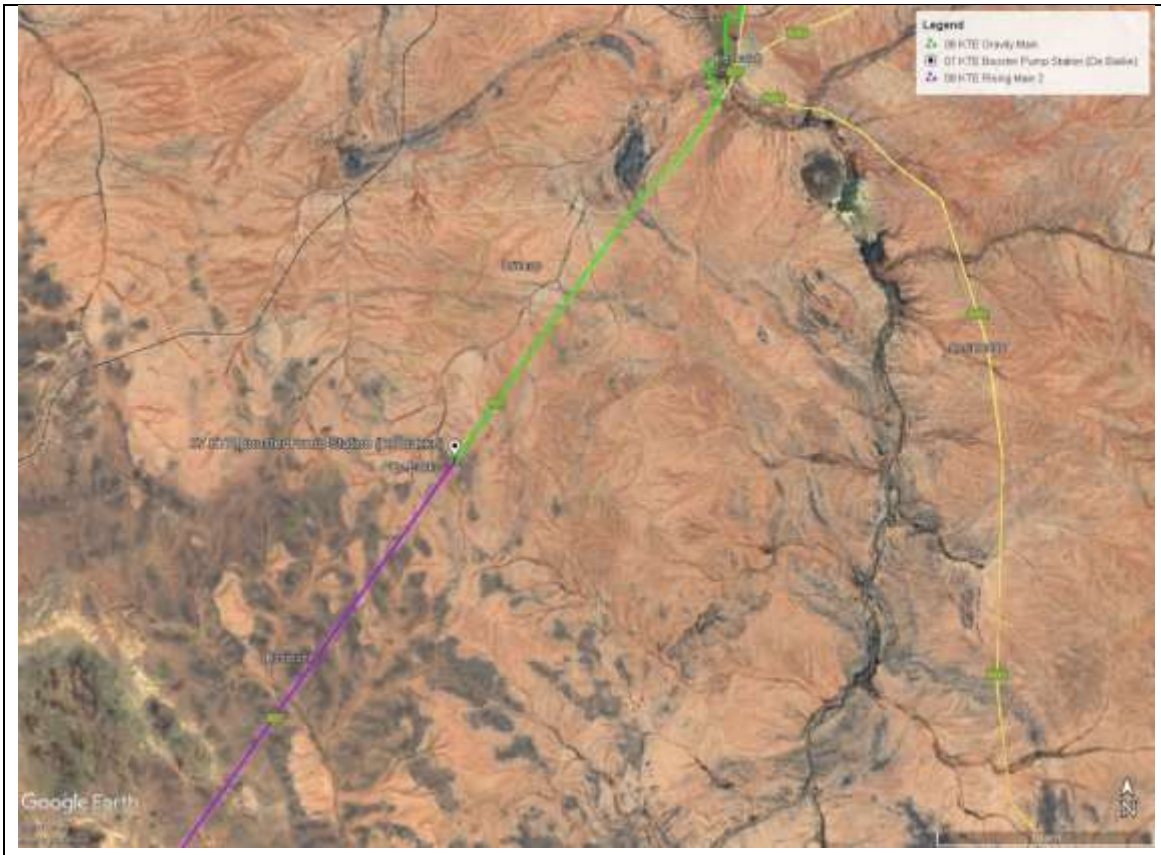


Figure 3. Close up view of the pipeline from Kenhardt to the De Bakke Booster Pumpstation.

Figure 4. Close up view of the pipeline from the Booster Pump station to the proposed evaporation ponds at the end of the pipeline route.

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

Listed activity as described in GN 327	Description of project activity
"9. The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water— " ***(i) with an internal diameter of 0,36 metres or more;*** *or* *(ii) with a peak throughput of 120 litres per second or more;* *excluding where—* *(a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or* *(b) where such development will occur within an urban area."*	The proposed development includes the development of a 200+ km and up to 800 mm diameter pipeline outside an urban area.
"12. The development of— *(i) canals exceeding 100 square metres in size;* *(ii) channels exceeding 100 square metres in size;* *(iii) bridges exceeding 100 square metres in size;* *(iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size;* *(v) weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size;* *(vi) bulk storm water outlet structures exceeding 100 square metres in size;* *(vii) marinas exceeding 100 square metres in size;* *(viii) jetties exceeding 100 square metres in size;* *(ix) slipways exceeding 100 square metres in size;* *(x) buildings exceeding 100 square metres in size;* *(xi) boardwalks exceeding 100 square metres in size; or* *(xii) infrastructure or structures with a physical footprint of 100 square metres or more;]* *The development of—* *(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or*	The proposed activity entails the development and expansion of the treatment plant and reservoir and the development and expansion of the De Bakken Booster Reservoir which will have a physical footprint of 100 m^2 or more and occurs over several drainage lines, thus less than 32 m from watercourses.

(ii) infrastructure or structures with a physical footprint of 100 square metres or more; *where such development occurs—* ***(a) within a watercourse;*** *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;* *— excluding—* *(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such development occurs within an urban area; [or]* *(ee) where such development occurs within existing roads, [or] road reserves or railway line reserves; or* *(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared."*	
"*13. The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014."*	The proposed activity involves the development and expansion of multiple off-stream water storage facilities, including the Lennertsville Water Treatment Plant reservoirs, the Piet Rooi and De Bakke reservoirs, and the final storage reservoirs at Steyns Vley and Uitkyk, with a combined storage capacity exceeding 50,000 cubic meters.
"19. The infilling or depositing of any material of more than [5] 10 cubic metres into, or the ***dredging, excavation****,* ***removal or moving of soil****, sand, shells, shell grit, pebbles or rock of* ***more than [5] 10 cubic metres from —*** ***(i) a watercourse;*** *(ii) the seashore; or* *(iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water*	The proposed development includes the installation of pipelines which will cross existing watercourses. The watercourse may be infilled and/or excavated during construction of the pipelines.

mark of the sea or estuary, whichever distance is the greater— *but excluding where such infilling, depositing, dredging, excavation, removal or moving—* *(a) will occur behind a development setback;* *(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; [or]* *(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;* *(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or* *(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies."*	
"27. ***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) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan."*	The proposed activity involves the clearance of more than 1 hectare of indigenous vegetation to accommodate the construction and expansion of the KTE water storage reservoirs, booster stations, and associated infrastructure.
"28. 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) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or* ***(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."*	The development will take place outside an urban area and will encompass more than 1 hectare of land to accommodate the expanded pipeline, reservoirs, and support structures needed for the KTE water supply project.
"45. The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure— *(i) has an internal diameter of 0,36 metres or more; or* *(ii) has a peak throughput of 120 litres per second or more; and*	The existing pipeline will be upgraded to almost double the capacity and extended by more than 1000 m (Appendix A).

(a) where the facility or infrastructure is expanded by more than 1 000 metres in length; or ***(b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more;*** *excluding where such expansion—* *(aa) relates to transportation of water or storm water within a road reserve or railway line reserve; or* *(bb) will occur within an urban area."*	
"48. The expansion of— *(i) canals where the canal is expanded by 100 square metres or more in size;* *(ii) channels where the channel is expanded by 100 square metres or more in size;* *(iii) bridges where the bridge is expanded by 100 square metres or more in size;* *(iv) dams, where the dam, including infrastructure and water surface area, is expanded by 100 square metres or more in size;* *(v) weirs, where the weir, including infrastructure and water surface area, is expanded by 100 square metres or more in size;* *(vi) bulk storm water outlet structures where the bulk storm water outlet structure is expanded by 100 square metres or more in size; or* *(vii) marinas where the marina is expanded by 100 square metres or more in size;* ***(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or*** *(ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more;* *where such expansion [or expansion and related operation] occurs—* ***(a) within a watercourse;*** *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;* *excluding—* *(aa) the expansion of infrastructure or structures within existing ports or harbours that will not*	The upgrade of the Lennerstville Water Treatment Plant by more than 100 m^2, the expansion (development) of additional transition concrete reservoirs and the upgrade and expansion of the De Bakke Reservoir and Booster Pump station which is less than 32 m from a watercourse.

increase the development footprint of the port or harbour; *(bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such expansion occurs within an urban area; or* *(ee) where such expansion occurs within existing roads, road reserves or railway line reserves*	
"50. The expansion of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, where the combined capacity will be increased by 50 000 cubic metres or more"	The proposed activity involves the expansion of off-stream water storage infrastructure, including the Lennertsville, Piet Rooi, De Bakke, Steyns Vley, and Uitkyk reservoirs, as part of the KTE water pipeline project. This expansion will collectively increase the storage capacity by over 50,000 cubic meters.
Listed activity as described in GN 325	Description of project activity
Listed activity as described in GN 324	Description of project activity
"*2. The development of reservoirs, [for bulk water supply] excluding dams, with a capacity of more than 250 cubic metres.* ***g. Northern Cape*** *i. In an estuary;* *ii. In a protected area identified in terms of NEMPAA, excluding conservancies;* *iii. Outside urban areas:* ***(aa) National Protected Area Expansion Strategy Focus areas;*** *(bb) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *(cc) Sites or areas identified in terms of an international convention;* ***(dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*** *(ee) Core areas in biosphere reserves;* *(ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of*	The proposed activity involves the development of multiple bulk water supply reservoirs, each exceeding 250 cubic meters in capacity, as part of the KTE water pipeline project.

NEMPAA or from the core area of a biosphere reserve; or *(gg) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or* *iv. Inside urban areas:* *(aa) Areas zoned for use as public open space;* *(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose; or* *(cc) Areas seawards of the development setback line or within urban protected areas."*	
"*12. 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.* ***g. Northern Cape*** *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;* ***ii. Within critical biodiversity areas identified in bioregional plans;*** *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* *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."*	The proposed activity involves the clearance of more than 300 square meters of indigenous vegetation to develop infrastructure for the KTE water pipeline project.
"14. The development of— *(i) canals exceeding 10 square metres in size ;* *(ii) channels exceeding 10 square metres in size;* *(iii) bridges exceeding 10 square metres in size;* *(iv) dams, where the dam, including infrastructure and water surface area exceeds 10 square metres in size;*	The proposed development includes the development of infrastructure (pipelines) that will exceed 10m^2, and is located less than 32 m from a watercourse.

(v) weirs, where the weir, including infrastructure and water surface area exceeds 10 square metres in size; *(vi) bulk storm water outlet structures exceeding 10 square metres in size;* *(vii) marinas exceeding 10square metres in size;* *(viii) jetties exceeding 10 square metres in size;* *(ix) slipways exceeding 10 square metres in size;* *(x) buildings exceeding 10 square metres in size;* *(xi) boardwalks exceeding 10 square metres in size; or* *(xii) infrastructure or structures with a physical footprint of 10 square metres or more;* *(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or* ***(ii) infrastructure or structures with a physical footprint of 10 square metres or more;*** *where such development occurs—* ***(a) within a watercourse;*** *(b) in front of a development setback; or* *(c) if no development setback has been adopted, within 32metres of a watercourse, measured from the edge of a watercourse;* *excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.* ***g. Northern Cape*** *i. In an estuary;* *ii. Outside urban areas:* *(aa) A protected area identified in terms of NEMPAA, excluding conservancies;* ***(bb) National Protected Area Expansion Strategy Focus areas;*** *(cc) World Heritage Sites;* *(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *(ee) Sites or areas identified in terms of an international convention;* ***(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic***	

biodiversity plans adopted by the competent authority or in bioregional plans; *(gg) Core areas in biosphere reserves;* *(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;* *(ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or* *iii. Inside urban areas:* *(aa) Areas zoned for use as public open space;* *(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or* *(cc) Areas seawards of the development setback line."*	
"23. The expansion of— *(i) canals where the canal is expanded by 10 square metres or more in size;* *(ii) channels where the channel is expanded by 10 square metres or more in size;* *(iii) bridges where the bridge is expanded by 10 square metres or more in size;* *(iv) dams where the dam is expanded by 10 square metres or more in size;* *(v) weirs where the weir is expanded by 10 square metres or more in size;* *(vi) bulk storm water outlet structures where the structure is expanded by 10 square metres or more in size;* *(vii) marinas where the marina is expanded by 10square metres or more in size;* *(viii) jetties where the jetty is expanded by 10 square metres or more in size;* *(ix) slipways where the slipway is expanded by 10 square metres or more in size;* *(x) buildings where the building is expanded by 10 square metres or more in size;* *(xi) boardwalks where the boardwalk is expanded by 10 square metres or more in size;* *(xii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more;*	The proposed development includes the expansion of existing infrastructure (pipelines) that will exceed 10m^2, and is located less than 32 m from a watercourse.

(i) dams or weirs where the dam or weir is expanded by 10 square metres or more; or ***(ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more;*** *where such [development] expansion occurs—* ***(a) within a watercourse;*** *(b) in front of a development setback adopted in theprescribed manner; or* *(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.* ***g. Northern Cape*** *i. In an estuary;* *ii. Outside urban areas:* *(aa) A protected area identified in terms of NEMPAA, excluding conservancies;* ***(bb) National Protected Area Expansion Strategy Focus areas;*** *(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *(dd) Sites or areas identified in terms of an international convention;* ***(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans****;* *(ff) Core areas in biosphere reserves;* *(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; or* *(hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or* *iii. Inside urban areas:* *(aa) Areas zoned for use as public open space; or* *(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by*	

the competent authority or zoned for a conservation purpose."	

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

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
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):**
Preferred Alternative		
• Proposed River Abstraction Site	28°44'13.27"S	20°59'1.65"E
• Proposed KTE Water Treatment Plant Site	28°45'28.59"S	20°59'49.59"E
• Piet Rooi Reservoir	28°59'35.82"S	21° 7'18.82"E
• R27 and railway crossing	29°19'48.43"S	21° 9'13.25"E
• Bend point at bridge	29°19'50.18"S	21° 8'46.37"E
• Hartebees River Crossing 1 bend	29°20'49.03"S	21° 8'46.13"E
• Hartebees River Crossing 2 bend	29°21'3.91"S	21° 8'14.10"E
• R27 Bend south of Kendhardt	29°21'50.81"S	21° 8'38.48"E
• KTE Booster Pump Station (De Bakke)	29°30'51.93"S	21° 1'9.47"E
• Turn off to Soafskolk Road	29°51'34.25"S	20°44'9.33"E
• Bend 1 (to follow road)	29°50'14.68"S	20°41'12.35"E
• Bend 2 (to follow road)	29°49'54.11"S	20°38'15.95"E
• Steyns Vlei Storage Reservoir	29°47'42.42"S	20°36'20.15"E
• Split to proposed evaporation ponds	29°49'19.22"S	20°37'45.62"E
• Bend 1 to follow road towards Karee Bosch Kolk intersection	29°55'34.98"S	20°23'51.72"E
• Bend 2 to follow road towards Karee Bosch Kolk intersection	29°57'46.01"S	20°23'37.38"E
• Karee Bosch Kolk intersection	29°58'23.21"S	20°22'43.20"E
• Bend at railway to follow the Sishen-Saldanha Railway line	29°56'39.50"S	20°13'34.34"E
• Bend to along the Sishen-Saldanha Railway line to go inland towards the proposed evaporation ponds	29°59'54.95"S	20° 9'21.97"E
• End point of the activity	29°58'20.12"S	20°08'52.83"E

Alternative 2 (if any)		
• Proposed River Abstraction Site	28°44'13.27"S	20°59'1.65"E
• Proposed KTE Water Treatment Plant Site	28°45'28.59"S	20°59'49.59"E
• Piet Rooi Reservoir	28°59'35.82"S	21° 7'18.82"E
• R27 and railway crossing	29°19'48.43"S	21° 9'13.25"E
• Bend point at bridge	29°19'50.18"S	21° 8'46.37"E
• Hartebees River Crossing 1 bend	29°20'49.03"S	21° 8'46.13"E
• Hartebees River Crossing 2 bend	29°21'3.91"S	21° 8'14.10"E
• R27 Bend south of Kendhardt	29°21'50.81"S	21° 8'38.48"E
• KTE Booster Pump Station (De Bakke)	29°30'51.93"S	21° 1'9.47"E
• Turn off to Soafskolk Road	29°51'34.25"S	20°44'9.33"E
• Bend 1 (to follow road)	29°50'14.68"S	20°41'12.35"E
• Bend 2 (to follow road)	29°49'54.11"S	20°38'15.95"E
• Steyns Vlei Storage Reservoir	29°47'42.42"S	20°36'20.15"E
• Split to proposed evaporation ponds	29°49'19.22"S	20°37'45.62"E

• Bend 1 to follow road towards Karee Bosch Kolk intersection	29°55'34.98"S	20°23'51.72"E
• Bend to move inland (west) before reaching the Karee Bosch Kolk intersection	29°56'9.51"S	20°23'44.29"E
• Bend to move southwest towards Bulsny	29°54'3.95"S	20°13'47.01"E
• Bend near Bulsny (south) towards the proposed evaporation ponds	29°57'10.64"S	20° 9'19.88"E
• End point of the activity	29°58'20.12"S	20°08'52.83"E

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) Lay-out alternatives

Alternative 1 (preferred alternative)
Description
The preferred route for the KTE pipeline has been selected based on its advantageous location and alignment. Starting from the site storage reservoir, this route closely follows existing road infrastructure for most of its length, deviating only slightly (approximately 4 kilometers) before reconnecting with the Sishen-Saldanha railway line. From this point, the pipeline will continue parallel to the railway, ultimately reaching the proposed evaporation ponds. This alignment offers logistical benefits, as the proximity to established roads and rail lines simplifies access for construction and maintenance. Additionally, the chosen route minimizes environmental impacts by staying close to pre-existing infrastructure corridors.

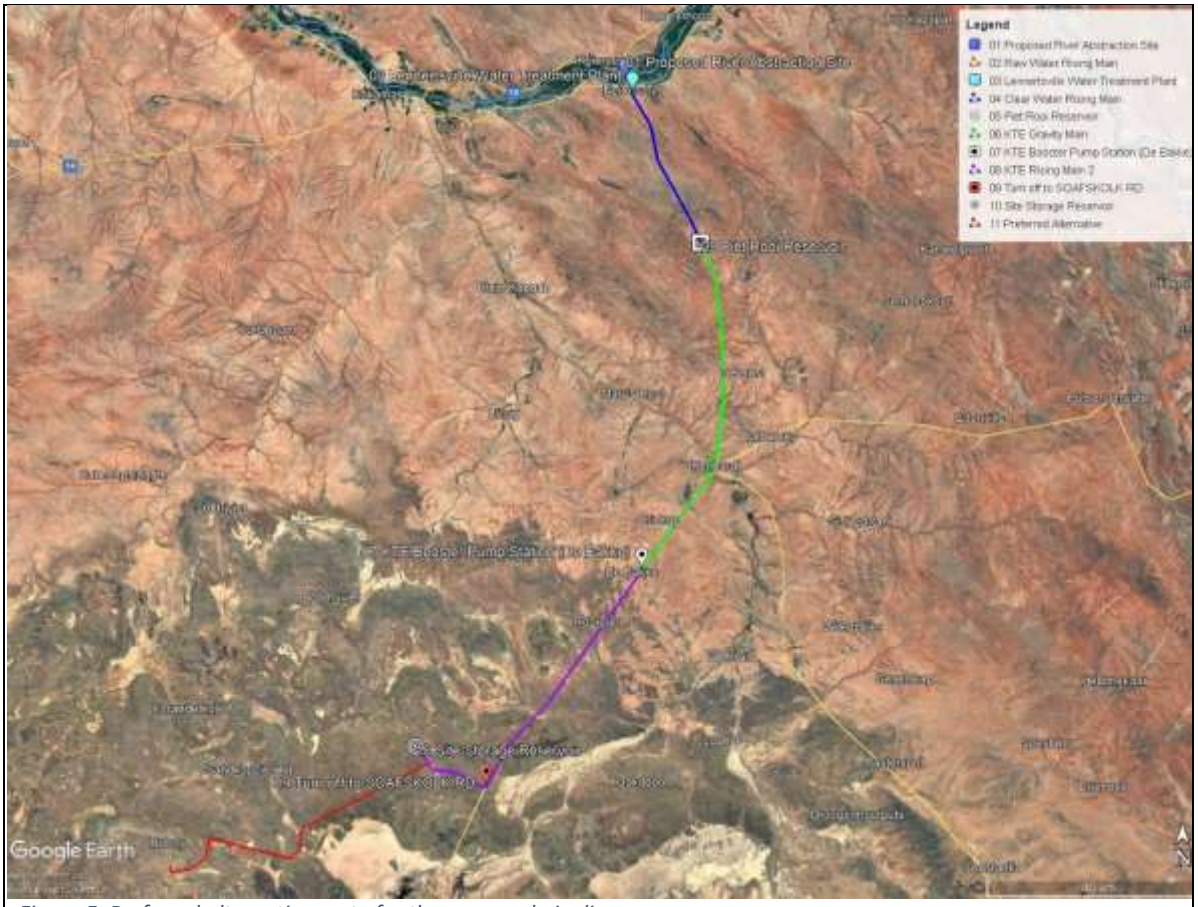


Figure 5. Preferred alternative route for the proposed pipeline.

Alternative 2
Description
Alternative 2 diverges significantly from established infrastructure, as it does not align with existing roads or the railway line for approximately 29 kilometers. This route traverses more challenging terrain, with a varied elevation profile and complex topography that would pose additional difficulties for the construction and maintenance thereof. Given these factors, Alternative 2 is less favorable, as the lack of accessible infrastructure would increase both the environmental footprint and the complexity of the project's implementation.

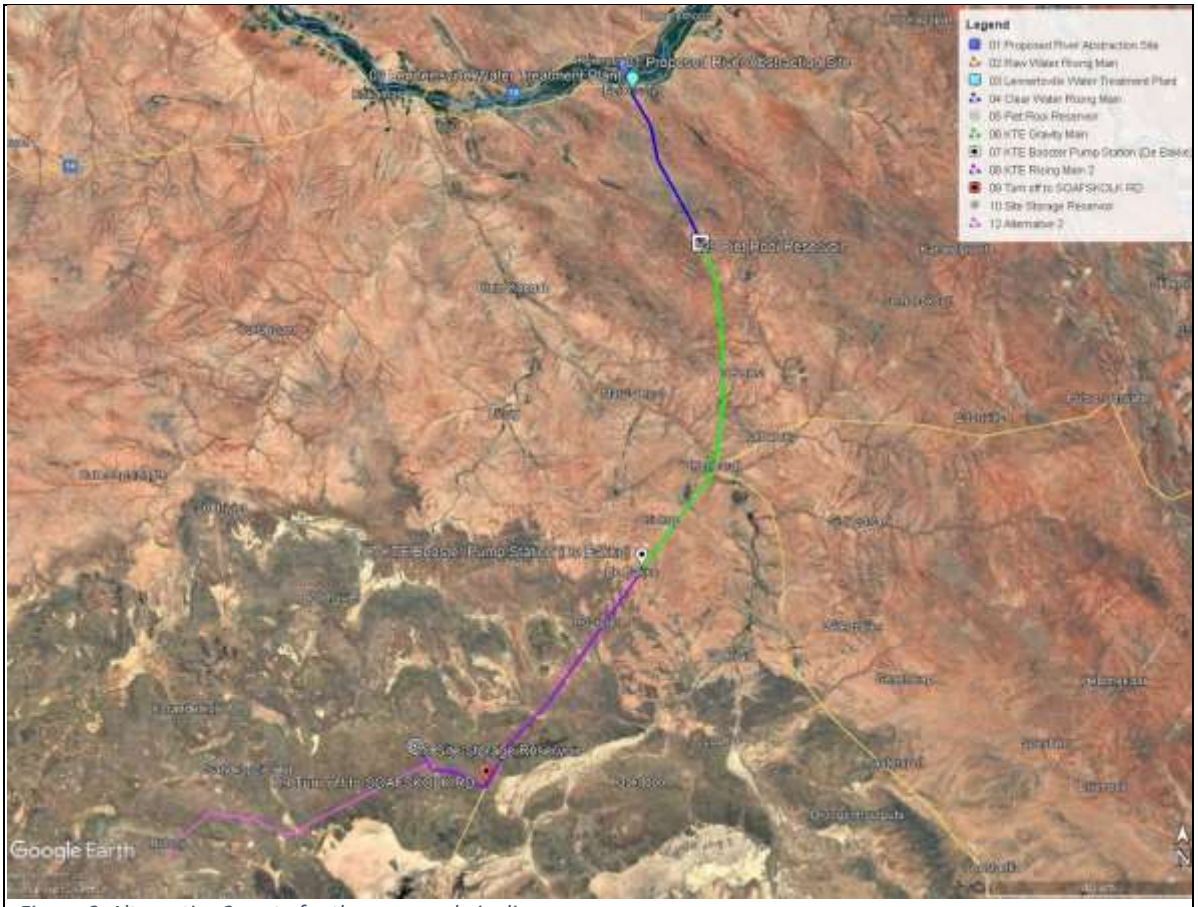


Figure 6. Alternative 2 route for the proposed pipeline.

Figure 7. Close up view of alternative 2 following no roads for approximately 29 km and the terrain thereof.		
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)
[redacted]		

c) Technology alternatives

No technology alternatives were considered.

Alternative 1 (preferred alternative)
Alternative 2
Alternative 3

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

No other alternatives were considered.

Alternative 1 (preferred alternative)		
Alternative 2		
Alternative 3		

e) No-go alternative

The "No-go alternative" refers to the scenario where the proposed development does not proceed. In this case, the region would continue relying on the existing, limited water supply infrastructure, which is inadequate to meet the growing water demands for local communities, agriculture, and renewable energy projects. This would perpetuate water scarcity issues in the area, negatively impacting socio-economic development, agriculture, and planned projects reliant on sufficient water access.

The no-go option would only have been recommended if it were found that the construction of the proposed pipelines and powerlines on this site or in this area might potentially cause substantial detrimental harm to the environment.

According to the Biodiversity and Terrestrial Compliance statement, the no-go alternative does not necessarily result in a no impact scenario. It will however result in a negative socio-economic impact and slow degradation might continue.

The status quo will be maintained, but veld will still be impacted by urban and agricultural related activities. Water is a basic right and all communities should have access to drinking water.

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:	**Size of the activity:**
Alternative A1[1] (preferred activity alternative)	[redacted]
Alternative A2 (if any)	
Alternative A3 (if any)	

or, for linear activities:

Alternative:	**Length of the activity:**
Alternative A1 (preferred activity alternative)	Approximately 220 km
Alternative A2 (if any)	Approximately 220 km

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

Alternative:	**Size of the site/servitude:**
Alternative A1 (preferred activity alternative)	[redacted]
Alternative A2 (if any)	
Alternative A3 (if any)	

4. SITE ACCESS

Does ready access to the site exist?	**YES** [redacted]
If NO, what is the distance over which a new access road will be built	m

Describe the type of access road planned:

Existing farm roads and access roads will be used.

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:

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

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- 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**	
The activity is the construction and upgrading of an existing pipeline and infrastructure across a number of properties. The pipeline will mostly be located in the road reserve and where it deviates it will mostly be located on Agriculture land and Municipal land.		
2. Will the activity be in line with the following?		
(a) Provincial Spatial Development Framework (PSDF)	**YES**	
The proposed **221 km KTE water pipeline development and expansion** appear to align well with the goals and priorities outlined in the NCPSDF[2]: 1. **Infrastructure Development**: The NCPSDF emphasises the development of essential infrastructure to promote economic resilience and quality of life in rural areas. By expanding the water supply network, this project provides a critical utility that supports both community needs and potential agricultural and industrial activities, particularly in areas like Kenhardt where water scarcity can limit growth. 2. **Sustainable Resource Use**: By sourcing water from the Orange River and implementing a comprehensive pipeline and reservoir system, the project appears to be designed to maximise water distribution efficiency. This aligns with the NCPSDF's focus on managing water resources effectively in a water-scarce region. 3. **Strategic Alignment with Transport Corridors**: By following routes like the **R27** and **Soafsklok road reserves** where possible, and integrating with the **Sishen-Saldanha railway line**, the project supports the NCPSDF's emphasis on developing infrastructure along existing transportation and utility corridors, which minimises environmental impact and optimises access for maintenance and future development. Overall, this project seems to align strongly with the objectives of the Northern Cape Spatial Development Framework by promoting water security, infrastructure development, and sustainable resource use within the province.		
(b) Urban edge / Edge of Built environment for the area		NO
Based on the position of the pipeline as described in section 1a), the project remains in rural or agricultural zones and should not infringe on any urban edge regulations.		

[2] http://www.northern-cape.gov.za/index.php/psdf/psdf-2020#

(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**	

Alignment with the Municipal IDP:

The proposed development aligns with the broader objectives of both the Kai! Garib[3] and Hantam[4] Local Municipalities' Integrated Development Plans (IDPs), which emphasise infrastructure development, water security, and sustainable service delivery. The pipeline project is designed to enhance water distribution efficiency, which supports these municipalities' goals of improving access to essential resources and promoting economic growth, especially in rural communities. The project also contributes to regional development by integrating with existing transport routes, thus minimising additional environmental impact.

Impact on the Municipal SDF:

Since the pipeline infrastructure primarily involves underground development, it will not impose any restrictions on above-ground land use. This means it does not conflict with the municipalities' Spatial Development Frameworks (SDFs), as the land can continue to support surface-level developments in alignment with the existing and planned land-use objectives. Consequently, the approval of this application will not compromise the integrity of the municipalities' approved SDFs.

(d) Approved Structure Plan of the Municipality	**YES**	

The alignment with infrastructure corridors such as roads and railways (e.g., the R27 and Sishen-Saldanha railway line) aligns with the structure plan principles, as it minimizes environmental impact and maximizes efficient land use.

The underground placement of the pipeline ensures that it does not limit above-ground land use or interfere with existing zoned areas, allowing for continued compliance with the intended land-use zoning and development within these municipalities.

Thus, the proposed development respects and upholds the structure plan objectives by enhancing infrastructure without disrupting the planned spatial layout or land-use priorities. This ensures alignment with both municipalities' structure plans.

[3] https://www.kaigarib.gov.za/idp-2023-2024/

[4] https://www.hantam.gov.za/wp-content/uploads/2023/07/Finale-Hantam-IDP-2023-2024-2.pdf

(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**	

The proposed development will align with the priorities and guidelines established in the Siyanda District Municipality Environmental Management Framework (EMF)[5], as it has been designed to address water distribution in a manner that considers environmental and sustainability principles, which are key to the EMF's objectives.

The Siyanda EMF prioritises sustainable resource management, minimal environmental impact, and the integration of infrastructure with natural systems. The proposed KTE pipeline:

- Follows existing infrastructure corridors (such as roads and railway lines), which helps reduce habitat fragmentation and minimises the ecological footprint
- Focuses on sustainable water distribution, which supports the EMF's goals of ensuring efficient resource use in a water-scarce area. By enhancing water availability without creating new demands on water extraction, the pipeline supports resilience in local water supply, a priority in the EMF
- Maintains above-ground land use compatibility as the pipeline is primarily underground, meaning it does not interfere with surface-level land uses and allows for continued biodiversity and ecological connectivity (where applicable)

Approval of this application can be justified on sustainability grounds, as it meets the framework's objectives of resource efficiency.

(f) Any other Plans (e.g. Guide Plan)	

N/A

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**	

The IDPs and SDFs of these municipalities identify water infrastructure and supply improvements as critical priorities to support socio-economic development, service delivery, and sustainable resource management. The proposed development directly contributes to these objectives by ensuring reliable water distribution across the municipalities, supporting residential, agricultural, and potential industrial needs, which aligns with the SDF's projected infrastructure goals.

Moreover, the proposed development's integration with existing transportation corridors and minimal disruption to above-ground land use ensure that the development respects the spatial planning intentions. Therefore, this proposed development/expansion falls within the SDF's planned timeframe and meets the IDPs' prioritisation of essential infrastructure upgrades, aligning with the credible and approved municipal development frameworks.

[5] https://screening.environment.gov.za/ScreeningDownloads/EMF/SIYANDA_EMF_REPORT_2008.pdf

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**	
The KTE pipeline expansion addresses a critical need at both the strategic and local levels, aligning it as a societal priority: 1. Strategic Level: At a provincial and national level, water infrastructure is essential for resilience in arid regions like the Northern Cape. National frameworks, such as the National Development Plan and Northern Cape Provincial Spatial Development Framework (PSDF), prioritise sustainable water supply as **fundamental** to supporting socio-economic growth, particularly in water-scarce areas. This pipeline directly addresses these strategic priorities by enhancing water distribution in the region. 2. Local Level: Within the Kai! Garib and Hantam Local Municipalities, water scarcity significantly impacts community well-being, agricultural activity, and potential economic development. The pipeline's expanded capacity will improve water security for residents, support local agricultural and commercial activities, and enable potential future developments without placing additional strain on limited water resources. Local IDPs have also emphasised the need for improved basic services and infrastructure to uplift community standards, making this pipeline a crucial investment. Given these factors, the pipeline is not only strategically significant but also a necessary development at the local level, meeting both immediate and long-term societal needs within the context of sustainable resource management.			
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.)		**NO**	
No additional services will be required from the local authority.			
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.)		**NO**	
No additional services will be required from the local authority.			
7. Is this project part of a national programme to address an issue of national concern or importance?		**YES**	
Sufficient and functioning basic services, including water provision, is a national concern.			

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**	

The pipeline's route strategically begins at the Orange River, a reliable and sustainable water source, and extends through areas with critical water supply needs, such as Kenhardt and surrounding communities.

The route largely follows existing infrastructure corridors, such as the R27 road and the Sishen-Saldanha railway line, minimizing environmental impact and ensuring efficient land use. This approach reduces habitat disturbance and eases construction and maintenance logistics, aligning with best practices in sustainable development.

Additionally, the pipeline's location is consistent with regional and municipal IDP's, which prioritize infrastructure development to support socio-economic growth and resilience in water-scarce areas. These factors collectively demonstrate that the location is well-suited for the proposed activity within its broader environmental, social, and economic context.

9. Is the development the best practicable environmental option for this land/site?	**YES**	

The proposed development represents the best practicable environmental option for this land/site. The project is designed to address critical water supply challenges in the region while minimizing environmental impact through strategic planning and alignment with existing infrastructure corridors, such as the R27 road and Sishen-Saldanha railway line. By following these routes, the pipeline reduces habitat disturbance, avoids ecologically sensitive areas where possible, and ensures efficient land use.

The pipeline will provide long-term socio-economic benefits and community water needs in an arid region. It also aligns with regional and national strategies for sustainable development, such as the National Development Plan (NDP 2030) and local spatial development frameworks.

Alternative scenarios, such as maintaining the status quo ("No-go alternative"), would fail to address water scarcity and could worsen socio-economic challenges in the region. Therefore, the development balances environmental, social, and economic considerations, making it the most viable and sustainable option for this site.

10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	**YES**	
The project will better water supply in the region, addressing critical shortages. This enhanced water availability will foster socio-economic growth, support local livelihoods, and enable sustainable development in an arid area with limited resources. While the project has potential negative impacts, such as habitat disturbance, watercourse crossings, and temporary construction-related disruptions, these are being mitigated through careful planning, adherence to environmental management plans, and alignment with existing infrastructure corridors to minimise ecological and social harm. The socio-economic benefits, including job creation during construction and enhanced agricultural productivity, combined with the project's alignment with local and regional development priorities, make the proposed land use a net positive for the region. Thus, the advantages far outweigh the manageable negative impacts.		
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?		
N/A		
12. Will any person's rights be negatively affected by the proposed activity/ies?	**NO**	
No person's rights are expected to be negatively affected by the proposed development. The activity is expected to have a general positive impact on the surrounding area.		
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	**NO**	
No, the proposed pipeline activities will not compromise the urban edge as defined by the Kai! Garib and Hantam Local Municipalities. The pipeline project is primarily routed through rural and agricultural areas, extending from the Orange River near Neilersdrift to Farm Uitkyk, and is largely underground. It does not introduce urban-type developments or sprawl that would extend or infringe upon urban boundaries.		
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	**NO**	

15. What will the benefits be to society in general and to the local communities?	Please explain
The project will provide job opportunities during the construction and the operational phase. This development has the potential to provide an economic injection in the local community, by means of creating employment opportunities. Most importantly, it will provide reliable and additional water capacity to the town of Kenhardt, thereby supplying the town of Brandvlei with water as well, with the proposed Brandvlei pipeline running from Kenhardt to Brandvlei (Separate application).	

16. Any other need and desirability considerations related to the proposed activity?	Please explain

The proposed KTE pipeline project addresses critical water supply challenges in the region, fulfilling both local and regional needs. The Northern Cape is characterized by its arid climate and water scarcity, which hinder socio-economic development and agricultural productivity. The pipeline's development ensures a reliable water supply to **Kenhardt** and other surrounding areas, directly supporting agricultural activities, renewable energy projects, and community water needs.

Moreover, the pipeline aligns with strategic planning frameworks, such as the **National Development Plan (NDP 2030)** and local Integrated Development Plans (IDPs), which prioritize infrastructure development to enhance water security and sustainability. The project also leverages existing infrastructure corridors, such as roads and railway reserves, minimizing environmental impacts while addressing an urgent demand for improved water infrastructure.

17. How does the project fit into the National Development Plan for 2030?	Please explain

The proposed development aligns closely with several objectives outlined in the National Development Plan (NDP) 2030, which emphasises sustainable development, resource management, and economic inclusion:

1. Addressing Infrastructure Deficits:

- The NDP identifies infrastructure as a critical driver of economic growth and social development. By expanding water supply infrastructure in a water-scarce region, the pipeline addresses a key need for reliable access to water, enabling sustainable agricultural activities, supporting communities, and improving resilience in the Northern Cape.

2. Water Security and Resource Management:

Chapter 5 of the NDP highlights the importance of managing South Africa's water resources sustainably. The KTE pipeline facilitates efficient water distribution, reducing reliance on localised water sources and enhancing long-term water security in an arid area.

3. Rural Development and Inclusion:

- The NDP prioritises rural development and equitable access to basic services. The pipeline project directly supports rural communities like those in **Kenhardt**, enhancing access to water for domestic, agricultural, and economic use, which can uplift local living conditions and drive socio-economic development.

4. Job Creation and Economic Growth:

- Infrastructure projects like this pipeline contribute to the creation of jobs during construction and maintenance phases. In line with the NDP's goals to reduce unemployment and stimulate local economies, this project has the potential to catalyse economic activities and improve livelihoods in the region.

5. Sustainable Development:

- The project's alignment with existing infrastructure corridors minimizes its environmental footprint, reflecting the NDP's emphasis on sustainability.

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 have been taken into account through the following:

Promoting Sustainable Development:

The project ensures the efficient use of water resources by facilitating distribution from the Orange River to areas where water scarcity affects community well-being and development. This aligns with sustainable development principles by addressing a critical societal need while maintaining ecological balance.

Considering Environmental, Social, and Economic Impacts:

Comprehensive environmental assessments, including the use of **Environmental Management Frameworks (EMFs)** and specialist studies have been conducted to identify and mitigate potential impacts on biodiversity, ecosystems, and communities. The project minimises disruption by following existing infrastructure corridors.

Ensuring Participation:

Adequate and appropriate opportunity for public participation was ensured through the public participation process, ensuring that **Interested and Affected Parties (I&APs)** had the opportunity to raise concerns or submit comments to the EAP.

Promoting the Integration of Environmental Management:

The project has been designed to align with regional planning instruments such as the municipal IDPs, ensuring coherence with broader environmental and development frameworks.

Minimising Environmental Impact:

The route of the pipeline largely follows existing transport corridors (e.g., road reserves and railway lines), significantly reducing habitat fragmentation and land-use disruption. Measures have also been taken to mitigate impacts on critical biodiversity areas identified along the route.

Aligning with Strategic Priorities:

The project supports national priorities such as water security, infrastructure development, and socio-economic upliftment in rural areas. This aligns with NEMA's objectives of fostering development that benefits both people and the environment.

Providing for Transparency and Accountability:

Documentation and reporting requirements associated with the EIA process ensure that decision-making is transparent, with clear accountability mechanisms to address compliance with NEMA and other relevant legislation.

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 set out in section 2 of NEMA have been taken into account. The principles pertinent to this activity include:

1. **Sustainable Development**:
   The project is designed to meet critical water needs in water-scarce communities, addressing both current and future demands without compromising the environment.
2. **Precautionary Principle:**
   A precautionary approach was taken in planning, including route selection to avoid sensitive areas where possible.
3. **Environmental Justice:**
   By improving water access in underserved rural areas, the project supports environmental justice, ensuring that communities in need benefit equitably from infrastructure development without bearing disproportionate environmental costs.
4. **Public Participation and Transparency:**
   The project adheres to NEMA's public participation requirements, involving Interested and Affected Parties (I&APs) through consultation and feedback processes to ensure transparency and community involvement in decision-making.
5. **Biodiversity Conservation:**
   The route was chosen to minimise impacts on biodiversity, avoiding ecologically sensitive areas and utilising existing transport corridors to reduce habitat fragmentation.
6. **Responsible and Transparent Decision-Making:**
   Environmental and impact assessments were conducted in accordance with legal requirements, providing decision-makers with comprehensive, transparent information on potential impacts and mitigation strategies.
7. **Integrated Environmental Management:**
   The project aligns with regional environmental frameworks, including the Siyanda EMF and municipality IDP's, to ensure that it supports broader environmental management goals within the district.

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 Water Act	Water Use Licence (Appendix J)	Department of Water and Sanitation	TBC
Northern Cape Nature Conservation Act, Act 9 of 2009	NCNCA Protected plant species located on the site	Department of Environment and Nature Conservation (DENC)	TBC

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES ☐
If YES, what estimated quantity will be produced per month?	m^3

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

The general solid waste will be adequately disposed of as per the Environmental Management Program (Appendix G).

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

The general solid waste generated during construction will be consolidated on site during construction and disposed of at the nearest approved municipal landfill site

Will the activity produce solid waste during its operational phase?	☐ NO
If YES, what estimated quantity will be produced per month?	m^3

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

N/A

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

N/A

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

N/A

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? ☐ **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? ☐ **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?	☐ 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?	☐ 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? [redacted] **NO**

If YES, provide the particulars of the facility:

Facility name:	[redacted]
Contact person:	
Postal address:	
Postal code:	
Telephone:	**Cell:**
E-mail:	**Fax:**

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

N/A

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other that exhaust emissions and dust associated with construction phase activities? **NO** [redacted]

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:

N/A

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA? [redacted] **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? **NO** [redacted]

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

Describe the noise in terms of type and level:

The activity is not expected to produce significant noise that would be a nuisance to any nearby residents.

13. WATER USE

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

	River, stream, dam or lake	

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:	10 950 000 m3/a
Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?	**YES**

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

14. ENERGY EFFICIENCY

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

N/A

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

N/A

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. 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): ☐

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

3. Has a specialist been consulted to assist with the completion of this section? **YES** ☐

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	ZF Mgcawu & Namakwa District Municipalities	
Local Municipality	Kai! Garib & Hantam Local Muncipalities	
Ward Number(s)	Kai! Garib Municipality: Wards 5 & 9 Hantam Municipality: Wards 3	
Farm name and number	Farm Neilers Drift No. 34 Farm Piet Roois Puts No. 56 Farm No. 1049 Farm De Bakke No. 186 Farm Styns Vley No. 280 Farm Kopjes Vlei No. 281 Farm Gemsboks Rivier No. 301 Farm Karee Bosch Kolk No.329 Farm Bysteek No. 423 Farm Uitkyk No. 889	
Portion number	Portion 103 of the Farm Neilers Drift No. 34 Portion 213 of the Farm Neilers Drift No. 34 Portion 2 of the Farm Piet Roois Puts No. 56 The Remainder of Farm No. 1049 Portion 2 of the Farm De Bakke No. 186 Portion 2 of the Farm Styns Vley No. 280 Portion 1 of the Farm Gemsboks Rivier No. 301 Portion 2 of the Farm Kopjes Vley No. 281 The Remainder of the Farm Karee Bosch Kolk No.329 Farm Bysteek No. 423 Portion 1 of the Farm Uitkyk No. 889	
SG Code	**Farm**	**SG Code**
	Portion 213 of the Farm Neilers Drift No. 34	C03600000000003400213
	Portion 103 of the Farm Neilers Drift No. 34	C03600000000003400103
	Portion 2 of the Farm Piet Roois Puts No. 56	C03600000000005600056
	The Remainder of Farm No. 1049	C03600100000104900000
	Portion 2 of the Farm De Bakke No. 186	C03600000000018600002
	Portion 2 of the Farm Styns Vley No. 280	C03600000000028000002
	Portion 1 of the Farm Gemsboks Rivier No. 301	C03600000000030100001
	Portion 2 of the Farm Kopjes Vley No. 281	C03600000000028100002
	The Remainder of the Farm Karee Bosch Kolk No.329	C03600000000032900000
	Farm Bysteek No. 423	C03600000000042300000
	Portion 1 of the Farm Uitkyk No. 889	C01500000000088900001

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:	The pipeline will mostly be located in the road reserve and where it deviates, it will be mostly located on Agriculture land and municipal land.

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**

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

	1:50 – 1:20	

Alternative S2 (if any):

	1:50 – 1:20	

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	**x**
2.2 Plateau		2.5 Open valley		2.8 Dune	
2.3 Side slope of hill/mountain		2.6 Plain	**x**	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):**	
Shallow water table (less than 1.5m deep)		**NO**		**NO**
Dolomite, sinkhole or doline areas		**NO**		**NO**
Seasonally wet soils (often close to water bodies)	**YES**		**YES**	
Unstable rocky slopes or steep slopes with loose soil		**NO**		**NO**
Dispersive soils (soils that dissolve in water)		**NO**		**NO**
Soils with high clay content (clay fraction more than 40%)		**NO**		**NO**

Any other unstable soil or geological feature		NO		NO
An area sensitive to erosion		NO		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. GROUNDCOVER

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]**			
	Cultivated land		**Building or other structure**	**Bare soil**

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

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

Perennial River: The pipeline abstracts water from the **Orange River**, a perennial river that serves as a major water resource in the region.
Non-Perennial River: The pipeline crosses several non-perennial rivers, including the **Hartbees River** and other smaller episodic watercourses, which flow during seasonal rainfall or significant storm events (Appendix D4).
Seasonal Wetland: The route encounters drainage lines and pans.

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**	
		Agriculture
		River, stream or wetland
	Railway line [N]	
		Archaeological site

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:

The land use character of the surrounding area are expected to have no long-term impact. Temporary construction impacts, such as safety risks and potential disruption at crossing points, will be managed through coordination with the railway authority and adherence to safety protocols. The pipeline's alignment along the railway corridor optimises land use and minimises additional environmental disturbance. In the operational phase, the underground pipeline will not interfere with the railway's functioning, ensuring compatibility and efficient co-existence of both infrastructure types.

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:

No impacts are expected

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:

No impacts are expected

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

Critical Biodiversity Area (as per provincial conservation plan)	**YES**	
Core area of a protected area?		**NO**
Buffer area of a protected area?		**NO**
Planned expansion area of an existing protected area?	**YES**	
Existing offset area associated with a previous Environmental Authorisation?		**NO**
Buffer area of the SKA?		**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:	YES	

According to the Heritage Impact Assessment (HIA) (Appendix D5), there are culturally and historically significant elements, as defined in Section 2 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), located close to the development site. These include historical features such as irrigation furrows dating back to the early 1900s, which are situated near the pipeline route but outside the immediate 20-meter zone.

Additionally, a British military observation post, has been identified near the proposed alignment, necessitating the implementation of safety buffers to protect it during construction activities.

The HIA also identified a grave and a fenced off cemetery near the development footprint. These sites are considered to be of importance and worthy of conservation. The presence of these elements highlights the importance of implementing mitigation measures, including heritage monitoring during construction. Should any previously unidentified heritage resources be discovered during excavation, they must be reported to the South African Heritage Resources Agency (SAHRA) for further investigation and management.

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

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.		NO
	YES	

Section 38 (1) (a) of the Act also stipulates that any person constructing a powerline, pipeline or road, or similar linear development or barrier exceeding 300m in length is required to notify the responsible heritage resources authority, who will in turn advise whether an impact assessment report is needed before development can take place.

The project is therefore subject to Section 38(1) of the NHRA. The project has been registered with SAHRA through SAHRIS.

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:

In both the Kai! Garib and Hantam Local Municipalities, unemployment rates are high, reflecting the broader economic challenges of rural areas in the Northern Cape. Within the Hantam Local Municipality, unemployment rates decreased by 4.3% to the lowest provincial unemployment figures in 14 years. Seasonal employment, particularly in agriculture along the Orange River and livestock farming, provides temporary relief but does not adequately address structural unemployment. Many residents depend on social grants as a primary source of income, highlighting limited economic opportunities and the need for job creation initiatives.

Economic profile of local municipality:

In both the Kai !Garib and Hantam Local Municipalities, unemployment rates are high, reflecting the broader economic challenges of rural areas in the Northern Cape. Seasonal employment, particularly in agriculture along the Orange River and livestock farming, provides temporary relief but does not adequately address structural unemployment. Many residents depend on social grants as a primary source of income, highlighting limited economic opportunities and the need for job creation initiatives.

Level of education:

Education levels in both municipalities are low, with many residents having completed only primary education. This limits access to skilled job opportunities and perpetuates cycles of poverty. In remote areas, access to quality education remains a significant challenge, and the lack of formal qualifications among the workforce restricts local economic development. Addressing these educational barriers is crucial for improving socio-economic outcomes and leveraging emerging opportunities in sectors like renewable energy.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R4.3 billion	
What is the expected yearly income that will be generated by or as a result of the activity?	R357 billion	
Will the activity contribute to service infrastructure?	**YES**	
Is the activity a public amenity?		**NO**
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Approximately 300	
What is the expected value of the employment opportunities during the development and construction phase?	R5 billion	
What percentage of this will accrue to previously disadvantaged individuals?	60%	
How many permanent new employment opportunities will be created during the operational phase of the activity?	Approximately 300	

What is the expected current value of the employment opportunities during the first 10 years?	R5 million
What percentage of this will accrue to previously disadvantaged individuals?	60%

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)**		The proposed development is located within a CBA, ESA and other natural areas according to SANBI BGIS (Figure 8). Please refer to section 4.3 in the Botanical & Terrestrial Biodiversity Compliance Statement (Appendix D3).

According to the Botanical & Terrestrial Biodiversity Compliance Statement (Appendix D3) the proposed pipeline and its associated infrastructure is likely to impact on critical biodiversity areas (CBA's) and ecological support areas (ESA's). The reasons for assigning this CBA, and ESA are not clearly explained in the GIS layers, but according to information given in Critical Biodiversity Areas of the Northern Cape: Technical Report (Holness & Oosthuysen, 2016) all areas in close proximity of larger rivers were prioritized and all NFEPA (National Freshwater Ecosystem Priority Areas) rivers were given a minimum category of CBA as were areas of specific important bird areas (IBA). Areas of special habitats (e.g. rocky outcrops, koppies, dolerite dykes, boulder fields, woody vegetation on outwash plains etc.) were included with a 50% target and ESA status as minimum.

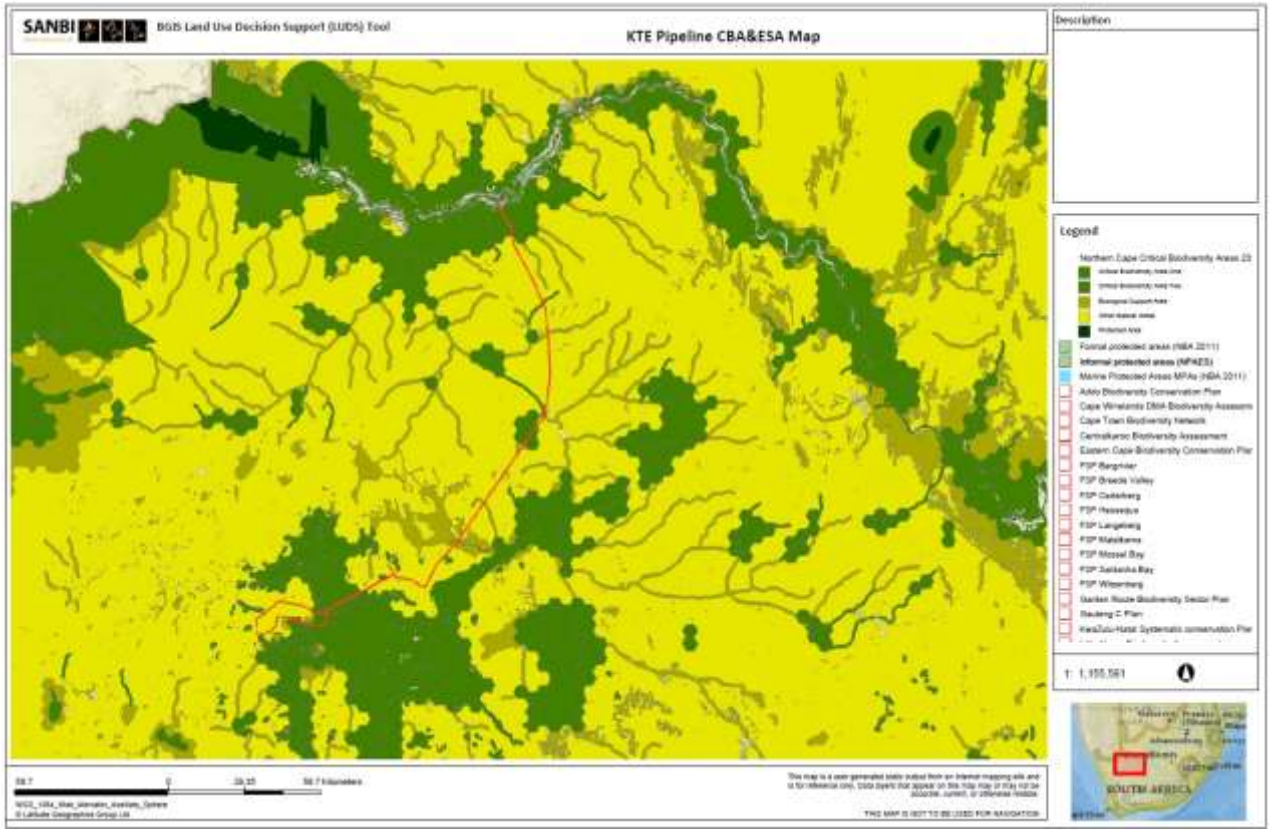


Figure 8. The proposed development (red line) crossing CBA's, ESA's and other natural areas as per the SANBI NC Critical Biodiversity Areas Map.

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	15%	According to the Botanical & Terrestrial Compliance statement (Appendix D3), the route passes through areas of relatively undisturbed natural vegetation, including **Bushmanland Arid Grassland** and **Lower Gariep Broken Veld**, particularly in sections farther from roads and settlements. These areas are in good ecological condition but are subject to localized grazing.
Near Natural (includes areas with low to moderate level of alien invasive plants)	50%	Areas along the pipeline route exhibit a low to moderate presence of alien invasive plants, particularly near road reserves and watercourses. The pipeline will be mostly located within the road reserve.
Degraded (includes areas heavily invaded by alien plants)	10%	According to the Freshwater Report (Appendix D4) and the Botanical & Terrestrial Compliance statement (Appendix D3), Degraded areas are associated with disturbed watercourses, drainage lines, and road verges where heavy grazing, erosion, and some invasive species (e.g., Prosopis) are evident.

Transformed (includes cultivation, dams, urban, plantation, roads, etc)	25%	Includes cultivated lands near the Orange River abstraction point, the R27 road, and the railway line, where land use has permanently altered natural habitats.

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)	[redacted]	Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)		Estuary		Coastline	
	Least Threatened	**YES**	[redacted]	**NO**	[redacted]		**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)

According to the Botanical & Terrestrial Compliance statement (Appendix D3), the vegetation assessment follows the pipeline route from its extraction point at the Orange River southwards until it reaches the reservoir located on the Farm Uitkyk, No. 899.

1) Orange river extraction point to WTW

The proposed extraction point, and its associated pump station will be located just north of Neilersdrif (Keimoes), at the same location as the existing pump station for the Kenhardt pipeline (the footprint of the existing pump station will be enlarged). Lower Gariep Alluvial Vegetation (Figure 9) was expected in this area, however, the riparian vegetation along the river in this area, had been totally compromised as a result of past and present agricultural activities (vineyards) and associated anthropogenic activities. No natural veld remains in this area. The only plants remaining in this area were several planted Palm trees,a few weedy indigenous species such as *Convolvulus sagittatus* (bobbejaantou), *Salsola kali* and weedy invader species such as *Argemone ochroleuca* (white Mexican poppy), *Nicotiana glauca* (tabakboom), *Melia azedarach* (seringboom).

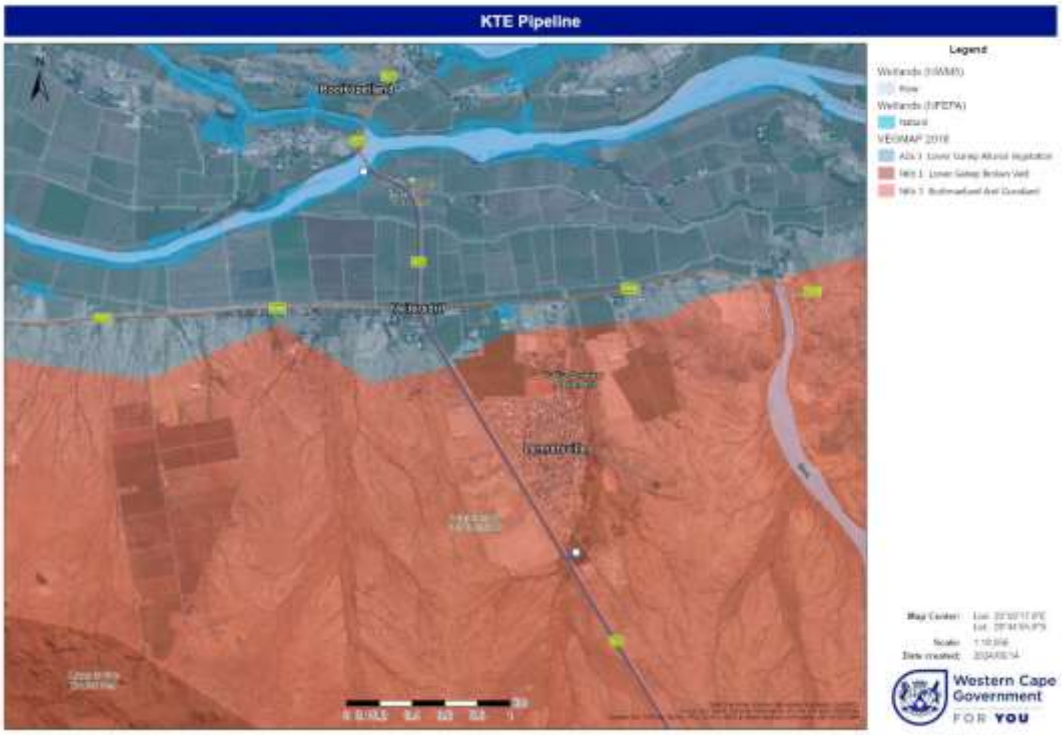


Figure 9. Vegetation map of South Africa (2018) showing the first section of the pipeline route (CapeFarmMapper).

Because of agricultural and urban development, the first section of the pipeline route up to the Lennertsville WTW can only be described as transformed with no natural veld. However, two Vachellia erioloba (camelthorn) trees are located within the road reserve within which the pipeline will be placed. One of these trees are a magnificent specimen of 10-12m in height. All efforts should be made to avoid impacting this tree.

2) Lennertsville WTW

According to the Botanical & Terrestrial Compliance statement (Appendix D3), raw water will be extracted from the Orange River and pumped to a Water Treatment Works (WTW) that will be located next to the existing Kenhardt WTW, just north of Lennertsville. Here, the raw water will be treated to potable water standards before being pumped to a balancing reservoir at Piet Rooi's Puts. The area that will be impacted by the new WTW & Reservoir at Lennertsville will be between 2 – 3 ha in size. Two potential locations for the proposed WTW were evaluated, one to north of the existing Kenhardt WTW, next to Lennertsville (the preferred location) and the other to the south of the Kenhardt WTW (Figure 10).

Figure 10. Google image showing the study area (yellow) for the proposed WTW, the routes walked (light blue) and the locations of species of potential conservation concern (marked by waypoints). The waypoints refers to: Euphorbia = Euphorbia braunsii; Bfoet = Boscia foetida individuals (Derived from the Botanical and Terrestrial Biodiversity Compliance Statement).

A large portion of the area to the north of the existing Kenhardt WTW was characterized by dense stands of *Senegalia mellifera* and alien invasive *Prosopis* trees, in the wetter areas that seems to receive overflow water spilling from the evaporation ponds from the Kenhardt WTW. The site itself showed various signs of disturbance, which includes physical disturbances and illegal dumping. In general, this area was quite disturbed as a result of continual human impact and included many weedy species such as *Erigeron sumatrensis* (tall fleabane), *Tribulus zeyheri* and *Senecio* species. The occasional *Chascanum garipense*, *Tetraena decumbens*, *Phaeoptilum spinosum*, and *Aptosimum indivisum* were observed in between the grass dominated bottom layer (e.g. *Stipagrostis ciliata* and *Fingerhuthia africana*), but no species of conservation concern was observed in this area. The area to the south of the Kenhardt WTW includes several fenced-off local dwellings (which might be illegal settlement), which had resulted in a disturbance footprint impacting about three quarters of this area.

3) Bushmanland arid grassland section of the R27

According to the Botanical & Terrestrial Compliance statement (Appendix D3), from the Lennertsville WTW the proposed BWS pipeline will be placed in the western road reserve of the R27, running south, towards the balancing reservoir at Piet Rooi's Puts, past Kenhardt and onto the De Bakke pump station and reservoir. The De Bakke pump station and reservoir is located almost at the point where Bushmanland Arid Grassland is replaced by Bushmanland Basin Shrubland vegetation (Figure 11). This section of discusses the vegetation encountered along the R26 covered by Bushmanland Arid Grassland.

Figure 11.Vegetation map of South Africa (2018), showing the expected vegetation types along the pipeline route (CapeFarmMapper).

The R27 road reserve (for its whole length) is purposely cleared of larger vegetation to improve visibility and in so doing lowering the risk of road accidents (e.g. larger animals sheltering and grazing within the road reserve). As a result, all along the R27 the vegetation is generally short and the only larger shrubs remaining are mainly protected *Boscia* species and the *Botanical* occasional indigenous tree, including quite a number of protected *Vachellia erioloba* (camelthorn) trees, some of them magnificent individuals reaching up to 10 m as well as the occasional other indigenous tree such as *Ziziphus mucronata* (blinkblaar wag-'n-bietjie). Whereas the *Boscia albitrunca* and *Boscia foetida* individuals are scattered all along the R27 road reserve in areas associated with Bushmanland Arid Grassland, the *Vachellia erioloba* trees are associated with deeper sandy soils of the Gordonia Duneveld or larger watercourses. The first patch of these trees are found about 7.5 km south of Lennertsville (Gordonia Duneveld), the second area (about 3 trees) about 33km further south. The greatest concentration of these trees are within the last 27 km going south towards Kenhardt (most of which were associated with the various watercourse in the N'Rougas North and South areas).

The vegetation assessment identified over 70 Vachellia erioloba (camel thorn) trees within the road reserve along the R27, stretching from the Orange River to south of Kenhardt, with only three trees observed south of Kenhardt. Among these, 40–45 individuals exceed 6m in height, including 17 significant, large specimens. Importantly, the pipeline can be positioned to avoid impacting these trees. Additionally, one dead individual of Sensitive Species 144 was noted, with no other living individuals observed within the road reserve.

Due to regular brush-cutting in the road reserve, the natural shrub layer has been largely compromised, favoring grasses and disturbance-tolerant annual plants. Observed low shrubs and herbs include species such as Aizoon burchellii, Aptosimum indivisum, Blepharis mitrata, Justicia australis, and Tetraena chrysopteron. In proximity to watercourses or sheltered areas, larger shrubs such as Lycium cinereum, Senegalia mellifera, and Phaeoptilum spinosum may be encountered, providing additional ecological diversity in these microhabitats.

4) Reservoir: Piet Roois Puts

According to the Botanical & Terrestrial Compliance statement (Appendix D3), a balancing reservoir will be constructed approximately 30 km south of Lennertsville on Farm Piet Rooi's Puts 56/3. Water will be pumped from the Lennertsville Water Treatment Works (WTW) to this reservoir, referred to as Piet Rooi's Puts Reservoir, before gravitating to the De Bakke Reservoir and Pump Station located south of Kenhardt. The proposed location for the reservoir is adjacent to the existing Kenhardt Bulk Water Supply (BWS) Reservoir, within a previously disturbed area used as an old road camp during the construction of the R27.

The site visit confirmed that the proposed reservoir footprint will not impact any significant natural veld, as it lies entirely within this disturbed area. The vegetation in the area is limited to grasses and weedy species, with no indigenous species of conservation concern present. Five Boscia albitrunca individuals were identified along the northern edge of the study area, with only one near the proposed site. These plants can be protected with proper environmental controls, avoiding any direct impact.

On the outer edge of the disturbed site, a few indigenous shrubs were observed, including Senegalia mellifera, Aptosimum lineare, Dicoma capensis, Dimorphotheca species, Pentzia incana, and Tetraena chrysopteron, among others.

Additionally, Justicia spartioides and Ruschia divaricata were noted under the protective cover of larger shrubs like Boscia albitrunca and Senegalia mellifera. A notable individual of Sensitive Species 144 was found to the west of the site but remains well outside the proposed impact area, ensuring it will not be affected by the project.

5) Kenhardt by-pass route

According to the Botanical & Terrestrial Compliance statement (Appendix D3), the proposed pipeline route bypasses Kenhardt to the west, primarily following existing roads and tracks to minimize disturbance. The route crosses under the Sishen-Saldanha railway line using an existing bridge before traversing a saline alluvial floodplain between the Hartbees River and Kenhardt. The pipeline continues south toward the Hope Street gravel road, turning west-southwest to cross the Hartbees River at a right angle, then following gravel roads and tributaries to the R27. It finally aligns with the eastern road reserve of the R27, running south toward the De Bakke Reservoir and Pump Station.

The vegetation north of Kenhardt is typical Bushmanland Arid Grassland, dominated by white grasses and scattered shrubs like Senegalia mellifera and Boscia albitrunca, which are mostly located away from the pipeline footprint. One Vachellia erioloba tree near an intermittent stream north of the railway bridge is within proximity but can easily be protected. Dense stands of invasive Prosopis trees are common near watercourses, interspersed with native species such as Tamarix usneoides, Vachellia karroo, and Ziziphus mucronata.

As the pipeline enters the floodplain, vegetation transitions to salt-tolerant species similar to those in Bushmanland salt pans, such as Salsola cf. aphylla, Mesembryanthemum spp., Galenia africana, and Atriplex vestita. Riparian zones along intermittent streams and the Hartbees River feature deeper sandy soils and dense tree borders, primarily invasive Prosopis, along with patches of Vachellia karroo, Tamarix usneoides, and Ziziphus mucronata. Larger shrubs like Lycium cinereum, Phaeoptilum spinosum, and Rhigozum trichotomum are also present in these areas.

The eastern road reserve of the R27, where the pipeline will cross, includes two Vachellia erioloba trees located just outside the proposed footprint and marked for protection. While the larger indigenous trees along the route are of botanical significance and must be safeguarded, the overall vegetation associated with the Kenhardt bypass route is considered to have low botanical importance. Efforts will be made to minimize impacts on these trees and preserve the ecological integrity of the area.

6) Bushman Basin Shrubland

According to the Botanical & Terrestrial Compliance statement (Appendix D3), about 20 km south of Kenhardt, near the De Bakke Reservoir and Pump Station, the vegetation transitions from Bushmanland Arid Grassland to Bushmanland Basin Shrubland, which becomes the dominant vegetation type impacted along the pipeline route up to the balancing reservoir on Farm Uitkyk. The route also crosses patches of Lower Gariep Broken Veld, associated with rocky dolerite outcrops, and Bushmanland Vloere, linked to salt pans. Soils in this area are shallower and darker, derived from mudstones and shales, resulting in a shift toward drought-resistant shrubs and a less prominent grassy component. The terrain becomes visibly drier moving southward, with species such as Vachellia karroo and Ziziphus mucronata persisting near watercourses, while Vachellia erioloba is absent.

The Bushmanland Basin Shrubland is characterized by sparse and dry vegetation, requiring minimal maintenance to retain its low shrub layer. South of the De Bakke Pump Station, the vegetation is often dominated by Galenia africana (kraalbos) and various Mesembryanthemum species, alongside other drought-resistant plants such as Aptosimum spinescens, Lycium cinereum, and Rhigozum trichotomum. Occasional rocky outcrops feature Lower Gariep Broken Veld, though road maintenance has diminished vegetation differences in these areas. Wildlife, such as dassies, is frequently observed near these outcrops.

In watercourses and wetlands, larger trees like Vachellia karroo, Searsia lancea (karee) with Tapinanthus oleifolius (mistletoe), and Parkinsonia africana are found, along with shrubs such as Argyrolobium cf. argenteum and Berkheya annectens (disseldoring). Along the edges of salt pans associated with Bushmanland Vloere, dense stands of Prosopis trees dominate the vegetation. These changes reflect the arid and saline-adapted ecosystems that characterize the southern sections of the pipeline route.

7) De Bakke Reservoir and Pump Station

According to the Botanical & Terrestrial Compliance statement (Appendix D3), the proposed site for the De Bakke Reservoir and Pump Station, located east of the R27, covers an area of approximately 1–2 hectares. The vegetation within the site is sparse, dominated by a low grassy layer interspersed with occasional shrubs. Shrubs observed include Galenia africana, Aptosimum spinescens, Augea capensis, Eriocephalus cf. microphyllus, Kleinia longiflora, Lycium cinereum, Monsonia umbellata, Phaeoptilum spinosum, Pteronia cf. leucoclada, Rhigozum trichotomum, and Salsola tuberculata. The overall vegetation reflects the arid conditions of the region.

8) Soafskolk turn-off to Uitkyk Reservoir

According to the Botanical & Terrestrial Compliance statement (Appendix D3), the pipeline route from the Soafskolk turn-off to the reservoir at Farm Uitkyk follows secondary gravel roads, crossing farms such as Styns Vley, Dagab, and Bysteek 423/0, before crossing under the Sishen-Saldanha railway via an existing culvert. The route primarily impacts Bushmanland Basin Shrubland, with occasional proximity to salt pan areas that are often heavily invaded by dense stands of invasive Prosopis trees. The pipeline largely remains within the road reserve, minimizing additional disturbance, and avoids regular brush cutting observed along the R27, resulting in a more pronounced shrub layer along this section.

The vegetation along the route is dominated by “white” grasses (Stipagrostis species) with hardy shrubs such as Rhigozum trichotomum (driedoring), Lycium cinereum (kriedoring), and Phaeoptilum spinosum (brosdoring). Near salt pan edges, sparse vegetation includes Salsola tuberculata, Eriocephalus cf. microphylla, and occasional hardy species like Aptosimum spinescens and Augea capensis. Watercourses and intermittent drainage lines are marked by Parkinsonia africana, denser shrub cover, and species like Cadaba aphylla (swartstorm) and Gomphocarpus filiformis (lammerlat). Larger trees, such as Searsia lancea (karee) and Royena lycioides (Karoo-bloubos), were observed sporadically, particularly near the R27.

The shrubland becomes progressively drier toward Farm Uitkyk, with grasses diminishing and shrubs such as Rhigozum trichotomum and Lycium cinereum dominating. In addition to the primary vegetation, scattered smaller shrubs were observed along the route, including Acanthopsis disperma, Galenia africana, Mesembryanthemum species, and Tetraena species, reflecting the arid and saline-adapted ecosystems of the region. This vegetation composition underscores the resilience of the landscape to arid conditions and occasional watercourse activity.

9) Reservoir on Farm Styns Vley 280

According to the Botanical & Terrestrial Compliance statement (Appendix D3), the proposed reservoir on Farm Styns Vley will be located to the south of the farm near the Soafskolk road, with a disturbance footprint of less than 1 hectare. The site is situated in the lower part of the farm, which remains actively used for sheep grazing. The vegetation at the site features a fair grassy cover, primarily Stipagrostis obtusa, interspersed with scattered shrubs. Larger shrubs include Parkinsonia africana, Lycium cinereum, Phaeoptilum spinosum, and Rhigozum trichotomum, while smaller shrubs such as Cadaba aphylla, Salsola tuberculata, Tetraena chrysopteron, and Aptosimum spinescens were also observed, reflecting the arid shrubland ecosystem typical of the region.

10) Reservoir on Farm Uitkyk 899/1

According to the Botanical & Terrestrial Compliance statement (Appendix D3), the proposed reservoir on Farm Uitkyk is located at a significant distance from the proposed KTE plant site. The site was strategically chosen for its higher elevation, which enables gravity-fed water distribution back to the plant, offering substantial long-term energy savings. The disturbance footprint for the reservoir will be approximately 1 hectare and is currently used for sheep grazing. During the site visit, the vegetation was observed to be very dry, with sparse cover. The area features a low grassy layer, primarily Stipagrostis obtusa, with occasional shrubs such as Rhigozum trichotomum, Lycium cinereum, and Tetraena chrysopteron, indicative of the arid conditions and limited vegetation in the region.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	Noordwester/Oewernuus	
Date published	22 March 2024	
Site notice position	**Latitude**	**Longitude**
	Please table 1 below	
Date placed	During the week of 11th – 15th March 2024	

Table 1. Coordinates of site notices placed during the week of 11 - 15 March 2024.

Site Notice Position	Coordinates
Brandvlei Agrimark	30 27' 49.112" S 20° 28' 41.026"E
Brandvlei hv Buitekant st & R27	30° 27' 43.283"S 20° 28' 41.582"E
Brandvlei Municipality	30° 27' 57.11" S 20° 29' 05.92" E
Soafskolk afdraai	29° 51' 34.17" S 20° 44' 08.10" E
Gannakom split	29° 49' 21.56" S 20° 37' 48.81" E
De Bakken Reservoir	29° 30' 50.49" S 21° 01' 07.49" E
Lus 10	30° 00' 08.48" S 20° 08' 56.18" E
Gert Rooi Reservoir	28° 59' 34.98" S 21° 07' 20.46" E
Lennertsville Plant	28° 45' 33.27" S 20° 59' 51.01" E
Orangeriver Pump	28°44'13.27"S 20°59'1.65"E
Keimoes Municipality	28° 46' 25.631"S 20° 37' 19.754"E
Kenhardt Municipality	29° 20' 44" S 21° 09' 28" E
KLK Kenhardt	29° 20' 54.835"S 21° 9' 11.040"E
Calvinia Municipality	31° 22' 39.370"S 19° 6' 48.035"E

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

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.

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)
[redacted]	Landowner: Portion 103 of the Farm Neilers Drift No. 34	
[redacted]	Landowner: Portion 213 of the Farm Neilers Drift No. 34	
[redacted]	Portion 2 of the Farm Piet Roois Puts No. 56	
[redacted]	The Remainder of Farm No. 1049	
[redacted]	Portion 2 of the Farm De Bakke No. 186	
[redacted]	Landowner: Portion 2 of the Farm Styns Vley No. 280 & Portion 2 of the Farm Kopjes Vley No. 281	
[redacted]	Portion 1 of the Farm Gemsboks Rivier No. 301	
[redacted]	The Remainder of the Farm Karee Bosch Kolk No.329	
[redacted]	Landower: Farm Bysteek No. 423 & Portion 1 of the Farm Uitkyk No. 889	[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]	Neighbour: Farm Klaasjobsvley	[redacted]
[redacted]	Oranjerivier Landbou Unie	[redacted]

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-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 E3 – Comments and Responses Report	

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 E3.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	e-mail	Postal address
Kai! Garib Local Municipality: Municipal Manager	Okabeng Issacs		obakengisaacs2@gmail.com	Private Bag X6 Kakamas 8870
Kai! Garib Local Municipality: Municipal Manager - PA	Valerie Springbok		valerialetricia@gmail.com	Private Bag X6 Kakamas 8870
Kai! Garib Local Municipality: Mayor	MMM Matthys		mayor@kaigarib.gov.za	Private Bag X6 Kakamas 8870
ZF Mgcawu District Municipality: Executive Mayor	Maureen Catherine Basson	054 338 7350	mbasson@zfm-dm.gov.za	Private Bag X6039 Upington 8800
ZF Mgcawu District Municipality: Executive Mayor - PA	Devine Oliver		devineolivier@zfm-dm.gov.za	Private Bag X6039 Upington 8800
Hantam Local Municipality	Riaan van Wyk		vanwykrj@hantam.gov.za	12 Hoop Street Calvinia 8190
Namakwa District Municipality (Manager)	Christiaan Fortuin	027 712 8040	cathleenb@namakwa-dm.gov.za	Private Bag X20 Van Riebeeck Street Springbok 8240
Hantam Local Municipality	Aubrey Claassen		claassenaubrey@gmail.com	12 Hoop Street Calvinia 8190
Hantam Local Municipality	Felix Shereave		idp@hantam.gov.za	12 Hoop Street Calvinia 8190
Hantam Local Municipality	Riana Lock		rlock@hantam.gov.za	12 Hoop Street Calvinia 8190
Hantam Local Municipality	J.I Swartz		jiswartz@hantam.gov.za	12 Hoop Street Calvinia 8190
Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform	Dineo Moleko	053 838 9100	dmoleko@ncpg.gov.za	162 George Street, Kimberlite Building Kimberley 8000

Deputy Director: CMA: Upington DWS	Shaun Cloete	083 633 3642	cloetes@dws.gov.za	Olyvenhouts Drift Settlement, Upington 8874
Control Environmental Officer	Christo Louw	083 250 7958	louwc@dws.gov.za	IE: Lower Orange Proto-CMA - WUA Vaal-Orange WMA" Upington 8874
DWS Upington	Mosala Ntoi	072 134 0770	ntoim@dws.gov.za	Olyvenhouts Drift Settlement, Upington 8874
Northern Cape Department of Social Development	Shouneez Wookey		hsamson@ncpg.gov.za	Latlhi Mabilo Complex, 257 Barkley Rd Kimberley 8301
SANPARKS	Bernard van Lente	083 640 4915	bernardvl@sanparks.org	
SANPARKS	Elton le Roux	054 452 9200	eltonl@sanparks.org	
SANPARKS	Leane Smit	072 824 3852	leanesmit@sanparks.org	
Department of Water Affairs	Hannes De Wet	053 832 9595	hannes@telpoort.co.za	Bebington Steert Nr 2, Monument Heights, Kimberley 8000
Transnet		011 308 3000	enquiries@transnet.net	
Deputy Director: CMA: Upington DWS	C Cloete	083 633 3642	cloetes@dws.gov.za	Olyvenhouts Drift Settlement Upington
Dept of Water & Sanitation- Northern Cape	R Mazwi	053 838 9100	mazwir@dws.gov.za	Private Bag X6101 Kimberley 8300
Department of Rural Development and Land Reform	Nozizwe Makgalemele	053 838 9100	makgamelen@dws.gov.za	Private Bag X5018 Kimberley 8300
Department of Rural Development and Land Reform	Mangalane Du Toit	053 838 9100	Mangalane.Du Toit@drdlr.gov.za	Private Bag X5018 Kimberley 8300
SANRAL	Nicole Abrahams	021 657 4607	AbrahamsN@nra.co.za'	Private Bag X19 Bellville 7530
Dept of Water & Sanitation- Northern Cape	Ramugondo Vhonani	053 836 7699	ramugondoV@dws.gov.za	28 Central Road, Beaconfield Beaconfield, Kimberley 8300
Cooperative Governance, Human Settlements and Traditional Affairs	Bentley Vass	053 830 9422	Mmanyeneng@ncpg.gov.za	Private Bag X5005 Kimberley 8300
Northern Cape Department of Social Development	E Botes	053 874 9100	EBotes@ncpg.gov.za	Private Bag X5042 Kimberley 8300
Dept of Transport, Roads & Public Works	Kevin Nogwili	053 839 2100	KNogwili@ncpg.gov.za	PO Box 3132 Kimberley 8300
Northern Cape Economic	Thobela Dikeni	087 086 0350	DThobela@ncpg.gov.za	69 Memorial Road Kimberley 8300

Development, Trade and Investment Promotion Agency (NCEDA)				
NC - Economic Development and Tourism	H Samson	053 839 4000	samsonh@ncpg.gov.za	Private Bag X6108 Kimberley 8300
National Development Agency - Agriculture	Anneliza Collett	012 319 7508	AnnelizaC@nda.agric.za	Private bag X120 Kimberley 8300
Chief Forester:NFA Regulations Dept of Forestry and Enviroment	J Mans	082 808 2737	Jmans@dffe.gov.za	26 Olien Street, Louisvaleroad Upingtonton 8300
BirdLife South Africa	Samantha Ralston-Paton		energy@birdlife.org.za	
Dept: Forestry, Fisheries & Environment	Thoko Buthelezi		ThokoB@nda.agric.za	
Dept: Forestry, Fisheries & Environment	Seoka Lekota		BCAdmin@dffe.gov.za	
Dept: Water & Sanitation - Northern Cape	Steven Shibambu		shibambus@dws.gov.za	
NC Dept: Agri, Env Affairs, Rural Dev & Land Reform	Peter Cloete		peter.denc87@gmail.com	
NC Dept: Agri, Env Affairs, Rural Dev & Land Reform	Samantha De La Fontaine		sdelafontaine@gmail.com	
NC Dept: Agri, Env Affairs, Rural Dev & Land Reform	Bryan Fisher		BFisher@ncpg.gov.za	
NC Dept: Agri, Env Affairs, Rural Dev & Land Reform	Elsabe Swart		elsabe.dtec@gmail.com	
NC Dept: Roads & Public Works	Jaco Roelofse		roelofse.j@vodamail.co.za	
NC Heritage Resource Ngwao-Boswa Ya Kapa Bokone	Timothy Ratha		ratha.timothy@gmail.com timothy@nbkb.org.za	
NC Dept: Roads & Public Works	Menelisi Sithole		menelisi.sithole@vodamail.co.za	
NC Dept: Agri, Env Affairs, Rural Dev & Land Reform	Dewald Badenhorst		pamnc@vodamail.co.za	
NC Economic Dev Agency	Babalwa Mbobo		mbobobc@gmail.com	
SAHRA	Natasha Higgitt		nhiggitt@sahra.org.za	
South African Radio Astronomy Observatory (SARAO)	Selaelo Matlhane		smatlhane@sarao.ac.za smatlhane@ska.ac.za	
South African Radio Astronomy Observatory (SARAO)	Busang Sithole		bsethole@ska.ac.za bsethole@sarao.ac.za	

South African Radio Astronomy Observatory (SARAO)	Adrian Tiplady		atiplady@ska.ac.za atiplady@sarao.ac.za	
Department of Water and Sanitation	Nkosikhona Mbeje		mbejen@dws.gov.za	

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 E5.

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.

Activity	Impact summary	Significance	Proposed mitigation
Alternative 1 (preferred alternative)			
Avifauna	***Direct impacts***: Destruction of natural vegetation and faunal habitat (construction phase)	Medium (Negative)	Crossing the Hartbees River floodplain in a currently undisturbed area should be avoided. If technically feasible, the suggested route change shown below (blue lines) must be considered. This suggested route follows existing tracks that are already disturbed, rather than disturbing the floodplain in new areas  Construction activities should commence during the dry winter months as far as possible to minimise the impacts on breeding fauna
	Destruction of natural vegetation and faunal habitat (construction phase)	Low (negative)	If technically feasible, the suggested route change shown above (blue lines) must be considered. This suggested route follows existing tracks that are already disturbed, rather than disturbing the floodplain in new areas. This will help avoid repeating impacts during the operational phase whenever repairs or maintenance is required

Activity	Impact summary	Significance	Proposed mitigation
Biodiversity: Orange River Extraction Point	**Special habitats:** Potential impact on special habitats (e.g. true quartz or "heuweltjies")	Very Low (Negative)	The site should be located next to the existing pump station and should utilise the existing disturbance footprint as much as possible.
	Landuse and cover: Potential impact on socio-economic activities.	Very Low (Negative)	The construction period might result in a temporary nuisance impact on agricultural activities.
	Vegetation status: Loss of vulnerable or endangered vegetation and associated habitat.	Very Low (Negative)	The site should be located next to the existing pump station and should aim to utilise the existing disturbance footprint as much as possible.
	Conservation priority: Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.	Very Low (Negative)	The site should be located next to the existing pump station and should aim to utilise the existing disturbance footprint as much as possible.
	Connectivity: Potential loss of ecological migration corridors.	Very Low (Negative)	The site should be located next to the existing pump station and should aim to utilise the existing disturbance footprint as much as possible.

	Cumulative impacts: Cumulative impact associated with proposed activity.	Very Low (Negative)	• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner.
			• A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies.
			  ○ The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible.
			  ○ Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3).
			  ○ Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of the magnificent thick stem individuals over 8 m should be non-negotiable.
			• The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation).

Activity	Impact summary	Significance	Proposed mitigation

			• The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).
			  o All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area.
			  o ***Euphorbia braunsii* & *E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area.
			  o Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.
			• A NFA Permit application must be obtained should any of the protected trees be impacted.
			• A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10.
			• All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.
			  o Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);
			  o Care must be taken to dispose of alien plant material responsibly.
			• Indiscriminate clearing of any area outside of these footprints may not be allowed.
			• An integrated waste management approach must be implemented during construction.
			  o Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.

	The "No-Go" option: Potential impact associated with the No-Go alternative.	Very Low (Negative)	No additional impact on a CBA. However, the CBA overlaps an area already transformed with minimal connectivity and no SoCC.
Biodiversity: Lennertsville WTW	**Landuse and cover**: Potential impact on socio-economic activities.	Medium Low (Negative)	Municipal land - the southern option might impact on several fenced-off dwellings (potential illegal settlement). The preferred location (to the north of the existing WTW) will avoid the impact on the dwellings and NCNCA protected species.
	Vegetation status: Loss of vulnerable or endangered vegetation and associated habitat.	Very Low (Negative)	The preferred location (to the north) will minimise the impact on natural veld and SoCC.

Activity	Impact summary	Significance	Proposed mitigation
	Conservation priority: Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.	Low (Negative)	The preferred location (to the north of the existing WTW) will minimise impact on remaining natural veld.
	Connectivity: Potential loss of ecological migration corridors.	Low (Negative)	The preferred location to the north will minimise the accumulative impact on connectivity slightly.
	Plant SoCC: Potential impact on threatened or protected plant species.	Low (Negative)	The northern option will avoid the impact on these species, otherwise implement the mitigation measures in Table 10 of the Biodiversity and Terrestrial Compliance statement (Appendix D3).
	Cumulative impacts: Cumulative impact associated with proposed activity.	Medium Low (Negative)	• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner. • A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies. o The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible. o Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3). o Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of the magnificent thick stem individuals over 8 m should be non-negotiable. • The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation). • The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations). o All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area. o ***Euphorbia braunsii*** **&** ***E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area.

Activity	Impact summary	Significance	Proposed mitigation
			○ Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • A NFA Permit application must be obtained should any of the protected trees be impacted. • A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. ○ Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods); ○ Care must be taken to dispose of alien plant material responsibly. • Indiscriminate clearing of any area outside of these footprints may not be allowed. • An integrated waste management approach must be implemented during construction. • Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.
	The "No-Go" option: Potential impact associated with the No-Go alternative.	Very Low (Negative)	No additional impact on a CBA. However, the CBA overlaps an area already disturbed with minimal connectivity.
Biodiversity: Lennertsville to Kenhardt	**Landuse and cover**: Potential impact on socio-economic activities.	Very Low (Negative)	• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner. • A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies. ○ The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible. ○ Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3). ○ Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of the magnificent thick stem individuals over 8 m should be non-negotiable. • The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation).

Activity	Impact summary	Significance	Proposed mitigation
			• The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations). o All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area. o ***Euphorbia braunsii* & *E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area. o Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • A NFA Permit application must be obtained should any of the protected trees be impacted. • A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. o Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods); o Care must be taken to dispose of alien plant material responsibly. • Indiscriminate clearing of any area outside of these footprints may not be allowed. • An integrated waste management approach must be implemented during construction. Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.
	Vegetation status: Loss of vulnerable or endangered vegetation and associated habitat.	Low (Negative)	• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner. • A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies. o The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible. o Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3). o Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of

Activity	Impact summary	Significance	Proposed mitigation
			the magnificent thick stem individuals over 8 m should be non-negotiable. • The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation). • The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations). o All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area. o ***Euphorbia braunsii* & *E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area. o Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • A NFA Permit application must be obtained should any of the protected trees be impacted. • A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. o Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods); o Care must be taken to dispose of alien plant material responsibly. • Indiscriminate clearing of any area outside of these footprints may not be allowed. • An integrated waste management approach must be implemented during construction. • Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites. (Environmental oversight during planning and construction, protection of NFA protected trees).
	Conservation priority: Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.	Low (Negative)	• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner. • A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies. o The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to

Activity	Impact summary	Significance	Proposed mitigation
			minimise the impact on all NFA protected trees, wherever possible. o Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3). o Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of the magnificent thick stem individuals over 8 m should be non-negotiable. • The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation). • The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations). o All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area. o ***Euphorbia braunsii*** **&** ***E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area. o Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • A NFA Permit application must be obtained should any of the protected trees be impacted. • A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. o Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods); o Care must be taken to dispose of alien plant material responsibly. • Indiscriminate clearing of any area outside of these footprints may not be allowed. • An integrated waste management approach must be implemented during construction. • Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites. (Environmental oversight during planning and construction, protection of NFA protected trees).
	Connectivity: Potential loss of	Very Low (Negative)	• All construction must be done in accordance with an approved construction and operational phase Environmental

Activity	Impact summary	Significance	Proposed mitigation

	ecological migration corridors.		Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner.
			• A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies.
			  o The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible.
			  o Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3).
			  o Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of the magnificent thick stem individuals over 8 m should be non-negotiable.
			• The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation).
			• The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).
			  o All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area.
			  o ***Euphorbia braunsii*** **&** ***E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area.
			  o Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.
			• A NFA Permit application must be obtained should any of the protected trees be impacted.
			• A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10.
			• All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.
			  o Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);
			  o Care must be taken to dispose of alien plant material responsibly.
			• Indiscriminate clearing of any area outside of these footprints may not be allowed.

Activity	Impact summary	Significance	Proposed mitigation
			• An integrated waste management approach must be implemented during construction. • Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites. (Environmental oversight during planning and construction, protection of NFA protected trees).
	Plant SoCC: Potential impact on threatened or protected plant species.	Medium (Negative)	• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner. • A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies. o The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible. o Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3). o Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of the magnificent thick stem individuals over 8 m should be non-negotiable. • The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation). • The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations). o All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area. o ***Euphorbia braunsii* & *E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area. o Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • A NFA Permit application must be obtained should any of the protected trees be impacted. • A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.

Activity	Impact summary	Significance	Proposed mitigation
			○ Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods); ○ Care must be taken to dispose of alien plant material responsibly. • Indiscriminate clearing of any area outside of these footprints may not be allowed. • An integrated waste management approach must be implemented during construction. • Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites. (Environmental oversight during planning and construction, protection of NFA protected trees).
	Cumulative impacts: Cumulative impact associated with proposed activity.	Medium (Negative)	• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner. • A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies. ○ The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible. ○ Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3). ○ Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of the magnificent thick stem individuals over 8 m should be non-negotiable. • The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation). • The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations). ○ All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area. ○ ***Euphorbia braunsii* & *E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area. ○ Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival.

Activity	Impact summary	Significance	Proposed mitigation

			• A NFA Permit application must be obtained should any of the protected trees be impacted.
			• A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10.
			• All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.
			  o Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);
			  o Care must be taken to dispose of alien plant material responsibly.
			• Indiscriminate clearing of any area outside of these footprints may not be allowed.
			• An integrated waste management approach must be implemented during construction.
			• Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.

	The "No-Go" option: Potential impact associated with the No-Go alternative.	Low (Negative)	No additional impact on a CBA, or on SoCC. Maintenance (brush-cutting) of the road reserve will continue, but impact on SoCC is less likely.
Biodiversity: The road reserve from Soafskolk to Uitkyk Farm	**Watercourses & Wetlands:** Potential impact on natural water resources and it's ecological support areas.	Low (Negative)	There is no mitigation apart from staying next to the existing road corridor and minimising the construction footprint.

	Landuse and cover: Potential impact on socio-economic activities.	Very Low (Negative)	• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner.
			• A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies.
			  o The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible.
			  o Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3).
			  o Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of

Activity	Impact summary	Significance	Proposed mitigation
			the magnificent thick stem individuals over 8 m should be non-negotiable. • The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation). • The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations). o All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area. o ***Euphorbia braunsii*** **&** ***E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area. o Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • A NFA Permit application must be obtained should any of the protected trees be impacted. • A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. o Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods); o Care must be taken to dispose of alien plant material responsibly. • Indiscriminate clearing of any area outside of these footprints may not be allowed. • An integrated waste management approach must be implemented during construction. • Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.
	Vegetation status: Loss of vulnerable or endangered vegetation and associated habitat.	Very Low (Negative)	• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner. • A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies. o The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible.

Activity	Impact summary	Significance	Proposed mitigation
			○ Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3). ○ Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of the magnificent thick stem individuals over 8 m should be non-negotiable. • The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation). • The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations). ○ All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area. ○ ***Euphorbia braunsii* & *E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area. ○ Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • A NFA Permit application must be obtained should any of the protected trees be impacted. • A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. ○ Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods); ○ Care must be taken to dispose of alien plant material responsibly. • Indiscriminate clearing of any area outside of these footprints may not be allowed. • An integrated waste management approach must be implemented during construction. • Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites. (Environmental oversight during planning and construction, protection of larger indigenous trees).
	Conservation priority: Potential impact on protected areas, CBA's, ESA's		• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner.

Activity	Impact summary	Significance	Proposed mitigation
	or Centre's of Endemism.		• A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies. o The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible. o Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3). o Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of the magnificent thick stem individuals over 8 m should be non-negotiable. • The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation). • The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations). o All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area. o ***Euphorbia braunsii*** **&** ***E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area. o Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • A NFA Permit application must be obtained should any of the protected trees be impacted. • A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. o Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods); o Care must be taken to dispose of alien plant material responsibly. • Indiscriminate clearing of any area outside of these footprints may not be allowed. • An integrated waste management approach must be implemented during construction.

Activity	Impact summary	Significance	Proposed mitigation
			• Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.
	Connectivity: Potential loss of ecological migration corridors.		• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner. • A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies. o The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible. o Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3). o Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of the magnificent thick stem individuals over 8 m should be non-negotiable. • The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation). • The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations). o All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area. o ***Euphorbia braunsii*** **&** ***E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area. o Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • A NFA Permit application must be obtained should any of the protected trees be impacted. • A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. o Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);

Activity	Impact summary	Significance	Proposed mitigation
			○ Care must be taken to dispose of alien plant material responsibly. • Indiscriminate clearing of any area outside of these footprints may not be allowed. • An integrated waste management approach must be implemented during construction. • Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites. (Environmental oversight during planning and construction, protection of larger indigenous trees).
	Plant SoCC: Potential impact on threatened or protected plant species.	Low (Negative)	• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner. • A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies. ○ The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible. ○ Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3). ○ Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of the magnificent thick stem individuals over 8 m should be non-negotiable. • The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation). • The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations). ○ All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area. ○ ***Euphorbia braunsii* & *E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area. ○ Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • A NFA Permit application must be obtained should any of the protected trees be impacted.

Activity	Impact summary	Significance	Proposed mitigation

			• A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10.
			• All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.
			  o Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);
			  o Care must be taken to dispose of alien plant material responsibly.
			• Indiscriminate clearing of any area outside of these footprints may not be allowed.
			• An integrated waste management approach must be implemented during construction.
			• Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.
			(Environmental oversight during planning and construction, protection of NFA protected trees).

	Cumulative impacts: Cumulative impact associated with proposed activity.	Low (Negative)	• All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner.
			• A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the mitigation recommendations pertaining to specialist studies.
			  o The route for each section of the pipeline must be clearly marked and approved by the ECO. The aim must be to minimise the impact on all NFA protected trees, wherever possible.
			  o Special care must be taken to protect as many as possible of the single stem Boscia albitrunca individuals over 1.5 m in height (marked in green in Appendix 3).
			  o Special must be taken to protect as many as possible of the larger Vachellia erioloba trees over 6 m in height (marked in yellow in Appendix 3), and the protection of the magnificent thick stem individuals over 8 m should be non-negotiable.
			• The pipeline route and disturbance footprint must stay within the road reserve (to control the construction footprint and minimise the impact on the adjacent natural vegetation).
			• The "Search & Rescue" recommendations given in Table 10 must be implemented along the pipeline route as well as for the associated infrastructure footprints (reservoirs and pump station locations).
			  o All ***Aloe*** species encountered within the footprint area, must be replanted outside the footprint area.

Activity	Impact summary	Significance	Proposed mitigation
			○ ***Euphorbia braunsii* & *E. spinea*** individuals encountered within the footprint area must be replanted outside the footprint area. ○ Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • A NFA Permit application must be obtained should any of the protected trees be impacted. • A Northern Cape Nature Conservation Act permit must be obtained for the "Search & Rescue" and other impacts on the protected species listed in Table 10. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. ○ Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods); ○ Care must be taken to dispose of alien plant material responsibly. • Indiscriminate clearing of any area outside of these footprints may not be allowed. • An integrated waste management approach must be implemented during construction. • Construction related spoil, general- and hazardous waste must be disposed to approved waste disposal sites.
	The "No-Go" option: Potential impact associated with the No-Go alternative.	Very Low (Negative)	No additional impact on a CBA, or on SoCC. The only potential impacts will be related to that associated with the surrounding land-use and the continual threat of alien invasive species on the wetland habitats (pans).
Freshwater (Construction phase)	Trenching of the new pipeline, washing of soil down the drainage line during storm events Trenching of the new pipeline through the Hartbees River, washing sediments down the Hartbees River when it rains Trenching of the new pipeline along the banks of the pan, washing of sediments into the pan	High (Negative)	• Do not disturb any land outside of designated trenching area in the reserve of existing roads • Construct outside of rainy season • Ensure that the new pipeline is trenched deep enough as appropriate for various water ways. • Carefully replace backfill in layers and compact to resemble permeability prior to construction • Level and landscape wherever the pipeline is trenched • Remove divots and bumps as not to encourage deposition or erosion • Take measures to ensure that the pipeline is not denuded in drainage lines and the river.
Freshwater (Rehabilitation	Destruction of stormwater	High (Negative)	Repair the stormwater infrastructure in the road reserve to effectively prevent erosion and excessive runoff.

Activity	Impact summary	Significance	Proposed mitigation
following construction)	infrastructure in the road reserve such as walls, berms, gabions and reno mattresses		
Freshwater (Operational)	Operation of new pipeline	Medium (Negative)	Budget for the maintenance of the pipeline and the road reserve Inspect according to schedule and repair if leaking, prevent denuding of pipeline, cover when denuded. Maintain and repair stormwater infrastructure if required
Heritage and cultural resources identified	Field Rating IVB (KTE-037: 29º21'18.7"S; 21º08'58.2"E, KTE-038: 29º20'53.2"S; 21º08'56.1"E, KTE-039: 29º20'51.7"S; 21º09'03.0"E, KTE-041: 29º21'10.2"S; 21º08'54.0"E, KTE-006: 29º57'24.8"S; 20º09'08.2"E) (Appendix D5)	Medium (Negative)	• No further mitigation is recommended since KTE-037, 038, 039, and 041 are outside the proposed footprint. • A 100 m buffer/safety zone is recommended to negate the negative impact on the British campsite (KTE-006). The buffer/safety zones implemented should be clearly demarcated during the project's construction phase and completely avoided by personnel and equipment.
	Field Rating IVA (KTE-002: 29º57'33.5"S; 20º09'13.9"E, KTE-003: 29º57'34.1"S; 20º09'12.5"E, KTE-004: 29º57'32.7"S; 20º09'11.5"E, KTE-005: 29º57'28.6"S; 20º09'07.1"E, KTE-033: 29º58'28.3"S; 20º22'40.8"E) (Appendix D5)	Medium (Negative)	A 200 m buffer/safety zone is recommended to negate the negative impact on these resources. The buffer/safety zones implemented should be clearly demarcated during the project's construction phase and wholly avoided by personnel and equipment.
	Graves with Field Rating IIIA (KTE-011: 29º57'10.2"S; 20º15'46.2"E, KTE-014: 29º57'26.3"S; 20º09'04.8"E) (Appendix D5)	Medium (Negative)	It is recommended that a buffer/safety zone of 100 m should be implemented around KTE-011 and a 50 m buffer/safety zone around KTE-014. In addition, KTE-014 should be fenced off. The buffer/safety zones implemented should be clearly demarcated during the project's construction phase and wholly avoided by personnel and equipment.

Activity	Impact summary	Significance	Proposed mitigation
	Loss of fossil heritage by destruction, movement or sealing of fossil heritage in Or below the earth's surface	Medium Low (Negative)	Although no further mitigation is recommended, it is recommended that if Palaeontological Heritage is uncovered during surface clearing and excavations, the Chance Find Protocol attached should be implemented immediately (Butler 2024).
	Cumulative Impact	Medium (Negative)	Refer to above mentioned Heritage mitigation.
Palaeontological	Impacts associated with construction phase	High (Negative)	It is the responsibility of the project's Environmental Site Officer (ESO) or site manager to train the workers and foremen on what to do if a fossil is accidently discovered. In the absence of the ESO, a member of staff must be designated to be accountable for the effective application of the chance discovery protocol so that the conservation of fossil material is not jeopardized. Chance Find Procedure: • If a chance find is made, the person responsible for the find must immediately stop working, and all work in the immediate vicinity of the find must stop as well. • The individual who discovered the item must immediately notify his or her direct supervisor, who must then notify his or her management and the ESO or site manager. The ESO or site manager must notify the relevant Heritage Agency (South African Heritage Resources Agency, SAHRA) of the discovery. (Contact information: SAHRA, 111 Harrington Street, Cape Town, South Africa. PO Box 4637, Cape Town 8000, South Africa. Fax: +27 (0)21 462 4509. Tel: 021 462 4502. Web address: www.sahra.org.za). Photographs of the find from various perspectives, as well as GPS coordinates, must be submitted to the Heritage Agency. • Within 24 hours of the discovery, a preliminary report must be sent to the Heritage Agency, which must include the following: 1) the date of finding; 2) a description of the discovery; and 3) a description of the fossil and its context (depth and position of the fossil), as well as GPS coordinates. • Photographs of the discovery (the more the merrier) must be of high quality, in focus, and accompanied by a scale. Photographs of the vertical part (side) where the fossil was discovered are also required. • Upon receipt of the preliminary report, the Heritage Agency will notify the ESO (or site manager) whether a palaeontologist rescue excavation or collection is required. • The place must be guarded to prevent future damage. There should be no attempt to remove material from their environment. Stabilize the exposed items and cover them with a plastic sheet or sand bags. The Heritage organization will also be able to advise on the best way to protect the find.

Activity	Impact summary	Significance	Proposed mitigation
			• If the fossil cannot be stabilized, the ESO (site manager) may carefully collect the fossil. • Once the Heritage Agency has received the written authorization, the developer may continue with the development on the affected area. • Fossil finds must be placed in tissue paper and in an appropriate box while necessary care must be taken to remove any fossil material from the rescue site.
Socio-economic (Construction phase)	Employment of Workforce and Contractors.	Medium (Positive)	Enhancement Measures: To enhance the local employment, skills development and business opportunities associated with the construction phase, the following measures should be implemented: • The developers be committed to involving and benefiting the communities surrounding the development, contributing to their development and growth. • It is recommended to conduct structured and proactive engagement sessions within the municipal district, to expose local small, micro, and medium enterprises which will benefit from the proposed development. • Training and skills development programmes should be offered to employees of the development prior to the commencement of the construction phase. • The communities which are most in need of employment on a local level should be considered for employment before outsourcing. • Engage proactively with local stakeholders and implement transparent hiring practices to ensure equitable distribution of employment opportunities.
	Economic Multiplier Effects.	Medium (Positive)	Enhancement Measures: • Preference is given to suppliers that are local to the operation where the service will be consumed. • Establishing liaison and communication structures with the district and local government structures. • Liaise with the local governmental structures and municipal authorities in the labour-sending communities to ensure that group development initiatives are integrated into the economic and development plans of those areas. • The continuous review of the economic development of the Project during the implementation process will ensure that the Project does not become static but is revised in terms of changing needs and also to ensure sustainability. • Prior to the start of the construction contractor procurement, a database of local companies, specifically Historically

Activity	Impact summary	Significance	Proposed mitigation
			Disadvantaged (HD) companies, that qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies, etc) should be identified and informed about the tender process and invited to bid on Project-related work, if applicable. • Engage with local authorities and business organisations to investigate the feasibility of obtaining construction materials, goods, and products from local suppliers, where possible.
	Influx of Jobseekers and Change in Population.	Medium (Negative)	• A Community Liaison Officer should be appointed. • A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. • Regular community meetings and information campaigns to manage expectations regarding employment opportunities, fostering understanding between local residents and incoming job seekers. • Prioritising local hiring to reduce the influx of external job seekers and support community development. • Implementing training programs for local residents to enhance employability in the project, thereby reducing reliance on external semi-skilled and unskilled labour. • Collaborating with local authorities to strengthen infrastructure and service provision (like healthcare, education, and public utilities) to accommodate population growth and increased demand. • Establishing monitoring systems to track socio-economic impacts and setting up conflict resolution platforms to address any emerging issues between local and newcomer communities. • Working with local law enforcement to implement crime prevention strategies and ensure public safety.
	Safety and Security Impacts.	Medium (Negative)	• Conduct thorough safety and security training for all construction workers and staff involved in the Project to reinforce the importance of adhering to safety protocols and secure practices. • Enhance site security measures, including installing surveillance cameras, lighting, and fencing around the construction areas to deter unauthorized access and reduce theft. • Implement strict access controls, requiring identification checks for anyone entering the construction site to ensure only authorized personnel are on-site. • Develop and distribute safety guidelines to local communities, informing them of the construction activities, potential hazards, and safety precautions to minimize accidents and misunderstandings.

Activity	Impact summary	Significance	Proposed mitigation
			• Appoint a Community Liaison Officer to act as a bridge between the Project and the community, addressing any safety and security concerns that may arise promptly. • Provide adequate firefighting equipment on-site and conduct regular training sessions on fire safety and emergency response for the construction team.
	Increased Pressure on Local Services / Resources	Medium (Negative)	• Appointment of a Community Liaison Officer to facilitate communication between the Project and the community, ensuring any concerns related to increased demand on services are promptly addressed. • Strategic Planning with local authorities to anticipate service needs and develop plans to enhance local services in preparation for the construction phase. • Investment in local infrastructure where feasible, such as upgrading roads or utilities, to benefit both the Project and the community, thereby reducing the Project's impact on local services. • Establish temporary facilities, such as mobile healthcare units or temporary housing, to accommodate the needs of the construction workforce without overly burdening local services. • Implement traffic management plans to minimize the impact of construction-related vehicle movements on local transportation systems, reducing congestion and potential safety hazards.
	Increased Probability of Fire Risk	Medium (Negative)	• Ensure training is given to employees on the risks of fires. • Ensure that firefighting equipment is present and working. • No fires are to be made on site for any reason. • No hunting or cooking of any animals or plants in or around the development footprint.
	Nuisance Impacts (Noise and Dust)	Medium (Negative)	• During construction, care should be taken to ensure that noise from construction vehicles and plant equipment does not intrude on the farms and residential areas nearby. Plant equipment such as generators, compressors, concrete mixers, and vehicles should be kept in good working order and, where possible, equipped with effective exhaust mufflers. • The movement of construction vehicles on the site should be confined to agreed access road/s. • Heavy vehicle movement during the construction phase should be timed (where possible) to avoid times of the week, such as weekends, when the volume of traffic on the access roads may be higher. • Dust suppression measures must be implemented on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.
Socio-economic (Operational phase)	Direct and Indirect Employment Opportunities	Medium (Positive)	Enhancement Measures: • Local Hiring: Prioritise hiring from the local community for all available positions. This will ensure that the benefits of employment are directly felt within the local community.

Activity	Impact summary	Significance	Proposed mitigation
			• Skills Transfer: In cases where highly skilled expertise is required, provide provisions for skills transfer. This will facilitate knowledge sharing within the local workforce and enhance the overall skill level of the community. • Support for Local Businesses: Encourage the involvement of local businesses in providing materials, goods, and services during the operational phase of the project. This can stimulate entrepreneurial growth and create indirect job opportunities. • Community Engagement: Maintain open lines of communication with the local community through the development's existing community liaison officer. This will ensure that job opportunities are communicated effectively and that local residents are given fair consideration in the hiring process. • Fair Labour Practices: Align the project with the development's socio-economic labour plan to ensure fair labour practices and safe working conditions for all workers.
	Economic Multiplier Effects	Medium (Positive)	Enhancement Measures: • Local Supplier Engagement and Development: Actively engage with local suppliers to understand their capabilities and limitations. Offer support and development programs to help them meet the project's needs. This could include training in specific skills, quality standards, or business management. • Community Liaison Officers (CLOs): Employ CLOs to facilitate communication between the project and local businesses, ensuring that the needs of both are met and that opportunities are fairly distributed • Investment in Local Capacity Building: Invest in local infrastructure and capacity building to enable local businesses to scale up and meet the operational or maintenance demands of the project, where feasible. This could include financial support, technology transfer, or infrastructure improvements. • Long-term Community Development Plans: Work with local authorities and community groups to develop and implement long-term economic development plans that align with the project's long-term presence and potential for economic stimulation. • Transparent Procurement Processes: Establish transparent and fair procurement processes that give local businesses a fair chance to compete for services required such as maintenance contracts, ensuring equitable opportunity distribution.
	Enhanced Water Supply and Security	Medium (Positive)	Enhancement Measures: • Infrastructure Upgrades: Implement advanced water treatment and monitoring technologies to ensure water quality and sustainability. • Stakeholder Engagement: Work closely with local communities and stakeholders to manage water resources effectively and address concerns related to water distribution and access.

Activity	Impact summary	Significance	Proposed mitigation
			• Water Conservation Initiatives: Promote water conservation through community education programs and the introduction of water-saving technologies in homes and industries.
Socio-economic (Cumulative)	An increase in employment opportunities, skills development, and business opportunities	Medium (Positive)	Enhancement Measures: • Adopt local employment policies to ensure that job creation benefits the community surrounding the Proposed Project. • Utilize local service providers for construction, maintenance, and operational needs to enhance business opportunities in the area. • Implement skills development programs in partnership with local educational institutions and technical training centers to prepare the local workforce for opportunities arising from the Project and other similar developments in the region.
	Negative impacts and change to the local economy with an in-migration of labourers, businesses, and jobseekers	Low (Negative)	• Develop and enforce a local recruitment policy to prioritize hiring from the surrounding communities, thereby reducing the need for extensive in-migration. • Collaborate with local government agencies and community organizations to align the Project's development with the local area's needs, ensuring that service provisions meet the requirements of both existing residents and newcomers. • Establish joint ventures or partnerships with community organizations, potentially through Trusts, to provide tangible benefits to local communities, including employment opportunities and essential services. • Formulate and distribute a clear recruitment protocol in partnership with the local municipality and community leaders, ensuring transparent communication about employment processes.
Visual	• Alteration of Landscape Character • Local Land Use • Dust and Construction Impact • Nighttime lighting	Low (Negative)	• Comprehensive restoration plans that utilise native vegetation for recovery post-construction, alongside sensitive siting and underground placement of the pipeline to minimise visibility. • Construction management practices are rigorously implemented, featuring dust suppression techniques and limiting operations to daylight hours to reduce disturbances. Controlled lighting is designed to minimise light pollution, and community engagement ensures that the project aligns with local aesthetic values. All temporary structures and debris are promptly removed post-construction to restore the site's visual integrity.
Alternative 2			
Avifauna	***Direct impacts***		• The alternative route for 750 mm rising main to the final storage reservoir is not preferred from a faunal perspective as it is routed through natural arid shrubland, impacts on undisturbed drainage lines and floodplain habitat, and natural dolerite outcrops. This alternative will therefore impact negatively on natural faunal habitat. This can be avoided by opting for the preferred route in this section. This will also help avoid repeating

Activity	Impact summary	Significance	Proposed mitigation
			impacts during the operational phase whenever repairs or maintenance is required
	Direct impacts:		
	Indirect impacts:		
	Cumulative impacts:		
No-go option			
	Direct impacts: This would mean that no development will take place and the proposed site will remain as is.	This would mean that no development will take place and the proposed site will remain as is.	N/A

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 1 (preferred alternative)

The **preferred alternative** for the proposed KTE pipeline is designed to minimise environmental impacts by following existing infrastructure corridors, such as road reserves and the Sishen-Saldanha railway. This alignment reduces habitat disturbance and avoids ecologically sensitive areas wherever possible. The potential impacts include temporary disturbances during the construction phase, such as habitat loss, soil erosion, and pollution of watercourses, particularly at crossings of the Orange River and Hartbees River. These impacts are **short- to medium-term**, depending on the rehabilitation efforts. However, with the implementation of mitigation measures (see section D above and Appendix G), the impacts are reduced to **low to moderate significance (Table 2)**.
The likelihood of significant impacts occurring after mitigation is **low**, as the project design and EMPr address the most critical risks. Over the long term, the pipeline will have **positive socio-economic impacts** by improving water security and supporting regional development.

Table 2. Impact Assessment Table for the proposed development.

KTE Pipeline														
Nature of Impact			Without Mitigation (Baseline)						With Mitigation					
No.	**Aspect**	**Impact**	**Probability (Likelihood)**	**Extent**	**Duration (Frequency)**	**Magnitude (Intensity/ Severity)**	**Receiving Environment (Significance/ Consequence)**	**Without Mitigation Score (Baseline)**	**Probability (Likelihood)**	**Extent**	**Duration (Frequency)**	**Magnitude (Intensity/ Severity)**	**Receiving Environment (Significance/ Consequence)**	**With Mitigation Score (Impact Assessment)**
CONSTRUCTION PHASE														
1	Biodiversity **Orange River Extraction Point**	**Special habitats**: Potential impact on special habitats (e.g. true quartz or "heuweltjies")	-1	-1	-4	-1	-4	-2	-1	-1	-4	-1	-4	-2
		Landuse and cover: Potential impact on socio-	-2	-1	-4	-1	-4	-2	-2	-1	-4	-1	-4	-2

		economic activities.												
		Vegetation status: Loss of vulnerable or endangered vegetation and associated habitat.	-2	-1	-4	-1	-4	-2	-2	-1	-4	-1	-4	-2
		Conservation priority: Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.	-1	-1	-4	-1	-4	-2	-2	-1	-4	-1	-4	-2
		Connectivity: Potential loss of ecological migration corridors.	-1	-1	-4	-1	-4	-2	-2	-1	-4	-1	-4	-2
		Protected and Endangered plant species: Potential impact on threatened or protected plant species.	-1	-1	-4	-1	-4	-2	-2	-1	-4	-1	-4	-2
		Cumulative impact associated with proposed activity.	-1	-1	-4	-1	-4	-2	-2	-1	-4	-1	-4	-2
2	Biodiversity **Lennerts-ville WTW**	**Landuse and cover:** Potential impact on socio-economic activities.	-4	-1	-8	-1	-1	-4	-2	-1	-4	-1	-4	-2
		Vegetation status: Loss of vulnerable or endangered	-1	-1	-4	-1	-4	-2	-2	-1	-4	-1	-4	-2

		vegetation and associated habitat.											
		Conservation priority: Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.	-2	-1	-4	-1	-4	-3	-2	-1	-4	-1	-4	-2
		Connectivity: Potential loss of ecological migration corridors.	-2	-1	-4	-1	-4	-3	-2	-1	-4	-1	-4	-2
		Protected and Endangered plant species: Potential impact on threatened or protected plant species.	-2	-1	-4	-1	-4	-3	-2	-1	-4	-1	-4	-2
		Cumulative impact associated with proposed activity.	-8	-1	-8	-4	-1	-5	-2	-1	-4	-1	-4	-2
3	Biodiversity **R27 Lennerts-ville to Kenhardt**	**Landuse and cover:** Potential impact on socio-economic activities.	-1	-1	-4	-1	-4	-2	-1	-1	-4	-1	-4	-2
		Vegetation status: Loss of vulnerable or endangered vegetation and associated habitat.	-2	-1	-4	-1	-4	-3	-2	-1	-4	-1	-4	-2
		Conservation priority: Potential impact on	-2	-1	-4	-1	-4	-3	-2	-1	-4	-1	-4	-2

		protected areas, CBA's, ESA's or Centre's of Endemism.												
		Connectivity: Potential loss of ecological migration corridors.	-1	-1	-4	-1	-4	-2	-2	-1	-4	-1	-4	-2
		Protected and Endangered plant species: Potential impact on threatened or protected plant species.	-8	-1	-8	-4	-1	-5	-2	-1	-4	-1	-4	-3
		Cumulative impact associated with proposed activity.	-8	-1	-8	-4	-1	-5	-2	-1	-4	-1	-4	-3
4	Biodiversity **The road reserve from Soafskolk to Farm Uitkyk**	**Watercourses & Wetlands:** Potential impact on natural water resources and it's ecological support areas.	-2	-1	-4	-1	-4	-3	-2	-1	-4	-1	-4	-3
		Landuse and cover: Potential impact on socio-economic activities.	-1	-1	-4	-1	-4	-2	-2	-1	-4	-1	-4	-2
		Vegetation status: Loss of vulnerable or endangered vegetation and associated habitat.	-1	-1	-4	-1	-4	-2	-2	-1	-4	-1	-4	-2
		Conservation priority: Potential impact on	-2	-1	-4	-1	-4	-3	-2	-1	-4	-1	-4	-3

		protected areas, CBA's, ESA's or Centre's of Endemism.												
		Connectivity: Potential loss of ecological migration corridors.	-1	-1	-4	-1	-4	-2	-2	-1	-4	-1	-4	-2
		Protected and Endangered plant species: Potential impact on threatened or protected plant species.	-2	-1	-4	-1	-4	-3	-2	-1	-4	-1	-4	-2
		Cumulative impact associated with proposed activity.	-2	-1	-4	-1	-4	-3	-2	-1	-4	-1	-4	-3
5	Avifauna	Destruction of natural vegetation and faunal habitat	-8	-1	-8	-4	-1	-5	-2	-1	-4	-1	-4	-3
6	Freshwater	Trenching of the new pipeline, washing of soil down the drainage line during storm events Trenching of the new pipeline through the Hartbees River, washing sediments down the Hartbees River when it rains Trenching of the new pipeline along	-8	-1	-8	-4	-4	-7	-4	-1	-8	-1	-1	-3

		the banks of the pan, washing of sediments into the pan												
7	Freshwater (Rehabilitation following construction)	Destruction of stormwater infrastructure in the road reserve such as walls, berms, gabions and reno mattresses	-8	-1	-8	-4	-4	-7	-4	-1	-8	-1	-1	-3
8	Heritage	Field Rating IVB (KTE-037, 038, 039, 041, 006)	-8	-1	-8	-4	-1	-5	-4	-1	-8	-1	-1	-3
		Field Rating IVA (KTE-002, 003, 004, 005, 033) (Appendix D5)	-8	-1	-8	-4	-1	-6	-4	-1	-8	-1	-1	-3
		Graves with Field Rating IIIA (KTE-011, 014) (Appendix D5)	-8	-1	-8	-4	-1	-5	-4	-1	-8	-1	-1	-3
		Loss of fossil heritage by destruction, movement or sealing of fossil heritage in	-8	-1	-8	-4	-1	-5	-4	-1	-8	-1	-1	-3
		Or below the earth's surface	-8	-1	-8	-4	-1	-6	-4	-1	-8	-1	-1	-3
		Cumulative Impact	-8	-1	-8	-4	-1	-5	-4	-1	-8	-1	-1	-3
9	Palaeonto-logical	Impacts associated with construction phase	-8	-1	-8	-4	-4	-7	-4	-1	-8	-1	-1	-3

		Employment of Workforce and Contractors	8	1	4	4	4	4	8	8	4	1	4	8
		Economic Multiplier Effects	8	2	4	4	4	5	8	8	4	2	4	7
		Influx of Jobseekers and Change in Population	-8	-1	-8	-4	-1	-5	-4	-1	-8	-1	-1	-3
10	Socio-Economic	Safety and Security Impacts	-8	-1	-8	-4	-1	-5	-4	-1	-8	-1	-1	-3
		Increased Pressure on Local Services / Resources	-8	-1	-4	-4	-1	-6	-4	-1	-4	-1	-1	-3
		Increased Probability of Fire Risk	-8	-1	-8	-4	-1	-5	-4	-1	-8	-1	-1	-3
		Nuisance Impacts (Noise and Dust)	-8	-1	-8	-4	-4	-6	-4	-1	-4	-2	-1	-3
		An increase in employment opportunities, skills development, and business opportunities	8	2	4	4	4	5	8	8	4	2	4	7
11	Socio-economic (Cumulative)	Negative impacts and change to the local economy with an in-migration of labourers, businesses, and jobseekers	-2	-1	-4	-1	-4	-3	-2	-1	-4	-1	-4	-3

12	Visual	Alteration of Landscape Character Local Land Use Dust and Construction Impact Nighttime lighting	-2	-1	-4	-1	-4	-3	-2	-1	-4	-1	-4	-3
OPERATIONAL PHASE														
13	Avifauna	Destruction of natural vegetation and faunal habitat	-8	-1	-8	-4	-1	-5	-4	-1	-8	-1	-1	-3
14	Freshwater	Operation of new pipeline	-2	-1	-4	-1	-4	-3	-2	-1	-4	-1	-4	-2
15	Socio-economic	Direct and Indirect Employment Opportunities	-8	-1	-4	-4	-1	-6	-4	-1	-4	-1	-1	-3
		Economic Multiplier Effects	8	1	4	4	4	4	8	8	4	1	4	8
		Enhanced Water Supply and Security	8	2	4	4	4	5	8	8	4	2	4	7

Alternative 2 involves a route that deviates from existing infrastructure corridors for approximately 29 km (approximately 25 km more than the preferred alternative). This results in greater disturbance to natural habitats, including sensitive vegetation types such as Bushmanland Basin Shrubland and Bushmanland Vloere. Construction impacts would be greater compared to the preferred alternative, with **medium- to long-term impacts** that could be **high in significance** without mitigation.
Even with mitigation measures, the residual impacts for Alternative 1 are likely to remain **moderate to high** due to the difficulty of rehabilitating sensitive habitats and the lack of alignment with existing infrastructure. The likelihood of these impacts occurring is **moderate**, given the challenges associated with managing risks in less disturbed areas.

No-go alternative (compulsory)

This would mean that no-development would take place and the proposed site will remain as is. The positive impacts of the development, as discussed extensively in section A:10 and Section B:8 of this report and in the socio-economic report (Appendix D6), will not be met.

The no-go option would only have been recommended if it were found that the construction of the proposed development on this site or in this area might potentially cause substantial detrimental harm to the environment.
According to the socio-economic report (Appendix D6), the no-go option does avoid possible environmental impacts, however it also forgoes the potential benefits in terms of improved water infrastructure, economic development and social advancement. This option may leave existing challenges unaddressed and miss out on significant opportunities for regional development.

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**

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).

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.

Compliance with the EMPr, recommendations of the specialists and appointment of an ECO during the construction phase.

Is an EMPr attached?	**YES**

The EMPr must be attached as Appendix G.

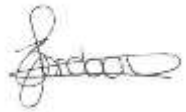
The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

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.

Zandria Jordaan

NAME OF EAP



08 January 2025

SIGNATURE OF EAP (Compiler) DATE

Bernard de Witt

NAME OF EAP

10 January 2025

SIGNATURE OF EAP (Reviewer) DATE

SECTION F: APPENDIXES

The following appendixes must be attached:

Appendix A: Locality Maps

Appendix B: Photographs - NA

Appendix C: Facility illustration(s) - NA

Appendix D: Specialist reports (including terms of reference and declarations of independence)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: DFFE Screening Tool