environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:	
Application Number:	
Date Received:	

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

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **08 December 2014**. 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.

14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included in the electronic copy of the report submitted to the competent authority.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?	YES	~~NO~~

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

1. PROJECT DESCRIPTION

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

Onseepkans: Bulk water supply, centralised pump and dam system.

The purpose of the project is to replace the existing and damaged earth canal with a centralised pump system. The system will provide water to the existing 370ha registered water user's along the canal, including 118ha of emerging farmers.

The centralised pump system will consist of a river pump station at the village of Viljoensdraai, from where water will be pumped to a storage reservoir (earth dam). Electricity, produced by a Solar Photo Voltaic (SPV) Generator, will be used to offset own consumption which is a form of net-metering. The SPV system will be connected to the ESKOM grid. The SPV Generator will produce just enough electricity for the pump station. No surplus energy will be generated or wasted. From the reservoir, water will be distributed to the different irrigation areas. This system will deliver irrigation water under pressure (2 Bar), which will enable farmers to use more efficient irrigation practices such as micro and drip irrigation, instead of flood irrigation. They will not only use less water, but will also be able to produce higher income crops such as vineyard.

Another advantage of the system is that it can be extended to accommodate further developments. An additional 200ha is currently planned as a separate project.

Pump and filter station:
Water will be pumped from the pump station with 4 x centrifugal pumps. The total flow rate will be approximately 2400m³/h, pumped at a pressure of 7,5 Bar. Water will be filtered through automatic self-cleaning disc filters.

Provision is made for an additional 2 pumps. These additional pumps will supply extra bulk water for future developments.

Dam:
An earth dam will be constructed at an elevation approximately 60m higher than the pump station. The dam will have a footprint of approximately 3ha, with a storage capacity of 75,000m³.

Due to the elevation of the dam, water supplied to the irrigation areas will be constantly under pressure.

Main Pipelines, to and from the dam:
Water will be pumped from the pump station to the dam through a 1000mm GRP pipe. The pipe will be approximately 2200m long, and will be installed subsurface.

Water will be supplied from the dam to the irrigation areas through a 800mm GRP pipe, approximately 1800mm long, also installed subsurface.

Solar Photo Voltaic (SPV) generator:
A 1MW SPV generator will be constructed to supply electricity to the pump and filter station. The footprint for the SPV generator will be approximately 2ha.

ESKOM will install a 1MVA connection point. A 33kV overhead line will be constructed between the ESKOM connection point and the 1MW SPV generator, as well as between the ESKOM point and the pump station.

Distribution pipelines:
UPVC pipes will be laid in the footprint of the existing canal. An Environmental Authorisation (Department of Environment and Nature Conservation reference: NC/BA/38/NAM/KHA/ONS1/2013, granted on 2014-04-24) has been obtained for this part of the work.

Figure 1: Google Earth image of the proposed development

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

Listed activity as described in GN 734, 735 and 736	Description of project activity
Government Notice R983 (Listing Notice 1): Activity No:	
1: The **development** of facilities or infrastructure for the generation of electricity from a **renewable resource** where- (i) the electricity output is more than 10 megawatts but less than 20 megawatts; or (ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare; excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs within an urban area.	Although the SPV development will have a output of 1MW (less than 10 MW), the development footprint will be 2ha (exceeding 1ha).
9: The **development** of **infrastructure** exceeding 1000 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 b) where such development will occur within an urban area.	Water will be pumped from the pump station to the dam through a 1000mm GRP pipe. The pipe will be approximately 2200m long, and have a peak throughput of 930 litres per second. Water will be supplied from the dam to the irrigation areas through a 800mm GRP pipe, approximately 1800mm long and have a peak throughput of 650 litres per second, also installed subsurface.
11: The **development** of facilities or infrastructure for the **transmission and distribution** of electricity; (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.	A 33kV overhead line will be constructed between the ESKOM connection point and the 1MW SPV generator, as well as between the ESKOM point and the pump station. The site is 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,	Infrastructure and buildings, such as the pipeline and pumpstation, exceeding 100m^2 will be constructed within, or within 32m of a watercourse.

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; 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.	
13: The **development** of facilities or infrastructure for the **off-stream storage of water**, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.	The dam will have a footprint of approximately 3ha, with a storage capacity of 75,000m³.
19: The **infilling** or **depositing** of any material of more than **5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 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 mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing , dredging, excavation, removal or moving;	More than $5m^3$ may need to be excavated or moved for the construction of the pipeline and/or pumpstation

(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.	
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.	More than 1ha will need to be cleared for the construction of the dam, SPV facility and pumpstation (combined footprint of approximately >5ha)
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 (a) where the facility or infrastructure is expanded by more than 1000 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 (bb) will occur within an urban area.	The existing water bulk transportation system will be expanded by more than 1000m.
Government Notice R984 (Listing Notice 2): Activity No:	
None	
Government Notice R985 (Listing Notice 3): Activity No:	
2: The **development** of **reservoirs** for bulk water supply with a capacity of more than 250 cubic metres. **Northern Cape** I. In an estuary; II. In a protected area identified in terms of NEMPAA, excluding conservancies; iii. Outside urban areas, in: a) National Protected Area Expansion Strategy Focus areas; b) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; c) Sites or areas identified in terms of an International Convention;	A dam exceeding 250m^3 will be constructed. The site is located in the Northern Cape, and within a CBA (please refer to Appendix A2)

d) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; e) Core areas in biosphere reserves; f) 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; g) 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. iv. In urban areas: a) Areas zoned for use as public open space; b) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose; c) 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 vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. **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. 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	More than 300m^2 of vegetation may be cleared. Part of the site is located within Lower Gariep Alluvial Vegetation (Endangered), and within a CBA (please refer to Appendix A2 and A3) Eastern Gariep Rocky Desert (least Threatened) Eastern Gariep Plains Desert (least Threatened) Lower Gariep Alluvial Vegetation (Endangered)
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 buildings, such as the pipeline and pumpstation, exceeding 10m^2 will be constructed within, or within 32m of a watercourse. The site is located in the Northern Cape, and within a CBA (please refer to Appendix A2)

infrastructure and water surface area exceeds 10 square metres in size; (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 10 square 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; 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 the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the harbour. **Northern Cape** i. In an estuary; ii. Outside urban areas, in: a) A protected area identified in terms of NEMPAA, excluding conservancies; b) National Protected Area Expansion Strategy Focus areas; c) World Heritage Sites; d) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; e) Sites or areas identified in terms of an International Convention; f) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; g) Core areas in biosphere reserves; h) 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; i) 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. iii. In urban areas: a) Areas zoned for use as public open space; b) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or c) Areas seawards of the development setback line.	

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.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. 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):**
Alternative S1 (preferred)		
• Starting point of the activity		
• Middle/Additional point of the activity		
• End point of the activity		
Alternative S2 (if any)		
• Starting point of the activity		
• Middle/Additional point of the activity		
• End point of the activity		
Alternative S3 (if any)		
• Starting point of the activity		
• Middle/Additional point of the activity		
• End point of the activity		

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

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

b) Lay-out alternatives

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

c) Technology alternatives

Alternative 1 (preferred alternative)
Onseepkans: Bulk water supply, centralised pump and dam system. The purpose of the project is to replace the existing and damaged earth canal with a centralised pump system. The system will provide water to the existing 370ha registered water user's along the

canal, including 118ha of emerging farmers.

The centralised pump system will consist of a river pump station at the village of Viljoensdraai, from where water will be pumped to a storage reservoir (earth dam). Electricity, produced by a Solar Photo Voltaic (SPV) Generator, will be used to offset own consumption which is a form of net-metering. The SPV system will be connected to the ESKOM grid. The SPV Generator will produce just enough electricity for the pump station. No surplus energy will be generated or wasted. From the reservoir, water will be distributed to the different irrigation areas. This system will deliver irrigation water under pressure (2 Bar), which will enable farmers to use more efficient irrigation practices such as micro and drip irrigation, instead of flood irrigation. They will not only use less water, but will also be able to produce higher income crops such as vineyard.

Another advantage of the system is that it can be extended to accommodate further developments. An additional 200ha is currently planned as a separate project.

Pump and filter station:
Water will be pumped from the pump station with 4 x centrifugal pumps. The total flow rate will be approximately 2400m³/h, pumped at a pressure of 7,5 Bar. Water will be filtered through automatic self-cleaning disc filters.

Provision is made for an additional 2 pumps. These additional pumps will supply extra bulk water for future developments.

Dam:
An earth dam will be constructed at an elevation approximately 60m higher than the pump station. The dam will have a footprint of approximately 3ha, with a storage capacity of 75,000m³.

Due to the elevation of the dam, water supplied to the irrigation areas will be constantly under pressure.

Main Pipelines, to and from the dam:
Water will be pumped from the pump station to the dam through a 1000mm GRP pipe. The pipe will be approximately 2200m long, and will be installed subsurface.

Water will be supplied from the dam to the irrigation areas through a 800mm GRP pipe, approximately 1800mm long, also installed subsurface.

Please note that, due to the possibly of hitting hard rock during construction, the pipeline route may need to cross Erf 730 in some places (please refer to Appendix C2)

Solar Photo Voltaic (SPV) generator:
A 1MW SPV generator will be constructed to supply electricity to the pump and filter station. The footprint for the SPV generator will be approximately 2ha.

ESKOM will install a 1MVA connection point. A 33kV overhead line will be constructed between the ESKOM connection point and the 1MW SPV generator, as well as between the ESKOM point and the pump station.

Distribution pipelines:
UPVC pipes will be laid in the footprint of the existing canal. An Environmental Authorisation (Department of Environment and Nature Conservation reference: NC/BA/38/NAM/KHA/ONS1/2013, granted on 2014-04-24) has been obtained for this part of the work (please see Alternative 2 below). However, the pipes will be uPVC pipes and will be substantially smaller. They will also require less bedding material, therefore, not as many of the borrow pits that were authorised will be required. The length of the distribution pipelines will also be less (10km, instead of 16.4km).

Alternative 2

Alternative 2 involves the repair of the existing canal by replacing it with large diameter concrete pipes. A NEMA Application was submitted for this to the Department of Environment and Nature Conservation (Northern Cape) reference: NC/BA/38/NAM/KHA/ONS1/2013, and granted on 2014-04-24.

The existing open canal, which runs the length of the Onseepkans settlement (a distance of approximately 16.4 km), before it releases its surplus water back into the Orange River, will be repaired and upgraded (please refer to Figure 2 below). It is proposed that the original earth and concrete canal be replaced by a closed concrete pipeline.

Over the years the canal had been repaired and upgraded on numerous occasions, usually after flooding incidents. The existing water supply system has an average water loss percentage of 30% (which are constantly aggravated with each new flood). The proposed activity will not only include the repair to the damage done by floods, but the closed pipeline will ensure better water conservation and management (a maximum of 5% water loss is expected from such a closed system).

The infrastructure will not be expanded or the capacity increased (although much better results are expected from the enclosed system) and the pipeline will be placed within the existing canal footprint. In addition the existing flood protection structures will also be repaired and the intake works as well as outlet works will be repaired and upgraded to better complement the new system and for better protection of the inlet and outlet structures and the environment at these structures (erosion management).

Water from the Orange River is currently supplied to the agricultural land and smallholdings through gravity feed earth canal system designed and build with the establishment of the settlement (no pumping is done). Water is extracted from the Orange River by means of a weir constructed in the river from where it enters the canal. The system is designed to extract a maximum of 1500 l/s. During months with low water demands, flow is regulated with a sluice gate.

Fill/bedding material will be required for the pipeline upgrade, and will be sourced from seven proposed borrow pits, which have been identified in Onseepkans. These are located at seven different locations along the canal route, to minimise the distance from the borrow pit to the pipeline.

Although this was originally the preferred alternative (previous NEMA Application), this alternative is now not considered viable due to the following reasons:

- The project capital cost was very high,
- This option did not present any opportunity for any further developments,
- This option only supported flood irrigation, an irrigation practise which is not efficient in terms of water usage.

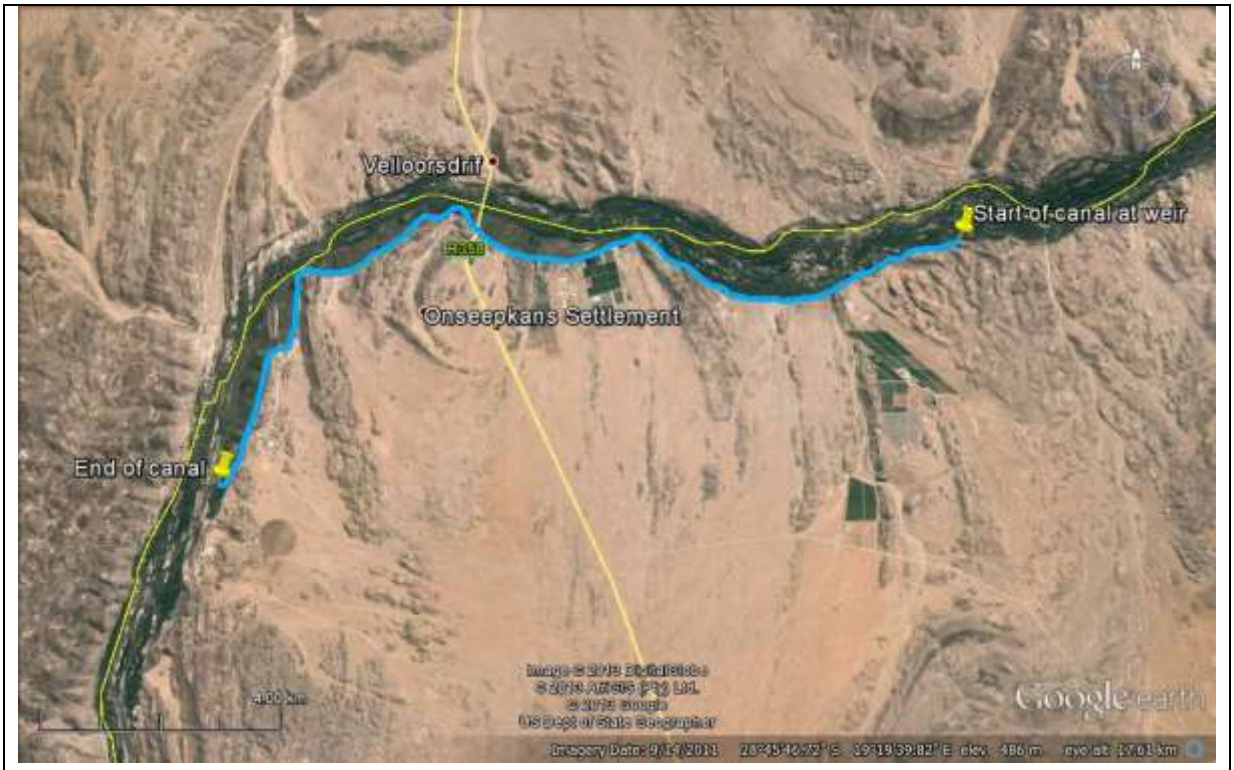

Figure 2: Location of the canal and the proposed pipeline route.

Alternative 3
Open concrete canal This design solution would entail the construction of an open concrete canal in the footprint of the existing earth canal. It would operate exactly the same as the earth canal, but with less maintenance. This option was not preferred due to its exposure during flood conditions.

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

Alternative 1 (preferred alternative)		
Alternative 2		
Alternative 3		

e) No-go alternative

The no-go option would the option of not constructing the bulk water supply system. The current status quo will remain, with the current earthen canal remaining in use.

According to the Biodiversity Assessment (**Appendix D2**), the "No-Go alternative" does not signify significant biodiversity gain or loss especially on a regional basis. However, it will ensure that none of the potential impacts above occur. The current status quo will remain and there will be no immediate additional impact on the vegetation, protected species or river corridors. However, the potential environmental improvement, better water management and conservation will also not be implemented and the canal will remain subject to flood damage, siltation and alien infestation, which

will be associated with constant maintenance and repair (thus constant disturbance).

There will also be no potential impacts on archaeological aspects on the proposed site.

However, the positive socio-economic impacts from the proposed bulk water supply scheme will not be achieved. The potential better water management and conservation will also not be implemented and the currently used canal will remain subject to flood damage, siltation and alien infestation, which will be associated with constant maintenance and repair (thus constant disturbance).

No jobs will be created during the construction or operational phase.

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)	Approximately 5.1ha
Alternative A2 (if any)	49 600m^2 (4.96ha)
Alternative A3 (if any)	m^2

or, for linear activities:

Alternative:	**Length of the activity:**
Alternative A1 (preferred activity alternative)	2 200m
Alternative A2 (if any)	16 400m
Alternative A3 (if any)	m

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)	m^2
Alternative A2 (if any)	m^2
Alternative A3 (if any)	m^2

4. SITE ACCESS

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

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

Describe the type of access road planned:

Existing roads in and around Onseepkans will be utilised as far as possible. No new roads are proposed.

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

5. LOCALITY MAP

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

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

6. LAYOUT/ROUTE PLAN

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

The site or route plans must indicate the following:

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

7. SENSITIVITY MAP

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

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

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

8. SITE PHOTOGRAPHS

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

9. FACILITY ILLUSTRATION

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

10. ACTIVITY MOTIVATION

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

1. Is the activity permitted in terms of the property's existing land use rights?	YES	NO	Please explain
The properties are zoned "Agricultural"			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES	NO	Please explain
The activity is for the development and expansion of the Onseepkans Bulk Water Supply Scheme. The applicant is the Northern Cape Department of Agriculture, land reform and development planning.			
(b) Urban edge / Edge of Built environment for the area	YES	NO	Please explain
The site is not located within the urban edge.			

(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES	NO	Please explain
The activity is for the development and expansion of the Onseepkans Bulk Water Supply Scheme. The applicant is the Northern Cape Department of Agriculture, land reform and development planning.			
(d) Approved Structure Plan of the Municipality	YES	NO	Please explain
The activity is for the development and expansion of the Onseepkans Bulk Water Supply Scheme. The applicant is the Northern Cape Department of Agriculture, land reform and development planning.			
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES	NO	Please explain
According to the Namakwa District Municipality, Integrated Development Plan 2012-2016, the Namakwa Environmental Management Framework (EMF) and Strategic Environmental Management Plan (SEMP) was developed in order to provide a high level plan for sustainable development in the Namakwa District Municipality of the Northern Cape Province. There are six Environment Managements Zones and one additional zone for areas where insufficient information exists to make a determination. The focus of the Environmental Management Zones is to restrict development in the zones with the greatest sensitivity, and allow development in the zones of low sensitivity. The EMF does not prohibit development in any one zone, neither does it give carte blanche for un-restricted development in any zone. The EMF should be used as guidance to the sensitivities of the proposed development area and tailor development planning and environmental authorisation approaches to the level of sensitivity in each zone.			
(f) Any other Plans (e.g. Guide Plan)	YES	NO	Please explain
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES	NO	Please explain
The activity is for the development and expansion of the Onseepkans Bulk Water Supply Scheme. The applicant is the Northern Cape Department of Agriculture, land reform and development planning.			

4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES	NO	Please explain
There was a need for a bulk water irrigation system which will provide the following: • Water provided under pressure, supporting more efficient irrigation systems such as micro and drip irrigation. System will provide water at a minimum pressure of 2 Bar, • Possibilities for further expansions. This system will supply water for 370ha, but have surplus capacity in the pump station, rising main pipeline and dam to supply water for an additional 200ha, • The system should not have additional operational cost (electricity, etc) compared to the current canal system. The 1MW SPV generator will generate enough electricity to drive the pump and filterstation.			
5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES	NO	Please explain
N/A. The proposed activity does not require electricity, water supply, sewerage or waste removal services.			
6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES	NO	Please explain
The applicant is the Northern Cape Department of Agriculture, Land Reform and Development Planning.			
7. Is this project part of a national programme to address an issue of national concern or importance?	YES	NO	Please explain
The applicant is the Northern Cape Department of Agriculture, Land Reform and Development Planning.			
8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES	~~NO~~	Please explain
The site is in close proximity to the source of the water, and to the end-users. There are no environmental constraints identified at this point which would make the preferred site unsuitable.			

9. Is the development the best practicable environmental option for this land/site?	YES	NO	Please explain
The best environmental option would be the no-go alternative. However, the massive social benefits of the proposed project would not be realised. Although the establishment of the pumpstation, storage dam and solar site will cause some disturbance, the implementation of the Environmental Management Programme, and recommendations from the specialist, the proposed activity is expected to have a low negative impact. However, the benefits of the proposed activity are expected to outweigh any potential negative environmental impacts.			
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES	~~NO~~	Please explain
The best environmental option would be the no-go alternative. However, the massive social benefits of the proposed project would not be realised. Although the establishment of the pumpstation, storage dam and solar site will cause some disturbance, the implementation of the Environmental Management Programme, and recommendations from the specialist, the proposed activity is expected to have a low negative impact. However, the benefits of the proposed activity are expected to outweigh any potential negative environmental impacts.			
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	~~YES~~	NO	Please explain
The proposed activity is not expected to set a precedent			
12. Will any person's rights be negatively affected by the proposed activity/ies?	~~YES~~	NO	Please explain
The rights of residents, local farmers, the community etc. are not expected to be negatively impacted as the proposed activity is expected to have positive impact			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	~~YES~~	NO	Please explain
The activity is not expected to compromise the urban edge.			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES	NO	Please explain
The project may contribute to SIP 11 – Agri-logistics and rural infrastructure (I*mprove investment in agricultural and rural infrastructure that supports expansion of production and employment, small-scale farming and rural development, including facilities for storage (silos, fresh-produce facilities, packing houses); transport links to main networks (rural roads, branch train-line, ports), fencing of farms, irrigation schemes to poor areas, improved R&D on rural issues (including expansion of agricultural college colleges), processing facilities (abattoirs, dairy infrastructure), aquaculture incubation schemes and rural tourism infrastructure*.).			
15. What will the benefits be to society in general and to the local communities?			Please explain
The activity is expected to provide temporary employment for approximately 100 people during the construction phase (90% previously disadvantaged) and 10 permanent job opportunities (90% previously disadvantaged).			

16. Any other need and desirability considerations related to the proposed activity?	Please explain
N/A	
17. How does the project fit into the National Development Plan for 2030?	Please explain
According to the National Development Plan (2030), agriculture uses the largest volume of water, and as a result, the farming sector will have to increase the efficiency of its water use to expand production and allow transfers to other users in water-scarce areas.	
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: - The actual and potential impacts of the activity on the environment, socio-economic conditions and cultural heritage have been identified, predicted and evaluated, as well as the risks and consequences and alternatives and options for mitigation of activities, with a view to minimizing negative impact, maximizing benefits and promoting compliance with the principles of environmental management – please refer to Section D below. - The effects of the activity on the environment have been considered before actions taken in connection with them – alternatives have been considered and investigated (please refer to Section A2 below). - Adequate and appropriate opportunity for public participation was ensured through the public participation process – please refer to Section C and **Appendix E** for the public participation information, including the list of identified Interested and Affected parties, as well as the methods for identifying and informing I&APs of the application and proposed activity. - The environmental attributes have been considered in the management and decision-making of the activity – an EMP has been included (**Appendix G**) with the proposed activity and must adhere to the requirements of all applicable state Authorities.	

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:

- People and their needs have been placed at the forefront while serving their physical, psychological, developmental, cultural and social interests – the proposed activity will have a beneficial impact on people, especially the local community and local farmers.
- Development must be socially, environmentally and economically sustainable. Where disturbance of ecosystems, loss of biodiversity, pollution and degradation, and landscapes and sites that constitute the nation's cultural heritage cannot be avoided, are minimised and remedied. - Although the activity is expected to have little significant environmental impact, these impacts have been considered, and mitigation measures have been put in place. This is dealt with in the EMP (**Appendix G**).
- Where waste cannot be avoided, it is minimised and remedied through the implementation and adherence of EMP.
- The use of non-renewable natural resources is responsible and equitable – no exploitation of non-renewable natural resources occurs with the proposed activity.
- The negative impacts on the environment and on people's environmental rights have been anticipated and prevented, and where they cannot be prevented, are minimised and remedied - refer to Section F below.
- The interests, needs and values of all interested and affected parties have been taken into account in any decisions through the Public Participation Process – please refer to Section C and **Appendix E** for the public participation information.
- The social, economic and environmental impacts of the activity have been considered, assessed and evaluated, including the disadvantages and benefits – refer to Section F below.
- The effects of decisions on all aspects of the environment and all people in the environment have been taken into account, by pursuing what is considered the best practicable environmental option – the proposed activity is expected to have minimal/negligible environmental impacts, especially after mitigation measures as described under Section D and in the EMP are implemented.

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	Department of Water and Sanitation	Not yet
Northern Cape Conservation Act, Act 9 of 2009 (NCNCA)	Flora Permits may be required if any protected trees will be disturbed	Department of Environment and Nature Conservation	Not yet (only if applicable)
National Heritage Resources Act, No 25 of 1999	Section 38(1)(a)(c)	South African Heritage Resources Agency (SAHRA)	Not yet

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES	~~NO~~
If YES, what estimated quantity will be produced per month?		m^3

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

All construction solid waste must be disposed of at the nearest licenced municipal waste disposal site, as per the EMP.

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

All construction solid waste must be disposed of at the nearest licenced municipal waste disposal site, as per the EMP.

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

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

Negligible, to no solid waste will be produced during the operational phase of the development

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

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

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

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA?	~~YES~~	NO

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

Is the activity that is being applied for a solid waste handling or treatment facility?	~~YES~~	NO

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

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	~~YES~~	NO
If YES, what estimated quantity will be produced per month?		m^3
Will the activity produce any effluent that will be treated and/or disposed of on site?	YES	NO

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

Will the activity produce effluent that will be treated and/or disposed of at another facility?	~~YES~~	NO

If YES, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		**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. The proposed activity is not expected to produce wastewater during the operational phase.

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other that exhaust emissions and dust associated with construction phase activities?	~~YES~~	NO
If YES, is it controlled by any legislation of any sphere of government?	YES	NO

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?	~~YES~~	NO

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

e) Generation of noise

Will the activity generate noise?	~~YES~~	NO
If YES, is it controlled by any legislation of any sphere of government?	YES	NO

Describe the noise in terms of type and level:

N/A

13. WATER USE

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

~~Municipal~~	~~Water board~~	~~Groundwater~~	River, stream, dam or lake	~~Other~~	~~The activity will not use water~~

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	litres	
Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?	YES	~~NO~~

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:

A 1MW SPV generator will be constructed to supply electricity to the pump and filter station.

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

A 1MW SPV generator will be constructed to supply electricity to the pump and filter station.

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 | NO

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

Property description/physical address:

Province	Northern Cape
District Municipality	Namaqualand District Municipality
Local Municipality	Khai Ma Municipality
Ward Number(s)	
Farm name and number	Farm No. 88 Erf. 209 Erf 730
Portion number	n/a
SG Code	C03600140000008800000 C03600140000020900000 C03600140000073000000

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

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

Agriculture Zone I

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

Is a change of land-use or a consent use application required? YES | NO

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

~~Flat~~	1:50 – 1:20	~~1:20 – 1:15~~	~~1:15 – 1:10~~	~~1:10 – 1:7,5~~	~~1:7,5 – 1:5~~	~~Steeper than 1:5~~

Alternative S2 (if any):

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

Alternative S3 (if any):

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

2. LOCATION IN LANDSCAPE

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

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

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

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

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

4. 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]	~~Natural veld with heavy alien infestation~~[E]	~~Veld dominated by alien species~~[E]	~~Gardens~~
~~Sport field~~	~~Cultivated land~~	~~Paved surface~~	~~Building or other structure~~	~~Bare soil~~

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. Please refer to the Biodiversity Assessment (**Appendix D2**).

Vegetation Encountered:

Extraction point - Most of the riparian zone along the Orange River neighbouring Onseepkans can be described as degraded and even transformed in places. Thickets are still found, but large portions of the riparian zone is dominated by dense stands of the common reed *Phragmites australis*, which often forms almost single species stands. *Phragmites australis* is the dominant semi-aquatic macrophyte along the whole of the Orange River.

At the point where the extraction point will be locate the riparian zone is very narrow and the vegetation dominated by *Phragmites*. Alien invader species like the *Prosopis glandulosa* (Mesquite tree), *Nicotiana glauca* (Wild tobacco), *Datura stramonium* (Thorn apple) and *Ricinus communis* (Castor-oil plant) were also observed. No protected tree species was observed in the vicinity of the proposed new extraction point.

Solar (SPV) site - The site is located within one of the sheet washed plains found in between rocky outcrops associated with Eastern Gariep Plains Desert vegetation type. The vegetation was dominated by a low grassy bottom stratum (reaching approximately 0.5 m) including, *Stipagrostis*-, *Enneapogon*- species and *Schmidtia kalahariensis*. The middle stratum (0.5-1m) consists of a very sparse short to medium shrubby layer, dominated by the hardy shrub *Petalidium setosum* and *Euphorbia gregaria. Other shrub species encountered included Sisyndite spartea*, *Aptosimum spinescens* and *Zygophyllum microcarpum*.

No other features of significance or protected tree species were encountered on the site and its immediate surroundings.

Reservoir (earth dam) site **-** the site is likely to be covered by Eastern Gariep Rocky Desert vegetation type, the vegetation is in fact a continuation of the sheet washed vegetation associated with Eastern Gariep Plains Desert. The species composition is almost identical to that described for the solar site, although *Euphorbia gregaria* might be slightly more prominent on this site.

The only additional feature of interest was the presence of two low individuals of *Boscia foetida* (protected in terms of the NCNCA), that was encountered to the west of the proposed site. However, it should be fairly simple to avoid these features by moving the site slightly to the east.

Pipeline and overhead cables - The proposed pipeline and overhead cables route follow existing roads. The vegetation from the river to almost at the solar site can be described as disturbed and impacted as a result of grazing practices and urban associated activities (being located right next to a small settlement).

The vegetation encountered between the solar- and reservoir site is the same low grassy bottom stratum (reaching approximately 0.5 m) with a sparse short to medium shrubby over layer as encountered at both the solar and reservoir sites.

5. SURFACE WATER

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

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

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

The pump station is located on the banks of the Orange River. The Orange River is a perennial river, classified as a Class B: Largely Natural, by the NFEPA (See Appendix A4).

According to the Freshwater Assessment (**Appendix D1**), there are a number of drainage lines and small ephemeral streams draining from the south into the Orange River within the study area. The lower lying alluvial soils along the Orange River have been cultivated and if the ephemeral streams transect the irrigated areas they are canalised through the agricultural fields . The ephemeral streams are visible in the landscape due to the relatively wide sandy beds and, in some instances, by vegetation associated with the river beds and riparian zones. The river beds are typically sandy with shrubs and trees aligning the riparian zones.

The Orange River however dominates the surrounding landscape, and displays braided features with secondary channels that are only active during high flow events. The riparian vegetation in terms of species composition within the channel is still natural and consists largely of common *Phragmites australis* reeds along the river banks in the wetbank and lower wetbank zone and large trees (*Acacia Karoo*) in the upper wet and lower dry banks.

The South African side (southern bank) of the Orange River has been developed and cultivated to within the riparian zone. Vineyards in particular have been established in the riparian zone, resulting in many of the indigenous riparian trees and shrubs being removed in these areas. Some invasive alien plants such as *Arundo donax (*Spanish reed*)* and *Prosopis gladulosa* (mosquito bush) have invaded these disturbed areas.

The existing irrigation canal is situated parallel to the river between the riparian zone and the mountain outcrop in the area of the proposed new abstraction point

6. LAND USE CHARACTER OF SURROUNDING AREA

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

Natural area	~~Dam or reservoir~~	~~Polo fields~~
~~Low density residential~~	~~Hospital/medical centre~~	~~Filling station H~~
Medium density residential	~~School~~	~~Landfill or waste treatment site~~
~~High density residential~~	~~Tertiary education facility~~	~~Plantation~~
~~Informal residential A~~	~~Church~~	Agriculture
~~Retail commercial & warehousing~~	~~Old age home~~	River, stream or wetland
Light industrial	~~Sewage treatment plant A~~	~~Nature conservation area~~
~~Medium industrial AN~~	~~Train station or shunting yard N~~	~~Mountain, koppie or ridge~~
~~Heavy industrial AN~~	~~Railway line N~~	~~Museum~~
~~Power station~~	~~Major road (4 lanes or more) N~~	~~Historical building~~
~~Office/consulting room~~	~~Airport N~~	~~Protected Area~~
~~Military or police base/station/compound~~	~~Harbour~~	~~Graveyard~~
~~Spoil heap or slimes dam A~~	~~Sport facilities~~	~~Archaeological site~~
~~Quarry, sand or borrow pit~~	~~Golf course~~	~~Other land uses (describe)~~

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

N/A

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

N/A

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

N/A

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

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

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A. Please refer to Appendix A2

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	~~NO~~
	Uncertain	

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:

According to the Heritage Impact Assessment (**Appendix D3**), there was only one Stone Age archaeological find within the assessment area, and no living heritage recognised on the proposed development footprints, except for the proposed pipeline development which runs through a nearby settlement. No archaeological remains/objects were detected on the proposed development sites which include the OSK Pump station, OSK Pipeline, OSK Reservoir and the OSK Solar farm. Onseepkans, however, has a rich living heritage in terms of historical Catholic Missionary activities in the area; this was the reason for the establishment of Onseepkans.

The assessment area (development footprint) for development has no significant archaeological places or structures. The footprint area is clear and consists of open field, arid Savannah vegetation, and rocky outcrops and surrounding mountains. There are no colonial/historical or pre-historical structures 60 years and older, neither are there any places or equipment of significance on the proposed development footprints. It is likely that places, structures and equipment has low heritage significance at the community specific, local and regional levels at least for its historic values. Since only one Stone Age archaeological artifact was detected on the entire site, which includes the areas of the proposed pipeline, solar farm and reservoir and pump station, archaeological heritage have at least low heritage significance at the community specific and local levels for its cultural and historic values.

No traditional burial places were recorded in the proposed development site. In addition, consultation with one traditional local inhabitant revealed no oral history or evidence of any traditional graves and burial places within the proposed development footprints. Onseepkans Settlement has two municipal cemeteries of which one might be of historical significance. Both these cemeteries are well outside the proposed development footprint. Traditional burial places have at least low heritage significance for its cultural and historic values.

It is likely that living heritage has medium to high heritage significance at the community specific, local and regional levels at least for its historical, cultural, socio-economical and socio-political values. Living heritage is absent on the development footprint, but surrounding areas like the Catholic Mission Station at Onseepkans Settlement have significant history which makes living heritage a possibility and a fact to be considered throughout the proposed development.

The impact on all heritage resources located within the proposed development site at OSK Pipe line, OSK Reservoir, OSK Pump station and OSK Solar farm is rated as low, due to the low density and low significance of archaeological material on the proposed development site, and the proposed development will possibly have no impact on such resources.

The impact on archaeological remains, material and objects is significantly low as only one stone tool was found, identified and recorded. No archaeological remains/objects were detected on the proposed bulk water supply development footprints which include the OSK Pump station, OSK Pipe line, OSK Solar farm and OSK Reservoir. It is however evident that the archaeological remains have low heritage significance at the community specific, local and regional levels, at least for its historic and, cultural values. Development can thus continue.

According to the Desktop Palaeontological Assessment (**Appendix D4**), the heritage resources in the area proposed for development are sufficiently recorded. No further palaeontological heritage work is recommended for the proposed development.

Mitigation measures:
Regarding the impact on heritage on the proposed Onseepkans bulk water supply development site and footprints, the impact on archaeological material will be significantly low in our professional point opinion. We see no reason for the development not to continue, as it will improve the socio-economical opportunities and livelihood of the Onseepkans community in the region. It is however important to consider the proximity of the built environment as well as the historical tangible and intangible landscape.

Due to the low impact of development on heritage resources, we thus recommend the bulk water supply development as described by the specifications of the client. The assessment is however subject to the approval of SAHRA.

It is possible that sub-surface heritage resources might be encountered during the construction phase of this project. The Project Engineer, Environmental Control Officer and all other persons responsible for site management and excavation should be aware that indicators of sub-surface sites could include:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments, including potsherds;
- Stone concentrations that appear to be formally arranged (may indicate the presence of an underlying burial)
- Fossilised remains of fauna and flora, including trees.
- Stone tool concentrations from San origin.

In the event that such indicator(s) of heritage resources are identified, the following actions should be taken immediately:

- All construction within a radius of at least 20m of the indicator should cease. This distance should be increased at the discretion of supervisory staff if heavy machinery or explosives could cause further disturbance to the suspected heritage resource.
- This area must be marked using clearly visible means, such as barrier tape, and all personnel should be informed that it is a no-go area.
- A guard should be appointed to enforce this no-go area if there is any possibility that it could be violated, whether intentionally or inadvertently, by construction staff or members of the public.
- No measures should be taken to cover up the suspected heritage resource with soil, or to collect any remains such as bone, ceramics or stone.
- If a heritage practitioner has been appointed to monitor the project, s/he should be contacted and a site inspection arranged as soon as possible.
- If no heritage practitioner has been appointed to monitor the project, SAHRA or Dr. D. Morris must be contacted at the SAHRA head office or at the McGregor museum.

- The South African Police Services should be notified by a SAHRA staff member or an independent heritage practitioner if human remains are identified. No SAPS official may disturb or exhume such remains, whether of recent origin or not.
- All parties concerned should respect the potentially sensitive and confidential nature of the heritage resources, particularly human remains, and refrain from making public statements until a mutually agreed time.
- Any extension of the project beyond its current footprint involving vegetation and/or earth clearance should be subject to prior assessment by a qualified heritage practitioner, taking into account all information gathered during this initial heritage impact assessment.
- We recommend the appointment of a Stone Age Specialist if any large finds of stone tools are discovered during construction.

According to the Desktop Palaeontological Assessment (**Appendix D4**), a Palaeo Chance Find Procedure should be included in the Environmental Management Plan.

~~YES~~	NO
YES	~~NO~~

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.

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:

The Khai-Ma Local Municipality has an unemployment rate of 20.1% according to Statistics South Africa.

Economic profile of local municipality:

According to the Local Government Handbook (www.localgovernment.co.za), the main economic sectors are: Agriculture; tourism; community, social and personal services; and renewable energy.

Level of education:

According to the Local Government Handbook (www.localgovernment.co.za), 3.9% of the population has no schooling, 5.8% has higher education and 18.1% has matric.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R130 - R150 million	
What is the expected yearly income that will be generated by or as a result of the activity?	R18.5 million	
Will the activity contribute to service infrastructure?	YES	~~NO~~
Is the activity a public amenity?	~~YES~~	NO
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	100	
What is the expected value of the employment opportunities during the development and construction phase?	R3 million	
What percentage of this will accrue to previously disadvantaged individuals?	90%	
How many permanent new employment opportunities will be created during the operational phase of the activity?	10	
What is the expected current value of the employment opportunities during the first 10 years?	R9 million	
What percentage of this will accrue to previously disadvantaged individuals?	90%	

9. BIODIVERSITY

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

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

Systematic Biodiversity Planning Category				**If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan**
Critical Biodiversity Area (CBA)	~~Ecological Support Area (ESA)~~	~~Other Natural Area (ONA)~~	~~No Natural Area Remaining (NNR)~~	See below

According to the Biodiversity Assessment (**Appendix D2**), the proposed sites as well as the whole of Onseepkans is located within proposed CBA 1 or CBA 2 areas. Ideally one would like to limit potential impact on the proposed CBA areas, but in this case it will be almost impossible. However, the impacts on the CBA's are already mitigated to a large degree by the placement of the sites next to existing roads and within areas already impacted by agricultural development and urban creep. However, it is still recommended that good environmental control must be implemented during construction and

rehabilitation, especially in this arid region where re-instatement of natural vegetation would be especially difficult after disturbance.

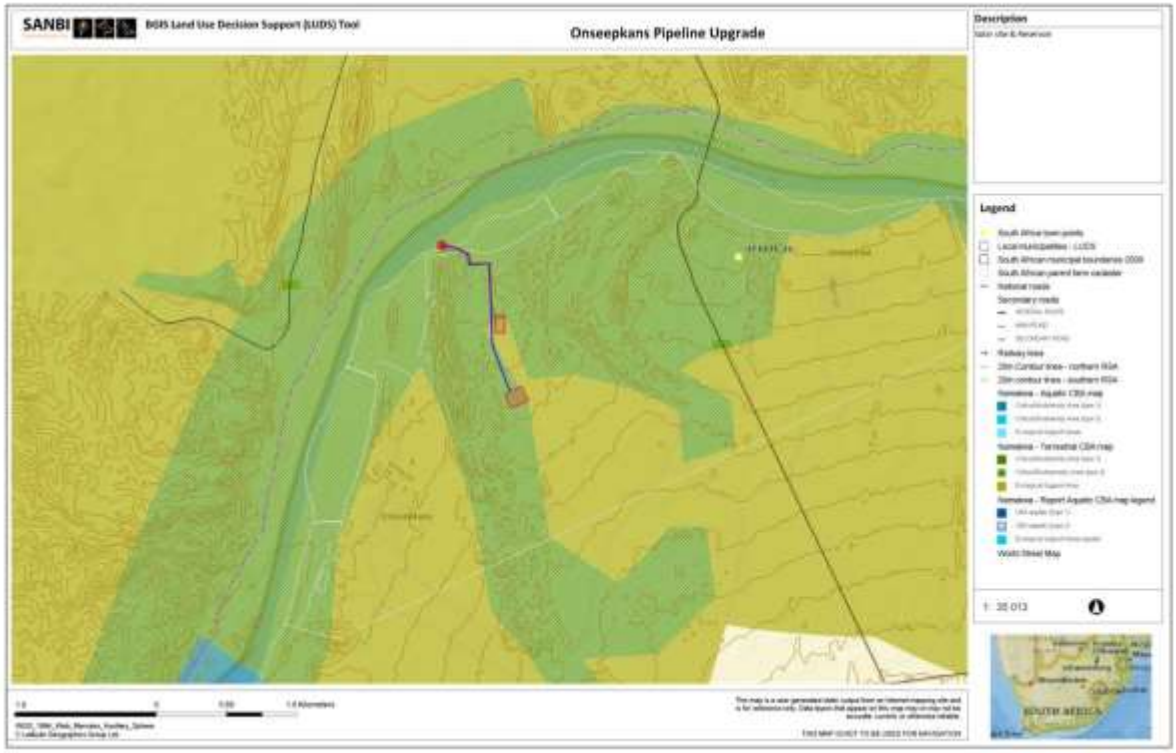

Figure 3: Critical Biodiversity Areas Map of Onseepkans.

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	%	
Near Natural (includes areas with low to moderate level of alien invasive plants)	40%	The solar plant and storage dam sites are near natural, but do show evidence of disturbance from grazing and also have some alien vegetation
Degraded (includes areas heavily invaded by alien plants)	50%	Large parts of the site show signs of disturbance, from agricultural practices, grazing and urban creep and have left the vegetation in poor condition and heavily infested with alien vegetation
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	10%	Part of the site (pipeline route and overhead cables) are along existing roads

c) Complete the table to indicate:

(i) the type of vegetation, including its ecosystem status, present on the site; and

(ii) whether an aquatic ecosystem is present on site.

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

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

Vegetation Type

According to the Biodiversity Assessment (**Appendix D2**), in accordance with the 2006 Vegetation map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006) three (3) broad vegetation types are expected in the vicinity of the proposed extraction point, solar site and reservoir, namely ***Lower Gariep Alluvial Vegetation (Endangered)*** (at the extraction point) along the Orange river alluvial plain while ***Eastern Gariep Rocky Desert (Least Threatened)*** is expected along the River and just back of the river and ***Eastern Gariep Plains Desert (Least Threatened)*** (at the reservoir and solar site).

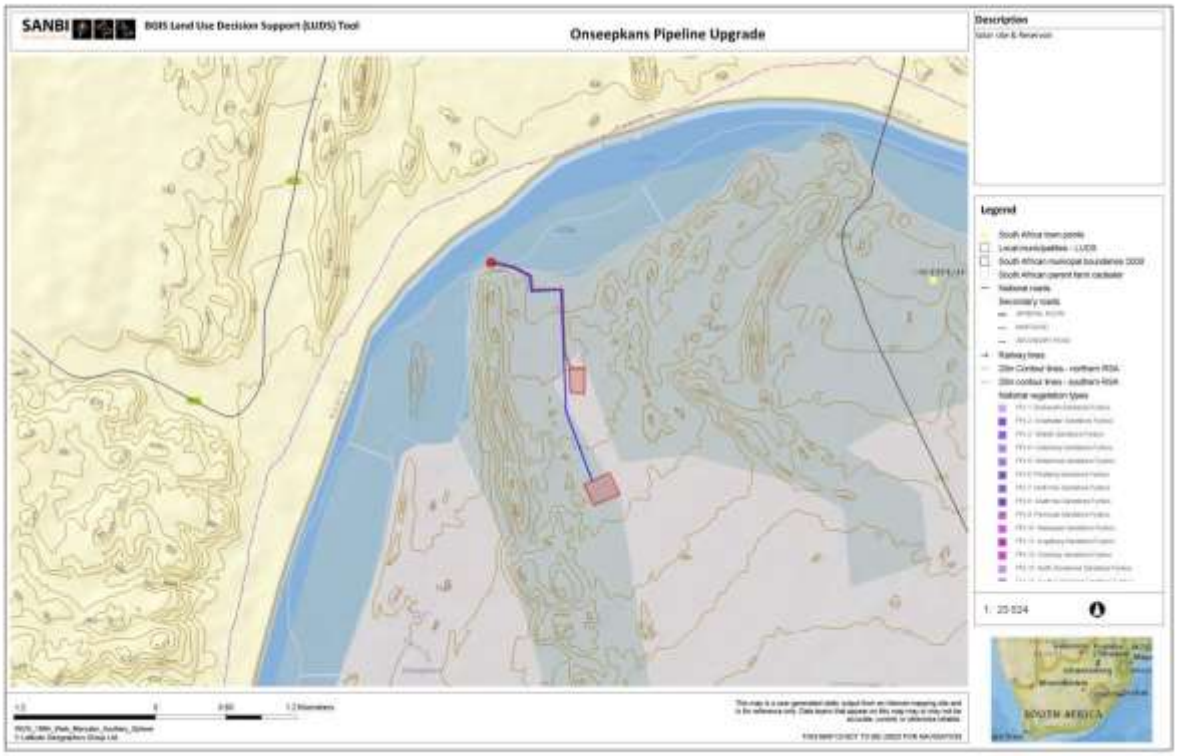

Figure 4: Vegetation Map of Onseepkans.

Nationally protected plant species - Both *Acacia erioloba* and *Boscia albitrunca* was observed at Onseepkans, but none within the study area.

Provincially protected plant species - Two species protected in terms of the NCNCA was encountered within the study area (*Boscia foetida* and *Euphorbia gregaria*). Flora permits will have to be obtained for the likely impact on individuals from these species.

Freshwater

According to the Freshwater Assessment (**Appendix D1**), the Orange River dominates the surrounding landscape, and displays braided features with secondary channels that are only active during high flow events. The riparian vegetation in terms of species composition within the channel is still largely natural. The South African side (southern bank) of the Orange River has been developed and cultivated into the alluvial riparian zone. The proposed inlet structure and pump house could potentially impact on these freshwater features.

The freshwater assessment of the proposed activities to the features described above indicates that:

- The Orange river is in a moderately modified present ecological state and has a high ecological importance in these lower reaches,
- In general the ephemeral streams and small drainage lines are largely natural with a low ecological importance,
- The biodiversity conservation mapping has indicated that the lower section of the Orange River and its tributaries within the study area have been mapped as a River Freshwater Ecosystem Priority Area and a Fish Sanctuary for on endemic fish species, while the channel of the Orange River has been mapped as a CBA2 (Important Area) due to the fact that it contains Lower Gariep Alluvium vegetation which is considered as endangered and the river provides an important corridor for migration.
- There are a number of drainage lines and small ephemeral streams draining from the south into the Orange River within the study area. The ephemeral streams are visible in the landscape due to the relatively wide sandy beds and, in some instances, by vegetation associated with the river beds and riparian zones. The unnamed ephemeral stream that will be impacted is largely modified and of low ecological importance.

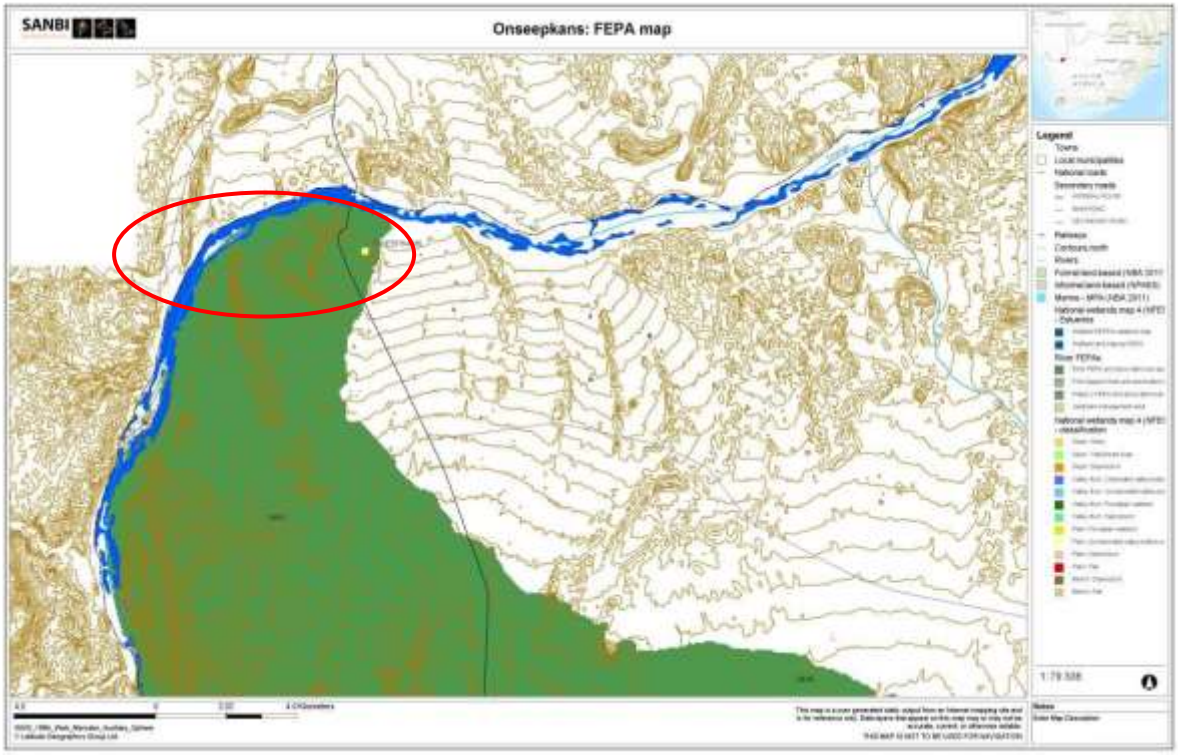

Figure 5: NFEPA (National Freshwater Ecosystem Priority Areas) Map of Onseepkans

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	Die Gemsbok	
Date published	06 November 2015	
Site notice position	**Latitude**	**Longitude**
	Please refer to Appendix E1	
Date placed	03 November 2015	

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)
M. Ranwedzi	Dept of Water Affairs- Northern Cape	054 338 5800
J. Mans	DAFF - Northern Cape	054 338 5909
K. Smuts	SAHRA	0214624502

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	

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	Fax No	e-mail	Postal address
Dept of Water Affairs- Northern Cape	M. Ranwedzi	054 338 5800		ranwedzim@dwa.gov.za	Private Bag X5912, Upington, 8800
DAFF - Northern Cape	J. Mans	054 338 5909	054 334 0030	jacolinema@daff.gov.za	P.O. Box 2782, Upington, 8800
SAHRA	K. Smuts	0214624502	0214624509		P.O. Box 4637, Cape Town, 8000

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)			
	Direct impacts: **Potential impact on freshwater ecosystems**	Low - negative	- Construction activities should be kept to a minimum within the Phragmites zone of the riparian area. - Material (infill) should not be sourced from the riparian zones; - Excess excavated material should not be dumped into the riparian zones; - Existing dumped material along the maintenance road should be removed and placed back into the trench as backfilling. This should be done in such a way as not to bulldoze non disturbed areas or to widen the existing road; - The exotic trees currently growing in the riparian zones should be cut and the stumps treated with herbicide to prevent re-growth; - Where possible the ephemeral streams previously cut off from the Orange River by the trench should be reconnected with the river; and - Appropriate construction methods should be deployed to ensure the prevention of erosion of the filled-in trenches during flood events which would prevent the need to undertake repetitive infilling of eroded areas once construction is completed. - The riparian zone areas should be re-planted with Phragmites in the areas where Phragmites has been removed. This can be done to digging sods out and replanting it in the affected area.

Activity	Impact summary	Significance	Proposed mitigation
			- The design of the pump house and inlet pipes must be done in such a way as to minimize the amount of infrastructure that needs to be placed in the rocky river banks. This could be achieved by the creation of a sump area for the inlets with a pump house some distance away from the actual inlet and riparian zone
	Loss of vegetation	Threatened or protected ecosystems – **Very Low negative** Special Habitats – **Low-Medium negative** Corridors and or conservancy networks – **Very low negative** Protected Species – **Medium-low negative** Direct impacts – **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 EMP and the Biodiversity study recommendations as well as any other conditions which might be required by the Department of Environmental Affairs. - An integrated waste management system must be implemented during the construction phase. All rubble and rubbish (if applicable) must be collected and removed from the site to a Municipal approved waste disposal site. - All invasive alien vegetation should be removed from all associated footprints within the various construction sites. - All efforts must be made to protect mature indigenous trees within the proposed final footprint (and any other protected species that might be encountered on site). - Permits must be obtained for the removal of any protected species which might be encountered. - Indiscriminate clearing of areas must be avoided (all remaining areas to remain as natural as possible). - All topsoil (the top 15-20 cm at all excavation sites), must be removed and stored separately for re-use for rehabilitation purposes. The topsoil and vegetation should be replaced over the disturbed soil to provide a source of seed and a seed bed to encourage re-growth of the species removed during construction. - Once the construction is completed rehabilitation must be implemented. -

Activity	Impact summary	Significance	Proposed mitigation
	The loss of Archaeological heritage during construction	Low - Negative	In the event that indicator(s) of heritage resources are identified, the following actions should be taken immediately: • All construction within a radius of at least 20m of the indicator should cease. This distance should be increased at the discretion of supervisory staff if heavy machinery or explosives could cause further disturbance to the suspected heritage resource. • This area must be marked using clearly visible means, such as barrier tape, and all personnel should be informed that it is a no-go area. • A guard should be appointed to enforce this no-go area if there is any possibility that it could be violated, whether intentionally or inadvertently, by construction staff or members of the public. • No measures should be taken to cover up the suspected heritage resource with soil, or to collect any remains such as bone, ceramics or stone. • If a heritage practitioner has been appointed to monitor the project, s/he should be contacted and a site inspection arranged as soon as possible. • If no heritage practitioner has been appointed to monitor the project, SAHRA or Dr. D. Morris must be contacted at the SAHRA head office or at the McGregor museum. • The South African Police Services should be notified by a SAHRA staff member or an independent heritage practitioner if human remains are identified. No SAPS official may disturb or exhume such remains, whether of recent origin or not. • All parties concerned should respect the potentially sensitive and confidential nature of the heritage resources, particularly human remains, and refrain from making public statements until a mutually agreed time. • Any extension of the project beyond its current footprint involving vegetation and/or earth clearance should be subject to prior assessment by a qualified heritage practitioner, taking into account all information

Activity	Impact summary	Significance	Proposed mitigation
			gathered during this initial heritage impact assessment. • We recommend the appointment of a Stone Age Specialist if any large finds of stone tools are discovered during construction. Further heritage recommendations: • In future, should the licensed activities require any extension, expansion or a borrow pit larger than 500m2 is required for material, SAHRA must be notified of teh development in terms of Section 38(1) and 38(8) of the National Heritage Resources Act (Act No. 25 of 1999)(NHRA). • If any evidence of archaeological sites or remains (e.g. remnants of stone-made, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Itumeleng Masiteng/ Mimi Seetelo 012 320 8490) must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required.
	Indirect impacts:		
	Cumulative impacts:		
	Direct impacts:		

Activity	Impact summary	Significance	Proposed mitigation
	Indirect impacts:		
	Cumulative impacts:		
Alternative 2			
	Direct impacts:		
	Indirect impacts:		
	Cumulative impacts:		
	Direct impacts:		
	Indirect impacts:		
	Cumulative impacts:		
Alternative 3			
	Direct impacts:		
	Indirect impacts:		
	Cumulative impacts:		
	Direct impacts:		
	Indirect impacts:		
	Cumulative impacts:		

No-go option: The no-go option would the option of not constructing the bulk water supply system. The current status quo will remain, with the current earthen canal remaining in use.

According to the Biodiversity Assessment (**Appendix D2**), the "No-Go alternative" does not signify significant biodiversity gain or loss especially on a regional basis. However, it will ensure that none of the potential impacts above occur. The current status quo will remain and there will be no immediate additional impact on the vegetation, protected species or river corridors. However, the potential environmental improvement, better water management and conservation will also not be implemented and the canal will remain subject to flood damage, siltation and alien infestation, which will be associated with constant maintenance and repair (thus constant disturbance).

There will also be no potential impacts on archaeological aspects on the proposed site.

However, the positive socio-economic impacts from the proposed bulk water supply scheme will not be achieved. The potential better water management and conservation will also not be implemented

Activity	Impact summary	Significance	Proposed mitigation
and the currently used canal will remain subject to flood damage, siltation and alien infestation, which will be associated with constant maintenance and repair (thus constant disturbance). No jobs will be created during the construction or operational phase.			
	Direct impacts:		
	Indirect impacts:		
	Cumulative impacts:		

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

2. ENVIRONMENTAL IMPACT STATEMENT

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

Alternative A (preferred alternative)

Summary:

The following is a summary of the potential impacts, and their ratings, after mitigation:

Construction phase.

Potential impact on freshwater ecosystems – **Low negative**

The loss of Archaeological heritage during construction – **Low negative**

Loss of vegetation:

- Threatened or protected ecosystems – **Very Low negative**
- Special Habitats – **Low-Medium negative**
- Corridors and or conservancy networks – **Very low negative**
- Protected Species – **Medium-low negative**
- Direct impacts – **Low Negative**

Socio-economic aspects (Job creation) – **Low (Positive)**

Noise impact - **Negligible**

Visual impact – **Low (Negative).**

Operational Phase

Potential impact on freshwater ecosystems – **Low negative**

Potential impacts on archaeological heritage – **No impact**

Loss of vegetation – **Negligible**

Socio-economic – **Low (Positive)**

Noise impact - **No significant impact**

Visual impact – **Medium-low (negative)**

Decommissioning

The project as proposed does not require 'decommissioning' or 'closure', as such the potential impacts thereof is considered irrelevant.

Alternative B

Construction phase.

Potential impacts on archaeological heritage – **No impact**

Loss of vegetation and associated habitat - **Low (Negative)**

Freshwater ecosystems (riparian habitat) **– Very Low (Negative).**

Job creation – **Low (Positive)**,

Noise impact - **Negligible**

Visual impact – **Very Low (Negative).**

Operational Phase

Potential impacts on archaeological heritage – **No impact**

Loss of vegetation and associated habitat – **Negligible**

Freshwater ecosystems (riparian habitat) **– Negligible**

Job creation – **Low (Positive)**

Noise impact - **No impact**

Visual impact – **No impact**

Alternative C

No-go alternative (compulsory)

The no-go option would the option of not constructing the bulk water supply system. The current status quo will remain, with the current earthen canal remaining in use.

According to the Biodiversity Assessment (**Appendix D2**), the "No-Go alternative" does not signify significant biodiversity gain or loss especially on a regional basis. However, it will ensure that none of the potential impacts above occur. The current status quo will remain and there will be no immediate additional impact on the vegetation, protected species or river corridors. However, the potential environmental improvement, better water management and conservation will also not be implemented and the canal will remain subject to flood damage, siltation and alien infestation, which will be associated with constant maintenance and repair (thus constant disturbance).

There will also be no potential impacts on archaeological aspects on the proposed site.

However, the positive socio-economic impacts from the proposed bulk water supply scheme will not be achieved. The potential better water management and conservation will also not be implemented and the currently used canal will remain subject to flood damage, siltation and alien infestation, which will be associated with constant maintenance and repair (thus constant disturbance).

No jobs will be created during the construction or operational phase.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	YES	~~NO~~

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

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.

Freshwater

- Construction activities should be kept to a minimum within the Phragmites zone of the riparian area.
- Material (infill) should not be sourced from the riparian zones;
- Excess excavated material should not be dumped into the riparian zones;
- Existing dumped material along the maintenance road should be removed and placed back into the trench as backfilling. This should be done in such a way as not to bulldoze non disturbed areas or to widen the existing road;
- The exotic trees currently growing in the riparian zones should be cut and the stumps treated with herbicide to prevent re-growth;
- Where possible the ephemeral streams previously cut off from the Orange River by the trench should be reconnected with the river; and
- Appropriate construction methods should be deployed to ensure the prevention of erosion of the filled-in trenches during flood events which would prevent the need to undertake repetitive infilling of eroded areas once construction is completed.
- The riparian zone areas should be re-planted with Phragmites in the areas where Phragmites has been removed. This can be done to digging sods out and replanting it in the affected area.
- The design of the pump house and inlet pipes must be done in such a way as to minimize the amount of infrastructure that needs to be placed in the rocky river banks. This could be achieved by the creation of a sump area for the inlets with a pump house some distance away from the actual inlet and riparian zone.
- The design of the inlet sump should be such that an attempt is made to prevent the siltation of the sump and therefore minimise the need to clean the inlet sump.
- Alien vegetation should be removed from the disturbed areas along the pipeline and road that are within or adjacent to the riparian zone and the areas should be kept clear of alien invasive vegetation. No material should be disposed into the riparian zone. The maintenance road should not be widened into the riparian zones. Erosion should be prevented especially in the upper reaches of the pipeline where steeps slopes down to the river occur.

Botanical

- 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 EMP and the Biodiversity study recommendations as

well as any other conditions which might be required by the Department of Environmental Affairs.

- An integrated waste management system must be implemented during the construction phase. All rubble and rubbish (if applicable) must be collected and removed from the site to a Municipal approved waste disposal site.
- All invasive alien vegetation should be removed from all associated footprints within the various construction sites.
- All efforts must be made to protect mature indigenous trees within the proposed final footprint (and any other protected species that might be encountered on site).
- Permits must be obtained for the removal of any protected species which might be encountered.
- Indiscriminate clearing of areas must be avoided (all remaining areas to remain as natural as possible).
- All topsoil (the top 15-20 cm at all excavation sites), must be removed and stored separately for re-use for rehabilitation purposes. The topsoil and vegetation should be replaced over the disturbed soil to provide a source of seed and a seed bed to encourage re-growth of the species removed during construction.
- Once the construction is completed rehabilitation must be implemented.

- The use of herbicides in a vegetation type classified as 'endangered' should be used with great caution to avoid accidental spills and harm to non-target indigenous plants and trees. The people applying herbicides must have the necessary AVCASA registration.

Heritage

In the event that indicator(s) of heritage resources are identified, the following actions should be taken immediately:

- All construction within a radius of at least 20m of the indicator should cease. This distance should be increased at the discretion of supervisory staff if heavy machinery or explosives could cause further disturbance to the suspected heritage resource.
- This area must be marked using clearly visible means, such as barrier tape, and all personnel should be informed that it is a no-go area.
- A guard should be appointed to enforce this no-go area if there is any possibility that it could be violated, whether intentionally or inadvertently, by construction staff or members of the public.
- No measures should be taken to cover up the suspected heritage resource with soil, or to collect any remains such as bone, ceramics or stone.
- If a heritage practitioner has been appointed to monitor the project, s/he should be contacted and a site inspection arranged as soon as possible.
- If no heritage practitioner has been appointed to monitor the project, SAHRA or Dr. D. Morris must be contacted at the SAHRA head office or at the McGregor museum.
- The South African Police Services should be notified by a SAHRA staff member or an independent heritage practitioner if human remains are identified. No SAPS official may disturb or exhume such remains, whether of recent origin or not.
- All parties concerned should respect the potentially sensitive and confidential nature of the heritage resources, particularly human remains, and refrain from making public statements until a mutually agreed time.
- Any extension of the project beyond its current footprint involving vegetation and/or earth clearance should be subject to prior assessment by a qualified heritage practitioner, taking into account all information gathered during this initial heritage impact assessment.
- We recommend the appointment of a Stone Age Specialist if any large finds of stone tools

are discovered during construction.

Further heritage recommendations:

- In future, should the licensed activities require any extension, expansion or a borrow pit larger than 500m2 is required for material, SAHRA must be notified of teh development in terms of Section 38(1) and 38(8) of the National Heritage Resources Act (Act No. 25 of 1999)(NHRA).
- If any evidence of archaeological sites or remains (e.g. remnants of stone-made, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Itumeleng Masiteng/ Mimi Seetelo 012 320 8490) must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required.

Is an EMPr attached?	YES	~~NO~~

The EMPr must be attached as Appendix G.

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

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

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

_____

NAME OF EAP

_____ _____

SIGNATURE OF EAP DATE

SECTION F: APPENDIXES

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information