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Department:
Environment & Nature Conservation
NORTHERN CAPE PROVINCE
REPUBLIC OF SOUTH AFRICA

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	(For official use only)
File Reference Number:	
Application Number:	
Date Received:	

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

Kindly note that:

- 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.
- 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
- 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.
- Where applicable **tick** the boxes that are applicable in the report.
- An incomplete report may be returned to the applicant for revision.
- 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.
- This report must be handed in at offices of the relevant competent authority as determined by each authority.
- No faxed or e-mailed reports will be accepted.
- The signature of the EAP on the report must be an original signature.
- The report must be compiled by an independent environmental assessment practitioner.
- 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.
- A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
- Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?	YES	NO
If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.		

PROPOSED CONSTRUCTION OF MANAGED AQUIFER RECHARGE STRUCTURES, CALVINIA, HANTAM LOCAL MUNICIPALITY, NORTHERN CAPE

- **ACTIVITY DESCRIPTION**

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

The Department of Water & Sanitation, on behalf of the Hantam Municipality, propose to implement several experimental structures to artificially recharge the underground water and several of the existing boreholes in the Calvinia area to improve the sustainability of these boreholes. The town of Calvinia is reliant on this aquifer for municipal groundwater and the proposed project would enhance the sustainability of this critical water resource.

Calvinia is located in the Northern Cape, in the Hantam local municipality.

The town gets water supplied from both surface and groundwater. Surface water is provided from the Karee Dam located north of the town (see Figure 1). This dam is extremely dependent on good winter rainfalls within a very small catchment of only 18km^2. Typically, the dam would supply water to the town from roughly July until March, whereafter the town will revert to groundwater sources for its water supply.

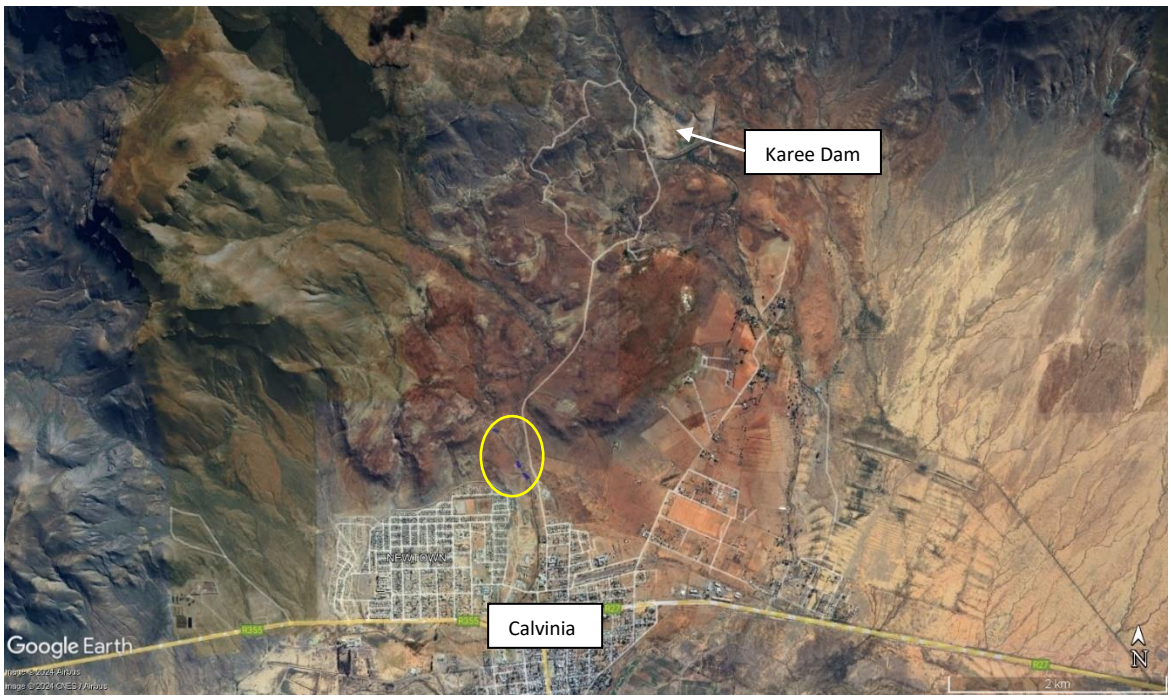

Figure 1: Location of Calvinia and the Karee Dam. Approximate location of the proposed project is indicated by the yellow circle.

The town lies in the winter rainfall area, and since 2014 a huge decline in rainfall has occurred, as indicated in Figure 2. The town mainly relies on surface water till the dam is depleted (or is less than 10%) and then uses groundwater. Since 2014 the dam has never reached 100% fullness, only 70% and running empty many times.

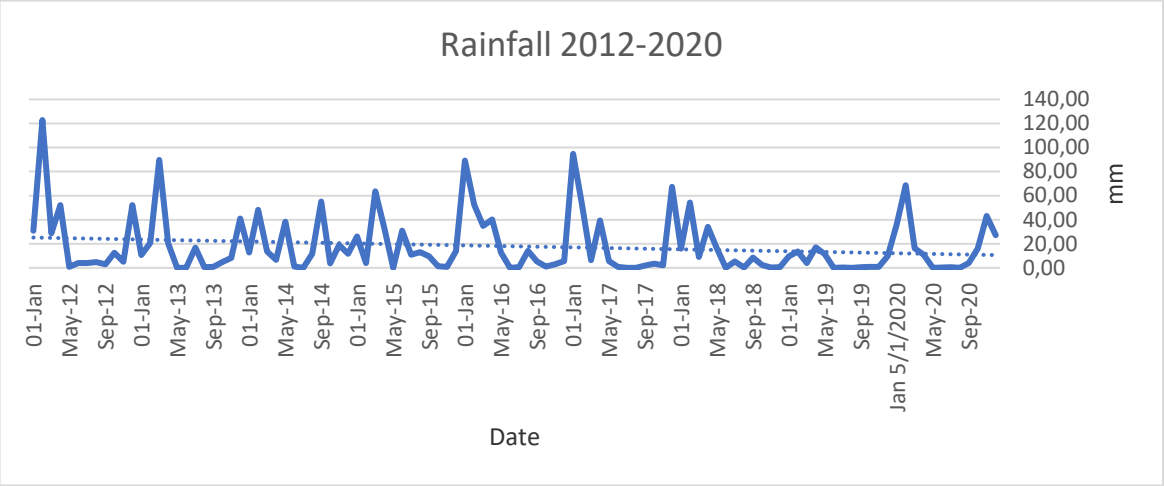

Figure 2: Rainfall for the period January 2012-Dec 2020

The region's climate is typical of the Karoo, with most of the rain falling during the winter months from May-August with an average of around 217mm per annum (Geoss, 2021). Winter rain and snow can also occur in high-lying areas in some years.

A significant decline in rainfall can be seen over the 7-year period. This can then be compared to the Karee Dam's water level providing drinking water to the town, as in Figure 3. The last time the dam was 100% full was in 2014 this was 8 years ago. From thereon the dam only reached around 70% capacity 3 times. Currently, South Africa is in a La Nina phase indicating wetter conditions but comparing it to the data of the rainfall and dam capacity, you would rather state that the town is in a drought phase. Currently, the Western Cape is also seeing less rainfall than the same period a year ago which can indicate the first signs of El Nino.

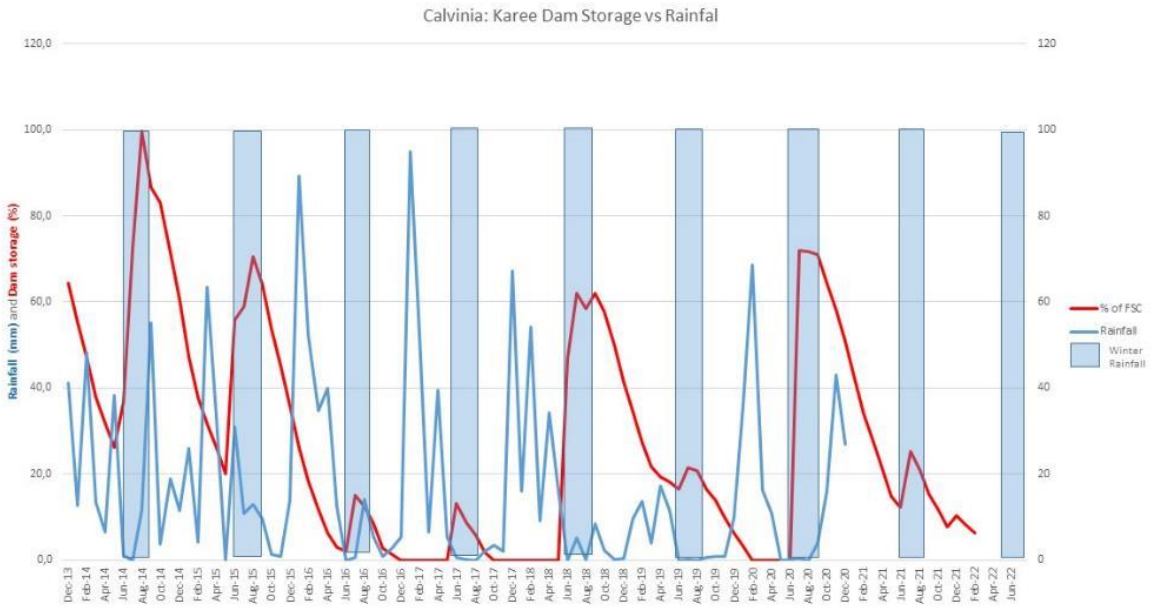

Figure 3: Rainfall data compared to dam % volume from 2013-2022 and indicating periods of winter rainfall.

The town has histroically depended on only 8 boreholes when the dam has been depleted. Since 2018, an additional 5 more boreholes to the north of Calvinia have been input into production (Calvinia North Wellfield), with 7 more that will be put into production by 2024 (Northwest Wellfield and Kreitzberg Wellfield).

When the Karee Dam runs dry, higher yielding boreholes, like the Deon Vlok Borehole, are typically pumped for 24 hours per day at maximum possible flow, which is not an ideal situation, as this practice may damage the boreholes permanently.

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When the Karee Dam runs dry, higher yielding boreholes, like the Deon Vlok Borehole, are typically pumped for 24 hours per day at maximum possible flow, which is not an ideal situation, as this practice may damage the boreholes permanently.

In order to lessen the load on the existing boreholes during the period when they are the sole supply to the town, it is proposed to construct a Managed Aquifer Recharge scheme whereby surface water runoff, will be utilized to augment the recharge of groundwater aquifers. It is proposed that this be done using a technique know as Managed Aquifer Recharge (MAR). There are several methods of doing this practically.

By enhancing the recharge to the aquifers, the sustainability of water supply from the existing groundwater supply could be significantly enhanced. Several possible interventions utilizing this technique, were identified around two of the current production boreholes in the Calvinia North Wellfield.

It is proposed that future surface runoff coming down two natural drainage lines, which flow south from the Hantam Mountains, be utilized to recharge existing production boreholes CAL Nat 6 and CAL DV1 as seen in Figure 4. Geophysical surveys done by GEOSS indicated five possible drill sites, within these two drainage lines, where infiltration boreholes could be drilled (MAR 2-6)(see Figure 5 below).

Figure 4: Location of the Cal Nat 6 and Cal DV1 boreholes

Figure 5: Location of the MAR 2 – 6 infiltration boreholes

Each Infiltration Borehole to be fitted with a 4m x 4m x 4m deep infiltration pit, which serves to increase the surface area for infiltration of surface water, but also to serve as a sediment filter to remove as much transported sediment as possible and to allow the infiltration of basically clear water into the aquifer below.

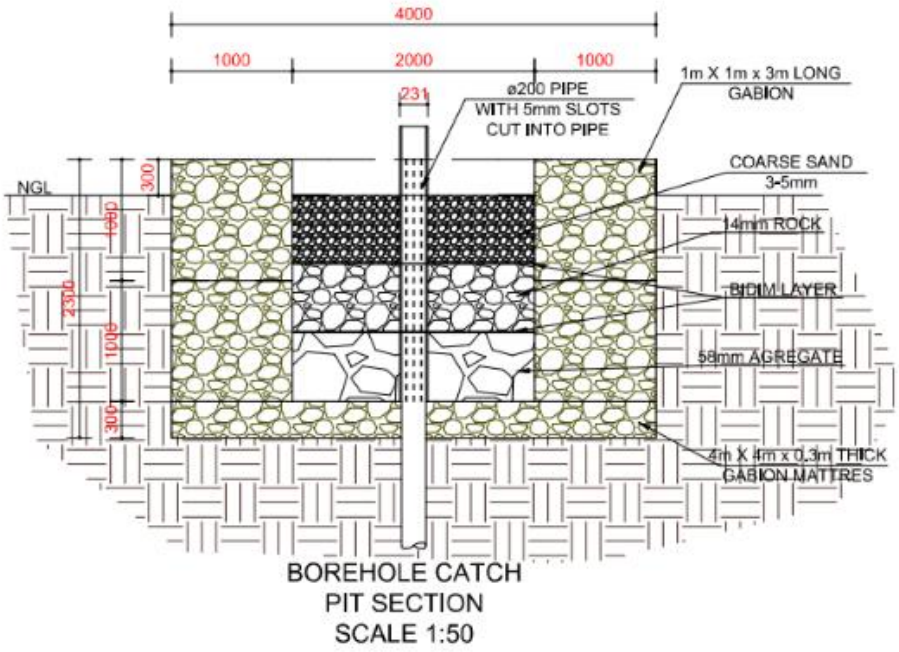

Figure 6: Sketch of infiltration pit to be constructed around infiltration borehole

In addition to the infiltration pits, it is proposed to construct a Check Dam across each of these drainage lines, using rock filled gabion baskets. This will render the Check Dam pervious, allowing water to pass both through, as well as over each structure, but will retard the flow sufficiently to allow significant infiltration of surface water at each infiltration borehole.

These Check Dams will essentially be a rock/stone structure, no more than 1.50m high, with an overflow weir 1.00m above natural ground level, constructed no more than 10m down stream of each infiltration borehole.

Figure 7: Typical rock filled gabion check dam structure

Geophysical work indicated that 5 possible drilling sites would have potential for infiltration boreholes. These boreholes with coordinates and descriptions as follows:

Borehole Details				
Borehole Name	**Latitude (DD)**	**Longitude (DD)**	**Borehole Depth (m)**	**Inner Diameter (mm)**
MAR 2	-31.4492022°	19.7716799°	82.34	264
MAR 4	-31.4506722°	19.7695179°	85.18	264
MAR 5	-31.4514812°	19.7700134°	84.06	264
MAR 6	-31.4552828°	19.7729331°	82.84	264
MAR 7	-31.4543752°	19.7720941°	119	264

Table 1: Data for potential infiltration boreholes drilled in Calvinia

Given the results following yield testing and injection testing conducted on the five potential boreholes, it was recommended that Boreholes MAR 5, MAR 6 and MAR 7 are to be utilized as infiltration boreholes to potentially recharge the aquifers supplying production boreholes CAL Nat 6 and CAL DV 1.

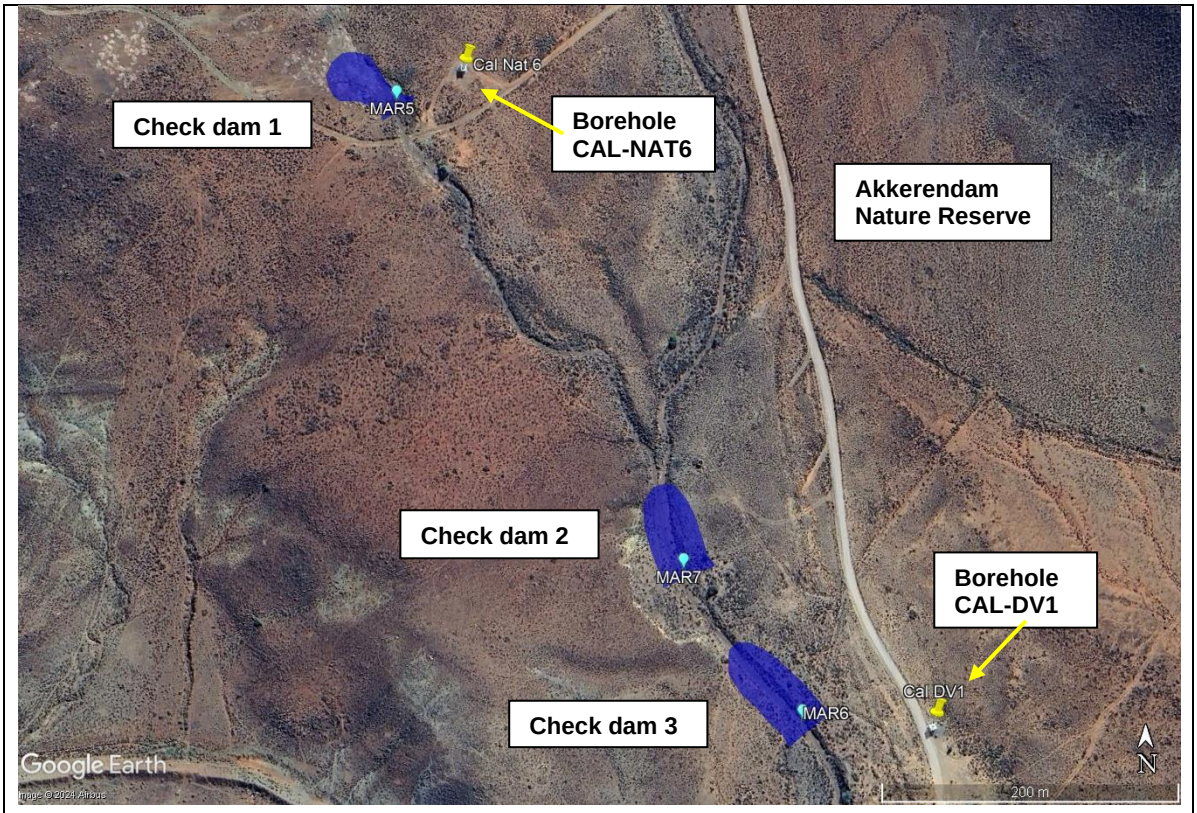

Figure 8: Location of the Check Dams at infiltration boreholes MAR 5, 6 and 7.

In summary, the scope of works for this sub-project, which forms a part of the larger Calvinia Bulk water Supply project, is as follows:

- Drilling of 5 number potential infiltration boreholes at coordinates given in Figure 10 to an approximate depth of at least 80m.
- Conducting of both yield and injection testing to determine infiltration potential at these 5 boreholes.
- Construction of infiltration pits around Boreholes MAR5, MAR 6 and MAR 7, consisting of a structure as shown in Figure 6.
- Construction of 3 number rock-filled gabion basket check dam structures as shown in Figure 7. The length of these structures will vary, depending on the cross section of each drainage line.

The successful completion of this project will then become a testbed for hydrogeologists in future. By continuously monitoring the effect of these proposed managed aquifer recharge boreholes, as well as the long-term water levels and production of the existing production boreholes, much can be learnt with regards to recharge methods to be employed all over the Northen Cape in future. Especially towns such as Williston, Sutherland and Fraserburg could benefit from the future data and research to be conducted at this project in Calvinia.

The development will take place within the Akkerendam Nature Reserve (Farm 805, Calvinia), located north of Calvinia.

- Check Dam 1: Approximate coordinates: 31° 27’ 04,96” S, 19° 46’ 11,30” E
- Check Dam 2: Approximate coordinates: 31°27' 14.90"S, 19°46' 19.29"E
- Check Dam 3: Approximate coordinates: 31°27' 18.35"S,19°46' 21.89"E

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

Listed activity as described in GN 324, 325 and 327	Description of project activity
Listing Notice 1 (GN327)	
Activity 12*:* The development of; (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs; (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;.	The proposed development includes the development of new infrastructure (check dams and gabions) which will exceed 100sqm, and is located less than 32m from a watercourse.
Activity 19*:* The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; (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.	The proposed development includes the installation of check dams and gabions within existing watercourses. The watercourse may be infilled and/or excavated during construction of the check dams and gabions
Listing Notice 3 (GN324)	
Activity 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.	More than 300m^2 of vegetation will need to be cleared to construct the check dams. The combined area of the check dams is approximately 6000m^2.

Activity 14*:* The development of; (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 10 square metres; (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs; (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback 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 port or harbour;	The proposed development includes the development of infrastructure which will exceed 10m^2, and is located less than 32m from a watercourse.

- **FEASIBLE AND REASONABLE ALTERNATIVES**

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

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

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

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

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

a) Site alternatives

There are no feasible site alternatives. This site was identified by the engineers as the most suitable site for this project.

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		

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

There are no feasible layout alternatives that were considered.

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

No feasible technology alternatives were considered.

Alternative 1 (preferred alternative)
Alternative 2
Alternative 3

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

Alternative 1
Alternative 2
Alternative 3 (preferred alternative)

e) No-go alternative

This would mean that no-development would take place and the proposed site will remain as is. The opportunity to potentially recharge the underground water and some of the existing boreholes in the Calvinia area to improve the sustainability of these boreholes will be lost.

Additional positive impacts such as the provision of job opportunities during the construction phase will not be met.

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

According to the Biodiversity Assessment (**Appendix D1**), the No-Go option means there would be no change to the *status quo*. The site will continue to be used for grazing. The No-Go alternative will mean no loss of vegetation or connectivity. The impact on the protected plant species will not occur. The land would remain in its natural state and any changes that would occur would only be attributable to the management of the reserve and external factors such as climate change. However, the potential positive impact in terms of long-term water security will not be realized.

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

- **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 (preferred activity alternative)		~1,2ha
Alternative A2 (if any)		m^2
Alternative A3 (if any)		m^2

or, for linear activities:

Alternative:		**Length of the activity:**
Alternative A1 (preferred activity alternative)		m
Alternative A2 (if any)		m
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

- **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		N/A

Describe the type of access road planned:

No new access roads will be required.

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.

- **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).

- **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.

- **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.

- **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.

- **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.

- **ACTIVITY MOTIVATION**

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

• **Is the activity permitted in terms of the property's existing land use rights?**	YES	~~NO~~	Please explain
The activity is the construction of a pipeline and powerline across a number of properties.			
• **Will the activity be in line with the following?**			
(a) Provincial Spatial Development Framework (PSDF)	YES	NO	Please explain
The provision of additional water to Calvinia is listed as a priority project in both the IDP and the WSDP.			
(b) Urban edge / Edge of Built environment for the area	~~YES~~	NO	Please explain
The pipeline route and boreholes are located outside the developed area of Calvinia.			
(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 provision of additional water to Calvinia is listed as a priority project in both the IDP and the WSDP.			
(d) Approved Structure Plan of the Municipality	YES	NO	Please explain
The Municipality is the Applicant.			
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	~~YES~~	NO	Please explain
No EMF was identified (see DEA Screening Tool).			
(f) Any other Plans (e.g. Guide Plan)	YES	NO	Please explain

• **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 provision of additional water to Calvinia is listed as a priority project in both the IDP and the WSDP.			
• **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

Calvinia has always been privileged to have both surface water and ground-water sources for its water supply, but the Karee Dam dependents on good winter rainfalls to collect and store sufficient water. During times of drought the town becomes totally reliant on its groundwater sources to augment the dam. With sufficient winter rains the water supply can lasts to mid-summer, after which the groundwater sources are utilized. However, the town has outgrown its existing water supply. The recent 7-year drought period had put enormous strain on the existing infrastructure. During 2018, the Namakwa district was declared a disaster area and the Department of Water and Sanitation provided funds for drought relief.

The Department of Water and Sanitation wishes to implement several experimental structures to artificially recharge the underground water resources (existing extraction boreholes). During rainfall events, small seasonal streams and drainage lines will flow (and even flood), for short periods of time (days or weeks). The flow downhill can be fast, which means that water penetration is restricted. The aim is to slow the runoff by installing check dams with shallow infiltration ponds, from where some of the runoff can be diverted, *via* boreholes, directly back into the underlying aquifer. If successful it could be of great benefit to the town of Calvinia (and many other communities in similar circumstances). It is considered a much better practice to store water underground rather than above ground in warm arid regions (where evaporation rates are high). Various location options within the Calvinia area had been investigated, but because of land-owner resistance it was decided to start with 4 infiltration ponds within the Akkerendam Nature Reserve, which will link up with existing extraction boreholes. It is also in close proximity to the Karee Dam and the Calvinia Water Treatment Works.

Calvinia's current population has outgrown its existing water sources which were last upgraded and increased in 1996 when the existing wellfield to the east of the town was upgraded.

Since 2015, Calvinia has increasingly been experiencing water supply problems. These problems were primarily caused by the following:

a. Extensions of the town due to the government drive to provide housing for indigent families. Number of households have increased from 2 020 in 2001 to 2 560 in 2018.

b. Lack of sufficient winter rainfalls to fill the Karee Dam. Measured rainfall in the 2015/16 season amounted to only 30mm, and in 2016/17 only 42mm was measured in the Karee Dam catchment area. During the 2017/18 season, the Karee Dam filled up to only 65% of its total capacity. To date no winter rains of any significance has fallen since the winter commenced in May 2018. The dam is currently only 22% full.

c. Deterioration of the existing sources. Currently only 4 of the existing 7 production boreholes are able to deliver their tested sustainable yield. This is also due to the lack of rainfall, as there

has been no significant groundwater recharge since 2015, subsequently, the groundwater levels have dropped dramatically.)

d. Dry climate with little rainfall to recharge the aquifers currently utilized as water source. Calvinia has an average rainfall of only 198mm per annum and an average evaporation rate of 1600mm per annum. The town is located on the edge between the winter and summer rainfall regions. Winter rainfall normally occurs due to cold fronts which move inland from the southwest, summer rainfall is usually in the form of thunderstorms if they do occur. The past 10 years, the summer rainfall has not contributed to any meaningful run-off to recharge the existing aquifers. The Calvinia area is seriously prone to drought conditions, and have been throughout their history. The occurrence of 4-to-5-year droughts is a regular pattern in this area.)

Without sufficient water, life is not possible. The lack of water and drought conditions over the past years has seen a significant decline in water consumption due to water restrictions imposed on the community. This has far reaching economic effects on both the town, as they cannot run any business dependent on a strong water supply, and in addition, the municipal budget is severely strained due to the significant decline in water sales and the resultant loss of income.

Calvinia currently has 2 509 households consuming water at a rate of 125 litres per capita per day. This returns an annual average daily demand of 1568 m^3/day. Historical consumption figures are available for several years and indicated a growth of less than 1% per annum for the town.

If this data is used, a future demand of 1767m^3/day is projected for 2040. The per capita consumption of the past 3 years has been significantly lower at 87 litres per capita per day due to stringent water restrictions imposed by the municipality.

From the calculation above, it is clear that the town has a current Annual Average Daily Demand of 18 litre per second which peaks in summer at around 40 litres per second. This equates to an annual demand in the order of 629 625 kiloliters per annum.

If a design horizon of 20 years and a population growth of 0.6% per annum are taken into account, the Annual Average Daily Demand required increases to 21 litres per second with a peak summer demand of 45 litres per second. The demand then increases to an annual figure of 709 560 kiloliters per annum.

The Karee Dam is able to supply 370 000 kiloliters per annum if it is at Full Supply Level after the winter, which is approximately half of the annual demand.

The balance, or approximately 339 560 kilolters per annum shortfall, must be delivered from the groundwater sources. Theoretically, the current groundwater sources could deliver a volume of 419 428 kiloliters per annum, which should be sufficient. Unfortunately, due to the extensive drought experienced over the past 3 to 5 years, this is not being achieved. The current boreholes are only just able to supply this demand.

When looking at current and future demand, from the historical data collected and analysed, the current demand equates to a figure of 473 000 m3 per annum. The projected future demand at a growth rate of 0.60% is calculated at 575 000m3 per annum by 2030 which is a pproximately11 years away.

Calvinia’s water supply is highly dependent on sufficient winter rains to fill the Karee Dam. If the Karee Dam does not impound sufficient water, the existing wellfield struggles to meet the demand. Calculations by the engineers indicate that by 2022, the towns’ demand and what the existing sources can supply will balance. From 2023 onwards, a deficit will be experienced. The fact that Calvinia is dependent on a single wellfield is also problematic. Subsequently, it will be strategically important to find additional sources for Calvinia other than the existing wellfield. If Calvinia were to run out of water, the towns’ location and distance from other known sources of water, makes carting of water, even in an emergency, almost impossible due to the volumes required and vast distances for carting.

• **Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)**	YES	~~NO~~	Please explain
The proposed project is to ensure water supply and capacity services for the community. The Municipality is the Applicant.			
• **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 municipality			
• **Is this project part of a national programme to address an issue of national concern or importance?**	YES	~~NO~~	Please explain
Sufficient and functioning basic services, including water provision, is a national concern.			
• **Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)**	YES	~~NO~~	Please explain
The proposed location has been identified by the engineers as suitable for the proposed development. There are no significant negative environmental impacts that have been identified by the freshwater, botanical or heritage specialists.			
• **Is the development the best practicable environmental option for this land/site?**	YES	NO	Please explain
The proposed development will result in the loss of some indigenous vegetation over the site, however, the vegetation is considered least threatened and the site slightly disturbed in places. it is also unlikely that any significant archaeological or palaeontological resources will be impacted. No significant environmental impacts associated with the proposed development have been identified.			
• **Will the benefits of the proposed land use/development outweigh the negative impacts of it?**	YES	~~NO~~	Please explain
No significant negative environmental impacts are expected by the proposed development and the benefits of better water supply to the town and its residents will outweigh any negative impacts.			
• **Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?**	~~YES~~	NO	Please explain
N/A			

• **Will any person's rights be negatively affected by the proposed activity/ies?**	YES	NO	Please explain
No person's rights are expected to be negatively affected by the proposed development. The activity is expected to have a general positive impact on the surrounding area.			
• **Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?**	~~YES~~	NO	Please explain
Unknown. The development is located outside the built up/urban area of Calvinia.			
• **Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?**	YES	~~NO~~	Please explain
The proposed bulk water supply system in Calvinia is considered to contribute to SIPS 18: **SIP 18: Water and sanitation infrastructure** A 10-year plan to address the estimated backlog of adequate water to supply 1.4m households and 2.1m households to basic sanitation.			
• **What will the benefits be to society in general and to the local communities?**	Please explain		
The project will provide job opportunities during the construction and the operational phase. This development has the potential to provide an economic injection in the local community, by means of creating employment opportunities. The proposed development will increase the income generated by the study area, which is currently non-existent. Most importantly, it will provide reliable and additional water capacity to the town of Calvinia.			
• **Any other need and desirability considerations related to the proposed activity?**	Please explain		
N/A			
• **How does the project fit into the National Development Plan for 2030?**	Please explain		
N/A			
• **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 A below).* - Adequate and appropriate opportunity for public participation was ensured through the public participation process – *please refer to Section C 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.*

- **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, as it will provide much needed additional housing opportunities.*
- 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.
- 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 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 B 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 E and in the EMP are implemented.*

• 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 (See Appendix J2)	Department of Water and Sanitation	Not yet

Northern Cape Nature Conservation Act, Act 9 of 2009	NCNCA Protected plant species located on the site	Department of Environment and Nature Conservation (DENC)	Not yet

- **WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT**

a) Solid waste management

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

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

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

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

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

Will the activity produce solid waste during its operational phase?	YES	~~NO~~
If YES, what estimated quantity will be produced per month?		m^3
How will the solid waste be disposed of (describe)?		
No solid waste is expected to be generated during the operational phase.		
If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.		
No solid waste is expected to be generated during the operational phase.		
Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?		
N/A		
If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.		

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA?	~~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?	N/A	
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. The proposed development includes the construction of 3 x 1000m^2 evaporation ponds at the Calvinia Water Treatment Plant to discharge the waste product from the Fluoride Treatment Plant.		

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

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:		

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

- **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:	An additional 56.8l per second Approximately 75 686m^3/month	
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.		

- **ENERGY EFFICIENCY**

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

N/A

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

N/A

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

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

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

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

• Has a specialist been consulted to assist with the completion of this section?	YES	~~NO~~
If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.		

Property description/physical address:	**Province**	Northern Cape
	District Municipality	Namakwa District Municipality
	Local Municipality	Hantam Municipality
	Ward Number(s)	
	Farm name and number	Erf 805, Calvinia
	Portion number	
	SG Code	C01500020000080500000
	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:	Conservation
	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

- **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

- **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					

- **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.

- **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.

- **SURFACE WATER**

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

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

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

The proposed development is located within two drainage lines.

These drainage lines have been drafted onto the sub-catchment in Figure 7 of the Freshwater Assessment (**Appendix D2**) (see Figure 8 below)

According to the Freshwater Assessment (**Appendix D2**), approximately two thirds of the sub-catchment is drained by the easterly drainage line. The two main reaches of the drainage line are intercepted by an earthen berm that channels the runoff into the Spoorweg Dam. This dam is a nothing more but a shallow scrape in the ground against than mountain side. It is dry most of the time, but during the site visit it contained water. Reportedly this water is used in town, when available.

At the time of the site visit on 11 October 2023, there was a strong flow in this main drainage line of 5 to 10 ls-1. Lower down the sub-catchment, close to the discharge point, the flow was much less, perhaps only 1 ls-1. There was no water in the smaller reach that drains the lower western one third of the sub-catchment.

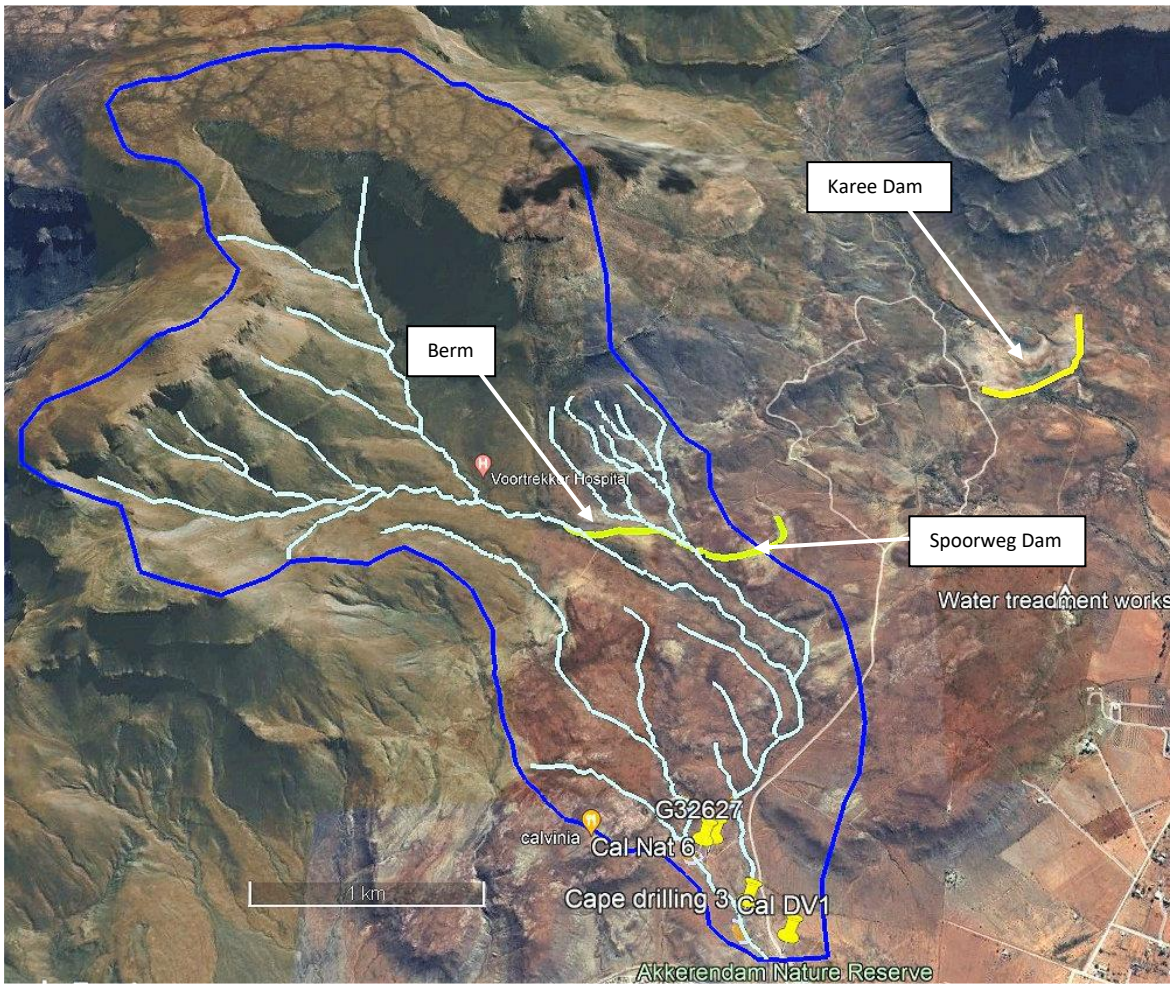

Figure 9: Drainage lines and sub-catchment (Source: Figure 7 of the Freshwater Assessment (**Appendix D2**)

The riparian vegetation of drainage lines in arid regions often forms a linear ecological corridor for many species of plant and animal that would not have been there, were it not for the drainage lines. This vegetation is maintained by shallow ground water that remains long after the surface water evaporated in these arid parts. Many parts of the Karoo are criss-crossed by these lines of higher vegetation, mostly soetdoring *Vachellia karoo*, a prominent feature of many karroid landscapes.

The upper parts of the main drainage lines, at the foot of the mountain, carry patches of this riparian vegetation.

Lower down the slope, where the ground levels out, the riparian vegetation does not differ from the surrounding karroid vegetation. The ecological benefit of higher riparian vegetation does not persist further downstream. Shallow groundwater evidently is not adequate to maintain a line of higher vegetation.

On the Hantam Mountain's western slopes, the riparian vegetation is more pronounced, in places with trees, but also not carry through lower down on the Hantam's flats.

The state of the drainage lines changes abruptly from the earthen wall and its associated infrastructure as much of the runoff is directed into the Spoorweg Dam. Human activity along with that of farm animals was evident in the reserve at the time of the site visit. The dirt road through the reserve acts as preferential flow paths, with signs of erosion.

Further down the slope into town, the drainage line becomes a straightened, highly engineered stormwater channel that has departed from its original ecological functioning. To the south of town

and into the Oorlogskloof River, most of its ecological functioning has been lost. This part of the drainage line is outside of the study area.

The stark contrast between the pristine upper sub-catchment and the much-impacted lower sub-catchment makes it difficult to find a realistic Present Ecological State (PES) value representative of the entire sub-catchment.

The groundwater recharge would take more surface water out of the system. Compared to the runoff that is diverted to the Spoorweg Dam, groundwater recharge would be small, tantamount to insignificant. It is not expected that the groundwater replenishment scheme, as planned, would change the category assignment of a "D" to the next lower class. The score would somewhat drop, but it would probably not be enough to lower the class.

The gabions and the check dams will be new features on the landscape. These are not enough to significantly lower the score and not enough to assign a lower class.

The Ecological Importance (EI) is based on the presence of especially fish species that are endangered on a local, regional or national level.

There are no fish in the drainage lines, as there is no permanent water. According to this assessment, which is prescribed for WULA's, the drainage lines are not important.

The presence of fish cannot be the only criterion for ecological importance. The drainage lines can be of immense importance as ecological corridors and an addition to habitat variability. The Natuurtuin drainage line only has patches of higher riparian vegetation and nothing that can serve as a corridor. From this perspective the drainage line is not important.

Ecological Sensitivity (ES) is often described as the ability of aquatic habitat to assimilate impacts. It is not sensitive if it remains the same despite of the onslaught of impacts. Put differently, sensitive habitat changes substantially, even under the pressure of slight impacts.

The Ecological Sensitivity also refers to the potential of aquatic habitat to bounce back to an ecological condition closer to the situation prior to human impact. If it recovers, it is not regarded as sensitive.

The drainage line and its riparian zones will take many decades, if not centuries, to bounce back once obliterated by large-scale agriculture. In these arid zones, vegetation is very slow to re-establish itself. From this point of view, the drainage line can be viewed as ecologically highly sensitive.

- **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 this impact will / be impacted upon by the proposed activity? Specify and explain:

No impacts are expected.

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

No impacts are expected.

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

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

- **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	
According to the Heritage Impact Assessment (**Appendix D3**), a cursory survey of the area as part of the proposed Calvinia Bulk Water project found no archaeological features of historical or cultural significance. Even though the site inspection was superficial, the development footprints lie within seasonal water courses and drainage lines (Botes 2023). The continuous seasonal water flow means that any recorded cultural material within the footprints would have been alluvial deposits with unknown provenance. Therefore, no in-situ heritage resources of any significance are expected to be impacted by the development. The project Formation is underlain by the Tierberg locality, which overlies the Collingham Formation in the south and the Whitehill Formation in the north and is overlain by the Waterford Formation. The age of this formation is probably the earliest Middle Permian. A maximum thickness of 1 252m		

has been recorded. It occurs north of Matjiesfontein northwards to the Calvinia-Brandvlei area, and from there eastwards to the Britstown area and then northeast-wards, passing northwest of Bloemfontein, to Hertzogville (Fourie 2024). Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks of igneous or metamorphic nature. Therefore, if there is the presence of strata the palaeontological sensitivity can generally be VERY LOW to VERY HIGH, and here locally in the development area MODERATE for the Vryheid Formation

Regarding the impact on palaeontological resources, the development footprint is situated on a geological layer with a MODERATE palaeontological sensitivity. The nature of the impact is the destruction of Fossil Heritage. Loss of fossil heritage will have a negative impact. The extent of the impact only extends to the region of the development activity footprint and may include transport routes (2). The impact's expected duration (5) is assessed as potentially permanent. The impact's intensity/magnitude (8) is moderate, as it may continue in a modified way. The probability (3) of the impact occurring is probable.

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

Will any building or structure older than 60 years be affected in any way?	~~YES~~	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	~~NO~~

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

Section 38(1) of the NHRA of 1999 requires the responsible heritage resources authority to notify the person who intends to undertake a development that fulfils the following criteria to submit an impact assessment report if there is reason to believe that heritage resources will be affected by such event:

any development or other activity that will change the character of a site—

- exceeding 5000m² in extent; or
- involving three or more existing erven or subdivisions thereof; or
- involving three or more erven or divisions thereof which have been consolidated within the past five years; or
- the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

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

- **SOCIO-ECONOMIC CHARACTER**

a) Local Municipality

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

Level of unemployment:

According to the Hantam Local Municipality Integrated Development Plan 2020 - 2021, the 2017 employment status of the working age population in the Namakwa district of 39.1% (or 29 212) formally employed is better than the situation in 2001 when 34.7% or 27 715 was formally employed but worse than in 2016 (39.3% or 29 317). However, and measured as a percentage, 10.3% of the working age population was unemployed in 2017, compared to 8.2% in 2001 and 10% in 2016. In the Hantam municipal area, 5 165 (or 38.2%) of the working age population was formally employed in 2017, compared to 5224 (or 39.3%) in 2016 and 5 614 (or 37.4%) in 2001, i.e. a relative improvement in overall formal employment since 2001 but worsening in recent years. These figures also represent a worsening trend if measured in number of persons employed. The number of unemployed persons (802) in the municipal area, in 2017, was more or less the same as in 2016 (746) and in 2001 (779). These trends must be seen in the light of the general depopulation of the municipality, i.e. a smaller working age population and the high percentage of persons not economically active.

Any unemployment figure, irrespective of how large, has serious repercussions on the ability of the population, at large, to uphold dignified living conditions and for the municipality to fulfil its revenue-raising mandate as the number of indigent households will increase. For the unemployed, pension/welfare payments are the only reliable source of income. The table below includes the employment status of the working age population in the Hantam and Namakwa District municipal areas in 2001, 2011, 2016 and 2017, respectively.

Economic profile of local municipality:

According to the Hantam Local Municipality Integrated Development Plan 2020 - 2021, the Hantam Municipality is a relatively small economy, making up about 13% of 2017 Gross Value Added (GVA) in the Namakwa district – up from 12% in 2016. These contributions are negligible proportions (for both years at 1.6%) of the provincial economy and are like the respective contributions in 2011. The percentage share contribution by the tertiary sector in 2017 to the total 'GVA' generated in the Hantam municipal area is about 69% or R1012 million compared to 70% or R928 million in 2016. The primary sector contributed 23.5% or R344 million and the secondary sector 7.5% or R111 million in 2017 – increased contributions from the year before. Between 2000 and 2015, every economic sector in the municipal area grew positively in terms of GVA contribution but manufacturing showed negative growth in recent years. Note that the subsectors do not have high levels of volatility that are typical for specifically the primary sector.

Level of education:

According to the Hantam Local Municipality Integrated Development Plan 2020 - 2021, there is a slight improvement in the number of persons with matric in the Hantam municipal area despite a very low population growth rate. The biggest success, however, is the substantially fewer persons with no schooling in 2011 and 2017 compared to 2001. The education levels in the municipal area are indicated in the table below:

Table 2: Education Levels

Indicator		**2001**	**2011**	**2017**	**% change (2011 – 2017)**
Education	No Schooling	4515	3080	3068	-32.1%
	Matric	2367	2390	2451	3.6%
	Higher Education	1035	997	1056	2.1%

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	Unknown at this stage	
What is the expected yearly income that will be generated by or as a result of the activity?	Unknown at this stage	
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?	Unknown at this stage	
What is the expected value of the employment opportunities during the development and construction phase?	Unknown at this stage	
What percentage of this will accrue to previously disadvantaged individuals?	100%	
How many permanent new employment opportunities will be created during the operational phase of the activity?	1	
What is the expected current value of the employment opportunities during the first 10 years?	Unknown at this stage	
What percentage of this will accrue to previously disadvantaged individuals?	100%	

- **BIODIVERSITY**

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

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

Systematic Biodiversity Planning Category				**If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan**
Critical Biodiversity Area (CBA)	~~Ecological Support Area (ESA)~~	~~Other Natural Area (ONA)~~	~~No Natural Area Remaining (NNR)~~	The site is located within a CBA identified on SANBI BGIS (refer to Figure 9 below and section 4.3 of the Botanical Assessment (**Appendix D1**).

According to the Botanical Assessment (**Appendix D1**), the proposed development will impact on the Akkerendam Nature Reserve (a Municipal Reserve) which had been identified as a critical biodiversity area (CBA1) within the Northern Cape critical biodiversity areas maps (2016).

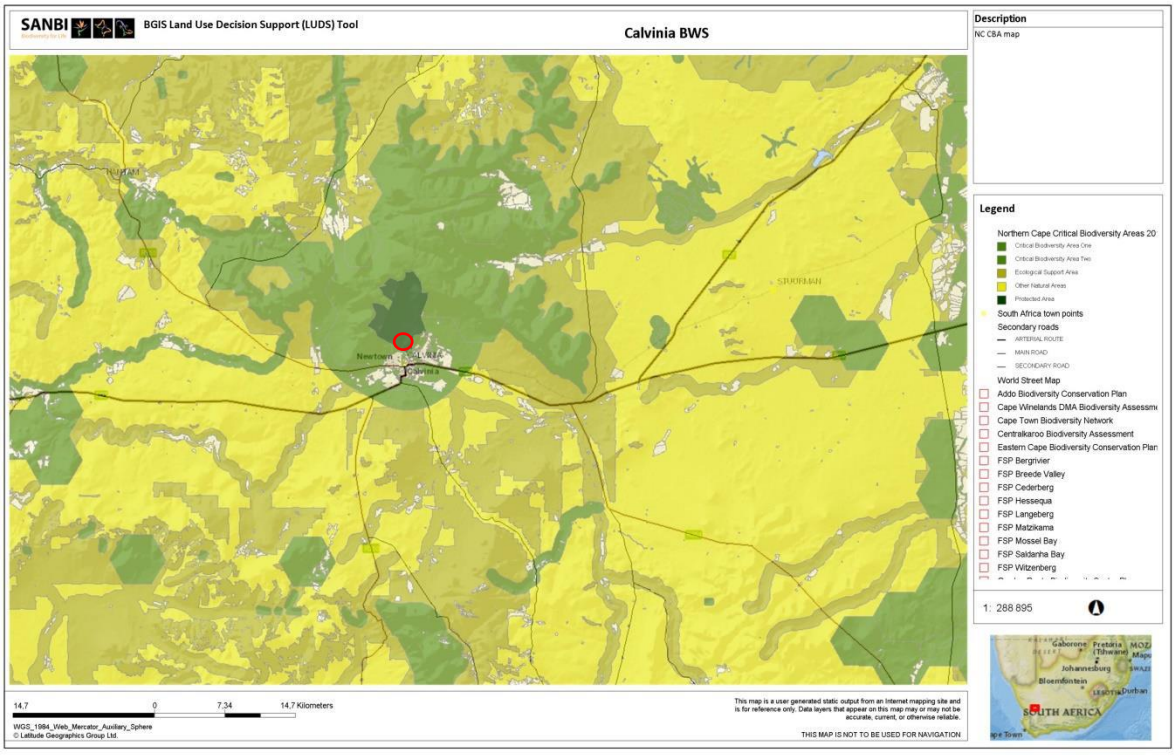

Figure 9: SANBI BGIS image of the CBAs in and around Calvinia. Proposed site is indicated by the red circle.

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	95%	The site is within the Akkerendam Nature Reserve
Near Natural (includes areas with low to moderate level of alien invasive plants)		
Degraded (includes areas heavily invaded by alien plants)		
Transformed (includes cultivation, dams, urban, plantation, roads, etc)		

c) Complete the table to indicate:

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

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

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

According to the Biodiversity Assessment (**Appendix D1**), in accordance with the 2018 Vegetation map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006), the proposed footprint(s) will only impact on one broad vegetation type, namely **Hantam Karoo** (Figure 10), a vegetation type classified as "Least Threatened" in terms of the NEM: BA "*national list of ecosystems that are threatened and in need of protection*" (GN 1002, December 2011).

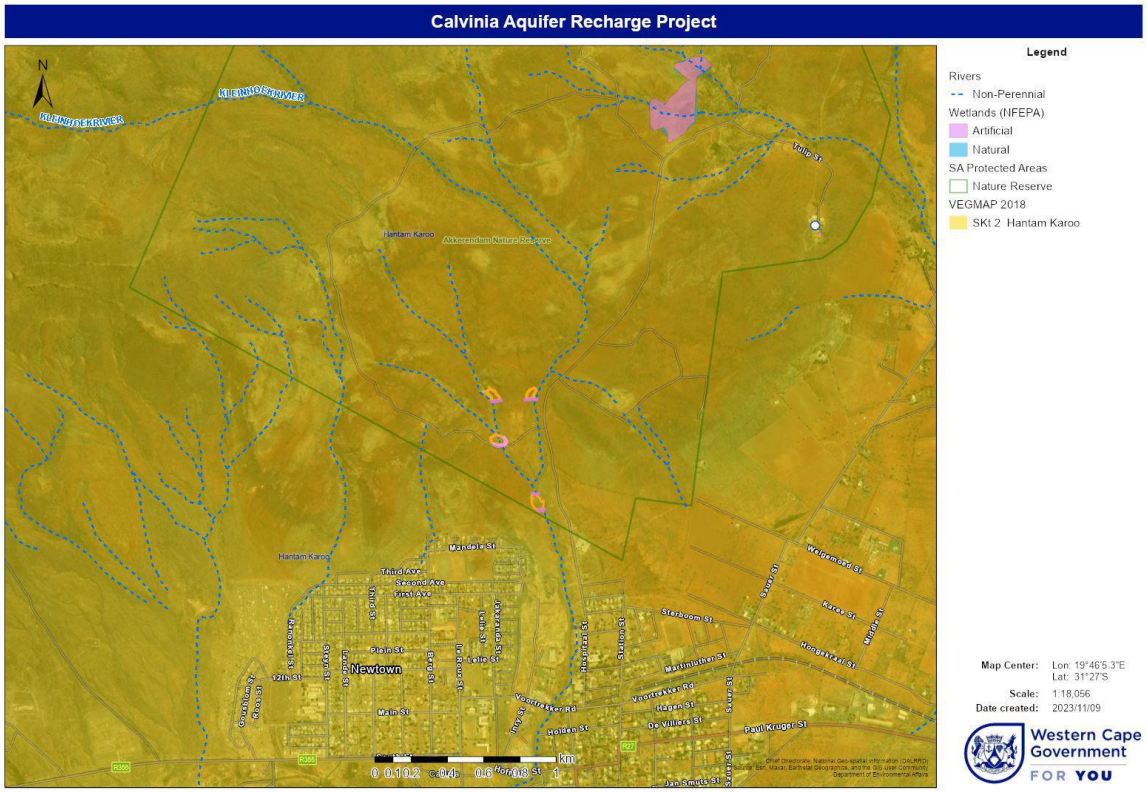

Figure 10: Vegetation Map of South Africa (2018).

According to the Biodiversity Assessment (**Appendix D1**), for most part the two small seasonal or episodic streams seems to run basically through the natural veld, with a poorly defined riparian sone. Only in areas where these streams are slightly wider and shallower (e.g., at Pond 1 &2) additional species were identified that actually represents a riparian zone.

In a vegetation study for the Akkerendam Nature Reserve, done by Van der Merwe (2014), three broad plant communities and 14 subcommunities were identified. According to this study, all of the infiltration ponds will be located in the *Galenia africana – Eriocephalus ericoides* Hantam Karoo Community.

The proposed infiltration ponds are located in the lower (almost the most southern part of the Akkerendam Nature Reserve). Altitude varied from 1010 to 1040 m asl. The soil can be described as red brown or light red brown in color, while the rock cover is generally low, consisting of pebbles and small stones. The vegetation can be described as a low Karoo shrubland with a cover that varied from 50% to 90%. The veld itself was in excellent condition and seems to have recovered well from the recent long term drought period. The vegetation was dominated by a combination of *Galenia africana*, *Chrysocoma ciliata*, *Pteronia incana* and *Eriocephalus ericoides*. The grass, *Ehrharta calycina,* was also common in most areas.

Other larger shrubs and herbs observed included: *Cotula microglossa* (dominating open areas after the recent rains), *Cotyledon orbiculata, Crassula subaphylla*, *Drosanthemum lique*, *Euphorbia mauritanica*, *Galenia sarcophylla*, *Gonialoe variegata*, *Hermannia* cf. *glabrata*, *Hirpicium alienatum* (haarbos), *Lycium cinereum*, *Mesembryanthemum junceum (=Psilocaulon), M. nodiflorum*, *M.* cf. *rapaceum*, *M. noctiflorum* (vleisbos), *Nenax* cf. *namaquensis, Osteospermum oppositifolium, O. sinuatum, Pelargonium rapaceum, Pentzia incana, P. spinescens, Pteronia glauca, Roepera pubescens, Ruschia* cf. *grisea (grey tent fig), R. divaricata, R.* cf. *uncinata, Salvia chamelaeagnea, Selago glabrata* (aarbossie), *Tetragonia fruticosa* and the parasitic *Septulina glauca.*

Smaller- and prostrate shrubs observed included: *Aptosimum indivisum*, *Crassula muscosa, Dimorphotheca pinnata, Felicia macrorrhiza, Gazania lichtensteinii, Mesembryanthemum guerichianum (soutslaai), Senecio arenarius, Leobordea* cf. *hirsuta* and one of the *Manulea* cf. *silenoides.*

A number of bulb and smaller herb species were also observed, including species such as: *Albuca concordiana*, *A. setosa*, *A. suaveolens*, *A viscosa, Brunsvigia* cf. *bosmaniae* (only leaves), *Cleretum* cf. *maughanii*, *Colchicum capense*, *C. crispum*, *C.* species, *Cyanella hyacinthoides*, *Eriospermum* cf. *capense*, *Ferraria macrochlamys* subsp. *kamiesbergensis*, *Hyobanche glabrata, Lachenalia* species (flowers were past), *Massonia depressa*, *Moraea* cf. *inconspicua, M. miniata, Trachyandra falcata, Wahlenbergia* cf. *roelliflora* and *Wurmbea* cf. *variabilis.*

Please see Section 5.2 – 5.5 for a more detailed description of the vegetation identified at each pond site.

According to the Biodiversity Assessment (**Appendix D1**), the following threatened and protected plant species were identified:

Red list of South African plant species: The Red List of South African Plants online provides up to date information on the national conservation status of South Africa's indigenous plants (SANBI, 2020).

- Two red-listed plant species were observed during the study (Refer to Table 1 for impact minimisation recommendations).

NEM:BA protected plant species: The National Environmental Management: Biodiversity Act, Act 10 of 2004, provides for the protection of species through the "Lists of critically endangered, endangered, vulnerable and protected species" (GN. R. 152 of 23 February 2007).

- No NEM: BA protected species was observed.

NFA Protected plant species: The National Forests Act (NFA) of 1998 (Act 84 of 1998) provides for the protection of forests as well as specific tree species (as updated).

- No species protected in terms of the NFA was observed.

NCNCA Protected plant species: The Northern Cape Nature Conservation Act 9 of 2009 (NCNCA) came into effect on the 12th of December 2011, and provides for the sustainable utilization of wild animals, aquatic biota, and plants. Schedule 1 and 2 of the Act gives extensive lists of specially protected and protected fauna and flora species in accordance with this act. NB. Please note that all indigenous plant species are protected in terms of Schedule 3 of this act (e.g., any work within a road reserve).

- Twenty six (26) species protected in terms of the NCNCA was observed (Refer to Table 1).

Table 3: **Plant species protected in terms of the NCNCA encountered within the study area.** (Appendix D1, Table 10)

FAMILY NAME	SPECIES NAME	RECOMMENDATIONS
AIZOACEAE All species within this family are protected by default in terms of Schedule 2 of the NCNCA. One of the species is a red-listed species.	*Mesembryanthemum guerichianum* *Mesembryanthemum junceum* ***Cleretum* cf. *maughanii (Rare)*** *Drosanthemum lique* *Galenia africana* *Mesembryanthemum cf. nodiflorum* *Mesembryanthemum rapaceum* *Ruschia cf. uncinate* *Ruschia divaricata* *Ruschia grisea* *Tetragonia fruticosa*	Most of these species are common, widespread species (some are considered disturbance indicator species). In this case most of these species are found in the surrounding veld and not specifically associated with the steams or its immediate surroundings. The potential impact on these species should be low. However, **topsoil should be removed** from all the excavated areas and re-used for the rehabilitation process. This will ensure that the seedbed is protected (and thus protecting the Aizoaceae by default).
AMARYLLIDACEAE All species within this family are protected by default in terms of Schedule 1 or 2 of the NCNCA.	*Brunsvigia* cf. *bosmaniae*	None of the plants was observed within any of the proposed footprint areas and the potential impact on these species should be low. **Search & Rescue**: Any bulb of the Amaryllidaceae observed within the footprint area, must be transplanted into the adjacent natural veld.
ASPOPHODELACEAE All species within this family are protected by default in terms of Schedule 1 or 2 of the NCNCA.	*Gonialoe variegata* *Trachyandra falcata*	A number of *Trachyandra* individual is likely to be impacted by the construction of the ponds, but they are common and widespread species. The *Gonialoe variegata* (=*Aloe variegata*) is less likely to be impacted (not

		normally associated with watercourses or wetlands) and although widespread, search & rescue is proposed. **Search & Rescue**: All *Aloe* and *Gonialoe* species observed within the footprint area must be transplanted into the adjacent natural veld.
CRASSULACEAE All species within this family are protected by default in terms of Schedule 1 or 2 of the NCNCA.	*Cotyledon orbiculata* *Crassula muscosa* *Crassula subaphylla*	All of these species are relatively common and widespread species. However, search & rescue of the two species is recommended (both should transplant relatively easy). **Search & Rescue**: All *Cotyledon* and all *Crassula muscosa* species observed within the footprint area must be transplanted into the adjacent natural veld.
EUPHORBIACEAE All *Euphorbia* species are protected by default in terms of Schedule 2 of the NCNCA.	*Euphorbia mauritanica*	This is a common widespread species and difficult to transplant. Protection through topsoil conservation and management.
FABACEAE All *Lessertia* and *Sutherlandia* species are protected by default in terms of Schedule 1 of the NCNCA.	*Lessertia frutescens (=Sutherlandia)*	Again, this is a relatively common and widespread species. Protection will be achieved through topsoil conservation and management.
IRIDACEAE All species are protected by default in terms of Schedule 1 or 2 of the NCNCA.	*Ferraria macrochlamys subsp. kamiesbergensis* *Gladiolus splendens* *Moraea cf. inconspicua* *Moraea miniata*	The *Gladiolus* and potentially some of the *Ferraria* individuals is likely to be impacted. The *Moraea* species are common in the surrounding veld but might also be impacted. Because of the short flowering times and small bulb sizes, it will be difficult to search & rescue

SECTION C: PUBLIC PARTICIPATION

- **ADVERTISEMENT AND NOTICE**

Publication name	Noordwester	
Date published	20 October 2023	
Site notice position	**Latitude**	**Longitude**
Date placed	See Appendix E1	

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

- **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)

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.

- **ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES**

Summary of main issues raised by I&APs	Summary of response from EAP
No comments were received during the initial PPP period	

- **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.

- **AUTHORITY PARTICIPATION**

Authorities and organs of state identified as key stakeholders:

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.

Please refer to the Interested and Affected Party List (Appendix E5).

- **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.

- **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:** **Construction phase:** Soil and rubble washing down the drainage line • Removal of the vegetation • Preparing the ground • Construction of the gabions • Construction of the concrete wall • Excavating the filter box • Placement of filter material • Removal of excavated soil • Clean-up, levelling and landscaping **Operational phase**: Soil and rubble washing down the drainage line. • Maintenance of the gabions • Maintenance of the submersible pump in the borehole • Replacement of the filter material in the catchpit, if necessary	Low - Negative (with mitigation) Low - Negative (with mitigation)	- Preserve drainage lines as much as possible - Preserve buffer zones as much as possible - Prevent loose soil and sediments from moving down the drainage line along with storm water - Limit the footprint - Prevent loose soil and sediments from moving down the drainage line along with stormwater.

	Biodiversity impacts: Special habitats: Potential impact on special habitats (e.g. true quartz or "heuweltjies") Land-use and Cover: Possible impact on socio-economic activities Vegetation Status: Possible loss of vulnerable or endangered vegetation and associated habitat. Conservation Priority Areas: Possible impact on Protected areas, CBA, ESA or centres of endemism. Connectivity: Possible loss of ecological corridors. Protected & endangered plant species: Potential impact on threatened or protected plant species. Fauna & Avi-fauna Potential impact on mammals, reptiles, amphibians & birds.	 Insignificant (with mitigation) Insignificant (with mitigation) Insignificant (with mitigation) Low (Negative) (with mitigation) Low (Negative) (with mitigation) Insignificant (with mitigation) Insignificant (with mitigation)	The following mitigation actions should be implemented to ensure that the proposed development does not pose a significant threat to the environment: • 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 any other conditions pertaining to specialist studies. • Before any work is done the footprint and access roads must be clearly demarcated. The demarcation must aim at minimum footprint and minimisation of disturbance. • Once the footprint area has been finalized (before construction commences) the “Search & Rescue” recommendations given in Table 10 must be implemented. • Access roads should remain twee-spoor tracks (not accessible to the public) and should not be scraped (where-ever possible). • A Northern Cape Nature Conservation Act permit must be obtained for the “Search & Rescue” and other impacts on the protected species listed in Table 10 species. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. - Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);

			- Care must be taken to dispose of alien plant material responsibly. • Indiscriminate clearing of any area outside of these footprints may not be allowed. • An integrated waste management approach must be implemented during construction. - Construction related general and hazardous waste may only be disposed of at approved waste disposal sites.
	The loss of palaeontological resources Destruction of Fossil Heritage.	Low (Negative)	If the development uncovers archaeological material, mitigation through assessment and collection is possible. • If a chance find is made the person responsible for the find must immediately **stop working** and all work that could impact that finding must cease in the immediate vicinity of the find. • The person who made the find must immediately **report** the find to his/her direct supervisor, which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
	The loss of archaeological resources No archaeological, historical, or cultural sites were identified	Low (Positive)	If the development uncovers archaeological material, mitigation through assessment and collection is possible.
	Indirect impacts: **Temporary jobs will be created in the construction industry**	Low - positive	No mitigation measures are required. Temporary jobs will be created during the construction phase

	during the construction phase.		
	Cumulative impacts: Biodiversity: Accumulative impact associated with the proposed activity.	Low (Negative)	Ensure that the footprint is minimised and that the mitigation recommendations are implemented.
	Direct impacts: - .		
	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			
	Direct impacts: This would mean that no-development would take place and the proposed site will remain as is.	Insignificant	N/A
	Indirect impacts:		

	Cumulative impacts:		

A complete impact assessment in terms of Regulation 19(3) of GN 326 must be included as Appendix F.

• ENVIRONMENTAL IMPACT STATEMENT

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

Alternative A (preferred alternative)

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

Construction phase.

Freshwater ecosystems:

Soil and rubble washing down the drainage line – **Low - Negative**

Loss of vegetation:

Special habitats – **Insignificant.**

Land-use and Cover – **Insignificant.**

Vegetation Status – **Insignificant.**

Conservation Priority Areas – **Low - Negative**

Connectivity – **Low - Negative**

Threatened or protected plant species – **Insignificant.**

Fauna and Avifauna – **Insignificant.**

Potential impacts on archaeological resources – **No Impact**

Potential impacts on palaeontological resources – **Low (Negative).**

Job creation – **Low (Positive)**, **definite**.

Noise impact - **Low (negative), definite, during construction phase.**

Visual impact – **Low (negative), definite, during construction**

Dust – **Low (negative), probable, during construction**

Traffic impact – Very **Low (negative), definite, during construction**

Operational Phase

Geographical and/or physical aspects - **No impact expected**

Freshwater ecosystems **–** Soil and rubble washing down the drainage line – **Low - Negative**

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

Socio-economic (additional job opportunities) – **Low (Positive), Definite**

Nuisances –**Low, Possible**

Visual impact – **Low, Probable**

Decommissioning

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

Alternative B

Alternative C

No-go alternative (compulsory)

This would mean that no-development would take place and the proposed site will remain as is. The positive impacts of the development, including water security for the town of Calvinia, would not be realised.

Additional positive impacts such as the provision of job opportunities during the construction and operational phases will not be met.

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

According to the Biodiversity Assessment (**Appendix D1**), the **"No Go" alternative** means there would be no change to the *status quo*. The site will continue to be used for grazing. The No-Go alternative will mean no loss of vegetation or connectivity. The impact on the protected plant species will not occur. The land would remain in its natural state and any changes that would occur would only be attributable to the management of the reserve and external factors such as climate change.

However, the potential positive impact in terms of long-term water security will not be realized.

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).

N/A

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

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