Water Use License Application

Freshwater Report

For the construction of a high voltage power line from the national power grid to the De Hoop substation, Malmesbury

A requirement in terms of Section 21 (c) and 21(i) of the National Water Act 36 of 1998 as well as the National Environmental Management Act 107 of 1998

October 2023

Executive Summary

The Swartland Municipality in the Western Cape is planning a 132kV high voltage power line from the national grid into a municipal sub-station. It will be over a distance of 4.7km from the west side of Malmesbury to the nearby Abbotsdale. It will be a typical overhead power line suspended on steel towers.

The power line will cross the Diep River as well as several drainage lines. This triggers Section 21(c) and 21(i) if the National Water Act. It is legally imperative that a application for a water use license be logged on the online eWULLAAS system. For this a Freshwater Report must by compiled and uploaded along with a completed Risk Matrix.

Dr Dirk van Driel of WATSAN Africa in Knysna was appointed to prepare the documentation and lodge the application.

The Diep River and its drainage lines are already impacted, with many major impacts from agriculture, urban and industrial development and roads, bridges and railway lines. The Diep River already lost much of its ecological functioning.

A premeditated set of assessments have been done focussed on the ecological state of the Diep River and its catchment as well as the environmental impacts that the new power line would bring.

A high voltage power line, its construction and operation, its pylons and overhead cables, are essentially low-impact activities. It is not expected that the proposed power line would measurably add to the already existing impacts.

It is therefore concluded that a General Authorisation is the correct level of approval. A license is not called for.

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Abbreviations

Critical Biodiversity Area	CBA
Department of Fisheries, Forestry and the Environment	DFFE
Department of Water and Sanitation	DWA
Ecological Importance	EI
Ecological Importance and Sensitivity Class	EISC
Ecological Sensitivity	ES
Ecological Support Area	ESA
Environmental Impact Assessment	EIA
Environmental Management Program	EMPr
Electronic Water Use License Application (on-line)	eWULAAS
Government Notice	GN
Metres Above Sea Level	masl
National Environmental Management Act (107 of 1998)	NEMA
National Freshwater Environment Priority Area	NFEPA
National Water Act (36 of 1998)	NWA
Present Ecological State	PES
Section of an Act of Parliament	S
South Africa National Biodiversity Institute	SANBI
Water Use License Application	WULA

1 Introduction

The Swartland Municipality in the Western Cape Province is planning a high voltage power line from the national grid into the municipal distribution network. This is a 132kV line of 4.7km long. This is a typical overhead power line suspended on steel towers. The line will stretch from the western side of Malmesbury to Abbotsdale on the southwestern side of town.

CK Rumboll and Partners in Malmesbury were appointed to deal with the required servitudes over private land, as well as with the legally required environmental authorisations.

Subsequently, Enviro Africa of Somerset West was appointed to carry out the environmental impact assessment in terms of the National Environmental Management Act. The EIA includes a public participation proces. The posters (Figure 1) and adverisements in relevant newspapers have been prepared and published.

The power line will cross the Diep River as well as drainage lines. This triggers section 21 (c) and (i) of the National Water Act. To prepare the required documents and obtain the necessary authorisations, Dr Dirk van Driel of WATSAN Africa in Knysna was appointed. This includes a Water Use License Application (WULA).

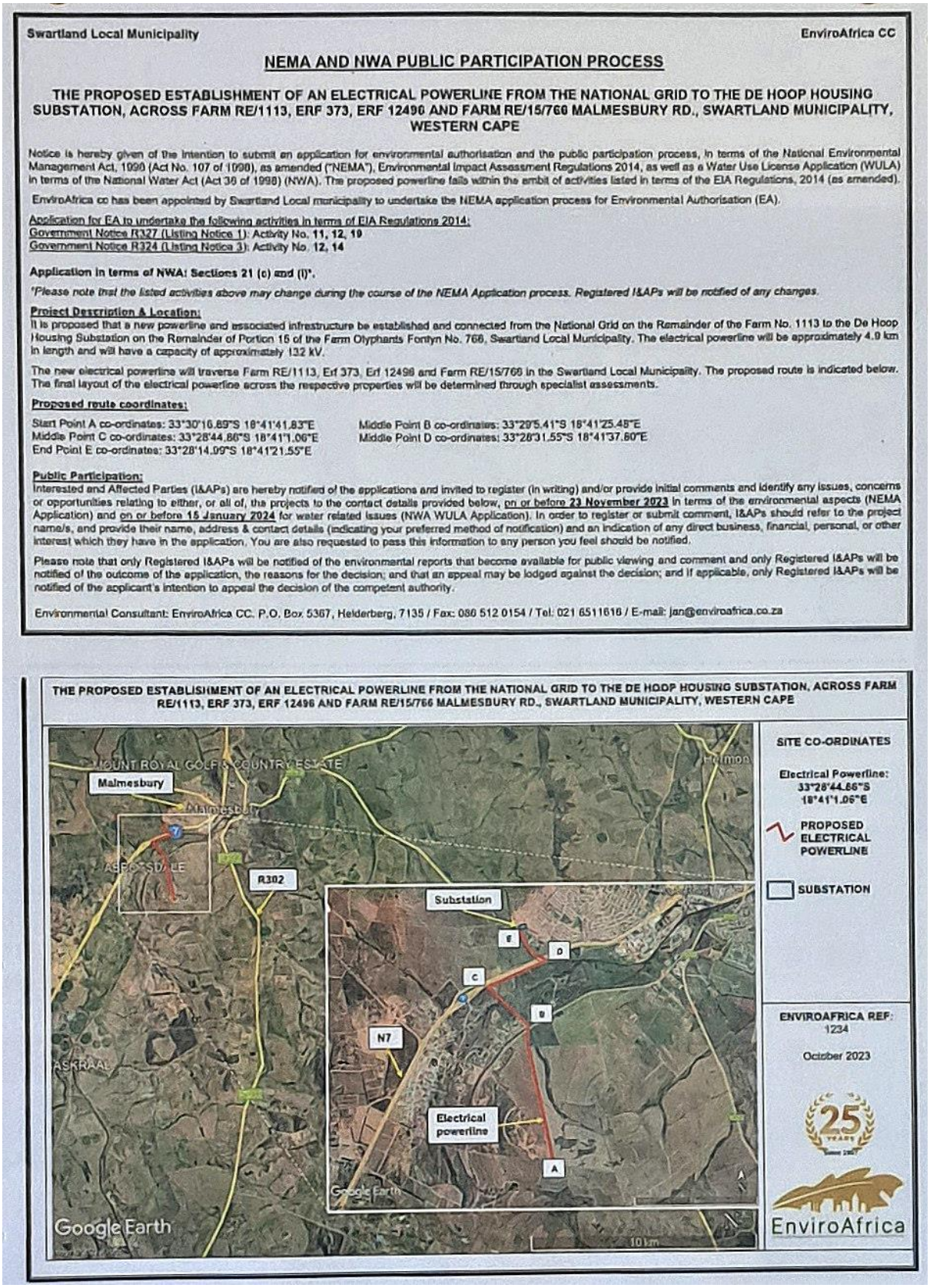
The WULA requires a Freshwater Report. The report must be compiled according to a set format and contents, with prescribed methodologies.

The Freshwater Report must be submitted along with a Risk Matrix.

After the completion of the Freshwater Report, the project must be registered on the online eWULAAS facility. This facility dictates the procedures and the steps that must be followed leading to the licensing of the project and its components. This report must include aspects that are required for the EIA process and its scoping report, as well as for the EMPr.

The WULA public participation process (Figure 1) runs along with that for the EIA, on the same posters and advertisements.

A site visit was conducted on 27 July 2023.



Swartland Local Municipality — EnviroAfrica CC

NEMA AND NWA PUBLIC PARTICIPATION PROCESS

THE PROPOSED ESTABLISHMENT OF AN ELECTRICAL POWERLINE FROM THE NATIONAL GRID TO THE DE HOOP HOUSING SUBSTATION, ACROSS FARM RE/1113, ERF 373, ERF 12498 AND FARM RE/15/766 MALMESBURY RD., SWARTLAND MUNICIPALITY, WESTERN CAPE

Notice is hereby given of the intention to submit an application for environmental authorisation and the public participation process, in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended ("NEMA"), Environmental Impact Assessment Regulations 2014, as well as a Water Use License Application (WULA) in terms of the National Water Act (Act 36 of 1998) (NWA). The proposed powerline falls within the ambit of activities listed in terms of the EIA Regulations, 2014 (as amended).

EnviroAfrica cc has been appointed by Swartland Local municipality to undertake the NEMA application process for Environmental Authorisation (EA).

Application for EA to undertake the following activities in terms of EIA Regulations 2014:
Government Notice R327 (Listing Notice 1): Activity No. **11, 12, 19**
Government Notice R324 (Listing Notice 3): Activity No. **12, 14**

Application in terms of NWA: Sections 21 (c) and (i)*.

**Please note that the listed activities above may change during the course of the NEMA Application process. Registered I&APs will be notified of any changes.*

Project Description & Location:
It is proposed that a new powerline and associated infrastructure be established and connected from the National Grid on the Remainder of the Farm No. 1113 to the De Hoop Housing Substation on the Remainder of Portion 15 of the Farm Olyphants Fontyn No. 766, Swartland Local Municipality. The electrical powerline will be approximately 4.9 km in length and will have a capacity of approximately 132 kV.

The new electrical powerline will traverse Farm RE/1113, Erf 373, Erf 12498 and Farm RE/15/766 in the Swartland Local Municipality. The proposed route is indicated below. The final layout of the electrical powerline across the respective properties will be determined through specialist assessments.

Proposed route coordinates:

Start Point A co-ordinates: 33°30'16.89"S 18°41'41.83"E
Middle Point B co-ordinates: 33°29'5.41"S 18°41'25.48"E
Middle Point C co-ordinates: 33°28'44.86"S 18°41'1.06"E
Middle Point D co-ordinates: 33°28'31.55"S 18°41'37.80"E
End Point E co-ordinates: 33°28'14.09"S 18°41'21.55"E

Public Participation:
Interested and Affected Parties (I&APs) are hereby notified of the applications and invited to register (in writing) and/or provide initial comments and identify any issues, concerns or opportunities relating to either, or all of, the projects to the contact details provided below, on or before **23 November 2023** in terms of the environmental aspects (NEMA Application) and on or before **15 January 2024** for water related issues (NWA WULA Application). In order to register or submit comment, I&APs should refer to the project name/s, and provide their name, address & contact details (indicating your preferred method of notification) and an indication of any direct business, financial, personal, or other interest which they have in the application. You are also requested to pass this information to any person you feel should be notified.

Please note that only Registered I&APs will be notified of the environmental reports that become available for public viewing and comment and only Registered I&APs will be notified of the outcome of the application, the reasons for the decision; and that an appeal may be lodged against the decision; and if applicable, only Registered I&APs will be notified of the applicant's intention to appeal the decision of the competent authority.

Environmental Consultant: EnviroAfrica CC. P.O. Box 5367, Helderberg, 7135 / Fax: 086 512 0154 / Tel: 021 6511616 / E-mail: jan@enviroafrica.co.za

Figure 1 Public participation

2 Locality

Figure 2 Locality

The locality of the project is shown in Figure 2. The power line will be constructed adjacent and to the southwest of Malmesbury. The beginning and end coordinates are as follows:

33°22'16.71"S; 18°41'22.15"E
33°30'18.07"S; 18°41'41.14"E

3 Quaternary Catchment

The new power line is to be constructed in the G21D quaternary catchment.

4 The Project

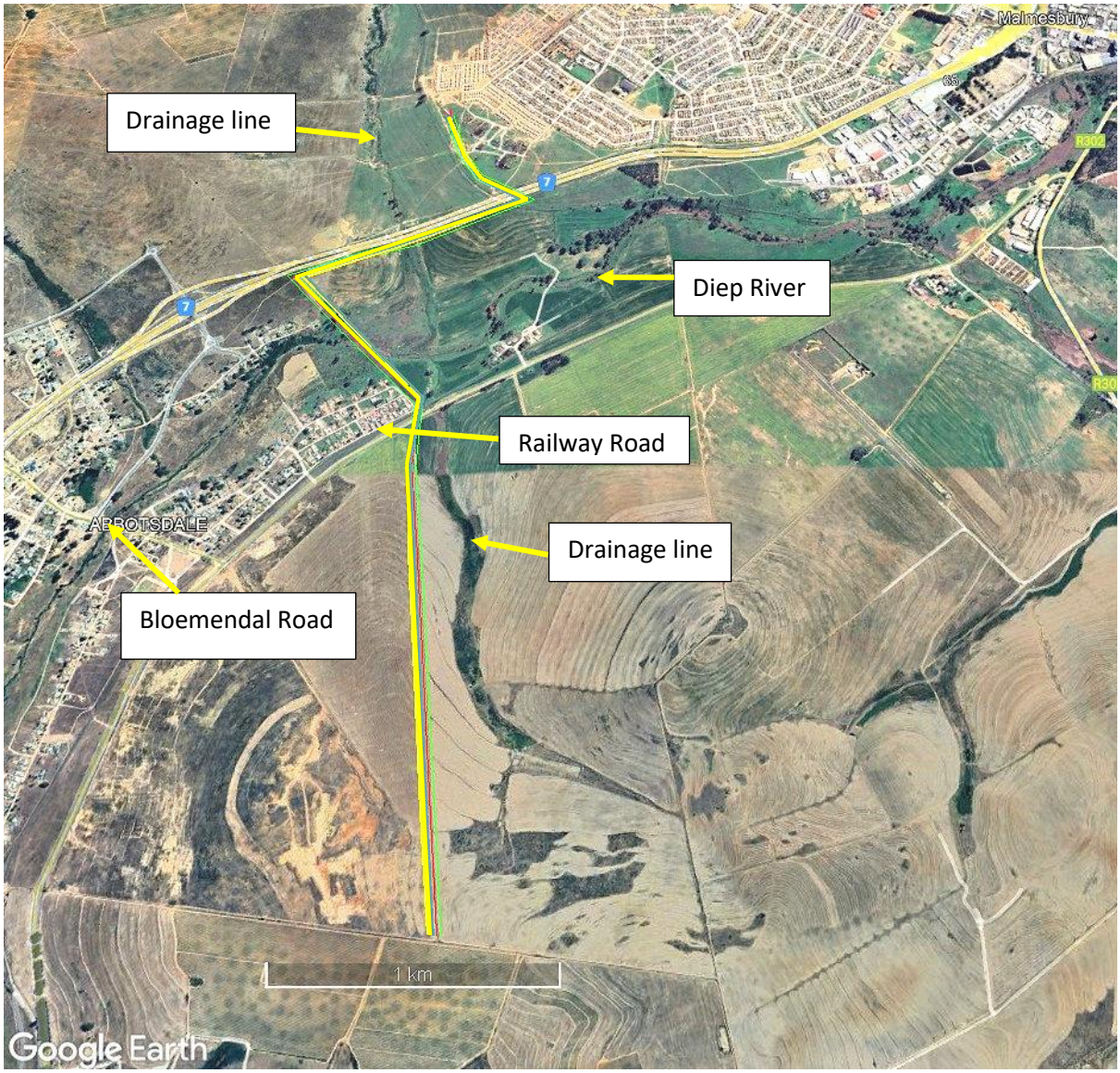


Figure 3 The Project

The power line will cover a distance of 4,7 km

The 132kV high voltage line will start to the southwest of Malmesbury, cross the N7 trunk road make a sharp angle to the southwest towards Abbotsdale, cross a drainage line, carry on further to the intersection on the N7 and then make another sharp angle to the southeast (Figure 3). It will cross the Diep River. At the end of town at Railway Road the line will again angle to the south towards its end point. Here it follows another drainage line that flows into the Diep River.

5 Legal Framework

The proposed development “triggers” sections of the National Water Act. These are the following:

S21 (c) *Impeding or diverting the flow of a water course*

The proposed rock quarry is adjacent to natural drainage lines that are identified in the NWA and its regulations as legitimate water resources. The drainage lines could possibly be altered, should the development go ahead.

S21 (i) *Altering the bed, bank, course of characteristics of a water course.*

The proposed pipeline may alter the characteristics of the drainage lines.

Government Notice 267 of 24 March 2017

Government Notice 1180 of 2002. *Risk Matrix.*

The Risk Matrix as published on the DWS official webpage must be completed and submitted along with the Water Use Licence Application (WULA). The outcome of this risk assessment determines if a letter of consent, a General Authorization or a License is required.

Government Notice 509 of 26 August 2016

An extensive set of regulations that apply to any development in a water course is listed in this government notice in terms of Section 24 of the NWA. No development take place within the 1:100 year-flood line without the consent of the DWS. If the 1:100-year flood line flood line is not known, no development may take place within a 100m from a water course without the consent of the DWS. Likewise, no development may take place within 500m of a wetland without the consent of the DWS.

National Environmental Management Act (107of 1998)

NEMA and regulations promulgated in terms of NEMA determines that no development without the consent and permission of the DEA and its regional agencies, in this case the DENC of the Northern Cape Provincial Government, may take place within 32m of a water course. The mostly dry drainage lines are perceived to be legitimate water courses.

6 Conservation Status

DFFE Screening Tool

Table 1 DFFE Screening Tool Results

Theme	Sensitivity
Animal species Avian species Aquatic biodiversity Plant species Terrestrial biodiversity	Medium Not mentioned Very High Medium Very High

Animal species

Two insect species are mentioned that won't be affected by an overhead line.

Aquatic biodiversity

The power line will be costructed in a aquatic CBA, an ESA and in a river NFEPA.

Plant Species

There is a long list of medium sensitivity plant species, of which at least 27 are numbered and of which the names may not be published.

Terrestrial biodiversity

The DFFE screening tool lists the following:

Swatland Shale Renosterveld	Critically Endangered
Swartland Granite Renosterveld	Endangered
Swartland Alluvium Renosterveld	Vulnerable

This can be an empediment to the proposed development. Conservation authorities will demand that the construction of the proposed power line would not cause undue damage to the vegetation.

7 Malmesbury Climate

https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/malmesbury_south-africa_3364346

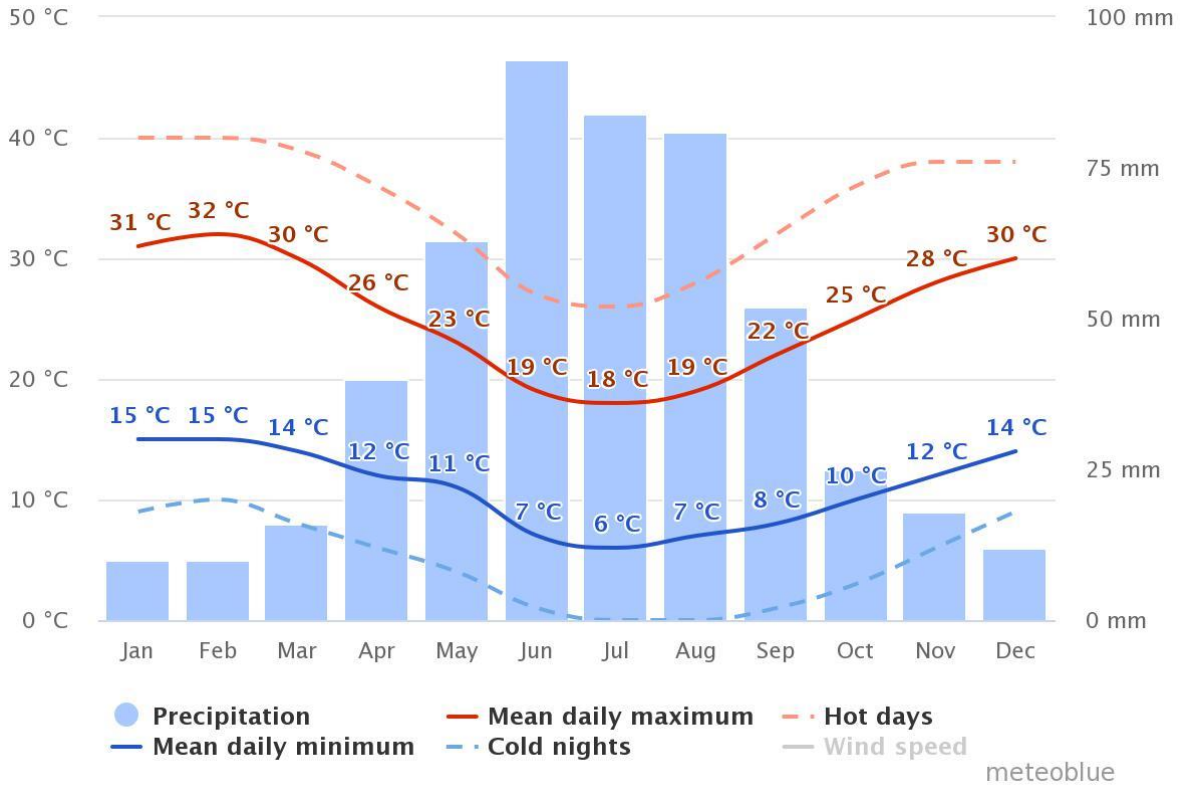


Figure 4 Malmesbury Climate

Malmesbury's climate is shown is Figure 4. Malmesbury is in South Africa's winter rainfall area. Rain is mostly orographic and rainfall events are often soft and spread out over a number of days. The summers are hot and dry with desiccating winds. This is a Mediterranean climate.

The average annual rainfall demands to only 437mm. This is a low rainfall, leaning to arid conditions.

https://www.weather-atlas.com/en/south-africa/malmesbury-climate

8 Regional Setting

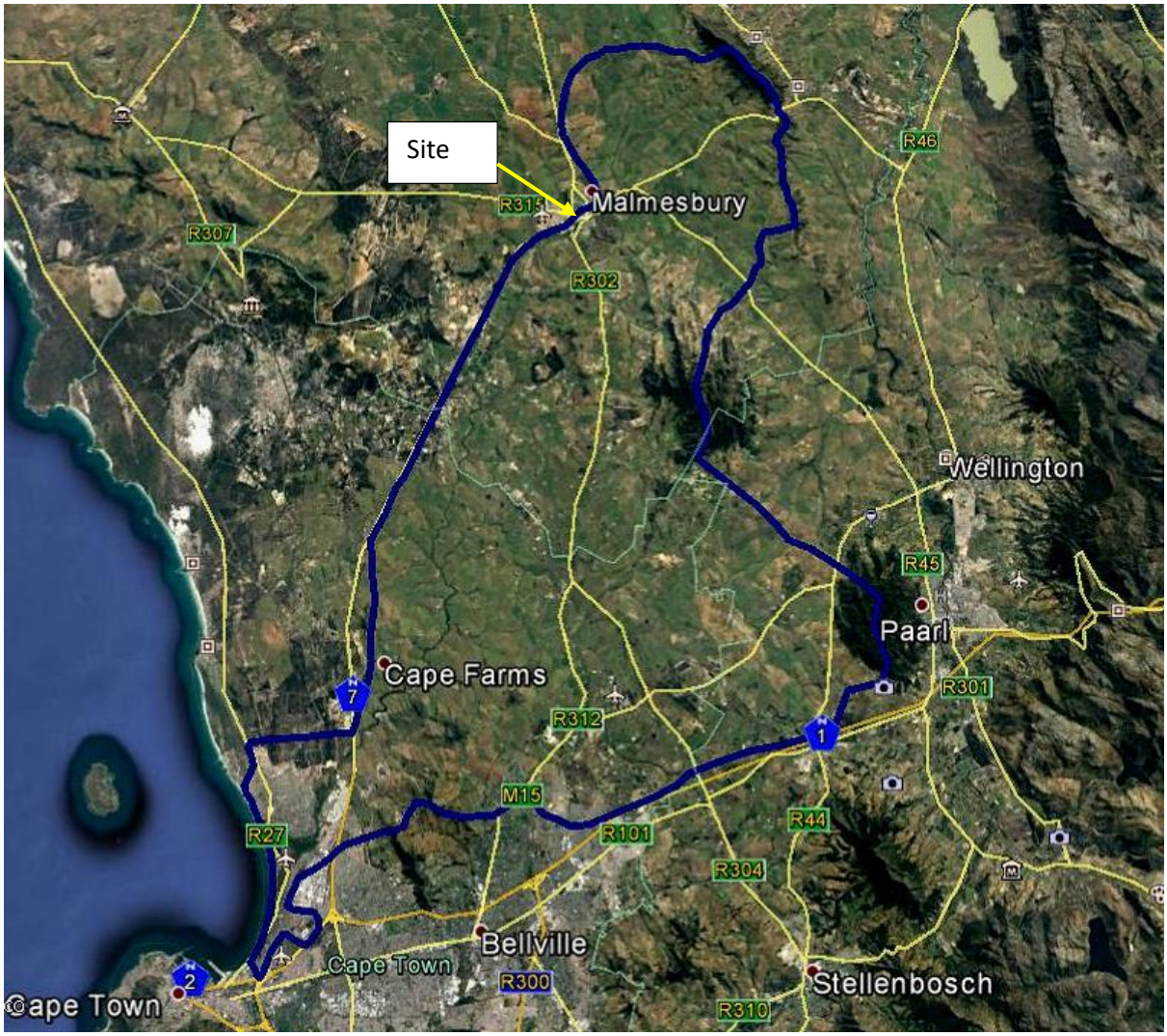


Figure 5 Diep River Catchment

The catchment area is depicted in Figure 5. The Diep River and its tributaries is shown in Figure 6

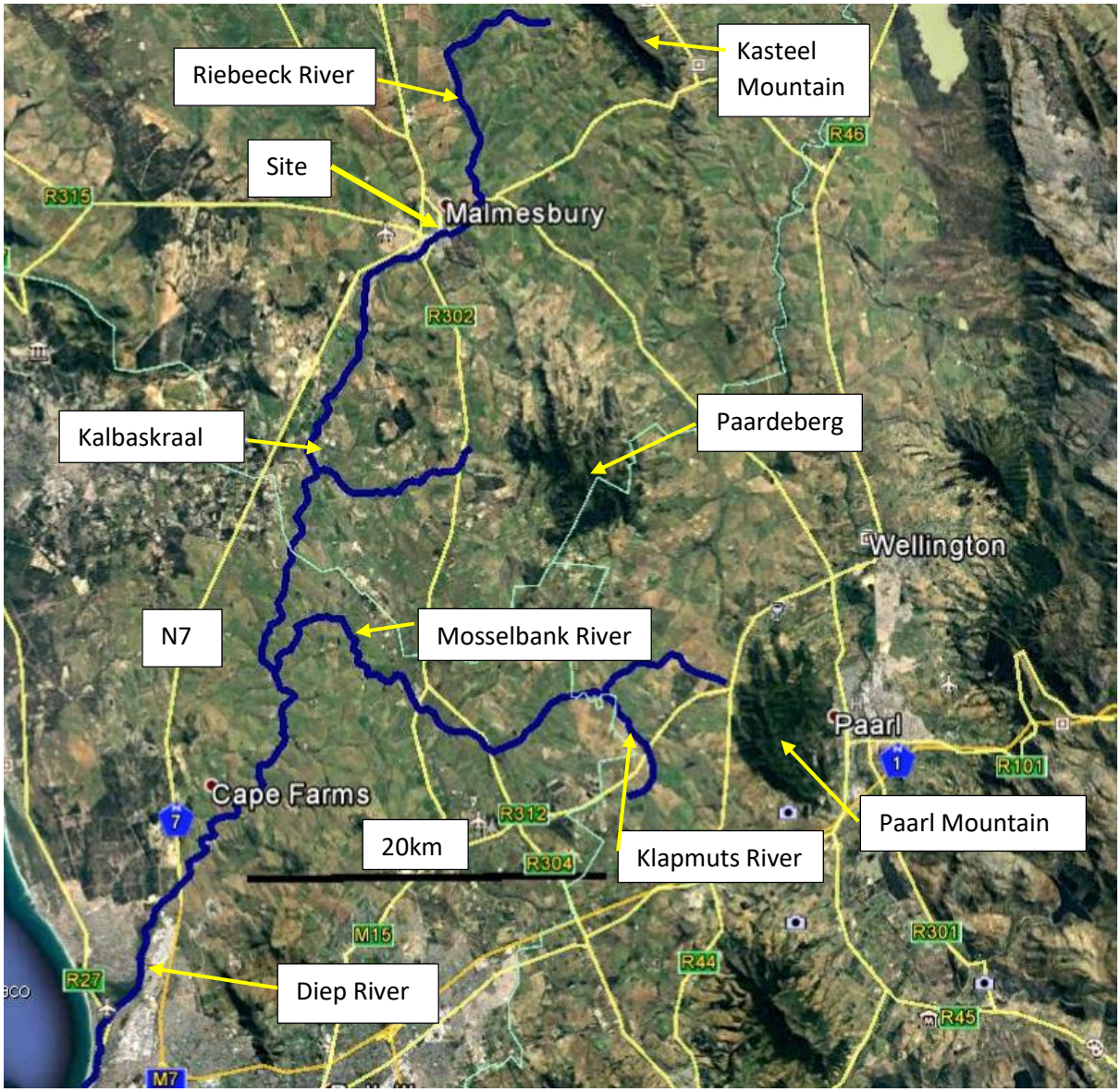


Figure 6 Regional Setting

The Diep River rises on a ridge some 900m high to the northeast of Malmesbury known as the Kasteel Mountain. From there is runs for approximately 70 km, as the crow flies, to the southwest to open in the Atlantic Ocean at Milnerton in the north of Cape Town.

To be more precise, from the Kasteel Mountain the river is known as the Riebeeck River to where it joins the Diep River at Malmesbury.

The main tributary of the Diep River is the Mosselbank River that rises in the east of the catchment on the high ground of the Paarlberg Mountain. This tributary drains a large part of Durbanville and Kraaifontein, which are the northern suburban areas of Cape Town.

The catchment is situated on the coastal lowlands of the Western Cape, with a surface area of 1495km^2. The landscape is rather flat, with undulating sandy hills and a couple of isolated mountains such as the Kasteel Mountain, Paardeberg and the Paarlberg. These mountains are along the eastern boundary of the catchment.

The naturalised runoff amounts to 50 million m^2. Most of the farm dams are located in the Mosselbank River sub-catchment. There are more farms in the upper Kasteel River against the slopes of the Kasteel Mountain. The runoff after development has been reduced to 45 million m^2.

The mountains and high ridges receive a high rainfall, according to some sources of up to 1200mm. The coastal lowlands receive 400mm and even less. The Diep River is characterized by a pulse of flow during the wet winter months. The orographic rain arrives as cold fronts that pass over the Western Cape.

The evaporation rate amounts to 1600mm per year.

During the hot summer months of up to 40 degrees centigrade with its desiccating winds the river dries up, with only stagnant pools (Figure 7). The main driver of the river is the seasonal rain on the mountain peaks.

Figure 7 Stagnant Pool

9 State of the Catchment

Most of the catchment originally was Swartland Shale Renosterveld, with Swartland Alluvium Renosterveld along the water courses. There are patches of Swartland Granite Renosterveld in the northern parts of the catchment. Up the mountains Hawequas Sandstone Fynbos still prevails. A more detailed description of the vegetation can be found of the SANBI webpage (http://bgisviewer.sanbi.org).

The entire catchment has been heavily impacted. Most of it has been ploughed over for an extensive dry land wheat farming industry. Against the slopes and higher ground an extensive wine farming industry was established in a previous millennium and has grown to be an important part of the local economy. Less than 5% of the original Renosterveld has survived the onslaught.

A large number of small to medium sized farm dams support the large-scale farming operation is the catchment. Most of these are against the slopes and in the valleys of the mountains. On the lowlands much water is abstracted from the aquafers for irrigations with centre pivot systems.

The treated effluent from the Kraaifontein, Malmesbury and Milnerton (Potsdam) impacts on the water quality of the Diep River.

There are a number of feedlots and dairy farms in the catchment that can impact on the water quality of the Diep River.

Figure 8 Eucalyptus trees in the Diep River

The available water in the Diep River and its tributaries are further compromised by the vast stand of mature eucalypt trees (Figure 8) along most of the river's length. These trees evapotranspirate large volumes of ground water into the atmosphere.

The closest biomonitoring sampling point to the proposed high voltage powerline in the Diep River for the State of the River Report (2003) was at Kalbaskraal. The river here was assigned a "fair" status, apart from the riparian zone that was "poor". According to the report a "fair" status was the desired status at the time.

10 Diep River at Abbotsdale

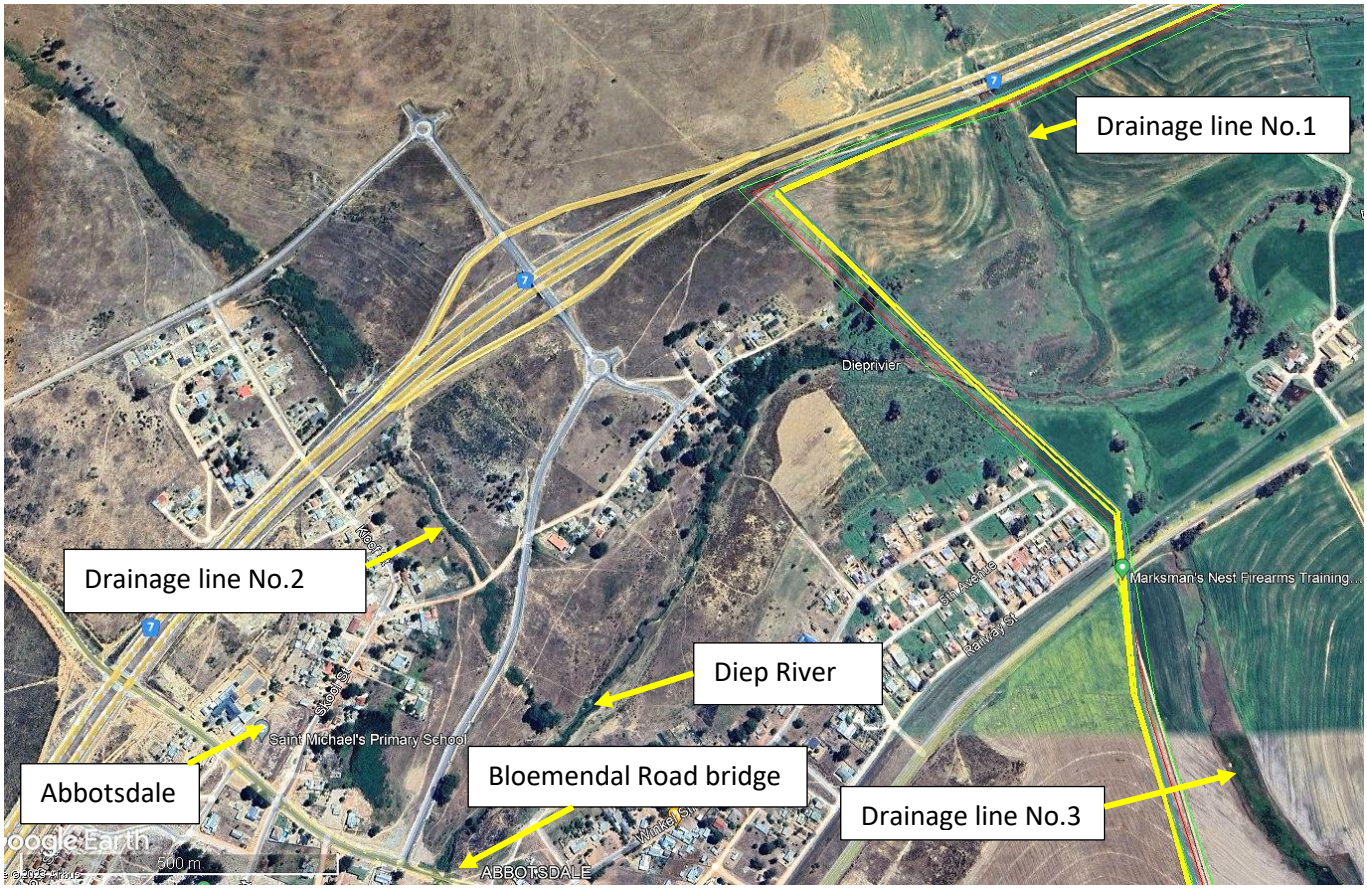


Figure 9 Diep River at Abbottsdale

When driving along the N7 from Malmesbury towards Abbotsdale, to where the proposed high voltage power line runs along the N7 (Figure 9), the first drainage line is encountered. Looking from the N7 south towards Abbotsdale, the drainage line is

covered with a dense stand of *Phragmitis* reeds (Figure 10). The reeds were dry at the time of the site visit, as reeds are in midwinter.

Figure 10 Drainage line No.1

Figure 11 Drainage line No.2

Figure 12 *Cyperus textilis*

Figure 13 Bloemendal Road bridge

Figure 14 Flow at Bloemendal Road bridge

Figure 15 Drainage line No.3

Driving into Abbotsdale via the intersection, the next drainage line (No.2, Figure 11) was a wet seep. The dominant vegetation here was *Cyperus textilis* (Figure 12). Cattle and other farm animals fed on these plants.

Driving further into town onto the Bloemendal Road bridge, the Diep River was flowing strongly at the time of the site visit (Figure 13 and 14).

Drainage line No.3 (Figure 15) was photographed during the dry season. It was covered with a dense stand of *Juncus krausii*. The wheat fields were right up against its banks, as were most wheat and canola fields were in the district, right against the river and the drainage lines. This drainage line was assessed for a previous project (Van Driel, 2020).

11 Present Ecological Status (PES)

The PES and EIS are protocols that have been produced by Dr Neels Kleynhans in 1999 of the then DWAF to assess river reaches. The scores (Table 2) given are solely that of the practitioner and are based on expert opinion. The practitioner has had many years of experience of the Diep River, from the start of the National River Health Program and when the State of the River Reports were produced.

At the time of the site visit on 27 July 2023, the Diep River flowed strongly because of the abundant winter rains sustained over the last 2 months. This was an exceptionally wet year.

The Diep River comes down in force during the winter rains. A great volume of water washes out to sea. As summer sets in, the water dries up, with no flow and with stagnant pools. The impact of the many farm dams and evapotranspiration is taken into consideration, which substantially shortens the hydroperiod.

Table 2 Habitat Integrity according to Kleynhans, 1999

Category	Description	% of maximum score
A	Unmodified, natural	90 – 100
B	Largely natural with few modifications. A small change in natural habitats and biota, but the ecosystem function is unchanged	80 – 89
C	Moderately modified. A loss and change of the natural habitat and biota, but the ecosystem function is predominantly unchanged	60 – 79
D	Largely modified. A significant loss of natural habitat, biota and ecosystem function.	40 – 59
E	Extensive modified with loss of habitat, biota and ecosystem function	20 – 39
F	Critically modified with almost complete loss of habitat, biota and ecosystem function. In worse cases ecosystem function has been destroyed and changes are irreversible	0 - 19

Table 3 Present Ecological State of the Diep River.

Instream	**score**	**weight**	**Product**
Water Abstraction	15	14	210
Flow modification	15	13	195
Bed modification	20	13	260
Channel modification	20	13	260
Water quality	12	14	168
Inundation	15	10	150
Exotic macrophytes	12	9	108
Exotic fauna	8	8	64
Solid waste disposal	20	6	120
max score		100	1445
% of total			57.8
Class			**D**
Riperian Zone			
Water abstraction	15	13	195
Inundation	15	11	165
Flow modification	20	12	240
Water quality	12	13	156
Indigenous vegetation removal	1	13	26
Exotic vegetation encroachment	1	12	12
Bank erosion	15	14	210
Channel modification	15	12	180
		100	1184
% of total			47.4
Class			**D**

Table 4 Present Ecological State of the drainage lines combined.

Instream	**score**	**weight**	**Product**
Water Abstraction	15	14	210
Flow modification	15	13	195
Bed modification	9	13	117
Channel modification	15	13	195
Water quality	20	14	280
Inundation	17	10	170
Exotic macrophytes	20	9	180
Exotic fauna	19	8	152
Solid waste disposal	22	6	132
max score		100	1631
% of total			65.2
Class			**C**
Riperian Zone			
Water abstraction	15	13	195
Inundation	17	11	187
Flow modification	15	12	180
Water quality	20	13	260
Indigenous vegetation removal	18	13	234
Exotic vegetation encroachment	17	12	204
Bank erosion	20	14	280
Channel modification	15	12	180
		100	1720
% of total			68.8
Class			**C**

The water quality has been deleteriously impacted by large-scale animal husbandry, agricultural runoff and a wastewater treatment works.

Some places water hyacinth *Eichornia crassipes* takes over each year when the river is full.

The river is hugely taken over by exotic carp *Cyprinus carpio*. In some place the indigenous minnow *Galaxias zebratus* still persists and one can be lucky to find the Cape kurper *Sandelia capensis*.

The Diep River at Abbotsdale, as well as over its entire length, has been largely modified because of human impact.

Both the instream habitat and the riparian zone of the Diep River came out as a "D", (Table 3) which means that the habitat has been largely modified with a significant loss of ecological functioning.

The 3 drainage lines have been combined for this assessment (Table 4). The score came out as a "C", which is impacted, but with still some ecological functioning left. The one aspect that saved the drainage lines from being worst is that they are still fairly clean of the huge stand of mature blue gum trees.

The proposed high voltage powerline is not about to change the status of the Diep River and its drainage lines in and downstream of Abbotsdale.

12 Ecological Importance

The Ecological Importance (EI) is based on the presence of especially fish species that are endangered on a local, regional or national level (Table 5).

Table 5 Ecological Importance according to endangered organisms (Kleynhans,1999).

Category	Description
1	One species or taxon are endangered on a local scale
2	More than one species or taxon are rare or endangered on a local scale
3	More than one species or taxon are rare or endangered on a provincial or regional scale
4	One or more species or taxa are rare or endangered on a national scale (Red Data)

The two indigenous fish species *Sandelia capensis* and *Galaxias zebratus* were encountered in deep pools at the lower reach of the river but not anywhere near Abbottsdale. *Galaxias* has distinct generic strains in rivers of the Southern Cape. If the Diep River strain were to be lost, it would represent a loss of genetic material.

The drainage lines completely dry up during summer with no permanent water and therefore no fish.

Taken these aspects into consideration and given the general compromised ecological state of the river, the Diep River at Abbotsdale cannot be considered as ecologically important.

The presence of fish cannot be the only yardstick for measuring ecological importance. All the large rivers on the Cape's coastal flats as well as in the country are ecologically important. Because of its downtrodden state, the Diep River at most can be considered as ecologically less important than other rivers in a better state.

13 Ecological Sensitivity

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.

If the human impacts were to be removed, all of it, will the Diep River bounce back to some status closer to the original unimpacted state? It probably would, as river do. This is not about to happen. As long as human habitation persists, the impacts will increase. Consequently, the state of the river will continue to deteriorate. The river will not bounce back. From this point of view, the Diep River and its drainage lines can be considered as ecologically sensitive, as all rivers are.

14 EISC

The EISC has been devised by Dr Neels Kleynhans of the then Department of Water and Forestry and is a number that must appear in the Risk Matrix. The EISC sheds light on the ecological worth of a site, as do some of the other indices.

Table 6 EISC

Determinant	Diep River	Drainage lines
Rare and endangered species	2	1
Populations of unique species	2	1
Species / Taxon richness	2	2
Diversity of habitat	2	2
Migration Route/ Breeding and feeding site for wetland species	4	3
Sensitivity to water quality changes	3	3
Flood storage, energy dissipation, particulate / element removal	4	2
Protection status	2	1
Ecological integrity	1	2
Average	2.4	1.9
Score	Moderate	Low

Score guideline:
Very High 4, High 3, Moderate 2, Low 1, None 0
Confidence Rating
Very High 4, High 3, Moderate 2, Low 1

15 Possible Impacts and Mitigating Measures

Dickens *et al* (2003) lists a number of possible impacts on wetlands. This outline can be used for the proposed high voltage line and the Diep River as well. The possible listed impacts are discussed as follows:

Flow modification

The pylons must be at least 32m away from the riverbanks, preferably further away. The NWA buffer zone is 100m on either side of a river or outside of the 1 in 100-year flood line. This placement is quite possible, as pylons can be wide apart. If not, steel pylons and their concrete anchors, because of the low-impact nature of the construction, are unlikely to measurably alter a large flow, as the riverbanks overflow during a large flood. The pylons must be constructed out of the danger area, if possible at all.

Permanent inundation

The pylons and overhead cables are not going to have any effect on the inundation regime of the Diep River at all.

Water quality modification

The pylons and overhead cables are not going to have any effect on the water quality regime of the Diep River at all. During the construction phase, remnants of concrete and rubble may end up in the river, but not if proper mitigating measures are being taken. Concrete must be mixed off site and trucked in, as is common practice at such sites.

Sediment load modification

There is a possibility of sand and mud washing into the river during the construction phase. Soil will be disturbed that can end up in the river along with stormwater during rainfall events. If the pylons are placed away far enough from the river, the likelihood of this happening is remote.

The access road to the construction sites must be limited, as mud can wash into the river from these roads. No more roads must be constructed than necessary. If not used any more following construction, the roads must be rehabilitated.

The sites where the pylons are constructed must be levelled, landscaped and rehabilitated as soon as construction is completed. Loose sand must be compacted and grassed over.

Canalization

The access roads create preferential flow paths. Access roads must be demolished and rehabilitated following construction, if not used any longer. During construction, stormwater management infrastructures such as berms and trenches may be necessary to divert stormwater from the roads.

Topographic alteration

The proposed high voltage power line is not about to alter the topography of the landscape in any way.

Terrestrial encroachment

The proposed power line will not add to any further encroachment into the riparian zone. The growth of Port Jackson and rooikrans invasive trees must be controlled over the longer term, as these are a major threat to the district's natural environment.

Indigenous vegetation removal

There is little if any indigenous vegetation left on the Swartland's wheatfields and along the rivers and streams. The proposed power line will not lead to any more destruction of the natural vegetation.

Alien fauna

At present the original wild angulates are replaced with cattle. The proposed power line would not change the status.

Over-utilization

The riverbanks are used for grazing. Human traffic on foot adds to the trampling of the riverbanks and surrounds. This situation would not change as a result of the proposed power line. Once construction is completed, it would be difficult to keep people and farm animals away from the riverbanks at the construction areas.

Ground water table

The proposed high voltage power line, its construction and its operation will not have any effect on the groundwater table.

Waste

At the moment waste and rubble is being dumped in and around the river. This is an ongoing municipal problem.

During the construction phase portable toilets will be serviced by a reputable company and wastewater will be discharged in the municipal wastewater treatment works. Waste will be collected in with the usual municipal system and it will be disposed of on the municipal waste disposal site at standard rates.

Stormwater Management Plan

Apart from best management practices, a stormwater management plan during construction is not called for.

16 Impact Assessment

Some of the authorities, such as the DFFE and its provincial offices prescribe an impact assessment according to a premeditated methodology.

The main benefit of this exercise is that it allows for the evaluation of mitigation measures. Later follows a Risk Assessment. This is different from the Impact Assessment as it does not attempt to weigh the success of mitigation measures.

The methodology is set out in the Appendix.

The impact assessment follows the stages in the life cycle of a project. These stages include planning, construction, operation, decommissioning and rehabilitation.

Table 7 Impact Assessment

Description of impact: Construction Phase

Construction of access roads
Digging foundations for the pylons
Casting concrete for the pylon foundations
Putting together the steel structure
Positioning the high voltage cables.
Hoisting the cables onto the pylons.
Cleanup, landscaping, gardening

Main Impacts

Soil washing into the river along with storm water.

Mitigation measures

Compile an environmental management program.
Appoint an ECO to implement program.
Keep mud and sand out of the river during construction.
Rehabilitate access roads.
Limit the footprint.
Rehabilitate and landscape as construction proceeds.

Type Nature	Spatial Extent	Severity	Duration	Significance	Probability	Confidence	Reversibility	Irreplaceability
Without mitigation								
Direct	Local	Low	Temporary	Medium	Probably	Certain	Reversible	Replaceable
With mitigation measures								
Negative	Local	Low	Temporary	Low	Unlikely	Possible	Reversible	Replaceable

Table 7 Impact Assessment

Description of impact: Operational Phase Repair damaged pylons Replace overhead cables if necessary. **Main Impacts** Rubble in the river **Mitigation measures** Keep building rubble out of the river.								
Type Nature	Spatial Extent	Severity	Duration	Significance	Probability	Confidence	Reversibility	Irreplaceability
Without mitigation								
Direct	Local	Low	Temporary	Medium	Probably	Certain	Reversible	Replaceable
With mitigation measures								
Negative	Local	Low	Temporary	Low	Unlikely	Possible	Reversible	Replaceable

The construction and the maintenance of the proposed high voltage cable are low-impact actions, with no activity going on in the riverbed or on its riparian zone. If kept far enough out of the river, the impacts would be negligible.

Best management practices, an awareness that the river must be kept intact, is all that is required to keep the impacts at bay. Construction companies in this field have standing operating procedures, which are scrutinised for contract purposes. This aught to be adequate to protect the river.

17 Risk Matrix

Table 8 Risk Matrix

No.	Activity	Aspect	Impact	Significance	Risk Rating
1	**Construction of the high voltage power line** Construction of access roads Digging foundations for the pylons Casting concrete for the pylon foundations Putting together the steel structure Positioning the high voltage cables. Hoisting the cables onto the pylons. Cleanup, landscaping, gardening	Mobilisation of soil	Soil washing into the river along with stormwater. Destruction of aquatic habitat	24	Low
2	**Operation of the high voltage power line** Repair damaged pylons Replace overhead cables if necessary.	Building rubble in the river	Alteration of aquatic habitat	12	Low

Table 8 Continued Risk Rating

No	Flow	Water Quality	Habitat	Biota	Severity	Spatial scale	Duration	Conse-quence
1.1 1.2	1 1	1 1	1 1	1 1	1 1	1 1	1 1	3 3

No	Frequency of activity	Frequency of impact	Legal issues	Detection	Likelihood	Significance	Risk Rating
1.1 1.2	1 1	1 1	5 1	1 1	8 4	24 12	Low Low

The assessment was carried out according to the interactive Excel table that is available on the DWS webpage. Table 8 is a replica of the Excel spreadsheet that has been adapted to fit the format of this report. The numbers in Table 8 (continued) represent the same activities as in Table 7.

The risk assessment is a requirement of Government Notice 1180 of 2002 in terms of the National Water Act (36 of 1998).

The methodology is set out in the Appendix.

The environmental risks are very low, negligible. This is because the construction and operation of an electric power line are inherently low risk activities. The aquatic habitat at Abbotsdale is already impacted. The proposed high voltage power line can hardly add more impacts than the ones already present.

The Risk Matrix indicates that a General Authorisation is the correct level of authorisation. A License is not called for.

18 Numerical Significance

Decision-makers often press on a numerical score for Significance**.** The score takes into consideration both the environmental value of the site and the degree of impact.

Table 25.3, p51, Appendix provides a system for allocation values for each of the parameters Conservation Value, Extent, Duration, Severity and Likelihood about possible impacts These values are then entered into the equation on p51 to derive at a value for Significance. The value for Significance can subsequently be evaluated according to Table 25.3.2.

Table 25.3.2 provides a yardstick for decision-making to allow or disallow a development with its concomitant impact on the environment.

The scores that were given are entirely those of the specialist (Table 9), based on his or her knowledge and experience. These scores form a bases for debate and consensus, should contemporaries and decision-makers wish to add to the process.

The scores apply under the assumption that mitigation measures will be in place.

This assessment shows that the potential impacts are insignificant.

Table 9 Significance Score

Parameter	Score
Conservation value	2
Likelihood	2
Duration	5
Extent	1
Severity	1
Significance	18
	Low

19 Resource Economics

The goods and services delivered by the environment is a Resource Economics concept as adapted by Kotze *et al* (2009). The methodology was designed for the assessments of wetlands, but in the case of these environments, the goods and services delivered are particularly applicable, hence it was decided to include it in the report.

The diagram (Figure 16) is an accepted manner to visually illustrate the resource economic footprint the drainage lines, from the data in Table 10. A diagram for the Berg River is not shown, as it is a complete circle, a very large resource economics footprint, as are all large rivers in the country.

The resource economics footprint of the drainage lines is very small, insignificant.

The proposed high voltage power line is not about to change any of this.

Table 10. Goods and Services

Goods & Services	Diep River	Drainage lines
Flood attenuation	5	3
Stream flow regulation	5	3
Sediment trapping	5	2
Phosphate trapping	5	2
Nitrate removal	5	2
Toxicant removal	5	2
Erosion control	5	2
Carbon storage	5	1
Biodiversity maintenance	5	2
Water supply for human use	5	1
Natural resources	5	3
Cultivated food	5	3
Cultural significance	5	1
Tourism and recreation	5	1
Education and research	5	1

0	Low
5	High

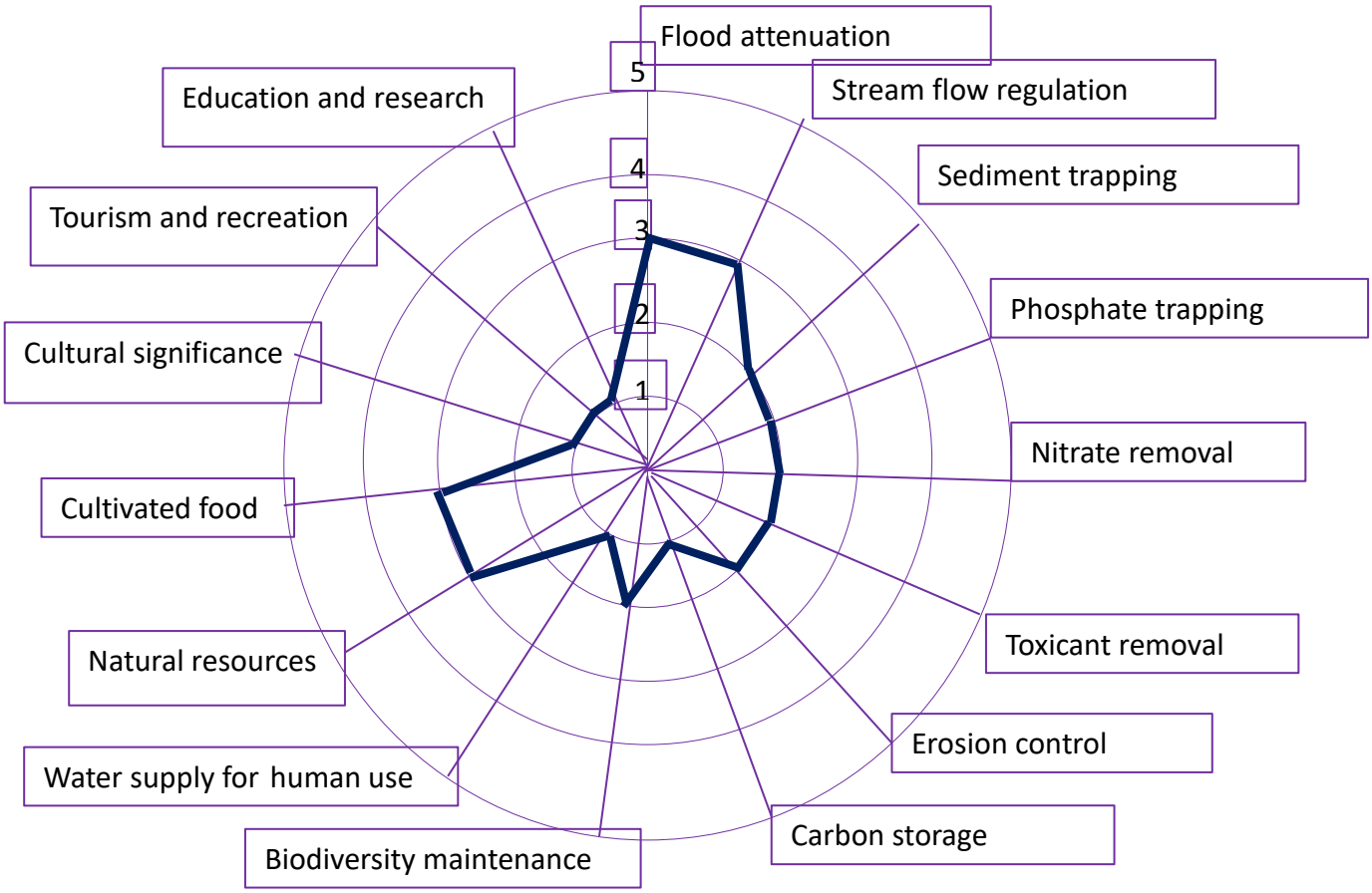


Figure 16. Resource Economics Footprint of the drainage lines

20 Summary

Table 11 Summary of evaluations

Aspect	Status
DFFE Screening Tool	Sensitivity Medium and Very High
Conservation status	CBA, ESA and NFEPA.
Vegetation	Critically Endangered, Endangered, Vulnerable
PES of the Diep River	Largely impacted, loss of ecosystem functioning
PES of the drainage lines	Moderately impacted, some ecosystem functioning left
Ecological Importance Diep River	Important
Ecological Importance of the drainage lines	Not important
Ecological Sensitivity Diep River	Sensitive
Ecological Sensitivity of the drainage lines	Not sensitive
EISC of the Diep River	High
EISC of the drainage lines	Low
Impact Assessment	Mitigating measures implementable
Risk Matrix	General Authorisation
Significance	Insignificant
Resource Economics Diep River	Very large footprint
Resource Economics drainage lines	Small footprint

Table 11 gives an overall and much condensed view of the evaluations and methodologies that have been applied to the coastal salt pans.

It shows a mixed bag of outcomes.

Given the low impact nature of the construction and operation of a power line of the aquatic environment, the power line is not about to change anything if mitigating measures are adhered to. Table 1 does not suggest that the project cannot go ahead.

The one aspect that raises a flag is the possible impact on the vegetation. It requires to be mentioned but is beyond the scope of this report.

21 Discussion and Conclusions

'An anthropogenic activity can impact on any of the ecosystem drivers or responses and this can have a knock-on effect on all the other drivers and responses. This, in turn, will predictably impact on the ecosystem services (Figure 17). The WULA and the EAI must provide mitigation measured for these impacts.'

Figure 17 has been adapted from a DWS policy document.

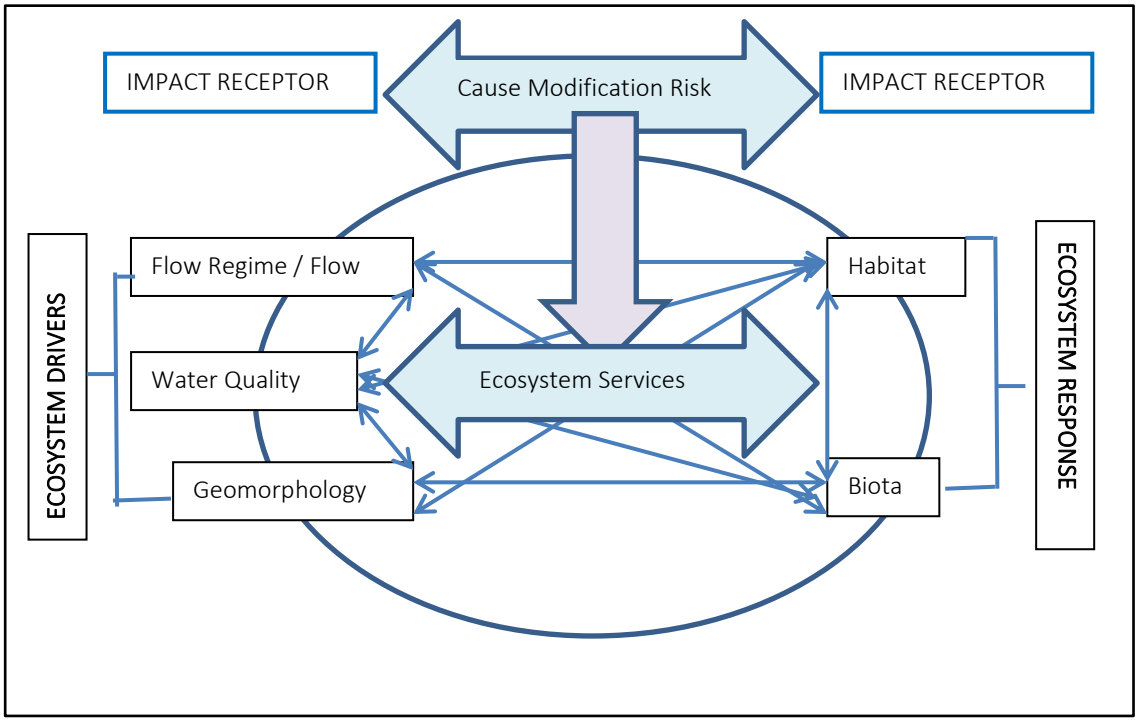


Figure 17 Minimum Requirements for a S21(c) and (i) Application

The driver for the Diep River and its drainage lines is the winter rainfall. Rainfall is variable, with the river coming down in flood during high rainfall events. The summer drought is as much of a driver as the winter rains. The river dries up, with only standing pools remaining.

Human impact has added to the low flow and drought flow conditions in the river. Water abstraction for large-scale agriculture exacerbates the low flow conditions in the river.

The Diep River and its catchment has departed a long way from its original condition. High voltage power lines with it overhead cables suspended on steel towers, its construction and its operation, are essentially low-impact activities. The proposed power line is not expected to measurably add to the existing impacts.

The Risk Matrix indicates that a General Authorisation is the correct level of approval. A license is not called for.

22 References

Dickens, CWS & PM Graham. 2002. *The South African Scoring System (SASS) Version 5 Rapid Bioassessment.* African Journal of Aquatic Science 2002, 27: 1–10**.**

Kleynhans, C.J. 1999. *Assessment of Ecological Importance and Sensitivity*. Department of Water Affairs and Forestry. Pretoria.

Kotze, G., G. Marneweck, A. Batchelor, D. Lindley & Nacelle Collins. 2009. *A technique for rapidly assessing ecosystem services supplied by wetlands.* Water Research Commission, Pretoria.

Mucina, L. & M.C Rutherford. 2006. *The vegetation of South Africa, Lesotho and Swaziland*. SANBI, Pretoria.

Van Driel, D. 2020. Freshwater Report. *Application for rezoning on Farm Oranjefontein 1113 Malmesbury.* WATSAN Africa, Cape Town

23 Declaration of Independence

I, Dirk van Driel, as the appointed independent specialist hereby declare that I:

- Act/ed as the independent specialist in this application
- Regard the information contained in this report as it relates to my specialist input/study to be true and correct and;
- Do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management act;
- Have and will not have vested interest in the proposed activity;
- Have disclosed to the applicant, EAP and competent authority any material information have or may have to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the environmental Impact Assessment Regulations, 2010 and any specific environmental management act.
- Am fully aware and meet the responsibilities in terms of the NEMA, the Environmental Impacts Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R543) and any specific environmental management act and that failure to comply with these requirements may constitute and result in disqualification;
- Have ensured that information containing all relevant facts on respect of the specialist input / study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties facilitated in such a manner that all interested and affected parties were provided with reasonable opportunity to participate and to provide comments on the specialist input / study;
- Have ensured that all the comments of all the interested and affected parties on the specialist input were considered, recorded and submitted to the competent authority in respect of the application;
- Have ensured that the names of all the interested and affected parties that participated in terms of the specialist input / study were recorded in the register of interested and affected parties who participated in the public participation process;
- Have provided the competent authority with access to all information at my disposal regarding the application, weather such information is favourable or not and;
- Am aware that a false declaration is an offence in terms of regulation 71 of GN No. R543.

Signature of the specialist:  25 October 2023

24 Résumé

Experience

USAID/RTI, ICMA & Chemonics. Iraq & Afghanistan **2007 -2011**
Program manager.

City of Cape Town **1999-2007**
Acting Head: Scientific Services, Manager: Hydrobiology.

Department of Water & Sanitation, South Africa **1989 – 1999**
Senior Scientist

Tshwane University of Technology, Pretoria **1979 – 1998**
Head of Department

University of Western Cape and Stellenbosch University 1994 - 1998 part-time

- Lectured post-graduate courses in Water Management and Environmental Management to under-graduate civil engineering students
- Served as external dissertation and thesis examiner

Service Positions

- Project Leader, initiator, member and participator: Water Research Commission (WRC), Pretoria.
- Director: UNESCO West Coast Biosphere, South Africa
- Director (Deputy Chairperson): Grotto Bay Homeowner's Association
- Member Dassen Island Protected Area Association (PAAC)

Membership of Professional Societies

- South African Council for Scientific Professions. Registered Scientist No. 400041/96
- Water Institute of South Africa. Member

Reports

- Process Review Kathu Wastewater Treatment Works
- Effluent Irrigation Report Tydstroom Abattoir Durbanville
- River Rehabilitation Report Slangkop Farm, Yzerfontein
- Fresh Water and Estuary Report Erf 77 Elands Bay
- Ground Water Revision, Moorreesburg Cemetery
- Fresh Water Report Delaire Graff Estate, Stellenbosch
- Fresh Water Report Quantum Foods (Pty) Ltd. Moredou Poultry Farm, Tulbagh
- Fresh Water Report Revision, De Hoop Development, Malmesbury
- Fresh Water Report, Idas Valley Development Erf 10866, Stellenbosch
- Wetland Delineation Idas Valley Development Erf 10866, Stellenbosch
- Fresh Water Report, Idas Valley Development Erf 11330, Stellenbosch
- Fresh Water Report, La Motte Development, Franschhoek
- Ground Water Peer Review, Elandsfontein Exploration & Mining
- Fresh Water Report Woodlands Sand Mine Malmesbury
- Fresh Water Report Brakke Kuyl Sand Mine, Cape Town
- Wetland Delineation, Ingwe Housing Development, Somerset West
- Fresh Water Report, Suurbraak Wastewater Treatment Works, Swellendam
- Wetland Delineation, Zandbergfontein Sand Mine, Robertson
- Storm Water Management Plan, Smalblaar Quarry, Rawsonville
- Storm Water Management Plan, Riverside Quarry
- Water Quality Irrigation Dams Report, Langebaan Country Estate
- Wetland Delineation Farm Eenzaamheid, Langebaan
- Wetland Delineation Erf 599, Betty's Bay
- Technical Report Bloodhound Land Speed Record, Hakskeenpan
- Technical Report Harkerville Sand Mine, Plettenberg Bay
- Technical Report Doring Rivier Sand Mine, Vanrhynsdorp
- Rehabilitation Plan Roodefontein Dam, Plettenberg Bay
- Technical Report Groenvlei Crusher, Worcester
- Technical Report Wiedouw Sand Mine, Vanrhynsdorp
- Technical Report Lair Trust Farm, Augrabies
- Technical Report Schouwtoneel Sand Mine, Vredenburg
- Technical Report Waboomsrivier Weir Wolseley
- Technical Report Doornkraal Sand Mine Malmesbury
- Technical Report Berg-en-Dal Sand Mine Malmesbury
- Wetland Demarcation, Osdrif Farm, Worcester
- Technical Report Driefontein Dam, Farm Agterfontein, Ceres
- Technical Report Oewerzicht Farm Dam, Greyton
- Technical Report Glen Lossie Sand Mine, Malmesbury
- Preliminary Report Stellenbosch Cemeteries
- Technical Report Toeka & Harmony Dams, Houdenbek Farm, Koue Bokkeveld
- Technical Report Kluitjieskraal Sand & Gravel Mine, Swellendam
- Fresh Water Report Urban Development Witteklip Vredenburg
- Fresh Water Report Groblershoop Resort, Northern Cape
- Fresh Water Report CA Bruwer Quarry Kakamas, Northern Cape
- Fresh Water Report, CA Bruwer Sand Mine, Kakamas, Northern Cape
- Fresh Water Report, Triple D Farms, Agri Development, Kakamas
- Fresh Water Report, Keren Energy Photovoltaic Plant Kakamas
- Fresh Water Report, Keren Energy Photovoltaic Plant Hopetown
- Fresh Water Report Hopetown Sewer
- Fresh Water Report Hoogland Farm Agricultural Development, Touws River
- Fresh Water Report Klaarstroom Wastewater Treatment Works

- Fresh Water Report Calvinia Sports Grounds Irrigation
- Fresh Water Report CA Bruwer Agricultural Development Kakamas
- Fresh Water Report Zwartfontein Farm Dam, Hermon
- Statement Delsma Farm Wetland, Hermon
- Fresh Water Report Lemoenshoek Farms Pipelines Bonnyvale
- Fresh Water Report Water Provision Pipeline Brandvlei
- Fresh Water Report Erf 19992 Upington
- Botanical Report Zwartejongensfontein Sand Mine, Stilbaai
- Fresh Water Report CA Bruwer Feldspath Mine, Kakamas
- Sediment Yield Calculation, Kenhardt Sand Mine
- Wetland Demarcation, Grabouw Traffic Center
- Fresh Water Report, Osdrift Sand Mine, Worcester
- Fresh Water Report, Muggievlak Storm Water Canal, Vredenburg
- Fresh Water Report, Marksman's Nest Rifle Range, Malmesbury
- Biodiversity Report, Muggievlak Storm Water Canal, Vredenburg
- Strategic Planning Report, Sanitation, Afghanistan Government, New Delhi, India
- Fresh Water Report, Potable Water Pipeline, Komaggas
- Fresh Water Report, Wastewater Treatment Works, Kamieskroon
- Fresh Water Report, Turksvy Farm Dam, Upington
- Fresh Water Report, Groblershoop Urban Development, IKheis Municipality
- Fresh Water Report, Boegoeberg Urban Development, IKheis Municipality
- Fresh Water Report, Opwag Urban Development, IKheis Municipality
- Fresh Water Report, Wegdraai Urban Development, IKheis Municipality
- Fresh Water Report, Topline Urban Development, IKheis Municipality
- Fresh Water Report, Grootdrink Urban Development, IKheis Municipality
- Fresh Water Report, Gariep Urban Development, IKheis Municipality
- Fresh Water Report, Bonathaba Farm Dam, Hermon
- Botanical Report, Sand Mine Greystone Trading, Vredendal
- Botanical Report Namakwa Klei Stene, Klawer
- Fresh Water Report Buffelsdrift Quarry, George
- Fresh Water Report Styerkraal Agricultural Development, Onseepkans.
- Technical Report Arabella Country Estate Wastewater Treatment Works, Kleinmond
- Fresh Water Report Calvinia Bulk Water Supply
- Fresh Water Report Swartdam Farm Dams, Riebeeck Kasteel
- Fresh Water Report Erf 46959, Gordon's Bay
- Fresh Water Report Melkboom Farm Dam, Trawal
- Stormwater Management Plan, Bot River Bricks
- Freshwater Report, Bot River Bricks
- Freshwater Report Sanddrif Farm, Joubertina
- Freshwater Report Zouterivier Cell phone tower, Atlantis
- Biodiversity Report Birdfield Sandmine, Klawer
- Freshwater Report New Wave Dam, Klawer
- Freshwater Report Harvard Solar Energy Plant, Bloemfontein
- Freshwater Report Doorn River Solar Energy Plant, Virginia
- Freshwater Report Kleingeluk Farm, De Rust
- Freshwater Report, Solar Energy Plant, Klein Brak River
- Site Verification Report Laaiplek Desalination Plant
- Freshwater Report, CA Bruwer Quarry, Kakamas
- Freshwater Report, Orren Managanese Mine, Swellendam
- Wetland Delineation, Klipheuvel ZCC Solar Energy
- Freshwater Report Delville Park, George
- Freshwater Report Wolseley bulk water pipeline
- Freshwater Report Urban Settlement No.1 Pababello Upington
- Freshwater Report Urban Settlement No.2 Pababello Upington
- Freshwater Report Pringle Rock Distillery, Rooiels

- Freshwater Report De Kuilen Resort, Kamiesberg
- Wetland Delineation, Klipheuvel ZCC Solar Energy
- Freshwater Report Delville Park, George
- Freshwater Report ZCC Akkerboom electric vehicle charging station, Keimoes
- Freshwater Report ZCC Piketberg electric automobile charging station
- Freshwater Report ZCC electric truck charging station Piketberg
- Freshwater Report ZCC electric truck charging station Prince Albert Weg
- Freshwater Report Vleesbaai Wastewater Treatment Works
- Freshwater Report ZCC Brandvlei electric vehicle charging station.
- Site Sensitivity Report desalination plant Velddrif
- Technical Report desalination plant Velddrif

25 Appendix

25.1 Methodology used in determining significance of impacts.

The methodology to be used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives is provided in the following tables:

Table 25.1.1 Nature and type of impact

Nature and type of impact	Description
Positive	An impact that is considered to represent an improvement to the baseline conditions or represents a positive change
Negative	An impact that is considered to represent an adverse change from the baseline or introduces a new negative factor
Direct	Impacts that result from the direct interaction between a planned project activity and the receiving environment / receptors
Indirect	Impacts that result from other activities that could take place as a consequence of the project (e.g. an influx of work seekers)
Cumulative	Impacts that act together with other impacts (including those from concurrent or planned future activities) to affect the same resources and / or receptors as the project

Table 25.1.2 Criteria for the assessment of impacts

Criteria	Rating	Description
Spatial extent of impact	National	Impacts that affect nationally important environmental resources or affect an area that is nationally important or have macro-economic consequences
	Regional	Impacts that affect regionally important environmental resources or are experienced on a regional scale as determined by administrative boundaries or habitat type / ecosystems
	Local	Within 2 km of the site
	Site specific	On site or within 100m of the site boundary
Consequence of impact/ Magnitude/ Severity	High	Natural and / or social functions and / or processes are severely altered
	Medium	Natural and / or social functions and / or processes are notably altered
	Low	Natural and / or social functions and / or processes are slightly altered
	Very Low	Natural and / or social functions and / or processes are negligibly altered
	Zero	Natural and / or social functions and / or processes remain unaltered
Duration of impact	Temporary	Impacts of short duration and /or occasional
	Short term	During the construction period
	Medium term	During part or all of the operational phase
	Long term	Beyond the operational phase, but not permanently
	Permanent	Mitigation will not occur in such a way or in such a time span that the impact can be considered transient (irreversible)

Table 25.1.3 Significance Rating

Significance Rating	Description
High	High consequence with a regional extent and long-term duration High consequence with either a regional extent and medium-term duration or a local extent and long-term duration Medium consequence with a regional extent and a long-term duration
Medium	High with a local extent and medium-term duration High consequence with a regional extent and short-term duration or a site-specific extent and long-term duration High consequence with either local extent and short-term duration or a site-specific extent with a medium-term duration Medium consequence with any combination of extent and duration except site-specific and short-term or regional and long term Low consequence with a regional extent and long-term duration
Low	High consequence with a site-specific extent and short-term duration Medium consequence with a site-specific extent and short-term duration Low consequence with any combination of extent and duration except site-specific and short-term Very low consequence with a regional extent and long-term duration
Very low	Low consequence with a site-specific extent and short-term duration Very low consequence with any combination of extent and duration except regional and long term
Neutral	Zero consequence with any combination of extent and duration

Table 25.1.4 Probability, confidence, reversibility and irreplaceability

Criteria	Rating	Description
Probability	Definite	>90% likelihood of the impact occurring
	Probable	70 – 90% likelihood of the impact occurring
	Possible	40 – 70% likelihood of the impact occurring
	Unlikely	<40% likelihood of the impact occurring
Confidence	Certain	Wealth of information on and sound understanding of the environmental factors potentially affecting the impact
	Sure	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact
	Unsure	Limited useful information on and understanding of the environmental factors potentially influencing this impact
Reversibility	Reversible	The impact is reversible within 2 years after the cause or stress is removed
	Irreversible	The activity will lead to an impact that is in all practical terms permanent
Irreplaceability	Replaceable	The resources lost can be replaced to a certain degree
	Irreplaceable	The activity will lead to a permanent loss of resources.

25.2 Risk Matrix Methodology

RISK ASSESSMENT KEY (Referenced from DWA RISK-BASED WATER USE AUTHORISATION APPROACH AND DELEGATION GUIDELINES)

Negative Rating

TABLE 1- SEVERITY

How severe does the aspects impact on the environment and resource quality characterisitics (flow regime, water quality, geomorfology, biota, habitat)

Insignificant / non-harmful	1
Small / potentially harmful	2
Significant / slightly harmful	3
Great / harmful	4
Disastrous / extremely harmful and/or wetland(s) involved	5
Where "or wetland(s) are involved" it means	

TABLE 2 – SPATIAL SCALE

How big is the area that the aspect is impacting on?

Area specific (at impact site)	1
Whole site (entire surface right)	2
Regional / neighbouring areas (downstream within quaternary catch	3
National (impacting beyond seconday catchment or provinces)	4
Global (impacting beyond SA boundary)	5

TABLE 3 – DURATION

How long does the aspect impact on the environment and resource quality?

One day to one month, PES, EIS and/or REC not impacted
One month to one year, PES, EIS and/or REC impacted but no change in status
One year to 10 years, PES, EIS and/or REC impacted to a lower status but can be improved over this period through mitigation
Life of the activity, PES, EIS and/or REC permanently lowered
More than life of the organisation/facility, PES and EIS scores, a E or F

TABLE 4 – FREQUENCY OF THE ACTIVITY

How often do you do the specific activity?

Annually or less	1
6 monthly	2
Monthly	3
Weekly	4
Daily	5

TABLE 5 – FREQUENCY OF THE INCIDENT/IMPACT

How often does the activity impact on the environment?

Almost never / almost impossible / >20%	1
Very seldom / highly unlikely / >40%	2
Infrequent / unlikely / seldom / >60%	3
Often / regularly / likely / possible / >80%	4
Daily / highly likely / definitely / >100%	5

TABLE 6 – LEGAL ISSUES

How is the activity governed by legislation?

No legislation
Fully covered by legislation (wetlands are legally governed)
Located within the regulated areas

TABLE 7 – DETECTION	
How quickly can the impacts/risks of the activity be observed on the environment (water resourc	
Immediately	
Without much effort	
Need some effort	
Remote and difficult to observe	
Covered	

TABLE 8: RATING CLASSES		
RATING	**CLASS**	**MANAGEMENT DESCRIPTION**
1 – 55	(L) Low Risk	Acceptable as is or consider requirement for mitigation. Impact to watercourses and resource quality small and easily mitigated. Wetlands may be excluded.
56 – 169	M) Moderate Risk	Risk and impact on watercourses are notably and require mitigation measures on a higher level, which costs more and
170 – 300	(H) High Risk	Always involves wetlands. Watercourse(s) impacts by the activity are such that they impose a long-term threat on a large scale
A low risk class must be obtained for all activities to be considered for a GA		

TABLE 9: CALCULATIONS

Consequence = Severity + Spatial Scale + Duration
Likelihood=Frequency of Activity + Frequency of Incident +Legal Issues + Detection
Significance \Risk= Consequence X Likelihood

Table 25.3 Numerical Significance

Table 25.3.1 Conservation Value

Conservation Value		
Refers to the intrinsic value of the area or its relative importance towards the conservation of an ecosystem or species or even natural aesthetics. Conservation status is based on habitat function, its vulnerability to loss and fragmentation or its value in terms of the protection of habitat or species	Low 1	The area is transformed, degraded not sensitive (e.g. Least threatened), with unlikely possibility of species loss.
	Medium / Low 2	The area is in good condition but not sensitive (e.g. Least threatened), with unlikely possibility of species loss.
	Medium 3	The area is in good condition, considered vulnerable (threatened), or falls within an ecological support area or a critical biodiversity area, but with unlikely possibility of species loss.
	Medium / High 4	The area is considered endangered or, falls within an ecological support area or a critical biodiversity area, or provides core habitat for endemic or rare & endangered species.
	High 5	The area is considered critically endangered or is part of a proclaimed provincial or national protected area.

Significance	Score	Description
Insignificant	4 - 22	There is no impact or the impact is insignificant in scale or magnitude as a result of low sensitivity to change or low intrinsic value of the site.
Low	23 - 36	An impact barely noticeable in scale or magnitude as a result of low sensitivity to change or low intrinsic value of the site, or will be of very short-term or is unlikely to occur. Impact is unlikely to have any real effect and no or little mitigation is required.
Medium / Low	37 - 45	Impact is of a low order and therefore likely to have little real effect. Mitigation is either easily achieved. Impacts may have medium to short term effects on the natural environment within site boundaries.
Medium	46 - 55	Impact is real, but not substantial. Mitigation is both feasible and fairly easily possible, but may require modification of the project design or layout. These impacts will usually result in medium to long term effect on the natural environment, within site boundary.
Medium High	56 - 63	Impact is real, substantial and undesirable, but mitigation is feasible. Modification of the project design or layout may be required. These impacts will usually result in medium to long-term effect on the natural environment, beyond site boundary within local area.
High	64 - 79	An impact of high order. Mitigation is difficult, expensive, time-consuming or some combination of these. These impacts will usually result in long-term change to the natural environment, beyond site boundaries, regional or widespread.
Unacceptable	80 - 100	An impact of the highest order possible. There is no possible mitigation that could offset the impact. The impact will result in permanent change. Very often these impacts cannot be mitigated and usually result in very severe effects, beyond site boundaries, national or international.

Table 25.3.2 Significance

Table 25.3.3 Scoring system

Parameter	1	2	3	4	5
Conservation value Likelihood Duration Extent Severity	Low Unlikely Temporary Site specific Zero	Medium /Low Possible Short term Local Very low	Medium More possible Medium term Regional Low	Medium / High Probable Long term National Medium	High Definite Permanent International High

Significance = Conservation value (Likelihood + Duration + Extent + Severity)