

BASIC ASSESSMENT REPORT (BAR) SUMMARY

Prince Albert Municipality: The proposed upgrade of the Klaarstroom Oxidation Pond Wastewater Treatment System,

**RE Portion 32 & RE Portion 34 of Farm Klaarstroom
178, Prince Albert, Western Cape**



February 2019

P.O.Box 5367

HELDERBERG 7135
Tel: (021) 851 1616
Fax: (086) 512 0154

e-mail: admin@enviroafrica.co.za

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

DETAILS OF THE APPLICANT

Applicant / Organisation / Organ of State:	Prince Albert Municipality		
Contact person:	Jannie Neethling (Acting Municipal Manager)		
Postal address:	Private Bag X53 Prince Albert		
Telephone:	023 5411 320	Postal Code:	6930
Cellular:		Fax:	()
E-mail:	jneethling@pamun.gov.za		

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER ("EAP")

Name of the EAP organisation:	EnviroAfrica cc		
Person who compiled this Report:	Inge Erasmus/Bernard De Witt		
EAP Reg. No.:			
Contact Person (if not author):	Inge Erasmus		
Postal address:	P. O. Box 5367		
Telephone:	(021) 8511616	Postal Code:	7446
Cellular:	0834170800	Fax:	086 512 0154
E-mail:	inge@enviroafrica.co.za admin@enviroafrica.co.za		
EAP Qualifications:	<u>Inge Erasmus</u> : BA Hons - Geography & Environmental Studies <u>Bernard de Witt</u> : B.Sc. Forestry (Stellenbosch); B.A. (Hons) Public Administration (Stellenbosch); National Diploma in Parks and Recreation Management; EIA Short course (UCT); ISO 14001 Auditors course (SABS)		

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PROJECT INFORMATION

1. ACTIVITY LOCATION

Location of all proposed sites:	Remainder of Portion 32 of Farm Klaarstroom 178, Prince Albert, Western Cape Remainder of Portion 34 of Farm Klaarstroom 178, Prince Albert, Western Cape
Farm / Erf name(s) and number(s) (including Portions thereof) for each proposed site:	Remainder of Portion 32 of Farm Klaarstroom 178, Prince Albert, Western Cape Remainder of Portion 34 of Farm Klaarstroom 178, Prince Albert, Western Cape
Property size(s) in m ² for each proposed site:	242.09 ha (RE 32 Farm Klaarstroom 178) 3.66 ha (RE 34 Farm Klaarstroom 178)
Development footprint size(s) in m ² :	Current Footprint: ±4446.83m ² Footprint after the upgrade: ±9510m ² Total area of new land required: ±5064
Surveyor General (SG) 21 digit code for each proposed site:	C0610000000017800032 C0610000000017800034

2. PROJECT DESCRIPTION

The following information was taken from the Bvi Technical Report from **Appendix D**.

The village of Klaarstroom is located south of the N12 National Road and the existing wastewater treatment plant is located north of the N12. All wastewater from the village is pumped to the wastewater treatment plant.

The village of Klaarstroom is fairly well serviced in terms of water, sewage, electricity and roads. The wastewater is collected at a central pump station in the village and then pumped through a 100mm diameter rising main over a distance of 800m to the wastewater treatment plant.

The current disposal of effluent takes place by means of overhead sprinklers discharging the treated effluent onto the veld north of the existing treatment plant. Any drainage from this area will eventually end up in the Groot River south of Klaarstroom.

Existing Infrastructure:

The existing wastewater treatment plant comprises of only two ponds. The first pond is an anaerobic pond followed by a single facultative pond from where the final effluent is discharged onto the ground. The design capacity of the pond system is given as 50m³/day and it was constructed in 1970. Records indicate a measured peak daily flow of 80 m³/day which is approximately 60% higher than the current design capacity.

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According to an analysis of the treated effluent dated August 2015 the current effluent is non-compliant with all important parameters. The total suspended solids on the final effluent is very high at 88mg/l and far exceeds the allowable minimum of 25mg/l. the COD and Ammonia levels are much higher than the allowable limits. The existing Klaarstroom WWTP is both hydraulically (flow) and organically (chemical load) overloaded.

BVi Consulting Engineers' brief was to provide a proposal for the upgrade of the oxidation pond system to increase the capacity and improve the quality of the Final Effluent. The current plant has a footprint of approximately 85m x 70m = 5950m².



Figure 1: Layout of Existing Waste Water Treatment Works (BVi Technical Report)

The existing system has a design capacity of 50m³ per day. The final effluent is currently chlorinated and then irrigated in the veld north of the plant by means of two overhead sprinklers. It is proposed that the current capacity of the Klaarstroom WWTP be upgraded to a new capacity of 61m³ per day (11m³/day expansion).

Given the existing layout of the plant, it is proposed that the existing plant be converted to a system comprising an inlet works, due anaerobic ponds, dual aerobic ponds, and a reed bed.



Figure 2: Proposed layout of refurbishment and improvement works of Klaarstroom WWTW (BVI Technical Report)

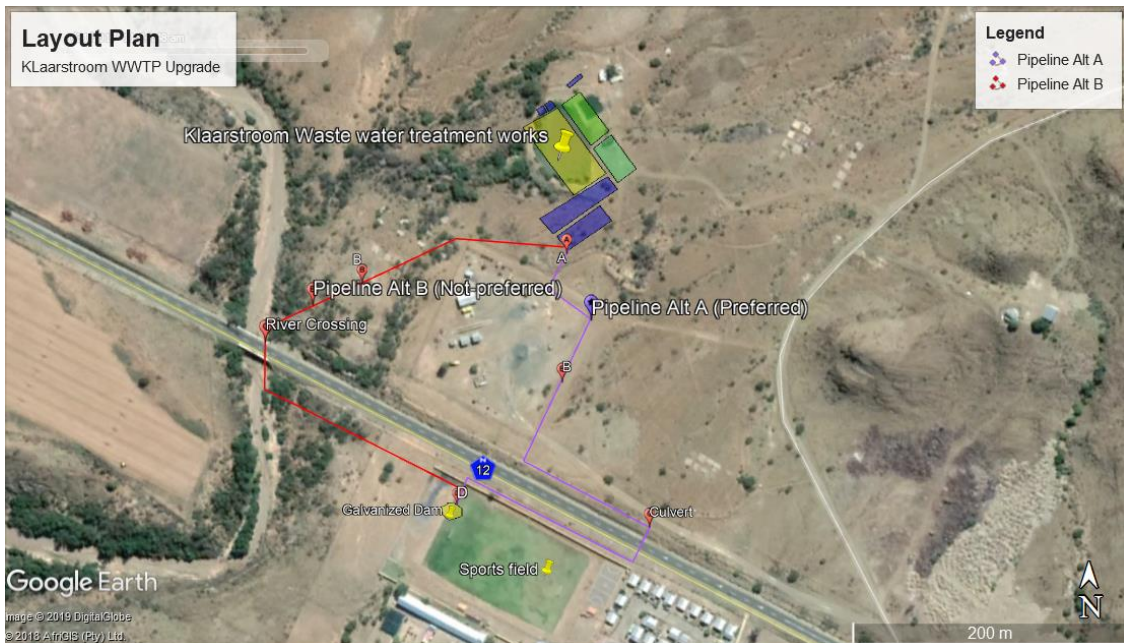


Figure 3: Layout Plan for proposed pipeline routes (Alternative A – preferred, Alternative B – not preferred)

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Proposed works:

1. The Inlet works will be rebuilt and comprise of a hand-raked screen in a channel, approximately 0.5m x 2m x 1m deep, followed by dual grit removal channels with approximate dimensions of 0.3m x 5m x 1m deep, followed by a Parshall measuring flume with dimensions of 0.3m x 0.7m x 1m deep. The flume outlet will drop off into a concrete chamber approximately 0.1 m x 0.1m. From this box, a 160mm diameter 25m gravity sewer will feed the Anaerobic ponds.

Approx. footprint for inlet works are: 25m²

2. The depth of the current single anaerobic pond is unknown and probably competently filled with sludge. It is proposed that two new anaerobic ponds are constructed. The anaerobic ponds are suggested to have a combined retention period of 24hours which should be sufficient to break down the organic fraction of the waste water by at least 50%.

Dimensions for each new anaerobic pond is proposed to be 5.5m x 5.5m x 3.5m depth.

Approx. footprint for both anaerobic ponds are: 60.5m² or 211.75m³.

3. The existing anaerobic pond is to be modified and reshaped to create a new secondary aerobic pond with dimensions of 38m x 15m x 100m deep
4. A second aerobic pond of 38m x 15m x 100m deep is proposed. Each of the secondary ponds to provide a retention period of 5.5day or a total of 11 days.

Approx. footprint for both aerobic ponds are: 1140 m² or 1140 000 m³

5. The existing facultative pond (large pond) to be refurbished and reshaped to encourage plug flow. Proposed final dimensions: 58m x 30m x 1.2 m deep. A total retention of 25 days is provided for.

Approx. footprint for the facultative pond is: 1740 m² or 2088 m³.

6. Construction of a single horizontal reed bed for polishing of the final effluent and to facilitate denitrification Proposed dimensions: 60m x 20m x 0.6m deep

Approx. footprint of the reed bed is: 1200 m² or 720 m³

7. Construction of a storage pond with a capacity to store at least 7 days of flow. Proposed dimensions include: 40m x 20m x 1.5m deep.

Approx. footprint of the storage pond is: 800 m² or 1200 m³

8. The final effluent is to be utilized for irrigation of sports fields in Klaarstroom village. This will be made possible by using a gravity system as the waste water treatment plant is located at a higher elevation than the village. It is proposed to construct a 160mm ø uPVC pipeline of 300m in length from the effluent storage point which will terminate in a new galvanized dam at the sports field.

There are currently two proposed routes for the for this pipeline. Please refer to the layout maps, Appendix A and Figure 3 above.

The preferred alternative is the purple line (Alternative A). this route will cross the N12 national road for which a wayleave from SANRAL is pending. The Water Resources map (Appendix C) from Cape Farm Mapper indicate that the proposed pipeline route will cross a small section of a non-perennial river.

The other alternative is the red line (Alternative B) which will cross the N12 under the bridge and runs parallel to the Grootrivier. The Water Resources map (Appendix C) from Cape Farm Mapper indicates that this proposed route will cross the Groot River and is therefore not proposed. Land owner consent from will also need to be obtained as pipeline Alternative B will cross private land.

9. The proposed galvanized (farm-type) dam will have dimensions of 6m diameter x 1.8m high. It is proposed the dam be lined with a polypropylene sheet and covered with a roof.
10. A small pump station (2m²) will be provided at the dam to provide a flow of 4.5l/s at a head of 3.5bar feeding a crawling irrigator which will be used to irrigate the sports field.
11. A chip doser for the dosing of a calcium hypochlorite solution into the circular dam will be provided to disinfect the final effluent prior to irrigation to avoid any pathogens from remaining in the irrigation water.

The proposed pipeline from the effluent storage pond to the proposed galvanized dam at the sports field will be approximately 500m long with a diameter of 160mm. The pipeline route will have a construction footprint of minimum 500m².

The current plant has a footprint of approximately 4446.83m²

The total area of the plant on completion of the proposed upgrade will be approximately 9510 m²

Thus, a new area of approximately 5064m² will need to be cleared for the upgrade.

Please refer to Appendix A for Locality maps and proposed layout plans as well as Appendix B for design drawings.

Environmental considerations:

From the Vegetation Map on Cape Farm Mapper (**Appendix C**) vegetation that would have been present on site is Prince Albert Succulent Karoo vegetation. This type of vegetation does not fall under the *National Environmental Management: Biodiversity Act 2004, National List of Ecosystems that are threatened and in need of protection (NEMBA)*. From google images vegetation on the site is sparse.

The Biodiversity Overlay Map from Cape Farm Mapper (**Appendix C**) indicate that the existing WWTW does fall within a CBA and ESA2. Input from the Biodiversity Specialist still required.

From the Water Resources Map on Cape Farm Mapper (**Appendix C**) a non-perennial river/ drainage line runs through the site. No wetlands present on site. The preferred pipeline route (Alternative A) will cross a non-perennial river.

The following information was taken from the Freshwater report (**Appendix E**).

The existing WWTP straddles a drainage line, although the drainage line is very faint. Refer Figure 4 below. The upgrade of the works will thus occur within this drainage line. The freshwater report states that during a very high rainfall event, the flow of water can be expected to be fast, with a high erosion potential evident from the deeply incised Groot Rivier and most drainage lines. The drainage line is separated from the next drainage line towards the east with a low ridge. The next drainage line is emphasised and clear.

The Water resources map from Cape farm mapper indicates that proposed pipeline route Alternative A (preferred alternative) will intersect a non-perennial river/ drainage line. However, according to the freshwater report this drainage line was not observed during the site visit on 23 January 2019. The report states that the ground is very level, leaving uncertainty to where the storm water flows. Instead of the drainage line, a culvert (refer to Figure 5 & Figure 5) was observed under the N12 for letting stormwater through that might have accumulated against the northern shoulder of the road. It is proposed that the pipeline (Alternative A – preferred alternative) cross the N12 through this culvert towards the proposed galvanized storage dam. swale with a hard surface stretches from the culvert to the south into the Klaarstroom township (Figure 6). This is part of the storm water system that releases its water into the Groot River south of the township.

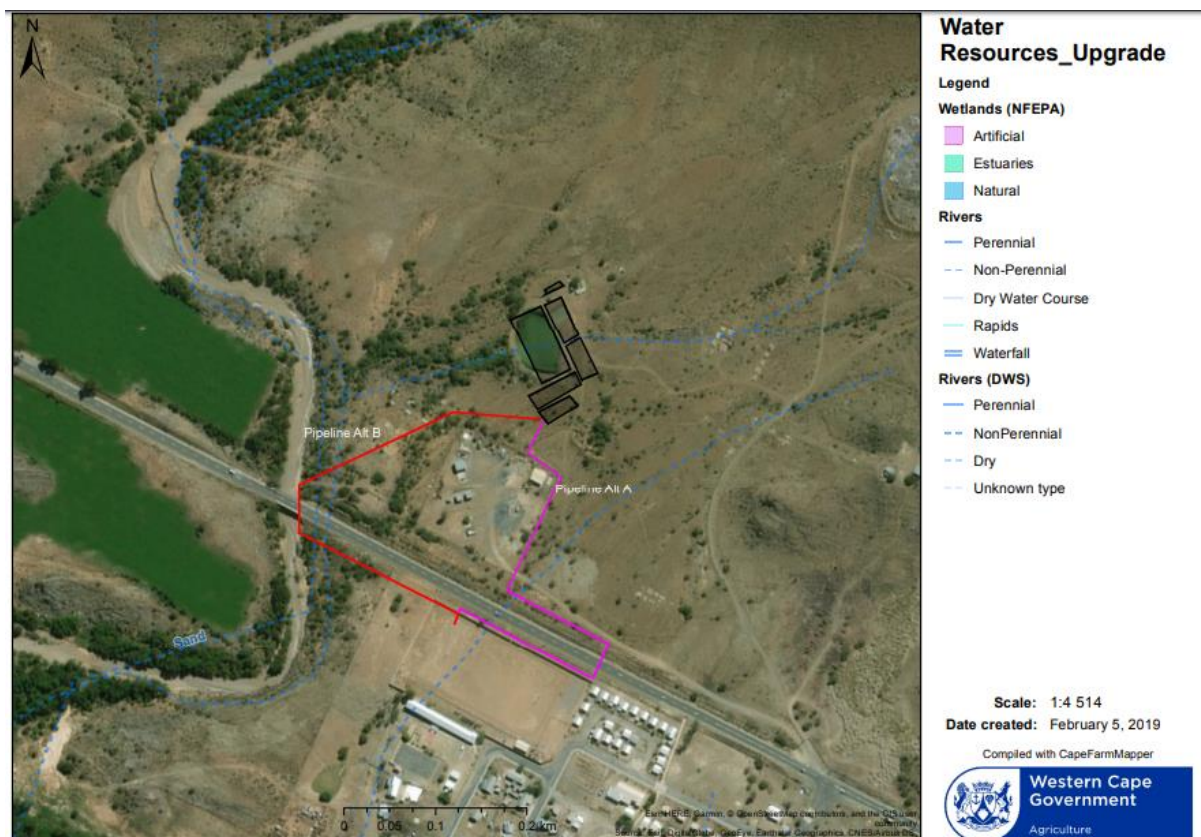


Figure 4: Water Resources Map indicating the proposed layout if the WWTP upgrade as well as pipeline alternatives (Cape Farm Mapper, 2019)

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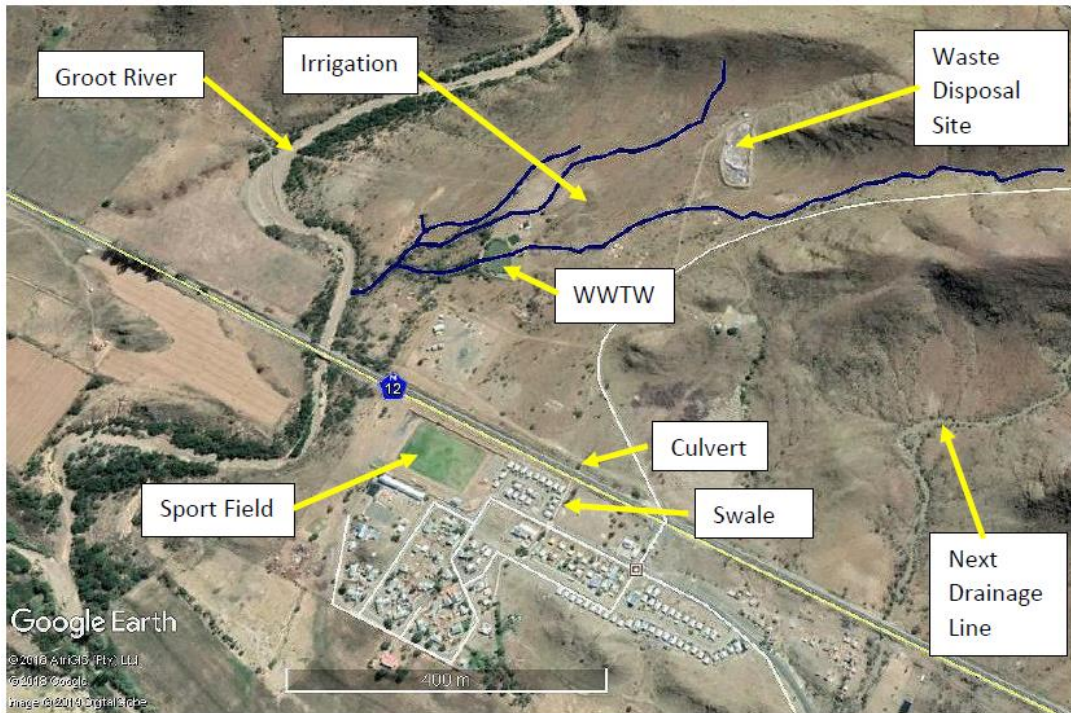


Figure 5: Drainage line (Freshwater Report, WATSAN 2019)



Figure 6: Culvert (Freshwater Report, WATSAN 2019)

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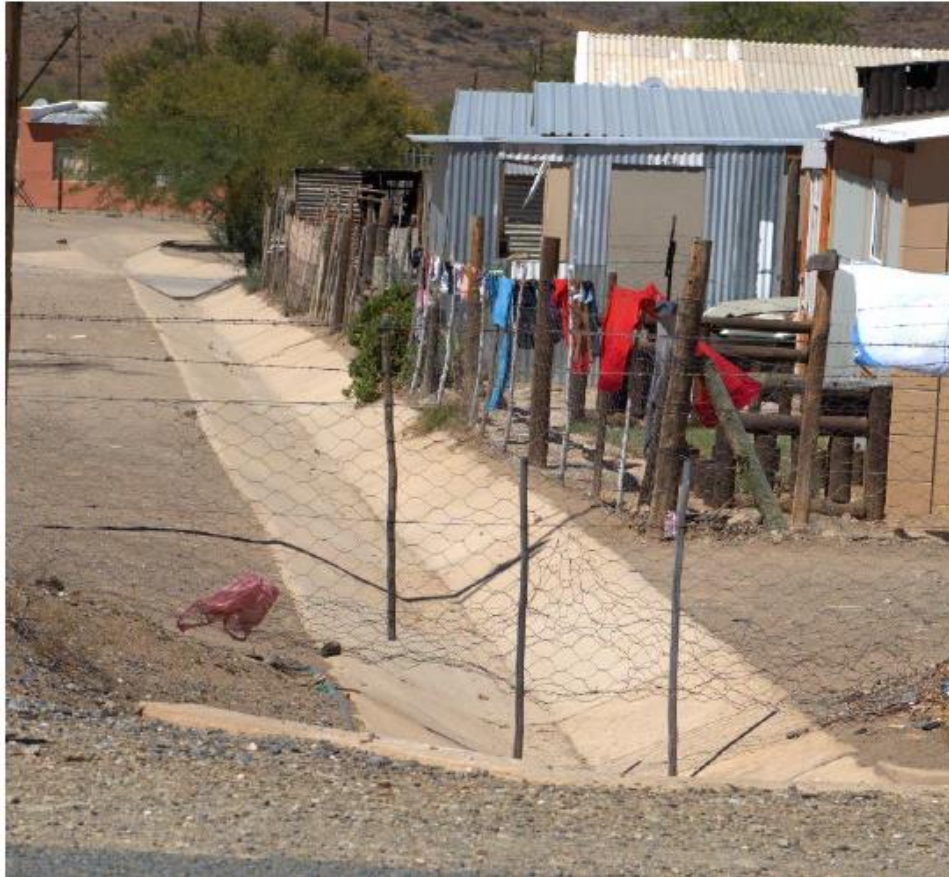


Figure 7: Swale (Freshwater Report, WTASAN 2019)

LISTED ACTIVITIES TRIGGERED AND BEING APPLIED FOR.

EIA Regulations Listing Notices 1 and 3 of 2014 (as amended):

Listed Activity No(s):	Describe the relevant Basic Assessment Activity(ies) in writing as per Listing Notice 1 (GN No. R. 983)	Describe the portion of the development that relates to the applicable listed activity as per the project description.	Identify if the activity is development / development and operational / decommissioning / expansion / expansion and operational.
19	The infilling 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.	The existing WWTW intersects non-perennial streams/ drainage lines. The upgrade of the works will allow the removal of more than 10m ³ of sand and soil in a watercourse	Expansion
48	The expansion of- (i) infrastructure where the physical footprint is expanded by 100m ² or more; where such expansion occurs – (a) within a watercourse	The existing WWTW intersect non-perennial streams/ drainage lines. With the upgrade of the works the footprint will be expanded by more than 100m ² within a watercourse.	Expansion

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Listed Activity No(s):	Describe the relevant Basic Assessment Activity(ies) in writing as per Listing Notice 3 (GN No. R. 985)	Describe the portion of the development that relates to the applicable listed activity as per the project description.	Identify if the activity is development / development and operational / decommissioning / expansion / expansion and operational.
3	The clearance of an area of 300m ² or more of indigenous vegetation (ii) within a CBA	The existing WWTW falls within a CBA. The upgrade of the works more than 300m ² vegetation within a CBA will be disturbed.	Expansion

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