PB CONSULT
ENVIRONMENTAL MANAGEMENT SERVICES

DEA&DP Ref: 16/3/3/1/C2/3/0008/19
NEAS Ref: WCP/EIA/0000621/2019

Date of issue: 25/11/2019

DEA&DP Case Officer: Ms Jessica Christie

UPGRADE OF THE KLAARSTROOM OXIDATION POND WASTE WATER TREATMENT SYSTEM

on the Remainders of Portions 32 & 34 of the farm Klaarstroom no. 178

PRINCE ALBERT LOCAL MUNICIPALITY, WESTERN CAPE

NEMA COMPLIANCE AUDIT REPORT

Required in terms of Condition 14 of the Environmental Authorization,

DATE: 25 OCTOBER 2021

P.J.J. Botes (Pr.Sci.Nat: 400184/05)

Registered Professional Botanical, Environmental and Ecological Scientist

22 Buitekant Street
Bredasdorp
7280

Cell: 082 921 5949
Fax: 086 611 0726
Email: peet@pbconsult.co.za

EXECUTIVE SUMMARY

ENVIRONMENTAL AUTHORIZATION(S)

The original Environmental Authorization was granted in terms of the National Environmental Management Act, 1998 (Act. 107 of 1998) and the Environmental Impact Assessment Regulations 2014 (as amended). Environmental authorization was granted as described in the Final Basic Assessment Report (BAR), dated 25 July 2019.

DEA&DP Ref: **16/3/3/1/C2/3/0008/19**
NEAS Ref: **WCP/EIA/0000621/2019**
Date of issue: **25/11/2019**

IMPORTANT DATES

- Commencement date: 24 January 2020.
- Completion date: 28 September 2021 (Please note that construction, for all practical implications, had been completed on the 30th of July 2020, apart from the Horizontal Flow Reed Bed (reeds that still needed to be planted, without which it will not function correctly). The reeds could not be planted before the growth media in the reed bed is fully saturated and the daily temperatures begin to increase again. This has now been completed.

COMPLIANCE TO CONDITIONS OF THE EA

According to the information received and the observations made during the compliance site visit, no significant non-compliances were observed (Refer to Table 2). In fact, the site seems to have been well managed with good environmental control. The footprint seems to have been managed with great care. The surrounding areas were not impacted. As a result, minimal rehabilitation was needed. Erosion and pollution prevention measures had been installed, which included a berm to re-direct water from an intermittent stream away from the WWTW.

Partial Non-compliance: One of the sub-conditions of Condition 8, states all ECO monthly compliance reports must be submitted to the Directorate on a monthly basis. ECO monthly reports were done and submitted to the Engineer as well as the contractor and discussed during monthly progress meetings (as per standard practice). According to the ECO these reports might not have been submitted to DEA&DP on a monthly basis (which overlaps the first COVID Lockdown area). Standard practice by EnviroAfrica is submit monthly reports to the Consulting Engineer and Contractor and discuss the findings on-site and during the monthly meetings. According to the ECO all ECO Reports were managed in this way and was then available to anybody on request (Refer to Appendix 6).

Proposed corrective action: Copies of all the ECO reports should be submitted to the Competent Authority. As a result, copies of all reports are attached as Appendix 6 to this report

COMPLIANCE WITH THE EMP

Compliance to the EMP (refer to Heading 4 of this report) was was evaluated through the ECO reports and other correspondence between the ECO, BVi Engineers and the main contractor. The construction footprint and construction site (after rehabilitation) were used as reference to evaluate the success of the environmental control. All major construction activities were completed at the time of the site visit for this audit, apart from a few engineering snag-list items and the planting of the reeds within the Horizontal Flow Reed Bed. The reeds could not be planted as treated effluent (needed to keep the reeds alive) had not yet reached these dams (the target date was for spring 2021). The reeds had now been planted and final completion achieved.

The construction footprint itself was relatively small and the layout largely overlapped or made use of the existing disturbance footprint (the old WWTW). Because of the relatively small and contained construction site, environmental control would have been relatively strait forward with the focus on footprint management (demarcation), management of the construction team (ensuring the implementation of the best environmental option) as well as waste-, pollution- and erosion management.

The EMP itself is well written and covers and incorporates the findings and mitigation measures prescribed by the specialist reports. It also seems to cover all reasonable environmental aspects that can be expected on a construction site of this size and type.

No significant non-compliance in terms of the requirements of the EMP had been observed. The ECO made a number of minor findings, which were resolved during the contract period.

POTENTIAL SHORTCOMINGS OF THE EMP

No obvious shortcomings or oversights were observed in the EMPr. It is considered well written and generally easy to use.

The only item not covered directly in the EMP was the management and disposal of sludge from the existing WWTW (although it might be covered under Heading 7.10.10 (Storing of hazardous substances), of the EMP. However, it was suitably managed through the method statement procedure.

AMENDMENTS TO THE EMP

No amendments to the EMP'r are considered necessary.

Although the EMP'r might be considered slightly generic, it is also a strong point, since it ensures that all potential construction activities are covered. Meaning that although all the aspects described in the EMP'r may not necessarily applicable on this specific project, any potential deviation or potential issue (e.g., blasting) are already covered and can be addressed by the ECO without further amendments.
However, future EMP's relating to upgrades of a WWTW might include the management of sludge and wastewater from the treatment works to be upgraded.

CLOSURE PLAN.

The ECO submitted a closure report (dated 8 December 2020), on completion of all significant construction related activities. A few engineering snag-list items (which mostly involve minor corrective actions) were still outstanding and the Horizontal Flow Reed Bed still needed to be planted with reeds (the planting of the reeds was delayed, as requested by the Engineer, to ensure successful establishment) [*The Engineer has requested that the planting of the reeds be delayed to overlap with their natural growing season. This will also provide time to fill the new oxidation ponds with wastewater. During 2020 the new WWTW was still only partially filled with effluent and the reeds could not be planted before the growth media in the reed bed is fully saturated and the daily temperatures begin to increase*.]

The site inspection done for this audit report confirms that rehabilitation work as well as site stabilization was completed. No significant shortcomings or non-conformities were observed. In fact, the site seems to have been well managed, especially with regards to footprint minimisation and re-instatement.

FINAL NOTES

The observations made during the site visit for this audit suggests that the site was well managed during construction. EnviroAfrica is known for implementing excellent rehabilitation practices and this seems to be the case on this project again. Both the ECO and Engineer should be commended for a neat and tidy terrain post-construction, which seems to have benefited from good control both in terms of environmental and engineering oversight.

COMPLIANCE WITH GN 982 (4 DECEMBER 2014)

REG	CONTENT OF ENVIRONMENTAL AUDIT REPORT	INCLUDED (YES / NO OR N/A)	REPORT REFERENCE
1.	An environmental audit report prepared in terms of the NEMA EIA Regulations (2014, as amended) must contain:		
(a)	(i) Details of the independent person who prepared the environmental audit report;	**Yes**	**Page v & vi**
	(ii) The expertise of independent person that compiled the environmental audit report;	**Yes**	**Page v & vi**
(b)	A declaration that the independent auditor is independent in a form as may be specified by the competent authority;	**Yes**	**Page v & vi**
I	An indication of the scope of, and the purpose for which, the environmental audit report was prepared;	**Yes**	**Par. 1.3**
(d)	A description of the methodology adopted in preparing the environmental audit report;	**Yes**	**Par. 2**
I	An indication of the ability of the EMPr, and where applicable, the closure plan to-		
	(i) sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an on-going basis;	**Yes**	**Par. 4 & 5**
	(ii) sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the closure of the facility; and	**Yes**	**Par. 6**
	(iii) ensure compliance with the provisions of environmental authorisation, EMPr, and where applicable, the closure plan;	**Yes**	**Par. 3, 3.1, 4 & 5**
(f)	A description of any assumptions made, and any uncertainties or gaps in knowledge;	**Yes**	**Par. 2.1**
(g)	A description of any consultation process that was undertaken during the course of carrying out the environmental audit report;	**Yes**	**Par. 2 & 2.1**
(j)	A summary and copies of any comments that were received during any consultation process; and	**N/a**	
(k)	Any information requested by the competent authority;	**N/a**	

INDEPENDENCE & CONDITIONS

PB Consult is an independent entity with no interest in the activity other than fair remuneration for services rendered. Remunerations for services are not linked to approval by decision making authorities and PB Consult have no interest in secondary or downstream development as a result of these services. There are no circumstances that compromise the objectivity of this report. The findings, results, observations and recommendations given in this report are based on the author's best scientific and professional knowledge and available information. PB Consult reserve the right to modify aspects of this report, including the recommendations if new information become available which may have a significant impact on the findings of this report.

RELEVANT QUALIFICATIONS & EXPERIENCE OF THE AUTHOR

Mr. Peet Botes holds a BSc. (Hons.) degree in Plant Ecology from the University of Stellenbosch (Nature Conservation III & IV as extra subjects). Since qualifying with his degree, he had worked for more than 20 years in the environmental management field, first (1997) at the Overberg Test Range (a Division of Denel) managing the environmental department of OTR and being responsible for developing and implementing an ISO14001 environmental management system, ensuring environmental compliance, performing environmental risk assessments with regards to missile tests and planning the management of the 26 000 ha of natural veld, working closely with CapeNature (De Hoop Nature Reserve).

In 2005 he joined Enviroscientific, an independent environmental consultancy specializing in wastewater management, botanical and biodiversity assessments, developing environmental management plans and strategies, environmental control work as well as doing environmental compliance audits and was also responsible for helping develop the biodiversity part of the Farming for the Future audit system implemented by Woolworths. During his time with Enviroscientific he performed more than 400 biodiversity en environmental legal compliance audits.

During 2010 he joined EnviroAfrica in order to move back to the biodiversity aspects of environmental management. Experience with EnviroAfrica includes NEMA EIA applications, environmental management plans for various industries, environmental compliance audits, environmental control work as well as more than 90 biodiversity & botanical specialist studies.

Towards the end of 2017, Mr Botes started his own small environmental consulting business focusing on biodiversity & botanical assessments, biodiversity management plans and environmental compliance audits.

Mr. Botes is a registered Professional Botanical, Environmental and Ecological Scientists at SACNASP (South African Council for Natural Scientific Professions) as required in terms of Section 18(1)(a) of the Natural Scientific Professions Act, 2003, since 2005.

DECLARATION OF INDEPENDENCE

THE INDEPENDENT PERSON WHO COMPILED THE COMPLIANCE AUDIT REPORT

I Petrus, Jacobus, Johannes Botes, 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, 2014, as amended, and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential 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, 2014 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2014 (specifically in terms of regulation 13 of GN No. R. 326) 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 in 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 was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all 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, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 13 of GN No. R. 326.

Note: The terms of reference must be attached.

Signature of the specialist:

PB Consult (Sole Proprietor)

Name of company:

25 October 2021

Date

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APPENDICES

1. INTRODUCTION

The existing WWTW was constructed during the 1970's with a design capacity of about 50m^3/day. It consists of only two ponds, an anaerobic pond followed by a single facultative pond from where the final effluent is discharged onto the ground. Current records show a peak daily flow of 80 m^3/day, which is approximately 60% higher than its design capacity. Chemical analysis shows that the existing WWTW is hydraulically (flow) and organically (chemical load) overloaded and that quality of the treated effluent does not meet the required standards (in almost all aspects). Bvi Consulting Engineers was appointed to evaluate the WWTW and to propose suitable upgrades that will increase the capacity and ensure that final effluent meet the required standards.

This project involved upgrades to the exiting Klaarstroom Wastewater Treatment Works (WWTW) on Remainder of Portion 32 of Farm Klaarstroom 178, Prince Albert, Western Cape in order to increase the capacity and improve the quality of the Final Effluent. The Final Effluent will be used for irrigation of the sport grounds at Klaarstroom village. A connection pipeline was constructed from the WWTP ponds to a new galvanized dam at the sports field on Remainder of Portion 34 of Farm Klaarstroom 178, Prince Albert to facilitate the irrigation of the sport grounds through an overhead sprinkler system.

Environmental approval (EA) for the project was granted in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and the Environmental Impact Assessment (EIA) regulations 2014, to undertake the listed activities specified in section B of the EA for the preferred alternative as described in the Final Basic Assessment Report (FBAR) submitted by EnviroAfrica CC (dated October 2019).

Since construction was completed (but for engineering snag list items) at the time when the site visit was done the physical audit could only evaluate the construction site in terms of the final product, the disturbance footprint and rehabilitation done. Assessment of the environmental control and the implementation of the EMP during construction relied on the ECO reports.

The WWTW is located to the northeast of Klaarstroom within the urban edge. The area that was impacted by the proposed WWTW upgrade and pipeline is very small. The existing WWTW footprint was described as transformed and the additional footprint was only about 5 000 m^2. The installation of the pipeline had a temporary impact on between 500- 800 m of veld, most of which overlapped areas already disturbed or transformed (within the urban edge) and was chosen to minimise impact on remaining natural veld and water sources.

1.1 THE APPLICANT

The Municipal Manager

Prince Albert Municipality

1.2 PROJECT TEAM

Consulting Engineers:	Bvi Consulting Engineers
Contractor:	De Jagers Loodgieter Kontrakteurs
ECO	EnviroAfrica

1.3 ENVIRONMENTAL AUDIT

This compliance audit is required in terms of conditions 14 of the Environmental Authorization (EA) for this project, which states that the holder of the authorization must ensure that compliance with the conditions of the EA and the EMP is audited and that a final Environmental Audit Report is submitted within (3) months of

the completion of the expansion activities (construction period) and the post construction rehabilitation and monitoring requirements.

This report is applicable to both the completion of the construction- and the rehabilitation activities (as they were completed simultaneously).

1.3.1 Scope of the audit

This audit report aims to evaluate the construction activity in terms of compliance with the conditions of the Environmental Authorization (EA) and the Environmental Management Plan (EMP) and to conform to the requirements of the NEMA EIA regulations 2014 (as amended), GN 326, 7 April 2017, Appendix 7, for Environmental Audit Reports.

PB Consult was commissioned to undertake the compliance audit. The environmental audit report will be submitted to the DEA&DP for comments, and all interested and affected parties will be notified of the submission of the report.

1.3.2 Objectives of the audit

The objective of the environmental audit report (in terms of GN 326, 7 April 2017) is to:

- Report on:
    a. The level of compliance with the conditions of the environmental authorization and the EMP'r, and where applicable, the closure plan; and
    b. The extent to which the avoidance, management and mitigation measures provided for in the EMP'r, and where applicable the closure plan, achieve the objective and outcomes of the EMP'r, and closure plan.
- Identify and assess any new impacts and risks as a result of undertaking the activity;
- Evaluate the effectiveness of the EMP'r, and where applicable the closure plan;
- Identify shortcomings in the EMP'r, and where applicable the closure plan; and
- Identify the need for any changes to the avoidance, management and mitigation measures provided for in the EMP'r, and where applicable, the closure plan.

1.4 SITE LOCATION

The Klaarstroom WWTW is located on Remainder of Portion of the Farm Klaarstroom No. 178 (Re/32/178), Prince Albert, on the municipal commonage land. The land will be fenced. The new galvanized storage dam (for irrigation of the Klaarstroom Primary School sport grounds) is located within these sport grounds on the Remainder of Portion 34 of the Farm No. 178 (Re/34/178), Prince Albert. Full details and co-ordinates are given under section C of the EA (Appendix 1).

1.5 PROJECT DESCRIPTION

The project is described in full detail within the EMP. A short summary is given in this report.

The original WWTW was constructed during the 1970's with a design capacity of about 50m^3/day. It consists of only two ponds, an anaerobic pond followed by a single facultative pond from where the final effluent is discharged onto the ground. Records show that current a peak daily flow is about 60% higher than its design capacity. Chemical analysis also shows that the existing WWTW is overloaded, and that quality of the treated effluent does not meet the required standards (in almost all aspects).

1.5.1 Construction activities associated with the upgrades

Again, a full description is given in the EMP, including details of the infrastructure. A short summary is given underneath.

1. **Inlet works**: The small inlet works was re-constructed to comprise of a hand-raked screen, followed by dual grit removal channels, followed by a Parshall measuring flume. Effluent from the flume outlet drops into a concrete chamber from where it gravitates to one of two anaerobic ponds.
2. **Anaerobic ponds**: Two new anaerobic ponds were constructed (approximately 5.5m x 5.5m x 3.5 m deep). One of which replaced the old anaerobic pond.
3. **Aerobic ponds**: Two new aerobic ponds were constructed with a combined footprint of approximately 1 140 m^2. One of which replaced the old aerobic pond.
4. **Refurbishment of the Facultative Pond**: The Facultative Pond was refurbished and reshaped to encourage plug flow. Final dimensions (approximately): 58m x 30m x1.2 m deep.
5. **Horizontal Flow Reed Bed**: A Horizontal Flow Reed Bed (60m x 20m x 0.6m deep) was constructed to polishing the final effluent and to facilitate de-nitrification.
6. **Final effluent storage pond**: A Final Effluent Storage Pond (40m x 20m x 1.5m deep) was constructed.
7. **Connecting pipeline**: A 160 mm Ø uPVC gravity feed pipeline was installed from the WWTW to the new dam at the sport grounds to facilitate irrigation of the sport fields.

Figure 1: The general location and layout of the Klaarstroom WWTW

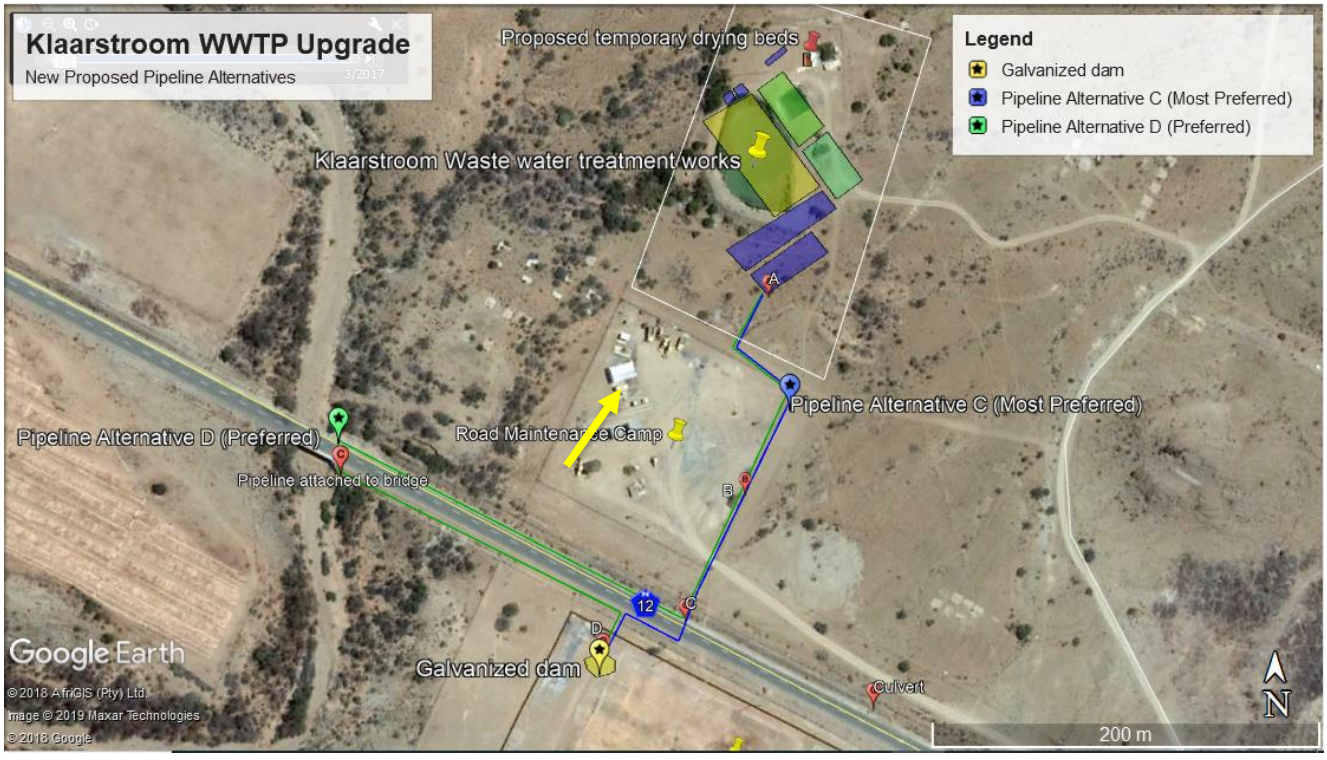

Figure 2: Google image of the existing works, overlaid by the layout design of the new WWTW (Bvi)

1.6 PROJECT STATUS

Table 1 gives a short summary of chronological order of events regarding the commencement of construction and progress.

Table 1: Chronological order of events in terms of the EA approval and commencement process

DATE	DESCRIBTION OF EVENT	NOTES
2019-11-25	Environmental Authorization (EA) granted in terms of the National Environmental Management Act, 1998 (Act. 107 of 1998) and the Environmental Impact Assessment Regulations 2014, as described in the in the Final Basic Assessment Report (BAR), dated October 2019.	**GRANTED**. Refer to Appendix 1 for a copy of the EA.
2019-11-29	Proof of notification to I&AP's of the outcome of the application and their right to appeal.	Refer to Appendix 2
2020-01-28	Notice of intent to commence submitted to DEA&DP (Please note that the date incorrectly displays 28 January 2019 – it should be 28 January 2020) • A copy of the updated EMP included as part of the NOI • EnviroAfrica was appointed to perform the duties of the ECO.	Refer to Appendix 3
2020/02/24	Environmental On-site Start-up meeting held by EnviroAfrica, including induction training and environmental site handover meeting (by EnviroAfrica & Bvi)	Refer to Appendix 4
2020/02/24	Commencement date	
2020/07/30	Completion of all significant construction activities (only the planting of the reeds in the Horizontal Flow Reed Bed Pond is still outstanding).	
2020/12/07	Date of Site visit for Independent Compliance audit (in terms of Condition 14 of the EA)	This Report
2021/09/28	Final Completion (Horizontal Flow Reed Bed plated with reeds)	

1.7 ABBREVIATIONS USED

FBAR	Final Basic Assessment Report
DEA&DP	Department of Environmental Affairs & Development Planning
EA	Environmental Authorization (Record of Decision)
EAP	Environmental assessment practitioner
ECO	Environmental Control Officer
EIA	Environmental impact assessment
EMP	Environmental Management Plan or Program
NEMA	National Environmental Management Act, 1998 (Act no. 107 of 1998)
WWTW	Wastewater treatment works

2. METHODOLOGY ADOPTED FOR PREPARING THE AUDIT REPORT

Information on the background and technical aspects of the project was obtained from the Environmental Control Officer (EnviroAfrica) and the Consulting Engineers (BVi).

A site visit was conducted on the 7th of December 2020.

Further information was gained from evaluating relevant documentation such as:

- The Environmental authorization;
- The Basic Assessment Report;
- The EMP approved by DEA&DP;
- The notice of intent to commence;
- The ECO files;
- Other documentation relevant to the proposed development;

In this environmental audit, compliance with the conditions of the EA is discussed under Heading 3. Findings are discussed in the comments & recommendations column next to each Condition of the EA.

Compliance with the EMP is discussed under Heading 4, with findings discussed under each heading.

2.1 Assumptions & uncertainties

Since all major construction was completed at the time of the site visit, the physical audit could only evaluate the construction site in terms of the final product, the disturbance footprint and rehabilitation done. The observations and conclusions therefore refer to the site conditions at the time of the site inspection.

Reporting on the site conditions during construction (which would have differed significantly) relied on the detail and quality of the ECO reports. In this case, the ECO reports are detailed and precise and gives a good overview of the issues encountered, potential non-conformities- and non-compliances observed and potential shortcomings of the EMP. It also allows for a good understanding of the on-going construction challenges (or lack there-off).

Uncertainties were discussed with the ECO and the Project managers or site engineers in order to make the best informative decision with regards to potential shortcomings and improvements that can be made, which in turn can lead to amendments to the EMP or improved method statements in terms of future projects or further works on the same project.

3. COMPLIANCE WITH THE CONDITIONS OF THE ENVIRONMENTAL AUTHORIZATION

Table 2 gives a summary of the conditions (as described under Section E of the EA) applicable to this environmental authorization and discuss compliance on the hand of evidence obtained. Table 3 gives a summary of the general conditions of the EA as described under Section F of the EA (with comments on compliance).

Table 2: A summary of the Conditions of the EA and comments on compliance with recommendations

No.	SHORT DESCRIPTION OF EACH CONDITION	COMMENTS ON COMPLIANCE & RECOMMENDATION(S)
Scope and Validity Period of authorization		
1	The authorisation is granted for the period from date of issue, until 30 November 2021, the date on which all the listed activities including post construction rehabilitation and monitoring requirements will be deemed to be concluded at the site. • Physical implantation of all approved activities must be concluded on the 1st of December 2021; • Post construction rehabilitation and monitoring requirements must be finalised within a period of 12 months from the date the activities are concluded, but by no later than 31 August 2021.	**Compliant** Date of Issue: 25 November 2019 Date of commencement: 24 February 2019 Construction concluded: End of July 2020 (All construction activities had been completed, but reeds still need to be planted in the Horizontal Flow Reed Beds – as soon as treated water reach the reed bed ponds) Final completion: 28 September 2021 (Planting of reeds within the Horizontal Flow Reed Bed completed).
2	The holder is authorised to undertake the listed activities specified in Section B of the EA (The Preferred Alternative described in the FBAR dated October 2019). The proposal also includes, the: • Alteration of the facility to include a temporary drying bed with a footprint off ±250m2, with a berm of ±200 to 500mm high and lined with an impermeable liner; • Construction of a pipeline from the WWTW to the new galvanised dam at the sport field (route Alternative C approved);	**Compliant** The approved alternative was implemented, including the drying beds and pipeline route as described within the EA.
3	The EA may only be implemented in accordance with an approved EMP	**Compliant** Refer to the updated EMP as approved (Appendix 5).
4	The holder shall be responsible for ensuring compliance with the conditions by any person acting on his/her behalf, including an agent, sub-contractor, employee, or person rendering a service to the holder.	**Compliant** No non-compliances reported by the ECO or Engineer.
5	Any changes to, or deviations from, the project description set out in this authorisation must be approved, in writing, by the Competent Authority before such changes or deviations may be implemented. In assessing whether to grant such	**Compliant** No changes or deviations applied for or reported by the ECO or Engineer.

No.	SHORT DESCRIPTION OF EACH CONDITION	COMMENTS ON COMPLIANCE & RECOMMENDATION(S)
	approval or not, the Competent Authority may request information to evaluate the significance and impacts of such changes or deviations and it may be necessary for the Holder to apply for further authorisation in terms of the applicable legislation	
Notification and administration of appeal		
6	The applicant must notify all registered I&AP's within 14 calendar days of the outcome of the application and their right to appeal	**Compliant** EA, Date of issue: 25 November 2019 Notifications to I&AP's: 29 November 2019 (within 14 days) (Appendix 2) Proof of these notifications was submitted with the notification of commencement to the Department, but a copy is attached as Appendix 2.
Written notice to the competent Authority		
7	Seven calendar days' notice, in writing, must be given to the Competent Authority before commencement of any activities	**Compliant** NOI submitted to DEA&DP: 28 January 2020 (Appendix 3) Commencement of Activities: 24 February 2020 (more than 7 days after NOI to DEA&DP)
Management of activity		
8	The draft or Environmental Management Programme ("EMPr") submitted as part of the application for Environmental Authorisation is hereby approved, subject to the following: - The EMPr must be amended to incorporate the following: • All ECO monthly compliance reports must be submitted to this Directorate on a monthly basis. • Incorporate all the conditions given in this Environmental Authorisation; • The amended EMPr must be submitted to the Competent Authority prior to the construction activities commencing on site	**Partially Compliant** • ECO monthly reports were done, and discussed during monthly team meetings, however, the ECO indicated that since this is not a standard condition, he somehow, missed the fact that the ECO reports had to be submitted to the DEA&DP on a monthly basis. But as per normal practice the reports were in the ECO site file and available on request (Refer to Appendix 6: ECO reports). • The EMP was updated and submitted to the DEA&DP with the notice of intent to commence on the 29th of November 2019 (Prior to commencement).
9	The EMPr must be included in all contract documentation for all phases of implementation	**Compliant** According to the Engineer, it is standard practice to include the EMP'r in all contract documentation. EnviroAfrica also made specific provisions for informing the contractor of his obligations in terms of the conditions of the EA, through the on-site start-up meeting and signing of the Memorandum of Understanding, which is held before construction may commence.

No.	SHORT DESCRIPTION OF EACH CONDITION	COMMENTS ON COMPLIANCE & RECOMMENDATION(S)
Monitoring		
10	The Holder must appoint a suitably experienced environmental control officer (ECO), for the duration of the construction and rehabilitation phases of implementation contained herein.	**Compliant** The ECO was appointed prior to commencement of works and notified the DEA&DP of their appointment through the notice of intent to commence (28 January 2019, Appendix 3).
11	The ECO must: • Be appointed prior to the commencement of any works; • Ensure compliance with the EMPr and the conditions contained herein; • Keep record of all activities on the site; problems identified; transgressions noted, and a task schedule of tasks undertaken by the ECO; • Remain employed until all development activities are concluded, and the post construction rehabilitation and monitoring requirement are finalised	**Compliant** • Compliant: Refer to Appendix 3; • Compliant: Refer to Appendix 4 and the ECO reports (Appendix 6) • Compliant: Refer to Appendix 6; • Compliant: Personnel communications with the ECO and Engineer (the ECO was also present on the day of the inspection for this audit – after all construction was completed – only engineering snag-list items remaining).
12	A copy of the Environmental Authorisation, EMPr, any independent assessments of financial provision for rehabilitation and environmental liability, closure plans, audit reports and compliance monitoring reports must be kept at the site of the authorised activities and be made available to anyone on request.	**Compliant** According to the ECO, the contractor was issued with an environmental file, which had to be on-site for the duration of the construction phase. This file includes copies of the EA, the EMP, Environmental On-site Start-up report, basic environmental training, ECO reports as well as an incident- and complaints reports.
13	Access to the site referred to in Section C must be granted, and the environmental reports mentioned must be produced, to any authorised official representing the Competent Authority	**Compliant** According to the ECO and Engineer, the site and information was available to any official who wanted access.
Auditing		
14	The Holder must, for the period during which the environmental authorisation and EMPr remain valid: - • Ensure the compliance with the condition of the environmental authorisation and the EMPr, is audited; • A final Environmental Audit Report must be submitted to the Competent Authority within 3 (three) months of completion of the expansion activities and the post construction rehabilitation and monitoring requirements	**Compliant** The ECO performed regular site visits and submitted monthly reports to BVi and the contractor (Appendix 6) • Refer to the ECO reports & On-site Start-up meeting; • This report.
15	The environmental audit report must – • Prepared and submitted to the Competent Authority by an independent	**Compliant** Refer to the content of this report.

No.	SHORT DESCRIPTION OF EACH CONDITION	COMMENTS ON COMPLIANCE & RECOMMENDATION(S)
	person, with the relevant expertise, and may not be the ECO or EAP; • Provide verifiable findings in a structured and systematic manner on the level of compliance with the EA and EMP and evaluate the effectiveness of the EMP; etc.	
16	The Holder must, within 7 days of submitting the audit report to the Competent Authority notify all potential and registered I&AP's of the submission of the audit report and how they can obtain a copy of the report.	**Noted** Proof of compliance will be submitted to the DEA&DP once completed.
Specific conditions		
17	The temporary sludge drying bed must be removed and rehabilitated once the sludge has been dried and appropriately disposed of at a licensed waste disposal facility.	**Noted** The sludge analysis was conducted and returned a classification of B1a. This indicates that the sludge is safe for agricultural use or co-disposal with domestic waste at a municipal landfill site. Management of the sludge was done in accordance with a formal Method Statement (Refer to Heading 3.1.2 and Appendix 8 & 9)
18	Should any heritage remains be exposed during excavations or any other actions on the site, these must immediately be reported to the Provincial Heritage Resources Authority of the Western Cape, Heritage Western Cape. Heritage remains uncovered or disturbed during earthworks may not be further disturbed. Heritage remains may only be disturbed by a suitably qualified heritage specialist working under a directive from the relevant Heritage Resources Authority.	**Compliant** According to the ECO and Engineer, no heritage or archaeological remains had been unearthed during the construction phases of the new ponds or the pipeline.

Table 3: General conditions of the EA (with comments on compliance)

No.	SHORT DESCRIPTION OF EACH CONDITION	COMMENTS ON COMPLIANCE & RECOMMENDATION(S)
1	Notwithstanding this Environmental Authorisation, the Holder must comply with any other statutory requirements that may be applicable when undertaking the listed activities	**Compliant** Refer to Heading 3.1 for more information A water use licence was obtained in terms of the NWA (Appendix 7); Dry sludge classification and disposal options were evaluated (Appendix 8 & 9).
Amendment of EA and EMP		
2	If the Holder does not start with all listed activities and exceed the threshold of each listed activity within the period referred to in Section G, this Environmental Authorisation shall lapse for that activity, and a new application for Environmental	**Compliant** The holder commenced with the activities within the prescribed timeframe and from the evidence obtained from the ECO and Engineer all works falls within the ambit of the design

No.	SHORT DESCRIPTION OF EACH CONDITION	COMMENTS ON COMPLIANCE & RECOMMENDATION(S)
	Authorisation must be submitted to the relevant Competent Authority	plans described in the FBAR.
3	The Holder is required to notify the Competent Authority where any detail with respect to the Environmental Authorisation must be amended, added, substituted, corrected, removed, or updated.	**Compliant** According to the ECO and Engineer, no amendments were required.
4	The manner and frequency for updating the EMP is as follows: • Further amendments must be approved by the competent authority (CA); • Application for amendments must be submitted to the CA, and may only be implemented once approved by the CA.	**Noted** No further updates or amendments required by the ECO.
5	Where an amendment to the impact management outcomes of an EMPr is required before an environmental audit is required in terms of the environmental authorisation, an EMPr may be amended on application by the Holder of the environmental authorisation.	**Noted** None required.
Compliance with EA and EMP		
6	Non-compliance with a condition of this environmental authorisation or EMPr is an offence in terms of Section 49A(1)(c) of the National Environmental Management Act, 1998 (Act no. 107 of 1998, as amended)	**Noted** No significant non-compliances were observed or reported.
7	Failure to comply with all the peremptory conditions (ie. 6,7,8 or 10) prior to the physical implementation of the activities (including site preparation) is an offence.	**Compliant** No significant non-compliances were observed or reported
8	In the event that the Environmental Authorisation should lapse, it is an offence in terms of Section 49A(1)(a) of NEMA of a person to commence with a listed activity, unless the competent authority has granted an Environmental Authorisation for the undertaking of the activity	**Compliant** Commencement started within the approved timeframes.
9	Offences in terms of the NEMA and the Environmental Impact Assessment Regulations, 2014, will render the offender liable for criminal prosecution	**Noted** No significant offences observed or reported.

3.1 OTHER STATUTORY REQUIREMENTS

3.1.1 Water Use License Application (WULA)

A WULA was submitted, and a license obtained in terms of the National Water Act, Act. 36 of 1998) for the water uses related to the upgrades and operation (disposal of wastewater) of the new facility, which includes;

- the diversion of an intermittent natural drainage line (re-routing potential flow around the WWTW);
- the irrigation of final effluent on the sport fields at Klaarstroom.

DWS WULA License No. /J33C/CEGI/10065 (Refer to Appendix 7).

DWS File No: 27/2/2/J333/2/3

3.1.2 Disposal of dry sludge from the old anaerobic ponds

The old Anaerobic Ponds contained raw sludge of unknown quantity and quality. During construction, a Temporary Drying Bed c/w HDPE liner was constructed, and the sludge was placed in this facility to dry out and make it more manageable. The Environmental Authorization required the sludge to be samples and analysed once dry to determine possible disposal options. The sludge analysis was conducted and returned a classification of B1a. This indicates that the sludge is safe for agricultural use or co-disposal with domestic waste at a municipal landfill site (Refer to Appendix 8).

The sludge was managed in accordance with a formal Method Statement (Refer to Appendix 9). Final disposal and management of the dried sludge (post construction) is the responsibility of the Municipality.

3.2 NON-COMPLIANCE WITH THE EA

According to the information received and the observations made during the compliance site visit, no significant non-compliances were observed (Refer to Table 2). The footprint seems to have been managed with great care. The surrounding areas were not impacted. As a result, minimal rehabilitation was needed. Erosion and pollution prevention measures had been installed, which included a berm to re-direct water from an intermittent stream away from the WWTW.

If mixing areas were on site, they were well rehabilitated and placed within the existing disturbance footprint (since no evidence of these areas was observed). There were also no obvious indications of any spillages, including oils, fuel, or wastewater (from the mixing areas) in the site or its surroundings. In fact, in terms of pollution (effluent overflow) and general condition, the site was in significant better condition than before construction started.

3.2.1 Partial compliance with Condition 8

In terms of the requirements of Condition 8, all ECO monthly compliance reports must be submitted to this Directorate on a monthly basis.

The ECO was unsure whether reports have been submitted or not (a period which overlapped the first COVID Lockdown). Standard practice by EnviroAfrica is to submit monthly reports to the Consulting Engineer and Contractor and discuss the findings on-site and during the monthly meetings. According to the ECO all information were managed in this way and were available to anybody on request (Refer to Appendix 6).

3.3 RECOMMENDATIONS ON CORRECTIVE ACTION

A copy of all ECO reports should be submitted to the Competent Authority. As a result, copies of all the ECO reports received are attached as Appendix 6 to this report.

4. COMPLIANCE WITH THE EMP

Compliance to the EMP was was evaluated through the ECO reports and other correspondence between the ECO, BVi Engineers and the main contractor. The construction footprint and construction site (after rehabilitation) were used as reference to evaluate the success of the environmental control. All major construction activities were completed at the time of the site visit for this audit, apart from a few engineering snag-list items and the planting of the reeds within the Horizontal Flow Reed Bed. The reeds could not be planted as treated effluent (needed to keep the reeds alive) had not yet reached these dams (the target date was for spring 2021). The reeds had now been planted and final completion achieved.

4.1 INTRODUCTION

The construction footprint itself was relatively small and the layout largely overlapped or made use of the existing disturbance footprint (the old WWTW). Because of the relatively small and contained construction site (Photo 1 & 2), environmental control would have been relatively strait forward with the focus on footprint management (demarcation), management of the construction team (ensuring the implementation of the best environmental option) as well as waste-, pollution- and erosion management.

Photo 1: An overview of the construction site on the 21st of March 2002 (from footage taken by the contractor, using a drone).

To the top left of picture, the old oxidation pond is still being used for management of incoming sewerage.

Photo 2: An overview of the construction site on the 23rd of March 2020 (from footage taken by the Contractor using a drone).

This footage was taken just before the national Covid lockdown came into effect, which halted the construction works till May 2020.

	**Photo 3:** An overview of the construction site on the 14th of May 2020 (from footage taken by the Contractor using a drone). This footage was taken just after construction resumed (after the compulsory national Covid lockdown came). Note that the original oxidation pond is still in use.
	**Photo 4:** An overview of the construction site on the 21st of June 2020 (from footage taken by the Contractor using a drone). The old oxidation pond had now been removed and reshaped to be incorporated within the new treatment works.
	**Photo 5:** An overview of the construction site on the 30th of July 2020 (from footage taken by the Contractor using a drone).

The ECO checked environmental compliance on a monthly basis, using an environmental compliance checklist developed by EnviroAfrica. The checklist allows for a scoring system, which aims to rate compliance in terms of the conditions of the EA and the EMP'r using a systematic checklist approach (Refer to Appendix 6).

The rating system gives an overview of the performance of the construction team in terms of compliance with the EMP and the EA.

4.1.1 WWTW operation during construction

Portions of the old WWTW pond systems had to remain in operation (to treat the incoming flow of sewage from Klaarstroom), until the newly constructed WWTW upgrades can take over the load.

This was achieved, by keeping some of the primary ponds in operation (e.g., the facultative pond) while constructing the new inlet works, the dual anaerobic ponds, the aerobic ponds, the horizontal flow reed bed, and the final effluent storage dam (Photo's 1 – 3). Once these were in operation the construction started on the refurbishment of the old facultative pond (Photo 4 – 6).

4.1.2 Sludge management

The accumulated sludge from the old treatment works had to be removed and disposed in a safe and legal way before refurbishment of these ponds could commence.

This was achieved, by constructing a lined sludge storage area, in which the sludge could be stored for drying. Once the sludge was dry, it was chemically analysed to determine viable disposal options. The removal and management of the sludge was done in accordance with an approved method statement (refer to Appendix 9).

The chemical analysis classified the sludge as dry sludge B1a (not hazardous) and suitable for agricultural uses (at agronomic rates) or for disposal to a Municipal Waste disposal site. Because of the small volumes it is not really feasible for agricultural use (transport costs) and at present the final dried sludge is likely to be disposed at the local Municipal site.

Please note that sludge from this type of WWTW will typically have to be removed every 7 years, after which responsible disposal will include drying of the sludge before disposal.

4.1.3 N12 crossing (irrigation pipeline)

The pipeline from the new WWTW which will transport the treated effluent (to be used for irrigation) to the small reservoir at the Klaarstroom sport grounds had to cross underneath the N12.

To minimise the impact on the road itself it was achieved through horizontal directional drilling underneath the road, lining this with a 160mm conduit/sleeve and pulling the new 110mm irrigation pipe through this sleeve. The drilling was done from east of the N12 right through to the sport grounds (thus not impacting the road and road reserve at all). Approval for the crossing of the N12 was obtained from the Department Transport & Public Works (responsible for this section of the N12) (Refer to Appendix 10).

4.2 ON-SITE START-UP MEETING

In accordance with the approved EMP a mandatory pre-construction start-up meeting must be done with the contractor before construction may commence. The aim of the start-up meeting is to discuss the conditions of the EA and the requirements of the EMP in terms of the specific project. During the start-up meeting site-specific requirements are discussed and agreements reached on the management of such aspects to minimize uncertainties. This includes site-specific arrangement in terms of:

- Method statements that might be required;
- Access roads and demarcation (if required);
- Site camp location and demarcation;
- Construction footprint demarcation and maintenance;
- Topsoil removal and conservation;

- Stockpiling and temporary storage areas;
- Mandatory equipment and preventative measures;
- Fuel storage and pollution prevention measures;
- Removal of the sludge from the old WWTW ponds (Refer to the Sludge removal Method statement, Appendix 9);
- Waste management and disposal;
- Location and management (including pollution prevention measures) for concrete batching plants or cement mixing areas;
- Placement, number and type of toilet facilities;
- Environmental education and awareness training;

According to the ECO records the original start-up meeting was held on the 24th of February 2020 (before commencement) and a second on the 12th of March 2020 (Refer to Appendix 4). A declaration of understanding was signed by the contractor on completion of the start-up meeting (as acknowledgment of understanding of the environmental requirements applicable during the construction phase).

4.3 DOCUMENT CONTROL

The ECO confirmed that they have prepared a copy of the Environmental File, which was discussed and delivered to the main contractor during the on-site start-up meeting. The Environmental file was kept at the site-offices (on-site) and was checked monthly by the ECO.

The file contained the following:

- Copies of the EA and EMP;
- An Environmental incidents register;
- A Complaints register;
- Copies of all Method statements requested;
- Copies of all the ECO reports;

4.3.1 Compliance status

According to the ECO the contractor maintained the environmental file and no significant environmental incidents or complaints were lodged.

Method statements were provided when required by the ECO or Engineer.

4.4 DEMARCATION

According to the ECO and the start-up report, it was agreed that the site boundaries will be demarcated with steel droppers and wire with traffic tape attached to it (for better visibility). The agreed demarcation footprint is given in the start-up report.

4.4.1 Compliance status

According to the ECO report and evidence seen during the site audit visit demarcation was well managed and maintained throughout the project. No non-compliances or transgressions into no-go areas were reported (or observed). According to the ECO, demarcation was of such a sturdy nature, that accidental movement into no-go areas was considered highly unlikely.

4.5 TOPSOIL REMOVAL, SEARCH & RESCUE

Larger portions of the site were already transformed because of the original WWTW footprint. Topsoil from the enlarged footprint was removed and used for the rehabilitation of the storm water berm and trench areas. The pipeline route was rehabilitated using topsoil removed from the footprint. The ECO also reported that special care was taken to protect *Aloe* species encountered on site.

4.5.1 Compliance status

No significant non-compliances could be observed or were reported. Rehabilitation seems to have been done excellently.

4.6 CONSTRUCTION CAMP, SITE OFFICES & LABOURER'S FACILITIES

Construction camps and site office areas had to be demarcated, organised and free of day-to-day litter (good housekeeping standards).

4.6.1 Compliance status

According to the ECO reports the areas were demarcated and well maintained throughout the project. From information received from both the ECO and Consulting Engineers it seems as if the contractor took care to ensure that all environmental and engineering conditions were met.

4.7 MANDATORY SITE EQUIPMENT

The EMP required certain mandatory site equipment which must be used and maintained in accordance with EMP and ECO requirements. Mandatory site equipment was evaluated in terms of the following:

- Sufficient refuse bins, well placed and cleaned regularly;
- Sufficient fire extinguishers, readily available, maintained, and functional;
- Drip trays must be used at all fuel and oil storage and refuelling sites;
- Toilets and sanitation facilities must be kept clean neat and hygienic.

4.7.1 Compliance status

According to the ECO reports no significant non-compliance were observed, but the following minor observations were made (which seems to have been corrected on time);

- Refuse bins to be placed at coffee break area (eating areas);

4.8 FUEL STORAGE

According to the EMP, fuel storage areas must be situated within the demarcated construction camp site (or an area approved by the ECO). In addition:

- Larger containers must be bunded (containment of accidental spillages).
- Drip trays must be used during refuelling or under stationary refuelling vehicles.
- Fuel and oil storage and refuelling sites must be maintained

4.8.1 Compliance status

According to the ECO reports, fuel tank was placed within a temporary bund (able to contain 110% of the volume of the fuel tank) lined with plastic and regularly checked for leaks. Drip trays was used during refuelling.

No non compliances (e.g., contaminated areas or waste items) were observed or reported.

4.9 STOCKPILING & TEMPORARY STORAGE

According to the EMP, stockpiling and temporary storage of construction material may only be done on pre-approved sites, which must be demarcated and maintained to the satisfaction of the ECO.

4.9.1 Compliance status

According to the ECO reports Stockpile area was done at the site offices. The demarcation of this site is the access road on the one side and the site office/laydown area on the other side. No non-conformities were observed or reported in the ECO reports.

4.10 WASTE CONTROL

According to the EMP, the contractor is expected to control all construction related waste material and general litter on actual construction sites and its immediate surroundings. Waste management must be in accordance with the EMP, of acceptable standards, with regular removal of general waste, hazardous waste as well as construction waste (e.g., concrete waste and spoil).

4.10.1 Compliance status

Since the major infrastructure was more related to earth-moving and shaping than actual building, construction waste seems to have been relatively small volumes and focused more on general waste.

According to the ECO reports no significant non-compliance were observed, but the following minor observations were made:

- More refuse bins to be placed at the construction site and especially the coffee break area (eating areas);
- It is suggested that a “chicken parade be conducted to pick up all cigarette buds, windblown papers (mainly from municipal dump site) and plastic containers.

4.11 CEMENT MIXING & BATCHING AREAS

According to the EMP mixing areas must be approved by the ECO, suitably demarcated and may not result in pollution. Polluted cement water may only be released into sedimentation ponds. Sedimentation ponds must be maintained and cleaned regularly (and reinstated after use).

4.11.1 Compliance status

According the ECO no concrete or cement batching plants was needed. Ready mix was used and smaller cement mixing was done on plastic liners. No non-conformities was observed or reported.

4.12 EARCH MOVING VEHICLES AND CONSTRUTION EQUIPMENT

According to the EMP, construction vehicles must be in good working order and well maintained to prevent oil and fuel leakages and to reduce noise levels. Construction vehicles and equipment may only operate within the demarcated site boundaries (and approved access roads), especially heavy earthmoving vehicles.

4.12.1 Compliance status

According to the ECO reports no non-compliances were observed or reported during the construction phase.

4.13 DUST, EROSION & NOISE CONTROL

DUST: According to the EMP, adequate control measures must be in place to prevent dust nuisance or pollution (entrance-, haul roads and exposed surfaces). Areas of concern must be watered regularly during construction AND periods of strong winds, BUT must take water saving into account.

EROSION: Likewise erosion resulting from works must be controlled. Temporary and permanent drainage areas must be maintained. Erosion damage and damage in drainage courses must be reinstated.

NOISE: Effective noise control measures must be in place and acceptable working hours must be kept (deviations must be approval by the ECO).

4.13.1 Compliance status

According to the ECO reports, dust was controlled by water truck as needed. No significant non-conformities was reported by the ECO or complaints lodged in the complaints register.

4.14 ENVIRONMENTAL CONDUCT

Environmental conduct of construction personnel must be acceptable (e.g. no burning or burying of refuse; no littering and no cement bags or other construction waste material lying around)

4.14.1 Compliance status

According to the ECO reports, no incidents or non-compliances were reported. Environmental conduct was described as good. The contractors Environmental Site agent checks all works daily and take remedial action as and when required.

4.15 REHABILITATION

According to the EMP, on completion of the project all areas impacted by the construction activities must be reinstated and/or rehabilitated to the satisfaction of the ECO with emphasis on the following:

- Site offices must be removed and the areas rehabilitated or reinstated to the satisfaction of the ECO.
- Labourer's facilities must be removed and the areas rehabilitated or reinstated to the satisfaction of the ECO.
- All construction site areas must be rehabilitated or reinstated to the satisfaction of the ECO.
- All temporary fencing and demarcation must be removed and the areas reinstated to the satisfaction of the ECO.
- Temporary storage areas must be rehabilitated or reinstated to the satisfaction of the ECO.
- All remaining construction material must be removed and the areas rehabilitated or reinstated to the satisfaction of the ECO.
- Any additional disturbed areas must be rehabilitated or reinstated to the satisfaction of the ECO.

4.15.1 Compliance status

According to the evidence seen during the day of the site visit, excellent re-instatement and rehabilitation was done. The site was neatly fenced and all work seems to be of a high standard.

No non-compliance or obvious non-conformities were observed. EnviroAfrica is known for implementing excellent rehabilitation practices and this seems to be the case on this project again. Both the ECO and Engineer should be commended for a neat and tidy terrain post-construction (Refer to the site photos underneath).

Photo 6: The newly constructed inlet works and fencing located within the upgraded WWTW site.

Note the neat and tidy WWTW terrain.

Photo 7: Effluent is directed from the inlet works into the newly constructed dual anaerobic ponds (which works in tandem to distribute the loads evenly).

Photo 8: Looking from north to southwest over the newly constructed WWTW. The aerobic pond to the left and the facultative pond to the right.

Photo 9: Standing on the protective berm (located above the WWTW), looking from north to south over the site.

Photo 10: The newly constructed horizontal flow reed bed. Note that reeds still need to be planted.

Photo 11: Looking from the new entrance over the new WWTW (From east to west)

Photo 12: The protective erosion channel to re-direct storm water away from the WWTW.

Note the *Aloe* cf. *ferox*, plant in the background of the picture – protected during construction.

Photo 13: The sludge drying bed just north east of the new WWTW.

Note the plastic liner as specified within the Method Statement.

Photo 14: The rehabilitated pipeline route, placed next to the existing road camp.

	**Photo 15:** The area impacted as a result of the horizontal drilling underneath the N12 (tar road). Please note that this area was located within an area already disturbed / transformed.
	**Photo 16:** The new galvanized reservoir and area impacted by the connecting pipeline within the Klaarstroom sport grounds.
	**Photo 17:** The newly planted reeds within the Horizontal Flow Reed Bed.

5. EFFECTIVENESS OF THE EMP

The construction activities for which the EMPr had been developed were relatively strait forward, and located on a site that was not overly environmentally sensitive.

The EMP is considered to be well written and covers and incorporates the findings and mitigation measures prescribed by the specialist reports. It also seems to cover all reasonable environmental aspects that can be expected on a c construction site of this size and type. The only item not covered directly in the EMP was the management and disposal of the sludge from the existing WWTW (although it might be covered under Heading 7.10.10 (*Storing of hazardous substances*), of the EMP. However, it was suitably managed through the method statement procedure.

5.1 POTENTIAL SHORTCOMINGS OF THE EMP

No obvious shortcomings or oversights were observed in the EMPr. It is considered well written and generally easy to use.

5.2 AMENDMENTS TO THE EMP

No amendments to the EMP'r are considered necessary.

Although the EMP'r might be considered slightly generic, it is also a strong point, since it ensures that all potential construction activities are covered. Meaning that although all the aspects described in the EMP'r may not necessarily applicable on this specific project, any potential deviation or potential issue (e.g. blasting) are already covered and can be addressed by the ECO without further amendments.

6. CLOSURE PLAN

The ECO submitted a closure report (dated 8 December 2020), on completion of all significant construction related activities. A few engineering snag-list items (which mostly involve minor corrective actions) were still outstanding and the Horizontal Flow Reed Bed still needed to be planted with reeds (the planting of the reeds was delayed, as requested by the Engineer, to ensure successful establishment) [*The Engineer has requested that the planting of the reeds be delayed to overlap with their natural growing season. This will also provide time to fill the new oxidation ponds with wastewater. During 2020 the new WWTW was still only partially filled with effluent and the reeds could not be planted before the growth media in the reed bed is fully saturated and the daily temperatures begin to increase*.]

The site inspection done for this audit report confirms that rehabilitation work as well as site stabilization was completed. No significant shortcomings or non-conformities were observed. In fact, the site seems to have been well managed, especially with regards to footprint minimisation and re-instatement.

Appendix 1: Environmental Authorization

Appendix 2: Notification to I&AP's of EA

Appendix 3: Notice of intent to commence

Appendix 4: Start-up Report

Appendix 5: DEA&DP acknowledgment of updated EMP

Appendix 6: ECO reports

Appendix 7: Water Use Licence Application

Appendix 8: Sludge analysis results

Appendix 9: Method Statement – disposal of dry sludge

Appendix 10: WC road network approval