CLANWILLIAM HOUSING DEVELOPMENT AND WWTW EXPANSION ON A PORTION OF REMAINDER OF ERF 279, CLANWILLIAM

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT DEA&DP: REF. NO. 16/3/3/2/F2/4/2021/25.

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

in support of an

ENVIRONMENTAL AUTHORISATION

Prepared for: Cederberg Municipality
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OCTOBER 2026

COMMITMENT AND DECLARATION OF UNDERSTANDING BY CONTRACTOR AND DEVELOPER FOR THE PROPOSED DEVELOPMENT

I, the undersigned …….., as duly authorized by the Contractor, have studied and understand the contents of this document. On behalf of the Contractor, I confirm that the Contractor undertakes to adhere to the conditions as set out herein, unless specifically otherwise agreed to in writing.

Signed at ……. on this …….. Day of ……20……

……..
For Contractor

I, the undersigned ……, as duly authorized by the Developer have studied and approve the contents of this document on behalf of the Developer, for implementation by all Contractors involved at the site.

Signed at ……. on this …….. day of ……..20…….

……..
Developer's Representative

DEFINITIONS

Auditing:	External Audit in fulfilment of Regulation 34 of the NEMA EIA Regulations, 2014 (as amended).
Biodiversity:	The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.
Contractor:	An employer, as defined in section 1 of the Occupational Health and Safety Act 85 of 1993, who performs construction work and includes principal contractors
Environment:	A place where living, non-living and man-made features interact, and where life and diversity is sustained over time.
Developer:	One who builds on land or alters the use of an existing building for some new purpose
Independent:	Is independent and has no interest in any business related to the development site, nor will receive any payment or benefit other than fair remuneration for the task undertaken
Groundwater:	Subsurface water in the zone in which permeable rocks, and often the overlaying soil, are saturated under pressure equal to or greater than atmospheric.
Landowner:	Holder of the estate in land with considerable rights of ownership or, simply put, an owner of land
Monitoring:	A systematic and objective observation of an organisation's activities and services conducted and reported on regularly.
Natural vegetation:	All existing vegetation species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on a site.
Pollution:	The result of the release into air, water or soil from any process or of any substance, which is capable of causing harm to man or other living organisms supported by the environment.
Protected Plants:	Plant species officially listed under the Threatened or Protected Species regulations as well as on the Protected Plants List (each province has such a list), and which may not be removed or transported without a permit to do so from the relevant provincial authority.
Red Data Species:	Plant and animal species officially listed in the Red Data Lists as being rare, endangered or threatened.
Rehabilitation:	Making the land useful again after a disturbance. It involves the recovery of ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the pre-disturbance condition, but does involve establishing geological and hydro logically stable landscapes that support the natural ecosystem mosaic.
Site:	Property or area where the proposed development will take place

ACRONYMS

DEA&DP:	Department of Environmental Affairs and Development Planning
DWS:	Department of Water and Sanitation
ECO:	Environmental Control Officer
EA:	Environmental Authorisation
EIA:	Environmental Impact Assessment
EM:	Environmental Manager
EMP:	Environmental Management Programme
EO:	Environmental Officer
ER:	Engineer's Representative
I&AP:	Interested and Affected Party
IEM:	Integrated Environmental Management
PM:	Project Manager
SANS:	South African National Standards

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DEVELOPER's COMMITMENT

The developer has committed itself to a set of values that include the maintenance of good relations and transparent communications with all stakeholders, and the dynamic engagement of the larger community.

The Developer undertakes to implement suitable management systems for all the areas and aspects of this operation. This will ensure that development itself and management of the project will comply with legal, technical, environmental and transformation policies and standards.

The developer, in drafting this EMP for implementation, intends to enable continuous improvement in legal compliance and the sustainable operation of the site.

This EMP intends to further guide the achievement of the strategic objectives of the organization at the project site and seeks to ensure that the basic requirements of ISO 14001: 2004 are satisfactorily met.

The EMP intends to change the way in which the owners, the construction process they have commissioned and the contractor plan for and manage resources to achieve sustainability.

The satisfactory implementation of the EMP on site will require both the full support and commitment of all personnel.

CHAPTER 1

1.1. Executive Summary

This EMP has been prepared principally in compliance with the requirements of section 24N and Section 34 of the National Environmental Management Act 107 of 1998. This document, together with the conditions in the Environmental Authorisation, must be adhered to.

The EMP must be included as part of all contract documentation for all contractors in the construction phase of the development.

The Author

Enviro-EAP (Pty) Ltd is an independent consulting company and has no interest in any business related to the development site, nor will it receive any payment or benefit other than fair remuneration for the task undertaken, as required in terms of the NEMA Regulations.

This report has been prepared by Nicolaas Hanekom who is a Registered Environmental Assessment Practitioner: 2020/1146 ("EAP") who holds a Masters Technologiae, Nature Conservation ("Vegetation Ecology and Biodiversity Assessment") degree from the Cape Peninsula University of Technology. Nicolaas is registered in terms of section 20(3)(a) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003), as a Professional Natural Scientist (Ecological Science) Registration Number: 004415. He further qualified in Environmental Management Systems ISO 14001:2004, at the Centre for Environmental Management, North-West University, as well as Environmental Management Systems ISO 14001:2004 Audit: Internal Auditors Course to ISO 19011:2003 level, from the Centre for Environmental Management, North-West University qualifying him to execute audits to ISO/SANS environmental compliance and EMS standards.

He has also completed the suite of Greener Governance courses with certificates in;

- An Overview of Environmental Management at the Local Government Level, Centre for Environmental Management, North-West University;
- Greener Governance for Local Authorities, Centre for Environmental Management, North-West University;
- Tools for Integrated Environmental Management and Governance, Centre for Environmental Management, North-West University.

He further attended and obtained a certificate on Integrated Protected Area Planning at the Centre for Environmental Development, University of Kwa Zulu Natal and a certificate in Project Management (Theory and Practical), through CS Holdings. Nicolaas has lectured in two subjects at the Cape Peninsula University of Technology. He has 26 years of environmental planning experience, working for Free State and Western Cape departments of environmental affairs, where he reviewed and commented on development (EIA) applications, in the West Coast Region.

He has, as practising EAP been responsible for many environmental impact assessments and EIA applications, waste license and atmospheric emission license applications.

He has also been involved in the implementation of several environmental management systems. He has engaged successfully with various clients as set out below.

1.2. Project Description

This section of the report is included in compliance with Section 24N (2) (c) of the National Environmental Management Act 107 of 1998.

Cederberg Municipality for the Clanwilliam Housing Development in two areas and WWTW expansion on a portion of remainder of Erf 279, Clanwilliam to develop:
Area 1: CLANWILLIAM HOUSING IRDP PROJECT

- 126 Single Residential Zone 1 erven - Average erf size: ±208m²
- 692 Single Residential Zone 2 erven - Average erf size: ±150m²
- 13 Open Space Zone 1 erven
- 5 Community Zone II (church) erven
- 1 Community Zone I (crèche) erven
- 1 Community Zone I (school) erf
- 1 Community Zone I (community center) erf
- 1 Community Zone III (clinic) erf
- 3 Local Business Zone II erven
- 2 Authority & Utility Zone erf
- Transport Zone II erven

With a total development footprint of ±29.3883 ha

Area 2: CLANWILLIAM HOUSING UISP PROJECT

- 459 Single Residential Zone II erven - Average erf size: ±120m²
- 4 Open Space Zone I erven
- 2 Community Zone II (church) erven
- 2 Community Zone I (crèche) erven
- 1 Local Business Zone II erven
- Transport Zone II erven

With a total development footprint of ±19.7680ha

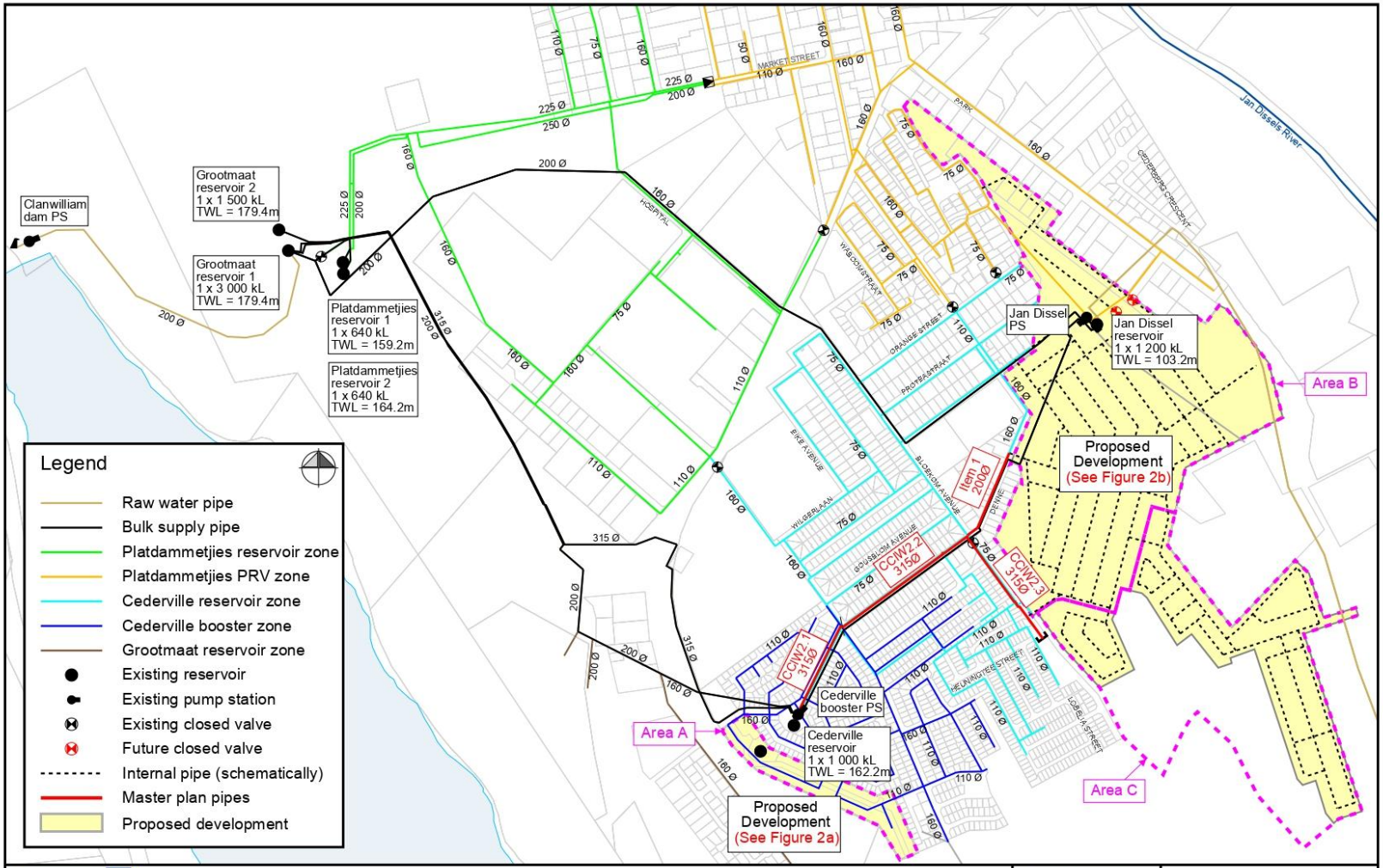
Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day. Expansion of the WWTW footprint by approximately 0.5ha to expand the WWTW infrastructure to treat less than 2000 cubic meters of effluent per day. The upgrade comprises refurbishment of the existing equipment, a lined night storage pond, a new 1.5 Ml/day activated sludge reactor and clarifier, and a new chlorine contact tank, giving a new rated treatment capacity of 3 600 m³/day, with the works intended to treat at least 3 600 m³/day on a constant basis during peak conditions. The night storage pond (about 1 500 m³) holds peak flows for treatment during off-peak periods; BVi (2024) refers to it as a 500 m³/day short-term increase in capacity, but it does not add treatment capacity. It is designed to meet the Special Limit Values, including COD below 30

mg/l, ammonia below 2 mg/l and phosphate below 1 mg/l (BVi, 2024).

With a total Development footprint of ±49.6ha

Water Services
The existing water reticulation system of the Cederville reservoir water distribution zone has insufficient capacity to accommodate the proposed development.

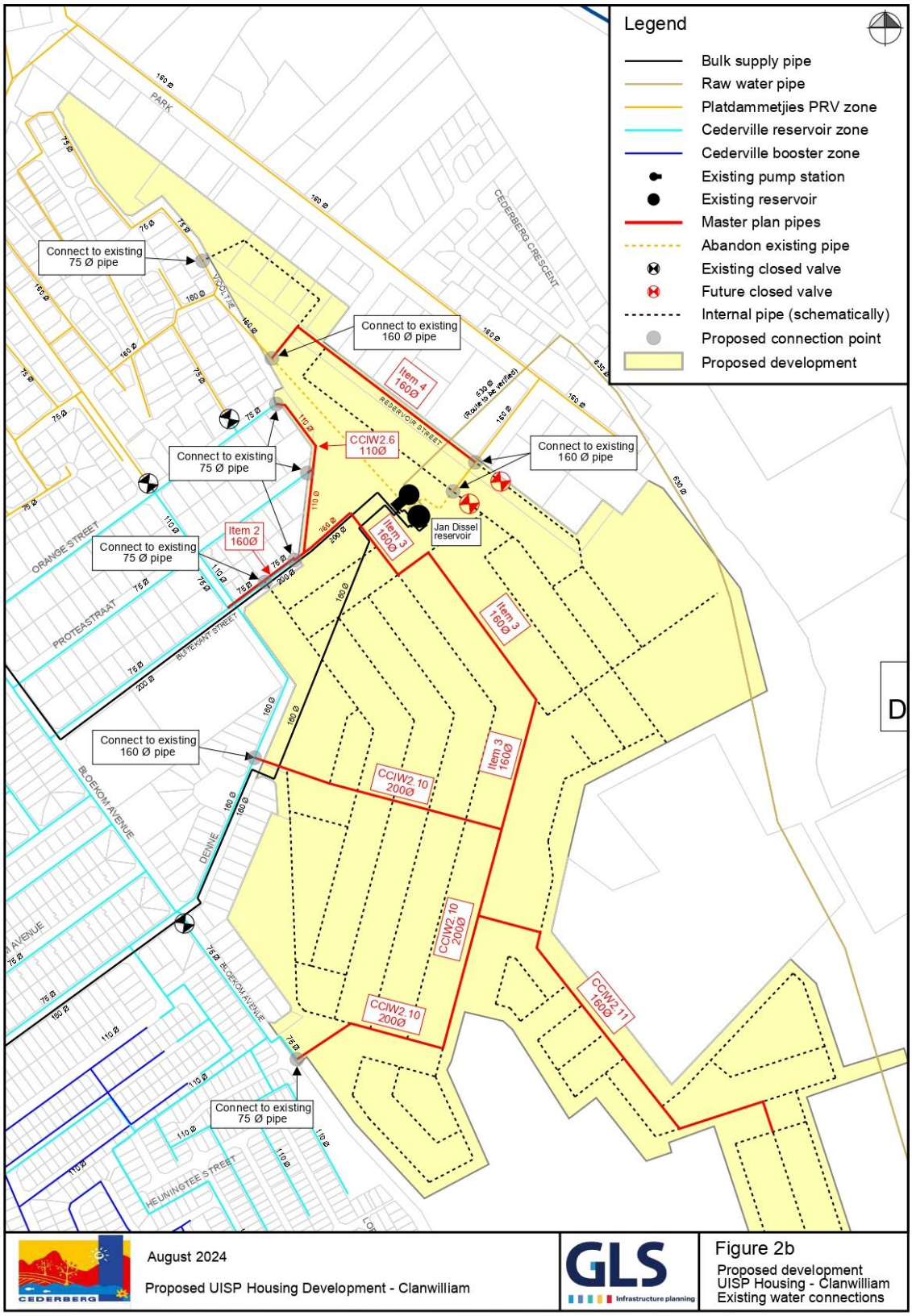
Network upgrade
- Item 1 – 190m x 200mm diameter; replace existing 160mm pipe
- Item 2 – 90m x 160m diameter; replace existing 75mm pipe
- Item 3 – 285m x 160mm diameter internal water pipes
- Item 4 – 550mm x 160mm diameter internal water pipes
- CCIW2.1 – 220m x 315mm new supply pipe
- CCIW2.2 – 320m x 315mm; replace existing 75mm pipe
- CCIW2.3 – 260m x 315mm; replace existing 75mm pipe
- CCIW2.6 – 190m x 110mm new supply pipe



August 2024

Proposed UISP Housing Development - Clanwilliam

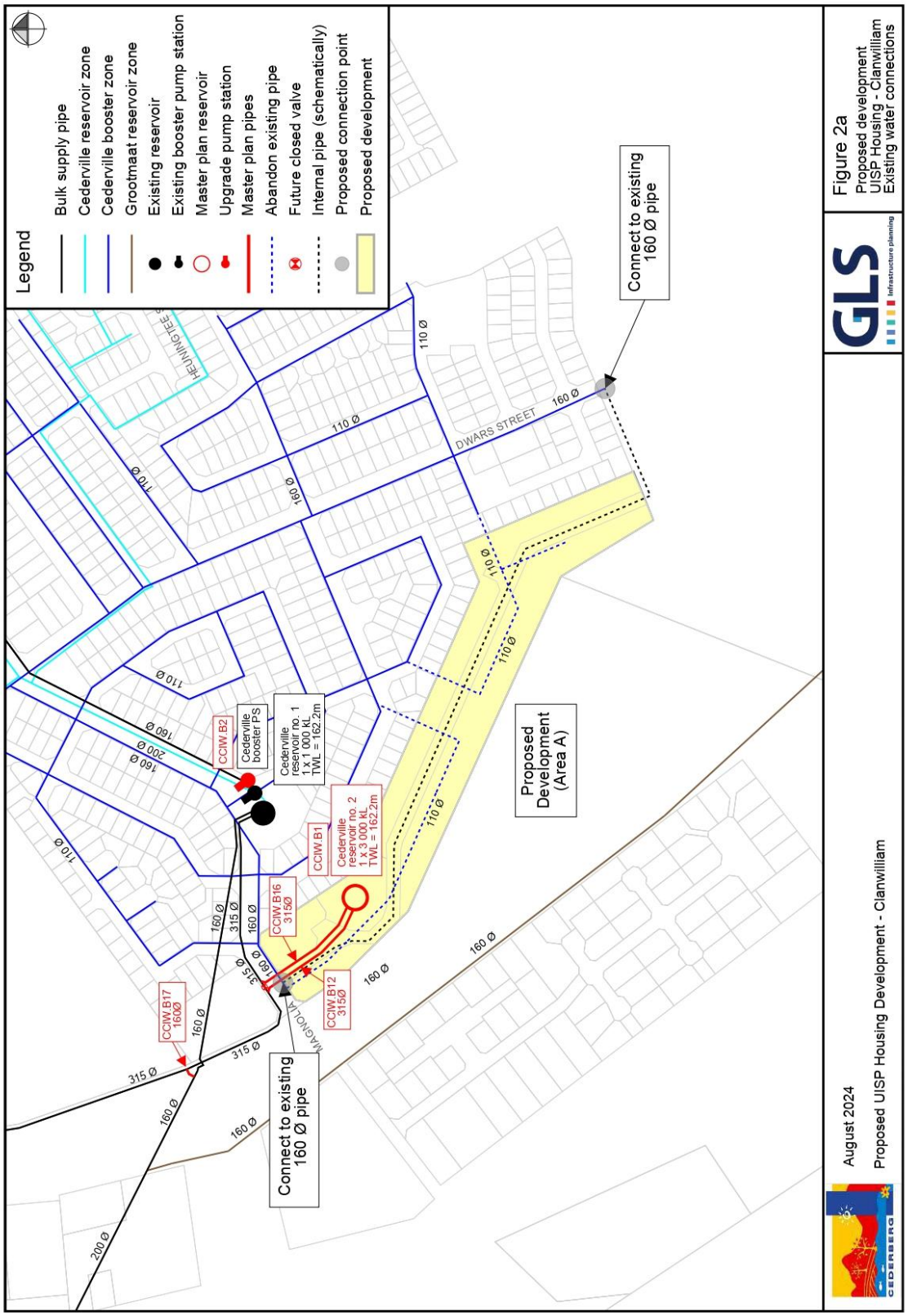
Figure 1
Proposed development
UISP Housing - Clanwilliam
Water master plan



Reservoir

- CCIW.B1: 3 000 kL additional storage capacity for Cederville reservoir site
- CCIW.B12: 90 m x 315 mm Ø New feeder pipe to Cederville no. 2 reservoir

- CCIW.B16: 90 m x 315 mm Ø link pipe between Cederville no. 1 & 2 reservoirs
- CCIW.B17: 5 m x 160 mm Ø inter-connection pipe between 2x bulk pipes



Sewer Services

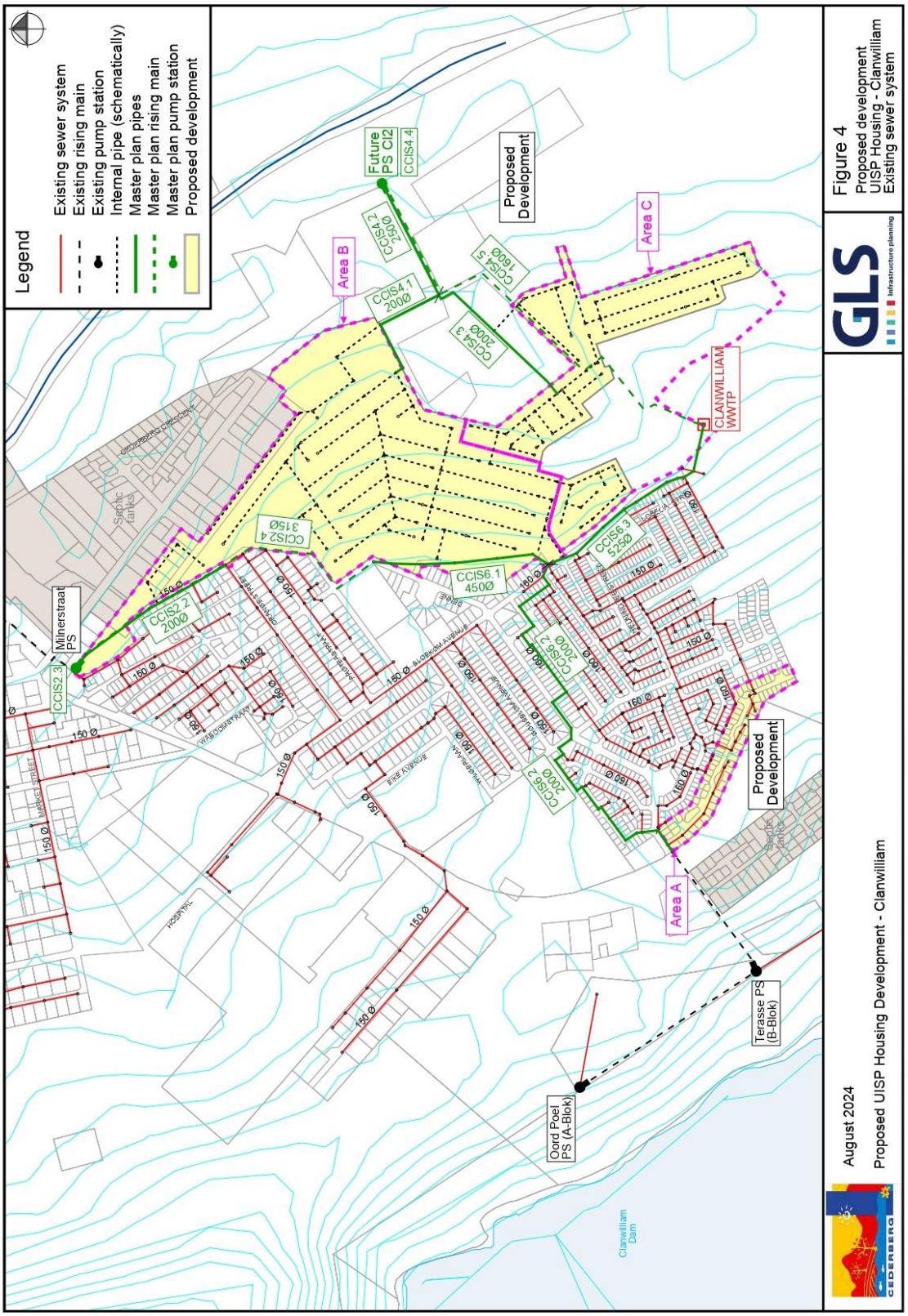
- CCIS6.1 – 380 m x 450 mm Ø Upgrade existing 150 mm Ø outfall sewer
- CCIS6.2 – 950 m x 200 mm Ø Upgrade existing 160 mm Ø outfall sewer
- CCIS6.3 – 475 m x 525 mm Ø Upgrade existing 150 mm Ø bulk sewer
- CCIS2.2 – 370 m x 200 mm Ø Upgrade existing 150 mm Ø outfall sewer
- CCIS2.3 – Upgrade capacity of Milner Street PS to 55 L/s
- CCIS2.4 – 780 m x 315 mm Ø Upgrade existing 200 mm Ø rising main
- CCIS4.1 – 260 m x 200 mm Ø New outfall sewer
- CCIS4.2 – 270 m x 250 mm Ø New outfall sewer
- CCIS4.3 – 350 m x 200 mm Ø New outfall sewer
- CCIS4.4 – New 20 L/s Future PS Cl2
- CCIS4.5 – 1 005 m x 160 mm Ø New rising main

For the development of Area A the following upgrades are required:

- Master plan items CCIS6.2 & CCIS6.3 to reinforce the capacity of the existing gravity system
- between the proposed development and the Clanwilliam WWTP.
- Link services items CCIS4.1 & CCIS4.2 to connect the internal sewer network of the development area to future PS Cl2, and
- Future PS Cl2 (master plan item CCIS4.4) and rising main (master plan item CCIS4.5) to service the larger drainage area.
- A small portion of the development drains towards the existing Milner Street PS, which discharges into the Clanwilliam Gravity drainage areas. The bulk sewer downstream of the Milner Street PS is at capacity and should be upgraded (master plan items CCIS6.1 & CCIS6.3).
- The existing Milner Street PS drainage area has spare capacity to accommodate the erven within development area A which drains towards the Milner Street PS. In the sewer master plan for Clanwilliam upgrading of the Milner Street PS and accommodating rising main is however proposed (refer to master plan items CCIS2.3 & CCIS2.4), as well as upgrading of the main outfall sewer gravitating toward the Milner Street PS (refer to master plan item CCIS2.2). It can be considered to upgrade the PS, rising main and outfall sewer (master plan items CCIS2.2, CCIS2.3 & CCIS2.4) as part of the construction of the development as these items runs through the development area.

For the development of Area B the following upgrades are required:

- Link services items CCIS4.2 & CCIS4.3 to connect the internal sewer network of the development area to future PS Cl2, and
- Future PS Cl2 (master plan item CCIS4.4) and rising main (master plan item CCIS4.5) to service the larger drainage area.



Stormwater

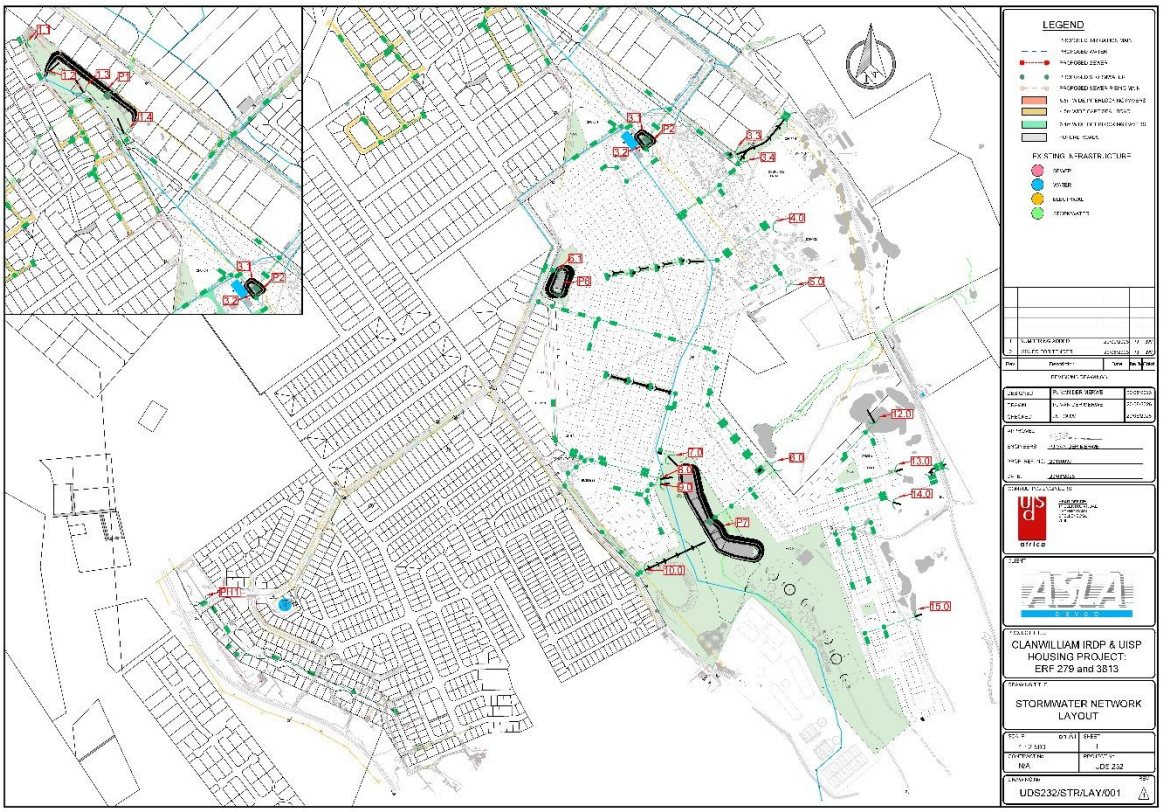
An underground piped stormwater system will be provided to accommodate for the minor storm events (up to RI 1: 5 years). The major storm events will be accommodated within the street reserves. Stormwater run-off will be channelled to the

existing Jan Dissels River flowing to the east of the proposed development using existing non-perennial river after it was detained and controlled released on an open space erf specifically created for stormwater control inside the development. Six other outlets on the eastern side will be constructed where stormwater pipe outlets will release stormwater next to roads and infrastructure. The degraded wetland on the western side and north of the WWTW with its greater open space area will be used to collect the existing stormwater released from the development on the western edge and other generated stormwater on the development. Building rubble and litter, as well as alien invasive trees will be controlled and eradicated from this area.

The stormwater infrastructure, comprising 21 headwalls, four attenuation ponds and a piped connection within the central valley-bottom wetland system, and the refurbishment and expansion of the WWTW, with a new 1.5 Ml/day module and the upgraded works intended to treat at least 3.6 Ml/day at peak, were assessed. With mitigation, the construction impacts and the operational impacts of the stormwater system are of Low significance. Combined with the Wetland Rehabilitation and Management Plan (Delta Ecology, 2026), the stormwater design offers an opportunity to improve the central wetland, which currently receives untreated stormwater from the informal settlement and township.

Stormwater will be collected by kerb inlets and underground pipes designed for the 1:5-year event, with larger events conveyed in the road reserves, and discharged through headwalls into the retained wetland system and towards the Jan Dissels River (UDS Africa, 2026b; Enviro-EAP, 2026) (**Figure 2-2**). The conceptual layout showed 10 headwalls, most discharging towards the Jan Dissels River, two directly into the wetland and two upstream of it (UDS Africa, 2026a). The tender-stage layout has 21 numbered headwalls, with design discharges of 17 to 843 l/s through 375 to 750 mm pipes, and four attenuation ponds (Ponds 1, 2, 6 and 7) (UDS Africa, 2026b). Overflow from Wetland 1 to Wetland 2 (both form part of the unchannelled valley-bottom wetland system) will be piped beneath the golf course.

The ponds were sized with the Abt and Grigg method to attenuate the 1:100-year peak inflow to the post- development 1:2-year flood peak (UDS Africa, 2026b). Pond 7, the largest, provides 4 853 m³ of storage against 2 913 m³ required and reduces a 1:100-year inflow of 5 863 l/s to 209 l/s. Pond 1's designed outflow (417 l/s) is marginally above its allowable rate (410 l/s). Each pond outlet is a field inlet or headwall with an open top for emergency overflow.



Roads

Access to the proposed development will be provided from the existing Bloekom Avenue, south of the proposed development, Denne and Buitekant Street to the west and from Oranje, Protea and Viooltjie Streets to the north. The internal roads (main access road 16m wide and other internal roads 10m wide) will consist of surfaced streets.

Environmental Sensitive Areas and No Go Areas Map

CHAPTER 2

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

It deals with issues relating to the implementation of the EMP.

2.1 Organizational Structure

The organizational structure identifies and defines the responsibilities and authority of the various persons and organizations involved in the project. All instructions and official communications regarding environmental matters must follow the organizational structure.
The Environmental Official (EO), to whom the Engineer's Representative (ER) and/or Environmental Control Officer (ECO) must report and interact, must be the responsible client representative.

The EMP must be an agenda item at the monthly site and operations meetings and the responsible client representative(s) may attend these meetings in order to provide input with respect to compliance with the EMP.

2.2 Responsibilities and Functions of the Environmental Control Officer

The ECO will be responsible for monitoring, reviewing and verifying compliance with the EMP and/or EA by all contractors and site management during site visits.

The ECO duties in this regard will include the following:

With the assistance, where necessary of the ER, to ensure all necessary environmental authorizations and permits have been obtained and are available and visible on site at the ER offices.

- monitor and verify that the EMP and/or EA is adhered to at all times and by taking action if the specifications are not followed;

- conduct the initial environmental awareness training for construction employees before construction commences onsite;
- monitor and verify that environmental impacts are kept to a minimum;
- review and approve construction method statements, with input as appropriate from the ER;
- assist the contractor in finding environmentally responsible solutions to problems;
- report on the environmental issues at the site meetings and other meetings that may be called regarding environmental matters, if requested by ER;
- inspect the site and surrounding areas regularly with regard to compliance with the EMP and/or EA;
- monitor the environmental awareness training for all new personnel coming onto site;
- advise management on the removal of person(s) and/or equipment not complying with the specifications, after collaboration with the ER. Recommendations must be recorded by the ER in Site Instruction Book.
- ensure that activities on site comply with known legislation of relevance to the environment;
- recommend the issuing of penalties via the developer for contraventions of the EMP and/or EA;
- keep a photographic record of progress on site from an environmental perspective; and
- Undertake a continual internal review of the EMP and/or EA and submit a report to the developer and the responsible DEA&DP Environmental Official as according to EA conditions.

2.3 Agreed Work Plan and Site Visit Schedule of ECO

After initial construction start-up site visit it is recommended that an ECO site visit be conducted once a month during construction and annually during operation.

Information recording activity on site, and any guidelines or instructions emanating there from will be routinely made available electronically to the developer and applicable contractors and a copy of the report must be available at the site office.
Clearly matters of urgency or immediate action may be channelled appropriately on an urgent basis.

2.4 Site Manager

The site manager will have the following environmental control responsibilities:

- In conjunction with the ECO will present the environmental education programs to all persons employed on site.
- Consult with the ECO, landowner, developer and any contractor to resolve all environmental issues.
- Issue any instructions from the ECO to the management team via a formal site instruction book or appropriate management tool used for the purpose.
- Take responsibility for the penalty system. The ECO and developer recommendations must be considered when deciding whether or not to impose a penalty.
- The engineer will, via the ECO actions, be accountable for the overall implementation of the Environmental Management Programme.
- Keep a site diary and complaints register

2.5 Contractors

As part of any tender, the tendering contractor must submit a first draft of a contractor's programme, to the developer which must include the environmental considerations to be followed prior to appointment. The appointed Contractor's representative will have the following responsibilities:

- Ensure that all staff is familiar with the Environmental Management Programme, which explains the environmental policy for the project.
- Allow for sufficient time between surveying the exact locations where services will be intended and actual construction, for the ECO to facilitate and instruct for the removal of plants, seeds and cuttings if necessary.
- The contractor must keep his personnel fully aware of environmental issues and ensure they show adequate consideration to all environmental aspects.
- Establish environmental signs to be erected on the construction site at locations identified by the ECO and approved by the engineer.

- Be responsible for the cost of the restoration of any damage caused, in environmentally sensitive areas, as a result of contractor responsibility regarding negligence. This must be done in accordance with the engineer / ECO's specifications.
- Take responsibility and active steps to avoid any increase in the fire hazard.
- The contractor must take responsibility for implementing all the relevant provisions of the EMP, or if he encounters difficulties with the specifications, he must discuss alternative approaches with the ECO and engineer prior to proceeding.

Failure to comply with the EMP may result in the application of fines as set out, and any reported non-compliance may result in the suspension of work or termination of a contract.

2.6. Record keeping of activities, inclusive of recording of non-compliances and corrective actions

The ECO or ER must keep a record of all activities relating to environmental matters on site, including:

- method statements received and approved;
- issues arising on site;
- cases of non-compliance with the EMP;
- corrective action taken and penalties issued.

This information will be recorded in an appropriate manner by the ECO or ER in a site diary, registers, issues/warning book, etc.

2.7 Compliance with other legislation

It is important that all on site staff are aware of other relevant legislation that may relate to the activities taking place on site, especially local authority required compliances.

CHAPTER 3

Applicable Legislation, Policy and Environmental Principles

3.1. Applicable Legislation Identified

1. ADVERTISING ON ROADS AND RIBBON DEVELOPMENT ACT, 21 OF 1940
2. BASIC CONDITIONS OF EMPLOYMENT ACT, 75 OF 1997
3. COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT, 130 OF 1993
4. CONSERVATION OF AGRICULTURAL RESOURCES ACT, 43 OF 1983
5. CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996
6. EMPLOYMENT EQUITY ACT, 55 OF 1998
7. ENVIRONMENT CONSERVATION ACT, 73 OF 1989
8. ENVIRONMENT CONSERVATION ACT, 73 OF 1989: WESTERN CAPE NOISE CONTROL REGULATIONS
9. FENCING ACT, 31 OF 1963
10. HAZARDOUS SUBSTANCES ACT, 15 OF 1973
11. LABOUR RELATIONS ACT, 66 OF 1995
12. NATIONAL BUILDING REGULATIONS AND BUILDING STANDARDS ACT, 103 OF 1977
13. NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 107 OF 1998
14. NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 39 OF 2004
15. NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 10 OF 2004
16. NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 59 OF 2008
17. NATIONAL FORESTS ACT, 84 OF 1998
18. NATIONAL HEALTH ACT 61 OF 2003
19. NATIONAL HERITAGE RESOURCES ACT, 25 OF 1999
20. NATIONAL VELD AND FOREST FIRE ACT, 101 OF 1998
21. NATIONAL WATER ACT, 36 OF 1998
22. OCCUPATIONAL HEALTH AND SAFETY ACT, 85 OF 1993
23. TOBACCO PRODUCTS CONTROL ACT, 83 OF 1993

24. WATER SERVICES ACT, 108 OF 1997

CHAPTER 4

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

4.1. Monitoring and Auditing

4.1.1 Introduction

In keeping with current environmental and associated legislation, all environmental management procedures and actions must be reviewed and refined on an ongoing basis.

This is in accordance with the dynamic nature of environmental management and allows for the timeous identification and mitigation of issues as they come to light.

The process of review and refinement, built into the requirements of the EMP, is known as monitoring and auditing. The audit must assessment of the effectiveness of monitoring and management arrangements after implementation.

4.1.2. Roles and responsibilities

Efficient implementation of the performance specifications, effective monitoring and auditing, as well as clear responsibility and accountability allocation requires that various role-players be defined for the construction implementation project.

Depending on the nature and scale of a project, implementing teams could be composed of any number of role-players, each with their own specified responsibilities.

Therefore, for the purpose of this document, the following role-players are defined, based purely on responsibility and accountability allocation. The actual designation of role-players may vary, but the responsibilities will largely remain as stated.

4.1.2.1. Developer/landowner or custodian of the land

The developer/landowner or custodian of the land is the person or organization with decision making capacity for the land in question, and thus ultimately accountable for what takes place on that land and implementation of the EA and EMP requirements.

4.1.2.2. Contractor

Contractors are appointed to undertake the works as specified in the contract. It is the responsibility of the contractor to do whatever is necessary from their side to ensure that he or an appointed advisor is well versed in environmental studies, so that they may accurately and efficiently carry out the requirements of the environmental specification.

The contractor is liable for any and all remedial work required in terms of the environmental specification, resulting from his environmental negligence, mismanagement and / or non-compliance.

4.1.2.3. Environmental Control Officer

An environmental control officer will manage and undertake monthly environmental inspections for the duration of the construction phase of the project as required.

The contractors or line management are answerable to the ECO for non-compliance with the performance specifications. Issues of non-compliance raised by the ECO/EO must be taken up by the project manager, and resolved as per the conditions of his contract.

Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation and not allowed for in the performance specification) must be endorsed by the project manager.

4.2. The Monitoring Procedure

Environmental monitoring is the continuous evaluation of the status and condition of environmental elements. Its purpose is to detect change that takes place in the environment over time and involves the measuring and recording of physical, social and economic variables associated with development impacts.

Many techniques for environmental monitoring have been proposed, each detailing a specific protocol. Regardless of which technique is used, the ultimate aim is that each environmental management specification be checked by means of a system in which a score may be allocated for:

- Full compliance
- Satisfactory performance
- Unsatisfactory performance and
- No action taken

Completed monitoring reports will be submitted to the project engineer, developer/landowner and the contractor, who will attend to issues. These reports must be kept on file and be made available upon request by any environmental authority requesting such.

All persons employed, the contractor or his sub-contractors, must abide by the requirements of these performance specifications as they apply to the works. Any employees, the contractor or his sub-contractors found to be in breach of any of the environmental specifications, may be ordered to vacate the site forthwith and/or be subject to a disciplinary process.

The order may be given orally or in writing by the ECO. Confirmation of an oral order will be given as soon as practicable, but lack of confirmation in writing must not be a cause for the offender to remain on site, or not be subject to a disciplinary process. Supervisory staff, the contractor or his sub-contractor may not direct any person to undertake any activities which would place such person in contravention of the EMP, legislation and specifications.
The contractor and staff are deemed not to have complied with the performance specifications if:

- There is evidence of wilful or accidental contravention of any specification included in the specification;
- There is evidence of the contractor carrying out activities not permitted in terms of the EMP, contract and / or the specification;
- There is evidence of environmental negligence and / or mismanagement resulting in negative impacts on the environment;
- Has failed to meet with the requirements of the approved schedule.

The contractor and developer/landowner will be informed via ECO monthly reports, as well as by means of direct instruction (if necessary) as to what corrective actions are required in terms of environmental compliance.

Disregard for an instruction, and failure to respond adequately to complaints from the public will be construed as non-compliance. Non-compliance may lead to parties being penalised.

In more serious cases, the ECO may give notice, and halt operations until such a time that the corrective action is taken and the site complies with the performance specifications.

In cases of persistent non-compliance, the contractor or staff may be evicted from site after disciplinary process is followed. Only the developer/landowner may issue such instruction, retaining any costs required to remedy situations perpetuated by environmental negligence, mismanagement and / or non-compliance.

4.3. The Auditing Procedure

Environmental auditing is the process of comparing the impacts predicted with those which have actually occurred during implementation.

An environmental performance audit examines and assesses practices and procedures which, in the

event of failure, would cause an environmental impact or result in an environmental risk. During each of the lifecycle phases, various issues will be monitored. The performance audit will ensure that the monitoring was correctly undertaken and that compliance was best achieved.

To these ends the project will be audited versus this EMP for effectiveness. ISO/SANS 19011:2018 auditing standards will be applied. External Audit in fulfilment of Regulation 34 of the NEMA EIA Regulations, 2014 (as amended) will be conducted by an independent person.

Audits will be undertaken annually and/or at completion of the construction phases. The audit must assessment of the effectiveness of monitoring and management arrangements after implementation. Audit reports will be submitted to management, who will attend to all noted issues and to DEA&DP.

These reports must be kept on record and be made available upon request by the developer/landowner/custodian of the land and any environmental authority or I&AP requesting such.

4.4 Compliance Auditing and Monitoring Schedule/s

Construction Phase	**Submission of Audit Report To**
Monthly ECO compliance monitoring	Construction Site Manager
Annual ECO compliance monitoring	Developer and DEA&DP
Completion of Construction Phase ECO compliance monitoring	Developer and DEA&DP
Operational Phase	**Submission of Audit Report To**
Internal annual compliance auditing to be conducted by municipality	Municipal Manager
Annual internal audit report to be compiled by municipality	Report back to community forum on results of internal compliance auditing

4.5 Retentions and Penalties

It is recommended that a penalty retention system be combined with the penalty system to both motivate and compel the contractor to adhere to the EMP for the duration of the contract.

In this way incentives may be created to perform (i.e. in the form of the retention amounts that will only be paid to the contractor at the end of the contract), without creating the misunderstanding that adherence to the EMP is optional.

Persistent non-compliance will not only result in the contractor forfeiting any retention amount, but he will also be fined.

Of importance is that the contract specifies exactly how the penalty and retention system will operate, as well as how any funds resultant from retentions and penalties will be utilised.

All such funds must be used to improve environmental conditions on the site in general.

4.5.1. The retention system

For this system, a percentage value for each of the sections priced for in the environmental bill of quantities is retained until the full completion of the contract works.

If the monitoring process reveals persistent and/or wilful non-compliance with any aspect of the environmental performance specifications, then the full retention associated with that particular item will be withheld.

The project may then apply these retained funds to rectify the problem on site possibly making use of other or alternate resources at his disposal.

At the end of the contract or action, all remaining environmental retention amounts will be paid out to the contractor or staff pending approval by the ECO, after having confirmed full compliance with the relevant performance and rehabilitation specifications.

4.5.2. Penalty System

A system of penalties will be introduced to reinforce environmentally sensitive and prudent behaviour. The maximum penalties that will be fined per incident that may be enforced are listed below. The penalty amount will be determined (inter alia) by the severity of the offence.

Non-compliance	R 5 000.00 (ex VAT) per non-compliant act, per day until compliance is achieved
Casual Litter on site resulting from operation	R250 / offence / day
Disposal of any litter or construction material in non-specified area or by non-compliant means	R5000 / m^3/per day
Dumping of cement, concrete, fuel or oil in an area or other than that authorised and suitable	R10 000 per offence/day
Failure to use portable / toilets	R100 / observed incident or evidence of human excrement on site

In addition to the above, all costs incurred by the client/developer to remedy any damage will be the responsibility of the offender.

Should the monitoring process reveal acts of persistent and / or wilful non-compliance with the environmental performance specifications, then the contractor or staff member will be fined according to the specified value of that item. The ECO will issue the fine to the offender on which the value of the fine will be prescribed. All penalties will be paid directly to an environmental charity / NGO as identified by the ECO.

4.6. Method Statements

Contractors must provide written statements if requested by the ECO on environmentally sensitive aspects of the contract. Environmentally sensitive aspects include by example excavations, work close to sensitive areas, collection and storage of top soil and vegetation, erosion control, wash water control, waste control, etc.

Methods Statement (MS) Content

Examples of sensitive aspects that may require method statements will be requested by the ECO. It is important to note that the ECO may request further methods specification, if it be deemed necessary in his view.

- MS to specify the construction.
- MS to indicate the timing and sequence of events to follow in sensitive areas to give sufficient time for the ECO to survey these areas and remove plants.

The Method Statement must include a site plan, preparatory steps, materials, and supervision details.

Example of Environmental Method Statement Form:

METHOD STATEMENT

CONTRACT:……..……... **DATE:**……..

PROPOSED ACTIVITY (give title of method statement and reference number from the EMP):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:	End Date:

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated maps and plans where possible):

Note: please attach extra pages if more space is required

DECLARATIONS

1) ENVIRONMENTAL SITE OFFICER/ ENGINEERS REPRESENTATIVE [select correct term]

The work described in this method statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

_____ _____

(signed) (print name)

Dated: _____

2) PERSON UNDERTAKING THE WORKS

I understand the contents of this method statement and the scope of the works required of me. I further understand that this method statement may be amended on application to other signatories and that the ECO / EO and ER will audit my compliance with the contents of this method statement

_____ _____
(signed) (print name)

Dated: _____

3) APPROVING AUTHORITY (Engineer)

The works described in this method statement are approved.

_____ _____ _____
(signed) (print name) (designation)

Dated: _____

CHAPTER 5

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

5.1. Good Housekeeping

The developer/landowner will ensure the maintenance of “good housekeeping” practices during operations.

This will help avoid several disputes regarding responsibility and will allow for the smooth running of the operation as a whole.

Good housekeeping extends beyond the environmentally sensitive construction methods to include the care for and preservation of the surrounding environment.

5.2 Record Keeping

The developer/landowner will ensure that a filing system, identifying all documentation related to the EMP, is established.

A list of reports likely to be generated during the project is set out below.

All applicable documentation must be included in the environmental filing system catalogue or document retrieval index.

- Approved EMP, authorizations, licenses or permits;
- Final design documents and diagrams issued;
- All communications detailing changes of design/scope that may have environmental implications;
- Daily, weekly and monthly site monitoring reports;
- Complaints register;
- Environmental training manual;
- Environmental training attendance registers;
- Incident and accident reports;
- Emergency preparedness and response plans;
- Copies of all relevant environmental legislation;
- Permits and legal documents as part of emergency preparedness teams e.g. fire teams, etc.;
- Crisis communication manual;
- Disciplinary procedures;
- Monthly site meeting minutes during construction;
- All relevant permits;
- All method statements for all phases of the project.

5.3 Document Control

The developer/landowner will be responsible for establishing a procedure for document control.

The document control procedure must comply with the following requirements:

Documents must be identifiable by organisation, division, function, activity and contact person;
Every document must identify the person and their positions, responsible for drafting and compiling the document, for reviewing and recommending approval, and final approval of the document for distribution;

All documents must be dated, provided with a version number and reference number, filed systematically, and retained for a specified period.

The owner will ensure that documents are periodically reviewed and revised where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMP are performed. All documents will be made available to the external auditor.

5.4 Reporting Requirements

All advice and recommendations made by the ECO must with the project engineer/engineers compliance be recorded on site in the site instruction book/ suitable register for his attention.

All hazardous spills will need to be documented and reported to DWS and other relevant authorities.

The applicant must ensure that "Any emergency incident, originating at the facility, which falls within the definition of section 30(1) of the National Environmental Management Act (NEMA), Act 107 of 1998, must be dealt with by the facility in accordance with Section 30 of NEMA". In the event of any incident the facility must ensure containment by the responsible person and report the incident to the West Coast District Municipality, Cederberg Local Municipality and DEA&DP.

CHAPTER 6

6.1. Public Communication Protocols

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

The developer/landowner must be responsible for regulating public access to information and compliance reporting.

The developer/landowner must respond to third party or public queries and complaints.

The developer/landowner must also be responsible for maintaining the compliance register to record complaints received and action taken.

CHAPTER 7

This section of the report is included in compliance with Section 24 N 2 (d - g) and 3 (a - b) of the National Environmental Management Act 107 of 1998.

Specialist Recommendations to be adhered to before and During Commencement of Construction, Operational and Decommissioning Phases

Terrestrial Biodiversity

CONCLUSION AND RECOMMENDATIONS

The sampling and analysis of the site, provides suitable data and results to present an informed decision on the local ecology and terrestrial biodiversity features. The lists of species for the site are based on those observed at the site as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach. During the site visits, the different biodiversity features, habitat, vegetation and landscape units present were identified and recorded in the field. Walk-through-surveys were conducted of representative habitats and areas of interest and species observed were recorded. Searches for listed species of conservation concern at the site were conducted, but none were observed which required the recording of their location. The study recorded low and very low sensitivity areas within the development area. No terrestrial CBA or ESA were mapped on the impact area.

Please refer to the Aquatic Biodiversity assessment for more detail on the mapped Freshwater ecologic features and buffers with management and mitigation measures to protect them. Included in the Environmental Management Plan is management and mitigation measures too protect the groundwater resources.

No additional survey or further assessment is in the authors view recommended.

The proposed area as per the Site Development Plan will have relatively little terrestrial biodiversity and ecological impact on sensitivity areas and the surrounding terrestrial biodiversity features provided that the development stays within the Site Development Plan area and appropriate mitigation measures included in the impact table above are included in the EMPr and adhered to.

Aquatic Biodiversity

CONCLUSION AND RECOMMENDATIONS

Enviro-EAP (Pty) Ltd was appointed to undertake a Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) analysis of the freshwater and riparian resources.

A site development plan layout amendment is required. The valley bottom wetland east of the development and golf course must be protected by a 15m wide buffer. In order to achieve this, the layout must be amended and the sewerage pipeline and pump station associated with an access road must be removed from the Site Development Plan in order to protect it. This will ensure that the development is appropriate and will not affect the status of the aquatic biodiversity features identified on site as a result of existing disturbances to the non-perennial river. Rehabilitation of the wetland by attending to alien invasive plant clearing and removal of litter and building rubble inside the wetland and creating of buffer around wetland of at least 15m, except for the GAP housing portion on the north and northeast of the wetland will protect the one wetland mapped. Creating stormwater detention after culvert before stormwater is released into the existing drainage line and valley bottom wetland releasing stormwater on site into the Jan Dissels River will protect the downstream valley bottom wetland. Rehabilitation of the existing stormwater pond by reshaping it and removal of alien invasive plants in the upper section of the valley bottom wetland and drainage line where into the discharged stormwater from the bigger wetland will be discharged before detained in on site stormwater pond on specially created open space erf in the development footprint will protect the valley bottom wetland and stormwater discharged into the Jan Dissels river.
No Freshwater Ecosystem Priority Area (FEPA) was mapped which confirmed the low impact.

The peer review has identified a number of short-comings in terms of alignment with best practice in the field of aquatic biodiversity assessment. These are what EnviroSwift believes to be an incorrect classification of the on-site aquatic feature as a drainage line whereas it is in fact a wetland. This was corrected in this peer review report and as identified assessed as a valley bottom wetland. When assessed in terms of compliance with the gazetted Protocol for Aquatic Biodiversity Assessment the report is found to have the following critical flaws:

- Drawings such as an SDP that show the extent of the development and whether any aquatic features are being retained were absent in the Enviro-EAP Aquatic Biodiversity Assessment report. This was corrected and included as figure 2.
- Failure to consult the WCBSP (2023) as this would have confirmed the provincial biodiversity conservation importance of the downstream, receiving aquatic features (indicated as an Aquatic CBA). When the report was drafted, the 2017 WCBSP was applicable. It was however updated in this report to the 2023 version and the Aquatic ESA mapped on the assessment area was corrected in this report.
- Lack of proof of the methods used to classify and delineate the on-site freshwater features such as auger results. Had auger samples been taken within the feature, the lack of evidence of alluvial processes would have been identified and the feature correctly identified as a wetland. The auger sampling and delineations done by EnviroSwift was used to update this peer reviewed report.
- Failure to recommend the minimum buffer width; and. The recommended 15m buffer, except for the GAP housing areas in north and north east of the wetland was accommodated in the SDP. Furthermore, the SDP was amended and the road, stormwater pipe and sewerage pipeline on the downstream wetland east of the golf course was removed from the site development plan. An open space erf was created in the layout to accommodate a stormwater detention pond before stormwater is discharged into this wetland system. A 15 buffer area is therefore not required in this section as the development infrastructure and roads was removed from the preferred layout.
- Failure to present a reasoned authorisation opinion based on a thorough evaluation of the assessment criteria that comprises an Aquatic Biodiversity Assessment. This was corrected in the updated peer review report.

Aquatic Biodiversity Impact Assessment Addendum_Clanwilliam Housing and WWTW V1.0
Van Zyl, K. and Morton, R. 2026. Aquatic Biodiversity Impact Assessment Addendum: Stormwater Management and WWTW Expansion, Clanwilliam Housing Development, Remainder Erf 279, Clanwilliam V1.0. Delta Ecology. RSA.
The wetland systems associated with the proposed Clanwilliam Housing Development are seriously modified (PES E). The central valley bottom wetland system currently receives substantial volumes of polluted stormwater, and possibly sewage, from the informal settlement and township upslope, which flow through the wetland and on to the Jan Dissels River untreated to a large degree. The southern seep wetland currently receives treated (and for many years untreated) effluent from the WWTW. Water quality sampling showed that the Jan Dissels River downstream of the works is strongly influenced by treated effluent, with ammonia at levels likely to cause chronic toxicity to sensitive aquatic biota, eutrophic nitrogen concentrations and increased E. coli.

The proposed stormwater design, combined with the rehabilitation of the central valley bottom wetland system, is supported, mainly because the water flowing from the wetland system to the Jan Dissels River is expected to be of better quality with formalized stormwater treatment than it is at present. This depends on the stormwater from both the new development and the existing settlement being treated before it enters the wetland, on peak flows being attenuated to pre-development levels, on outlets and ponds being placed outside the wetland and discharging diffusely, and on the system being maintained and the Wetland Rehabilitation and Management Plan being implemented.

The refurbishment and upgrade of the WWTW aim to treat the effluent to the Special Limit Values. They are expected to improve the quality of treated effluent reaching the Jan Dissels River compared with the long record of non-compliance at the works, and are supported and encouraged. Without mitigation, the effluent quality impact of the expanded works is of High significance. However, given the history of non-compliance, and because the additional capacity will need additional operational support, the impact of effluent quality to the Jan Dissels River remains of Medium significance after mitigation. Compliance must be secured through a specialist process engineer, a dedicated works manager and regular effluent monitoring. The increased discharge will also alter the flow in the river from the current status quo. This reach of the Jan Dissels River is already affected by the abstraction of potable water for the town upstream of the effluent release, and its floodplain downstream of the abstraction point has dried out, and the growth of the town that the expansion provides for over the next 15 years is likely to require additional abstraction. Downstream of the works the river is not natural: it flows past the town and through farmland for about 4.7 km before joining the Olifants River. These factors moderate the significance of the change in flow. The Olifants River, which the Jan Dissels joins about 4.7 km downstream of the release, is regulated by Clanwilliam Dam and is unlikely to be measurably affected in flow, although some water quality impairment is possible.

Two separate quantities need to be considered: the treated effluent generated by the housing development itself, estimated at about 640 m³/day, and the full 1.5 Ml/day expansion of the works, which provides for the growth of the town. These are assessed separately as Impacts 8a and 8b. After mitigation, the housing development's share is of Low significance, because it is small, only part of it is likely to reach the river while effluent continues to be reused for irrigation, and the lower river is already affected by abstraction. The full expansion remains of Medium significance on a precautionary basis, because it is larger and increases progressively, and without a water balance and current flow data the proportion reaching the river cannot be reliably quantified. Given the extent of abstraction, the additional discharge could be seen as partly offsetting the existing dry-season flow deficit in the lower Jan Dissels River (Van der Berg, 2008), but this cannot be confirmed without current flow and abstraction data, and the quality of that water remains the main concern. The southern seep, which has received effluent for many years, is likely to expand as the volume increases, but this is of Low significance, given the degree of disturbance it already exhibits (hydrology and water quality critically modified, PES E). A water balance would show how much of each reaches the river, but it was not available for this assessment, so the change in flow has been assessed using a conservative upper-bound scenario. If DWS require a hydrological assessment for the expansion of the WWTW, this report may need to be updated.

It is the opinion of the specialist that the proposed Clanwilliam Housing Development, including its stormwater infrastructure and the associated refurbishment and expansion of the Clanwilliam WWTW, is acceptable from an aquatic biodiversity perspective and may be authorised. This is on

condition that the mitigation measures in Section 6 are implemented and that the upgraded WWTW consistently meets the Special Limit Values for discharge to the Jan Dissels River.

The development will formalise housing for residents of the existing informal settlement, whose untreated stormwater, waste and possibly sewage currently drain into the central valley-bottom wetland system and on to the Jan Dissels River. Formal services, the treatment of stormwater from both the new development and the existing settlement, and the rehabilitation of the wetland offer a real opportunity to improve the condition of the wetland and the quality of water reaching the river. The refurbishment and upgrade of the WWTW, which has a long record of non-compliance, is likewise necessary, and is expected to improve the quality of the effluent reaching the Jan Dissels River compared with the status quo. Neither benefit is assured, however. The quality of treated effluent reaching the Jan Dissels River and the change in flow from the full expansion of the works remain of Medium significance after mitigation, and the river downstream of the works is already strongly influenced by effluent. Careful implementation of the recommended mitigation, monitoring and oversight is therefore essential. The following should be conditions of the environmental authorisation and the water use licence:

- The upgraded WWTW must be operated to meet the Special Limit Values (GN 665 of 2013) for discharge to the Jan Dissels River, and the refurbished works must be shown to meet them before the new module is commissioned.
- A suitably qualified wastewater process engineer must oversee the commissioning of the works and audit its performance, a dedicated works manager must be appointed, and staff, maintenance and funding must be increased in line with the additional capacity.
- A full WULA must be submitted for the section 21 (c) and 21 (i) water uses, together with the section 21 (e) and 21 (f) uses, and must include a monthly water balance for the works (inflow, irrigation and discharge to the river).
- The stormwater system must attenuate post-development peak flows to pre-development levels, treat stormwater from both the new development and the existing informal settlement before it enters the wetland, and place outlets and any new ponds outside the wetland where possible, with a settling pond or forebay before the discharge into the wetland at Pond 7, energy dissipation and diffuse discharge.
- The Wetland Rehabilitation and Management Plan (Delta Ecology, 2026) must be implemented for the central valley-bottom wetland system, to achieve its REC of D, and the reed bed of the southern seep must be retained as a polishing wetland.
- An irrigation management plan must be prepared for the golf course.
- Before construction starts, a suitably qualified aquatic specialist and the appointed engineers must prepare a comprehensive monitoring plan, covering effluent quality and volumes, water quality upstream and downstream of the works and in the Olifants River, SASS5 and fish, and the extent of the southern seep. SASS5 and fish baseline surveys must be completed before construction. Monitoring results must be reported to DWS and the municipality.
- An Environmental Control Officer must oversee construction and compliance with the EMPr.

If post-refurbishment effluent results, the water balance or a hydrological assessment required by DWS show conditions materially different from those assumed in this addendum, the assessment should be reviewed.

Animal Species

CONCLUSION AND RECOMMENDATIONS

The sampling and analysis of the site during the optimum season and year, provides suitable data and results to present an informed decision on the local animal species. The lists of species for the site are based on those observed at the site as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach. During the site visit, the different biodiversity features, habitat, vegetation, and landscape units present were identified and recorded in the field. Walk-through-surveys were conducted of representative habitats and areas of interest and species observed were recorded. Searches for listed species of conservation concern at the site were conducted. Extensive habitat is however available for them to utilize outside the proposed vegetation clear area. There are wetlands east of the site associated to the Jan Dissels River and significant undisturbed indigenous vegetation in good quality to the south of the site and town and east towards the Jan Dissels river and beyond that the

Cederberge. The presence of sensitive habitats such as wetlands or pans and unique edaphic environments, such as rocky outcrops or quartz patches, such as SCC habitats are present and therefore was recorded and mapped.
The study recorded medium and low sensitivity areas within the study area. The development of the site would have a **Medium Negative** impact on animal species. The proposed clearing will have relatively little animal species impacts provided that appropriate mitigation measures included in the impact table above are included in the EMPr and adhered to.

No additional survey or further assessment is in the authors view recommended. Provided that activities are restricted to the property and the mitigation measures to reduce the impacts of the activities are implemented, then the activities are not likely to result in long-term degradation of the receiving environment or significant net loss of SCC animal species.

Heritage Impact Assessment

CONCLUSION
The broader Cederberg area is renowned for its rock art and significant associated archaeology. Clanwilliam and its access via the Botterkloof Pass road act as a gateway from the N7 into the rest of the Cederberg area. Clanwilliam retains a number of historic farmsteads in the area, as well as excellent examples of vernacular architecture and Provincial Heritage Sites all oriented along the structuring elements of Hoof Street, Park Street and Ou Kaapse Road. As noted above, Clanwilliam suffered when the community of Sederville was moved and their houses demolished and as a result, very little historic fabric remains within the Sederville area.

The proposed development site is predominantly underlain by the Nardouw Subgroup, specifically the Rietvlei Formation. Both the Nardouw Subgroup and the Rietvlei Formation are characterised by low palaeontological sensitivity, as they generally do not contain fossils of significant scientific or heritage value. This conclusion aligns with previous studies, which have consistently indicated that these formations are not typically rich in palaeontological resources. The potential impact of the proposed development on palaeontological resources is assessed as minimal, with a low likelihood of encountering any significant fossil material during construction. Additionally, the Goudini, Skurweberg, and Rietvlei Formations, which are also present in the broader area, share similarly low palaeontological sensitivity. As a result, no specific mitigation measures are required for the proposed residential development. While no specific mitigation strategies are required, it is recommended that the Chance Fossil Finds Procedure be implemented during the construction phase. This protocol will ensure that any unexpected fossil discoveries are promptly reported and appropriately managed, safeguarding potential heritage resources. As noted above, the archaeology field assessment did not identify any visible evidence of the supply depot and field hospital located on the Clanwilliam commonage from the South African War mentioned above, although buried evidence of this infrastructure may be present beneath the ground surface. This development activity comprises infill development within the existing urban edge of Clanwilliam. The area proposed for development is located between two areas that have been identified as having historic value and are proposed as <Heritage Zones= (Park Street precinct - Zone E - and Sederville precinct - Zone G) in the Clanwilliam SDF (2023, Figure 7). In order to ensure that the proposed development fits into this infill space, the following recommendations are proposed:
- Open space is retained in the area indicated between the Park Street precinct and the Sederville precinct in order retain a remnant of the Clanwilliam commonage, and to provide these significant historic precincts and remnant historic built fabric with sufficient breathing space
- If the above is not possible, it recommended that these erven remain in their current form and layout and that the proposed subdivision and re-organisation of these erven is not approved (erven 1422, 359, 148, 147, 144, 143)
- Larger erven are positioned in the space between Zone G and Zone E
- Architectural guidelines are developed for the area between Zone G and Zone E
- Adherence to the historic grid alignment oriented around Park Street, Hoof Street and Ou Kaapse Road
- Sufficient breathing space and appropriate hierarchies in response to the significant heritage resources identified. In order to ensure that no impact to heritage resources occurs during the construction or operational phases of the development, recommendations are made below.
8. RECOMMENDATIONS
There is no objection to the proposed development from a heritage perspective on condition that:

- Open space is retained in the area indicated between the Park Street precinct and the Sederville precinct in order to retain a remnant of the Clanwilliam commonage, and to provide these significant historic precincts and remnant historic built fabric with sufficient breathing space. This would require the reallocation of approximately 50 GAP housing erven.
- If the above is not possible, it recommended that these erven remain in their current form and layout and that the proposed subdivision and re-organisation of these erven is not approved (erven 1422, 359, 148, 147, 144, 143)
- Due to the position of the proposed development between two areas that have been identified as having heritage value, additional design detail be submitted to HWC for approval as a condition of a positive comment on this HIA. The architecture of the proposed development should adhere to the Guidelines included as Appendix 3.
- The attached Chance Fossil Finds Procedure is implemented for the duration of construction activities
- Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. Heritage Western Cape (HWC) must be contacted immediately in order to determine an appropriate way forward.

Traffic Impact Assessment

CONCLUSIONS

The following can be concluded/summarised from the report:

1. This TIS accompanies the Application for Rezoning and Subdivision of Erf RE279, Clanwilliam.
2. The proposed development areas constitute Clanwilliam's Integrated Residential Development Programme (IRDP) and Upgrading of Informal Settlements Programme (UISP).
3. The total proposed subdivision includes 160x Residential Zone 1 erven, 1 155x Residential Zone 2 erven, 5x Community Zone 1 erven (1x Community Centre – 800 seats, 3x Crèche – 140 students, and 1x School – 500 students), 7x Community Zone 2 erven (Churches – 830 seats), 1x Community Zone 3 erf (Clinic – 443.4 m^2 GLA), 4x Local Business Zone 2 erven (± 3 026 m^2 GLA) and 1x Authority & Utility Zone erf (Police Station – ± 772.2 m^2 GLA).
4. The subject development areas are currently accessible via the residential streets leading to/from Ou Kaapse Way. Several additional and/or upgraded access points from/to the existing public road network are proposed for the future.
5. Traffic counts were conducted at 9 intersections in the vicinity of the proposed development areas on Thursday, 14 March 2024 during the AM (06:00 to 09:00) and PM (15:30 to 18:30) peak periods.
6. The proposed development has the potential to generate 523 AM peak hour trips (193 in, 330 out) and 471 PM peak hour trips (289 in, 182 out). These trips were distributed to/from the main streets intersecting Ou Kaapse Way.
7. Traffic analyses were performed for the most traversed sections of Graafwater Way, Main Road and Ou Kaapse Way as well as the three intersections with the highest total expected 2029 peak hour traffic volumes (Graafwater Way/Main Road, Ou Kaapse Way/Voortrekker Street/Denne Street, and Ou Kaapse Way/De Villiers Street/Bloekom Street). No upgrades are considered necessary to accommodate the total expected 2029 peak hour traffic. Nonetheless, mention is made of the potential benefits of the planned bypass road from the entrance of the town (Graafwater Way) to the industrial area (i.e. bypassing Main Road and most of the northern section of Ou Kaapse Way), which was identified as a need in the Cederberg Municipality Local Integrated Transport Plan 2020 – 2025.
8. For the new proposed local streets in the development areas, a road reserve of 10 m (typical for Class 5B local residential streets) is proposed for the residential areas, while 16 m (typical for Class 5B local commercial streets with on-street parking) is proposed for the main roads in Development Area 1 and Development Area 3.
9. The development areas' new/upgraded intersections are to be sign-controlled (i.e. stop or yield).
10. Further elements of the new streets, such as cross sections, right of way, kerb radii and sight distances are expected to be specified in the final road designs and will require separate assessment and approval based on the applicable standards.
11. Based on the information received, refuse removal will be carried out by the municipality via kerbside collection, as is current practice in the surrounding area.
12. The future parking layouts are expected to be addressed during each erf's building plan
13. application process and should comply with the requirements set out in the latest.
14. Due to its unpractical location, Clanwilliam's existing formal minibus taxi rank (situated on the corner of Mark Street and Visser Street) is not in use at present. Instead, minibus taxis operate

from the front of Spar on Main Road. The relocation of Clanwilliam's rank has been identified as a prioritised project in the municipality's transport plan, and a new site has been proposed along the eastern side of Ou Kaapse Way opposite Rooitee Street. Appropriate taxi/bus stops and turning facilities need to be provided where applicable.

15. Sidewalks of at least 1.5 m should be provided inside the road reserves of the new main streets to tie in with the existing and planned pedestrian facilities and/or routes.
16. Further formal public- or non-motorised transport facilities are not deemed necessary for the proposed development areas.

RECOMMENDATIONS

From the discussions provided in this report, it is recommended that the proposed development (Clanwilliam IRDP and UISP), indicated on the attached Subdivision Plan, be supported from a traffic impact perspective.

We trust that the Traffic Impact Assessment will be to your satisfaction and will gladly provide any additional information required on request.

HWC PROCEDURE: CHANCE FINDS OF PALAEONTOLOGICAL MATERIAL
June 2016

Introduction

This document is aimed to inform workmen and foremen working on a construction and/or mining site. It describes the procedure to follow in instances of accidental discovery of palaeontological material (please see attached poster with descriptions of palaeontological material) during construction/mining activities. This protocol does not apply to resources already identified under an assessment undertaken under s. 38 of the National Heritage Resources Act (no 25 of 1999).

Fossils are rare and irreplaceable. Fossils tell us about the environmental conditions that existed in a specific geographical area millions of years ago. As heritage resources that inform us of the history of a place, fossils are public property that the State is required to manage and conserve on behalf of all the citizens of South Africa. Fossils are therefore protected by the National Heritage Resources Act and are the property of the State. Ideally, a qualified person should be responsible for the recovery of fossils noticed during construction/mining to ensure that all relevant contextual information is recorded.

Heritage Authorities often rely on workmen and foremen to report finds, and thereby contribute to our knowledge of South Africa's past and contribute to its conservation for future generations.

Training

Workmen and foremen need to be trained in the procedure to follow in instances of accidental discovery of fossil material, in a similar way to the Health and Safety protocol. A brief introduction to the process to follow in the event of possible accidental discovery of fossils should be conducted by the designated Environmental Control Officer (ECO) for the project, or the foreman or site agent in the absence of the ECO

It is recommended that copies of the attached poster and procedure are printed out and displayed at the site office so that workmen may familiarise themselves with them and are thereby prepared in the event that accidental discovery of fossil material takes place.

Actions to be taken

One person in the staff must be identified and appointed as responsible for the implementation of the attached protocol in instances of accidental fossil discovery and must report to the ECO or site agent. If the ECO or site agent is not present on site, then the responsible person on site should follow the protocol correctly in order to not jeopardize the conservation and well-being of the fossil material.

Once a workman notices possible fossil material, he/she should report this to the ECO or site agent.

Procedure to follow if it is likely that the material identified is a fossil:

i. The ECO or site agent must ensure that all work ceases immediately in the vicinity of the area where the fossil or fossils have been found;
ii. The ECO or site agent must inform HWC of the find immediately. This information must include photographs of the findings and GPS co-ordinates;

iii. The ECO or site agent must compile a Preliminary Report and fill in the *Fossil Discoveries: HWC Preliminary Record Form* within 24 hours without removing the fossil from its original position. The Preliminary Report records basic information about the find including:

- The date
- A description of the discovery
- A description of the fossil and its context (e.g. position and depth of find)
- Where and how the find has been stored
- Photographs to accompany the preliminary report (the more the better):
  - ➔ A scale must be used
  - ➔ Photos of location from several angles
  - ➔ Photos of vertical section should be provided
  - ➔ Digital images of hole showing vertical section (side);
  - ➔ Digital images of fossil or fossils.

Upon receipt of this Preliminary Report, HWC will inform the ECO or site agent whether or not a rescue excavation or rescue collection by a palaeontologist is necessary.

v. Exposed finds must be stabilised where they are unstable and the site capped, e.g. with a plastic sheet or sand bags. This protection should allow for the later excavation of the finds with due scientific care and diligence. HWC can advise on the most appropriate method for stabilisation.

vi. If the find cannot be stabilised, the fossil may be collect with extreme care by the ECO or the site agent and put aside and protected until HWC advises on further action. Finds collected in this way must be safely and securely stored in tissue paper and an appropriate box. Care must be taken to remove the all fossil material and any breakage of fossil material must be avoided at all costs.

No work may continue in the vicinity of the find until HWC has indicated, in writing, that it is appropriate to proceed.

FOSSIL DISCOVERIES: HWC PRELIMINARY RECORDING FORM		
Name of project:		
Name of fossil location:		
Date of discovery:		
Description of situation in which the fossil was found:		
Description of context in which the fossil was found:		
Description and condition of fossil identified:		
GPS coordinates:	Lat:	Long:
If no co-ordinates available then please describe the location:		
Time of discovery:		

Depth of find in hole		
Photographs (tick as appropriate and indicate number of the photograph)	Digital image of vertical section (side)	
	Fossil from different angles	
	Wider context of the find	
Temporary storage (where it is located and how it is conserved)		
Person identifying the fossil	Name: Contact:	
Recorder	Name: Contact:	
Photographer	Name: Contact:	

Other specialist mitigation measures

- Undertake vegetation clearing only in identified and specifically demarcated areas.
- Search and rescue of important species must be conducted before clearing activities and site impacts occur.
- Access to roads and other areas must be controlled to avoid disturbance of areas outside the development footprint. Personnel should be restricted to the immediate clearing areas only.
- Monitor construction areas frequently for signs of erosion and if signs of erosion are detected implement repair and preventative measures immediately.
- Demarcate no-go areas before any land clearing occurs under the supervision of an ECO. Demarcation must be clearly visible and effective and no-go area must remain demarcated throughout construction phase.
- Site clearance along the border of the no-go areas must be done under the supervision of an ECO.
- Proposed construction activities must be limited to development footprint site.
- Dust must be managed and control on site.
- All construction vehicles must be serviced to prevent access exhaust emissions and noise.
- Working hours will be restricted to normal working hours.
- All noise and sounds generated by plant or machinery must adhere to SABS 0103 specifications for the maximum permissible noise levels.
- All plant and machinery are to be fitted with adequate silencers.
- No sound amplification equipment such as sirens, loud hailers or hooters may be used on site, after normal working hours, except in emergencies.
- If work is to be undertaken outside of normal work hours, permission must be obtained from the Local Authority
- All waste generated on site shall be collected and disposed of at a registered landfill facility;
- All safe disposal certificates and waste manifests from service providers to be kept and maintained;
- All staff to receive training on correct waste management practices.

This section of the report is included in compliance with Section 24 N 2 (d - g) and 3 (a - b) of the National Environmental Management Act, 107 of 1998.

Goal for Planning and Design

Overall Goal for Planning and Design: Undertake the planning and design phase of the development in a way that:

- Ensures that the design of the development responds to the identified environmental constraints and opportunities.
- Ensures that pre-construction activities are undertaken in accordance with all relevant legislative requirements.
- Ensures that adequate regard has been taken of any landowner concerns and that these are appropriately addressed through design and planning (where appropriate).
- Ensures that the best environmental options are selected for the project.
- Enables the development construction activities to be undertaken without significant disruption to other land uses in the area.
- In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

OBJECTIVE PD1: PRE-CONDITIONS

The following pre-conditions must be fully met before any construction activities may commence.

A site meeting between the contractors and the representatives of the developer must take place at least 5 days prior to commencement of construction work to:
- Demarcate micro construction sites, services routes, access routes, working boundaries and no-go areas;
- Discuss methods of stockpiling (vegetation, topsoil, sub-soil, shell-grit, etc);
- Check required toilets and fire-fighting facilities to be in place;
- Discuss and agree restricted access to construction site;
- Sign the Declaration of Understanding (Contractors);
- Discuss and agree communication channels including contact details;
- Discuss and agree areas of responsibility;
- Discuss and agree the demarcation and control of construction and building sites.

Minutes of this site meeting must be kept, and are to be distributed to all parties.
The no-go area must be verified by the ECO prior to commencement of construction. Construction may only take place within the boundaries of the site as the river is directly adjacent to the boundary of the site.

The following equipment must be on every micro or sub site before any construction work is due to start:
- Sufficient and suitable chemical toilet facilities.
- Sufficient refuse bins, which are weather and wind proof, with proper lids.
- 1 x type ABC (all purpose) 12.5 kg fire extinguisher

This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

As the Western Cape is a Water stressed province the use of municipal water for construction and operation must as far as reasonably practicable is to be done in accordance with Circular C1 of 2018: Water Crisis Response Guidelines for the Western Cape.

OBJECTIVE PD2: LAYOUT PLAN CONTROLS

The contractor must ensure that a copy of the signed approved layout plan is available at the office on site at all times for inspection by the developer or his representative(s). Any variation to the approved layout plan must be submitted to the developer for signed approval and may only be implemented once the approved variation is available to the contractor and available on site at the office. The variation of changes to the layout must be approved by the competent authority as per the EA conditions.

This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE PD3: ADVERTISING

The contractors may place no advertising material on the property unless prior formal written permission has been obtained from the landowner.

This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE PD4: METHOD STATEMENTS

To ensure all construction activities are undertaken with the appropriate level of environmental awareness to minimise environmental risk, in line with the specifications of the EMPr.

The environmental specifications are required to be underpinned by a series of Method Statements, within which the contractors and service providers are required to outline how any identified environmental risks will practically be mitigated and managed for the duration of the contract, and how specifications within this EMPr will be met. That is, the contractor will be required to describe how specified requirements will be achieved through the submission of written method statements to the site manager.

A method statement is defined as “a written submission by the contractor in response to the environmental specification or a request by the site manager, setting out the plant, materials, labour and method the contractor proposes using to conduct an activity, in such detail that the site manager is able to assess whether the contractor's proposal is in accordance with the specifications and/or will produce results in accordance with the specifications”.

The method statement must cover applicable details with regard to:
• Details of the responsible person/s
• Construction procedures
• Materials and equipment to be used
• Getting the equipment to and from site
• How the equipment/material will be moved while on-site
• How and where material will be stored

The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur
• Timing and location of activities
• Compliance/non-compliance with the specifications
• Any other information deemed necessary by the site manager

Method statements must be compiled for all activities which affect any aspect of the environment and should be applied consistently to all activities.

Specific areas to be addressed in the method statement pre, during and post construction may include:

General Administration:
• Designation of access road and protocol to be followed whilst the road is in use;
• Site establishment (which explains all activities from induction training to offloading, construction sequence for site establishment and the different amenities and to be established etc. Including a site camp plan indicating all of these). Preparation of the site (i.e. clearing vegetation, compacting soils and removing existing infrastructure and waste).

Soil Management:
• Soil management/stockpiling and erosion control.
• Excavations and backfilling procedure.

Water Management:
• Stipulate norms and standards for water supply and usage (i.e.: comply strictly to licence and legislation requirements and restrictions)
• Stipulate the storm water management procedures recommended in the storm water management method statement.
• Ablution facilities (placement, maintenance, management and servicing)

Solid Waste Management:
• Description of the waste storage facilities (on site and accumulative).
• Placement of waste stored (on site and accumulative).
• Management and collection of waste process.
• Recycle, re-use and removal process and procedure.

Liquid Waste Management:
• The design, establish, maintain and operate suitable pollution control facilities necessary to prevent discharge of water containing polluting matter or visible suspended materials into rivers, streams or existing drainage systems.
• Should grey water (i.e. water from basins, showers, baths, kitchen sinks etc.) need to be disposed of, link into an existing facility where possible. Where no facilities are available, grey water runoff must be controlled to ensure there is no seepage into wetlands or natural watercourses.

Dust and Noise Pollution:
• Describe necessary measures to ensure that noise from construction activities is maintained within lawfully acceptable levels.
• Procedure to control dust at all times on the site, access roads, borrow pits and spoil sites (dust control shall be sufficient so as not to have significant impacts in terms of the biophysical and social environments). These impacts include visual pollution, decreased safety due to reduced visibility, negative effects on human health and the ecology due to dust particle accumulation.

Hazardous Substance Storage:
• Ensure compliance with all national, regional and local legislation with regard to the storage of oils, fuels, lubricants, solvents, wood treatments, bitumen, cement, pesticides and any other harmful and hazardous substances and materials (South African National Standards apply.
• Lists of all potentially hazardous substances to be used. Appropriate handling, storage and disposal procedures.
• Prevention protocol of accidental contamination of soil at storage and handling areas. All storage areas, (i.e.: for harmful substances appropriately bunded with a suitable collection point for accidental spills must be implemented and drip trays underneath dispensing mechanisms including leaking engines/machinery).

Fire Prevention and Management:
• Fire management protocols and procedures to be put in place in accordance with relevant legislature.

Environmental Reporting:
• Incident and accident reporting protocol and procedures to be put in place on site in accordance with relevant legislature.

The contractor may not commence the activity covered by the method statement until it has been approved by the site manager, except in the case of emergency activities and then only with the consent of the site manager. Approval of the method statement will not absolve the contractor from their obligations or responsibilities in terms of their contract.

Failure to submit a method statement may result in suspension of the activity concerned until such time as a method statement has been submitted and approved.

This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

CONSTRUCTION PHASE
CIVIL CONTRACTOR

Goal for Construction Phase

Overall Goal for Construction:
Undertake the construction the development infrastructure in a way that:

- ensures that construction activities are properly managed in respect of environmental aspects and impacts;
- enables construction activities to be undertaken without significant disruption to other land uses in the area, in particular concerning noise impacts, dust, farming practices, traffic and road use, and effects on local residents;
- minimises the impact on the surrounding area;
- minimises impacts on avifauna and other fauna using the site; and
- minimises the impact on the heritage and historical value of the site
- minimise possible health impacts.

Objectives
In order to meet this goal, the following objectives have been identified, together with the necessary actions and monitoring requirements.

OBJECTIVE C1: WORKING HOURS

Civil & Construction Sites	
Mondays to Fridays	06h00 – 19h00
Saturdays & Public Holidays	06h00 – 17h00

Project Component/s	Development site;
Potential Impact	Surrounding landowners and residents are exposed to noise generated from the development site.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	Effective communication with affected and surrounding landowners; Addressing of any issues and concerns raised as far as possible in as short a timeframe as possible.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Contractors may only be present on the site during the public time hours.	Developer and contractor.	Construction and operational phase.

Performance indicator	Effective communication and procedures in place.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C2: SAFETY

Project Component/s	Development site;
Potential Impact	Safety of surrounding landowners and residents; Safety of personnel working on site.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect all involved from incidents and injury.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Telephone numbers of emergency services, including the local fire-fighting services, must be posted conspicuously in the contractor's office and near the telephone. No firearms are permitted on the construction site, other than those authorised by the developer for the property security service provider if needed. Notices should be displayed at all public entrances to the property, warning visitors that they are entering a construction site.	Contractor	Construction and operational phase

Performance indicator	Effective communication and procedures in place.

Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C3: SPEED LIMIT

Project Component/s	Development site.
Potential Impact	Speeding motorists and construction vehicles could injure personnel, members of the public or cause damage to property/infrastructure. Dust.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation; Dust may be generated as a result of speeding vehicles on the development site.
Mitigation: Target/Objective	To protect all involved from incidents and injury. Regular maintenance of access roads and low speed limits must be undertaken to minimize dust pollution.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
For security and safety reasons the speed limit on the property for all contractors' vehicles is 30 km per hour. The contractor is responsible for ensuring that all his employees, sub-contractors and delivery vehicles adhere to this rule. Dust control must be implemented to ensure that dust does not become a nuisance to the public during construction activities.	Contractor	Construction and operational phase

Performance indicator	Effective communication and procedures in place.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C4: CONTRACTOR'S CAMP

Project Component/s	Development site;
Potential Impact	Degradation of the natural environment inside/outside of the development area.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect and mitigate impacts on the environment.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
The contractor's camp will be indicated by and to landowner management and the ECO on the site. The final location of the contractor's camp will be authorized by the ECO and landowner.	Developer / Contractor	Construction phase

Performance indicator	ECO in conjunction with the landowner will approve construction camp area.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C5: DELIVERIES TO CONTRACTORS

Project Component/s	Access roads.

Potential Impact	Increased traffic, congestion and noise for surrounding landowners / residents and other road users. Impact on the natural environment.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect and mitigate impacts on the environment, surrounding land uses, landowners, and personnel working on site.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Contractors will at all times be responsible for compliance by their delivery service providers as engaged. Delivery times will be limited to working times as defined in this document. Contractors have the responsibility of advising the property security staff of deliveries expected and to be executed. Contractors must further ensure that drivers of service providers are informed of all procedures and restrictions e.g. which access road to use, speed limits, no-go areas, demarcated construction areas, and maximum allowed vehicle mass etc., as applicable before their first visit to site. Washing of service provider delivery vehicles and equipment will not be allowed on the property and must be carried out elsewhere. **Vehicle Access:** All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into the topsoil; In the event of a vehicle breakdown, maintenance of vehicles must take place with care and the recollection of spillage should be practiced near the surface area to prevent ingress of hydrocarbons into topsoil and subsequent habitat loss; and All spills should they occur, should be immediately cleaned up and treated accordingly.	Contractor	Construction phase

Performance indicator	Site is secure and there is no unauthorised entry. No members of the public/ landowners injured.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C6: ROADS

Project Component/s	Access roads.
Potential Impact	Increased traffic/congestion. Construction vehicles pose a potential risk to other road uses and the natural environment if they do not use designated routes.
Activities/Risk Sources	Activities associated with facility construction, receiving of goods by road.
Mitigation: Target/Objective	Designation of specific routes for construction vehicles to reduce impact on the environment and other road users.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Only existing access routes to the property will be used during construction work, so as to control the movement of construction vehicles. The contractor shall ensure that	Contractor	Construction phase

access to construction sites and associated infrastructure and equipment is designated off-limits to the public at all times during construction. Traffic safety measures shall be considered in determining entry or exit points to public roads.		

Performance indicator	To minimise the impacts on road users and the environment.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C7: ALIEN/INVASIVE PLANTS

Project Component/s	Development site.
Potential Impact	Alien/invasive plant species are allowed to spread into surrounding natural/indigenous vegetation areas.
Activities/Risk Sources	Activities associated with facility construction; Activities associated with facility operation.
Mitigation: Target/Objective	To protect and mitigate impacts on the environment. In terms of the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) ("CARA") landowners must prevent the spread of alien invasive plants on the property. in terms of the Alien and Invasive Species Regulations, NEM: BA[6],2014, specific alien plant species (e.g. *Acacia cyclops*) are either prohibited or listed as requiring a permit; aside from restricted activities concerning, *inter alia*, their spread, and should be removed.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
A contractor appointed by the developer and engineer must be tasked to ensure that all weeds and alien/invasive species are removed as instructed and approved by the ECO. No on-site burying, dumping or stockpiling of any weeds and aliens or invasive species must occur. Such should be removed from the site to a suitable dumping site from which seed cannot escape. Proliferation of alien and invasive species is expected within any disturbed areas. Whilst not considered severe at this time, the vegetation component within the freshwater environment is already transformed to an extent as a result of alien plant invasion; therefore, these species should be eradicated and controlled to prevent their spread beyond the project footprint. Alien plant seed dispersal within the top layers of the soil within footprint areas, that will have an impact on future rehabilitation, has to be controlled; Removal of the alien and weed species encountered within the freshwater resources must take place in order to comply with existing legislation (amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 and Section 28 of the National Environmental Management Act, 1998). Removal of species should take place throughout the construction, operational, and maintenance phases. **<u>Species specific and area specific eradication recommendations:</u>**	Contractor	Construction phase

Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used; Footprint areas should be kept as small as possible when removing alien plant species*;* and No vehicles should be allowed to drive through designated sensitive wetland areas during the eradication of alien and weed species.		

Performance indicator	All possible introduction and spreading of alien invasive plant species are controlled.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C8: ARCHAEOLOGY AND PALAEONTOLOGY MANAGEMENT

Project Component/s	Development site;
Potential Impact	The loss of cultural or heritage resources.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect and mitigate the potential loss of cultural and heritage resources.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Should any heritage or fossil remains be exposed during any excavation or related activities, these must immediately be reported to the provincial heritage resource authority of the Western Cape, Heritage Western Cape (in terms of the National Heritage Resources Act, 1999 (Act No.25 of 1999) via the ECO. Heritage remains uncovered or disturbed during earthworks must not be disturbed until inspection and verified by the professional.	Contractor	Construction phase

Performance indicator	Protection of heritage resources
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C8: ANTI-EROSION MEASURES (STORMWATER MANAGEMENT)

Project Component/s	Development site; Storm water channels; Access roads.
Potential Impact	Wind/water erosion as a result of construction/operation activities.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	Reduce the impact of erosion by implementing anti-erosion measures.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
The contractor must take all appropriate and active measures to prevent erosion, especially wind and water erosion, resulting from operations and activities, specifically of storm water control measures to the	Contractor	Construction and operational phase

satisfaction of the ECO/ER. During construction the contractor must protect areas susceptible to wind and water erosion, by installing all the necessary temporary and permanent works. Measures can include brush packing, anchovy net stabilisation, etc. Where required erosion protection measures must be installed. Aspects normally covered in construction contracts in terms of protection of works are standard and are not to be confused with those under environmental legislation. Development footprint must be minimised to ensure minimal disturbance. All areas disturbed during construction must be immediately rehabilitated and stabilised. Create single access points to all construction sites to restrict trampling and erosion. The existing storm water channels that are being left as public open space must be properly established and cleared of litter.		

Performance indicator	All possible erosion impacts are controlled and rehabilitated.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C9: CONSTRUCTION MATERIAL

Project Component/s	Development site;
Potential Impact	Aesthetically displeasing or causing a nuisance to surrounding landowners/residents.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	Reduce the visual impact or nuisance to the surrounding landowners/residents.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Construction material will be stored at the contractor's camp, as well as on the construction site within the demarcated working areas at each construction point. Special permission may be obtained from the ECO/ER to store material on suitable substitute or ancillary locations should the need arise, and as communicated by the project engineer. **Rehabilitation** Construction rubble must be collected and disposed of at a suitable landfill site; and All alien vegetation in the footprint area as well as immediate vicinity of the proposed development should be removed.	Contractor	Construction phase

Performance indicator	To minimise the impact on the surrounding land users.

Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C10: FIRES

Project Component/s	Development site;
Potential Impact	Uncontrolled fire on/off site, resulting in damage to the environment, property, injuries/death to personnel on site, or injuries/death to the public.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect and mitigate the safety of people, property, and the environment on and off site.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
No open fires will be allowed on site and adequate firefighting equipment should be available on site in good working order at all times as prescribed by the fire management protocols.	Contractor	Construction phase

Performance indicator	No fire occurred to damage the surrounding environment and land uses and management actions are in place should a fire occur.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C11: HERBICIDES, PESTICIDES AND FERTILIZERS

Project Component/s	Development site; Adjacent property/land.	
Potential Impact	Adjacent land/property or natural environments contaminated by the application of herbicides, fertilizers and pesticides.	
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.	
Mitigation: Target/Objective	To protect and mitigate impacts on the environment and surrounding land users.	
Mitigation: Action/Control	**Responsibility**	**Timeframe**
The contractor must make sure of, and allow, all legal requirements regarding herbicide application procedures. It is vital that the contractor becomes familiar with all the information detailed on every herbicide label before using it. The instructions on the label must be strictly followed throughout. The contractor must take all necessary precautions to prevent overspray of herbicides outside of the demarcated construction areas and onto natural veld. All personnel working with any herbicide, pesticide or fertilizer must be registered and comply with the requirements set in these registrations. The contractor must put a system in place to control the use of herbicides and pesticides. All equipment associated to herbicides and pesticides must be maintained in accordance to the set standards. The disposal of all redundant and empty containers of herbicides and pesticides must be controlled and disposed of at a waste management facility licensed under the National Environmental Management: Waste Act.	Contractor	Construction phase

Performance indicator	Herbicide, pesticides and fertilizer use is controlled to prevent impacts on the environment and surrounded land uses.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C12: AN EFFECTIVE MONITORING SYSTEM TO DETECT ANY LEAKAGE OR SPILLAGE OF ALL HAZARDOUS SUBSTANCES DURING THEIR TRANSPORT, HANDLING USAGE AND STORAGE. THIS MUST INCLUDE PRECAUTIONARY MEASURES TO LIMIT THE POSSIBILITY OF OIL AND OTHER TOXIC LIQUIDS FROM ENTERING THE SOIL OR STORM WATER SYSTEMS.

Project Component/s	Development site.
Potential Impact	Contamination of soil, storm water and ground water resources by hazardous substances.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	Prevention and mitigation of the environment contaminated as a result of exposure to hazardous substances.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
The EA holder, Landowner, Site Environmental Officer and Environmental Control officer will do daily, weekly and monthly inspections and report and monitor compliance with the management actions included in the EMPr and EA conditions. These monitoring and reporting requirements are recorded in several sections of the EMPr. Monitoring will focus on signs of spillages and procedures during handling and storage of dangerous goods as described in the EMPr. The section on storage and handling of dangerous goods in the EMPr will be enforced. Work within site boundaries with no construction activities outside the boundary of the proposed development. During the construction phase of the project, the impact on the no go areas should be kept to a minimum. After the construction phase, any impacted areas outside the development area should be rehabilitated.	Contractor	Construction phase

Performance indicator	Impacts on hydrological features minimized and mitigated
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C13: DIESEL FUEL AND LUBRICANT HANDLING PROGRAMME

Project Component/s	Development site;
Potential Impact	Contamination of soil, storm and ground water resources as a result of an oil/diesel/lubricant spill/leak.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect and mitigate impacts of contaminants on the environment and hydrological features.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Servicing of construction vehicles and machinery to take place of site. All vehicles must be in a good condition with	Contractor	Construction phase

no leakages leading to possible contamination of soil or water supplies. The following conditions related to the temporary fuel tanks must be implemented: The fuel tanks must be designed and installed in accordance with relevant Oil Industry standards and SANS codes where applicable for the aboveground storage tanks. The tanks must be located within a bund (110 % of the tanks capacity) in order to contain potential spills. During fuel tanker delivery, the tanker driver must be present at all times during product offloading. Should an incident occur the supply vehicle emergency cut-off switch must be activated to immediately stop fuel delivery. Flexible hoses with dry-break couplings and emergency isolation must be used. All spillage incidences and actions taken consequent thereto must be reported to the ECO and recorded in the site register. All fuel and flammable liquids should be stored under secure and fenced conditions and in a bunded site with the volume of the bunding capable of holding 110% of the liquid. The applicant must ensure that effective stock inventory monitoring and regular auditing take place for the early identification of possible leaks. The requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), must be adhered to. Within three months of the tanks ceasing to be used the tanks must be removed at the expense of the applicant, and the site, including all associated infrastructure must be rehabilitated to the satisfaction of the relevant authority. **Refuelling:** Refuelling of equipment must be conducted from the bunded fuel tank and pump at the contractor's camp. Fuel tanks must be bunded and supplied with a concrete apron. The concreted refuelling apron will be constructed with a drain along its extremities to collect any diesel contaminated run-off and channel it to the oil trap where separated oil will be collected and disposed of in the oil recycling container and process. Any spills on the concrete apron of floor below the tank are to be treated with OT8 or Spillsolve or equivalent as per the product instructions. A 500-litre drawn trailer to convey diesel to the equipment for re-fuelling may also be used. Such trailer will be drawn by a specified vehicle and driver, with alternate nominated as approved by the Project Engineer. Such tow vehicle may travel at 20kms per hour maximum at any time, be clearly identifiable as such, and may only tow the diesel cart should the pre requisite drip trays and emergency equipment be on the vehicle at the time. In situ refuelling activity may only take place during a standard specified daily time slot as displayed in the construction office, unless specific per day permission has been given to refuel at any other time by the ECO. This must be pre-recorded in the site record book. Staff will require		

instruction in the identification of diesel and oil leaks and the use of Spillsolve (or equivalent) products. **On-Site emergency repairs:** Only small mobile plant and emergency repairs are to take place on site. These will require the provision of drip trays and funnels to ensure that no oil or fuel leakages occur onto the ground. Should such spill take place, then the oil saturated soil is to be placed in suitable containers and disposed of at a hazardous waste disposal site. Any contamination of soil is to be treated with Spillsolve or similar product. Contaminated water as a result of an oil or fuel spillage on the area should similarly be treated in appropriate way, and the polluted water should not be specifically removed and not allowed to merge with run-off water collected in the trap collecting all run offs from the slab. **Collection of contaminated spares and waste oils:** Contaminated spares, oil filters, gaskets, water, etc. will be collected in separate holders at the designated storage facility for disposal at a licensed H:h site. Staff will require instruction in: • Deleterious effects of oil / fuel on the environment • Identification of oil leaks • Handling of oil / fuel leaks into soil • Location and method in storage of contaminated spares • Fire prevention and emergency drills in case of an accident		

Performance indicator	Ensure that no spillages occur and if it does occur that it is handled and cleaned up accordingly.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C14: APPROPRIATE HANDLING AND STORAGE OF CHEMICALS, HAZARDOUS SUBSTANCES AND WASTE (WASTE MANAGEMENT PLAN)

The construction phase will involve the storage and handling of a variety of chemicals including adhesives, abrasives, oils and lubricants, paints and solvents. The main wastes expected to be generated by the construction of the facility will include will include general solid waste and liquid waste, and may include hazardous waste.

Project Component/s	Construction camp; Storage areas; Development site; Adjacent land and environmental systems.
Potential Impact	Incorrect storage, handling, transporting and disposing of hazardous substances resulting in the contamination of soil, storm and ground water resources. Incorrect storage, handling, transporting and disposing of general solid waste resulting in litter, storm water pollution, and creating a nuisance to adjacent landowners/residents. Incorrect storage, handling, transporting and disposing of effluent/liquid waste resulting in the contamination of the storm water system, adjacent property, or hydrological systems.

	Incorrect storage, handling, transporting and disposing of garden waste, alien vegetation or natural vegetation during the clearing phase of the development site. Poor waste management practices, resulting in waste not being reduced, re-used or recycled.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation; Vehicles associated with site preparation and earthworks; Packaging and other construction waste; Hydrocarbon use and storage; Material from excavation, earthworks and site preparation; Incorrect disposal of waste; Using unregistered waste transporters / facilities.
Mitigation: Target/Objective	Protect and mitigate impacts on the environment and hydrological features; Ensure that the storage and handling of chemicals and hydrocarbons on-site does not cause pollution to the environment or harm to persons; Ensure that the storage and maintenance of machinery on-site does not cause pollution of the environment or harm to persons; Comply with waste management guidelines; Minimise production of waste; Ensure appropriate waste storage and disposal; Avoid environmental harm from waste disposal; Where solid waste disposal is to take place on site, ensure that only non-toxic materials which have no risk of polluting the groundwater, are buried in designated approved areas at acceptable depths below ground level.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Implement site-specific waste management plan during the construction phase. Specific areas must be designated on-site for the temporary management of various waste streams, i.e. general refuse, construction waste (wood and metal scrap) and contaminated waste as required. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage and vermin control. Where practically possible, construction and general wastes on-site must be reused or recycled. Bins and skips must be available on-site for collection, separation, and storage of waste streams (such as wood, metals, general refuse etc.). All waste generated during the construction process be separated into the different waste streams for recycling purposes, prior to removal by a reputable contractor from the construction site and disposed of at an appropriate licensed landfill facility. Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors and disposal at appropriately licensed waste disposal sites. The National Information Systems Regulation must be adhered to in terms of registering and reporting of	Contractor	Construction phase

hazardous waste generated on site via the Integrated Pollutant Waste Information System (IPWIS) if required. All stored fuels to be maintained within a sealed bund and on a sealed surface. The bund must be at least 110% of the volume of the total containers. Adjacent fuelling areas situated around fuel tanks must be provided with an impervious layer or drip trays must be used during refuelling; Areas around fuel tanks must be appropriately bunded or contained in an appropriate manner as per the requirements of SABS 089:1999 Part 1; Fuel storage areas must be inspected regularly to ensure bund stability, integrity, and function; Oily water from bunds at the substations must be removed from site by licensed contractors; The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately bunded, and stored in compliance with MSDS files; Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals will be compiled with and copies kept on site in the environmental file; Transport of all hazardous substances must be in accordance with the relevant legislation and regulations Construction sub-contractors must provide specific detailed waste management plans to deal with all waste streams; Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants. Corrective action must be undertaken immediately if a complaint is received, or potential/actual leak or spill of polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the affected environment as much as practically possible and implementing preventive measures. Implement an effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems. Leakage of fuels must be avoided at all times and if spillage occurs, it must be remediated immediately. In the event of a major spill or leak of contaminants, the relevant administering authority must be immediately notified as per the notification of emergencies/incidents. Spilled cement, fly ash and concrete must be cleaned up as soon as possible and disposed of at a suitably licensed waste disposal site. Any contaminated/polluted soil		

removed from the site must be disposed of at a licensed hazardous waste disposal facility. Hydrocarbon waste must be contained and stored in sealed containers within an appropriately bunded area Waste and surplus dangerous goods must be kept to a minimum and must be transported by approved waste transporters to sites designated for their disposal and copies of the safe disposal slips must be kept in the environment file on site. Documentation (waste manifest) must be maintained detailing the quantity, nature, and fate of any regulated waste. Waste disposal records must be available for review at any time. An incident/complaints register must be established and maintained on-site. The sediment control and water quality structures used on-site must be monitored and maintained in a fully operational state at all times. An integrated waste management approach that is based on waste minimisation must be used and must incorporate reduction, recycling, re-use and disposal where appropriate. Upon the completion of construction, the area must be cleared of potentially polluting materials. Dispose of all solid waste collected at an appropriately registered waste disposal site. Waste disposal must be in accordance with all relevant legislation and under no circumstances may waste be burnt on site. Where a registered waste site is not available close to the construction site, provide a method statement with regard to waste management. Where solid waste disposal is to take place on site, ensure that only non-toxic materials which have no risk of polluting the groundwater, are buried in designated approved areas at acceptable depths below ground level. Green waste generated during the site clearing phase must be taken to an approved municipal or private green waste facility. The Department has initiated a 50% ban of organic waste from landfill by 2022 and a complete ban of organics to landfill by 2027. It is therefore advised that organics be separated from the general waste stream and beneficiated where possible. Alternative treatment technologies for beneficiating this waste type must be considered. Building rubble should be diverted from landfill where possible e.g. reuse for the construction of internal roads or taken the nearest drop-off facility for crushing.		

Performance indicator	Limited chemical spills outside of designated storage areas; No water or soil contamination by spills;

	No complaints received regarding waste on site or indiscriminate dumping; Internal site audits ensuring that waste segregation, recycling and reuse is occurring appropriately; Provision of all appropriate waste manifests for all waste streams.
Monitoring	Observation and supervision of chemical storage and handling practices and vehicle maintenance throughout construction phase; A complaints register must be maintained, in which any complaints from the community will be logged; Observation and supervision of waste management practices throughout construction phase; Waste collection will be monitored on a regular basis; Waste documentation completed; A complaints register will be maintained, in which any complaints from the community will be logged; Complaints will be investigated and, if appropriate, acted upon; An incident reporting system will be used to record non-conformances to the EMPr; This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C15: EFFECTIVE MANAGEMENT OF CONCRETE BATCHING PLANTS

Project Component/s	Concrete batching plant.
Potential Impact	Dust emissions; Release of contaminated water; Generation of contaminated wastes from used chemical containers; Inefficient use of resources resulting in excessive waste generation.
Activities/Risk Sources	Operation of the batching plant; Packaging and other construction waste; Hydrocarbon use and storage; Spoil material from excavation, earthworks and site preparation.
Mitigation: Target/Objective	To protect and mitigate impacts on the environment and surrounding land users. To ensure that the operation of the batching plant does not cause pollution to the environment or harm to persons.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Concrete batching plants to be sited such that impacts on the environment or the amenity of the local community from noise, odour or polluting emissions are minimised; Access and exit routes for heavy transport vehicles should be planned to minimise noise and dust and impacts on the environment; The concrete batching plant site should demonstrate good maintenance practices, including regular sweeping to prevent dust build-up; The prevailing wind direction should be considered to ensure that bunkers and conveyors are sited in a sheltered position to minimise the effects of the wind; Aggregate material should be delivered in a damp condition, and water sprays or a dust suppression agent should be correctly applied to reduce dust emissions and reduce water usage; the applicant must consider the best available environmental method	Contractor	Construction phase

in terms to ensure dust suppression during the construction phase. The site should be designed and constructed such that clean storm water, including roof runoff, is diverted away from contaminated areas and directed to the storm water discharge system; Any liquids stored on site, including admixtures, fuels and lubricants, should be stored in accordance with applicable legislation; Contaminated storm water and process wastewater should be captured and recycled where possible. A wastewater collection and recycling system should be designed to collect and filter contaminated water; Process waste water and contaminated storm water collected from the entire site should be diverted to a settling pond, or series of ponds, such that the water can be reused in the concrete batching process. The settling pond or series of ponds should be lined with an impervious liner capable of containing all contaminants found within the water they are designed to collect; Areas where spills of oils and chemicals may occur should be equipped with easily accessible spill control kits to assist in prompt and effective spill control; Ensure that all practicable steps are taken to minimise the adverse effect that noise emissions. This responsibility includes not only the noise emitted from the plant and equipment but also associated noise sources, such as radios, loudspeakers and alarms; Where possible, waste concrete should be used for construction purposes at the batching plant or project site; The batching plant to be monitored by the ECO to ensure that the plant is operating according to its environmental objectives and within legislative requirements. The use of municipal water for construction and operation must as far as reasonably practicable is to be done in accordance with Circular C1 of 2018: Water Crisis Response Guidelines for the Western Cape.		

Performance indicator	No complaints regarding dust or contamination; No water or soil contamination by chemical spills; No complaints received regarding waste on site or indiscriminate dumping.
Monitoring	Observation and supervision of chemical storage and handling practices and vehicle maintenance throughout construction phase. A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. An incident reporting system will be used to record non-conformances to the EMPr.

	Developer or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

OBJECTIVE C16: EFFECTIVE MANAGEMENT OF NO GO AREAS

Project Component/s	No Go Areas
Potential Impact	Pollution and disturbance to buffer areas and no go areas
Activities/Risk Sources	Working outside development footprint
Mitigation: Target/Objective	To protect and mitigate impacts on the environment and surrounding land users.

Mitigation: Action/Control	Responsibility	Timeframe
Access to roads and other areas must be controlled to avoid disturbance of areas outside the development footprint. Personnel should be restricted to the immediate clearing areas only. Monitor construction areas frequently for signs of erosion and if signs of erosion are detected implement repair and preventative measures immediately. Strict compliance with the EMPr.	Contractor	Construction phase

Performance indicator	No impacts on surrounding no go areas.
Monitoring	Developer or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

OPERATIONAL PHASE

Not applicable. Only development phase.

CHAPTER 8

ENVIRONMENTAL REPORTING

In order to ensure that the necessary environmental issues are adequately addressed and recorded, the following environmental reporting shall be undertaken:

- Incident reporting; and
- Compliance reporting

The applicant must ensure that "Any emergency incident, originating at the facility, which falls within the definition of section 30(1) of the National Environmental Management Act (NEMA), Act 107 of 1998, must be dealt with by the facility in accordance with Section 30 of NEMA". In the event of any incident the facility must ensure containment by the responsible person and report the incident to the West Coast District Municipality, Cederberg Local Municipality, and DEA&DP.

See below for a template of an Incident Report to serve as a guideline for the recording and addressing of emergency incidents as and when they occur.

ENVIRONMENTAL INCIDENT REPORT

DATE:	**File Ref:**
NAME:	**Copy to:**
EXACT LOCATION OF INCIDENT:	

SECTION 1 : DESCRIPTION OF INCIDENT

SECTION 2 : REMEDIAL ACTION REQUIRED

Remedial Action Due Date:
Confirmation of implementation: **Name:** **Date:**

SECTION 3 : RELEVANT DOCUMENTATION

SECTION 4 : SIGNATURES

Municipal Engineer:

.....

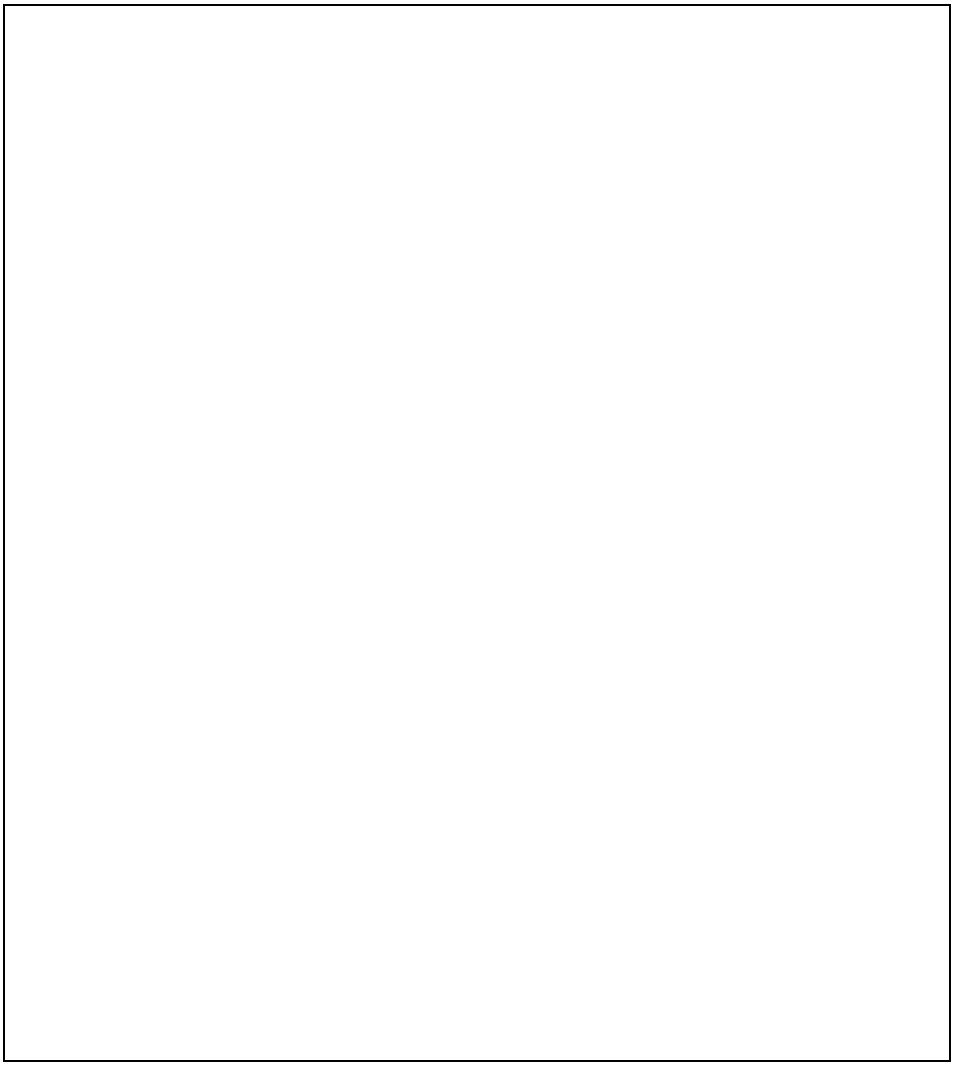
Name:
Date:

ECO:

.....

Name:
Date:

SECTION 5 : DRAWING/SKETCH



CHAPTER 9

DECOMMISSIONING PHASE

As the final phase in the project cycle, decommissioning may present positive environmental opportunities associated with the return of the land for alternative use and the cessation of impacts associated with operational activities. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased.

The decommissioning phase EMP provides specific guidance with respect to the management of the environmental risks associated with the decommissioning stage of a project.

Closure and decommissioning impacts are likely to be similar to the construction phase impacts. The management actions and control under the construction phase EMP need to be implemented to mitigate the negative impacts on the environment and to restore the property to its natural state.

A decommissioning phase is where a structure is removed or otherwise modified to make it incapable for re-use for the original design purpose.

The results of environmental monitoring during the decommissioning phase will be used to assess the impact of the decommissioning on the surrounding environment and demonstrate compliance with regulatory requirements.

The actual scope of the decommissioning environmental monitoring will be established following consultation with the regulatory authorities. The format of decommission management strategy will probably be similar to that of earlier development phases and consist of the following:

Management Principles

- Develop monitoring procedures in accordance with standard protocols and the requirements of the environmental legislation.
- Undertake environmental monitoring during the decommissioning phase as shown below.

Environmental monitoring during the decommission phase will include terrestrial flora rehabilitation monitoring.

CHAPTER 10

REHABILITATION SPECIFICATIONS AND SITE CLEAN-UP

The contractors must ensure that all temporary structures, equipment, materials and facilities used or created on site for, or during construction activities, are removed once the project has been completed. The construction sites must be cleared, and cleaned to the satisfaction of the developer.

Stabilisation and rehabilitation must take place immediately after construction operations have been completed. No vehicles or unauthorised personnel must be allowed onto areas that have been rehabilitated.

The areas impacted during construction must be stabilised and shaped according to the natural surrounding contours. If topsoil was removed during construction the topsoil must be used to stabilise the impacted areas.

The impacted areas must be re-vegetated with indigenous vegetation species within 3 months after completion of construction activities. Rehabilitated areas must be irrigated as and if required to ensure successful establishment of planted indigenous vegetation.

The rehabilitation of the site must ensure that the final conditions of the site is environmentally acceptable and that there will be no adverse long-term effects on the surrounding environment especially the water resources.

The rehabilitated areas must be monitored on a monthly basis and after heavy rains for signs of erosion. If erosion occurred, mitigation measures to be implemented.

Alien vegetation monitoring of the rehabilitated areas and surrounds must be conducted on an annual basis.

Operational management and mitigation measures.

Stormwater

These measures apply both to the new stormwater system and to the stormwater from the existing informal settlement and township that already flows into the central valley-bottom wetland system.

In operation: the municipality must inspect and clean inlets, litter traps, outlets, forebays and ponds at least quarterly and after large storms, remove sediment from forebays before they are half full and dispose of it off site, and repair erosion immediately.

Provide regular solid-waste collection in the informal settlement and township and clear dumped waste and tyres from the wetland, to reduce the litter and dumping that currently reach it.

Implement the Wetland Rehabilitation and Management Plan (Delta Ecology, 2026): removal of waste and tyres, clearing of alien invasive plants (including Acacia saligna), stabilisation of eroded areas and replanting with indigenous wetland vegetation.

WWTW

Operate the works to the Special Limit Values in the water use licence, with working inlet, outlet and irrigation flow meters, backup power, spares, qualified process controllers and a supervisor (none was in place at the 2023/24 Green Drop audit; DWS, 2026), and the operation and maintenance plan proposed by BVi (2024).

Appoint a suitably qualified and experienced wastewater process engineer to oversee the commissioning of the refurbished and expanded works and to audit its functioning regularly, at least quarterly for the first two years of operation and thereafter at the interval set in the monitoring plan. The audits should cover process performance, effluent compliance, maintenance and staffing, and be reported in writing to the municipality and DWS.

Appoint a dedicated works manager (site manager), with the appropriate process controller qualifications, to oversee the daily operation and functioning of the works, keep operational records and report any failure or non-compliance immediately.

Before the new module is commissioned, increase operational support in line with the added capacity: process controllers and maintenance staff on every shift, a dedicated operation and maintenance budget, spares and a planned maintenance schedule. The expanded works will be more demanding to operate than the existing works, which has a long history of non-compliance.

Monitor the final effluent periodically through an accredited laboratory (see Monitoring below), and confirm that the refurbished works meets the Special Limit Values before the new module is commissioned. If a result exceeds a limit, investigate the cause, take corrective action and resample, and notify DWS as the water use licence requires.

Repair the chlorine contact channel so that no effluent bypasses disinfection (DWS, 2026), control residual chlorine in the final effluent (dechlorination or optimised dosing), and consider UV disinfection.

Retain the reed bed below the golf course as a polishing wetland: do not clear or canalise it, keep the effluent spread across it rather than in a single channel, and control alien invasive plants.

Provide enough storage and pumping capacity that effluent is not forced to overflow when the golf course is not taking it (DWS, 2026), and route any excess through the reed bed rather than directly to the river.

Prepare an irrigation management plan for the golf course: application matched to turf demand, no irrigation during rain or on saturated soils, setbacks from the wetland and river,

and enough storage to avoid forced winter discharge.
Before the new module is commissioned, prepare a water balance for the works (inflow, irrigation and discharge to the river, by month) for the current flow, the housing development and the full 3.6 Ml/day, as part of the water use licence application.
Switch the town's dry-season (December to March) potable water abstraction from the Jan Dissels River to Clanwilliam Dam where possible, as recommended by Van der Berg (2008), to help restore summer low flows in the lower river.
• Fit the new houses with water-efficient fittings (for example low-flow taps and showerheads and dual-flush toilets), to reduce both the potable water abstracted from the Jan Dissels River and the volume of effluent produced by the housing development.

Monitoring
Monitoring plan: before construction starts, a suitably qualified aquatic specialist and the appointed engineers must prepare a comprehensive monitoring plan for the stormwater system, the wetlands, the WWTW effluent and the Jan Dissels River, for inclusion in the EMPr and the water use licence application. It must set out the monitoring points, parameters, frequencies, thresholds that trigger management action, responsibilities and reporting, and include at least the measures below. It must include biomonitoring of the Jan Dissels River: aquatic macroinvertebrates (SASS5; Dickens and Graham, 2002) and fish (for example with the Fish Response Assessment Index; Kleynhans, 2007), upstream and downstream of the effluent release and of the wetland outflow.
Baseline: before construction starts, a suitably qualified aquatic specialist must undertake SASS5 and fish surveys of the Jan Dissels River at the monitoring sites upstream and downstream of the effluent release and the wetland outflow, to provide a baseline against which later monitoring is compared.
Final effluent: at the frequency required by the water use licence, and at least monthly, for the parameters in Table 4-9, analysed by an accredited laboratory, with the results reviewed by the process engineer and reported to the municipality and DWS.
Stormwater system: record each inspection, clean-out and repair of the litter traps, forebays, ponds and outlets, with photographs.
Effluent volumes: meter the total treated effluent, the volume drawn off for golf course irrigation (using the existing meter on the draw-off) and the volume released to the reed bed and the Jan Dissels River. Record these daily from commissioning of the new module, together with rainfall, and report them with the water use licence monitoring. After the first year, these records provide a measured water balance and show whether the upper-bound assumption in Section 5.2 holds.
Jan Dissels and Olifants rivers: water quality upstream and downstream of the effluent release, and in the Olifants River above and below the confluence, monthly for two years after commissioning, then quarterly, with field measurement of temperature, pH, EC and dissolved oxygen and with analytical detection limits below the aquatic ecosystem TWQRs (in particular for phosphate and trace metals); SASS5 and fish sampling twice a year (high and low flow) at the baseline sites. Fish sampling requires a CapeNature permit.
Wetlands: fixed-point photographs and an annual inspection of erosion at the outlets, and a repeat WET-Health assessment of the central valley-bottom wetland system three and five years after the stormwater system and rehabilitation are complete, to confirm progress towards the Recommended Ecological Category (D).
Southern seep: map the extent of the seep and reed bed annually, from aerial imagery or a field survey, and relate it to the volumes of effluent released, to track its expansion as flows increase.

CHAPTER 11

ENVIRONMENTAL AWARENESS INDUCTION COURSE MATERIAL

This section of the report is included in compliance with Section 24N (3) (c) of the National Environmental Management Act 107 of 1998.

WHAT IS THE ENVIRONMENT?

- Soil
- Water
- Plants
- People
- Animals
- Air we breathe

WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- It affects us all as well as future generations
- We have a right to a healthy environment
- A Policy and System will be signed

HOW DO WE LOOK AFTER THE ENVIRONMENT?

- Report problems to your supervisor/ foreman
- Team work
- Follow the rules in the EMP

WORKING AREAS

Workers & equipment must stay inside the site boundaries at all times

RIVERS & STREAMS

- Do not swim in or drink from streams
- Do not throw oil, petrol, diesel, concrete or rubbish in the stream
- Do not work in the stream without direct instruction
- Do not damage the banks or vegetation of the stream

ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site

TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers

SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Do not light any fires without permission
- Know the positions of fire fighting equipment
- Report all fires
- Do not burn rubbish or vegetation without permission

PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray under vehicles & machinery
- Empty drip trays after rain & throw away where instructed

DUST

Try to avoid producing dust

NOISE

- Do not make loud noises around the site, especially near schools and homes
- Report or repair noisy vehicles

TOILETS

- Use the toilets provided
- Report full or leaking toilets

EATING

- Only eat in demarcated eating areas
- Never eat near a river or stream
- Put packaging & leftover food into rubbish bins

RUBBISH

- Do not litter – put all rubbish (especially cement bags) into the bins provided
- Report full bins to your supervisor
- The responsible person should empty bins regularly

TRUCKS AND DRIVING

- Always keep to the speed limit
- Drivers – check & report leaks and vehicles that belch smoke
- Ensure loads are secure & do not spill

EMERGENCY PHONE NUMBERS

Know all the emergency phone numbers:

- Ambulance:
- Fire:
- Police: 10111

FINES AND PENALTIES

- Spot fines of between R20 and R2000
- Your company may be fined
- Removal from site
- Construction may be stopped

PROBLEMS - WHAT TO DO!

- Report any breaks, floods, fires, leaks and injuries to your supervisor
- Ask questions!

ATTENDANCE REGISTER FOR ……	
PLACE …….	TRAINER……
NAME & SURNAME	SIGNED
SIGNED ……..	DATE & TIME ……

CHAPTER 12

COMPLIANCE WITH THE ENVIRONMENTAL AUTHORISATION

All conditions of the Environmental Authorisation must be adhered to onsite during the construction-, operational-, decommissioning- and rehabilitation phases of the proposed project. A copy of the Environmental Authorisation must be available on site together with the EMP and all contractors on site must sign the Declaration of Understanding as proof of awareness and understanding of all the conditions to be adhered to on site in terms of the EA and EMP.

CHAPTER 13

UPDATING/ADAPTING THE EMP

Although care has been taken to address all known relevant environmental issues for the development, it will become necessary to add or amend certain procedures or instructions to improve the efficiency of the EMP. Only those additions to, or amendments of, this EMP that will either improve environmental protection or can be proven not to have any negative effects would be considered to be included, and any amendments to the EMP must first be approved by the ECO and competent authority/ies i.e. DEA&DP.

REFERENCES

City of Cape Town (2002) Environmental Management Programme (Version 5) for Civil Engineering Construction Activities.

DEA&DP: ENVIRONMENTAL MANAGEMENT PROGRAMME. VER 5 (04/2002). Guideline Document for the ECO / ESO and the ER

Department of Water Affairs and Forestry, February 2005. Environmental Best Practice Specifications: Construction Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.