<u>FINAL</u> ENVIRONMENTAL MANAGEMENT PROGRAMME AND MAINTENANCE MANAGEMENT PLAN

BASIC ASSESSMENT

ENVIRONMENTAL PROCESS FOR THE PROPOSED DEVELOPMENT OF A NEW RETREAT AND ASSOCIATED MAINTENANCE MANAGEMENT PLAN ON A PORTION OF PORTION 11 OF FARM 1674, PAARL, AND ASSOCIATED INFRASTRUCTURE

D : EA&DP Pre-application Reference Number : 16/3/3/6/7/1/B4/12/1086/20
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CHAND
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NOTE:

This is the final Environmental Management Programme (EMPr) for the proposed development. Minor changes made to the document following public review of the Draft EMPr have been underlined for ease of reference.

This EMPr should be further updated to:

- Incorporate conditions and specifications imposed by the DEA&DP if Environmental Authorisation is granted;
- Incorporate conditions related to the GA;
- Reflect the final approved Stormwater Management Plan;
- Reflect the final approved Landscaping Plan;
- Incorporate conditions and specifications imposed by the Local Authorities as part of the Town Planning exercise, if applicable to the environment (note, this does not refer specific town planning conditions of approval, but only those where overlap with environmental issues occurs); and
- A copy of the final defined/adopted MMP and cover letter must be submitted to the responsible water authority.

Such updates must occur without the need for a formal approval process and must be undertaken by a qualified Environmental Assessment Professional.

This EMPr must be incorporated into all contract documentation and the Applicant is to ensure that the Contractor is made aware of the requirements herein when preparing a quote for the work.

DOCUMENT CONTROL SHEET

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DETAILS / EXPERTISE OF THE AUTHOR:	BSc Environmental Management (Zoology) (UNISA) BSc Hons Environmental Management (UNISA) **Marielle Penwarden** is an Environmental consultant at Chand with ten years' experience. She has a BSc Honours in Environmental Management (UNISA) and has experience in ISO9001 Quality Management Systems as well as NEC3 Engineering Contract management. She has worked on and managed several environmental authorisation processes such as Basic Assessments, Scoping and Environmental Impact Assessments, Section 24G applications, setback line applications, etc. inclusive of the supporting public participation, licensing, and compilation of Environmental Management Programmes (EMPr) required. These authorisation processes have been conducted for small, medium, and large-scale infrastructure projects such as a nuclear power station, wind farms, pipelines, roads, residential developments, etc. and have varied in complexity and controversy. She also has experience on Environmental Impact Assessments in Botswana as well as in the compilation of Site Environmental Management Plans and Waste Management Plans. Furthermore, Marielle has conducted numerous audits for the construction phase of small and medium-scale infrastructure projects. Prior to joining Chand, she worked as a Scientist for a large engineering organisation under the Mega Projects unit, which dealt with large projects of national importance.
CURRICULUM VITAE	See Appendix 8
SIGNATURE OF AUTHOR:	

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ACRONYMS

For the purposes of this document the following acronyms shall apply:

DEA&DP	Department of Environmental Affairs and Development Planning
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EO	Environmental Officer
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
PVC	polyvinyl chloride
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Act

DEFINITIONS

For the purposes of this document the following definitions shall apply:

Affected Environment:
Those parts of the socio-economic and biophysical environment impacted on by the development

Bund:
Enclosure under / around a storage facility to contain any spillage.

Batch plant:
Site for the large-scale mixing and production of concrete or plaster, and associated equipment and materials.

Contractor:
The principal persons /company undertaking the construction of the development.

- The main contractor as engaged by the developer/ developer's representative;
- Selected subcontractors; and
- Any other contractor from time to time engaged by the developer directly in connection with the construction part of the works.

Contaminated water:
Means water contaminated by the contractor's activities, e.g., concrete water, and runoff from plant/personnel wash areas.

Construction camp:
Means the area designated for all temporary site offices, storage sheds and areas, parking areas, maintenance workshops, staff welfare facilities, accommodation, etc.

Construction Environmental Management Programme (EMPr) :
The construction phase Environmental Management Programme, containing the environmental specifications for civil and building works, also forming part of the civils, and building contract documentation.

Engineer:
A person representing the Developer on site and who is responsible for the technical and contractual implementation of the works to be undertaken. This is usually the engineer, but may be any other person, such as an architect or project manager (see below), authorised by the developer to fulfil this role.

Environment:
Means the surroundings within which humans exist and that are made up of the land, water, and atmosphere of the earth:

- micro-organisms, plant, and animal life;
- any part or combination of the above and the interrelationships among and between them; and
- the physical, chemical, aesthetic, and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Education Programme:
An environmental education course for the contractor's management staff and labour force, which informs them of the requirements of the EMPr. The ECO will present and co-ordinate courses.

Environmental Control Officer (ECO):
The individual or company appointed by the developer to ensure the implementation of the EMPr and suitable environmental management practices on site for the duration of the construction phase of the project.

Environmental Impact Assessment (EIA):
A process of collecting, analysing, interpreting, and communicating data as it pertains to possible impacts (positive and negative) upon the environment due to a development.

Environmental Officer (EO):
The person appointed by the Contractor to ensure implementation of the EMPr on site.

Heritage Western Cape (HWC):
The statutory provincial body responsible for heritage resource management, in the Western Cape.

Maintenance:
Actions performed to keep a structure or system functioning or in service on the same location, capacity, and footprint.

Maintenance Management Plan:
A management plan for maintenance purposes defined or adopted by the competent authority.

Method Statement:
A written submission by the contractor to the engineer and ECO in response to the specifications or a request by the engineer, setting out the plant, materials, labour and method the contractor proposes using to carry out an activity, identified by the relevant specification or the engineer when requesting the Method Statement, in such detail that the engineer is enabled 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 shall cover applicable details regarding:

- construction procedures;
- materials and plant to be used;
- getting the plant to and from site;
- how the plant/ 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; and
- any other information deemed necessary by the engineer.

Mitigation:
The implementation of practical measures to reduce adverse impacts

No Go Areas:
Areas identified as being environmentally sensitive in some manner and delineated on plan, and on the site with pegs or fencing and which are out of bounds to unauthorised persons. Authorisation must be obtained prior to entry.

Potentially hazardous substance:
Is a substance, which, in the reasonable opinion of the engineer, can have a deleterious effect on the environment.

Project Manager:
A person representing the developer on site and who is responsible for the technical and contractual implementation of the works to be undertaken. This is usually the engineer (see above), but may be any other person, such as an architect or project manager, authorised by the developer to fulfil this role.

Reasonable:
Means, unless the context indicates otherwise, reasonable in the opinion of the engineer after he/she has consulted with a person, not an employee of the Employer, suitably

experienced in "environmental implementation plans" and "environmental management plans" (both as defined in the National Environmental Management Act (No. 107 of1998)).

River Reach:
A length of river characterised by a particular channel pattern and channel morphology, resulting from a uniform set of local constraints on channel form. A river reach is typically hundreds of meters in length.

Site:
The boundary and extent of development works and infrastructure, including any areas off the main site on which works are to be carried out in order to allow the development to proceed successfully.

Solid waste:
Means all solid waste, including construction debris, chemical waste, excess cement/ concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food, and domestic waste (e.g. plastic packets and wrappers).

Specification:
A technical description of the standards of materials and workmanship that the contractor is to use in the works to be executed, the performance of the works when completed and the way payment is to be made.

Stretch:
A section of watercourse delineated between two or more mapped coordinates, within which proposed maintenance activities are to take place as guided by an MMP.

Top material:
This refers to any surface material in the construction area, whether it is soil, fine material or stones including vegetation.

Topsoil:
Means the top 100mm of soil and may include vegetation and rocks.

Watercourse:
(a) a river or spring;
(b) a natural channel in which water flows regularly or intermittently;
(c) a wetland, lake, or dam into which, or from which, water flows; and
any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998); and
a reference to a watercourse includes, where relevant, its bed and banks.

Wetland:
Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and

which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

Works:
The construction operations and all related and incidental works, such as site works, earthworks, installation of services, rehabilitation etc., in connection with the execution and carrying to completion of the development.

Table 1 Checklist for Report Contents against the Requirements of Appendix 4 of GN No. 326 of 7 April 2017

NO.	REQUIREMENTS:	INCLUDED IN REPORT:	SECTION REFERENCE
a	Details of the EAP who prepared the report, including the expertise of the EAP, including a curriculum vitae.	✓	Document Control Sheet
b	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	✓	1.2
c	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers; *Note there are no areas or buffers which need to be avoided.*	✓	1.2 Figure 13 Figure 14
d (i)	A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed, and mitigated as identified through the environmental impact assessment process for all phases of the development including- Planning and design;	✓	1.3 3
(ii)	Pre-construction activities	✓	3 3.3
(iii)	Construction activities;	✓	3 3.3
(iv)	Rehabilitation of the environment after construction and where applicable post closure; and	✓	3.3
(v)	Where relevant, operation activities.	✓	4
(f) (i)	A description of proposed impact management actions, identifying the way the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to- Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	✓	3.2 3.3 3.4
(ii)	Comply with any prescribed environmental management standards or practices;	✓	1.4
(iii)	Comply with any applicable provisions of the Act regarding closure, where applicable; and	NA	
(iv)	Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	NA	
g	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f)	✓	2.2 2.3

h	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	✓	2.2 2.3 2.4
i	An indication of the persons who will be responsible for the implementation of the impact management actions;	✓	2.2
j	The time period within which the impact management actions contemplated in paragraph (f) must be implemented;	✓	2.2 2.3 3.2
k	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	✓	2
l	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	✓	2.3
m (i)	An environmental awareness plan describing the manner in which- The applicant intends to inform his or her employees of any environmental risk which may result from their work;	✓	2.4.3
(ii)	Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	✓	2.4.3
n	Any specific information that may be required by the competent authority.	An MMP is included in Chapter 5.	

1. INTRODUCTION

1.1 BACKGROUND, SITE LOCATION AND ACCESS

Boschendal (Pty) Ltd wishes to convert an existing cluster of cottages (i.e., the York Farm cottages) on a portion of Portion 11 of farm no. 1674, Paarl to tourist accommodation, but more specifically to accommodate the Bertha Retreat. The intention is to redevelop the existing cottages through a hybrid design strategy which would retain some cottages in largely unchanged form, while other cottages would be demolished and rebuilt on the original footprint. There would be some extensions to the existing footprint of the cottages as well as a range of hard- and soft- landscaping interventions and servicing to the facility. The proposal would accommodate up to approximately 34 overnight guests/attendees at capacity.

The site is located within the farm (refer to Figure 1) and is accessible via an existing internal dirt road (i.e., the "Ou Wapad") and externally accessible via Helshoogte Road, Lanquedoc Main Road and the Ou Wa-pad.

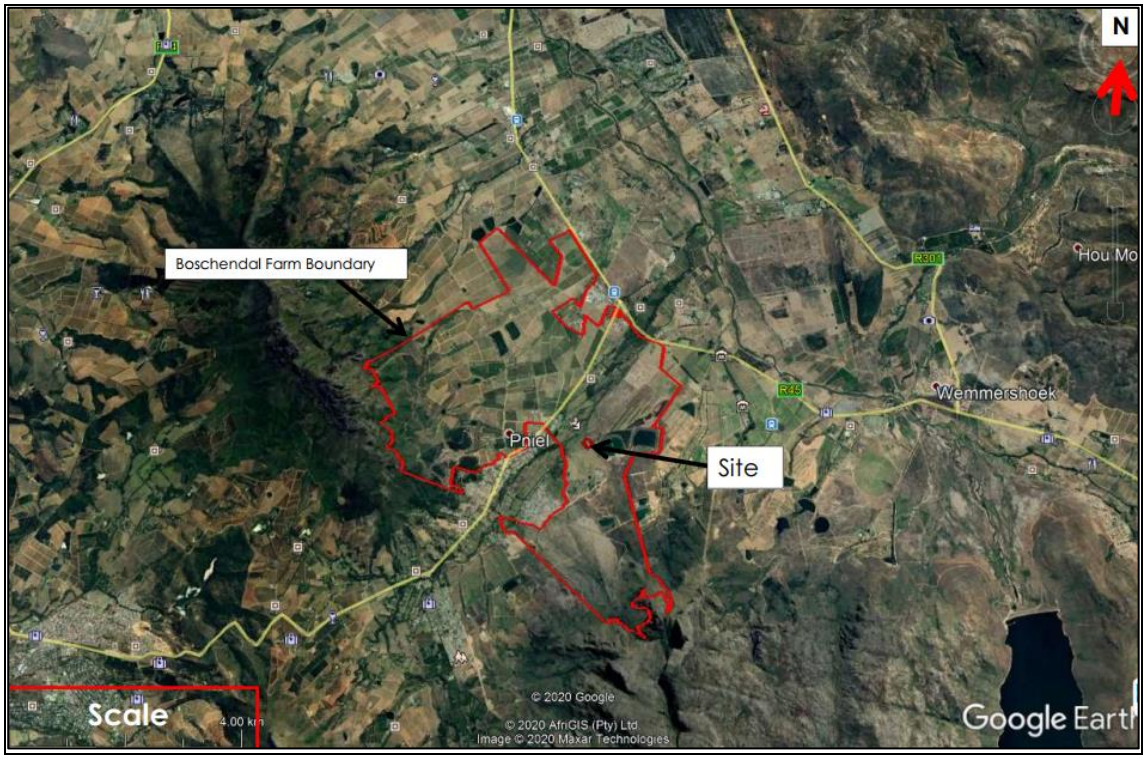


Figure 1 Locality map

1.2 PROJECT SCOPE

The Site Development Plan proposed is indicated in Figure 2 with a more detailed image and set of documents included in Appendix 2.

The proposed development entails the development of a "New Retreat", for the Bertha Foundation which draws on the positive attributes as well as lessons learned from the current Retreat on the farm. The Retreat is a Bertha Foundation initiative, and the overall intention is for the proposed development to provide a transformative space where people can gather, align and work to embolden the field for social justice. The space would provide sanctuary for organisations, movements, and individuals most marginalised within society. These could range from local community organisations or individuals to those from international origins. The New Retreat would be used to host any event which furthers the aims of social justice such as decision-focused meetings, training and capacity-building, strategic planning, and reflection sessions, retreats and team-building activities, convenings and exchanges for partnership strengthening/development, film screenings and discussions, and community recreation/engagement programmes.

The proposed development would include internal and external spaces for convening and accommodation, as well as the ancillary areas which would support this such as kitchens and staff quarters.

It is presently anticipated that the proposed development would have the capacity to accommodate up to approximately up to 34 overnight guests/attendees.

Figure 2 Site Development Plan, existing building footprints indicated in red (source: Tsai Design Studio, 20 August 2020)

The details of each component of the proposed development are described below.

1.2.1 Buildings

The existing building footprints of the remnant cottages on site would be used, where possible and the proposed development would comprise of the following buildings:

- Accommodation buildings to accommodate up to 34 overnight guests/attendees, which include bedrooms, bathrooms, a lounge/communal living area and covered outdoor areas/deck space;
- A conference facility which includes a small conference venue and up to approximately two breakaway areas;
- A communal dining and lounge area;
- An administration building with a reception and waiting lounge / library;
- Meeting room(s) for community programmes and a communal library; and
- A kitchen area, with space for staff dining, lockers, and ablution facilities.

1.2.2 Services

Services are depicted in Figure 3.

Figure 3 Proposed Civil Engineering Services and Flood Protection Measures (source: MH&A, from drawing "General Arrangement", DWG No C5960/03)

Sewage

There is no existing functional sewer system for development and the historic pipe and septic tanks systems have been abandoned and will not be rehabilitated (Middelmann & Hurworth, 2021). These existing septic tanks are located in close proximity to the cottages,

which is not ideal for future development, as this does not meet the requirements of section 133(2) of the Stellenbosch Municipality Water Services Bylaw (August 2017), which states that soakaways are not permitted within 5 metres of a dwelling (Nadeson, 2019). For this reason, the entire sewer infrastructure requires replacement.

Based on the water demand calculations, the Peak Day Dry Weather Flow (PDDWF) is calculated at 10kℓ/day (Middelmann & Hurworth, 2021).

A conservancy tank of 30m^3 capacity would be utilised to temporarily hold/store the sewage and wash-water until off-site disposal occurs (Middelmann & Hurworth, 2021). The wastewater from this tank would be pumped out by a honeysucker as required for off-site disposal. The siting of the various components has been intentionally devised in order to pose the least risk possible on freshwater systems on and around the site. The siting of the proposed pumpstation, pipelines, and conservancy tank has been aimed at locating the conservancy tank further from the stream by placing it on the opposite side of the ou wapad, to the south-west of the site. Note that in the long-term, the intention is to connect to municipal supply, but this would be done when capacity is available and approved by the Municipality and would be the subject of a separate application for Environmental Authorisation, should there be any Listed Activities triggered.

Electricity

The proposed development will be supplied with a 200 KVA (300 Amp three phase) low voltage connection to the new site reticulation (*pers comms*, R. Clark, TRAC, 25/03/2021). The new supply would be taken from the existing Kylemore Farmers 1 Eskom 11 kV line (refer to Figure 4) via a new 11 kV Tee-off. This would be installed to run across the gravel farm road from the existing Eskom 11Kv overhead line (*pers comms*, R. Clark, TRAC, 25/03/2021). The new line would feed a new 11 kV/420 Volt 200Kva pole-mounted transformer, installed on the site and connected to a new 300Amp (200Kva) three-phase low voltage Eskom bulk supply meter point (*pers comms*, R. Clark, TRAC, 25/03/2021). It is also the intention to supplement power from the grid with rooftop solar panels in the future (*pers comms*, R. Clark, TRAC, 25/03/2021). Confirmation of capacity in this regard has been provided by Eskom.

Figure 4 Existing Electrical Connection (source: Schoonwinkel, 2020)

The reticulation network within the development boundary would be a private network and would be designed to comply with the standards and requirements of SANS 10142 (Schoonwinkel, 2020). An underground internal low voltage network would be installed from the Eskom bulk supply point to each of the buildings (Schoonwinkel, 2020. The operation and maintenance of the private internal reticulation services would be the responsibility of the Retreat management (Schoonwinkel, 2020).

The proposed electrical infrastructure does not trigger any Listed Activities under NEMA as they are below the capacity thresholds contained in the Listed Activities pertaining to power. The rooftop solar is also an exclusion under the Listed Activities referring to renewable energy and solar power, and so, would not trigger Listed Activities in terms of NEMA.

Potable Water

There are no water networks in the vicinity of the proposed development (Schoonwinkel, 2020).

The total Average Annual Daily Demand (AADM) for the proposed development is estimated at 13 400 L/day (Schoonwinkel, 2020). The average estimated daily flow is 0.16 L/s and a peak factor of 2.4, therefore the network would be designed for a flow of 0.38 L/s (Schoonwinkel, 2020). The internal reticulation network would have pipes of 110 mm in diameter.

Two bulk water supply lines are proposed 1) an interim private supply which will source from an existing irrigation line and 2) a long-term solution which will source water from the municipal network in Landquedoc.

The proposed interim solution involves tying into the existing York Dam 300 mm diameter irrigation supply line that currently feeds a part of the Boschendal Estate irrigation reticulation. There is an existing "take-off" for water supply to existing houses just off Hoof Road within the York Farm boundary (refer to Figure 5). The existing connection would be upgraded to a 160 mm connection and a new 160 mm diameter uPVC Class 12 pipe would be laid to the Retreat. The new pipe route would extend 282 m and be installed within the road reserve on Hoof Road (Middelmann & Hurworth, 2021). The pipe would cross a perennial stream where approximately 20 m would be fastened to the existing culvert. The pipeline will terminate at the entrance of the Retreat. A 160 mm diameter uPVC Class 12 connection will be tied into the main line and feed the proposed meter chamber within the development boundary (Middelmann & Hurworth, 2021). In the interim, a holding tank and combination sand filter and Ultra-violet water treatment plant will be installed to treat the "irrigation water" to the required quality and standard for Municipal potable water.

Figure 5: Proposed temporary bulk water supply (source: MH&A DRG No. C5960/07)

In the long-term and following permission from affected landowners, bulk water would be sourced from the external municipal network in Lanquedoc. An underground 160 mm diameter uPVC link main is proposed to be constructed from a connection point on the Lanquedoc PRV water distribution zone, on the fringe of the Lanquedoc estate, along Hoof Road and into Boschendal (refer to Figure 6). The routing of the western segment of the

proposed water line would be determined on site but would be limited to the northern side of the roadway. It would either be routed within the northern half of the road (i.e. hard/blacktop) or between the existing hard top and row of gum trees alongside it (there is currently compacted, bare ground presently between the gum trees and hard/blacktop). A bulk meter would be required at the Boschendal boundary, proposed at a convenient location outside the security gate and to the approval of the local authority, and the pipeline would continue as a private main up to the Retreat development, on Portion 11 of Farm 1674 (Middelmann & Hurworth, 2021). The pipeline would bridge various stormwater culverts by surface fixing.

Figure 6 Proposed Bulk Water Line to Lanquedoc (source: MH&A, Drg No C5960/06)

Refuse

Refuse will be collected at the Retreat by the farm management and disposed of with the refuse generated on the farm (Schoonwinkel, 2020). Collection of refuse is currently done by a private company who dispose of the waste at a registered site (Schoonwinkel, 2020).

Telecommunications

A fibre spine is proposed to be installed along Hoof Road in the future, and the development would be equipped with a duct and drawpit system to provide connectivity to all units (pers comms, M. Middelmann, MH&A Consulting Engineers, 18/03/2021).

Stormwater and Flood Management Measures

Stormwater would be managed primarily by infiltration through permeable surfaces. Surface flow that may be generated by high rainfall events would be allowed to pass through the development by surface escape, without causing flow concentration. Flood management measures to protect the development from flooding of the adjacent watercourse would be required. These measures comprise the conversion of the existing culvert crossing on Hoof Road to an engineered low level road crossing to contain flood flow safely under and over the new culverts, within the river corridor. The existing berm on the development side of the watercourse would also be formalised to be continuous, reprofiled and raised. The existing head-cut within the stream would be "flooded" (i.e., water would be allowed to pool therein) so that the erosive cut is less likely to move upstream and there would be some low retaining of the channel side embankments in gabions, as well as floor armouring throughout the structure.

Refer to **Appendix 4** for the Civil Services Plan.

1.2.3 River Rehabilitation

Rehabilitation to the stream to the north of the site (i.e., stream 10) would also take place. There is a detailed rehabilitation plan included in this report and the Aquatic Biodiversity Impact Assessment Report, but Snaddon (2021) indicates the following necessary rehabilitation requirements:

- Bed (head-cut) Stabilisation;
- Bank (lateral) stabilisation);
- Removal of invasive alien plant species; and
- Replanting of rehabilitated areas.

Regular maintenance would also be required, hence the Maintenance Management Plan (MMP) contained in Section 5 of this document.

1.2.4 Transport and Access

There is an existing road network which provides access to the site. Access to the site would be obtained via the Ou Wapad, a 6 m wide gravel servitude road that traverses Portion 2 of Farm 1176 (which is not part of the Boschendal Estate and Farm 1730 of the Boschendal Estate, and which takes access via a security gate (which is owned and managed by Boschendal) off the Lanquedoc Main Road (which is accessible via Helshoogte Road) (Pretorius & Sequeira, 2020). The access control will be retained (Pretorius & Sequeira, 2020).

A total of 24 parking bays are proposed and confirmed as sufficient (Pretorius & Sequeira, 2020).

Internal access would be via a short, single new access road off the Ou Wapad, to a small parking area along the edge of the Ou Wapad (NMA, August 2020). This would serve to limit the movement of vehicles on and around the site (NMA, August 2020). Internal access to the various components of the proposed development would occur via a series of informal footpaths and landscaping interventions as described in the Landscaping section below.

There are public transport services in the form of mini-bus taxis available along the Helshoogte Road (Pretorius & Sequeira, 2020). A bus turning route (refer to Figure 7) for shuttle busses dropping off Retreat attendees is proposed south of the proposed

development, making use of the existing dirt road, as the Ou Wapad is too narrow for a bus to turn around (Pretorius & Sequeira, 2020). The bus would need to alley dock by means of reversing into the gravel road and then driving out again (Pretorius & Sequeira, 2020).

Figure 7 Proposed Bus Turning Route under consideration (source: Pretorius & Sequeira, 2020)

No additional pedestrian and cycling facilities are required for the proposed development (Pretorius & Sequeira, 2020). The Ou Wa-pad is a private gravel road and visitors to the farm will be able to walk along the Ou Wa-pad under these local traffic volume conditions (Pretorius & Sequeira, 2020).

1.2.5 Landscaping

The proposed interventions would connect the site to the farm by opening up views to the surrounding landscape, watercourse, and mountains, and forming new paths that connect the site to the adjacent watercourse and the Dwars River. The overall design intent is to integrate the development in the landscape and provide a multitude of diverse spaces that are comfortable for a range of people. The landscape plan in Figure 8 indicates a variety of spaces from the large central gathering space, the point of arrival to more intimate spaces for solitary pursuits and isolation in areas such as the boardwalks along the stream. The use of peripheral areas for guests to connect to nature is facilitated using a continuous footpath through the rehabilitated fynbos and a productive kitchen garden (pers comms, A. Bormans, 29/05/2020). The interface with the historic Ou Wapad would be softened with extensive planting (pers comms, A. Bormans, 29/05/2020).

The intention is that all spaces, including the parking area, be multi-use spaces to accommodate varying functions such as occasional markets, grantee gatherings, community gatherings, and play activities (NMA, August 2020).

In terms of sustainable drainage, stormwater would be managed primarily by infiltration through permeable surfaces. Car parking areas would be constructed from permeable gravel-fix systems, or permeable grass blocks, and edge restraints would be low and/or

have drainage gaps. Landscaped pedestrian areas and planting would also be permeable. Surface flow that may be generated by high rainfall events would be allowed to pass through the development by surface escape, without causing flow concentration. Refer to the Stormwater Management description below for more information.

There would be a combination of hard and soft landscaping measures applied.

Hard landscaping would include an open courtyard and a network of boardwalks, as well as an outdoor landscaped amphitheatre (which would be grassed). Proposed parking areas would also be landscaped, but these would be tucked within further planting to soften the entrance and interface with the Ou Wa-pad.

Soft landscaping would also be used to bridge scale with the proposed buildings and break-away areas as well as to provide screening and synergy with the surrounding landscape. Tree lines as well as rehabilitated fynbos corridors would be implemented to provide strong connections to the broader landscape (pers comms, A. Bormans, 29/05/2020). There would be peripheral areas to connect to nature through the provision of a continuous footpath through the rehabilitated fynbos and productive kitchen garden (pers comms, A. Bormans, 29/05/2020). The interface with the historic "Ou Wa-pad" would be softened with extensive planting. The intention would be for the site to be as self-sufficient as possible, and so a vegetable garden is a major component of the landscape plan.
The Landscape Plan is indicated in Figure 8 as well as in **Appendix 3**.

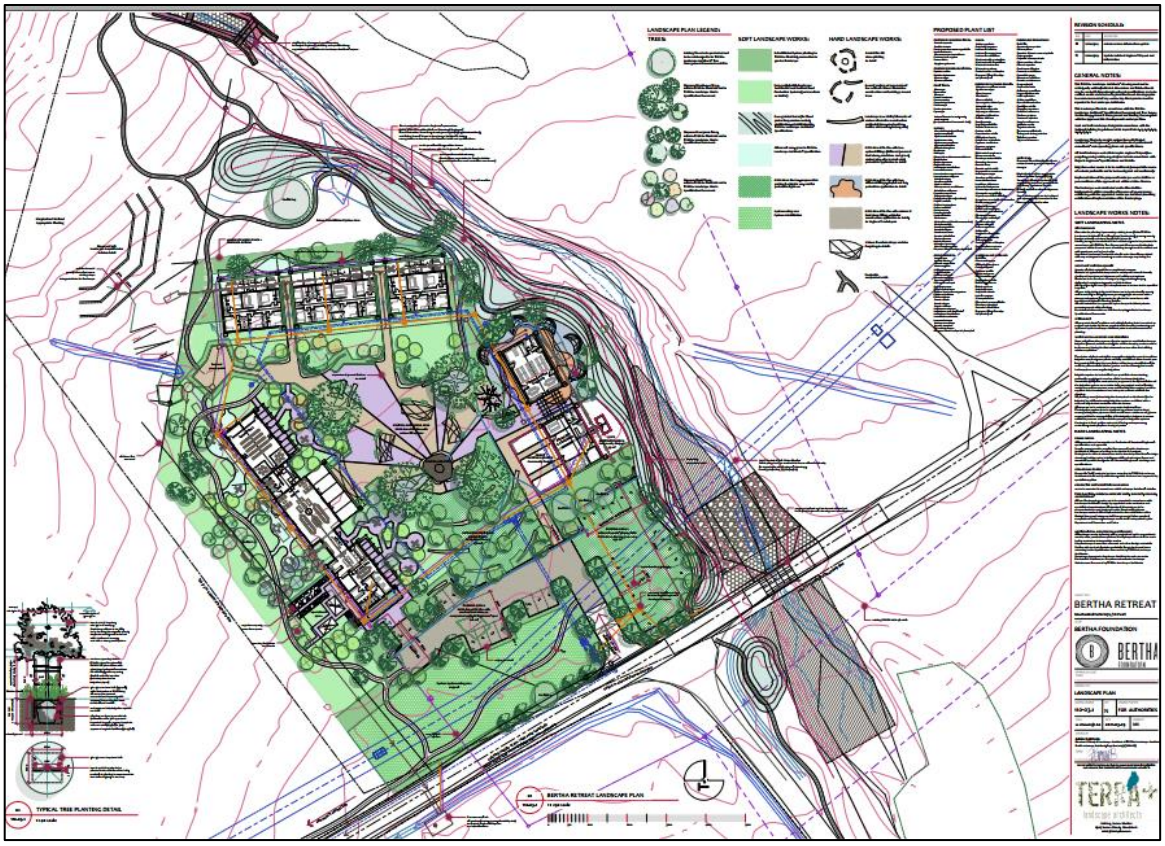


Figure 8 Landscape Plan (source: Terra+, 29 March 2021)

1.2.6 Design Philosophy

Some insight into the design approach is provided here in order to demonstrate the rationale behind the proposed development. The overall design objective is to alter the existing labourers' cottages as minimally as possible to ensure that past occupation of the site is remembered and acknowledged (NMA, August 2020). Another key objective is to improve the relationship between the present cottages and the landscape in which they are located (NMA, August 2020).

In order to retain the original form and character of the cottages, the roof construction would replace almost exactly what was there before (NMA, August 2020). The existing external walls and sizes of openings would also be retained where possible; however, the walls behind some of the verandas will be opened up to take advantage of the views (NMA, August 2020).

The existing external walls are currently constructed of a double layer of "hollow bricks" with no cavity and so technical solutions would be sought to counter the lack of thermal / sound insulation and protection from moisture penetration offered by the "hollow brick" walls as part of detail design (NMA, August 2020). The new interlinking spaces between the cottages would be constructed of conventional 280 mm cavity walls, painted in a different colour to differentiate them from the existing cottages and due to the nature and scale of the accommodation, not many of the existing internal would be retained NMA, August 2020). Structurally, is it not necessary to demolish the existing floor slabs, and so the slabs could be retained, and new concrete could be cast on top of the existing slabs (NMA, August 2020).

Passive design principles will would the design of the existing buildings as far as possible in order to achieve a low carbon footprint that does not have a negative impact on the immediate surroundings or the surrounding environment (NMA, August 2020). Extensions to the current footprints have been limited in the proposed development as far as possible (NMA, August 2020). Where unavoidable due to functional and programmatic requirements, the additional footprint has been located contiguous to the existing buildings to keep the development as compact as possible (NMA, August 2020).

1.2.7 Present State of Site

The site and potable water line routes are transformed and have low soil potential for agriculture. There are eight remnants of old worker cottages on the site, each of which are approximately 147m^2 in extent. Some of them have sections of walls still in place, but the interiors are completely removed, and the cottages are empty. They do not have any architectural or aesthetic value (Smuts & Scurr, 2020). The heritage value of the buildings is the social layer and memory that they and their layout (particularly with the communal central courtyard and gardening) hold (Smuts & Scurr, 2020).

In terms of landscaping, areas around the buildings used to be planted with flowers and that there were vegetable gardens in the back yards (NMA, August 2020). The central courtyard was also an important space which the former residents used to commune and gather in (Smuts & Scurr, 2020).

In terms of existing access, the site lies along the ou wapad, which was historically used as a main road which connected the farm to many local communities.

The site drains in a northerly direction towards the Dwars River and there is currently no formal stormwater infrastructure at the site (Schoonwinkel, 2020). The nearest connection to a water network is at the Thembalethu site, approximately 1.36 km from the site, to the north-east. The current sewer system consists of vitrified clay pipes that drain into septic tanks with a soakaway that infiltrates into the ground. There is therefore no formal sewer system in place (Nadeson, 2019). There is an existing 200 kVA transformer that supplies this area (refer to Figure 4).

Although much of the site itself has little ecological value, there are sensitive wetlands and a stream around the site which are of great importance, and which need to be protected during the construction and operational phases. Refer to section 1.2.9 for more information in this regard.

The proposed potable water lines are largely planned for existing roadway, which is disturbed and comprises compact dirt and gravel, or is tarred. There is a small section of the permanent route nearer Lanquedoc which is lined with Eucalyptus trees and the line may be routed in the compacted dirt walkway between the edge of the black-top and the trees (or within the roadway).

1.2.8 Flora

The site and potable water pipeline routes are of Low botanical and faunal diversity and sensitivity and presents no faunal or botanical constraints to the proposed development, other than the seasonal drainage line on the eastern edge of the site (see section below), where development planning should be in line with what is recommended by the freshwater specialist.

The overall ecological significance of the development of the site (excluding the seasonal drainage line on the eastern edge of the site- see section below) and installation of the potable water pipelines would be Low negative (before mitigation) on a regional scale.

1.2.9 Surface Water

Snaddon (2021) confirmed three freshwater resources on/near the site, namely the perennial stream 10 which runs along the eastern edge of the site, the Dwars River valley-bottom wetland and the seep wetland to the west of the site (refer to Figure 9). The upper reaches of stream 10 has a high ecological importance and sensitivity, while the lower river is of moderate EIS (Snaddon, 2021). Both wetlands are transformed from the natural state, as a result of the long history of cultivation of the Estate and there is evidence of excavations and berms in both wetlands, as well as roads and tracks (Snaddon, 2021). The "New Retreat seep" wetland was assessed to be in a Category D – largely modified – while the Dwars River valley-bottom wetland lies in a category C – moderately modified (Snaddon, 2021). Overall, the Dwars River valley-bottom wetland was placed in the High EIS category, and the seep wetland in the Moderate category (Snaddon, 2021).

Two Ecological Corridors pass through the New Retreat site, one along Stream 10 and the other following the Dwars River (Snaddon, 2021) (refer to Figure 10).

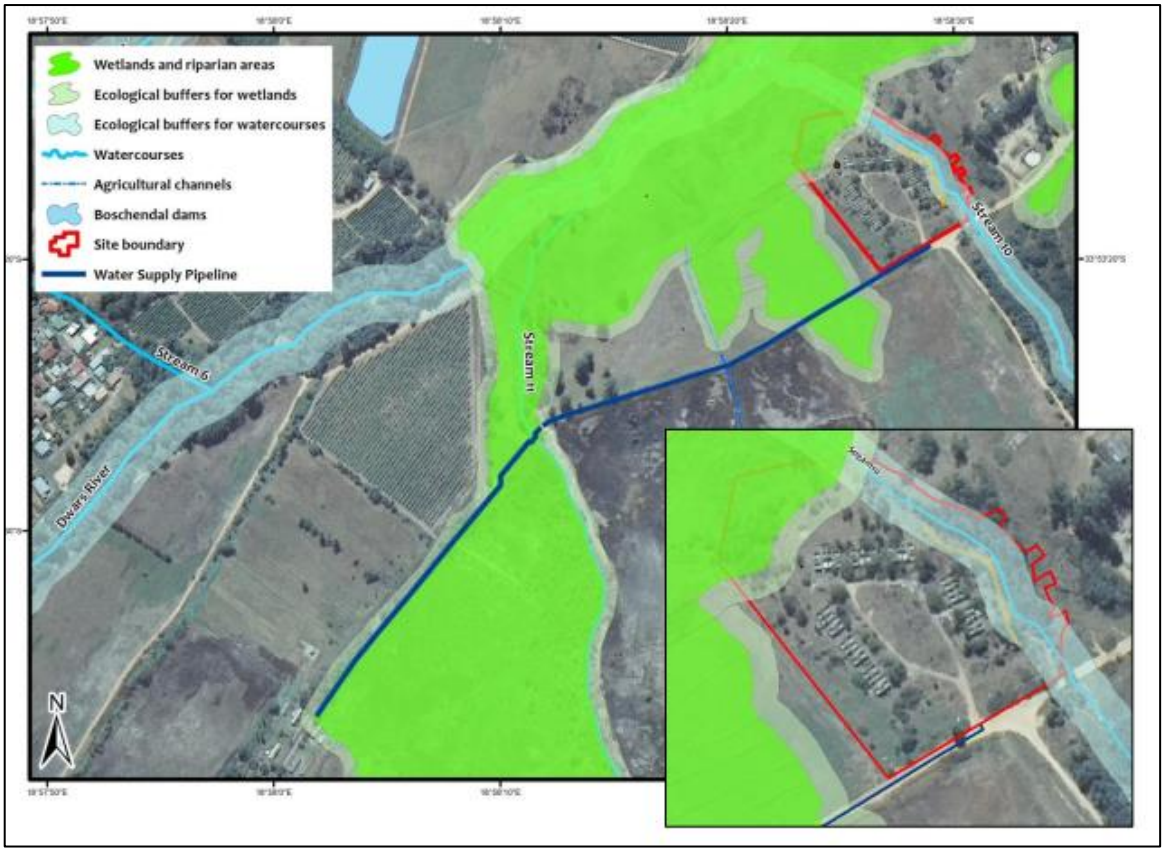


Figure 9 Watercourses and Ecological Buffers on site (source: Snaddon, 2021)

The route for the proposed permanent water supply line to Lanquedoc would cross stream 11 as well as its associated seep. Stream 11 is an earth-lined channel with cobble and fine sediments and the watercourse has been heavily invaded by invasive alien plants, with few indigenous riparian plants remaining in the riparian area (Snaddon, 2021). Stream 11 is surrounded by a seep wetland that extends uphill towards Lanquedoc and the diversion channel, with the seep having approximately 10% invasive alien plants and the remainder as indigenous vegetation (Snaddon, 2021). Stream 11 and its associated seep both hold a moderate ecological importance and sensitivity and in terms of Present Ecological Status (PES), they are both category D (largely modified) watercourses (Snaddon, 2021).

The interim water supply line which would connect to an existing irrigation supply located north-east of the site, would cross stream 10 as well as run very close to a seep below the York Dam. The York Dam seep wetland has been assessed as being in a PES category C – this seep has also been transformed by the presence of the road and the dam, and a few farm buildings. The wetland vegetation persists, however, including palmiet, *Prionium serratum* (Snaddon, 2021). In terms of EIS, the seep lies in the Moderate category (Snaddon, 2021). The key mitigation measure to protect the York Dam seep wetland is to place the temporary pipeline on the side of the road that is away from the seep wetland, so as to avoid the wetland.

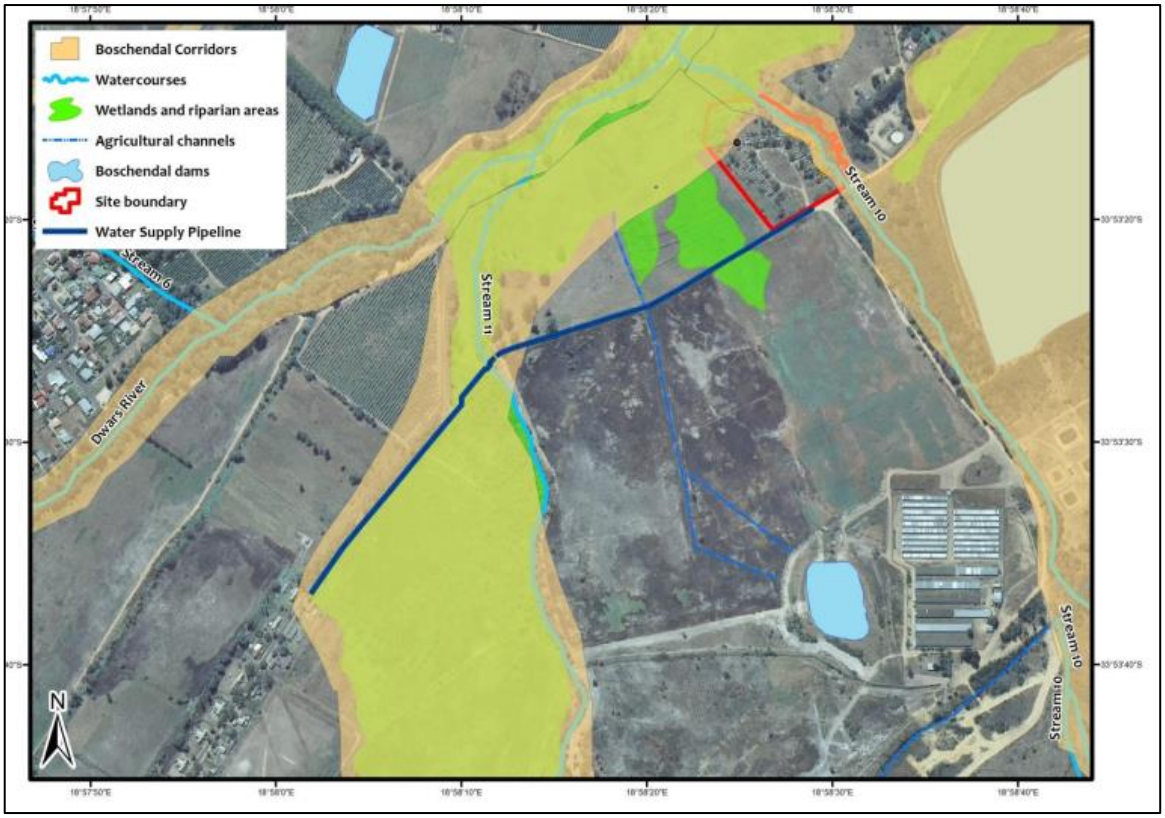


Figure 10 Stream, wetlands, and ecological corridors (source: Snaddon, 2021)

The wetlands and stream areas, as well as the ecological corridors depicted in Figure 9 and Figure 10 must be respected as no-go areas unless works are actively required (as part of an approved Site Development Plan and Landscape Plan) therein. These aspects around the site require careful execution of construction works as well as operational management of the site and facility.

1.2.10Fauna

The site is largely located within a low sensitivity faunal area (Jackson *et al*, 2019), however the high-sensitivity faunal areas and the association faunal corridors correlate with the wetlands and river (and associated ecological buffers) associated with the site (refer to Figure 10 and Figure 11).

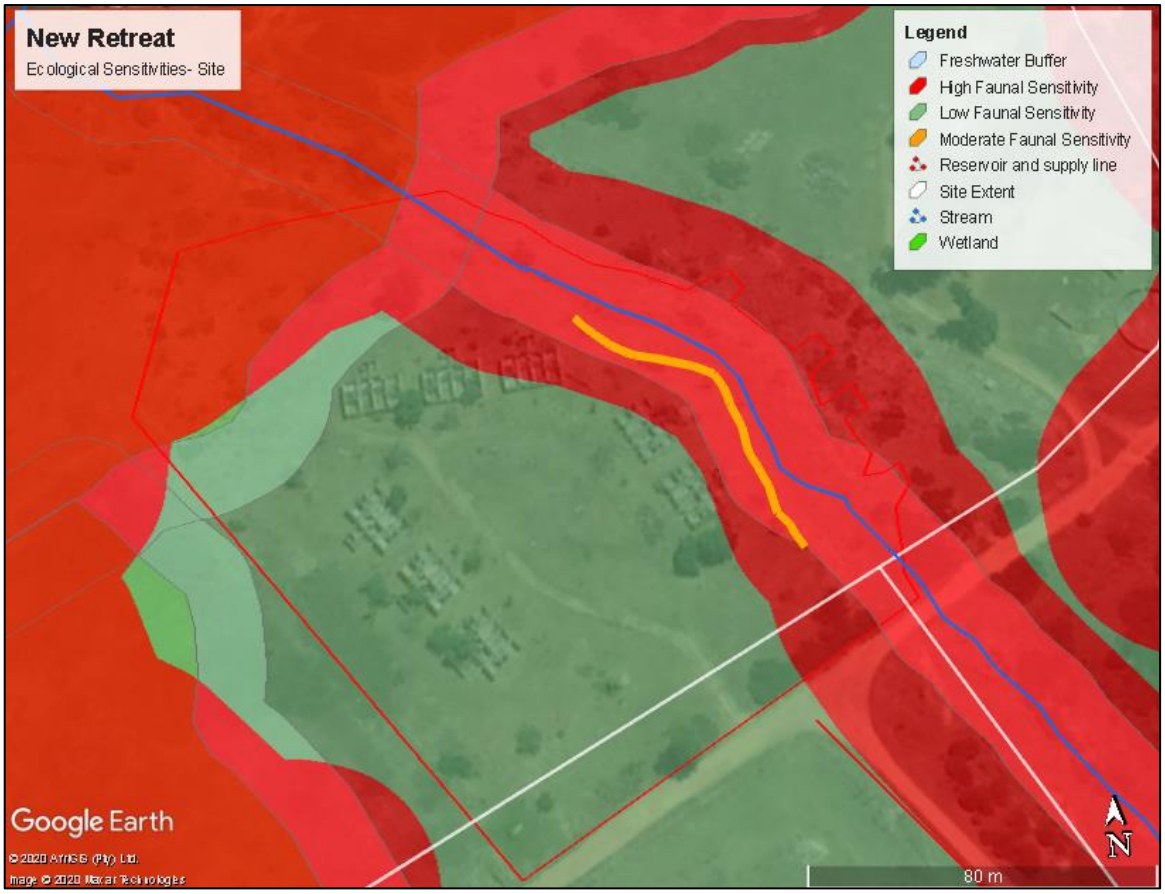


Figure 11 Ecological Sensitivities of the Site (source: created using Google Earth with data layers from Jackson, 2019, Snaddon, 2020 and Schoonwinkel, Sep 2020)

The proposed development is consisted with the goals for low and high sensitivity areas indicated in Jackson (2019). Helme (2021) states that the faunal diversity of the site is low, and typical of disturbed, remnant habitat in the region. No animal Species of Conservation Concern were recorded in the study area, and none are expected to survive in this disturbed area. Faunal sensitivity is Low on a regional scale (Helme, 2021). Fauna noted in the stream included the Cape River Crab, *Potomonautes perlatus*, blackfly larvae, *Simulium spp*., and numerous mayfly nymphs of the family *Baetidae*. These species are all hardy taxa, tolerant of impacted water quality (Snaddon, 2021).

The proximity of the faunal corridor as well as the general variety in faunal habitats on the farm and in the nearby nature reserves means that there may be some fauna encountered on the site during construction and operational phases. That is the reason there are measures in the Environmental Specifications to protect fauna and to best deal with fauna if encountered. Fauna must not be harmed, and potentially dangerous fauna must only be handled by professionals.

1.2.11 Heritage/Cultural/Archaeological Aspects

The proposed development also triggers Section 38 of the National Heritage Resources Act (No. 25 of 1999). The proposal and nature of the proposed development relative to the current context and sense of place trigger constitute a change of character to a site greater than 5000 m^2. The cultural landscape surrounding the site is of such high

significance that it forms part of the grade I Cape Winelands Cultural Landscape (CWCL) and has been put forward for inscription on the UNESCO tentative world Heritage Site list and the assessment methodology and mitigation measures applied by the heritage practitioners align as though it were ascribed that honour.

The Ou Wapad adjacent to the site is also a key component of the tangible heritage on site and in the context thereof. The social heritage of the site lies within the story thereof and use of the site as homes for the former farm workers.

Regarding the potable water line, that runs from the Boschendal gate to Lanquedoc links the historic workers' village of Lanquedoc with the R310 (Smuts & Scurr, 2021). Lanquedoc consists of its historic core of cottages designed by Sir Herbert Baker for Rhodes' workers at the turn of the C20th, and more recent RDP and low-cost workers' accommodation (Smuts & Scurr, 2021). The historic settlement of Lanquedoc carries high significance in terms of architectural and landscape significance, as well as social significance (Smuts & Scurr, 2021). In terms of archaeology, historic material from the c20th is likely to be found within the settlement of Lanquedoc itself, but significant material beyond the limits of the village, and within the road reserve, are not anticipated (Smuts & Scurr, 2021).

1.3 SUMMARY OF IMPACTS (SUMMARY AS IDENTIFIED DURING THE BASIC ASSESSMENT PROCESS)

The impacts anticipated as a result of the proposed development are indicated in Table 2.

Note that impacts for the following aspects are anticipated as insignificant and, therefore, not included in the assessment tables for the preferred alternative:

- Geohydrology;
- Geology;
- Agricultural;
- Botanical- noting that Helme (2021) noted positive operational impacts to terrestrial ecology;
- Noise (operational phase only);
- Dust (operational phase only); and
- Nature Reserves.

Note there are also no heritage impacts anticipated as a result of the proposed potable water pipeline to Lanquedoc (Smuts & Scurr, 2021).

Note that impacts for the following are anticipated as insignificant and, therefore, not included in the assessment tables for the existing rights alternative:

- Geohydrology;
- Geology;
- Agricultural;
- Botanical;
- Surface drainage regime;
- Traffic;
- Socio-economic;
- Noise; and
- Archaeological.

Note that the significance of the impacts with mitigation are assessed under the key assumption that the mitigation measures contained in this EMPr are all implemented. It is clear that impacts are generally higher before mitigation, and this emphasises the importance of adhering to the requirements in this document as it is a mechanism to ensure that impacts would be kept to low negative and positive levels of significance. It this EMPr is not implemented, then impacts would be higher, and this would not be acceptable.

Table 2 Summary of impacts and significance thereof for the proposed development alternatives assessed

Phase	Impact	Alternative 1, 2 and 3 (preferred)		No- Go Alternative 1		No- Go Altern	
		Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitig
Planning, design, and development	**Physical:** Altering the surface drainage regime	Low (-)	Neutral	N/A	N/A	N/A	N/A
	Socio-economic: Generation of local economic stimulus	Medium (+)	Medium (+)	N/A	N/A	N/A	N/A
	Nuisance Impacts: Noise and Dust	Low (-)	Very Low (-)	Low (-)	Very Low (-)	Low (-)	Very
	Visual: Adverse visual/ aesthetic impacts	Low (-)	Very Low (-)	N/A	N/A	N/A	N/A
	Natural Resources: Depletion of Natural Resources through use as material in the development/construction phase	Low (-)	Very low (-)	Low (-)	Very low (-)	Low (-)	Very
	Traffic: Effect on LOS of local road network during the operational phase (Some minor congestion could be experienced during morning peak along the local road network, or a slightly longer waiting period to cross the Dwars River Bridge in the morning peak)	Low (-)	Low (-)	N/A	N/A	N/A	N/A
	Traffic: Traffic Congestion on local road network during construction	Low (-)	Very Low (-)	N/A	N/A	N/A	N/A
	Freshwater: Storage of building or demolition materials (sand, soil, bricks etc) in or close to sensitive areas – this would damage the soil structure and would destroy or shade out plants growing in and around these ecosystems. Dump areas frequently lead to the compaction of soils, which can influence re-growth of plants.	Low (-)	No impact	Low (-) to no impact	Low (-) to no impact	Low (-)	Low
	Freshwater: Leakage or spillage of fuels, oils, etc. from construction / demolition machinery – this would lead to pollution of the wetlands or stream.	Low to medium (-)	Low (-)	Low (-)	Low (-)	Low (-) to medium (-)	Low med
	Freshwater: Foot and vehicular traffic across the site, leading to destruction or deterioration of freshwater habitat.	Low (-)	No impact	Low (-)	Low (-)	Low (-) to medium (-)	Low med

	Freshwater: Presence of construction / demolition teams and their machinery on site – this may lead to noise and light pollution in the area, which will disturb aquatic and terrestrial fauna and flora.	Low (-)	Low (-)	Low (-)	Low (-)	Low (-) to medium (-)	Low med
	Freshwater: Construction or demolition activities close to the wetlands or stream will lead to the loss of natural vegetation cover, and subsequent loss of biodiversity.	Low to medium (-)	Low (-)	Low (-)	Low (-)	Low (-)	Low
	Freshwater: Construction or demolition activities close to the wetlands or stream may lead to an increased input of mobile sediments, especially during the wet winter months when rain and runoff may cause erosion and sedimentation.	Low to medium (-)	Low (-)	Low (-)	Low (-)	Low (-) to medium (-)	Low med
	Freshwater: Topsoil or sand brought onto the site, for filling and landscaping can lead to the introduction of alien or invasive seedbanks.	Low to medium (-)	Low (-)	Low (-)	Low (-)	Low (-)	Low
	Heritage- Archaeology: Impacts are possible to subsurface remains, should these occur, during developmental stage through trenching and earthmoving activities related to construction activities.	Medium (-)	Medium (-) or minor Low (+) if it contributes to site identification	None	None	None	Non
	Heritage- Architecture: The cottages hold no architectural significance, and no impacts will arise. Unsympathetic alteration could, however, result in the loss of a layer of the farm's history as expressed in the variety of architectural styles present on the farm.	Medium (-)	Low (+)	Medium (-)	Low (-)	Medium (-)	Low
	Heritage- Landscape: Inappropriate landscaping interventions will interfere with the ability of the new development to sit in the landscape in an authentic, sympathetic manner, which is crucial to retaining the significance of the cultural landscape.	Medium (-)	Low (+)	Medium (neutral, slightly negative)	Low (neutral, slightly negative)	Medium (neutral, slightly negative)	Low sligh nega
	Heritage- Social: Redevelopment of former workers' cottages risks erasing traces of those people's lives and labour from the Boschendal landscape, negatively affecting the authenticity of the farm as a heritage site.	High (-)	Medium (+)	High (neutral, slightly negative)	Very High (neutral, slightly negative)	High (neutral, slightly negative)	Very (neu sligh nega
Operational Phase	**Fauna:** Impacts on faunal movement through the site (Restriction of passage of fauna through the site)	Medium (-)	Low (-)	Medium (-)	Low (-)	Medium (-)	Low
	Heritage-Archaeology: No impacts are anticipated to archaeological heritage during the operational phase	N/A	N/A	N/A	N/A	N/A	N/A

	Heritage- Architecture: The cottages hold no architectural significance, and no impacts will arise. Unsympathetic alteration could, however, result in the loss of a layer of the farm's history as expressed in the variety of architectural styles present on the farm.	Medium (-)	Low (+)	Loss of the cottages through either demolition or dereliction would constitute a loss of a layer of the farm's history as expressed in the variety of architectural styles present on the farm. Medium (-)	Low (-)	Medium (-)	Low
	Heritage- Landscape: Inappropriate landscaping interventions will interfere with the ability of the new development to sit in the landscape in an authentic, sympathetic manner, which is crucial to retaining the significance of the cultural landscape.	Medium (-)	Low (+)	Loss of built fabric illustrative of different periods of Boschendal history will reduce the heritage significance of the farm as a whole Medium (neutral, slightly negative)	Low (neutral, slightly negative)	Medium (neutral, slightly negative)	Low slig nega
	Heritage- Social: Redevelopment of former workers' cottages risks erasing traces of those people's lives and labour from the Boschendal landscape, negatively affecting the authenticity of the farm as a heritage site.	High (-)	Medium (+)	The loss of these cottages through either demolition or dereliction represents the	Very High (neutral, slightly negative)	High (neutral, slightly negative)	Very (neu slig nega

				loss of representative samples of recent labour practices and worker's lives on the farm High (neutral, slightly negative)			
	Socio-economic: Generation of local economic stimulus in perpetuity (Creation of employment opportunities as a result of operation of the proposed development. Note that additional indirect stimulus as a result of attracting more tourists to the area would also result.)	Medium (+)	Medium (+)	N/A	N/A	N/A	N/A
	Resource- use: Depletion of resources through use of resources such as energy and water and production of waste as a result of domestic activities	Low (-)	Very low (-)	Low (-)	Very low (-)	Low (-)	Very
	Nuisance Impacts- Dust- The cultivation or used of the site for grazing would result in the generation of dust which may be a nuisance to surrounding land users, in perpetuity.	N/A	N/A	Low (-)	Very Low (-)	Low (-)	Very
	Terrestrial Biodiversity	Low (+)	N/A	N/A	N/A	N/A	N/A

Phase	Impact	Alternative 1		Alternative 2		Alternative 3 (Preferred)		No-Go Alternative 1		No-Go A
		Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**
Operational Phase	**Freshwater:** Stormwater discharge into natural areas – water quality impacts.	Medium (-)	Low (-)	Medium (-)	Low (-)	Low (-)	Negligible	Low (-)	Low (-)	Medium (-)
	Freshwater: Stormwater discharge into natural areas – water quantity impacts.	Low to medium (-)	Low (-)	Low to medium (-)	Low (-)	Low (-)	Negligible	Low (-)	Low (-)	Low (-) t medium (-)

	Freshwater: Proximity of buildings and human activity to the wetlands and Dwars River. This may lead to local disturbance of fauna and flora, through noise, light, trampling, etc. Fauna may move away from the site.	Low to medium (-)	Low (-)	Low to medium (-)	Low (-)	Low to medium (-)	Low (-)	Low (-)	Low (-)	Low (-)
	Freshwater: Disturbance of soils for landscaping / maintenance of gardens/agricultural activities. Alien or invasive seeds and seedlings may be transported onto site. Alien vegetation is well adapted to establishing on previously disturbed soils and road verges.	Low (-)	Low (+)	Low (-)	Low (+)	Low (-)	Low (+)	Low (-)	Low (-)	Low (-)
	Ecological- Freshwater: On-site treatment of wastewater – impacts on water quality	Medium (-)	Low to medium (-)	Medium (-)	Low (-)	Low (-)	Negligible/ Low (-)	Low (-)	Low (-)	N/A

1.4 STATUTORY APPROVALS

The required approvals in terms of applicable legislation are tabled below. It must be ensured that all required approvals are in place prior to the commencement of construction.

LEGISLATION	ADMINISTERING AUTHORITY	AUTHORISATION TYPE
National Environmental Management Act, 2008 (Act No. 59 of 2008) (NEMA)	DEA&DP: Land Use Management	Environmental Authorisation
National Heritage Resources Act (No. 25 of 1999) (NHRA)	Heritage Western Cape	Comment on HIA and proposed development-
National Water Act (No. 36 of 1998)	Department of Human Settlement, Water and Sanitation	General Authorisation applicable, as confirmed by DWS in their email dated 18 May 2021. Reference is WU17609.
Western Cape Land Use Planning Act, No. 3 of 2014, section 35(1) Stellenbosch Municipality Zoning Scheme By-law, 2019 (ZSBL)	Stellenbosch Municipality	Land use application to the Stellenbosch Municipality (SM) to grant its Consent for the establishment of the proposed development.

1.5 COMPONENTS OF THE EMPr

The EMPr consists of the following components:

Section 1: Introduction	Provides background information regarding the site, the proposed development and the EMPr.
Section 2: Implementation of the EMPr	Provides details of the communication and organisational structures within which the EMPr will be implemented, responsibilities of key role players, and provides the terms of reference for the ECO.
Section 3: Environmental Management Specifications for Planning, Design and Construction Phase	Provides all construction phase environmental management requirements applicable to the principal construction contractors, and their subcontractors.
Section 4: Environmental Management Specifications for Operational Phase	Provides all operational phase environmental management requirements applicable to the proposed development.
Section 5: Maintenance Management Plan	This section includes the requirements for the maintenance of the watercourses on site, specifically stream 10 and the wetland and their buffers located within the site limits.

2. IMPLEMENTATION OF THE EMPR DURING THE CONSTRUCTION PHASE

2.1 INTRODUCTION

This document describes mitigation measures in detail, and is partly prescriptive, identifying specific people or organisations to undertake specific tasks in order to ensure that impacts on the environment are minimised during the construction phase of this project. The EMPr is applicable to all works comprising the project. It is an open-ended document implying that information gained during construction activities and/or monitoring of procedures on site could lead to changes in the EMPr.

The appointed Environmental Control Officer (ECO) will monitor compliance with the EMPr, and other Conditions of Approval contained in the Environmental Authorisation issued by the D: EA&DP, as they relate to environmental matters. This EMPr gives direction and guidance to all responsible parties. The responsible parties are expected to co-operate closely to minimise or avoid unnecessary environmental impacts.

Non-compliance penalties are described in this EMPr and are thus to be included into the official contract documentation. The contractor is obliged to inform the ECO immediately of events that may cause serious environmental damage or breach the requirements of the EMPr. The ECO in turn will immediately inform the Engineer and Developer and, if necessary, the environmental branch of the Local Authority, of such events.

2.2 ROLES AND RESPONSIBILITIES

The key role-players during the construction phase of the project, for the purposes of environmental management on site, include but are not limited to the Applicant (developer), the engineer, the main contractors (direct appointments including civil works contractor, building contractor, landscape contractor etc.) the ECO, the Community Liaison Professional and representatives of the relevant Authority/ies.

Details of the responsibilities of each of the key role-players have been provided in section 2.2.1 to 2.2.4. Lines of communication and reporting between the various parties are illustrated in Figure 12 below.

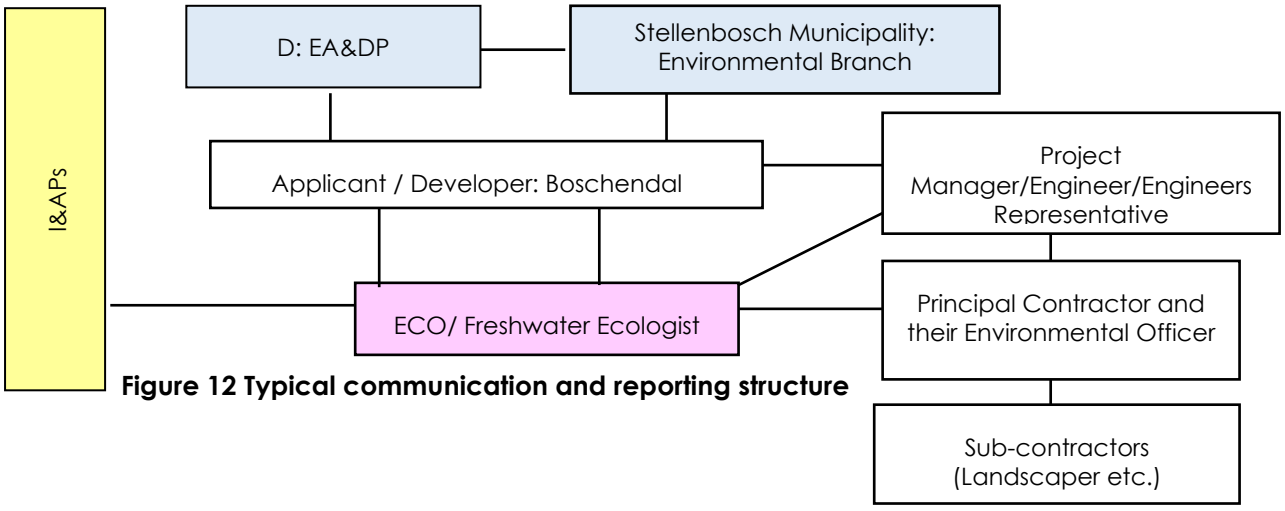


Figure 12 Typical communication and reporting structure

All parties must comply with Section 28 of the National Environmental Management Act No. 107 of 1998 (NEMA), i.e. "Duty of Care" which states that: "Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorized by law or cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment."

2.2.1 The Applicant / Developer

With respect to the construction phase of the proposed development, the Applicant / Developer is to:

- Ensure that the EMPr is included in all Contract documentation, particularly with regard to the appointment of the Contractor. The EMPr is also to be provided to the Contractor when requested to quote for the works in order to ensure financial provision has been made for the specifications contained herein.
- Ensure that the proposed development is developed as per the intention and design philosophy as described in this report.
- Ensure that the development footprint is contained within site limits.
- Ensure that the Engineer/ Project Manager appointed to manage the works is aware of the requirements of the EMPr, particularly with regard to auditing and the involvement of an ECO.
- Ensure that the responsible manager within Boschendal/ the Bertha Foundation is aware of the EMPr, particularly with regard to the operational requirements.
- Ensure that all relevant approvals and permits have been obtained prior to the start of construction activities on site.
- Ensure that D: EA&DP have been notified of the date on which construction activities will be starting, one week prior to commencement of the activity (or as per the requirement of the Environmental Authorisation if this is different).
- Ensure that construction activities start prior to the expiration date of the Environmental Authorisation issued by the D: EA&DP, failing which the approval of the development by the department would lapse unless an extension is applied for.
- Appoint a suitably qualified or experienced ECO prior to the start of construction activities on site, for the duration of the construction contract.
- Appoint a suitably qualified and experienced botanist or freshwater ecologist to provide the guidance and oversight of rehabilitation activities, if needed, and as prescribed in this EMPr (under circumstances where rehabilitation beyond that described in the scope of works is necessary).
- Engage with the surrounding workers or adjacent landowners on an ad-hoc basis throughout the construction phase on important matters arising that may have an impact on them, as required.
- Liaise with those residing in the surrounding areas as and when valid complaints, issues or concerns are raised in relation to the construction works.

2.2.2 The Project Manager / Engineer

For the purposes of this document, "The Project Manager" refers to the engineer / project manager for the development, or any other person authorised by the Developer, to be responsible for the technical and contractual implementation of the works to be undertaken.

The responsibilities of the Project Manager are to:

- Ensure that the requirements as set out in this EMPr and by the relevant Authorities are adhered to and implemented.
- Ensure that the proposed development is developed as per the intention and design philosophy as described in this report.
- Ensure that the development footprint is contained within site limits.
- Assist the ECO in ensuring that the conditions of the EMPr are being adhered to and promptly issue instructions requested by the ECO, to the Contractor. All site instructions relating to environmental matters issued by the Project Manager are to be copied to the ECO.
- Ensure that the Contractor has signed the protection of the declaration of understanding (Appendix 7);
- Assist the ECO in making decisions and finding solutions to environmental problems that may arise during the various phases of the development.
- Review and approve construction Method Statements with input from the ECO.
- Order the removal of person(s) and/or equipment not complying with the specifications (as required by the ECO or otherwise).
- Issue penalties for transgressions of Environmental Specifications.
- Provide input into the ECO's on-going internal review of the EMPr.

2.2.3 The Contractor

For the purposes of this document "The Contractor" refers to any directly appointed company or individual (by the Developer or Developer's representative) undertaking the implementation of the works. The Contractor will be responsible for the day-to-day implementation of the EMPr. During construction regular compliance audits will need to be undertaken, which must be undertaken by appropriately qualified environmental practitioners.

The Contractor is to:

- Compile the required Method Statements for submission to the Engineer/ Project Manager and the ECO for approval.
- Ensure implementation of all applicable Environmental Management Specifications, including all additional requirements related to approved Method Statements, during all works on site, failing which penalties, as outlined in the EMPr may be imposed by the ECO via the Project Manager.
- Construct that the proposed development is developed as per the intention and design philosophy as described in this report.
- Ensure that the development footprint is contained within site limits.
- Ensure that all its sub-contractors, employees, suppliers, or agents etc. are fully aware of the environmental requirements detailed in the Environmental Specifications of this EMPr (the main contractor will be held liable for any penalties incurred by sub-contractors).
- Liaise closely with the Project Manager and the ECO and ensure that the works on site are conducted in an environmentally sensitive manner.
- Nominate a member of personnel as the Contractors' Environmental Officer who will be responsible for enforcing the EMPr specifications daily. This individual shall liaise closely with the ECO and inform the Project Manager, as well as the ECO, should environmentally issues on site arise, e.g., dumping, pollution, littering and damage to vegetation.
- The Contractors' Environmental Officer is to complete a weekly site inspection checklist in accordance with the requirements of the EMPr, to be supported by photographic evidence, and provide this to the ECO each week.
- Carry out instructions issued by the Project Manager, on request of the ECO, required to fulfil his/her compliance with the EMPr.

- Investigate and comply with all existing regulations and laws/by-laws unless the relevant authority grants specific written compliance with any legislation.
- Comply with the Occupational Health and Safety Act (Act 85 of 1993) and the requirements of the current Construction Regulations.
- Make provision for inspections of the site by any Authority and/or any party authorised by the Project Manager or the ECO.

Upon failure by the contractor or contractor's employee to show adequate consideration to the environmental aspects of this contract, monetary penalties for breach of the EMPr (and thus the contract) may be imposed by the ECO via the Project Manager or to have the Contractor's representative or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the Contractor.

Note that it is recommended that of 30 days should be set-aside in the construction program for the recovery of archaeological material where/if discovered.

2.2.4 Environmental Control Officer (ECO)

A suitably qualified ECO shall be employed throughout the duration of the construction phase.

During the construction of the development, the ECO is to:

- Ensure that the Contractor has a copy of the EMPr and all agreed Method Statements.
- Ensure that the Stormwater Management and Landscaping Plans have been approved by Stellenbosch Municipality and are being duly implemented.
- Check that the proposed development is developed as per the intention and design philosophy as described in this report.
- Check that the development footprint is contained within site limits.
- Assist the Project Manager in identifying the need for or applying for special or required permits.
- Review weekly environmental checklists submitted by the Contractor's Environmental Officer.
- Undertake **fortnightly** site inspections (frequency may change as required) to audit compliance of all parties with the requirements of the EMPr.
- Undertake **weekly** site inspections during the period where works occur within the wetlands, as well as ecological buffers for the wetlands and stream (as depicted in Figure 11, Figure 13, and Figure 14).
- Conduct more frequent site inspections, as required, particularly if the Contractor's Environmental Officer's checklists are incomplete, not submitted timeously or show evidence of significant non-compliance with the conditions of the EMPr.
- Be present on site during the demarcation of the no-go areas. *This may require additional site visits beyond the site inspections detailed above if such activities are not aligned with the site inspection.*
- Should rehabilitation be required, the input of additional specialists may be sought.
- Advise/recommend on actions or issues impacting on the environment to the Project Manager, who shall issue any required site instructions to the Contractor.
- Environmentally educate and raise the awareness of the Contractor and their staff as to the sensitivity of the site and facilitate the appropriate attitude during works on site.
- Review and approve construction Method Statements together with the Project Manager.
- Assist the Contractor in finding environmentally responsible solutions to problems.

- Recommend to the Project Manager the issuing of a penalty for any environmental damage caused on site, or non-compliance with the Environmental Specifications.
- Recommend to the Project Manager the removal of person(s) and/or equipment not complying with the Specifications.
- Engage the Applicant and/or Engineer/Project Manager on all matters relating to concerns / issues raised by the surrounding residents.
- Act as the contact person between the Developer, the Stellenbosch Municipality's Environmental Resources Management Unit, D: EA&DP and the public regarding environmental matters.
- Report to the Stellenbosch Municipality's Environmental Unit and D: EA&DP, where required and in terms of the Conditions of Approval in terms of the Environmental Authorisation, regarding the implementation of the EMPr, compliance with the Conditions of Approval contained in the Environmental Authorisation and implementation of the relevant mitigation measures contained in the EMPr.
- Send monthly audit reports to DEA&DP and Stellenbosch Municipality's Environmental Unit during the construction phase.
- Keep a register of complaints and record and manage any community comments or issues, having reported these first to the Project Manager.
- Undertake photographic monitoring of the construction site.
- Keep records of all activities/ incidents on site concerning the environment in a site diary.
- Complete temporary and permanent site closure checklists.
- Take immediate action on site to stop works where significant and irreparable damage is being inflicted on the environment and inform the Project Manager immediately of the occurrence and action taken.
- Undertake a continual internal review of the EMPr and make recommendations to the Project Manager and Developer. This includes monitoring of construction activities and compiling reports on performance relative to this EMPr.
- Support the Developer with engagement with the surrounding workers or adjacent landowners on an ad-hoc basis throughout the construction phase on important matters arising that may have an impact on them, as required.
- Support the Developer with liaison with those residing in the surrounding areas as and when valid complaints, issues or concerns are raised in relation to the construction works.

The ECO has the authority to recommend to the D: EA&DP that works be stopped, if in his/her opinion serious harm to, or impact on, the environment is imminent, is likely to occur or has occurred. Furthermore, the ECO may also recommend that works be stopped if such actual or potential harm or impact is in contravention of this EMPr and which is, or may be, caused by construction, or related works.

Upon failure by the Contractor or Contractor's employees to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the Project Manager and the project management team to have the Contractor's representative, or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the Contractor.

2.2.5 Freshwater Ecologist

A suitably qualified freshwater ecologist must monitor the implementation of the rehabilitation plan through regular site visits and must visit the site upon completion of the rehabilitation works and each phase thereof (Snaddon, 2021). The site visits by the freshwater ecologist must occur when the hard engineering interventions are being laid

out on site prior to construction, then after construction and/or upon conclusion of each phase (*pers comms*, K. Snaddon, 11/06/2021).

The head-cut and bank incision need to be monitored probably only on an annual basis until the interventions are built (*pers comms*, K. Snaddon, 11/06/2021).

Snaddon (2021) notes that the ecologist must check the following:

- Hard engineering interventions are built to specifications;
- The head-cut and bank incision have not advanced further compared with the current situation;
- All IAPs have been removed from the Stream 10 corridor, wetlands, and their buffers, and along the water supply pipeline, up to 20 m from the trench;
- The bed and banks that have been impacted by the felling of trees and removal of alien grasses must be in good condition, and not eroding or bare;
- Areas within the streams, wetlands and buffers that have been impacted by construction and rehabilitation activities have been re-planted.

The freshwater ecologist must provide a short report (in the form of a letter) regarding the implementation of this rehabilitation plan (Snaddon, 2021). The report must be submitted to the case officer at Department of Human Settlements, Water and Sanitation, Bellville (Snaddon, 2021).

2.3 MONITORING AND REPORTING

2.3.1 ECO Diary Entries

The ECO will maintain a site diary that relates to environmental issues as they occur on site for record keeping purposes.

2.3.2 Contractor's Environmental Officer Checklist

The Contractors' Environmental Officer is to complete a weekly site inspection checklist in accordance with the requirements of the EMPr, to be supported by photographic evidence, and provide this to the ECO each week.

The ECO is to review the checklist and revert to the Contractors' Environmental Officer if there are any issues identified.

2.3.3 Site Instructions

Site Instructions, stipulating recommended actions required to improve compliance with the EMPr by the Contractor will be issued by the ECO to the Project Manager, who in turn will ensure that the Contractor is informed of the said instruction.

The audits by the ECO as well as the ECO's review of the Contractor's Environmental Officer's checklists would inform the logging of site instructions.

Comments made by the ECO in the Site Instruction Book are advisory and all site instructions required may only be issued by the Project Manager. Site Instructions will also be used for the issuing of stop work orders for the purposes of immediately halting any particular activity(ies) of the Contractor deemed to pose immediate and serious risk of unnecessary damage to the environment.

2.3.4 External Audits by the ECO

The ECO will undertake fortnightly site inspections for the duration of the construction phase, but weekly site inspections must be undertaken where works occur within the wetland, or ecological buffers of the wetlands and stream as depicted in Figure 11, Figure 13, and Figure 14. The ECO must also be present on site during the demarcation of the no-go areas, these may form part of the initial audits/ environmental education, or separate visits, depending on the timing of the works.

The ECO may need to conduct more frequent site inspections, as required, particularly if the Contractor's Environmental Officer's checklists are incomplete, not submitted timeously or show evidence of significant non-compliance with the conditions of the EMPr

2.3.5 Monthly Monitoring Reports

The ECO will compile a monitoring checklist to facilitate checking against the requirements of the EMPr, which will be used to record the site visits. Monthly monitoring reports will be compiled in which events, concerns, and general compliance of the Contractor with the EMPr will be recorded. This report will be submitted to the Project Manager and to the authorities (i.e., D: EA&DP and Stellenbosch Municipality).

During the construction phase of the development, the ECO must report to the Stellenbosch Municipality's Environmental Resource Management Department and D: EA&DP, where required, regarding the implementation of the EMPr, compliance with the Conditions of Approval which would be contained in the Environmental Authorisation and implementation of the relevant mitigation measures contained in the EMPr.

Should the EMPr require further updates (with the exception of the items listed in the "NOTE" on the first page), the manner and frequency for updating the EMPr must be done as follows:

An application for amendment to the EMPr must be submitted to the competent authority if any further amendments are to be made to the EMPr, other than potential amendments mentioned in the environmental authorisation, possible recommendations from DWS and/or the town planning approvals. Further changes may only be implemented once the amended EMPr has been authorised by the competent authority.

As above, the freshwater ecologist involved in monitoring the rehabilitation works, or each phase thereof, must submit a short report to DWS regarding the implementation thereof (Snaddon, 2021). The report must be submitted to the case officer at Department of Human Settlements, Water and Sanitation, Bellville (Snaddon, 2021). If the case officer in question is no longer there, it must be submitted to their replacement or the Head of Department.

2.3.5.1 Temporary Site Closure Report

If the site is closed for a period exceeding one week, a checklist procedure shall be carried out by the Contractor in consultation with the ECO.

The Contractor's Safety Officer(s) (in terms of the Occupational Health and Safety Act) are to check the site and report to the Project Manager regarding the following:

Fuels / flammables / hazardous materials stores:

- Ensure fuel stores as low in volume as possible;
- No leaks;
- Outlet secure / locked;
- Bund empty;

- Fire extinguisher serviced and accessible;
- Secure area from accidental damage e.g., vehicle collision;
- Emergency and Management telephone numbers to be available and displayed; and
- Adequate ventilation.

Other:

- All trenches and manholes secured;
- Fencing and barriers in place per the Occupational Health and Safety Act (No. 85 of 1993);
- Notice boards applicable and secured;
- Security persons briefed and had facility for contact;
- Traffic management is applied in terms of safety for road users and pedestrians;
- Night hazards checked e.g., reflectors, lighting, traffic signage;
- Fire hazards identified – local authority notified of any potential threats e.g., large brush stockpiles, fuels etc.;
- Pipe stockpile wedged / secured;
- Any scaffolds are secure; and
- Inspection schedule and log by security or contracts staff.

The ECO is to check and report to the Project Manager:

- Wind and dust mitigation in place e.g., straw, brush packs, irrigation;
- Slopes and stockpiles at stable angle;
- Any landscaped areas' watering schedules & supply secured;
- Fuels/hazardous substances stores secure;
- Cement and materials stores secured;
- Toilets empty and secure;
- Refuse bins empty and secure (lids);
- Any oil or hydrocarbon spills are treated e.g., Spill Sorb or Enretech #1 powder;
- Drip trays empty & secure (where possible); and
- Structures vulnerable to high winds secure.

The Contractor is to ensure that all temporary closure requirements are met before leaving the site.

2.3.5.2 Construction Site Closure Report

The ECO will compile a Final Closure Checklist for site closure auditing purposes. Once the site has been cleared of all construction related debris, materials, and equipment the ECO will undertake an audit and report on the condition of the site and the adequacy of site clean-up / restoration/rehabilitation measures. The construction site will be regarded as being "closed" on agreement between the ECO and the Project Manager that the Contractor has met all requirements to "make good".

2.3.6 Rehabilitation Monitoring

In order to mitigate against the negative impacts associated with proposed activities that are in, or close to (i.e., within ecological buffers) the watercourses and wetlands identified on and around the site, a rehabilitation plan is proposed in this report. Rehabilitation activities are designed to mitigate against the impacts associated specifically with the proposed flood protection measures in Stream 10, and landscaping in and around the wetlands and Stream 10. Implementation of the relevant components of the rehabilitation plan must commence upon completion of the landscaping and / or the flood protection

measures. The rehabilitation plan can be implemented in a phased manner and must include monitoring visits by a freshwater ecologist, at the initial planning/pegging out of works, and then upon conclusion of each phase, with annual monitoring of the head-cut and bank incision until such time as the flood management works are complete.

2.4 COMMUNICATION STRUCTURES ON SITE

2.4.1 Site Meetings during Construction Phase

The ECO is required to attend regular site meetings of the project management team during the construction phase to facilitate the transfer of information and to update all parties on the environmental compliance of the project as a whole and minute requirement.

The ECO will report on the main construction activities as they relate to the environment and any impacts and the mitigation thereof, at this meeting.

The minutes of these meetings will form part of the construction phase of the EMPr records. These minutes will reflect environmental queries, agreed actions and dates of eventual compliance by the Contractor.

The following people should attend these meetings:

- Developer's Representative;
- Project Manager;
- Landscape Architect (when applicable);
- the ECO (on a monthly basis); and
- Contractor(s) representative.

2.4.2 COMMUNITY RELATIONS

All third party or public queries and/or complaints relating to the works will be handled by the Developer and ECO, who will in turn engage the Project Manager to agree on the way forward. In addition, the Developer shall be responsible for dissemination of information to the community and the media (press releases, notice boards, etc.).

The Contractor shall keep a "Complaints Register" on site to record any complaints received and action taken. The Register shall contain all contact details of the person who made the complaint and information regarding the complaint itself. Copies of all entries into the complaints register should be kept in the environmental site file. The Contractor shall notify the Developer (or Project Manager) and ECO immediately of complaints lodged.

The Contractor shall erect and maintain information boards on site which shall include contact details for the Developer and the ECO for complaints by members of the public in accordance with details provided by the Project Manager.

2.4.3 ENVIRONMENTAL EDUCATION PROGRAMME

The Contractor in consultation with the ECO shall arrange for a presentation to site staff to familiarise them with the environmental aspects of the EMPr within seven days from the commencement date of construction. This presentation should take cognisance of the level of education, designation, and language preferences of the staff. General site staff would commonly receive a basic environmental awareness course highlighting general environmental "do's and don'ts" and how they relate to the site. Management on site e.g., site agents and foremen, who require more detailed knowledge about the environmental sensitivities on site and the contents and application of the construction phase of the EMPr document itself, will benefit from a separate presentation dealing with

these issues. The ECO may call upon the services of a specialist environmental education translator should this be required.

Environmental awareness training courses shall be run for all personnel on site. Courses shall be run in the morning during normal working hours at a suitable venue provided by the Contractor. All attendees shall remain for the duration of the course and sign an attendance register on completion that clearly indicates participants' names, a copy of which shall be filed in the (site) environmental file.

The Contractor's general site staff shall attend an initial presentation of approximately 45 minutes, and approximately half an hour a month thereafter for the duration of the contract shall be allowed for employees to attend any follow-up lectures, should this be deemed necessary by the ECO. In addition, all new staff and sub-contractor's employees that spend more than 1 day a week or four days in a month are to attend the environmental education program within 1 (one) week of commencement of work on site. The Contractor shall on request of the ECO provide documented proof (signed attendance registers) that all employees have received such training. The ECO will conduct competency testing on site to gauge the personnel's understanding of the EMPr specifications.

The cost, venue and logistics for this/ these course/s shall be for the Contractor's responsibility.

Notwithstanding the specific provisions of this clause, it is incumbent upon the Contractor to convey the sentiments of the EMPr to all personnel involved with the works.

The initial environmental awareness training course shall be presented by the ECO. Subsequent courses to be held as and when required should be presented by the Contractor's Environmental Officer or the Health and Safety Officer.

The purpose of the training is to stress the importance of biodiversity and the effect that a loss of biodiversity could have on the ecosystem and the workers themselves. The following points will also be highlighted:

- The importance of preventing littering and the spillage of hydrocarbons and other harmful chemicals into the wetlands and stream;
- The importance of avoiding unnatural erosion and the effects thereof;
- The location of no-go areas (i.e., the wetlands, stream and associated ecological buffers);
- Staff ablution facilities and the strict use thereof (i.e., no watercourses and wetlands shall be used for any ablution purposes);
- The potential for heritage/ archaeological finds and the procedure for reporting these (and stopping works); and
- Given that there are faunal corridors along the perimeter of the site and that works would occur within a farm, the way fauna found on site is treated should also be emphasised in the training. This must include the possibility of encountering venomous snakes such as the puff adder and Cape Cobra (refer to Figure 18).

2.5 OCCUPATIONAL HEALTH & SAFETY REQUIREMENTS

The Occupational Health and Safety Act (Act 85 of 1993) and the requirements of the Construction Regulations issued in July 2003, must be complied with.

2.6 DISPUTE RESOLUTION

Any disputes or disagreements between role players on site (regarding environmental management) will firstly be referred to the Project Manager. If no resolution on the matter is possible then the matter will be referred to the Stellenbosch Municipality Environmental Resource Management for clarification.

Where a dispute still persists, this shall be referred for arbitration to a panel of persons, consisting of one specialist environmental consultant, one qualified engineer, one official of the D: EA&DP and one legal practitioner of no less than 4 years' experience in environmental issues whose decision by simple majority will be final and binding on the parties. Representatives of the Developer, the Project Manager, Contractor and ECO should appoint the panel by mutual agreement. This arbitration will be informal ("the informal arbitration") and will be finalised within a period of 48 hours from the date of the ruling of the ECO, the purpose being to ensure that disagreements are rapidly resolved and thereby to limit any prejudice to the Contractor or the other parties to this agreement in the construction process. In the event of a deadlock in the aforesaid panel, the legal practitioner forming part of the panel will have a casting vote.

2.7 SOCIAL RESPONSIBILITIES

The Developer and Contractor(s) shall encourage and implement wherever possible the procurement of locally based labour, skills, and materials. Historically disadvantaged individuals should also be employed as far as possible.

3. PLANNING, DESIGN AND CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

3.1 INTRODUCTION

The Environmental Specifications contained in this section of the EMPr cover the requirements for controlling the impact of design as well as construction activities on the environment.

This section of the document describes mitigation measures in detail, and is partly prescriptive, identifying specific people or organisations to undertake specific tasks in order to ensure that impacts on the environment are minimised during the construction phase of this project. This section of the EMPr is applicable to all works comprising redevelopment of the York Farm cottages and development of associated infrastructure and landscaping. It is an open-ended document implying that information gained during construction activities and/or monitoring of procedures on site could lead to changes in the EMPr.

The appointed ECO will monitor compliance with section 3 of the EMPr and other Conditions of Approval contained in the Environmental Authorisation issued by the DEA&DP, as they relate to environmental matters. This EMPr gives direction and guidance to all responsible parties. The responsible parties are expected to co-operate closely to minimise or avoid unnecessary environmental impacts.

Non-compliance penalties are described in this EMPr and are thus to be included into the official contract documentation with contractors. The Contractor is obliged to inform the ECO immediately of events that may cause serious environmental damage or breach the requirements of the EMPr. The ECO in turn will immediately inform the Project Manager and Applicant and, if necessary, the environmental branch of the Local Authority, of such events.

3.2 METHOD STATEMENTS

The Contractor shall provide Method Statements for approval by the ECO and the Project Manager prior to work commencing on aspects of the project identified to be of greater risk to the environment and/or which may not be covered in sufficient detail in the EMPr, when called upon to do so by the Project Manager or ECO.

A Method Statement is a "live document" in that modifications are negotiated between the Contractor and the ECO/project management team, as circumstances unfold. All Method Statements will form part of the EMPr documentation and are subject to all terms and conditions contained within the EMPr.

Note that a Method Statement is a 'starting point' for understanding the nature of the intended actions to be carried out and allows for all parties to review and understand the procedures to be followed in order to minimise risk of harm to the environment.

A Method Statement describes the scope of the intended work in a step-by-step description for the ECO and the Project Manager to understand the Contractor's intentions. For each instance where it is requested that the Contractor submit a Method Statement to the satisfaction of the Project Manager and ECO, the format should clearly indicate the following:

- **What** - a brief description of the work to be undertaken;
- **How** - a detailed description of the process of work, methods, and materials;
- **Where** - a description/sketch map of the locality of work (if applicable);
- **When** - the sequencing of actions with due commencement dates and completion date estimates;
- **Who** – The person responsible for undertaking the works described in the Method Statement; and
- **Why** – a description of why the activity is required.

The Contractor shall provide Method Statements for approval by the ECO and the Project Manager prior to work commencing on aspects of the project deemed to pose environmental risks. Changes to, and adaptations of Method Statements should be made in response to changes in construction methods or where effectiveness of environmental management measures requires improvement. All Method Statements are to be to the satisfaction of the ECO and Project Manager.

The Project Manager / ECO may request a Method Statement for any activity they believe may impact on the environment. The Project Manager / ECO may also require changes to a Method Statement if the proposal does not comply with the Specification or if, in the reasonable opinion of the Project Manager, the proposal may result in, or carries a greater than reasonable risk of damage to the environment in excess of that permitted by the Specifications.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. The Contractor shall carry out the works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of their obligations or responsibilities in terms of the Contract.

3.2.1 Specific Method Statements Required

The following initial Method Statements shall be provided by the Contractor and submitted to the ECO at least seven working days before site establishment:

- **Site Establishment and Site Camp Division**

The location, layout and method of establishment of the construction camp (including all no-go areas, buildings, offices, lay down yards, vehicle wash areas, fuel storage areas, batching areas and other infrastructure required for the running of the project) shall be detailed and presented in a drawing. Cognisance must be taken of the environmental management requirements set out in this EMPr in developing this plan.

- **Site Clearing**

Method and schedule for clearing of vegetation on site during site, disposal procedure for cleared material, as well as topsoil management.

- **Access/Haul Routes**

Details, including a drawing, showing where and how the access points and routes (including areas where plant would be parked) will be located and managed, including traffic safety measures that will be utilised.

- **Fuel Storage and Use**

The design, location and construction of the fuel storage and service areas as well as for the filling and dispensing from storage tanks and management of drip trays.

- **Solid Waste Management**

Expected solid waste types, sorting methods, quantities, methods and frequency of collection and disposal, as well as location of disposal sites. Include details of the proposed recycling program.

- **Contaminated Water**

Methods of minimising, controlling, collecting, and disposing of contaminated water.

- **Stormwater management**

Methods of managing, controlling, stormwater runoff during construction, including dewatering where required.

- **Hazardous Substances**

Details of any hazardous substances / materials to be used, together with the transport, storage, handling, and disposal procedures for the substances.

- **Cement and Concrete Batching**

Location, layout, and preparation of cement / concrete mixing areas including the methods employed for the mixing of concrete, particularly the containment of runoff water from such areas and the method of transportation of concrete.

- **Dust**

Details on the methods employed for reducing dust on the site.

- **Trenching**

Details on the methods employed for trenching, depths of trenches, supporting structures for trenches, time-line regarding the duration at which they would remain open, phasing for excavation and in-filling, details of slopes areas for fauna to escape (if they fall in), search and rescue plan for fauna that fall in trenches (to include examples of types of fauna and the manner in which they would be dealt with).

- **Emergency Procedures**

Emergency procedures for fire, accidental leaks, and spillages of hazardous substances (including fuel and oil). Include details of risk reduction measures to be implemented including fire-fighting equipment, fire prevention procedures and spill kits (materials and compounds used to reduce the extent of spills and to breakdown or encapsulate hydrocarbons).

- **Noise mitigation methods**

Detail the steps to be implemented to reduce/avoid noise impacts on the surrounding area.

- **Riverbank (lateral) & Bed (head-cut) stabilisation**

Methods to be employed during the installation of gabions and a weir in Stream 10 as per the river rehabilitation plan.

- **Construction of Flood Management Measures**

Methods to be employed during the implementation of flood management measures (berm, bridge and culvert construction).

- **Additional Method Statements required**

Any additional Method Statements that may be required by the Project Manager and ECO during construction are to be provided by the Contractor within a minimum of 10 working days prior to the commencement of works or activities to which they apply.

The ECO may require changes to a Method Statement if the proposal does not comply with the specification or if, in the reasonable opinion of the ECO, the proposal may result in, or carries a greater than reasonable risk of damage to the environment in excess of that permitted by the specifications or any legislation. The ECO may request this in response to issues raised by the Developer, Project Manager or Contractor, as well as in response to audits or the weekly checklists submitted by the Contractor's Environmental Officer.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel and Sub-contractors. The Contractor shall carry out the works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any obligations or responsibilities in terms of the contract. No claim for delay or additional cost incurred by the Contractor shall be entertained should the inadequacy of a Method Statement be the cause.

3.3 ENVIRONMENTAL MANAGEMENT REQUIREMENTS

The environmental management requirements take account of the findings of the Environmental Impact Assessment (EIA), together with the typical measures needed to prevent or at least minimise potential adverse environmental effects associated with construction activities. Method Statements must take account of these requirements. Additional measures may be identified during construction and Method Statements would be required in this regard. Environmental management requirements cover the following:

- Detail design phase;
- Documentation, planning and programming;
- Site Camp Establishment;
- Site access, access routes, and traffic management;
- Waste management;
- Soil and water pollution management;
- Protection of natural features and fauna;
- Protection of any paleontological and archaeological resources;
- Noise management;
- Dust management;
- Aesthetics/ Visual;
- Hazardous substances (including cement) management;
- Labour relations, facilities and site health and safety;
- Incident management;
- Resource use (raw materials and resources); and
- Site clean-up and rehabilitation.

It should be noted that the construction phase is anticipated to continue for approximately 8 to 12 months, however the programme may shift.

Table 3: Table of Environmental Management Requirements / Specifications

ISSUE	MANAGEMENT / MITIGATION MEASURES
DETAIL DESIGN MEASURES: Management Statement and objective: To ensure that the final designs are in line with the considerations contemplated in the environmental assessment phase. Impact Management Outcomes: No deviations from the below.	
Stormwater	• Ensure that the final Stormwater Management Plan is approved by the Stellenbosch Municipality. • It will be a condition for the development that the difference between the pre- and post-development stormwater run-off will have to be detained on-site. The pre-development run-off will be accommodated in the existing municipal stormwater system without any major impact on the surrounding areas (Stellenbosch Municipality, 2021).
Landscaping	• Obtain approval from the Stellenbosch Municipality for the final landscaping plan. • The proposed *Podocarpus falcatus* (Real yellowwood) should be replaced with *Ekebergia capensis* (Cape ash) or *Harpephyllum caffrum (*Wild plum*)*, as the former is not adapted to the hot, dry summers in this area. The tall restio, *Restio paniculatus* should also be added to the planting list, for damper areas (Helme, 2021). *Note that this has already been incorporated into the Landscape Plan plant list.* • Make use of indigenous, bee forager plants wherever possible, see here for suitable species: https://www.sanbi.org/sites/default/files/documents/documents/infosheet-indigenous-plants-honey-bee-forage-19-11-2014.pdf • No kikuyu grass is allowed anywhere on site (Snaddon, 2021). • The pathways and amphitheatre planned within the wetlands and the ecological buffers must not be hardened, and compaction of soils along the pathways minimised to a narrow area (less than 1 metre)- applicable to all development alternatives (Snaddon, 2021). *Note that this is included in the proposed landscape plan.* • Pathways outside the ecological buffers and the aquatic ecosystems can be constructed with gravel of Gravel Fix- applicable to all development alternatives (Snaddon, 2021). *Note that this is included in the proposed landscape plan.* • The vehicle track leading to the waste treatment components located on site, proposed to encroach into the Dwars River valley-bottom wetland buffer for both development Alternatives, must be constructed with permeable materials, such as permeable paving, Gravel Fix, mulch, or earth- applicable to alternatives 1 and 2 only (not the preferred alternative) (Snaddon, 2021). • Where possible protect habitats such as rocky outcrops, riverine areas and wetlands which provides roosting, breeding and foraging sites and shelter many small faunal species (Jackson et al, 2019). *Note that this is achieved through the fynbos components of the proposed landscape plan.* • Landscaping should avoid orthogonal layouts and geometric planting patterns, and reflect the untended, less formal character of this part of the farm (Smuts & Scurr, 2020).

	• HWC should endorse the Landscape concept Plan of August 2020 presented in the HIA, subject to detailed plans being provided for review and endorsement by HWC (Smuts & Scurr, 2020). • Landscaping interventions should be in keeping with the broader rural character of the site and its open planted pasture setting (Smuts & Scurr, 2020). • The landscaping needs to reflect the openness and informality of the landscape, as well as the lack of clear definition between farmland and wilderness. while some planted blocks are present, and some tree lines, these are not the predominant feature as they are to the west (Smuts & Scurr, 2020). • Landscaping around the cottages should be minimal, and unobtrusive, avoiding orthogonal plantings, treed avenues, and lawns. Lush, dense stands of indigenous vegetation would be similarly out of place (Smuts & Scurr, 2020). • The final approved (by Stellenbosch Municipality) Landscaping Plan is to be provided to the DEA&DP for their information prior to the implementation of the landscape plan. As per the current version of the Landscaping Plan, the Fynbos Rehabilitation indicated as should remain and be implemented. • The planting list provided in the landscape plan and informed by Helme (2021) should be followed for the fynbos rehabilitation component of the landscaping plan. Suitable species which must come from a reputable supplier and grown from a guaranteed source in close proximity (25 km) to the site should preferably be used. • It is also important to note that no locally indigenous flora may be used for landscaping unless from a guaranteed source within the study area i.e., originating from a natural population in the study area. This is to prevent genetic contamination of existing populations. If a species is moved outside of its natural range and into that of a closely-related species, problems associated with competition and hybridisation (when two varieties or species interbreed to form a hybrid or "mix") could result (Esler, Pierce & De Villiers, 2014, Pg. 151).
Site Plan	• The proposed development is to be developed as per the intention and design philosophy as described in this report. • The final Site Plan is to be approved by the Stellenbosch Municipality prior to commencement of construction. • The final approved (by Stellenbosch Municipality) Site Plan is to be provided to the DEA&DP for their information prior to the commencement of construction. • Any conditions which may potentially stem from DWS following their review of the pre-application and post-application draft BAR, if such comment is submitted and accepted by the DEA&DP, should be included, and implemented.
Resource Use	• The waste generated by the proposed development should be incorporated into the system of the overall farm, which engages in recycling and composting. Therefore, appropriate bins and signage should be included. • Energy efficient lighting technology should be used as far as possible to reduce the energy requirements of the development (Schoonwinkel, 2020). • Energy efficiency should be included in the design and development and water heating would have to comply with SANS 204. This could be achieved through a combination of strategies such as heat pumps, solar power, consideration of natural ventilation in the design, energy efficient air-conditioning systems, etc. Examples of ways to achieve this include:

	○ Energy efficient LED light fittings to reduce the electrical consumption of the property. ○ Heat pumps could be used for hot water generation, which is three times more efficient than direct heating (pers comms, I Baatjies 28/06/2019). ○ Natural ventilation should be used as far as possible in the design. ○ Air-conditioning units could be the inverter type, which is more efficient than the normal type units (pers comms, I Baatjies 28/06/2019).
Consideration of Faunal Movement through the site	• The site should be unfenced. • Should night-lighting be required (e.g., security) these should be of the low UV emitting types, such as most LEDs, which attract significantly less insects (Jackson *et al*, 2019).
Transport, Access, and Parking Considerations	• A bus turning route (refer to Figure 7) for shuttle busses dropping off Retreat attendees is proposed south of the proposed development, making use of the existing dirt road, as the Ou Wa-pad is too narrow for a bus to turn around (Pretorius & Sequeira, 2020). The bus would need to alley dock by means of reversing into the gravel road and then driving out again (Pretorius & Sequeira, 2020).. • A total of 24 parking bays will be provided by the development. This is acceptable as it is more than the required 14 bays (Pretorius & Sequeira, 2020). • The proposed access to the Retreat on the Ou Wapad be aligned in the future with the Delta Farm (old Piggery) access road, if the Delta Farm is developed is developed further (Pretorius & Sequeira, 2020). • Note that no additional pedestrian and cycling facilities are recommended for the proposed development (Pretorius & Sequeira, 2020). • Access roads should utilise existing farm roads and tracks wherever possible (Smuts & Scurr, 2020). • Parking areas and roads should not be under hard surfaces, parking areas should preferably be constructed using permeable materials to allow for infiltration of water. Applicable to all development alternatives. (Smuts & Scurr, 2020. Snaddon, 2021). • Parking areas should be obscured from view as far as possible, and visually fragmented by appropriate landscaping and planting • Road edges should not be hard landscaped; • Barriers to movement and access, including fencing and security gates, should be limited, and removed as far as possible such that the landscape reads as a unified, coherent space.
Services	• The final Services Plan must be approved by the Stellenbosch Municipality and a copy thereof provided to the DEA&DP for their records. • Wastewater conveyance, storage or treatment infrastructure must be placed outside of the delineated ecological buffers. (all alternatives) (Snaddon, 2021).

	• Services are to be installed as per the plan in Figure 3 (should the preferred alternative be granted Environmental Authorisation). • In the long-term, a new 160mm diameter uPVC link main is proposed to be constructed from a connection point (exact location still to be finalised) on the northern fringe of the Lanquedoc PRV water distribution zone (Middelmann & Hurworth, 2021), if the preferred alternative is granted Environmental Authorisation. • This pipe (the abovementioned pipe) will be aligned along Hoof Road and into Boschendal property (Middelmann & Hurworth, 2021). • A bulk meter will be required at the Boschendal boundary, and the pipeline will continue as a private main up to the Retreat development, on Ptn 11 of Farm 1674 (Middelmann & Hurworth, 2021). The route investigation and detail design of this link infrastructure will be subject to a formal engineering approval process (Middelmann & Hurworth, 2021). • The link main will continue into Boschendal farm, along Hoof Road, and terminate at the New Retreat, to supply both potable and fire water to the development. This supply will be managed through a private sub-meter and is proposed to separate on-site into a 110 mm uPVC Class 16 fire ring and a 50 mm uPVC Class 12 domestic system (Middelmann & Hurworth, 2021). • In the interim, • The new private sewer system comprises a conventional underground 110 mm diameter class 34 uPVC gravity pipe and manhole system, collecting waste and ablution flow from all the cottages, as well as washdown from the refuse enclosure (Middelmann & Hurworth, 2021). • The system will gravitate to a small underground pumpstation at the western edge of the development. This pumpstation is proposed to comprise two 1,5kW pumps that will operate 'flip-flop' (alternating standby and duty), with simple flexible hoses, non-return valves, external wall mounted control panel and alarm link (Middelmann & Hurworth, 2021). • The 75mm diameter rising main will be aligned along the south-western edge of the development footprint, and discharge is proposed to be contained in a conservancy tank located outside of the development but on private property on the south side of Hoof Road (Middelmann & Hurworth, 2021). • The conservancy tank will have capacity for 30m3, approximately 3 x the daily flow of 10m3 (Middelmann & Hurworth, 2021). • The conservancy tank is proposed to be a structure suitable for conversion to a main pumpstation, at a future time when the local authority capacity upgrades to the Dwars River Wastewater Treatment Works (WWTW) between Pniel and Lanquedoc are complete (Middelmann & Hurworth, 2021). At this time, the conservancy tank will be equipped as a pumpstation, and a new rising main is proposed along Hoof Road to discharge into the Lanquedoc pumpstation, which in turn lifts effluent to the WWTW (Middelmann & Hurworth, 2021). This has been confirmed in principle by Stellenbosch Municipality (refer capacity letter of 19 April), and again will be subject to a formal engineering approval process (Middelmann & Hurworth, 2021). Further to that, it should be noted (as added by the EAP), that this solution would also

	be subject to any relevant NEMA process where listed activities in this regard are triggered because it is not included in this application for Environmental Authorisation.
	• Stormwater will be managed sensitively, primarily by infiltration through existing soft or new landscaped or permeable surfaces (Middelmann & Hurworth, 2021).
	• Car parking areas will be constructed from permeable gravel-fix systems, or permeable grass blocks, and edge restraints will be low and/or have drainage gaps (Middelmann & Hurworth, 2021).
	• There will not be any increase in hard surfaces under the post development scenario and it is therefore not envisaged that on-site attenuation will be necessary (Middelmann & Hurworth, 2021).
	• Surface flow that may be generated by extreme or high rainfall events will be allowed to pass through the development by surface escape, without causing flow concentration (Middelmann & Hurworth, 2021).
	• The proposed development would be supplied with a 200KVA (300 Amp three phase) low voltage connection to the new site reticulation (pers comms, R. Clark, TRAC, 25/03/2021).
	• The new supply would be taken from the existing Kylemore Farmers 1 Eskom 11 kV line via a new 11kV Tee-off. This would be installed to run across the gravel farm road from the existing Eskom 11 Kv overhead line (pers comms, R. Clark, TRAC, 25/03/2021).
	• The new line would feed a new 11 kV/420 Volt 200Kva pole-mounted transformer, installed on the site and connected to a new 300Amp (200Kva) three-phase low voltage Eskom bulk supply meter point (pers comms, R. Clark, TRAC, 25/03/2021).
	• The development will connect to the existing 160 mm diameter municipal water line in Lanquedoc. The link water (Item 1 on GLS Figure 1) will be for the Developers cost. The route of the proposed pipeline is schematically shown on Figure 1 but has to be finalized subsequent to a detail pipeline route investigation by the Developer's Consulting Engineer and to be approved by the Municipality (Stellenbosch Municipality, 2021).
	• Where the pipeline crosses any private property, a servitude must be registered and the Developer must provide written proof that consent is given by the Owner, prior to any drawings being approved by the Municipality (Stellenbosch Municipality, 2021).
	• A bulk water meter must be installed before the line enters private property Stellenbosch Municipality, 2021).
	• The line between the connection point and the bulk water meter will be public (maintained by the Municipality) and the section between just after the bulk water meter and the development will be private (maintained by the Developer) (Stellenbosch Municipality, 2021).
	  • The SOG filter should be placed as distant from the sensitive natural areas (stream and wetlands and their buffers) as possible, as proposed for Alternative 2- Applicable to alternatives 1 and 2 (Snaddon, 2021).
	  • The area immediately around the solids separator and SOG filter should be protected with a berm, which would catch surface water flowing out of any of the components and would serve to avoid contamination of surface flows from leaks or overflows- applicable to alternatives 1 and 2 only (Snaddon, 2021).

	• Treated wastewater should preferably be recycled back into the toilet system, thus creating essentially a closed system- applicable to alternatives 1 and 2 (Snaddon, 2021). • Treated wastewater can also be used for irrigation of landscaped areas, but should be directed towards road verges, rather than the margins of the stream or the wetlands- applicable to alternatives 1 and 2 (Snaddon, 2021). • Downpipes from all buildings to discharge to filtration areas- applicable to all alternatives (Snaddon, 2021). • Hardened surfaces should discharge into filtration areas (Snaddon, 2021). • Natural drainage should be maintained and the silt loads into rivers, streams and wetlands must be managed to stay within normal limits (Jackson *et al,* 2019). • As a principle, all hardened areas within the site should be associated (where possible) with vegetated filter strips (broad, sloped vegetated areas that accept shallow runoff from hardened surfaces), bioswales (landscaped areas that are designed to remove silt and a number of pollutants from runoff, through ensuring that water flows slowly along these gently sloping (<6% slope) features, often planted with grass or other plant species, mulch or riprap), and / or bio-retention systems (vegetated areas where runoff is filtered through a filter media layer, e.g. sand, as it percolates downwards), all of which are designed to reduce the quantity of runoff leaving a hardened surface and entering the stormwater system- applicable to all alternatives (Snaddon, 2021). • Stormwater should not be conveyed directly (e.g., by pipe or drain) into the wetlands or stream but must flow along unlined swales, permeable areas, and bioswales- applicable to all alternatives (Snaddon, 2021). • Ducts must be placed at road crossings for a future telecommunication network and the selected service provider will install further ducts and manholes as per their design (Schoonwinkel, 2020). • Telecommunication attachments such as satellite dishes should not be visible from the wapad (Smuts & Scurr, 2020). • Note that future sewage reticulation to connect to municipal supply is not part of this Basic Assessment process and would need to follow the requirements of applicable law at the time, as well as those of the Stellenbosch Municipality. • The method of supplying the electricity will be determined once details are made available (Eskom, 2021). The formal quote process will confirm spare capacity available and a proposal to supply such development (Eskom, 2021). Execution of making supply available will only be initiated on acceptance of a formal quote (Eskom, 2021). The date to make a point of supply available will be confirmed during this process (Eskom, 2021). Please direct a formal application to our Group Customer Services for a quote: Distribution, Eskom, PO Box 2100, Bellville, 7535 (Eskom, 2021).
Flood Management	• Flood management measures to protect the development from flooding of the adjacent watercourse will be required (Middelmann & Hurworth, 2021). These measures comprise the conversion of the existing culvert crossing on Hoof Road to an engineered low level road crossing to contain flood flow safely under and over the new culverts, within the river corridor (Middelmann & Hurworth, 2021). The existing berm on the development side of the watercourse will also be formalised to be continuous, reprofiled and raised (Middelmann & Hurworth, 2021).

	• The bridge structure must be enlarged or lowered to allow excess flow to pass over the structure and back into the watercourse, so as to ensure that the full flow remains in the watercourse. The flood lines for the proposed development are based on the assumption that this will be done (Obree, 2021). • It must further be noted that the sides of the watercourse have previously been raised by the construction of longitudinal berms on either bank (Obree, 2021). This has presumably been done to contain the flow within the watercourse and prevent floodwaters from affecting the areas alongside (Obree, 2021). However, these berms vary in height, resulting in the possibility of flow escaping to the areas alongside in places where they are of insufficient height (Obree, 2021). In order to protect the areas adjacent to the watercourse from occasional flooding it will be necessary to be repair and extend the berms in certain areas (Obree, 2021). • Since the proposed development is located on the left bank of the watercourse, it may not be necessary to provide berms to protect the areas on the right bank at this time (Obree, 2021). Nevertheless, it is recommended that the improvements to the berms on the left bank be sufficient to contain the flood, should any work be carried out on the right bank in due course (Obree, 2021). • It is further recommended that consideration be given to the prevention of further erosion on the bed and banks of the watercourse in the lower reaches, so as to prevent further development of the erosion that is already evident (Obree, 2021). • It is proposed that new culverts be installed consisting of 5 units each 1.5 m wide x 0.9 m high (Obree, 2021). The total area will then be 6.75 m^2 (Obree, 2021). The road surface will be lowered at the culverts and raised on either side, to allow any surplus flows to pass over the road and return to the watercourse downstream (Obree, 2021). • Rock for the reno mattress, riprap and rehabilitation gabions may not be sourced from the streams on Boschendal Estate (Snaddon, 2021). • <u>A Method Statement must be prepared and submitted to the ECO for approval prior to commencement of the above-described works.</u> • <u>These must be implemented in the dry season (Snaddon, 2021)</u>
Design	• Community and Reception Buildings: o The brickwork above window and door height has lost all structural integrity and will not support a roof structure. This section of brickwork will have to be removed (M&H Consulting, 2020). o The plaster has lost its integrity and will have to be removed (M&H Consulting, 2020). o New window and door positions will require brickwork remedials (M&H Consulting, 2020). o In-fill brickwork will need remedials (M&H Consulting, 2020). o New plaster will require mesh and mortar enhancing (M&H Consulting, 2020). o The floor slabs can remain but will require a 100mm overlay (M&H Consulting, 2020).

	- A new concrete ringbeam will need to be constructed to fix the new roof trusses and new brickwork built above to form the gables (M&H Consulting, 2020). - There are no roof trusses currently so all roof construction will be new (M&H Consulting, 2020). - Foundations and plinth brickwork is salvageable and will be re-used (M&H Consulting, 2020). - Visitors Cottages and Learning/ Dining/ Lounge Buildings: - The interventions are such that none of the above slab superstructure brickwork can remain (M&H Consulting, 2020). - The foundations and plinth brickwork can be re-used (M&H Consulting, 2020). - The existing floor slab can remain and will be overlain by a new 100 mm thick slab (M&H Consulting, 2020). - All new superstructure brickwork will be new (M&H Consulting, 2020). - A new concrete ring-beam above windows and doors will be cast (M&H Consulting, 2020). - Roof structure will be new - New hardened surfaces (impermeable) must be limited to the developable area outside the aquatic ecosystems and their buffers- applicable to all alternatives (Snaddon, 2021). - Effort should be made to minimise the hardening of surfaces cross the whole site. Natural areas, gardens and road verges are areas where water can filter into the ground- applicable to all alternatives (Snaddon, 2021). - All walls and new roads should have culverts through and under them to allow passage for small fauna, these are commonly referred to as wildlife underpasses and over passes (Jackson et al, 2019). - Should night-lighting be required (e.g., security) these should be of the low UV emitting types, such as most LEDs, which attract significantly less insects (Jackson *et al*, 2019). - It is recommended that the HIA be endorsed as fulfilling the terms of Section 38(3) of the National Heritage Resources Act (No. 25 of 1999) (Smuts & Scurr, 2020). - The strategy of hybrid redevelopment modes across the site should be employed, such that the reception/community centre is retained in largely unaltered form, and simply made fit for purpose. other cottages can then be freely adapted without sacrificing the integrity and authenticity of the original settlement (Smuts & Scurr, 2020). - Smuts & Scurr (2020) state that HWC should endorse the designs presented in the HIA, namely: - SK 100 (24/07/2020) - SK 102 (14/08/2020) - SK 103 (17/08/2020) - SK 104 (17/08/2020) - SK 105 (17/08/2020) - Detailing should be low key to prevent misrepresentation of the significance of form and fabric (Smuts & Scurr, 2020).

	• A representative example of farm-workers housing from this recent period should be retained as a "memory" of a past land tenure system farm labour, the rural land reform process, and the social-economic impact that resettlement had on its community. the appropriate adaptive reuse of structures should be community based (Smuts & Scurr, 2020). • The subsidiary, modest, domestic scale of the grouping should remain unaltered (Smuts & Scurr, 2020). • Physical changes to the cottages should be modest in nature and not overwhelm or obscure their existing character (Smuts & Scurr, 2020). • The location, orientation, and arrangement of the cottages in the landscape should be retained or reflected in any new builds. this retention and reflection could be variable across site, ranging from the retention of entire structures, partial elements, footprints, or envelopes (Smuts & Scurr, 2020). • Limited on-site parking can be accommodated and should preferably be located outside of the central area, respecting the visibility of the cottages both from the wapad and the Boschendal werf: o New parking should be informal and fragmented to minimise its impact (Smuts & Scurr, 2020). o New patterns of access should not introduce new formal axes (Smuts & Scurr, 2020). o Vehicular traffic should be directed to the periphery of the cottage clusters and away from the open area between them (Smuts & Scurr, 2020). • The following design principles have been included in the HIA and recommended by Smuts & Scurr (2020): o Form: ▪ Existing infrastructure could be redeveloped, through creative and sympathetic adaptation; ▪ Traditional vernacular forms, allowing for the multiplicity of vernacular forms recognised in terms of the principles of Restorative Redevelopment, should be employed in the redevelopment of existing infrastructure or the construction of new buildings and low-key additions where this is necessary; ▪ Modest scale understated modern structures may be inserted where these do not dominate or detract from the dominant rural character. o Height: ▪ Structures should not exceed single story height to ensure that patterns and rhythm of traditional forms are respected. Deviations from this would need to be carefully tested on a case by case basis in order to verify why additional height should be permitted. ▪ Materials: ▪ The materiality of existing infrastructure should be respected, and redevelopment of such structures should make use of appropriate materials that reflect the vernacular origin of these structures; ▪ where replacement of elements, such as asbestos roofing with corrugated iron, will enhance a structure, this should be considered;

	▪ Modern materials can be considered for use on new structures or additions to existing structures only where these do not detract from the original or become visually dominant. o Visibility: ▪ The rural landscape must remain the dominant visual form; ▪ Developments should not disrupt or interfere with the existing pattern of land use and settlement ▪ No new development should occur in visually prominent locations, including important view cones, slopes, and ridges. o Landscape: ▪ Any development must consider its rural landscape setting and the impact the development and intervention will have on the rural landscape character; ▪ The landscape character must remain predominantly rural; ▪ Interventions must respect traditional settlement patterns and hierarchies; ▪ Agricultural blocks and superblocks must be retained and enhanced such that development does not fragment and compartmentalise the rural quality of the landscape. • Where possible, avoid sensitive habitat corridors, e.g., drainage lines and wetlands (Jackson et al, 2019) (this is already responded to in the proposed development layout) (Jackson et al, 2019). • Design development footprints and transport linkages around sensitive faunal habitat where practical (this is already responded to in the proposed development layout) (Jackson et al, 2019). • Minimise the number of roads required to access the same area, thereby avoiding unnecessary loss of faunal habitat (this is already responded to in the proposed development layout as it uses a single pre-existing access road) (Jackson et al, 2019). • The water supply pipelines for all development Alternatives must be laid in the road (Snaddon, 2021). • For Alternative 3, the pipelines must preferably be located to the north of Hoof Pad, where the landscape is more disturbed (Snaddon, 2021). • The temporary water supply pipeline must be placed on the side of the road that is away from the York Dam seep wetland, so as to avoid the wetland (Snaddon, 2021). • The following measures to retain the story and memory of those who lived on the site have been recommended by an I&AP and can be considered in the design and décor of the proposed development (pers comms, G Viljoen, local resident, 01/02/2021): o Placement of information board throughout the site that contain photographs of people who used to live on the site and extracts from their memories of living and being there; and o Plaques could be put up on each cottage to remember the families that lived there.

ISSUE	MANAGEMENT / MITIGATION MEASURES
DOCUMENTATION, PLANNING AND PROGRAMMING REQUIREMENTS: Management Statement and objective: To ensure that the works schedule is appropriately planned to limit adverse impact on the environment. Impact Management Outcomes: No deviations from the below.	
Programming/ Timing of Works	• Construction/demolition activities that must take place within the aquatic ecosystems (such as the flood protection measures, road drift, amphitheatre and pathways, and the demolition of buildings) or the ecological buffers must be done in the dry season, to reduce the risks of contamination of the aquatic ecosystems through rainfall and runoff (Snaddon, 2021). • The rehabilitation plan must be implemented during the dry season (Snaddon, 2021). • In order to mitigate against the negative impacts associated with proposed activities that are in, or close to (i.e., within ecological buffers) the watercourses and wetlands identified on and around the site, a rehabilitation plan is proposed in this report. Rehabilitation activities are designed to mitigate against the impacts associated specifically with the proposed flood protection measures in Stream 10, and landscaping in and around the wetlands and Stream 10. Implementation of the relevant components of the rehabilitation plan must commence upon completion of the landscaping and / or the flood protection measures. The rehabilitation plan can be implemented in a phased manner, and must include monitoring visits by a freshwater ecologist
Development as Proposed	• The ECO is to ensure that the proposed development including services, landscaping and transport requirements as detailed in this EMPr (including those measures prescribed in "Detail Design Measures" in Table 3) are implemented, particularly regarding the areas of road surfacing which are to comprise of interlocking pavers, as well as the freshwater measures indicated in italics. Constant checking against these requirements as construction occurs in the relevant area must be carried out by the ECO.
EMPr	• The mitigation measures provided in the freshwater impact assessment report should be incorporated into a construction EMPr and audited throughout the construction process (Snaddon, 2021). *Note that this is addressed in this EMPr.* • An adequately qualified independent environmental control officer (ECO) must be appointed before construction begins (Snaddon, 2021). *Note that this is addressed in this EMPr.* • The construction EMPr must also include recommendations regarding the method statements required by the ECO (Snaddon, 2021). *Note that this is addressed in this EMPr.*

	• Constant monitoring of the construction site by the Site Engineer and ECO must occur (Snaddon, 2021). *Note that this is addressed in this EMPr.*
Pre-construction site documentation	• Demolition should be subject to photographic recording and a record of the names and profile of its last occupants (Smuts & Scurr, 2020). • The site should be photographed by the EO prior to commencement of works to note the general condition thereof.

ISSUE	MANAGEMENT / MITIGATION MEASURES
SITE CAMP ESTABLISHMENT: Management Statement and objective: To ensure that the site camp is located and laid out in an environmentally sensitive manner, which also does not adversely affect farm operations Impact Management Outcomes: No deviations from the below and no damage to environmentally sensitive areas or harm to fauna as a result of the location and set-up of the site camp.	
Site Camp Establishment	• The recommended buffer for Stream 10 at the site (above the dam) and stream 11 is 21 m for the Construction Phase (Snaddon, 2021). • The recommended ecological buffer for the New Retreat seep, York Dam seep wetland and Dwars River valley-bottom wetland and the seep associated with stream 11 is 17 m for the Construction Phase (Snaddon, 2021). • Site Camp establishment requires a Method Statement which must be approved by the Engineer and ECO. • The site camps will be positioned in areas of low environmental sensitivity which will provide minimal disruption to the users of the roads. • The site camp/s must be a minimum of 50 m from the nearest watercourse. • Ensure that all building materials and rubble are stored at least 50m away from the edge of the wetlands and stream channel, as demarcated prior to construction. Storage areas should be bunded adequately to prevent contaminated runoff from entering the aquatic ecosystems (Snaddon, 2021). • Materials should be stored in piles that do not exceed 1.5m in height and should be protected from the wind (such as using shade-cloth), to prevent spread of fine materials across the site (Snaddon, 2021). • Machinery prone to oil or fuel leakage must be located at least 50m away from the edge of the wetlands and stream, and the area adequately bunded in order to contain leakages, and must be well maintained (Snaddon, 2021). • Toilets must be at least 50m away from the wetlands and streams (Snaddon, 2021). • Keep clearing to a minimum (Jackson *et al*, 2019).

	• All stationary plant and equipment must have drip trays under them at all times. Drip trays are to be in good condition (i.e., no cracks or holes) and they are to be cleaned regularly (i.e., at least weekly). • Prior to site establishment, photographs of the site camp area should be taken to serve as a record of the site condition (for reference during future site clean-up). • The Contractor should restrict all activities, materials, equipment, and personnel to the specified areas on site. • Construction and staff vehicles must be parked within the site boundaries in a designated area. Construction vehicles must have drip trays placed underneath during non-working hours. All plant must be maintained and leak-free. • Likely disturbance to surrounding users of the roads must be considered and kept to a minimum. • Appropriate emergency, environmental and health and safety signage should be put up at the site camp. • Storage facilities for chemicals should be bunded and situated in high lying areas to avoid spillages and damage from flood events (Jackson *et al*, 2019). • Should night-lighting be required (e.g., security) these should be of the low UV emitting types, such as most LEDs, which attract significantly less insects (Jackson *et al*, 2019).
Establishment of no-go areas and protection of ecological system	• The Contractor is to ensure sufficient supply supplies of silt screen and sediment control fabrics are available. • A search and rescue of important or sensitive plants should be completed before construction occurs in sensitive areas (Snaddon, 2021). • Sensitive areas, such as the boundaries of the wetlands and the active channel of the stream, must be clearly demarcated and fenced off (using temporary fencing and danger tape) before any work or site preparation begins. These are no-go areas (refer to Figure 13 Figure 14, Figure 15 & Figure 16) during the construction or demolition process (Snaddon, 2021). Figure 15 depicts the no-go areas associated with the proposed potable water line for Alternative 3 (the preferred alternative), namely any areas either side of the existing roadway, with the exception of the southern segment near Lanquedoc where the no-go area is limited to all areas adjacent to the eastern edge of the existing road. Stream 11 and all wetlands and seep are no-go areas. This activity is to be overseen by the ECO. • Figure 16 depicts the no-go areas associated with the proposed interim potable water line for Alternative 3 (the preferred alternative), namely any areas either side of the existing roadway particularly Stream 10 and the York Dam wetland seep. This activity is to be overseen by the ECO. • Pathways and access roads for construction or demolition must avoid the stream and wetlands (Snaddon, 2021).

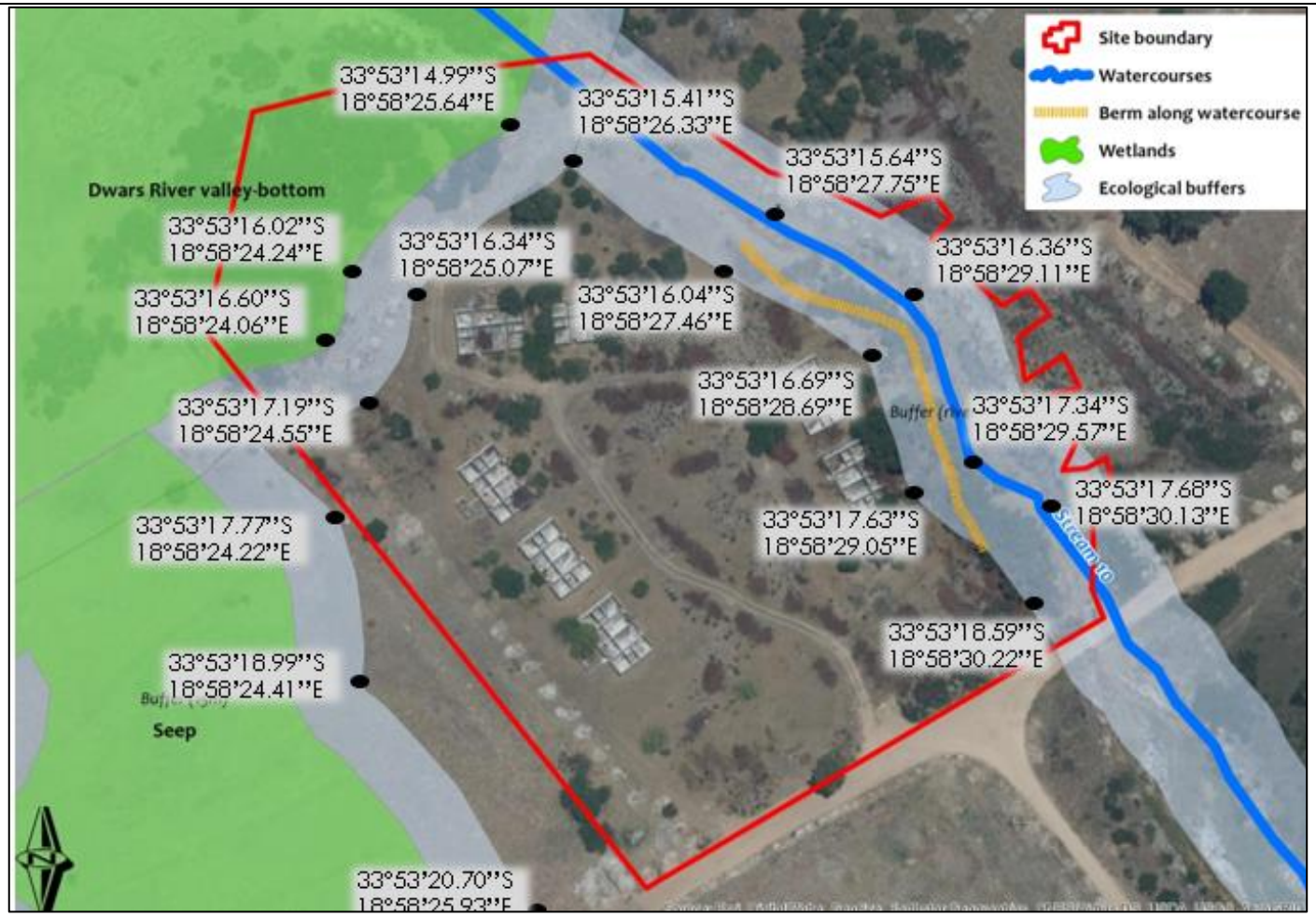


Figure 13 No-go Site Areas with co-ordinates

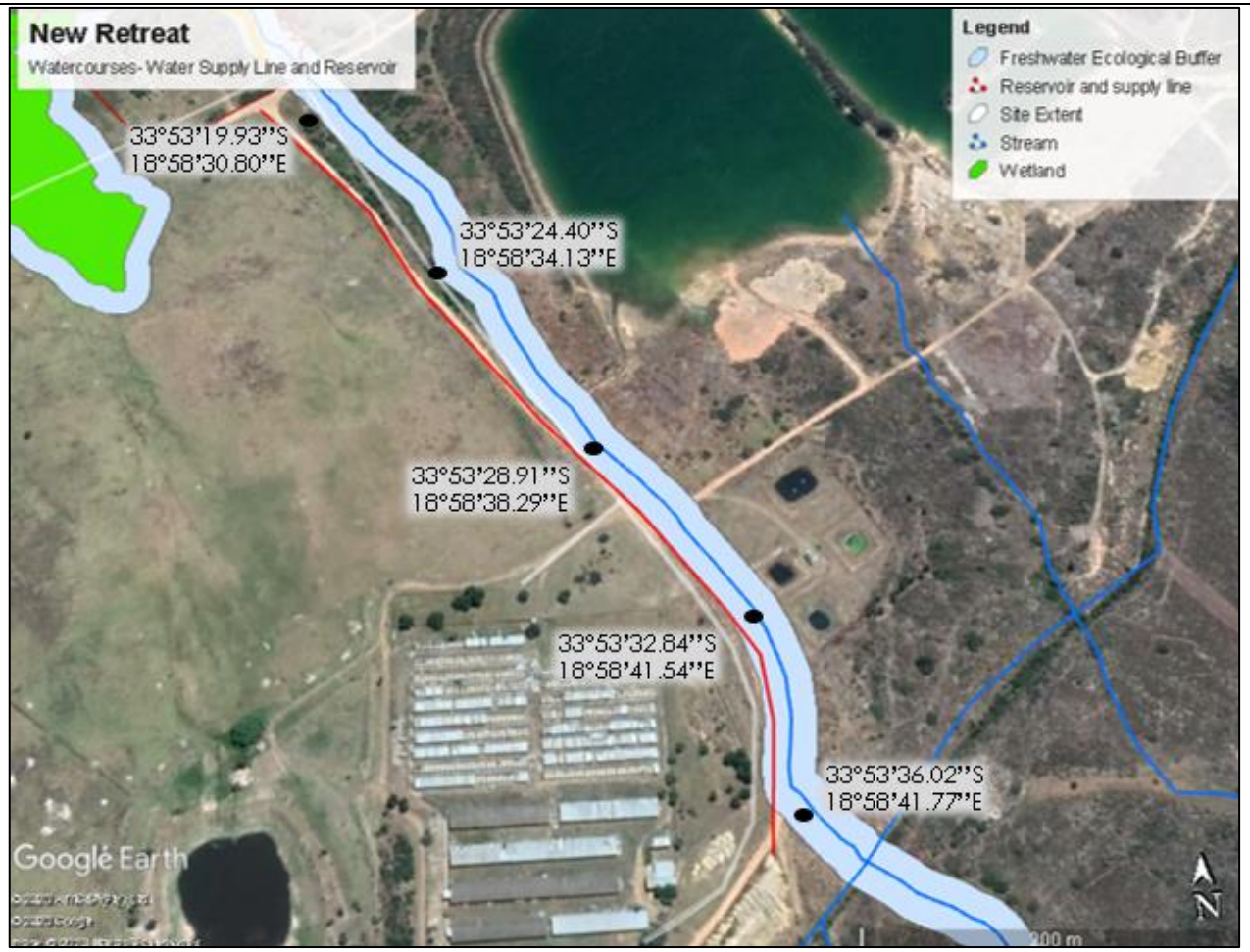


Figure 14 No-go areas along water line (applicable to Alternatives 1 and 2 only) with co-ordinates

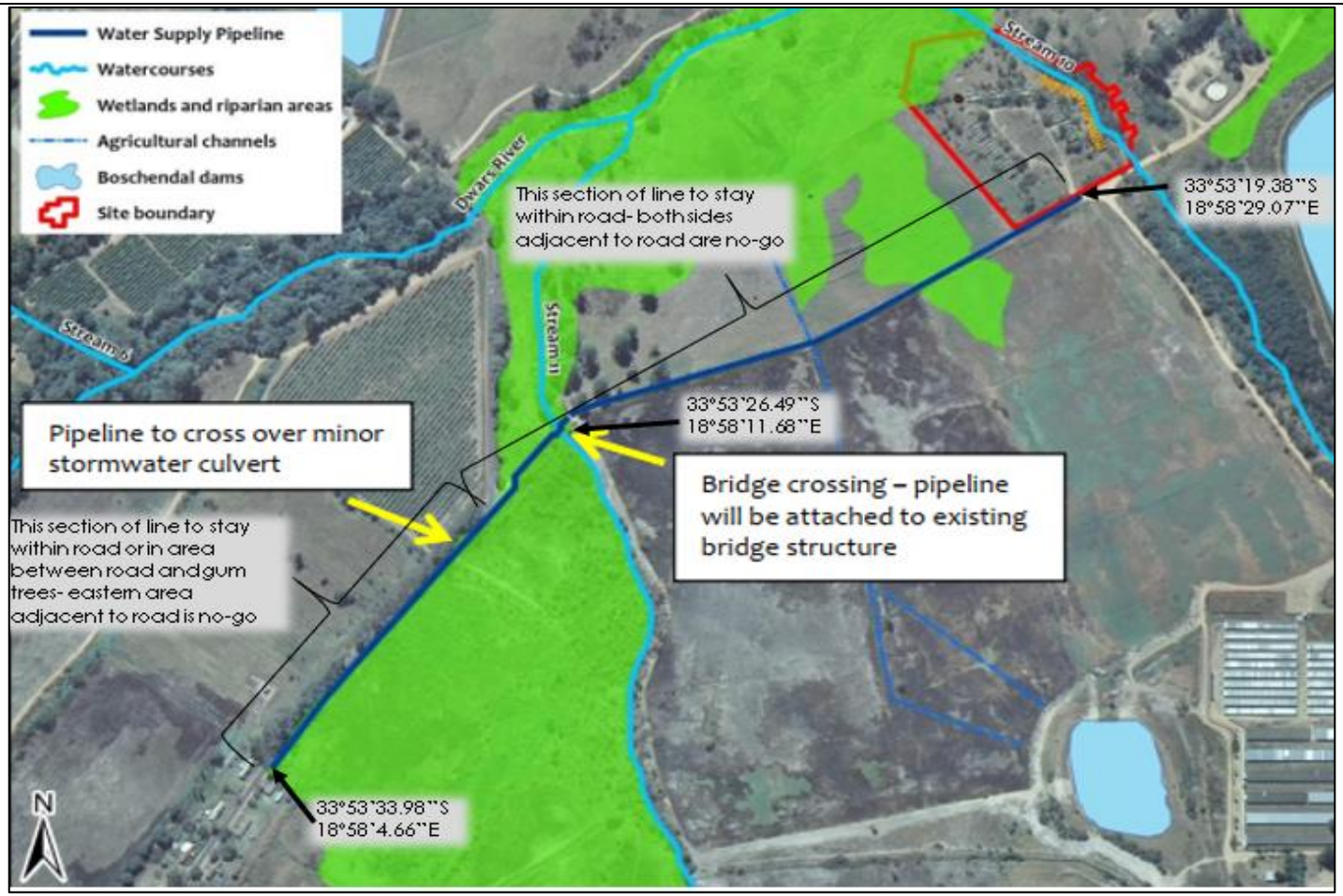


Figure 15 No-Go areas associated with the permanent potable water pipeline to Lanquedoc – Alternative 3 (preferred alternative) only (source: base map from Snaddon, 2021, with additional no-go notes and co-ordinates added by the EAP, 01/06/2021)

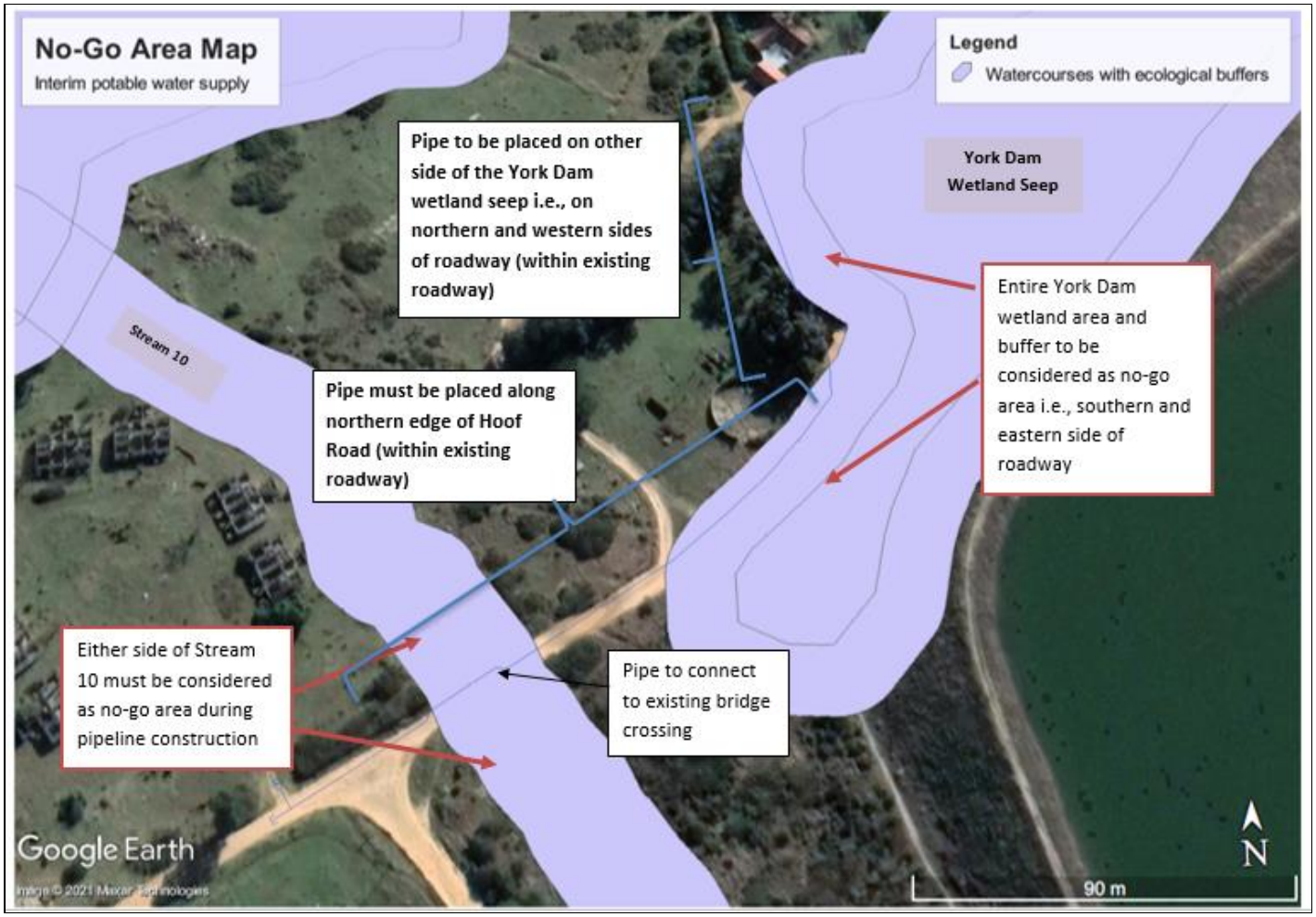
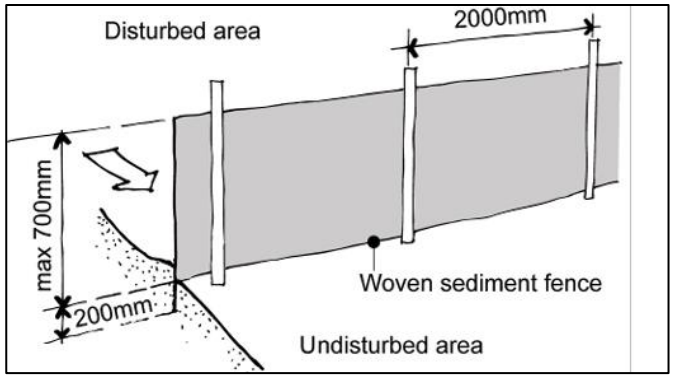


Figure 16: No-Go areas associated with the interim water pipeline to the existing irrigation line – Alternative 3 (preferred alternative) only (source: base map from Snaddon, 2021, with additional no-go notes and co-ordinates added by the EAP, 17/11/2021)

	• In general, all rivers/streams and wetlands are to be considered no-go areas and all personnel and equipment must remain outside of these areas at all times. Absolutely no disposal of any materials used during construction is permitted to occur in the watercourses. • The ecological buffer for the stream and the Dwars River valley-bottom wetland, when works are not occurring in those areas, must abutted by a silt screen/sediment fence (refer to Figure 17). The silt screen is to be checked and cleaned daily for debris, litter and sediment during the construction works along the affection affected sections. Daily photographs of the condition of the silt screen must be taken by the EO and these photographs to be sent to the ECO on a daily basis.  **Figure 17 Silt Screen Establishment (source: https://www.yourhome.gov.au/housing/sediment-control** • Rock for the reno mattress, riprap and rehabilitation gabions may not be sourced from the streams on Boschendal Estate (Snaddon, 2021).

ISSUE	MANAGEMENT / MITIGATION MEASURES
SITE ACCESS, ACCESS ROUTES AND TRAFFIC MANAGEMENT Management Statement and objective: To avoid and/or minimise impacts on the local road network and road users any such impacts are appropriately dealt with to prevent further impacts in the longer term. To avoid construction related impacts to other road users associated with the movement of construction vehicles. Impact Management Outcomes: No disruptions to traffic on local networks such that complaints are elicited, no damage to vehicles and related claims and no nuisance to surrounding caused by dust.	
General	• The bellmouth at the Lanquedoc Main Road/Ou Wapad intersection must be surfaced (Pretorius & Sequeira, 2020). • Use existing roads and tracks to access the site during construction (Snaddon, 2021). • During the laying of the potable water pipeline, the road must not be obstructed, and traffic must be allowed to pass at all times. • The work area within the road for the potable water line must be cordoned off and pedestrians must be encouraged to use the opposite side of the road. • Where access by construction vehicles across the Dwars River bridge could have the potential to cause congestion, access could also be taken off the R45 to alleviate congestion at the bridge. • Access to the site must be carefully managed to avoid unauthorised entry onto the site, and to prevent loitering of construction contractors beyond the development area. • The Contractor shall control the movement of all vehicles and plant including that of their suppliers so that they remain on designated routes, are distributed so as not to cause an undue concentration of traffic and comply with all relevant laws and specifications. In addition, such vehicles and plant shall be so routed and operated as to minimise disruption to regular users of the routes not on the site. • All construction vehicle movement shall as far as possible be limited to off-peak hours wherever possible. Delivery of materials or collecting waste shall be scheduled outside of peak periods. • The vehicles of the Contractor and their suppliers shall not exceed the 40km/h speed restriction within the site and on farm roads (Jackson et al, 2019). • Where necessary, additional traffic control measures should be implemented. • Construction of the infrastructure is to be undertaken during a limited duration to prevent protracted construction impacts to parties making use of the farm. • Subsequent to construction works, all access routes must be inspected and any repairs/cleaning necessary as a result of the construction works must be undertaken.

ISSUE	MANAGEMENT / MITIGATION MEASURES
WASTE MANAGEMENT Management Statement and objective: To prevent pollution/contamination associated with the generation and temporary storage of general waste, hazardous waste construction rubble and litter generated by the workforce on site. Impact Management Outcomes: No non-conformances and no pollution of soil, groundwater and/or stormwater as a result of waste generation and management activities.	
General requirements	• Limited but sufficient capacity is available at the Stellenbosch waste disposal site for spoil as well as construction and demolition wastes. Whilst the landfill is not accepting domestic or commercial municipal solid waste sufficient airspace is available at the alternative site being used by the Municipality for disposal, until airspace at the Stellenbosch landfill has been authorised and constructed (Stellenbosch Municipality, 2021). Garden waste and recyclables are unaffected. If the construction phase entails generating large spoil volumes, the Developer must identify and give proof of an alternative disposal site, as the municipality will not be able to accept large spoil volumes, due to capacity constraints at the landfill site (Stellenbosch Municipality). It should be noted that this requirement stems from the Stellenbosch Municipality and is applicable at the time of writing. Should the situation change, then confirmation thereof from the Stellenbosch Municipality must be provided to the ECO, following which, this requirement may fall away. • Construction related waste will typically include general waste (such as plastic packaging, strapping, and lunch wrappers.), rubble (like broken bricks, tiles, waste concrete) and limited quantities of hazardous waste items (e.g., paint tins, oily rags etc.). • The Contractor shall be responsible for the establishment of an integrated waste management system that is acceptable to the Project Manager and ECO, and a Method Statement is required in this regard. The Method Statement must include a description of the estimated quantity and types of waste, a description of the services required to store, collect, transport, and dispose of waste and a procedure for separating recyclable and non-recyclable material. The local authority must be notified of any changes to the estimated quantities and types of waste. • No refuse, building rubble or waste material will be disposed of by burying. • Construction waste must be sorted into recyclable and non-recyclable waste. • The Contractor will be responsible for ensuring the removal of the waste to Municipal-approved recycling facilities (where possible), as well as the final disposal of non-recyclable wastes at a registered landfill facility. • On-site waste segregation shall take place. Waste shall be sorted into the following categories: - Paper / cardboard; - Metals; - Non-recyclable general waste; - Glass; and - Hazardous waste.

	• Suggested contacts for information on recycling collection points include the following, however existing service providers and systems on the farm may also be used: - Plastic containers: Plastics Federation (021) 591 5512; - Cans and tins: Collect-a-Can (021) 534-7010; - Glass: CONSOL Glass (021) 888 4000; - Motor and cooking oils: Oilkol (086) 110 1961; - Paper: Nampak 0800 018 818; and - Organic waste: Reliance Compost (021) 872 5962.
Storage, handling, and disposal of general waste	• Waste may be temporarily stored on site in a central waste storage area that is weatherproof and scavenger-proof, and which both the Project Manager and the ECO have approved. • All waste shall be sorted in the waste handling / storing area. The location of the waste storage area shall be approved by the ECO. • Colour-coded or clearly marked skips / bins will be utilised in order to differentiate the various waste types suitable to each receptacle. • General waste must be removed from the site at least once every two weeks if it does not pose a risk to human health. • Waste may only be disposed of at a licenced landfill site approved by the Project Manager and the ECO or to legitimate recycling facilities. • Waste disposal certificates must be obtained and filed in the environmental file and submitted with the monthly audit reports. • As far as possible, materials used or generated by construction shall be recycled. **Recycling ensures that we do not waste valuable resources** **Recycling can also create employment opportunities**
Litter prevention and housekeeping	• Litter and general waste materials (excluding rubble and hazardous waste materials) shall be disposed of into scavenger- and weather-proof bins. • The Contractor shall provide enough bins with lids on site to store the waste produced daily. Bins shall not be allowed to become overfull and shall be emptied as required, but at least weekly, to prevent overtopping. • The Contractor shall provide dedicated resources to clean up the Contractor's camp and working areas **daily** and ensure that refuse is placed within the central waste storage area to prevent spreading as a result of wind. • Empty cement bags must be collected from the construction area by the end of every day and before rain events and shall be stored in bins that are either placed under cover or have been fitted with lids. • Wind-blown litter beyond the site boundary that are in the opinion of the ECO emanating from works on site must be

	cleared as part of the waste management of the site.
Storage, handling, and disposal of hazardous waste	• Hazardous and general waste must be stored separately and in a location a minimum of 50m from the river and wetlands and their associated ecological buffers. Hazardous waste containers must be stored in a secure area with bunding / secondary containment and should not be easily accessible to local fauna. The location of the storage area is to be approved by the Project Manager and the ECO. • All hazardous waste must be placed in drums / containers labelled for this purpose. These containers must be kept securely closed when not in use and must be protected from the ingress of rain. • Hazardous waste may not be disposed to a General Landfill site and waste must be removed by a registered hazardous waste Contractor for disposal to a licensed hazardous waste landfill. This must be done at least once every three months in accordance with the limit applicable to the temporary storage of hazardous waste if it does not pose a risk to human health. • Records of hazardous waste disposal must be maintained. The Contractor shall retain copies of receipts from such waste disposal sites to the Project Manager and ECO as proof of proper disposal. • Storage and disposal of waste items are also controlled through other relevant legislation which must be complied with e.g., Occupational Health & Safety Act.
Storage, handling, and disposal of vegetative waste	• Cleared vegetative material is not to be disposed anywhere other than a licenced composting facility or licenced waste disposal site. • Any invasive alien plant species, which are removed from the site, are not to be chipped for mulch if they are in a seed-bearing state. Such material is to be disposed of at a suitable waste disposal site. • Plant material removed from the site is not to be burnt for disposal on site given the proximity to other activities on the farm.
Storage, handling, and disposal of builder's rubble	• In accordance with the integrated waste management approach to be followed through the construction phases of the development, materials used or generated by construction or the construction areas of other projects on the farm shall be re-used as far as possible. **Clean** builders' rubble and soil/sand/rock may therefore be used as infill material / backfill material at the ECO's discretion. • All builders' rubble is to be removed from the works area on a weekly basis, unless approved otherwise by the ECO. • The Contractor shall provide resources to clean up the Contractor's camp and working areas of rubble generated in the

	course of construction work at least twice a week, or more frequently if specifically required. • Rubble shall be temporarily stockpiled in a waste skip or a central stockpile and shall be removed from site to an approved landfill site as soon as it constitutes a practical load for removal and before temporary closure of the site. • No plastics, shrink wrap, paint buckets or any other debris that do not constitute clean building rubble, shall be stored at such stockpile sites.

ISSUE	MANAGEMENT / MITIGATION MEASURES
SOIL AND WATER POLLUTION MANAGEMENT Management Statement and objective: To prevent groundwater and soil pollution associated with the handling storage and use of hazardous materials or materials that have the potential to cause environmental harm. Impact Management Outcomes: No non-conformances, no pollution to soil and groundwater and/or stormwater or any water courses as a result of the construction activities.	
Prevention of impacts on the river and wetlands	• Refer to the no-go areas in the "Site Camp Establishment" table. No vehicles, machinery, personnel, construction material, cement, fuel, oil, bitumen, or waste should be allowed into these no-go areas, unless express permission is granted by the ECO for specific activities. • Do not impede the movement of aquatic and riparian biota. • All potential pollutants should be kept away from the wetlands and stream. • All stockpile of building materials (e.g., sand) must be protected to prevent erosion by wind and water. Stockpiles should not be higher than 1.5 m. • All soil stockpiles should be covered (e.g., with geotextile or plastic sheeting) and not exceed a maximum height of 1.5 m.
Prevention of soil and ground water pollution	• All major earthworks to be carried out in the dry season when the water table is at its lowest, unless otherwise indicated through the findings of a geotechnical assessment (i.e., if groundwater levels are not sufficiently high that construction during wetter months would be problematic). • The Contractor shall prevent pollution of surface or ground water as a result of construction activities. Such pollution could result from the release, accidental or otherwise, of chemicals, oils, fuels, sewage, water from excavations, construction water, water carrying soil or other particles or waste products, etc. • No residues from cleaning activities or any other form of contaminated water may be released onto bare soil or into vegetated areas. Such wastewater must be appropriately contained and disposed. • In the event of a significant spill or leak of hazardous substances (e.g. petrol, diesel, etc.) used during the proposed activities, such an incident(s) must be reported to the relevant authorities, including the DEA&DPs Pollution & Chemicals Management Directorate, in accordance with section 30 of the NEMA. • Any incident that may result in the pollution of a water resource must be reported to the Department of Water and Sanitation (DWS) immediately. • No watercourse in the greater area shall be used for disposal / dumping of any material or substance under any circumstances, even temporarily. • Servicing of vehicles or machinery is strictly prohibited on the site.

	• All maintenance of plant shall be performed off site. If it is necessary to do emergency repairs on site, the Contractor shall obtain the approval of the Project Manager and ECO prior to commencing activities and ensure that there is no contamination of the surrounding soil or vegetation by using drip trays to collect waste oil and other lubricants. • Water pumps shall have drip trays to contain oil and fuel leaks – these must be cleaned regularly (Snaddon, 2021). • Drip trays shall be provided in construction areas for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders, vehicles). Drip trays shall be inspected and emptied daily and serviced when necessary. Drip trays shall be closely monitored during rain events to ensure that they do not overflow. Drip trays must be free of cracks/ holes / punctures to ensure no spillage from these receptacles. • Stationary equipment (such as generators etc.) must also be placed inside drip trays whilst in use. • All stationary machinery that store or run-off hydro-carbons (excluding vehicles) must have drip trays to prevent hydrocarbon spillages (Jackson et al, 2019). • The washing of equipment shall be restricted to urgent or preventative maintenance requirements only. A Method Statement shall be required for all wash areas where hydrocarbon, hazardous materials and pollutants are expected to be used. This includes, but is not limited to, paint equipment cleaning. • Wash areas for domestic use shall ensure that the disposal of contaminated "grey" water is sanctioned by the Project Manager. • Water containing potential pollutants such as cements, concrete, lime, chemicals, fuels, and hydrocarbons shall be contained and discharged into an impermeable storage facility for evaporation and ultimate removal from the site or for recycling. This particularly applies to water emanating from concrete batching plants and concrete swills, and to runoff from hydrocarbon storage areas. Under no circumstance may contaminated water be discharged into the watercourses in the greater area. • The site office, toilets, material storage/stockpiling, storage or stockpiling of spoil material and all temporary waste storage areas should be located at least 50m away from the no-go areas and in areas approved by the ECO. • Bulk storage of fuel/hydrocarbons is strictly prohibited, and the temporary storage of such substances will be limited as far as possible. Note that storage of fuel in volumes greater than 200litres is subject to a flammable substance permit, obtainable from the local fire chief. All storage areas for such substances shall be bunded, covered and have an impermeable surface and shall be in areas approved by the ECO. • Refuelling of plant/equipment must be undertaken on a concrete platform with secondary containment. The necessary decanting equipment must be used to prevent spills and leaks whilst refuelling. • Storage facilities for chemicals should be bunded and situated in high lying areas to avoid spillages and damage from flood events (Jackson et al, 2019).

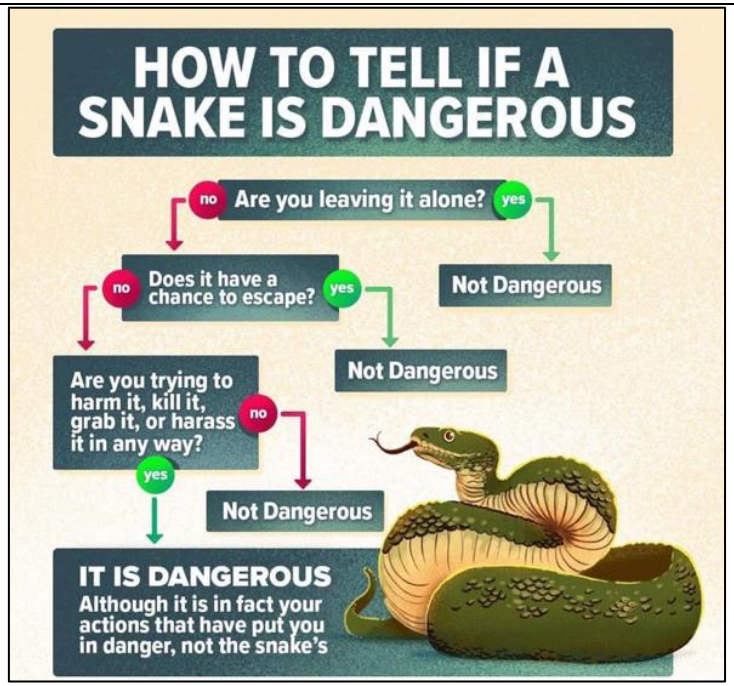
Spills and spill control	• A Method Statement must be put in place for the handling of spills and leaks. The Contractor shall ensure that employees are aware of the procedure to be followed in this regard and shall make the necessary materials and equipment for dealing with spills and always leaks available on site. Clean-up and remediation must occur immediately after a spill incident. • All fuel, oil or hydraulic fluid spills are to be reported to the Project Manager or ECO immediately. • In the event of a hydrocarbon spill, the source of the spillage must be isolated, and the spillage contained. Should a leak emanate from equipment (such as earth moving equipment), the machinery shall be parked on a hard surface until such time as a repair can be made, to prevent contamination of bare ground. • The Contractor shall ensure that there is always a supply of appropriate material readily available to absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage. The quantity of such materials shall be able to handle the volume of a spill similar to the volume of the largest container on site used for storage of such substances that are not stored and / or used inside a bunded area. This material must be approved by the Project Manager prior to any refuelling or maintenance activities.
Erosion prevention, sedimentation control	Erosion and sedimentation can occur due to the loss of vegetation, compaction of soils due to excavations, trampling by construction personnel and movement and storage of materials and machinery during the construction. The following mitigation measures must be put in place: • Special care should be taken around storm and heavy rain events. The construction site should be inspected for erosion damage at these times (i.e., after heavy rainfall) (Snaddon, 2021). • If construction areas are to be de-watered (e.g., after rains), this water must first be pumped into a settlement area or portable tank / pool, and not directly into the wetlands or stream (Snaddon, 2021). • Exposed surfaces should be compacted, and ideally re-vegetated, as quickly as possible. • The Contractor shall take all reasonable measures to limit erosion and sedimentation due to the construction activities. Where erosion and/or sedimentation occurs, whether on or off the site, despite the Contractor complying with the foregoing, rectification shall be carried out in accordance with details specified by the Project Manager. Where erosion and/or sedimentation occur due to the fault of the Contractor, rectification shall be carried out to the reasonable requirements of the Project Manager. • The Contractor shall be vigilant during periods where strong winds prevail (especially during the dry summer months) to manage dust generation in accordance with the Dust Control Regulations. No potable water shall be used for dust suppression purposes while water restrictions apply. • Prior to the start of construction, a system must be put in place to manage stormwater runoff from the site during the construction period. A stormwater management plan which complies with all the regulations set out by the Stellenbosch Municipality must be drawn up by the Project Manager and submitted to the local authorities for approval. This must

	include specifications for stormwater management whilst construction activities area undertaken on site and must be incorporated into the related Method Statement.

ISSUE	MANAGEMENT / MITIGATION MEASURES
PROTECTION OF NATURAL FEATURES AND FAUNA • Management Statement and objective: To ensure that no vegetative cover is removed and/or impacted on outside of the approved works area (i.e., nearby mapped environmental areas). To protect any protected plant species on the property and prevent impacts on fauna found on the site. To preserve the top layers of soil for use in the final landscaping. Appropriate temporary storage and stockpiling of topsoil to prevent erosion, sedimentation, and dust pollution. To avoid intrusion into the adjacent natural areas and prevent related impacts. • Impact Management Outcomes: No removal of vegetation and/or other impacts on any vegetative cover in the area outside of site limits. No damage or defacing of any natural features situated in or around the site. No harm or destruction of faunal habitats outside the site limits or the death of any animals on the site or as a result of actions of removing fauna off site.	
General	• A Method Statement detailing the layout and method of establishment of the construction camp (including all buildings, offices, lay down yards, wash areas, fuel storage areas, batching areas and other infrastructure required for the running of the project) and indicating these in a drawing shall be submitted to the ECO for review and approval. • All site camps, laydown areas etc. must be located in already transformed areas. These must be "fit-for-purpose" i.e., not an open space but rather a hard-surfaced fenced off area. • All natural areas that are to remain untransformed but that are impacted by the dumping of materials must be ripped and re-planted after construction is complete, to the satisfaction of the Environmental Control Officer (ECO) (Snaddon, 2021). • The Contractor shall not deface, paint, damage or mark any natural features situated in or around the site for survey or other purposes unless agreed beforehand with the Project Manager. Any features affected by the Contractor in contravention of this clause shall be restored/ rehabilitated to the satisfaction of the Project Manager. • The Contractor shall restrict all activities, materials, equipment, and personnel to within the area specified. • Movement of vehicles and personnel, stockpiling, dumping or storage of equipment or materials outside the designated working areas, termed as "no-go" areas, will not be permitted without written authorisation of the Project Manager and ECO. • The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including "no-go" areas) and required to comply with the specifications. • The Contractor shall ensure that delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the Specifications.

Site Clearance	• Any work that may be required outside of the site area should be supervised by the ECO. This may necessitate additional site visits over and above the monthly audits by the ECO. • Keep clearing to a minimum (Jackson et al, 2019). • All clearing activities must deploy search and rescue teams in front of clearing machinery to assist in relocating slower moving faunal species e.g., tortoises out of the clearing path and relocating to ecological corridors (Jackson et al, 2019). • Unnecessary disturbance of the soil shall be avoided in order to prevent reduce the potential for erosion and changes to the drainage regime, as well as dust and noise generation which could lead to nuisance factors for the adjacent land users. • Burning of vegetation is strictly prohibited. • Full-grown riparian tree species must not be disturbed or damaged (Snaddon, 2021). • Disturbed areas must be checked regularly for alien and invasive seedlings (Snaddon, 2021). • The site must be inspected at least weekly for alien and invasive seedlings, and these removed and destroyed. (Snaddon, 2021). • All woody alien invasive species on the south side of the Lanquedoc road section of pipeline, and within 20m of the pipeline, should be removed during the construction phase. All cut stems must be painted with herbicide immediately after felling to prevent resprouting (Helme, 2021). IAPs must be removed from an area up to 20 m from the water supply pipeline (Snaddon, 2021). • Plant which is in good working condition must be used to clear and grub, remove, and stockpile the surface vegetation and topsoil. • No cut vegetation may be burned on site.
Management of potential disturbance to fauna	• If lights are used, these must be directed away from all sensitive areas (refer to Figure 11) (Snaddon, 2021). • Site inspections are to be conducted prior to the commencement of clearing activities to allow for any faunal species to be removed from the area. • All clearing activities must deploy search and rescue teams in front of clearing machinery to assist in relocating slower moving faunal species e.g., tortoises out of the clearing path and relocating to ecological corridors/habitats (refer to Figure 11) (Jackson *et al*, 2019). • Assist (harmless) animals in moving: When animals are observed and they appear to be trapped or unable to escape to a safe area, they should be assisted in so doing. Animals that are potentially dangerous should be moved with the help of knowledgeable and experienced persons. It is recommended that the Cape Reptile Club (Secretary: Marcel Witberg: 082 784 7314) be approached for the contact details of a local person who would be able to be on site at short notice, should a situation arise. This person should be put on standby for the period of site clearance.

	• If animal species are encountered in the course of site clearing or earth moving activities the ECO or the Contractor's Environmental Officer (if the ECO is not on site) must be consulted so that any animals vulnerable to injury can be moved. • Hunting of any animal species is strictly prohibited. • If any dangerous species are encountered, the ECO must be consulted regarding their removal and all Contractor employees shall be moved away from the area until a professional can remove the animal in a safe manner. • There may be no interference or harassment of wild animal species. If wild animals are encountered, they should be avoided and not approached. • Do not leave holes and trenches open for extended periods of time. Holes and trenches should be left open for as short a period as possible, because such cavities act as pitfall traps for small animals. Trenches must be built with slopes that allow fauna that fall in to escape (Jackson, 2019). • A search and rescue plan should be developed for fauna which fall into construction trenches, ideally these should be filled (Jackson et al, 2019). • No fires should be allowed within the site as there is a risk of fires spreading into the surrounding farm. • Do not poison any faunal species (Jackson *et al*, 2019). • No construction during the hours of darkness (Jackson *et al*, 2019). • Residents, staff, and visitors must not be allowed to trap animals on site (Jackson *et al*, 2019). • Prevent employees/workers from killing snakes through environmental training and awareness (refer to Figure 18 for poster) (Jackson et al, 2019). • Prevent employees/workers from hunting reptiles, amphibians, mammals and birds through environmental awareness and training (Jackson *et al*, 2019). • Educate staff which snakes are venomous/nonvenomous and differentiate between defensive and aggressive behaviour. Employees/workers must not kill snakes (Jackson *et al*, 2019). • Where possible, limit project vehicles from driving on project roads during the hours of darkness (Jackson *et al*, 2019).

	 **Figure 18 Snake behaviour information poster (source: Jackson et al, 2019)**
Protection of Trees to be retained	• Only trees earmarked for removal are allowed to be removed from the site, the remaining trees must be protected as per the tree plan in Appendix 5. • Refer to Appendix 6 for tree pruning techniques to be employed. • The Hoarding is to be constructed of a firm and rigid material well bedded in the ground to obviate it falling over in the wind. The proposed material is to be approved by the Landscape Architect (Terra +, 2020). • In relation to the installation of the hoarding within the tree canopy drip line, each condition needs to be individually assessed with a view to minimizing damage to the roots of the trees (Terra +, 2020). • When working around the tree stem, all measures must be taken not to damage the tree branches, bark, roots, and leaves. Hoarding must be replaced once work has been completed (Terra+, 2020). • The Project Manager is to advise the Landscape Architect when work commences adjacent to the trees (Terra+, 2020).

	• A line of Communication is to be agreed by all consultants and contractors' telephone numbers are to be clearly displayed on site (Terra+, 2020). • Mark out the hoarding alignment on site for approval by the Landscape Architect before commencement of installation thereof (Terra+, 2020). • Signs are to be posted on the protective hoarding at frequent intervals explaining in Afrikaans, English, and isiXhosa, that this is a Tree Protection Zone and that no access is permitted (Terra+, 2020). • The hoarding is to be kept intact at all times, if any portion of the hoarding becomes damaged it is to be repaired immediately to the cost of the main contractor and reported to the landscape architect (Terra+, 2020). • No fires are to be made at any place within the tree canopies (Terra+, 2020). • No materials are to be stored under the trees or against the hoarding (Terra+, 2020). • No hanging of clothing or any items on the trees or the hoarding (Terra+, 2020). • No item, nail, etc may be attached to the trees unless deemed necessary by the approved arborist (Terra+, 2020). • No storm water runoff or/and spilling of materials from site must be directed towards the trees. (Terra+, 2020). • No branches or tree roots can be removed without the prior approval of the Arborist, all pruning of trees to be performed under supervision of the arborist (Terra+, 2020). • All waste from tree surgery must be recycled, being used in a variety of situations, including mulches for shrub beds, firewood, habitat piles or dead standing timber where suitable, thereby avoiding the use of landfill sites (Terra+, 2020). • The hoarding and status of the trees will be assessed and monitored on a weekly basis, and supplemented by monthly reports (Terra+, 2020). • Where interference to the tree's root ball or canopy is required (e.g., through pruning or excavation), the arborist should assess and recommend appropriate action (e.g., the application of suitable wound sealant, fertilizer, soil improver or surface dressing) and monitor the tree's health (Terra+, 2020). • The existing water table around existing trees needs to be maintained during the project works and after completion thereof. An appropriate watering program must be implemented for new trees (Terra+, 2020). • A site journal is to be kept indicating recording dates, people spoken to, any damage to trees and the like (Terra+, 2020). • The hoarding can only be removed on the instruction of the landscape architect (Terra+, 2020). • Excavations within the tree root zone to be implemented by hand. • Potential compaction of soil within the root zone to be ameliorated through methods approved by the Landscape Architect (e.g., place boarding or mulch in local area effected and the like) (Terra+, 2020). • Pruning to clear for building site or construction works to be done by an Arborist (Terra+, 2020).

	• In addition, dependent on the extent of excavation adjacent to the root zones (to be accessed by the Landscape Architect), retention of the root ball will be required – sand bagging retention method to be used until the pre-construction levels are reinstated (Terra+, 2020).

ISSUE	MANAGEMENT / MITIGATION MEASURES
PROTECTION OF ANY PALEONTOLOGICAL AND ARCHAEOLOGICAL RESOURCES Management Statement and objective: Protection of archaeological and/or palaeontological resources on, or adjacent to the site. Impact Management Outcomes: No non-conformances and no impacts on such resources and proper execution of the excavation thereof.	
General	• An appropriately experienced archaeologist should conduct a site visit, once during and again after any deep excavation activities on site, prior to backfilling or construction, to identify any evidence for in situ, subsurface LSA material (Stellenbosch Interest Group, 2020). • Demolition should be subject to photographic recording and a record of the names and profile of its last occupants (Smuts & Scurr, 2020). • The development team/site foreman should be advised of the type of archaeological materials that could occur on site (Smuts & Scurr, 2020). • An appropriately experienced archaeologist should conduct a site visit, once during and again after any deep excavation activities on site, prior to backfilling or construction, to identify any evidence for in situ, subsurface LSA material (Smuts & Scurr, 2020). • Should any significant, in situ material be encountered on site, work in that area must stop immediately, and HWC should be notified so that they can advise of the appropriate way forward; this may include further inspection and mitigation by an archaeologist (Smuts & Scurr, 2020). • Should any human burials, or potential burials be encountered, all work should cease in that area, and HWC should be notified immediately to determine the appropriate course of action (Smuts & Scurr, 2020). Failure to notify the ECO of a find will result in a penalty. The ECO will notify a relevant specialist (e.g., palaeontologist, archaeologist) immediately to determine the way forward. The appropriate procedures for the relevant fossil-finds as detailed below must be followed, should anything of an archaeological nature be found on site by the Contractor (or any other party). This aspect must be carefully explained to workers during the Environmental Education Programme undertaken by the ECO. The ECO will advise on demarcation of this area and notify a relevant specialist to view material and ascertain whether further study of the area is required. Should a specialist confirm a genuine artefact or fossil and recommend further study of the area, work in the applicable area is to cease until further notice and the find be reported to HWC by the ECO.

ISSUE	MANAGEMENT / MITIGATION MEASURES
PROTECTION OF ANY PALEONTOLOGICAL AND ARCHAEOLOGICAL RESOURCES Management Statement and objective: Protection of archaeological and/or palaeontological resources on, or adjacent to the site. Impact Management Outcomes: No non-conformances and no impacts on such resources and proper execution of the excavation thereof.	
	• Note that potential heritage, archaeological or paleontological material could be graves, human burials, stone hand tools, remnants of old structures not previously visible, old ceramic shards etc. • If any human remains, or potential human remains/burials, are discovered during earth moving activities, they are to be treated with respect and the South African Police Service and HWC contacted immediately. Should the SAPS indicate that the remains are older than 60 years, SAHRA should be notified. An archaeologist should be contracted to remove such remains at the expense of the developer. A maximum of 30 days should be set-aside in the construction program for the recovery of archaeological material where/if discovered. The contact details for the SAHRA are as follows: 111 Harrington Street, Cape Town, 8001 P O Box 4637, Cape Town, 8000 Tel: (021) 462 4502 Fax: (021) 462 4509 Email: director@sahra.org.za • Regarding the proposed potable water pipeline, archaeological monitoring of the trenching activities should be undertaken periodically to inspect for any in situ or significant below surface features or artefacts (Smuts & Scurr, 2021). Should any such material be uncovered, the archaeologist should stop work on site in that area and contact HWC to determine the best way to proceed; this could include mitigation by way of excavation of the site (s) (Smuts & Scurr, 2021).

ISSUE	MANAGEMENT / MITIGATION MEASURES
NOISE MANAGEMENT Management Statement and objective: To avoid and/or minimise impacts on the surrounding farm users and farm activities and ensure that any such impacts are appropriately dealt with to prevent further impacts in the longer term. To provide a forum for any Interested and/or Affected Parties to raise their concerns and log complaints for remediation action and prevention of similar incidents. Impact Management Outcomes: No disruptions or nuisance to other users of the farm or farm activities by noise from the construction site. Effective complaints handling. No repeat complaints received.	
Management of potential noise disturbance	Noise, at a level typically associated with construction activities, would be experienced by surrounding land users during construction works: • The Contractor's attention is drawn to the Noise Regulations as promulgated in terms of the relevant Local Authority bylaws. • Noise generated on site from all the proposed activities must comply with the Western Cape Noise Control Regulations Provincial Notice 200/2013. • All noise and sounds generated by machinery must adhere to SABS 0103 specifications (Jackson et al, 2019). • In terms of noise legislation, a noise exemption permit needs to be obtained if the limits as contemplated in legislation will be exceeded for any given period. This requires obtaining of signatures from affected parties within a 150m radius of a site. • Working hours must be restricted to normal daily working hours considered in the construction regulations. Should works be necessitated outside of these hours, surrounding users of the farm must receive timeous notification. This is particularly the case of the Bookings office at the farm, who would need to be made aware of possible impact on nearby guests. • Machinery to be fitted with silencers and no sound amplification equipment such as sirens, loud hailers and hooters may be used on site except in emergencies. • No amplified music shall be allowed on site. • No noise generating work may take place at night unless prior approval was granted by the local municipality and notification was sent to the surrounding residents. • The Contractor shall take preventative measures, such as screening, muffling, timing, and pre-notification of affected parties to minimise complaints regarding noise. • The Contractor shall control the movement of all vehicles and plant including that of their suppliers so that they remain on designated routes/haul roads, so as not to cause an undue environmental damage.

ISSUE	MANAGEMENT / MITIGATION MEASURES
DUST MANAGEMENT Management Statement and objective: No unacceptable levels of dust. To avoid and/or minimise impacts on the surrounding farm users and activities and to ensure that any such impacts are appropriately dealt with to prevent further impacts in the longer term. To prevent wind and water erosion and/or sedimentation of any features surrounding the site. To provide a forum for any Interested and/or Affected Parties to raise their concerns and log complaints for remediation action and prevention of similar incidents. Impact Management Outcomes: No nuisance to surrounding users of the farm and farm activities caused by dust. Effective complaints handling. No repeat complaints received.	
Prevention of dust nuisance	• The Contractor must take all reasonable steps to prevent nuisance caused by dust in accordance with the National Dust Control Regulations and the Stellenbosch Municipality Air Quality By-Law 2018. These Regulations prohibit a person from conducting any activity in such a way as to give rise to dust in such quantities and concentrations that the dust, or dust fallout, has a detrimental effect on the environment, including human health. • These regulations prohibit a person from conducting any activity in such a way as to give rise to dust in such quantities and concentrations that the dust, or dust fallout, has a detrimental effect on the environment, including human health • Land clearing and planting/construction should be phased as far as possible such that land is not left open and unplanted for long periods of time. • The Contractor shall take all reasonable measures to minimize any dust nuisance and inconvenience to or interference with the public (or others) as a result of the execution of the works. A Method Statement will be required in this regard as determined by the Project Manager and ECO. • During windy and dry conditions, dust suppression methods must be employed, for example on project roads. NOTE: The use of potable water for dust suppression is not permitted when water restrictions are in place and discouraged even when water restrictions are not in place. • Stockpiles of materials as well as the loads on all trucks transporting any material that could lead to dust pollution should be covered with a tarpaulin or similar cover to minimise dust / windblown sand. • In extreme cases, a dust suppression product (e.g., dustex) should be used. • Excavation, handling, and transport of erodible materials shall be avoided under high wind conditions or when a visible dust plume is present. • All access and haul routes/ roads shall be cleared from debris deposited by construction vehicles associated with this project.

	• The Contractor shall be responsible for any clean-ups resulting from the failure by their employees or suppliers to properly secure transported materials. • The Contractor shall take preventative measures, such as monitoring, screening, dust control, timing, and pre-notification of affected parties to minimise complaints regarding dust. • Construction activities must be limited on days where there are high winds • If, in the reasonable opinion of the ECO, excessive dust is noted or complaints regarding dust exceed 1 complaint a week, the ECO may request dust fallout monitoring to be undertaken to determine the need for additional control measures.

ISSUE	MANAGEMENT / MITIGATION MEASURES
AESTHETICS (VISUAL) Management Statement and objective: To ensure that visual impacts are avoided as far as possible, and where these cannot be altogether avoided, that it is reduced to acceptable limits. Impact Management Outcomes: No unacceptable visual impacts occur as a result of construction activities.	
Site Housekeeping	• The Contractor shall take appropriate measures to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area. • Should it be deemed necessary, the ECO may request that activities which may have a high visual impact be suitably screened off to the surrounding environment. Site construction hoarding / fencing should be neutral in colour and free of excessive branding. • The Contractor shall supply and maintain adequate and suitable sheds or containers for the storage of materials. Sheds for the storage of materials that may deteriorate or corrode if exposed to the weather shall be weather-proof, adequately ventilated and provided with raised floors. • All site establishment components (as well as equipment) shall be positioned to limit visual intrusion surround users and the size of the area disturbed. • The type and colour of roofing and cladding materials to the Contractor's temporary structures shall be selected to reduce reflection. • The Contractor shall ensure that any lighting installed on the site for their activities does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding community or other users of the area. Site lighting should be kept to a minimum and should not be flood type lighting where possible, particularly over the stream and wetlands. • Neon, spot, or up- lighting are visually inappropriate. Light sources should be screened and filtered as far as possible.

	• Construction signage should not be excessively sized or located along sensitive visual corridors. • Excavation machinery and trucks should be stored and kept out of sight of surrounding residential areas and scenic routes where possible. • Construction signage should not be excessively sized or located along sensitive visual corridors. • Excavation machinery and trucks entering and leaving the site should take care not to leave rubble, sand, rock, branches, and the like on roads linking to the site.

ISSUE	MANAGEMENT / MITIGATION MEASURES
HAZARDOUS SUBSTANCES (INCLUDING CEMENT) MANAGEMENT Management Statement and objective: To prevent pollution or fire associated with the handling storage and use of materials deemed hazardous to human health or the environment. Impact Management Outcomes: No non-conformances and no pollution of soil, groundwater and/or stormwater as a result of the construction activities. No fires as a result of the handling / use of fuel.	
Hazardous substances handling, use and storage	• No fuel storage, refuelling, vehicle maintenance or vehicle depots should be allowed within 50m of the no-go areas. • All fuel is to be stored within a demarcated area. No refuelling of vehicles or machinery is to take place outside of this demarcated area unless authorised by the Project Manager. The Project Manager shall be advised of the area that the Contractor intends using for the storage of fuel. • Cement mixers shall have drip trays to contain oil and fuel leaks – these must be cleaned regularly (Snaddon, 2021). • The Contractor shall ensure that all liquid fuels (petrol and diesel) are stored in tanks with lids, which are kept firmly shut. Only empty and externally clean tanks may be stored on the bare ground. All empty and externally dirty tanks shall be sealed and stored on an area where the ground has been protected. • Tanks containing fuels shall be situated on a smooth impermeable surface (plastic or concrete) base with a bund (if plastic, it must have sand on top to prevent perishing) to contain any possible spills and prevent infiltration of fuel into the ground. The impermeable lining shall extend to the crest of the bund and the volume inside the bund shall be 110% x the total capacity of the largest storage tank / vessel inside the bund. • The floor of the bund shall be sloped towards an oil trap or sump to enable any spilled fuel to be removed. An Enretech or similar hydrocarbon absorption/remediation product approved by the ECO shall be installed in the sump to reduce the risk of pollution. Bulk fuel storage and bunded areas shall have overhead cover to prevent rain from entering the bunded area. • The Contractor shall always keep fuel under lock and key. • Areas or containers for storage of fuels and other flammable materials shall comply with standard fire safety regulations and may require the approval of the municipal fire prevention officer in terms of the Municipality's community fire safety by-law. • If fuel is dispensed from 200 litre drums, the proper dispensing equipment shall be used, and the drum shall not be tipped in order to dispense fuel. The dispensing mechanism of the fuel storage tank shall be stored in a waterproof container when not in use. • When parked, a drip tray must be placed under the temporary fuel storage tanker (bowzer) to contain incidental drips and spills. • Refuelling must take place on a concrete / hard standing area or over a drip tray. • During fuel delivery, a trained individual must always be present during offloading of product. An emergency cut off switch must be installed to immediately stop fuel delivery should an accident occur. An anti-flash nozzle must be installed

	at the end of the vent pipe with a fuel dispenser equipped with an automatic cut off switch to prevent fuel tank overfills. • Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction shall be stored in secondary containers. • The relevant Material Safety Data Sheets (MSDS) shall be available on site. • Procedures detailed in the MSDSs shall be followed in the event of an emergency. • If potentially hazardous substances are to be stored on site, the Contractor shall provide a Method Statement detailing the substances/ materials to be used, together with the storage, handling, and disposal procedures of the materials. • No paint products and chemical additives and cleaners such as thinners and turpentine, may be disposed of on site. Brush / roller wash facilities shall be established to the satisfaction of the Project Manager. A Method Statement, approved by the Project Manager, is required.
Working with cement and concrete	• Cement powder has a high pH. Spillage of dry cement powder and concrete slurry will affect both soil and water pH adversely. The permitted location of the batching plant (including the location of cement stores and sand and aggregate stockpiles) shall be indicated on the site layout plan and approved by the ECO. • No mixing of concrete may occur close to (less than 50m) the wetlands or stream (Snaddon, 2021). • Cement mixers shall have drip trays to contain oil and fuel leaks – these must be cleaned regularly (Snaddon, 2021). • Cement is to be stored in a secure weatherproof location to avoid contamination of the environment. • All runoff from batching areas shall be strictly controlled so that contaminated water does not enter stormwater, or groundwater or any water courses. Dagga boards and mixing trays should be used at all mixing and supply points. • Cleaning of equipment and flushing of mixers shall not result in pollution of the surrounding environment. • Settling tanks for the evaporation of contaminated water should be constructed with an impermeable surface. Sediment should be left to dry out before being removed to the hazardous waste skip. • The cement mixing area should not be located in such a way that run-off will enter into the streams or wetlands. • All cement work within ecological buffers of streams must be done by hand.

ISSUE	MANAGEMENT / MITIGATION MEASURES
LABOUR RELATIONS, FACILITIES AND SITE HEALTH AND SAFETY Management Statement and objective: To ensure the safety of all site personnel as well as the surrounding users of the farm. Impact Management Outcomes: No injuries / incidents on site and emergency situations managed effectively. No safety breaches.	
Employment	• Make use of local previously disadvantaged individuals for the bulk of the unskilled labour as well as for the skilled labour, where feasible.

General safety	• Environmental awareness training courses shall be run for all personnel on site. All new staff and sub-contractors' employees that spend more than 1 day a week or four days in a month must attend the environmental education program within 1 (one) week of commencement of work on site. All attendees shall remain for the duration of the course and sign an attendance register on completion that clearly indicates participant's names, a copy of which shall be handed to the Project Manager. • Telephone numbers of emergency services, including the local firefighting service, shall be posted conspicuously in the Contractor's office near the telephone.
General site security	• No unauthorised firearms are permitted on site and access to the work site by unauthorised persons is to be prevented by the Contractor as far as is practical. • The work site is to be secured and access by members of the public is to be prevented. • The Occupational Health and Safety Act (Act 85 of 1993) and the requirements of the Construction Regulations must be complied with. • Apart from any security staff who may be required to stay overnight at the Contractor's camp, no personnel will be permitted to live on site. • Security staff must be provided with heating and cooking facilities (in order that they do not need to light fires), access to toilet facilities and communication equipment. • No swimming in the nearby farm dams should be allowed.
Trenching	• All trenching within the tree canopies is to be approved by the landscape architect before commencement thereof (Terra+, 2020). • All trenching within the tree canopies is to be performed by hand (spade work), any roots that are exposed during these excavations are to be left intact and inspected by an arborist (Terra+, 2020). Roots can only be pruned by an arborist (or done under the supervision of an Arborist) (Terra+, 2020). Notwithstanding if any part of the tree is damaged during the said works this is to be reported to the landscape architect immediately (Ankia Bormans: 082 448 4645) (Terra+, 2020). This is to ensure that the approved arborist can be instructed to perform any tree surgery if required (Terra+, 2020). • Any trenching required for the provision of services to the site shall be done in an environmentally sensitive manner. • Trenching for services should be done in accordance with the engineering specifications (SANS 1200DB). • Trenching shall be kept to a minimum. • Trenching for the proposed pipeline should be minimised, and should be closed up as soon as possible, to prevent entrapment of animals (Helme, 2021). • Trenching for laying the water supply pipeline must be done in sections, so that trenches are left open for a minimum length of time (Snaddon, 2021).

	• The planning and selection of trench routes shall be undertaken in liaison with the Project Manager and cognisance should be given to minimising the potential for soil erosion. • Trench routes within permitted working areas shall be clearly defined and marked beforehand with, for example, painted stakes. • Trench lengths shall be kept as short as practically possible before backfilling and compacting. • Trenches shall be re-filled to the same level as (or slightly higher to allow for settlement) the surrounding land surface to minimise erosion. Excess soil shall be stockpiled in an appropriate manner. • Where there is a particularly high erosion risk, anti-erosion measures shall be implemented e.g., a fabric such as Geojute (biodegradable). In addition, the ECO and Landscape Architect must be consulted if the removal of any landscape planting is unavoidable. • Measures should be instituted to safeguard workers in service trenches from collapse of the sidewalls of the trenches (see safeguarding measures below). • Trenches should be safeguarded against the collapse of sidewalls by means of support plates against the walls which in turn is mounted with support arms. The support plates / panels should be adjustable to accommodate trenches of various depths. • Subsurface services should be designed and constructed so that they are located sufficiently far from buildings that their backfilled trenches do not interfere with the foundations of other structures. • Trenches must be built with slopes that allow fauna that fall in to escape. • A search and rescue plan should be developed for fauna which fall into construction trenches, ideally these should be filled. • Twice daily inspection of the trench should be undertaken by the ECO to remove any trapped animals (Helme, 2021).
Ablution facilities	• Suitable toilet and wash facilities must be provided to avoid the use of sensitive areas for these activities (Snaddon, 2021). These service areas must be maintained, and toilets emptied on at least a weekly basis (Snaddon, 2021). • Toilet and washing facilities must be located a minimum of 50m from the ecological buffers depicted in Figure 11. • Washing, whether of the person or of personal effects, and acts of excretion and urination are strictly prohibited other than at the facilities provided. • The Contractor shall provide suitable sanitary arrangements at the Contractor's Camp and approved points around the designated work area to allow easy access to all employees on site. • No staff members are permitted to commence with work on a site without suitable toilet facilities available for them.

	• One chemical toilet is to be provided on site for every 15 contract personnel at each working area. These toilets must have doors and locks and shall be secured to the ground to prevent them blowing over. Toilet paper shall always be provided. • Toilets are to be emptied as and when required and always prior to builders' holidays. • The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from site. • Discharge of waste from toilets into the environment and burial of waste is strictly prohibited. • The Contractor shall maintain the toilets in a clean, neat, and hygienic condition. If the Contractor fails to provide and/or maintain all site sanitation facilities in a clean and hygienic condition, the Project Manager may order the Contractor to suspend any or all work on the site until these requirements are met. No payment shall be made for any delays or disruption of the works caused thereby nor shall extensions of time be granted for such delays.
Eating Areas	• The Contractor shall designate eating areas to the approval of the Project Manager which shall be clearly demarcated. Enough tamper- and wind- proof bins shall be present in this area. • The Contractor shall erect and maintain information posters for the information of their employees depicting actions to be taken to ensure compliance with aspects of the Specifications. Such posters shall be erected at the eating areas and any other locations specified by the Project Manager.
Drinking Water	• The Contractor shall ensure that drinking water is available for all staff on site. If no potable water source is available on site, then the Contractor shall import drinking water to the site.
Working Hours	• Working hours must be restricted to normal daily working hours considered in the construction regulations and the National Building Standards SANS 10400:1990. • If works are to take place outside of normal working hours, the ECO and the Project Manager are to be notified and disturbance to the surrounding land users is to be prevented. • Note that legislation requires the Contractor to obtain approval for carrying out works at night. This entails obtaining signatures from everyone within a 150 m radius of a site. Furthermore, the Project Manager will, where required, notify the Relevant Authority of work done outside of normal working hours.

ISSUE	MANAGEMENT / MITIGATION MEASURES
INCIDENT MANAGEMENT Management Statement and objective: To guide the way in which emergencies and/or environmental incidents are handled on site and remediate any damage appropriately. To prevent the starting of fires on site. Impact Management Outcomes: No non-conformances and no adverse impacts on the environment as a result of emergency situations and/or environmental incidents. No fires started on the site. Swift response to incidents.	
General	• Method Statements are required for the management of fire incidents as well as for accidental leaks and spills.
Prevention of fires	• No fires shall be permitted on site. Notices are to be prominently displayed that no fires are allowed. Any fires that occur, shall be reported to the Project Manager immediately. • Burning is not permitted as a waste disposal method. • Smoking shall only be permitted in designated smoking areas, depicted by the appropriate signage. Such areas shall not be located close to fire hazards. Notices are to be prominently displayed prohibiting smoking in areas that are deemed fire hazards. Such areas shall include the workshop and fuel storage areas and any areas where the vegetation or other material is such as to make liable the rapid spread of an initial flame. • The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until they can no longer control it. • A fire evacuation route is always to be clearly demarcated and kept clear of obstruction. The Contractor shall ensure that their employees are aware of the procedure to be followed in the event of a fire. • The Contractor shall appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedure to be followed. The Contractor shall forward the name of the Fire Officer to the Project Manager for their approval seven days prior to the date of the environmental awareness training course. • The Contractor shall supply all site offices, kitchen areas, workshop areas, materials, stores, and any other areas identified by the ECO with tested and approved firefighting equipment. Firefighting equipment is to be maintained in good working order. • Welding, gas cutting or cutting of metal will only be permitted within specifically designated and adequately marked areas on the site. These sites are to be approved by the ECO. • All flammable material is to be stored in a suitable lockable storage area and combustible materials may not accumulate on site.

	• Symbolic safety signs depicting "No Smoking", "No Naked Lights" and "Danger" are to be provided and are to conform to the requirement of SABS 1186. The volume capacity of any fuel tanks shall be displayed. The product contained within the tank shall be clearly identified; using the emergency information system detailed in SABS 0232 part 1. • Any electrical or petrol-driven pump shall be equipped and positioned, so as not to cause any danger of ignition of the product. • In the event of a fire emergency: o The site supervisor or worker should sound the fire alarm; o The site supervisor or worker should notify the Stellenbosch Fire Department (021 808 8888); o All workers on site should go to the designated emergency assembly point; o The Fire Officer shall do a head count of all workers and ensure all personnel are present; and o When the Fire Brigade arrives, the Fire Officer shall provide them with all the information they require regarding the incident.
Accidental Leaks and Spillages	• <u>In the event of a significant spill or leak of hazardous substances (e.g. petrol, diesel, etc.) used during the proposed activities, such an incident(s) must be reported to the relevant authorities, including the DEA&DPs Pollution & Chemicals Management Directorate, in accordance with section 30 of the NEMA.</u> • The Contractor shall ensure that their employees are aware of the procedure to be followed for dealing with spills and leaks, which shall include notifying the Project Manager and the relevant authorities. • Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the Project Manager and ECO. • The site shall have a suitable number of spill kits available. A spill kit (with the supply of absorbent material) shall be readily available at works areas to absorb any emergency hydrocarbon spills, and where possible be designed to encapsulate minor hydrocarbon spillage. There are several products on the market, which are designed and suitable as absorbents and encapsulators of hydrocarbons. The following are examples of those products used to contain incidental spillage: - Spill-Sorb – oil and chemical absorbent and encapsulating products - Drizzat Pads - Enretech Powder – absorbent and encapsulator - Peat moss
	• Treatment and remediation of spill areas shall be undertaken to the satisfaction of the ECO. In the event of a spill: - The source of the spillage shall be isolated. - The Contractor shall contain the spillage using sand berms, sandbags, pre-made booms, and sawdust or other absorbent materials. - Cordon off and ensure safety of the spillage area.

	- Notify the Project Manager, ECO, and the Pollution Control Inspectorate (if serious spillage has occurred in a sensitive environment). - The ECO (in consultation with the Pollution Control Inspectorate where necessary) shall determine the need for further remedial actions. - All cleared materials will be treated as hazardous waste and disposed of as such, in accordance with the waste management specifications of this EMPr.

ISSUE	MANAGEMENT / MITIGATION MEASURES
RESOURCE USE (RAW MATERIALS AND RESOURCES) Management Statement and objective: To prevent excessive and unnecessary use of natural resources and wasting of natural resources during the construction phase. Impact Management Outcomes: Development of an attitude towards a reduction in natural resources consumption where feasible and possible	
Water Use	• Conduct activities in accordance with any water restrictions set by the local Municipality in terms of the applicable By-Law which may be in place at the time. • At the time of writing this document, the Western Cape is on the tail-end of a severe drought. With that in mind, Contractors are encouraged to use treated effluent water for construction activities as far as possible. Contractors may approach the Municipality for the use of treated effluent water. • The use of drinking water for non-structural work such as dust control, is prohibited. • As far as possible, limit the use of potable water to activities which require them. • It is suggested that a temporary storage tank for rainwater be set up at the construction camp, which could collect rainwater during the construction phase for use in the works. This would, however, only apply if construction takes place during the winter months (i.e., June to August). • Dripping taps/ leaking pipes should be addressed immediately to limit waste of water.

ISSUE	MANAGEMENT / MITIGATION MEASURES
RESOURCE USE (RAW MATERIALS AND RESOURCES) Management Statement and objective: To prevent excessive and unnecessary use of natural resources and wasting of natural resources during the construction phase. Impact Management Outcomes: Development of an attitude towards a reduction in natural resources consumption where feasible and possible	
Energy/Fuel Use	• Plant should not be left running while not in use.
Construction Materials	• Make use of locally supplied building materials where possible. • Reclaimed building materials should be used where possible. • In accordance with the integrated waste management approach to be followed through the construction phases of the development, materials used or generated by construction or the construction areas of other Boschendal projects nearby shall be re-used as far as possible. • No materials containing invasive plant seeds, litter or contaminants may be imported. The Supplier shall be informed of the sites of origin of imported gravel, sand, stone, etc. and shall have the authority to reject imported material if deemed necessary. • Durable building materials to increase the lifespan of the developments should be used. • Low VOC paints & building materials should be used. • Adequate storage facilities for raw materials should be provided in order to minimise damage during construction works. • Where possible, suppliers with a green footprint or certification are to be used.

ISSUE	MANAGEMENT / MITIGATION MEASURES
SITE CLEANUP AND REHABILITATION Management Statement and objective: To prevent impacts on the environment as a result of the conclusion of construction activities and any related impacts requiring rehabilitation actions prior to the contractors leaving the site. Impact Management Outcomes: Provision of a development whereby all construction-related materials are no longer evident and rehabilitation of all disturbed areas, both on and off-site.	
Site clean-up and rehabilitation	• Note that the tree hoarding can only be removed on the instruction of the landscape architect (Terra+, 2020). • All natural areas that are to remain untransformed but that are impacted by the dumping of materials must be ripped and re-planted after construction is complete, to the satisfaction of the Environmental Control Officer (ECO) (Snaddon,

	2021, Jackson et al, 2019). • All topsoil and sand brought onto the site should be inspected for seedlings throughout construction. Seedlings must be removed regularly (Snaddon, 2021). Snaddon (2021) notes that it is a challenge to ensure that the disturbance of soils and use of imported topsoil does not lead to the spread and establishment of alien plants, adding that it is likely that some will avoid detection and only constant monitoring and removal will solve this problem. • Where alien species, particularly kikuyu grass, are removed, these must be replaced by indigenous species of similar growth form (Snaddon, 2021). • Any vegetation affected beyond site boundaries should be appropriately rehabilitated, with inputs from the ECO, a botanist or landscape architect, to ensure that it is done to acceptable levels. • Once construction is complete, the fynbos component of the landscaping plan area should be fully planted. • Any waste material should be removed from the site during and after construction works is complete. • After construction, any areas within the maintenance footprint that have been degraded from their condition prior to construction and as a result of the construction activities must be restored to their former condition. • The Contractor shall ensure that all temporary structures, equipment, materials, waste, and facilities used for construction purposes are removed upon completion of the project. • The site clean-up shall be to the satisfaction of the Project Manager and the ECO. • Where appropriate, the Contractor shall employ a suitably qualified person to rehabilitate areas damaged by construction activities during the project. • All construction scars are to be rehabilitated immediately after construction is complete. This is especially true for all activities related to the supply of infrastructure, some of which may be outside the development area. • The Contractor shall be responsible for rehabilitating areas identified by the ECO and the Project Manager. • The Contractor's procedure for rehabilitation shall be approved by the ECO and the Project Manager and where required, the Local Authority environmental representative. • No fencing or loose rope should be left on site.
Rehabilitation Plan for Stream 10 and Wetlands	The plan detailed below is duplicated from Section 8 of the Freshwater Impact Assessment Report compiled in support of the Basic Assessment Process. • The proposed river rehabilitation plan must be implemented, during the dry season (Snaddon, 2021). • A Freshwater ecologist must annually check/monitor the head-cut and bank incision until all rehabilitation and flood management interventions are built (pers comms, K Snaddon, 11/06/2021). The impacts on the watercourses and (less so) the wetlands that are on and close to the New Retreat site can be mitigated

by the implementation of a rehabilitation plan specifically for Stream 10 (as it lies on the property), the creation of a riverine corridor along its course and for the wetlands on and around the site. The sections that follow describe the principles behind the rehabilitation and the details of a proposed rehabilitation plan.

1.1 Principles of ecological rehabilitation

- Rehabilitation is the reinstatement or improvement in the effectiveness of the driving forces that created and continue to shape and sustain the ecosystem (Kotze *et al.*, 2009; Russell, 2009);
- The goal of rehabilitation should not be to return an ecosystem to and maintain it in a static state at some time in the past, but rather to aim to achieve a dynamic and resilient system that can respond to change and that is largely self-maintaining, requiring little human intervention over time;
- Rehabilitation should be integrated with the surrounding landscape in order to address the upstream and downstream causes of degradation;
- If a rehabilitation programme is to be effective and sustainable, there must be ownership of the project by the landowner or land-user, and their commitment to sustaining the integrity of the system must be demonstrated, and
- Rehabilitation should be well-planned with clearly stated and measurable objectives, effectively implemented, and must be continually monitored and evaluated.

1.2 Aims of ecological rehabilitation of Stream 10

The "driving forces" for the watercourse mentioned under the "Principles of Ecological Rehabilitation" above include the following:

- Flow regime - The timing, duration, and temporal sequencing of floods, baseflows (low flows), and the general movement of water into, through and out of the stream corridor exert a strong influence over the flora and fauna living in it, and over the physical and chemical characteristics of the ecosystem.

  There is minimal opportunity for returning the flow of Stream 10 to a more natural regime. The flow regime has been considerably altered by the diversion channel and the presence of large storage dams upstream of the development site. This will not be the focus of rehabilitation.
- Bed and bank stability - The distribution of sediment within the river, as well as the types of substrate are important determinants of bank and bed stability. Unnatural erosion and deposition will lead to a change in the morphology of the river channel, and the way in which water flows along the channel. This can have knock-on effects downstream. Exotic trees can change the physical properties of the substrate in the stream channel and on the banks, leading to erosion of the bed and banks, and sedimentation within the channel downstream.

  There is an in-channel head-cut at contour 203.5m, and the banks of the stream are steeply incised from this point

	downstream towards the Dwars River. The flow regime (patterns and quantities of flow, and flow velocities) has been altered by the diversion channel and the dams upstream, possibly leading to unnaturally high and sudden discharges in the stream. This increase in stream power that comes with an increase in flow velocity will lead to further gully and head-cut erosion (e.g., Day *et al.*, 2016). It is possible that the historical berm alongside Stream 10 has over time caused concentration of flows in the stream, when these should be spread out over a wider area and into the Dwars River floodplain. **The rehabilitation plan proposes interventions that aim to stabilise the channel and the banks without impacting further on the characteristics of the stream and avoiding flooding of property and roads.** • Water quality - This is a major driver of biological responses within all aquatic ecosystems. **It is expected that stabilisation of the bed and banks of the watercourse, and the introduction of a mix of instream and riparian plants to further stabilise the system and improve biodiversity, will have a positive impact on water chemistry.** • Biota and biological processes – The fauna and flora inhabiting the river channel have adapted to the current conditions over time. In addition, the biota themselves influence the above drivers – for instance, riparian vegetation is extremely important for stabilisation of the riverbanks, controlling nutrients and providing habitat and for providing a buffer between the river and the surrounding development and agriculture. Riparian areas are particularly prone to invasion by alien invasive plant species, due to the ready availability of water. **This rehabilitation plan proposes the removal of all kikuyu and other exotic plant species within the stream corridor, and re-planting with indigenous shrubs and trees. This will favour the return of more stream flora and fauna to this section of river.** **1.3 Ecological Rehabilitation and Management Actions** ***1.3.1 Bed (head-cut) stabilisation*** • A head-cut is located at contour 203.5 m (Figure 19 and Figure 20). • The ideal longitudinal slope to prevent erosion along a river channel is 1:7 (roughly 14%). Currently the short steep section of channel that is of concern downstream of the head-cut (contour 203.5 m to 198.5 m – a stretch of roughly 12 m) has a

gradient of 39%. The steep gradient of the bed may lead to the head-cut advancing upstream.

Figure 19 Head-cut in channel of Stream 10 (source: Snaddon, 2021)

- It is recommended that a small weir be constructed at the site of the head-cut, tied into the banks, followed by a steep but stepped waterfall structure and a short section of armouring on the base of the channel downstream of the "waterfall" to prevent down-cutting. A Method Statement must be prepared for any works within the river channel and submitted to the ECO for approval.

1.3.2 Bank (lateral) stabilisation

- Ideally, bank slopes should be around 1:3 (roughly 33%; Russell, 2009) to 1:4. There is a short section of river where both banks (left and right) are approximately 60% (see Figure 20). The bank material is rocky (sandstone cobble and soil) and difficult to shape. Removing sufficient fill to shape the banks to an acceptable gradient would require significant earthworks. This is not recommended.

- Banks should be stabilised, however, possibly using gabion structures.
- **All mature indigenous trees must be kept in place.**

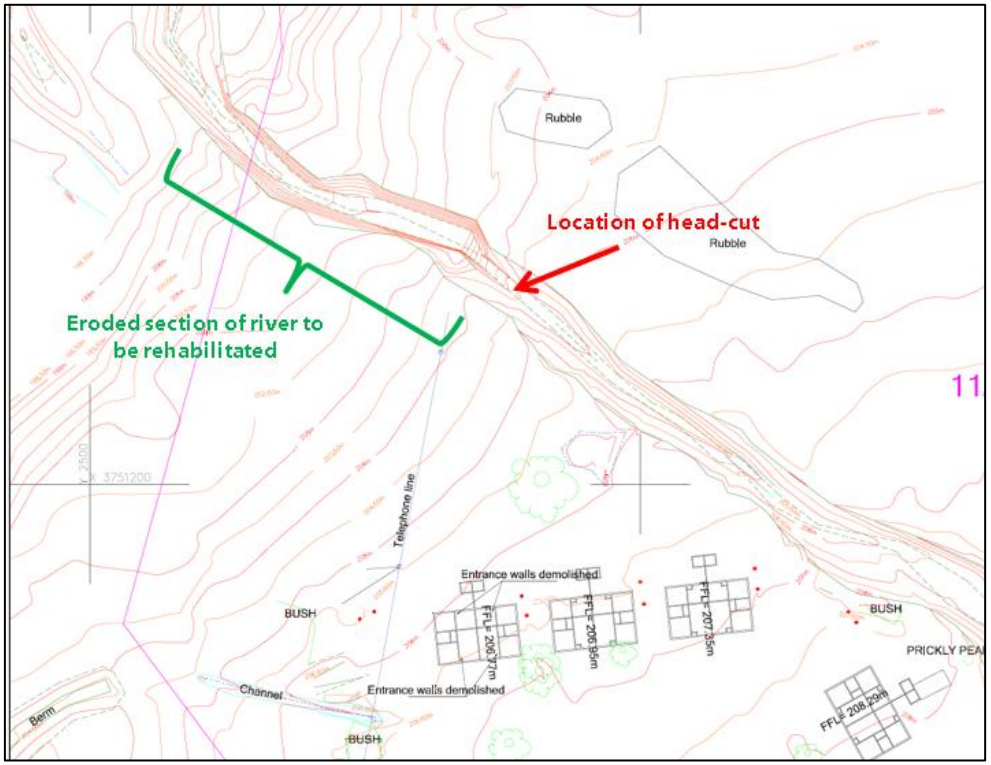


Figure 20 Extract from survey drawing for the New Retreat (FBV, Feb 2021) showing location of eroded section of river to be rehabilitated

Figure 21 Steep right-hand bank downstream of the head-cut (source: Snaddon, 2021)

- The proposal presented by MH & A engineers for a stepped gabion weir structure will achieve stabilisation of the channel and head-cut. This proposes the construction of a series of gabion weirs along the stretch of river below the head-cut (Figure 22). The upper weir will flood the head-cut in order to stabilise this section of channel.

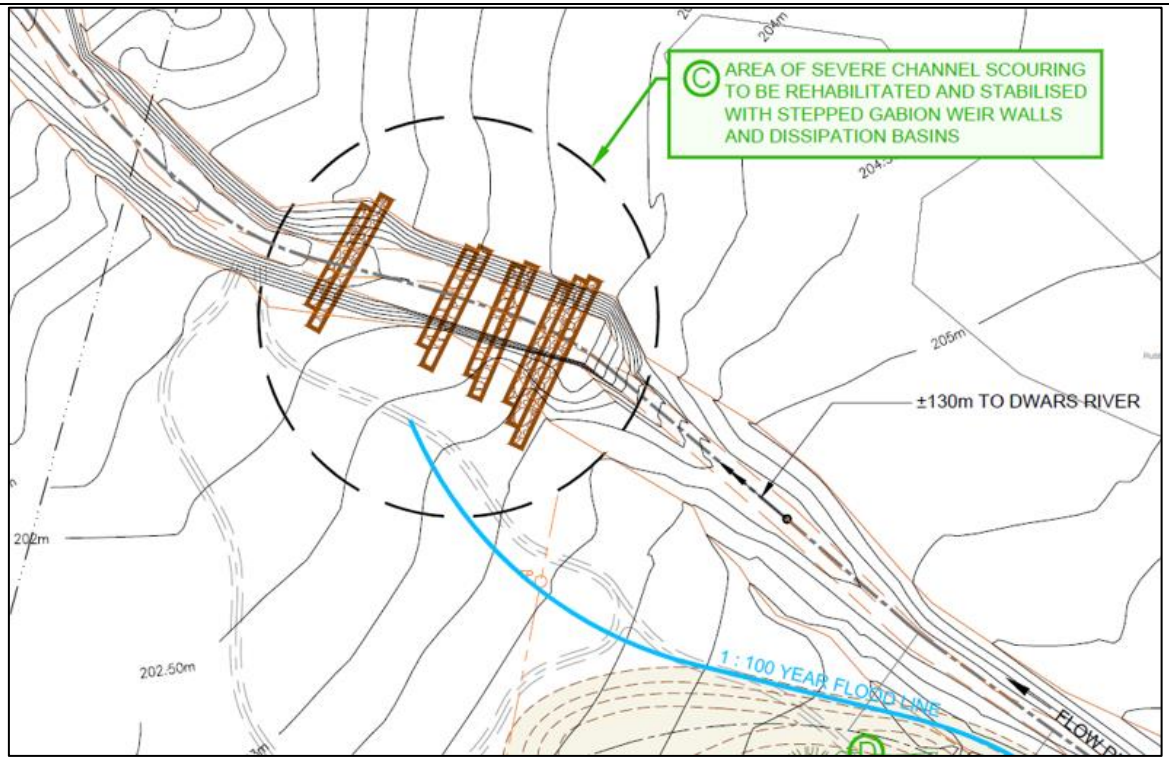


Figure 22 Proposed series of gabion weirs to stabilise the area of scour in Stream 10 (source: Snaddon, 2021)

- There must be no dredging of the river channel, removal of indigenous plants or removal of sediment or rock, without the approval of a freshwater ecologist.
- Rock for the gabions cannot be taken from any of the streams on Boschendal Estate.
- Work in the river channel must be undertaken during the dry months of the year. The shape and topography of the channel and banks mean that flow diversion will not be possible. A Method Statement must be prepared for works within the river channel and submitted to the ECO for approval.
- Other stabilisation measures can be used elsewhere on the site, in order to prevent erosion in and around planted areas. Stabilisation materials include:

- Ecologs (dry woody material or sand contained in a hessian and chicken wire roll – (see Figure 24);
- Biodegradable netting/matting;
- Geotextile matting of thick filaments designed to be secured over a vulnerable slope to prevent surface erosion (see Figure 24);
- Mulch stabilisation, or
- Compost stabilisation.

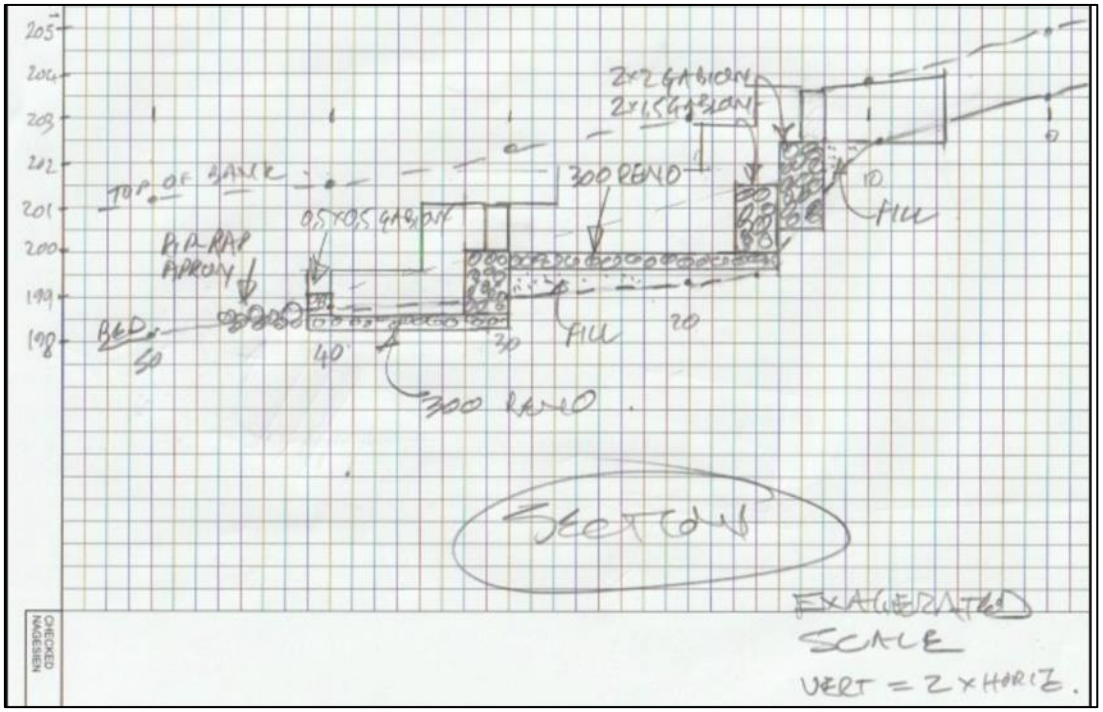


Figure 23 Cross-section through gabion weirs (MH&A). Scale is exaggerated – vertical scale is equal to twice the horizontal (source: Snaddon, 2021)

Figure 24(Left) Ecologs used to stabilise the banks of a stream; (Below) Geotextile stabilisation of a slope (source: Snaddon, 2021)

1.3.3 Removal of invasive alien plant species

All invasive alien plants (IAPs) must be removed entirely from the stream 10 corridor, and also along the water supply pipeline route, up to a distance of 20 m from the trench, as recommended by the botanist (Helme, 2021). This includes the highly invasive Kikuyu grass (*Pennisetum clandestinum*). The following guidelines must be applied for grass removal:

- Herbicide can be used, but it is recommended that Focus Ultra be used instead of a glyphosate-based herbicide

	such as Roundup. • Ensure herbicide application is done only during the dry season. After spraying with Focus Ultra, grasses tend to change colour within 1 – 3 weeks, and a follow-up application can focus on grasses not killed by the first application; • Ensure safe use of herbicide (Pest Control Operator supervision, personal protective equipment, standard health, and safety requirements); • After die-back of the grass, the plant can be removed by hand, ensuring that all runners are removed; • Allow for spot-spraying of re-sprouting grass in isolated areas; After removal of the Kikuyu, the bare soil must be re-planted as soon as possible with indigenous plant species. Herbicide must be applied to all freshly-cut tree stumps to prevent resprouting. ***1.3.4 Re-planting of rehabilitated areas*** Areas that have been impacted by construction within the wetlands, streams or their buffers must be re-planted with indigenous plant species. The graphic and table below (refer to Figure 25) provide some guidance for planting, which should be used in conjunction with guidelines provided by the botanist and landscape architects

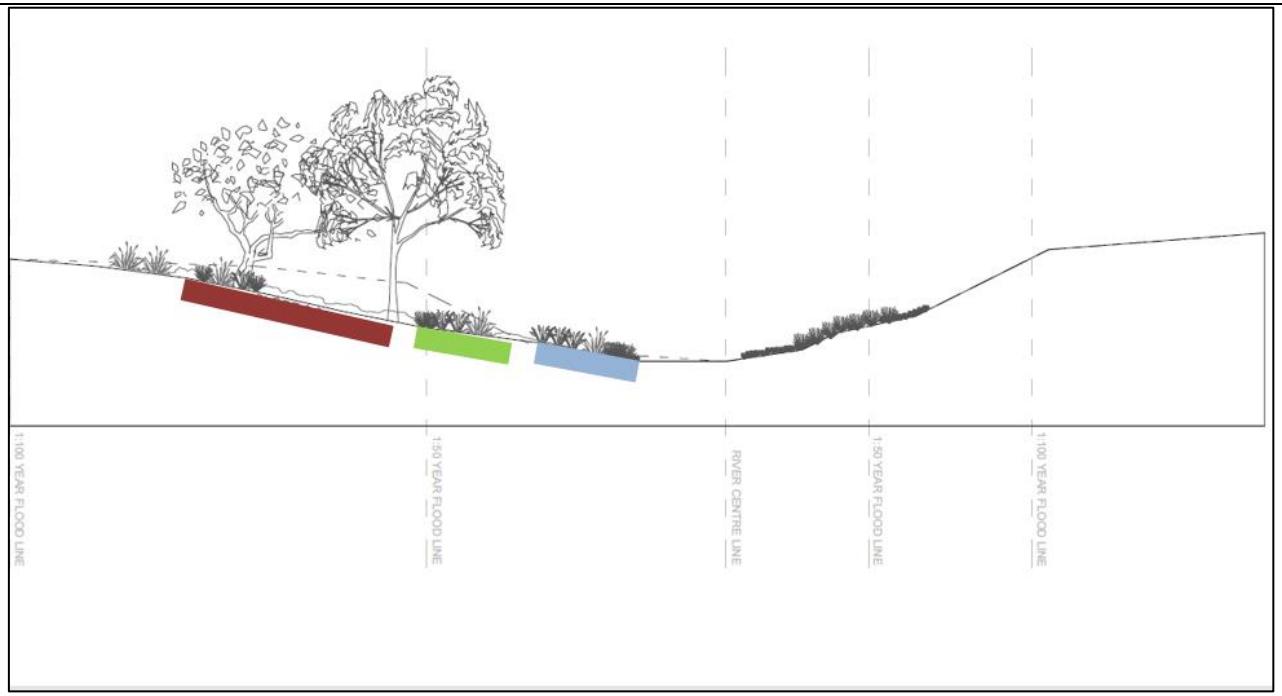


Figure 25 Planting Guidance, to be read with Table 4 (source: Snaddon, 2021)

Appropriate species for the three zones are indicated in Table 4.

Table 4 Planting for Rehabilitation Zones, to be read with Figure 25 (source: Snaddon, 2021)

Zone 1 – river margin (sedges and rushes)	Zone 2 – transitional zone (sedges, restios, rushes and shrubs)	Zone 3 – dry bank (shrubs and trees)
Juncus effusus (rush)	*Juncus effusus* (rush)	*Brabejum stellatifolium* (wild almond)

Juncus kraussii (rush)	*Cliffortia graminea*	*Maytenus oleoides* (kershoud)
Ficinia nodosa (clubrush)	*Cliffortia ferruginea*	*Metrosideros angustifolius (smalblaar)*
Ficinia brevifolia	*Restio spp. (restios)*	*Kiggelaria africana (wild peach)*
Fuirena coerulescens	*Meterosideros angustifolia*	*Brachylaena neriifolia*
Juncus lomatophyllus		*Cliffortia graminea*
		Cliffortia ferruginea
		Olea europea subsp. africana
		Searsia angustifolia
		Kiggelaria africana
		Searsia lancea
		Capeochloa cincta

1.4 Rehabilitation of wetlands

The two wetlands located on and close to the site – the Dwars River valley-bottom wetland, and the New Retreat seep – may be negatively impacted by some of the landscaping proposals. The significance of these impacts has been assessed as being **low negative**, assuming that mitigation measures are implemented. These include:

- Any areas of soil within the wetlands and their buffers that may have been compacted through dumping or storage of building materials must be ripped and replanted, and checked for invasion by IAP seedlings;
- Where the wetlands or their buffers encroach onto the New Retreat site, these areas must be cleared of IAPs,

	including kikuyu grass. See Section 1.3.3 above for guidelines for IAP removal; • Cleared areas must be replanted with locally indigenous plant species. Appropriate species can be chosen from the Zone 1 and Zone 2 species advised in Figure 25 and Table 4 above. **1.5 Timing of implementation** The rehabilitation plan for Stream 10 must commence once the flood protection measures proposed for the watercourse have been constructed. Implementation of the river rehabilitation plan can proceed in a phased manner. Rehabilitation of wetlands and their buffers must be implemented once the landscaping of affected areas has been completed, and should be completed in one phase, with a follow-up maintenance phase to follow planting. **1.6 Monitoring** Implementation of this rehabilitation plan must be monitored by a suitably qualified freshwater ecologist during, and on completion of the rehabilitation activities. The ecologist must check the following: • Hard engineering interventions are built to specifications; • The head-cut and bank incision have not advanced further compared with the current situation; • All IAPs have been removed from the Stream 10 corridor, wetlands, and their buffers, and along the water supply pipeline, up to 20 m from the trench; • The bed and banks that have been impacted by the felling of trees and removal of alien grasses must be in good condition, and not eroding or bare; • Areas within the streams, wetlands and buffers that have been impacted by construction and rehabilitation activities have been re-planted. It is the responsibility of the landowner to ensure that this monitoring visit takes place timeously, i.e., upon completion of each phase of rehabilitation. It is the responsibility of the ecologist to provide a short report (in the form of a letter) regarding the implementation of this rehabilitation plan. The report must be submitted to the case officer at Department of Water and Sanitation, Bellville. • <u>A Freshwater ecologist must annually check/monitor the head-cut and bank incision until all rehabilitation and flood management interventions are built (pers comms, K Snaddon, 11/06/2021)</u>

3.4 PENALTIES AND BONUSES

Where the Developer fails to ensure that the Project Manager and Contractor are not provided with this EMPr or where an ECO is not appointed prior to commencement of construction works, a fine of R50, 000.00 (excl. VAT) should be imposed and the Environmental Authorisation should be suspended or revoked (this would be at the discretion of the DEA&DP) until such time as the situation has been rectified to the satisfaction of the DEA&DP. Furthermore, a retrospective audit of the construction activities should be carried out against the specifications of the EMPr by an independent, suitably qualified ECO at the expense of the Developer. The retrospective audit should also suggest fines in line with those recommended in the EMPr for any non-compliances and should be provided to the Stellenbosch Municipality and DEA&DP for comment.

This penalty is to be paid to a local environmental non-profit, as approved by the ECO and authorities.

Where the Contractor inflicts damage upon the environment or fails to comply with any of the Environmental Specifications contained within this EMPr, they shall be liable to pay a penalty for breach of the conditions of the Environmental Specifications which form part of the works contract.

The Contractor is deemed NOT to have complied with these Environmental Specifications if:

- There is evidence of contravention of the Environmental Specifications within the boundaries of the site, site extensions and haul/ access roads;
- Environmental damage ensues due to negligence;
- The Contractor fails to comply with corrective or other instructions issued by the Project Manager within a specific time; or
- The Contractor fails to respond adequately to complaints from the public.

Penalties shall be issued per incident and per individual for the Contractor's responsibility. The amount of the penalty shall be determined by the ECO, in consultation with the Project Manager. The Project Manager shall inform the Contractor of the contravention and they shall notify the consulting quantity surveyor to deduct such a penalty from monies due under the Contract prior to the issuing of the monthly payment certificates.

Payment of any penalties in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

The following penalties (not an exclusive list) shall be issued in addition to any remedial costs incurred as a result of non-compliance with the Environmental Specifications and shall be imposed by the Project Manager on the Contractor for contraventions of the Environmental Specifications by individuals or operators employed by the Contractor and/or their sub-contractors. Where there are ranges, the amount shall depend on the severity and extent of the damage done to the environment, as indicated in the table below:

OFFENCE	PENALTY
Contractor's Environmental Officer fails to complete and provide ECO with weekly environmental checklist	R1,000 per week not submitted, with 50% added to each subsequent transgression
A Contractor fails to inform the ECO immediately of events that may cause serious environmental damage or breach the requirements of the EMPr	R 500
The Contractor fails to produce Method Statements on identified aspects of the project prior to commencement of that aspect	R 1,000 per Method Statement
The Contractor's Environmental Site File is incomplete/non-existent	R 500
The Contractor fails to keep activities within the site boundaries	R 1,000
Dust and/or erosion occurs because of lack of appropriate implementation of mitigation measures	R 200
Green waste is not disposed of at an approved waste site or composting facility	R400
Trespassing of people into no-go areas	R 500
Trespassing of machinery or equipment into no-go areas	R 500 – R 2 000
Delivery drivers are off-loading without supervision	R 300
Loads for transporting are unsecured or uncovered	R 500
Temporary storage of fuel used for construction purposes is not within specifications	R 100- R1,000
Fuel is dispensed with the incorrect equipment	R 400
Individuals are smoking in the vicinity of the fuel stores	R 200
Appropriate safety signs (e.g., Danger) are not displayed	R 200
There is a lack of firefighting equipment at the fuel stores	R 500
The storage areas fail to comply with standard fire safety regulations	R 200
Inadequate supply of material to absorb / breakdown and encapsulate minor hydrocarbon spillage	R 1,000- R2,000
An integrated waste management system is not established	R 100- R1000
Waste is buried as a means of disposal	R 1000- R3000
There is evidence of littering	R 100 per item
Appropriate scavenger and weatherproof bins are not supplied	R 1,000- R1,500
Bins are overflowing	R 400 per bin
Refuse is not removed or disposed of at an approved site	R 100-R1000
Empty cement bags are not removed from the construction area and placed under cover or discarded in the hazardous waste stream	R 1,000- R2,500
Hazardous waste is not stored in an enclosed area	R 1000
Hazardous waste is not disposed of at a hazardous waste disposal facility	R 500 – R1000
Rubble is not appropriately stored in a skip or central stockpile	R 500
Materials that do not constitute clean building rubble are stored at the stockpiling site	R 200
An individual makes use of areas other than the designated facilities for ablutions	R 200
Latrine facilities and first-aid services are not in a sanitary condition	R 500
Insufficient provision of toilets	R 1000
Toilet waste (sewage) is discharged or buried in the environment	R 1000 – R2000
Potential pollutants are not stored safely away to prevent pollution of ground or surface water	R 500

Washing of vehicles or cement chutes occurs on site	R 800
Hazardous chemical substances are not stored in secondary containers	R 800- R2000
Paint products, chemical additives or cleaners are being disposed of on site	R 200 – R 1500
Adequate sheds/ dry containers for the storage of materials are not provided	R 500
Maintenance of plant occurs on site when only emergency maintenance is permitted	R 200
Emergency maintenance is performed without efforts to prevent contamination of the surrounding environment	R 100 – R1500
Individuals fail to repair leaking equipment immediately	R 100 per item
Drip trays are not provided in construction areas under all relevant plant/equipment	R 100 – R500 per absent drip tray
Effective silencing devices are not in use to reduce noise impacts	R 50
Amplified music is heard on site	R 50
Failure to provide environmental awareness training to all site personnel	R 500 per staff member/ worker
Necessary Information posters (procedures for ensuring compliance) are not displayed	R 500
Lighting of fires occurs on site	R 200 – R 10 000
Smoking occurs outside of designated areas	R 20 – R 50
Unnecessary spillage of cement due to inadequate prevention measures, or haphazard working procedures	R 500 – R 1 500
Spillage of cement products are not rectified to the satisfaction of the ECO	R 50 – R 1000
Cement is not stored in a suitable weatherproof location	R 1000
Polluted runoff is reaching groundwater/stormwater	R 200 – R 3 000
Screening and suitable containment is not in place /constructed in the concrete batching area	R 100 – R 500
Hydrocarbon spills are not isolated, contained, cleared, and rehabilitated	R 100 – R 2 000
Appropriate safety precautions are not implemented	R 20 – R 1 000
Unauthorised firearms are present on site	R 1 000
Personnel other than security staff are living on site	R 1 000
Individuals are swimming or washing (clothes, equipment etc.) in the stream and dams near the site	R 500- R1000
Animals are being trapped, poisoned, shot, or harmed	R 1,000 – R 5,000
Erosion or sedimentation caused by construction is not rectified	R 400 – R 2 000
The ECO is not notified of heritage or archaeological remains found	R 1 000
Trenching is conducted without the specified environmental specifications	R 1000
Failure to avoid stormwater impacts through the adequate protection of stormwater inlets	R 100 per inlet
Unapproved materials are used for landscaping (e.g., invasive plant seeds)	R 50 – R 2000
All elements of the site are not removed during clean-up for closure	R 100 – R 3000
A specialist is not employed for rehabilitation where necessary and previously advised by the ECO	R 500- R2000
The site not demarcated as required	R 300- R3000
Water wastage	R 100 – R 1000
Method statements not appropriately and/or fully implemented	R 500 – R 1,000 per Method Statement
Speed limit on site not adhered to	R 100

Note that for each subsequent similar offence, the penalty shall be doubled in value to a maximum value of R 10 000.00.

The following penalties are suggested for transgression where damage has been done to the environment:

a	Erosion	A penalty equivalent in value to the cost of rehabilitation plus 20%
b	Oil Spills	A penalty equivalent in value to the cost of clean-up operation plus 20%
c	Damage to sensitive environments	A penalty equivalent in value to the cost of restoration plus 20%
d	Damage to archaeological finds	A penalty to a maximum of R 100 000 shall be paid for any damage to any archaeological sites/finds

All monies collected through penalties shall be held an environmental fund by the Developer and be accounted for. A summary page is to be included with the monthly payment certificates as a record of penalties issued to date. A portion of these funds may be used for token monetary bonuses to individual site staff members that have shown exceptional diligence in applying good environmental practice on the site. The remaining funds shall be allocated for the purposes of contributing to environmental education efforts in the local community e.g., for environmental books for the library, posters, excursions or trees for local schools or environmental resource material for the local public library. The Developer, in consultation with the ECO, Project Manager and possibly the local authority, will make a final decision regarding the precise allocation of all penalty funds. Documentation accounting for all penalty funds obtained and how these funds were utilized shall be copied to the Stellenbosch Municipality's Environmental Resources Management Unit and D: EA&DP, together with the environmental closure documentation on completion of the project.

3.5 MEASUREMENT AND PAYMENT

3.5.1 Basic Principles

No separate measurement and payment will be made to cover the costs of complying with the provisions of these Environmental Specifications except in the case of the points noted below and as scheduled items. Such costs shall be deemed to be covered by the rates tendered for the items in the Schedule of Quantities completed by the Contractor when submitting their tender.

Some of the important cost items have been listed below to assist the Contractor in making provision for implementation of the Environmental Specifications. This list is by no means exhaustive and should only be used as a guideline.

a. **Protection of stockpiles from blowing or washing away:** The spraying or covering of stockpiles, including the supply of the spray or cover material, as required.

b. **Trench shielding / protection:** Including all required support structures and resources required.

c. **Storage of fuel and oils:** The supply, construction, installation, transport, upkeep, and removal of all facilities required for storage and management of fuel and oils.

d. **Cement-laden water management:** The supply, construction, installation, transport, upkeep, and removal of all facilities required for the management of wastewater from concrete operations.

e. **Contaminated water management:** The supply, construction, installation, transport, upkeep, and removal of all facilities required for managing contaminated water.

f. **Stormwater and flood management:** The supply, construction, installation, transport, upkeep, and removal of all facilities required for managing storm water run-off from the site and protection of works from flooding.

g. **Bunding and management of run-off from workshop areas and supply of drip trays for stationary and "parked" plant:** The supply, construction, installation, transport, upkeep, and removal of all facilities required for bunding and managing the run-off from workshop areas as well as all drip trays required.

h. **Prevention of harm to animals:** The supply and installation of drift fences and safe animal passages.

i. **Dust management:** The supply, application, transport, upkeep, and removal of all materials required to ensure that dust is adequately controlled.

j. **Solid waste management:** The supply, application, transport, upkeep, and removal of all materials required to ensure that solid waste is adequately controlled (including a waste sorting and recycling program).

k. **Fire control:** The supply, transport, upkeep, and removal of all material required for fire control.

l. **Eating areas:** The supply, construction, installation, transport, upkeep, and removal at the end of the construction of all eating areas structures.

m. **Ablutions:** The supply, maintenance, regular emptying, and removal of toilets.

n. **Site demarcation:** The supply, installation, and removal at the end of the construction of all temporary fences.

3.5.2 Scheduled items

(a) Provision of venue and staff attendance at the environmental awareness training course

The provision of a venue and attendance at the environmental training course will be measured as a lump sum.

The sum shall cover all costs incurred by the Contractor in providing the venue and facilities and in ensuring the attendance of all relevant employees and sub-contractors, at the training.

(b) Method Statements: additional work

No separate measurement and payment will be made for the provision of Method Statements but, where the Project Manager requires a change on the basis of their opinion that the proposal may result in or carries a greater than warranted risk of damage to the environment in excess of that warranted by the Environmental Specifications, then any

additional work required, provided it could not reasonably have been foreseen by an experienced Contractor, shall be valued accordingly.

3.6 EXISTING RIGHTS ALTERNATIVE- RECOMMENDED ENVIRONMENTAL SPECIFICATIONS

The impact assessment process provided the impacts with- and without- mitigation measures for the existing rights alternative (refer to Table 2). Therefore, mitigation measures for the existing land use rights alternative have been included in this report as suggested practice and to provide an indication of the type of actions which would serve to reduce any potential negative impacts.

Note, however, that the mitigation measures would not be monitored or controlled by any external parties (such as would be the obligation in terms of an Environmental Authorisation).

Recommended mitigation measures pertain to the possibility of dust nuisance and include the following:

- Land clearing and planting should be phased as far as possible such that land is not left open and unplanted for long periods of time.
- All Local Authority Bylaws as well as the National Dust Control Regulations, Notice R.827 of 2013 must be adhered to.
- The Developer shall take all reasonable measures to minimize any dust nuisance and inconvenience to or interference with the public (or others) as a result of the execution of the works.
- During windy and dry conditions, dust suppression methods must be employed. NOTE: The use of potable water for dust suppression is not permitted when water restrictions are in place and discouraged even when water restrictions are not in place.
- Stockpiles of materials as well as the loads on all trucks transporting any material that could lead to dust pollution should be covered with a tarpaulin or similar cover to minimise dust / windblown sand.
- In extreme cases, a dust suppression product (e.g., dustex) should be used. The product used must receive prior approval from a freshwater/aquatic specialist.
- Excavation, handling, and transport of erodible materials shall be avoided under high wind conditions or when a visible dust plume is present.
- The Developer shall be responsible for any clean-ups resulting from the failure by employees or suppliers to properly secure transported materials.
- The Developer shall take preventative measures, such as screening, dust control, timing, and pre-notification of affected parties to minimise complaints regarding dust.

Recommended measures pertaining to use of natural resources:

- Conduct activities in accordance with any water restrictions set by the local Municipality in terms of the applicable By-Law which may be in place at the time.
- At the time of writing this document, the Western Cape has recently emerged from a severe drought. With that in mind, Contractors are encouraged to use treated effluent water for construction activities as far as possible. Contractors may approach the Municipality for the use of treated effluent water.

- The use of drinking water for non-structural work such as dust control, is prohibited.
- As far as possible, limit the use of potable water to activities which require them.
- It is suggested that a temporary storage tank for rainwater be set up at the construction camp, which could collect rainwater during the construction phase for use in the works. This would, however, only apply if construction takes place during the winter months (i.e., June to August).
- Plant should not be left running while not in use.
- Make use of locally supplied building materials where possible.
- Reclaimed building materials should be used where possible.
- In accordance with the integrated waste management approach to be followed through the construction phases of the development, materials used or generated by construction or the construction areas of other Boschendal projects nearby shall be re-used as far as possible.
- No materials containing invasive plant seeds, litter or contaminants may be imported. The Supplier shall be informed of the sites of origin of imported gravel, sand, stone, etc. and shall have the authority to reject imported material if deemed necessary.
- Durable building materials to increase the lifespan of the developments should be used.
- Low VOC paints & building materials should be used.
- Adequate storage facilities for raw materials should be provided in order to minimise damage during construction works.
- Where possible, suppliers with a green footprint or certification are to be used.
- Dripping taps/ leaking pipes should be addressed immediately to limit waste of water.

Recommended measures pertaining to heritage:

- Retain examples of the Amfarm cottage types in largely unaltered form to illustrate and inform about this period of Boschendal's history
- Retention of examples of all categories of built form enhance the authenticity of the cultural landscape as a layered expression of the farm's past

Recommended measures pertaining to protection of the freshwater ecosystem:

- Runoff from agricultural lands should discharge into filtration areas some distance from the stream and wetlands, to allow for infiltration to ground- applicable to no-go alternatives only (Snaddon, 2021).
- Ensure that all building materials and rubble are stored at least 50 m away from the edge of the wetlands and stream channel, as demarcated prior to construction. Storage areas should be bunded adequately to prevent contaminated runoff from entering the aquatic ecosystems.
- Materials should be stored in piles that do not exceed 1.5 m in height and should be protected from the wind (such as using shade-cloth), to prevent spread of fine materials across the site.
- All natural areas that are to remain untransformed but that are impacted by the dumping of materials must be ripped and re-planted after construction is complete, to the satisfaction of the Environmental Control Officer (ECO).
- Rehabilitate impacted sensitive areas.

- Construction/demolition activities that must take place within the aquatic ecosystems or the ecological buffers must be done in the dry season, to reduce the risks of contamination of the aquatic ecosystems through rainfall and runoff.
- No mixing of concrete may occur close to (less than 50 m) the wetlands or stream.
- Machinery prone to oil or fuel leakage must be located at least 50 m away from the edge of the wetlands and stream, and the area adequately bunded in order to contain leakages.
- Water pumps and cement mixers shall have drip trays to contain oil and fuel leaks – these must be cleaned regularly.
- Suitable toilet and wash facilities must be provided to avoid the use of sensitive areas for these activities. These service areas must be maintained, and toilets emptied on at least a weekly basis.
- Pathways and access roads for construction or demolition must avoid the stream and wetlands.
- Sensitive areas, such as the boundaries of the wetlands and the active channel of the stream, must be clearly demarcated and fenced off (using temporary fencing and danger tape) before any work or site preparation begins. These are no-go areas during the construction or demolition process.
- If lights are used, these must be directed away from all sensitive areas. Lighting should face away from the wetlands, and stream
- Inspect all soil and fill brought onto site and remove all seedlings. Site must be inspected at least weekly for alien and invasive seedlings, and these removed and destroyed.
- Visitors should be discouraged from walking on the bed and banks of the stream, and into the wetter areas, through construction of walkways and benches, guiding visitors to use specific pathways and areas- applicable to all alternatives (Snaddon, 2021).
- **No-go Alternative 2 only:** A search and rescue of important or sensitive plants should be completed before construction occurs in sensitive areas.
- **No-go Alternative 2 only:** Full-grown riparian tree species must not be disturbed or damaged.
- **No-go Alternative 2 only:** Where alien species, particularly kikuyu grass, are removed, these must be replaced by indigenous species of similar growth form.
- **No-go Alternative 2 only:** These disturbed areas must be checked regularly for alien and invasive seedlings.
- **No-go Alternative 2 only:** Special care should be taken around storm and heavy rain events. The construction site should be inspected for erosion damage at these times.
- **No-go Alternative 2 only:** If construction areas are to be de-watered (e.g., after rains), this water must first be pumped into a settlement area or portable tank / pool, and not directly into the wetlands or stream.
- **No-go Alternative 2 only:** Constant monitoring of the construction site by the Site Engineer and ECO must occur.
- **No-go Alternative 2 only:** Runoff from agricultural lands should discharge into filtration areas some distance from the stream and wetlands, to allow for infiltration to ground.
- **No-go Alternative 1 only:** Downpipes from renovated buildings to discharge to filtration areas.

4. OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN

4.1 SCOPE, RESPONSIBILITY AND AUDITING

The environmental specifications contained in this section address the requirements for controlling the environmental impacts resulting from operational activities. Given the nature of the proposed development, the impact assessment process found that operational impacts of the proposed development are anticipated to be limited, or indeed positive.

Much of the adverse impacts would be mitigated through the design and development phase, therefore the operational phase would merely have to run its course within the scope described in this report.

The responsibility of the implementation of the Operational EMPr lies with the Applicant, namely Boschendal (Pty) Ltd. The provincial environmental authorities may at any given time conduct site visits to audit compliance with these specifications.

Due to the limited nature of operational activities and associated impacts, as well as the fact that mitigation for the adverse operational impacts would be implemented (and therefore audited) during the design and development phase, independent compliance auditing by an environmental professional is not warranted during this stage, however this is at the DEA&DP's discretion.

It is further noteworthy that the listed activities triggered by the proposed development would occur within the development (i.e., construction phase).

It is advised that a single operational audit be conducted by a suitably qualified, independent professional six to nine months following commencement of the operational phase in order to ensure that the proposal remains developed as planned and also to ensure that the fynbos component of the landscaping has established and that the stormwater and sewage system are operating appropriately. The audit report should be submitted to the DEA&DP, and this could serve to inform their requirements for any potential future operational audits.

4.2 OPERATIONAL SPECIFICATIONS:

The environmental specifications pertaining to the operational phase are based on the anticipated impacts for this phase which were assessed in the Basic Assessment process (refer to Table 2), all of which would essentially be mitigated in the design phase. The consideration of such measures in the operational phase is related to the implementation thereof.

Specifications specific to the operation include are included in accordance with the anticipated impacts as tabled in Table 2.

PROTECTION OF ECOLOGICAL RESOURCES
Management Statement and objective: To prevent loss and damage to ecological resources (i.e., indigenous vegetation, wetlands, stream, and riparian zone) on site Impact Management Outcomes: Continued existence of flourishing fynbos components of the landscaped area and continued health of the stream, riparian zone, and the wetlands in close proximity to the site
• Refer to Appendix 6 for appropriate tree pruning techniques. • All sewage storage facilities must be regularly checked for leaks and overflow. (all alternatives) (Snaddon, 2021). • The recommended buffer for Stream 10 at the site (above the dam) and stream 11 is 15m for the Operational Phase, noting that any existing infrastructure within these buffers can remain in place (Snaddon, 2021). • The recommended ecological buffer for the New Retreat seep, the Dwars River valley-bottom wetland, the seep associated with stream 11 and the York Dam seep wetland is 15m for the Operational Phase, noting that any existing infrastructure within these buffers can remain in place (Snaddon, 2021). • Ensure that the proposed development is developed as per the intention and design philosophy as described in this report. • Implementation and compliance to the Landscape Management Plan for the project. • Ensure that the fynbos rehabilitation component remains established and healthy and free of non-indigenous vegetation. • Treated wastewater should preferably be recycled back into the toilet system, thus creating essentially a closed system (Snaddon, 2021). • Treated wastewater can also be used for irrigation of landscaped areas, but should be directed towards road verges, rather than the margins of the stream or the wetlands (Snaddon, 2021). • Lighting should face away from the wetlands, and stream – applicable to all alternatives (Snaddon, 2021). • Visitors should be discouraged from walking on the bed and banks of the stream, and into the wetter areas, through construction of walkways and benches, guiding visitors to use specific pathways and areas- applicable to all development alternatives (Snaddon, 2021). • In order to increase the flow of water in the rivers, an invasive alien plant management plan should be implemented to remove and manage alien invasive plant in the riparian zones and drainage lines (Jackson *et al*, 2019). • Landscaping requiring ongoing maintenance around the units must be kept to a minimum, especially within the ecological buffers. Gardens should rather be natural areas, where the locally indigenous vegetation is allowed to grow- applicable to all development alternatives (Snaddon, 2021). • No kikuyu grass is allowed anywhere on site (Snaddon, 2021). • The spread of alien plant species into all natural areas must be prevented and monitored (Snaddon, 2021). Applicable to all alternatives.

- Road verges must be monitored for alien species, especially grasses (Snaddon, 2021). Applicable to all alternatives.
- Prevent livestock from trampling the riverbank and damaging natural riparian vegetation (Jackson *et al*, 2019).

FAUNAL PASSAGE THROUGH THE SITE AND SAFETY ON THE SITE

Management Statement and objective: To encourage faunal movement through site as far as possible

Impact Management Outcomes: No harm or disturbance to fauna on site

- Ensure that the proposed development is developed as per the intention and design philosophy as described in this report.
- Ensure that the perimeter of the site remains unfenced.
- Residents, staff, and visitors must not be allowed to trap animals on site.
- Prevent employees/guests from killing snakes through environmental training and awareness.
- Prevent employees/guests from hunting reptiles, amphibians, mammals and birds through environmental awareness and training.
- Educate staff and guests around which snakes are venomous/non-venomous and differentiate between defensive and aggressive behaviour (refer to Figure 18).
- Posters of venomous and non-venomous snakes should be used, and selected staff members should be trained in snake handling to remove snakes safely from site. Employees/guests must not kill snakes.
- Any dead amphibians and reptiles found on site should be preserved and donated to the University of Stellenbosch (Jackson *et al*, 2019).
- Local communities should be made aware of the threats of displaced animals (by development disturbance) especially venomous snakes and pest species (Jackson *et al*, 2019). This is particularly true for any community groups who may make use of the site.
- All domestic pets (dogs and cats) must be sterilised and all domestic cats must wear a collar with a bell (Jackson *et al*, 2019).
- Speed restrictions for all project vehicles (40km/h is recommended) should be in place to reduce the impact of faunal road mortalities on project roads (Jackson et al, 2019).
- Do not poison any faunal species (Jackson et al, 2019).

EMPLOYMENT EQUITY

Management Statement and objective: To provide opportunities for local previously disadvantaged individuals

Impact Management Outcomes: Employment to go to local and previously disadvantaged groups, as far as possible

- Labour to be sought from local communities (i.e., Kylemore, Pniel, Lanquedoc, etc.) as far as possible, particularly for unskilled labour
- Beyond local communities, labour should be sourced from the greater Stellenbosch/Cape Town area as far as possible, particularly regarding skilled labour

VISUAL/AESTHETICS PRESERVATION
Management Statement and objective: To prevent degradation of visual appearance of the site over time. Impact Management Outcomes: No reduction in aesthetic appearance over time.
• Ensure that the proposed development is developed as per the intention and design philosophy as described in this report. • Ensure regular maintenance of structures and landscaped areas.

RESOURCE USE MANAGEMENT PLAN - WATER
Management Statement and objective: To facilitate the efficient use of water resources on the site. Impact Management Outcomes: No water wastage.
• Dry clean-up measures (use of brooms, vacuums, etc.) must be standard practice and should be undertaken before resorting to water–based cleaning. If required, ensure that the minimum amount of water is used in cleaning tasks. • Compile a checklist of equipment / fittings / sanitary ware that uses water and conduct monthly leak detection inspections. • Repair dripping faucets and any water leaks immediately upon detection. • Employees must be encouraged to report leaks and be trained on the importance of water efficiency. • Gardens and landscaped areas should be watered before 10h00 and after 16h00. Watering of gardens and landscaped areas should occur a maximum of four times per week. • Implement timed irrigation. • Water restrictions as imposed from time to time by the local authority By-Laws must be adhered to. • A water awareness programme should, where possible, be implemented within the development (e.g., notifications in rest rooms to use water sparingly). It is noted that this approach is implemented throughout Boschendal's other tourism facilities.

RESOURCE USE MANAGEMENT PLAN – ELECTRICITY (ENERGY CONSERVATION PLAN)
Management Statement and objective: To facilitate the efficient use of electricity on the site, specifically in relation to housekeeping activities. Impact Management Outcomes: No wastage of electricity/energy
• All electrical equipment must be maintained in a good working condition. • All light fittings must be energy efficient (e.g., low voltage, or compact fluorescent lights). • The facility must keep up with new technologies / industry standards that exist for energy efficiency in terms of pumping of fuel. • Should the applicant consider the installation and operation of a generator, the noise aspect should be considered and appropriately mitigated regarding the operation of a generator.

Noise generated on site from all the proposed activities must comply with the Western Cape Noise Control Regulations Provincial Notice 200/2013.

- Stormwater maintenance activities are best done during the dry season.

SOLID WASTE MANAGEMENT PLAN

Management Statement and objective: To prevent pollution associated with the generation and temporary storage of general waste, hazardous waste and litter generated by the workforce on site.

Impact Management Outcomes: No non-conformances and no pollution of soil, groundwater and/or stormwater as a result of waste generation and management activities.

- General waste generated during the operational phase will comprise typical domestic waste generated by administrative and housekeeping operations as well as waste associated with convenience stores and take-away food outlets, such as paper, lunch wrappers, packaging material etc. The hazardous waste will comprise of empty oil cans / tins, oily rags, spent fluorescent tubes, etc.
- An integrated waste management system must be implemented, and this must be underpinned by the following waste management hierarchy:

- Waste from the facility is to be incorporated into the existing waste management system for the Boschendal Farm.
- All general waste material (e.g., non-hazardous waste) should be contained in lined general waste bins.
- Any hazardous waste will be stored in separate lined waste bins. The bins would be marked as hazardous and flammable.
- Note that hazardous waste volumes are not to exceed 20kg per day.
- Although it is not anticipated that any waste temporarily stored on site (as no waste would permanently be held on site) would exceed 80 m^3, if it does, then the National Norms and Standards for the storage of Waste in terms of Government Notice (GN) No. 926 of 29 November 2013 would apply and the applicant would be required to register the facility on, and subsequently continue to update, the Department's Integrated Pollutant and Waste Information System.

- Waste storage and sorting areas must be enclosed such that the activity is contained within the allocated footprint area.
- Windblown litter from the waste storage and sorting areas must be monitored and removed from adjacent properties daily.
- The handling of waste must take place on a hardened surface.

4.3 MONITORING AND AUDITING

Monitoring and auditing of the operational phase would be up to the discretion of the DEA&DP, given that the operational phase would be relatively benign. However, it is recommended that a single audit be conducted by an independent professional six months from commencement of operation of the proposed development in order to determine whether the impacts have been successfully mitigated. A report detailing the findings thereof should be provided to the DEA&DP, upon receipt of which, the DEA&DP would indicate the need and frequency for future operational audits.

4.4 EXISTING RIGHTS ALTERNATIVE- RECOMMENDED ENVIRONMENTAL SPECIFICATIONS

The impact assessment process provided the impacts with- and without- mitigation measures for the existing rights alternative (refer to Table 2). Therefore, mitigation measures for the existing land use rights alternative have been included in this report as suggested practice and to provide an indication of the type of actions which would serve to reduce any potential negative impacts.

Note, however, that the mitigation measures would not be monitored or controlled by any external parties (such as would be the obligation in terms of an Environmental Authorisation).

Recommended mitigation measures for dust and resource-use include the following:

- Cover areas between crop rows with mulch, wood chips, or similar material to prevent windblown dust and to retain soil moisture.
- Time field work to coincide with conditions that are not too windy.
- Cover loads carrying compost during transit.
- Use non-potable water (where possible and depending on the quality of water required for the crops) to suppress dust during high wind conditions.
- Employ timed irrigation and attempt to irrigate outside peak heat midday times, particularly during the summer months.
- Ensure as full a load as possible when transporting materials/resources to and from the site in order to minimise on the number of trips required.

Recommended measures for consideration of fauna include the following:

- Any fencing required for domestic, or game animals must be wildlife permeable, at least at strategic places such as along drainage lines or other areas of dense vegetation. This allows for small and medium sized animals to move between their

natural habitat unencumbered. If electrified strands are to be use, there are to be no strands within 30 cm of the ground. As an example, if a tortoise touches this strand it automatically retreats into its shell and does not move because it senses danger, and the repeated shocks eventually kill it (Arnot & Moteno, 2017 in Jackson et al, 2019).

- Prevent livestock from trampling the riverbank and damaging natural riparian vegetation (Jackson et al, 2019).
- Where possible protect habitats such as rocky outcrops, riverine areas and wetlands which provides roosting, breeding and foraging sites and shelter many small faunal species (Jackson et al, 2019).
- Residents, staff, and visitors must not be allowed to trap animals on site.
- Prevent employees/guests from killing snakes through environmental training and awareness.
- Prevent employees/guests from hunting reptiles, amphibians, mammals and birds through environmental awareness and training.
- Educate staff and guests around which snakes are venomous/non-venomous and differentiate between defensive and aggressive behaviour (refer to Figure 18).
- Posters of venomous and non-venomous snakes should be used, and selected staff members should be trained in snake handling to remove snakes safely from site. Employees/guests must not kill snakes.
- Any dead amphibians and reptiles found on site should be preserved and donated to the University of Stellenbosch.

Recommended heritage mitigation measures include the following:

- Retain examples of the Amfarm cottage types in largely unaltered form to illustrate and inform about this period of Boschendal's history
- Retention of examples of all categories of built form enhance the authenticity of the cultural landscape as a layered expression of the farm's past

Recommended measures for consideration of aquatic biodiversity/ freshwater resources include the following:

- Lighting should face away from the wetlands, and stream- applicable to all alternatives (Snaddon, 2021).
- Visitors should be discouraged from walking on the bed and banks of the stream, and into the wetter areas, through construction of walkways and benches, guiding visitors to use specific pathways and areas- applicable to all development alternatives (Snaddon, 2021).
- Landscaping requiring ongoing maintenance around the units must be kept to a minimum, especially within the ecological buffers. Gardens should rather be natural areas, where the locally indigenous vegetation is allowed to grow- applicable to all development alternatives.
- No kikuyu grass is allowed anywhere on site. - applicable to all development alternatives.

- The spread of alien plant species into all natural areas must be prevented and monitored. Applicable to all alternatives.
- Road verges must be monitored for alien species, especially grasses. Applicable to all alternatives.
- **No-go Alternative 1 only**: Downpipes from renovated buildings to discharge to filtration areas.
- **No-go Alternative 2 only**: Runoff from agricultural lands should discharge into filtration areas some distance from the stream and wetlands, to allow for infiltration to ground.

5. MAINTENANCE MANAGEMENT PLAN

5.1 BACKGROUND

During the public review of the pre-application draft Basic Assessment Report, the DEA&DP advised of the need to include an MMP in the application, therefore a MMP has been incorporated into the EMPr for approval in terms of the NEMA and EIA Regulations, 2014 (as amended) as it pertains to watercourses on site i.e., Stream 10 and the components of the New Retreat Seep and Dwars river wetlands and their associated ecological buffers which are located within the limits of the site as per Figure 26 and as depicted in the Site Plan and Landscape Plan in Figure 2 and Figure 8 respectively.

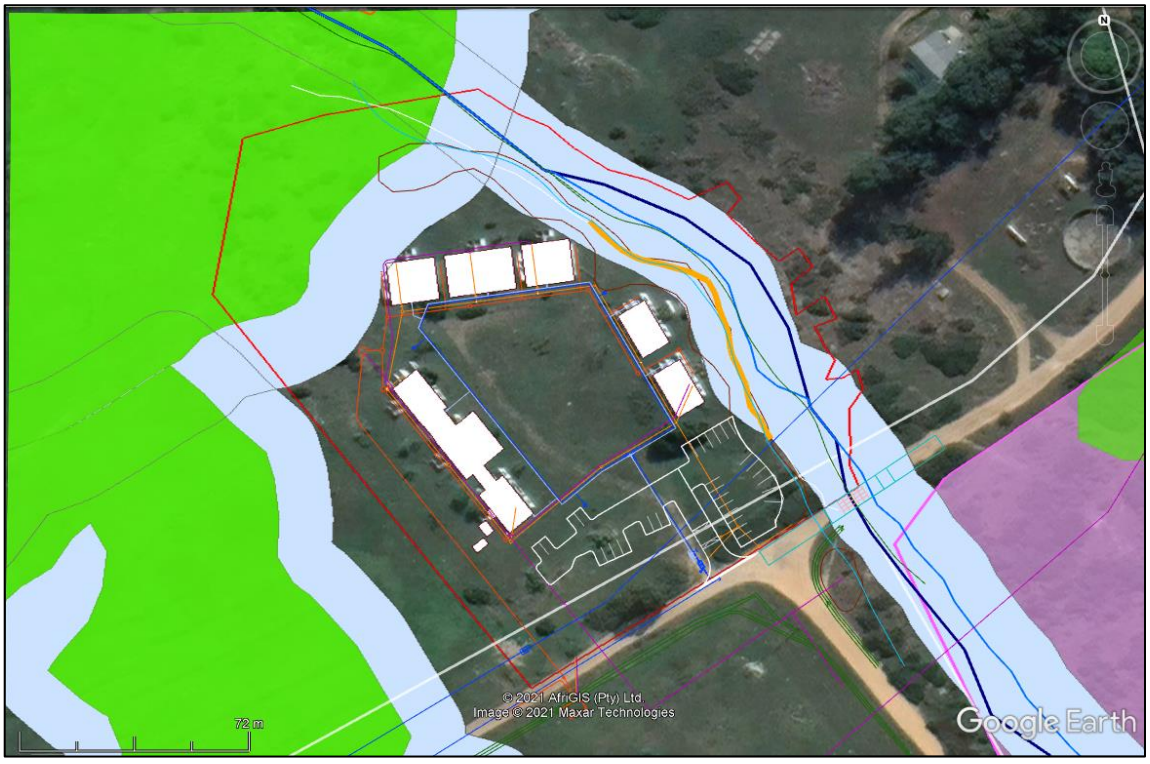


Figure 26 Watercourses (wetland indicated in green, stream in navy) and buffers (light blue polygons) within site limits, for MMP (created by EAP using Google Earth Pro and layers from MH&A and Snaddon, 2021, 11/06/2021)

The recommended buffer for Stream 10 at the site is 21 m for the Construction Phase (Snaddon, 2021). The recommended ecological buffer for the New Retreat seep, Dwars River valley-bottom wetland and York Dam wetland seep is 17 m for the Construction Phase (Snaddon, 2021).

The recommended buffer for Stream 10 at the site (above the dam) is 15 m for the Operational Phase, noting that any existing infrastructure within these buffers can remain in place (Snaddon, 2021). The recommended ecological buffer for the New Retreat seep, the Dwars River valley-bottom wetland and the York Dam wetland seep is 15 m for the

Operational Phase, noting that any existing infrastructure within these buffers can remain in place (Snaddon, 2021).

The form which formally requests that the Competent Authority adopt an MMP for a watercourse in terms of the NEMA, EIA Regulations, 2014 (as amended) is included in Appendix 9 (it has also been appended to the Application Form).

It should be noted that the DWS has indicated that the proposed development can be undertaken in terms of a General Authorisation for Section 21 (c) and 21(i) of the NWA, and they have requested the rehabilitation plan for the stream and wetlands. The freshwater impact assessment report and associated Risk Assessment Matrix indicated in Appendix 10 has also been provided to the DWS as part of the General Authorisation registration.

Note also that the MMP has been compiled by Marielle Penwarden of Chand Environmental Consultants (as indicated in the document control sheet) with a CV included in Appendix 8, with review and input from Kate Snaddon of Freshwater Consulting Group.

Further note that the MMP was updated following the public review period of the post-application Draft BAR, EMPr and MMP to include future maintenance related work only and to exclude construction work related to new or expanded structures or infrastructure beyond the existing footprint which would be implemented as part of construction and rehabilitation works. Such activities must be guided by the environmental specifications and Method Statements contained in the Construction EMPr.

5.2 IMPLEMENTATION

The holder of the Environmental Authorisation must be responsible for the implementation of the MMP, unless another party formally acknowledges the roles and responsibilities therein. If a change in holder of the Environmental Authorisation or responsibilities for the MMP is needed, written notification thereof which includes a letter signed by the new party responsible, acknowledging their understanding of the requirements and the MMP attached, must be provided to the DEA&DP and DWS.

The MMP may be implemented through contracts/ appointments of appropriate professionals where this expertise is not available in-house, although checks can be executed and documented internally, with works to be done internally or externally, as far as expertise allows for this.

5.3 OVERARCHING PRINCIPLES

The following are overarching principles to be used by landowners and managers when considering the development and implementation of this MMP:

a. The anticipation and prevention of negative impacts and risks, then minimisation, rehabilitation, or 'repair', where a sequence of possible mitigation measures to avoid, minimize, rehabilitate and/or remedy negative impacts is explicitly considered;
b. Avoid and reduce unnecessary maintenance;
c. Maintenance and management of a watercourse must be informed by the condition of the physical and ecological processes that drive and maintain aquatic ecosystems within a catchment, relative to the desired state of the affected system;
d. Management actions must aim to prevent further deterioration to the condition of affected watercourses and, overall, be guided by a general commitment to improving and maintaining ecological infrastructure for the delivery of ecosystem services;
e. Managers and organs of state must identify, address and, where feasible, eliminate the factors that necessitate intrusive, environmentally damaging maintenance; and
f. A process of continuous management improvement be applied, namely Planning; Implementing; Checking (monitoring, auditing, determine corrective action) and Acting (management review).

5.4 DETERMINING THE NEED FOR AN MMP

The following information indicates the need for an MMP and aligns with the necessary requirements indicated in the Department's information document for drafting an MMP.

	Question	**If the answer to any of the questions is YES, then a MMP may be applicable.**
2.1	Is there a watercourse on or adjacent to the property?	Yes
2.2	Has there been a history of flood damage or vandalism to the existing infrastructure or watercourse – erosion and/or sedimentation?	Not that the EAP is aware of
2.3	Is there infrastructure or any community at risk of being damaged by flooding?	Yes, but this is for a 1:100 year flood event and no community would be affected, only the proposed development
2.4	Is the design of infrastructure considered inadequate in terms of managing the risk of flooding, erosion and/or sedimentation?	The current infrastructure is inadequate; however, the proposed flood management measures are considered adequate to contain a 1:100 year flood (Obree, 2021)
2.5	Would you consider an improved design to existing infrastructure to reduce maintenance needs?	Yes, this would contain the 1:100 year flood to the stream 10
2.6	Are there specific incidences where the watercourse is obstructed, or blockages occur that alter the flow of the river during floods?	Yes, during high rain/flood events, the overtopping of the dam to the east of the site contributes to flooding. The Hoof Road crosses over the

		watercourse at the upstream corner of the development site (Obree, 2021). Twin box culverts of approximately 1.5m x 1.5m are provided at this crossing (Obree, 2021). These box culverts restrict flow, causing a build-up of water on the upstream side (Obree, 2021). Flows is excess of about 8m^3/s will result in overtopping of the road on either side of the culvert, since the level of the road has been raised at this point (Obree, 2021). Due to the topography of the area on either side of the crossing, excess flows (that do not pass through the culverts) will move overland in an uncontrolled manner, with some of this water passing through the site of the proposed development (Obree, 2021).
2.7	Is there an existing obstruction in the watercourse that has changed the flow of the river under normal conditions?	No, only for flows in excess of about 8m^3/second
2.8	Is there a marked increase in the rate of erosion/sedimentation being experienced which threatens operations and assets?	No
2.9	Is there a presence of alien or bush encroachment vegetation within the watercourse and/or the presence of woody debris after flooding?	Yes, to a degree

5.5 MAINTENANCE REQUIREMENTS

The maintenance requirement for stream 10 and the associated wetlands on site (note only within the New Retreat site, not along the potable water line to Lanquedoc) fall under the categories indicated in Table 5, and the associated timing of these is also indicated.

Table 5 Maintenance Category and Requirements for the Proposed Development and Operation of the New Retreat

Maintenance Category	Types of maintenance activities (examples only)	Timing of maintenance activities

Category A: Sediment removal as a result of deposition or sediment deposition as a result of erosion	Clearing sediment from culverts and the associated drift. After these are constructed as part of the proposed development and after heavy rainfall events. See **MS01**.	Construction phase If there is sediment during construction, this must be cleared at the time of construction of new culverts and drift. Ongoing-operational phase implementation After heavy rain events (such as a 1:100 year flood), or as needed. To check and note at least annually, after winter.
Category B: Emergency repairs – urgent action required to manage risk and damage to assets	• Maintenance of berms, culverts, drift and other flood protection and rehabilitation measures (e.g. gabions, bank stabilisation, etc.) for stream 10 as described in the project description in section 1.2 and the rehabilitation plan in sections 1.2.3 and 3.3. See **MS05**.	Operational phase These structures must be checked, and their state recorded after high-rain events (such as a 1:100 year flood), otherwise annually, in spring. Maintenance must be undertaken as needed, per issues identified in the annual check.
Category C: Managing alien invasive and bush encroachment plant species	Removal of invasive alien plant species, as well as potentially obstructive indigenous species/encroachment (specifically, and only, in instances where vegetation is blocking culverts), to reduce maintenance requirements as they relate to erosion and sedimentation and to improve hydrological flow and reduce associated flooding impacts. This must be removed from the stream 10 corridor	Construction-phase timing For Stream 10, this must commence once the flood protection measures proposed for the watercourse have been constructed (Snaddon, 2021). Implementation of

	and from wetlands and associated ecological buffers within site limits. See **MS02**.	the river rehabilitation plan can proceed in a phased manner (Snaddon, 2021). Regarding the wetlands and their buffers, this must be implemented once the landscaping of affected areas has been completed, and should be completed in one phase, with a follow-up maintenance phase to follow planting (Snaddon, 2021). Operational phase timing Annual clearing from stream, wetlands, and associated buffers
Category D: Rehabilitation and restoration activities for maintaining ecological infrastructure	• Snaddon (2021) confirms other stabilisation measures can be used elsewhere on the site, in order to prevent erosion in and around planted areas. Stabilisation materials include: o Ecologs (dry woody material or sand contained in a hessian and chicken wire roll; o Biodegradable netting/matting; o Geotextile matting of thick filaments designed to be secured over a vulnerable slope to prevent surface erosion; o Mulch stabilisation, or o Compost stabilisation	Construction Phase- The rehabilitation plan for Stream 10 must commence once the flood protection measures proposed for the watercourse have been constructed. Implementation of the river rehabilitation plan can proceed in a phased manner- as per requirements in rehabilitation plan

	See **MS03**.	indicated in section 1.3.2 in section 3.3. Operation Phase- after heavy rain events or as needed.
	• Replanting/rehabilitation of stream 10 corridor and wetlands and associated buffers on site- Areas that have been impacted by construction within the wetlands, streams or their buffers must be re-planted with indigenous plant species (Snaddon, 2021). Refer to Figure 25 and Table 4 for further guidance. Planting must also be as per the final approved landscape plan (the draft is indicated in Figure 8). See **MS04**.	Construction phase - This must be undertaken at the time the landscaping plan is implemented, following clearing of invasive alien plants. Operational phase - This must be undertaken as needed- i.e., when plants are removed (for whatever reason), they must be replaced with indigenous species as per the landscape plan
	• Maintenance of structures within the wetlands and their ecological buffers. Given that some hard landscaping (like the amphitheatre and pathways/boardwalks) would occur within these areas, there would be a need for some maintenance (although not likely to be frequent). See **MS06**.	Operational phase These structures must be checked, and their state recorded annually, in spring. Maintenance must be undertaken as needed, per issues identified in the annual check.

Method Statements for each of the activities indicated in Table 5 are provided in section 5.6 below.

5.6 METHOD STATEMENTS

The Method Statements indicated below are aligned with the following considerations:

- Watercourses experience a natural process of sedimentation and erosion, with varying rates depending on the geomorphology and the integrity of the land-uses within the catchment; *The surrounding land-uses for the site and the catchment context have been considered in the freshwater impact assessment, and the recommendation of associated mitigation measures, which are included in this document.*
- Manipulation of the watercourse results in increased erosion and/or deposition being experienced further downstream, perpetuating greater need for manipulation and more drastic and costly maintenance interventions; *The rehabilitation measures provided by the freshwater ecologist in the independent assessment have considered the downstream and cumulative impacts and the rehabilitation indicated takes account of this.*
- Locally indigenous riparian and wetland vegetation assists in the stabilization of riverbanks through effective root structures, while contributing to improve in-stream habitat and water quality conditions; *This is understood and would be implemented in the rehabilitation plan, and landscape plan, both of which recommend indigenous vegetation planting.*
- Invasive alien and bush encroachment vegetation significantly impacts on the functioning of a watercourse, often leading to increased flood associated damage, with further implications and a reduction in water quality and availability; *This is understood and would be implemented in the rehabilitation plan, and landscape plan, both of which recommend indigenous vegetation planting. It would also be considered in the rehabilitation plan in terms of the requirement for regular removal of invasive alien plants.*
- Persons undertaking maintenance activities have a responsibility to ensure a sense of duty of care is applied as prescribed within NEMA Section 28(1). *This is a guiding principle in the compilation of the EMPr and MMP, wherein measures have been included to protect the environment.*

Note that all Method Statements apply to the proposed New Retreat Project, located indicated in Figure 1 and as described in section 1.2. The applicable watercourse and their reaches are depicted in and include the relevant stretch of stream 10 and wetland and ecological buffers on site (refer to Figure 26). Details of the Contractor cannot be provided as they have not yet been appointed (because the proposal is still in the permitting phase) and the date/duration of their applicability will be as per the Environmental Authorisation (if granted), noting that implementation would occur in phases. The operational maintenance would occur beyond the period indicated in the Environmental Authorisation (if granted) and would typically occur annually and/or as required. In terms of environmental standards, the following requirements would apply:

- Conditions of authorisation in terms of the Environmental Authorisation in terms of the NEMA (if granted), noting the general 'duty of care' also applies; and
- Conditions of registration for General Authorisation in terms of the NWA.

5.6.1 Sediment Removal (MS01)

Proposed activity:	Sediment removal as a result of deposition or sediment deposition as a result of erosion
What work is to be undertaken?	Clearing sediment from culverts and the associated drift. After these are constructed as part of the proposed development.
Timing of implementation:	Construction phase- If there is sediment during construction, this must be cleared at the time of construction of new culverts and drift. Ongoing- operational phase implementation- After heavy rain events (such as a 1:100 year flood), or as needed. To check and note at least annually, after winter.

Description of how potential environmental impacts will be prevented or managed

Construction Phase

- Existing roads and tracks must be used to access the site (Snaddon, 2021).
- Sediment must be removed by hand, or with hand-held tools. No large machinery will enter the stream bed.
- Sediment removal must be done during the dry season.
- Disturbed areas must be checked regularly for alien and invasive seedlings (Snaddon, 2021).
- Special care should be taken around storm and heavy rain events. The construction site should be inspected for erosion damage at these times (i.e., after heavy rainfall) (Snaddon, 2021).

Operation Phase – Ongoing

- Sediment removal must be done during the dry season.

Monitoring and record keeping

Construction Phase

An adequately qualified independent environmental control officer (ECO) must be appointed before construction begins (Snaddon, 2021).

1. Weekly inspections by Contractor's Environmental Officer	Record: Weekly checklist
2. Weekly site inspections by ECO	Record: Weekly checklist
3. Monthly audits by ECO	Record: Monthly audit report
4. Incident reporting	Record: Environmental Incident Reports including corrective action
5. Public complaints	Record: Complaints Register
6. Staff training	Record: Induction training register, toolbox talks attendance register for construction staff

Operation Phase

1. Annual Checklist by Staff	Record: Annual checklist
2. Ad hoc Checklist by Staff	Record: ad hoc checklist, after heavy rain

5.6.2 Removal of invasive alien plants and bush encroachment (MS02)

Proposed activity:	Clearing of vegetation and bush encroachment, includes invasive alien species and indigenous vegetation (specifically that block culverts).
What work is to be undertaken?	Removal of invasive alien plant species to reduce maintenance requirements as they relate to erosion and sedimentation and to improve hydrological flow and reduce associated flooding impacts. Invasive alien species must be removed from the stream 10 corridor and from wetlands and associated ecological buffers within site limits. Also applies to removal or pruning/cutting back of indigenous species from culverts if they are causing blockage.
Timing of implementation:	Annual clearing of invasive alien plants from stream, wetlands, and associated buffers. Annual cutting back/pruning of indigenous species from culverts.

Description of how potential environmental impacts will be prevented or managed

Construction Phase

- An adequately qualified independent environmental control officer (ECO) will be appointed before construction begins (Snaddon, 2021).
- A search and rescue of important or sensitive plants will be completed before construction occurs (Snaddon, 2021).
- Works will be implemented during the dry season (Snaddon, 2021).
- Regarding the wetlands and their buffers, this will be implemented once the landscaping of affected areas has been completed, and should be completed in one phase, with a follow-up maintenance phase to follow planting (Snaddon, 2021).
- Where alien species, particularly kikuyu grass, are removed, these will be replaced by indigenous species of similar growth form (Snaddon, 2021).
- Disturbed areas will be checked regularly for alien and invasive seedlings (Snaddon, 2021).
- Areas that have been impacted by construction within the wetlands, streams or their buffers will be re-planted with indigenous plant species (Snaddon, 2021). Refer to Figure 25 and Table 4 for further guidance. Planting will also be as per the final approved landscape plan (the draft is indicated in Figure 8).
- Full-grown riparian tree species will not be disturbed or damaged (Snaddon, 2021).

- All topsoil and sand brought onto the site will be inspected for seedlings throughout construction. Seedlings must be removed regularly. Snaddon (2021) notes that it is a challenge to ensure that the disturbance of soils and use of imported topsoil does not lead to the spread and establishment of alien plants, adding that it is likely that some will avoid detection and only constant monitoring and removal will solve this problem.
- Site will be inspected at least weekly for alien and invasive seedlings, and these removed and destroyed (Snaddon, 2021).

Operational Phase

- Rehabilitation will be implemented during the dry season (Snaddon, 2021).
- Full-grown riparian tree species will not be disturbed or damaged (Snaddon, 2021).
- Where alien species, particularly kikuyu grass, are removed, these will be replaced by indigenous species of similar growth form (Snaddon, 2021).
- Disturbed areas will be checked regularly for alien and invasive seedlings (Snaddon, 2021).
- It is preferable that any indigenous vegetation found blocking culverts be pruned/ cut back rather than removed completely.

Monitoring and record keeping

Construction Phase

1. Weekly inspections by Contractor's Environmental Officer	Record: Weekly checklist
2. Weekly site inspections by ECO	Record: Weekly checklist
3. Monthly audits by ECO	Record: Monthly audit report
4. Initial site visit by freshwater ecologist– for hard engineering interventions in the watercourse, this visit must be at the start and end of construction work.	Record: Report on progress of rehabilitation works To check the following: • All IAPs have been removed from the Stream 10 corridor, wetlands, and their buffers; • The bed and banks that have been impacted by the felling of trees and removal of alien grasses must be in good condition, and not eroding or bare; • Areas within the streams, wetlands and buffers that have been impacted by construction and rehabilitation activities have been re-planted.
5. Incident reporting	Record: Environmental Incident Reports including corrective action
6. Public complaints	Record: Complaints Register
7. Staff training	Record: Induction training register, toolbox talks attendance register for construction staff
8. End of phase site visit by freshwater ecologist	Record: Report on conclusion of rehabilitation works/ phase of works

	To check the following: • All IAPs have been removed from the Stream 10 corridor, wetlands, and their buffers; • The bed and banks that have been impacted by the felling of trees and removal of alien grasses must be in good condition, and not eroding or bare; • Areas within the streams, wetlands and buffers that have been impacted by construction and rehabilitation activities have been re-planted.

Operation Phase

1. Annual Checklist by Staff	Record: Annual checklist and evidence of clearing undertaken

5.6.3 Rehabilitation: Watercourse Stabilisation (MS03)

Proposed activity:	Rehabilitation and restoration activities for maintaining ecological infrastructure
What work is to be undertaken?	Stabilisation measures can be used elsewhere on the site, in order to prevent erosion in and around planted areas (Snaddon, 2021). • Snaddon (2021) confirms appropriate stabilisation materials include: o Ecologs (dry woody material or sand contained in a hessian and chicken wire roll; o Biodegradable netting/matting; o Geotextile matting of thick filaments designed to be secured over a vulnerable slope to prevent surface erosion; o Mulch stabilisation, or o Compost stabilisation
Timing of implementation:	After heavy rain events or as needed.
Description of how potential environmental impacts will be prevented or managed	
Construction Phase • An adequately qualified independent environmental control officer (ECO) will be appointed before construction begins (Snaddon, 2021). • A search and rescue of important or sensitive plants will be completed before construction occurs in sensitive areas (Snaddon, 2021). • Works will be implemented during the dry season (Snaddon, 2021) • Disturbed areas will be checked regularly for alien and invasive seedlings (Snaddon, 2021).	

- Special care will be taken around storm and heavy rain events. The construction site will be inspected for erosion damage at these times (i.e., after heavy rainfall) (Snaddon, 2021).
- Plant which is in good working condition will be used to clear and grub, remove, and stockpile the surface vegetation and topsoil.
- No cut vegetation will be burned on site.
- Measures contained in the environmental specifications of the Construction Phase EMPr (refer to section 3.3) regarding site camp establishment, site access, waste management, soil and water pollution management, protection of natural features and fauna, dust management, hazardous substances (including cement) management, Labour relations, facilities and site health and safety, Incident Management, as well as site clean-up and rehabilitation (noting that this is one component of rehabilitation and full rehabilitation would likely be phased) will be implemented.

Operational Phase

- Full-grown riparian tree species will not be disturbed or damaged (Snaddon, 2021).

Monitoring and record keeping

Construction Phase

1. Weekly inspections by Contractor's Environmental Officer	Record: Weekly checklist
2. Weekly site inspections by ECO	Record: Weekly checklist
3. Monthly audits by ECO	Record: Monthly audit report
4. Initial site visit by freshwater ecologist- during pegging/laying out of stabilisation structures	Record: Report on progress of rehabilitation works To check the following: • Stabilisation is planned as per specifications listed above.
5. Incident reporting	Record: Environmental Incident Reports including corrective action
6. Public complaints	Record: Complaints Register
7. Staff training	Record: Induction training register, toolbox talks attendance register for construction staff
8. End of phase site visit by freshwater ecologist	Record: Report on conclusion of rehabilitation works/ phase of works To check the following: • Stabilisation has been carried out as planned/ per specifications indicated at the initial layout/pegging out of the works (noted during the initial freshwater specialist site visit).

Operation Phase

1. Annual Checklist by Staff	Record: Annual checklist

2. Ad hoc Checklist by Staff	Record: ad hoc checklist, after heavy rain

5.6.4 Rehabilitation: Replanting (MS04)

Proposed activity:	Rehabilitation and restoration activities for maintaining ecological infrastructure
What work is to be undertaken?	Replanting/rehabilitation of stream 10 corridor and wetlands and associated buffers on site
Timing of implementation:	This must be undertaken as needed- i.e., when plants are removed (for whatever reason), they must be replaced with indigenous species as per the landscape plan.

Description of how potential environmental impacts will be prevented or managed

Construction Phase

Refer to MS02.

Operational Phase

- Where alien species, particularly kikuyu grass, are removed, these will be replaced by indigenous species of similar growth form (Snaddon, 2021).
- Disturbed areas will be checked regularly for alien and invasive seedlings (Snaddon, 2021).
- Landscaping requiring ongoing maintenance around the units will be kept to a minimum, especially within the ecological buffers (Snaddon, 2021). Gardens will rather be natural areas, where the locally indigenous vegetation is allowed to grow (Snaddon, 2021).

Monitoring and record keeping

Construction Phase

Refer to MS02.

Operation Phase

1. Annual Checklist by Staff	Record: Annual checklist and evidence of replanting undertaken

5.6.5 Maintenance- Flood Management Infrastructure (MS05)

Proposed activity:	Repairs and maintenance
What work is to be undertaken?	Maintenance of berms, culverts, drift and other flood protection and rehabilitation measures
Timing of implementation:	These structures must be checked, and their state recorded after high-rain events (such as a 1:100 year flood), otherwise annually, in spring. Maintenance must be undertaken as needed, per issues identified in the annual check.

Description of how potential environmental impacts will be prevented or managed
• Full-grown riparian tree species will not be disturbed or damaged (Snaddon, 2021). • Works and maintenance activities will be limited to existing infrastructure footprints, and these must not be widened or lengthened. Expanding upon these footprints may necessitate a statutory process, entailing, at least, an amended to existing approvals.
Monitoring and record keeping

Operation Phase

1. Annual Checklist by Staff	Record: Annual checklist
2. Ad hoc Checklist by Staff	Record: ad hoc checklist, after heavy rain

5.6.6 Rehabilitation: Maintenance- Landscaping and Structures within Watercourses (MS06)

Proposed activity:	Rehabilitation and restoration activities for maintaining ecological infrastructure
What work is to be undertaken?	Maintenance of structures within the wetlands and their ecological buffers. Given that some hard landscaping (like the amphitheatre and pathways/boardwalks) would occur within these areas, there would be a need for some maintenance (although not likely to be frequent).
Timing of implementation:	These structures must be checked, and their state recorded annually, in spring. Maintenance must be undertaken as needed, per issues identified in the annual check.
Description of how potential environmental impacts will be prevented or managed	
• Works and maintenance activities will be limited to existing infrastructure footprints, and these must not be widened or lengthened. Expanding upon these footprints may necessitate a statutory process, entailing, at least, an amended to existing approvals. • No further hardening of pathways will be undertaken without the necessary approvals in place.	
Monitoring and record keeping	

Operation Phase

1. Annual Checklist by Staff in spring	Record: Annual checklist
2. Ad hoc Checklist by Staff	Record: ad hoc checklist

5.7 MONITORING AND REPORTING REQUIREMENTS

Table 5 and the associated Method Statements in section 5.6 and the associated timing of these is also indicated.

Form A below must be completed by the Holder of the Environmental authorisation, or appropriate appointed professional (e.g., Contractor, Resident Engineer, Project Manager, ECO, or freshwater ecologist) before maintenance activities are undertaken and Form B after a maintenance activity has been completed. At least two photographs are required from two different points of perspective (A and B) looking at the site (coordinates of these points are required). When listing the type and reference code, this must be done by specifically listing the relevant detail within the adopted MMP.

A copy of each completed Form A and B must be sent to the DEA&DP, DWS and the Provincial Department of Agriculture, Directorate: Sustainable Resource Management. Where relevant/applicable, these forms can also be appended to ECO audit reports and need not be separately submitted, if programming allows.

Form A must be completed at least 7 working days before the commencement of any maintenance activity and Form B at least 3 working days following the completion of the maintenance activity(ies).

Note that the DEA&DP and other authorities may, within a reasonable notice period, request to evaluate the maintenance activities and assess the maintenance sites as per the adopted MMP.

REPORTING FOR INTENT TO UNDERTAKE MAINTENANCE ACTIVITIES – FORM A				
Section A: Landowner Details				
Name	**Surname**	**Farm No.**	**Erf No.**	**Today's Date**
Section B: Details of proposed maintenance activity				
WUA/GA reference number and DEA&DP reference number for MMP.	**Activity Type:**	**Reference code (*make reference to MMP*)**	**Footprint area (m^2)**	**Volume of material (m^3)**
Equipment to be used:	**Description of method for planned activity:**			**Date when work will commence:**
Date of last flood event for site:	**Note any further damage and comments regarding the state of the site**			

Section C: Photographs of activity location before maintenance	
Before A **Coordinates:** **S** **E** **Date of photos taken:**	
Before B **Coordinates:** **S** **E** **Date of photos taken:**	

REPORTING FOR COMPLETION OF MAINTENANCE ACTIVITIES – FORM B				
Section A: Landowner Details				
Name	**Surname**	**Farm No.**	**Erf No.**	**Today's Date**
Section B: Details of proposed maintenance activity				
WUA/GA reference number and DEA&DP reference number for MMP.	**Activity Type:**	**Reference code (*make reference to MMP*)**	**Footprint area (m^2)**	**Volume of material (m^3)**

Equipment that was used:	**Description of method for completed activity and if commence date changed**			**Date activity completed**
Date of last flood event for site:	**Note any challenges or difficulties experienced in following the MMP method statement**			
Section C: Photographs of activity location after maintenance				
After A **Coordinates:** **S** **E** **Date of photos taken:**				
After B **Coordinates:** **S** **E** **Date of photos taken:**				

5.8 PUBLIC PARTICIPATION PROCESS

The following parties were notified of the availability of the post-application draft Basic Assessment Report and its EMPR and MMP available for comment:

- Department of Water and Sanitation
- CapeNature
- SANParks
- Western Cape Department of Agriculture, Directorate: Sustainable Resource Management
- District Municipality (Cape Winelands District Municipality)
- Local Municipality (Stellenbosch Municipality)
- Irrigation Board / Water Users Association (Berg River Irrigation Board)
- Heritage Western Cape
- Department of Environmental Affairs & Development Planning

Public participation for the MMP has been part of the statutory Basic Assessment process and this has involved:

- The I&AP database has been updated to include registrations received to-date;
- A Public review period of 30 days for the post-application Draft BAR and associated EMPr and MMP;
- Notification of the availability of the post-application Draft BAR (in the form of a letter) was provided to registered I&APs via email and regular post (for those I&APs who do not have email addresses);
- Hard copies of the documentation were made available at the Pniel Public Library, and the Protea Bookstore, Stellenbosch;
- The executive summary and a comment box were also left at the Pniel Public Library for I&APs who cannot access the internet;
- The post-application Draft BAR was made available for download from Chand's website, and the executive summaries were also made available for download as separate documents (to limit data requirements for I&APs who do not have access to much data).
- Advertisements of the availability of the post-application draft BAR were placed in the Cape Times and the Eikestad Nuus, noting the proposed development and Basic Assessment and MMP, Heritage Impact Assessment and Water Use Registration/ Licensing processes;
- With respect to the written notice to the owners and persons in control of the site, note that the Applicant is the landowner of the site where the MMP is to be implemented;
- Note that there are no legitimate "occupiers" on the site, but users of the site would be able to see the site notices;
- Written notice to the municipal councillor of the ward in which the site is located was done;

- Written notice to the municipality (Local and District Municipality) which has jurisdiction in the area was done as part of the notification and advertisement above; and
- Written notice to any organ of state having jurisdiction in respect of any aspect of the activity has been done as part of the written notification of the availability of this post-application draft BAR.

Following the public review period of the post-application Draft BAR, EMPr and MMP specific feedback on the MMP was received from the DEA&DP regarding the need to only include future maintenance related work and not construction work related to new or expanded structures or infrastructure beyond the existing footprint. Such updates were made to the Method Statements contained in the MMP.

The DEA: DP Pollution and Chemicals Management Directorate expressed their support for the MMP.

No other comments specifically related to the MMP were received from other I&APs or organs of state.

5.9 TYPICAL REQUIREMENTS FOR AN MMP

Information has been included in this EMPr and MMP which meets the requirements for maintenance and management activities, as per the Department's Information document for the development of an MMP for a watercourse. References to where this information is contained are included in Table 6.

Table 6 Provision of Requirements for the MMP

No.	Information/data Required	Location/ Reference
1	Provide a map (at an appropriate scale) of the watercourse or stretch of watercourse being applied for within the stretch where maintenance activities will take place being clearly defined – consideration must be made to mapped features relating to Critical Biodiversity Areas (CBAs) and National Freshwater Ecosystem Priority Areas (NFEPAs).	Refer to Figure 26 of this report.
2	GPS coordinates must be provided for all site(s) at which maintenance activities will take place and included on the map which defines the stretch of watercourse. Coordinates must be provided in degrees, minutes and seconds using the Hartebeesthoek94 WGS84 co-ordinate system. Where numerous properties/sites	Refer to Figure 13 and Figure 26 of this report.

	are involved (e.g., linear activities), you may attach a list of property descriptions and co-ordinates to this form.	
3	Specialist assessment to be undertaken to determine (NOTE: information relating to the specifications and Terms of Reference used for the appointment of all specialist inputs must be provided): • Hydrological (incl. flood hydrological data etc.) and geomorphological assessment of watercourse functioning;	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix) and Appendix 11 (Flood Report).
4	• The relevant Present Ecological Status (PES) of the stretch of watercourse in question, if not available an assessment is to be done to determine PES in accordance with the Department of Water and Sanitation (DWS) guidelines;	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix).
5	• What is the reason/cause for the maintenance activities based on an ecological and hydrological assessment of the watercourse within the context of the larger catchment;	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix) and Appendix 11 (Flood Report), and section 1.1 within section 3.3 of this report.
6	• What are the drivers of system functioning within the watercourse and what is the ecological objective – based on historical condition and PES;	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix) and Appendix 11 (Flood Report).
7	• What is the management objective given the ecological status of the watercourse based on historical and PES data; as set out in agreement with the person(s) responsible for undertaking the maintenance activities;	Refer to section 1.1 within section 3.3 of this report.

8	• What is the impact on the watercourse/river system (resource quality characteristics: flow regime, geomorphology, water quality, habitat, and biota) for a minimum of 500m both up and downstream of the proposed maintenance activities, with the mitigation measures included;	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix) and impacts summary in section 1.3 of this report.
9	• An appropriate assessment for risk for each of the proposed types of maintenance activities and linked management actions in terms of the risk matrix for General Authorisations (GA) of Section 21 (c) and (i) by the DWS (GN 509 of 2016) or where applicable.	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix).
10	Mapped biodiversity features such as Critical Biodiversity Area, Ecological Support Area, National Freshwater Ecosystem Priority Area (NFEPA), and the National list of Ecosystems that are threatened and in need of protection (2011) gazetted in terms of Section 52 of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA), the Western Cape Biodiversity Spatial Plan 2017, as well as relevant provincial specific plans and classifications etc. Please consult the website www.bgis.sanbi.org.za to determine mapped features.	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix).
11	Include a description of existing or previous protection measures or reinforcements (e.g., gabions or groynes etc.) and infrastructure. Describe any evidence of erosion and/or siltation at the various sites and outlining possible causal factors and maintenance practices.	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix) and Appendix 11 (Flood Report).
12	Provide historical maps and data (images/flow/water quality/land use) of the river channel (if available) in order to assess the natural to changing flow patterns of the watercourse to determine cause of	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix) includes a description of the context and history of the watercourse.

	maintenance and possible impact of the maintenance activities, to inform mitigation measures.	
13	Provide a photographic record for the condition of the riparian habitat around maintenance sites, with the presence of important and/or sensitive habitat/species noted.	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix) and Appendix 11 (Flood Report) for photograph of the watercourse.
14	For sites prone to flood damage, a description regarding the history and effect of past floods and include dates of most recent events must be provided. This must inform the process to understand what actions are required along the stretch of the watercourse to reduce such impacts to the resource quality characteristics.	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix) and Appendix 11 (Flood Report) for an indication of general history, however detailed dates are not available.
15	Explain the risks associated with the no-go option for the MMP i.e., the risk of not undertaking the maintenance activities as stated in the MMP.	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix) and impacts summary in section 1.3 of this report. The no-go alternative is assessed and included in that table.
16	Reference must be made to any strategic plan where available, for example, a Catchment Management Strategy, with the objectives of the MMP shown to be in alignment with such plans.	Refer to Appendix 10 (Freshwater Baseline, Impact Assessment and Risk Assessment Matrix). Note that site is located in an area of no natural remaining vegetation from a terrestrial perspective and in an ESA wetland area, with rivers mapped thereon. The biodiversity spatial planning information for the wetland areas ultimately indicates that some habitat loss would be acceptable, but that the functioning of the ecosystem should not be compromised (Pool-Stanvliet *et al*, 2017). General best-practice for development should also be implemented in these areas, with consideration and implementation of suitable buffers, and any necessary authorisations should be obtained, where required. The mapping of rivers on site has also

		indicated the need for further assessment. The Freshwater Impact Assessment by Snaddon (2021) has been carried out and mitigation (which includes the rehabilitation plan and MMP) has focused on keeping risk to the freshwater ecosystem (rivers and wetlands) low, which also considers the off-site (i.e., cumulative) aspects. Furthermore, with respect to specific guidelines provided by Pool-Stanvliet *et al* (2017), the Freshwater Impact Assessment has included the delineation of wetlands on site as well as the establishment (and appropriate motivation) of the required buffer areas for the development on the new retreat site itself. This was also carried out for the river on the site and impacts of that assessed. These buffers are already considered and applied in the development footprint for all three development alternatives assessed. The rehabilitation plan also addresses the ecological rehabilitation of the stream such that the adverse impacts would be adequately mitigated and the intentions of the WCBSP (to continue for ecosystem function) would be fulfilled. The proposed development has considered the WCBSP in so far as the development footprint avoids the most sensitive areas and includes buffers from aquatic features. This is also considered in the routing of the proposed potable water line wherein it would remain within the existing roadway and cross a stream and culverts with a pipe fixed to the site of the existing crossing. In addition, the as

		stormwater management has been designed according to principles which are considered appropriate by Snaddon (2021) thereby limiting risks to the aquatic ecological system to a low level. Furthermore, Snaddon (2021) includes mitigation measures which would be implemented during detail design (noting that many recommendations are already present in the services plan as well as the proposed site plan), measures on the wastewater treatment system and use of treated wastewater (note that this does not apply to the preferred alternative, but rather only to Alternatives 1 and 2), landscaping and rehabilitation, measures to ensure the continued integrity of the ecological corridor, as well as construction mitigation measures, that would ensure low risk to the aquatic system, while acknowledging that some possible habitat loss could occur, noting also that Snaddon (2021) confirms that there may be positive (albeit low in significance) operational impacts through the landscaping and control of alien and invasive species. There is also a stream rehabilitation plan for stream 10 which would ensure ongoing sustainability of the system. The MMP would serve to support same. These recommendations would form conditions of environmental authorisation (if granted by the competent authority). Helme (2021) adds that the guidelines for ESA 2 are that it is degraded habitat that should be restored, mainly for its ecological connectivity value. Reasons given for selection of this area as an ESA2

		include the threatened status of the underlying (original) vegetation type, water resource protection, and potential habitat for threatened vertebrates (Cape Mountain Zebra) (Helme, 2021). The latter is purely theoretical, as is the former, with negligible natural habitat remaining on site (Helme, 2021).

6. REFERENCES/RESOURCES

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7. APPENDICES

APPENDIX 1
METHOD STATEMENT TEMPLATE

METHOD STATEMENT

CONTRACT: _____ **DATE**: _____

PROPOSED ACTIVITY (give title of Method Statement and reference number from the EMPR):

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 give too much information rather than too little. Please ensure that issues such as emergency procedures, hydrocarbon management, wastewater management, access, individual responsibilities, materials, plant used, maintenance of plant, protection of natural features etc. are covered where relevan