



LORNAY
ENVIRONMENTAL CONSULTING

MAINTENANCE MANAGEMENT PLAN

Proposed Residential development and associated infrastructure on Erf 1486,
Vermont, Hermanus, Caledon RD

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Consultant:

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Site Plan
A4 Scale 1 : 1000

PROJECT
Erf 1486 Vermont

TITLE
Site Plan

Erf	Zoning	Land Use	Area
1	GR1	Town Housing	640m ²
2	GR1	Town Housing	622m ²
3	GR1	Town Housing	618m ²
4	GR1	Town Housing	746m ²
5	GR1	Town Housing	816m ²
6	GR1	Town Housing	811m ²
7	OS3	Private Road	1456m ²
8	OS3	Private Open Space	9361m ²
Total			15070m²

- Application Area
- Permanent Wetland (depression)
- Seasonal Wetland
- Servitude (to be cancelled)
- Zoning Scheme Building Lines

CLIENT

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A4 SCALE

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1. INTRODUCTION AND BACKGROUND

Elephant Ventures Africa cc, the owner of Erf 1486, Vermont (hereinafter 'the Applicant') proposes the subdivision of the property to create six (6) residential erven for town housing, a private access road, and a large private open space erf. The central portion of the property will remain undeveloped and will accommodate the delineated wetland system together with the associated rehabilitation and offset area.

This Monitoring and Management Plan (MMP) has been prepared in terms of the National Environmental Management: Integrated Coastal Management Act and the National Water Act (Act 36 of 1998), read in conjunction with the Wetland Offset, Rehabilitation and Management Plan prepared by Delta Ecology (Van Zyl & Morton, 2026). It must further be read together with the Environmental Authorisation (EA) issued for the proposed development.

An aquatic biodiversity screening assessment confirmed and delineated a natural Unchanneled Valley-Bottom (UVB) wetland onsite (EnviroSwift, 2018; Delta Ecology, 2023). Although the site is disturbed in nature, it was determined to be of 'Very High' aquatic sensitivity. Because a portion of the UVB wetland will be unavoidably lost due to the proposed boundary access roads, an approved Wetland Offset, Rehabilitation and Management Plan is required as a condition of approval. This MMP sets out how the rehabilitation, protection, and long-term management of the remaining wetland will be implemented, monitored, and reported.

2. LEGAL AND REGULATORY FRAMEWORK

This MMP is informed by and must comply with the following legislative instruments:

- National Environmental Management Act, 1998 (Act No. 107 of 1998) and GN R. 320 of 2020 (as amended)
- National Water Act, 1998 (Act No. 36 of 1998) – Water Use Authorisation (WUA) obligations
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) – alien and invasive species control
- NEM:BA Alien and Invasive Species Regulations (2014) and Alien Species List (2020)
- Western Cape Biodiversity Spatial Plan (WCBSP, 2017)
- Macfarlane et al. (2016) National Wetland Offset Guidelines for South Africa
- WET-Health Version 2.0 (Macfarlane et al., 2020) – Present Ecological State (PES) assessment

The following specific environmental legislation is applicable to this Maintenance Management Plan:

Listing Notice 1, Activity 19

The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving – a. will occur behind a development setback; b. is for maintenance purposes undertaken in accordance with a maintenance management plan; c. falls within the ambit of activity 21 in this Notice, in which case that activity applies; d. occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or e. where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.

Listing Notice 3, Activity 12

The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.

3. PROJECT DESCRIPTION AND SITE CONTEXT

3.1 Site Location

Erf 1486 is located in Vermont within the Overstrand Local Municipality, Western Cape Province. The 1.5 ha erf is bordered to the north by the R43 road reserve, to the west by the Hoek van der Berg Private Nature Reserve, to the south by a small residential housing estate, and to the east by Lynx Road. The site lies within the Breede-Olifants Water Management Area (WMA), quaternary catchment G40G, which is demarcated as a Fish Support Area and Fish Sanctuary.

3.2 Proposed Development

The proposed development entails the subdivision of Erf 1486 to create:

- Six (6) residential erven (Erven 1-6) for town housing in the northern and southern portions of the property;
- One (1) private access road erf (Erf 7, 1 456 m²) along the eastern and southern boundaries; and
- One (1) large private open space erf (Erf 8, 9 361 m²) comprising the central portion of the property.

The private open space erf (Erf 8) will remain undeveloped and will accommodate the delineated wetland together with the offset, rehabilitation, and management area.

3.3 Wetland Description

The delineated UVB wetland covers approximately 0.90 ha (60%) of the 1.50 ha site. The wetland was assessed as having a Present Ecological State (PES) of Category D (largely modified condition) at the time of assessment, with Moderate Ecological Importance and Sensitivity (EIS) and Wetland Ecosystem Service (WES) scores. The dominant vegetation types identified include the wetland obligate species *Juncus kraussi*, *Typha capensis*, and *Senecio halimifolius*, alongside alien invasive species such as Kikuyu grass (*Cenchrus clandestinum*) and pampas grass (*Cortaderia selloana*).

3.4 Wetland Loss and Offset

In the preferred layout, a small portion of the UVB wetland (approximately 0.024-0.027 ha, i.e., approximately 3%) will be lost as a result of the proposed eastern and southern boundary access roads. For conservative assessment purposes, a loss of 0.027 ha has been used in all calculations. The application of the Macfarlane et al. (2016) offset calculator indicates losses of 0.0157 Hectare Equivalents (HE) of wetland function and 0.1985 HE of wetland habitat.

The rehabilitation and protection of the remaining 0.9361 ha wetland within Erf 8 (private open space) is expected to generate 0.1173 HE of wetland function and 1.0025 HE of wetland habitat, resulting in a net surplus of 0.1016 HE of wetland function and 0.8041 HE of wetland habitat. The offset plan thereby achieves a net ecological gain.

3.5 Offset Balance Summary

UVBW	Area (ha)		Function (HE)		Habitat (HE)	
	Losses	Gains	Losses	Gains	Losses	Gains
Wetland 1 (portion lost)	-0.0270	0.0000	-0.0157	0.0000	-0.1985	0.0000
Wetland 1 (remaining rehabilitated)	0	0.8460	0.0000	0.1173	0.0000	1.0025
Balance (HE)	0.8190		0.1016		0.8041	

4. GOALS AND OBJECTIVES

The broad goal of this MMP is to ensure that residual impacts on water resources, biodiversity, and ecosystem services are appropriately compensated, and that a material contribution is made to achieving water resource objectives and safeguarding valuable ecosystem services within the Vermont catchment.

The specific objectives are:

- To rehabilitate and protect the remaining 0.846 ha UVB wetland on Erf 8, achieving a PES of upper Category C (minimum PES score of 79%) through targeted interventions.
- To ensure like-for-like replacement of the wetland habitat and function lost due to the development footprint – no new wetland construction is proposed or required.
- To control and eliminate alien invasive species (AIS) from the offset wetland area in compliance with NEM:BA requirements.
- To reinstate appropriate hydrology through improved stormwater management and improved flow regime along Lynx Avenue.
- To establish and maintain a healthy and diverse indigenous wetland vegetation community within cleared and disturbed areas.
- To formally protect the wetland area through the establishment of a conservation servitude (title deed restriction) over Erf 8, preventing future development within the wetland.
- To monitor the rehabilitation progress and ecological condition of the offset wetland through regular site visits, fixed-point photography, and periodic PES assessments.

5. SCOPE OF THIS PLAN

This MMP covers the following maintenance and management activities within the regulated area of Erf 1486:

- Alien invasive species (AIS) monitoring and control
- Fill material removal and wetland reshaping
- Revegetation with locally indigenous wetland plant species
- Maintenance of infrastructure onsite
- Like for like replacement of infrastructure falling within the regulated area of the wetland.
- Stormwater management and maintenance
- Erosion monitoring and control

IMPORTANT: This plan is limited to like-for-like rehabilitation and restoration of the existing onsite UVB wetland. There is no requirement for and no intention to undertake new construction of wetland or aquatic features outside the approved development footprint.

6. ROLE PLAYERS AND RESPONSIBILITIES

Successful implementation of this MMP requires the collaboration of the following role players:

Role Player	Responsibilities
Water Use Licence (WUL) Holder / Property Owner (Craig Saunders)	Overall implementation of and compliance with this MMP. Appoint and instruct all implementing agents. Transfer obligations to future owners. Report to DWS/DEADP as required.
Homeowners Association (HOA)	Day-to-day monitoring of the wetland and open space area. Ensure homeowner compliance with landscaping and stormwater restrictions. Report issues to the ECO and freshwater specialist.

Environmental Control Officer (ECO)	Oversight of all on-site activities during the construction and rehabilitation phases. Ensure compliance with EA conditions and this MMP. Approve method statements and sign off on rehabilitation milestones.
Freshwater Biodiversity / Aquatic Specialist (SACNASP registered)	Lead and supervise all wetland rehabilitation activities. Conduct monitoring site visits. Undertake PES assessments. Provide recommendations and sign off on rehabilitation completion. Conduct or commission 5-yearly audits.
Restoration Ecologist / Qualified Landscaper	Plant, seed, and propagule procurement. Implement revegetation at correct species composition and planting densities. Supervise alien invasive clearing operations.
Civil Engineer	Design and size culverts/drainage improvements along Lynx Avenue. Design stormwater management system. Provide on-site inspections during infrastructure installation.
Construction Implementing Agent / Contractor/ Wetland Ecologist	Remove foreign fill material from the wetland. Undertake earthworks for reshaping under ECO and specialist supervision. Install stormwater and drainage infrastructure.

7. METHOD STATEMENTS

The following method statements describe the activities that will be undertaken to rehabilitate and manage the UVB wetland on Erf 1486. All activities are limited to like-for-like replacement and rehabilitation of the existing wetland. No new construction is proposed.

7.1. Method Statement 1: Removal of Foreign Fill Material

What?

Sections of the proposed development site have been historically impacted by infilling and currently contain foreign fill material (building rubble, fill material from the dirt road, etc.). Wetland infilling buries hydric soils and causes aquatic habitat loss. Removal of all foreign fill material is the first and most critical rehabilitation intervention.

Why?

To restore natural soil hydrology, re-establish wetland microtopography, and allow the wetland to function as a UVB system. Removal of fill material is a prerequisite for all subsequent revegetation and flow restoration activities.

Where?

Within the delineated UVB wetland area on Erf 8 (private open space) wherever foreign fill material is present, as confirmed by the freshwater specialist during a pre-works site inspection.

When?

Removal of infill must occur at the start of summer (October-November) and must NOT be undertaken during the Western Cape winter rain season (May-August) to prevent downstream sedimentation or erosion. Earthworks must not take place during the Western Leopard Toad breeding season (late July to September).

How?

- A suitably qualified contractor, under ECO and freshwater specialist supervision, must remove all foreign fill material (building rubble, imported soil, road fill, etc.) from the wetland.
- Care must be taken to avoid disturbance of intact natural wetland habitat and the permanent wetland zone during removal.
- The substrate in the remnant wetland area must consist only of natural soils after completion.

- All foreign fill material must be disposed of at a designated offsite waste facility. No building rubble or cleared plant material may be dumped within a natural area or within 200 m of any onsite watercourse.
- After removal, a freshwater specialist must inspect the site to confirm all fill material has been removed.
- Once fill material is removed, reshaping and reprofiling must be done to restore the UVB wetland profile (see Method Statement 2).

Monitoring Indicator

Visual confirmation of reinstated wetland contours; evidence of infiltration and ponding after rainfall events. Sign-off by freshwater specialist.

Timeframe

Complete in Year 1 (summer); verify during first post-rainy season (Years 1-2).

Responsible Party

Contractor under ECO and freshwater specialist supervision.

7.2. Method Statement 2: Wetland Reshaping and Reprofiling

What?

Following the removal of fill material, the disturbed areas must be reshaped and reprofiled to replicate the natural slope characteristics of a UVB wetland. This constitutes like-for-like replacement of the naturally occurring wetland topography that was altered by infilling and does not constitute new construction.

Why?

A natural UVB wetland has a very gentle to nearly flat slope with a flat, broad valley floor and no defined river channel or banks. Replicating these slopes is essential to restore proper hydrological function and ecological integrity. Steep banks increase erosion risk and may lead to rapid drainage, undermining wetland stability and long-term functionality.

Where?

Disturbed areas within the UVB wetland from which fill material has been removed.

When?

Wetland reshaping must take place during the dry season (October-April). Earthworks must be completed in time to allow for plant establishment prior to the onset of the winter rainfall season. Earthworks must NOT take place during the Western Leopard Toad breeding season (late July to September).

How?

- Reshape the wetland to replicate natural UVB slope characteristics:
 - Central basin (floor): 0-1% slope – nearly flat to allow seasonal or permanent ponding.
 - Transitional edge (fringe zone): 1-3% slope – allows plant zonation from emergent to facultative.
 - Outer buffer/upland zone: >3% slope (typically 4-5%) – transition to adjacent upland.
- Bank slopes must not be steeper than 1:3 (vertical:horizontal).
- Earthworks must not disturb the permanent wetland zone (central depression) dominated by indigenous wetland species, as far as practicably possible.
- Topsoil should be applied to stabilise wetland banks where required.
- Planting of wetland vegetation must take place shortly after earthworks are completed (see Method Statement 4).

Monitoring Indicator

Wetland profile consistent with natural UVB morphology; absence of steep banks; evidence of ponding in central zone after rainfall.

Timeframe

Complete in Year 1 (dry season); verify during Year 1-2 wet season.

Responsible Party

Contractor under ECO and freshwater specialist supervision.

7.3. Method Statement 3: Removal of Alien Invasive Species (AIS)

What?

Alien invasive species present within the offset wetland area and immediate surrounds must be systematically removed. The dominant AIS within the wetland area are:

- Kikuyu grass (*Cenchrus clandestinum*) – NEMBA listed
- Pampas grass (*Cortaderia selloana*) – NEMBA Category 1b
- Port Jackson willow (*Acacia saligna*) – NEMBA listed
- Rooikrans (*Acacia cyclops*) – NEMBA listed
- Australian myrtle (*Leptospermum laevigatum*)
- Sweet needlebush (*Hakea drupacea*)
- Additional garden species in the southwest corner of the Erf coinciding with the wetland.

Why?

AIS outcompete indigenous wetland plant species by forming dense stands, reducing overall biodiversity, altering fire regimes, and in the case of woody species, reducing average water flow and increasing erosion and sedimentation. NEM:BA (Act No. 10 of 2004) requires all landowners to control listed alien and invasive plant species on their property.

Where?

Within the entire delineated UVB wetland on Erf 8 and within a 10 m buffer around the wetland edge.

When?

Initial clearing must be completed in Year 1. During the rehabilitation phase, monthly AIS monitoring and clearing must be undertaken. Once rehabilitation is complete, quarterly clearing must continue for 5-10 years. Thereafter, clearing can be reduced to annual inspections once two consecutive quarterly inspections reveal no invasive individuals.

How – Pampas Grass (*Cortaderia selloana*)

- Manual removal is preferred. Wear full protective gear (flowers cause respiratory irritation; leaves cause skin cuts).
- Cut flower heads first and bag immediately to prevent seed dispersal.
- Cut plant as close to the ground as possible.
- Dig up the entire root system to prevent resprouting.
- Dispose of all plant material at an appropriate offsite waste facility.

How – Kikuyu Grass (*Cenchrus clandestinum*)

- In dry areas: apply selective herbicide Focus Ultra during summer months under dry conditions. Herbicide must NOT be applied during winter or in wet conditions.
- In saturated summer areas: hand-pull, digging out all rhizomes/stolons to prevent resprouting.
- Follow-up inspections every 6 weeks during growing season.

How – *Acacia saligna* (Port Jackson) and *Acacia cyclops* (Rooikrans)

- Seedlings (<5 cm stem diameter): Hand pulling – grip firmly at stem base and remove entire plant including rootstock.
- Saplings (~5 cm diameter): Tree-Popper technique to remove entire tree including roots.
- Trees (>5 cm diameter): Felling with chainsaw or bow saw; cut as close to ground as possible (5-30 cm above ground).

- Post-felling herbicide stump treatment: Apply 3% Triclopyr solution to freshly cut cambium surface within 3 minutes of felling. Port Jackson requires this treatment; Rooikrans usually dies when cut below the lowest branch.
- Herbicide safety: Do not apply during rain; never dispose of herbicide equipment near watercourses; apply only to cut surfaces – not foliarly near the wetland.

Timeframe

Year 1: Initial clearing. Years 2-3: Quarterly follow-ups. Years 4-5: Annual maintenance. Thereafter: Annual inspections.

Responsible Party

Rehabilitation contractor and ECO, under freshwater specialist guidance.

7.4. Method Statement 4: Revegetation with Indigenous Wetland Species

What?

Active revegetation of cleared and disturbed areas within the offset wetland with locally indigenous wetland plant species, as described in the Wetland Offset Rehabilitation and Management Plan.

Why?

Indigenous vegetation is essential for successful wetland rehabilitation. Vegetation reduces erosion, improves water quality, provides habitat, attenuates stormwater flows, and prevents AIS re-establishment. The rehabilitation target is 80% total natural wetland vegetation cover within 8-12 months after revegetation is complete.

Where?

All areas cleared of AIS, all areas from which fill material has been removed, and any bare or sparsely vegetated areas within the offset wetland on Erf 8.

When?

The best time for planting is autumn (March-May) to allow root establishment before winter rains. Planting should be initiated as soon as practicably possible after fill removal and reshaping are complete. Nurseries must be given at least 12 months' notice (6 months minimum) to secure plant stock.

Procurement

Plant material must be procured from reputable local nurseries with locally appropriate genetic stock. Recommended sources include:

- Kraaibosch Nursery: +27 44 889 0092
- Fynbos Life Nursery: 082 378 9445
- Kirstenbosch Botanical Gardens Nursery: 021 797 1305
- Intaba Indigenous Nursery: 087 943 4524

Species List

A minimum of six (6) species from the following list must be introduced, ensuring representation across all hydrological zones (permanent, seasonal, temporary). *Typha capensis* must NOT be used for revegetation as it can become invasive.

Family	Species	Status	General Info	Wetland Type	Hydro Zone
Asteraceae	<i>Senecio halimifolius</i>	LC	Indigenous	Facultative	Temporary
Cyperaceae	<i>Bolboschoenus maritimus</i>	LC	Indigenous	Obligate	Permanent
Cyperaceae	<i>Cyperus textilis</i>	LC	Endemic	Obligate	Permanent/Seasonal
Cyperaceae	<i>Cyperus thunbergii</i>	LC	Endemic	Obligate	Seasonal/Temporary

Cyperaceae	<i>Hellmuthia membranaceae</i>	LC	Endemic	Facultative	Permanent/Seasonal
Cyperaceae	<i>Ficinia nodosa</i>	LC	Indigenous	Obligate	Permanent/Seasonal
Poaceae	<i>Pennisetum macrourum</i>	LC	Indigenous	Obligate	Permanent/Seasonal
Restionaceae	<i>Elegia capensis</i>	LC	Endemic	Obligate	Permanent
Rosaceae	<i>Cliffortia strobilifera</i>	LC	Indigenous	Obligate	Permanent/Seasonal
Dennstaedtiaceae	* <i>Pteridium aquilinum</i>	LC	Indigenous	Facultative	Seasonal/Temporary

How?

- Plant at a density of approximately 4 plants per square metre.
- Transplant whole plants with well-established root balls as the primary method (most reliable for erosion-prone areas).
- Planting procedure: dig a hole 1.5 times the depth and 2 times the width of the bag; loosen roots gently; place plant in hole; replace soil with a slight depression (1-3 cm below surrounding level); firm soil by hand.
- Water plants in the temporary zone approximately every three days for the first six months (unless rain has fallen within the preceding 24 hours). Winter rainfall will substantially reduce watering requirements.
- Seed can also be sown in autumn; rake bare soil lightly before spreading seed evenly; maintain area and remove weeds.

Inspection and Follow-up

- Inspect and photograph the wetland before and immediately after planting.
- Inspect every 6 months until 80% cover is achieved.
- A SACNASP-registered freshwater specialist must inspect the site 12 months after revegetation is complete to confirm whether 80% cover has been achieved.
- If 80% cover has not been achieved, the specialist must provide recommendations for improvement.

Monitoring Indicator

Survival rate after planting; proportion of indigenous vs alien cover; 80% indigenous cover achieved within 8-12 months.

Timeframe

Plant in Year 1 (autumn). Assess survival in Year 2. Conduct annual cover surveys Years 2-5.

Responsible Party

Specialist ecologist and restoration contractor.

7.5. Method Statement 5: Stormwater Management

What?

Ongoing monitoring and maintenance of stormwater management infrastructure to prevent concentrated inflow and contaminant loads from surrounding roads, adjacent residential areas, and the new development from reaching the UVB wetland. This activity also addresses existing stormwater-related pressures already affecting the wetland system.

Why?

The proposed development will increase catchment hardening, which may elevate runoff volumes and storm peak flows. Stormwater runoff can carry sediments, nutrients, and hydrocarbons into the wetland, posing a risk of water quality impairment and habitat degradation. Robust stormwater management is also required to protect downstream ecological receptors such as the Vermont Salt Pan.

Where?

Within all stormwater infrastructure zones, including permeable paving areas, enhanced vegetated swales, drainage outlets and inlets, and identified areas with accumulated sediment or erosion.

When?

- Install in Year 1.
- Inspect every 6 months (Years 1-5).
- Inspect immediately after major storm events.
- Remedial action must be taken within 2 weeks if issues are detected.
- Late summer (February-April) is the optimal time for sediment removal to minimise ecological disturbance.

How?

- Discharge stormwater from rooftops into rain-harvesting tanks to limit volumes reaching the wetland.
- Use vegetated swales rather than concrete drains or underground stormwater pipes to encourage infiltration.
- Install energy dissipaters/erosion protection (stones, grass, reno-mattresses, or gabions) where stormwater is released.
- Intercept sheet runoff from hardened surfaces; promote treatment and infiltration.
- Incorporate sediment traps into stormwater drains/swales upstream of all discharge points into the wetland.
- Treat all stormwater entering the wetland with basic filtering prior to release.
- Use curb inlet drain grates and debris baskets/bags to trap solid waste and sediment.
- Stormwater from higher-risk areas (parking, roads) must pass through sand filter traps and oil-water separators.
- Minimise hardened surface extents; use permeable paving where required.
- Prohibit pool backwashing directly into the wetland. Collect backwash in settling tanks and reuse or divert to greywater tanks.
- Prohibit use of herbicides, pesticides, or poisons within private gardens adjacent to the wetland. The HOA is responsible for enforcement.
- Stormwater systems must be monitored, maintained, and kept clear of debris into perpetuity.

Permeable Paving Maintenance Schedule

Activity	Schedule
Ensure porous paver and outlet structures are free of sediment	Monthly
Check that the system dewateres between storms	As needed, based on inspection
Ensure contributing area and porous paver surface are clear of debris	As needed, based on inspection
Vacuum sweep porous paver surface to keep free of sediment	3-4 times per year
Inspect surface for debris or spalling	Annually
Totally rehabilitate porous paver system (top and base course) if needed	Upon failure

Monitoring Indicator

Functioning swales, energy dissipaters, and sediment traps in place; no scouring at outlets; reduced sediment and nutrient inputs to the wetland.

Responsible Party

Civil Engineer and ECO during installation; HOA and ECO for ongoing maintenance.

7.6. Method Statement 6: Erosion Control

What?

Monthly monitoring and prompt remediation of erosion within the UVB wetland and its buffer zone, particularly at stormwater inflow points, swales, and outflow zones.

Why?

Unchecked erosion causes loss of topsoil and wetland structure, sedimentation of wetland pools, disruption of natural hydrology, and reduced biodiversity and ecological function.

When?

- Monthly inspections to detect signs of erosion.
- Additional inspections immediately after significant storm events.
- Erosion repair must be implemented as soon as erosion is detected.

How?

- Conduct visual inspection to assess extent and type of erosion (sheet erosion, rills, gullies, bank collapse). Maintain photographic records.
- Preferred: soft engineering stabilisation techniques such as geotextiles, coir fibre mats, erosion blankets, brush mattresses, sandbags, fascine bundles, live staking with rooted indigenous cuttings.
- Place geotextile fabric over exposed areas, secure with stakes, cut planting holes, and plant indigenous species mix; gradually remove fabric as vegetation establishes.
- Fill erosion rills and gullies with rocks of 5-20 cm diameter; establish silt fences or fascines along flow paths for reinforcement until vegetation has established.
- Loosen compacted areas to approximately 30 cm depth to improve infiltration and reduce runoff concentration.
- Replant or reseed all disturbed areas immediately after stabilisation.
- Use appropriately sized lightweight machinery to remove large debris; avoid driving heavy equipment through the wetland.

Timeframe

Install erosion control measures in Year 1; inspect annually (Years 1-5); remediate within 1 month if erosion occurs.

Responsible Party

HOA and ECO for inspections; qualified rehabilitation contractor under freshwater specialist supervision for moderate to severe erosion control.

7.7. Method Statement 7: Flood Damage Response

What?

Due to increasing frequency and intensity of extreme weather events, flooding within the UVB wetland and adjacent infrastructure on Erf 1486 is possible. This method statement provides the protocol for post-flood inspection and repair.

When?

As soon as practically possible after a significant storm or flood event.

How?

- Conduct flood damage inspection immediately after the storm event. Photograph all damage.
- Notify the Overstrand Municipality immediately if damage occurs to municipal infrastructure (culverts, outfall structures) or if water flow is obstructed.
- Use appropriately sized lightweight machinery to remove debris, tree trunks, or damaged vegetation. Cut large items on-site before removal.
- Follow the approved sediment removal protocol when clearing sediment from swales, stormwater drains, or within the wetland buffer.

- Inspect and secure all sewer-related infrastructure for structural damage or leaks.
- Avoid driving heavy equipment through the wetland; use the smallest possible plant and restore all disturbed areas post-repair.
- Document all damage and remediation actions for compliance and audit purposes.
- Prioritise repairs to stormwater attenuation features and flow paths, particularly if additional rainfall is forecast.

Responsible Party

HOA for initial inspection and notification; suitably qualified professionals and contractors for repair; local authorities notified if municipal infrastructure is damaged.

7.8. Method Statement 8: Maintenance of Infrastructure within the Regulated Area of the Wetland

What?

This method statement covers the routine inspection, maintenance, and like-for-like replacement of all physical infrastructure components of the proposed development that fall within or immediately adjacent to the regulated area of the UVB wetland on Erf 1486 (i.e., within the delineated wetland and its 32 m buffer zone). Infrastructure components that are likely to fall within the regulated area include:

- Private internal access road (Erf 7) – eastern and southern boundary access roads that cross or run adjacent to the wetland edge, including the road surface, kerbing, and road drainage structures;
- Stormwater drainage infrastructure – culverts, underground pipes, vegetated swales, permeable paving, energy dissipaters, sediment traps, and stormwater outfall structures draining to or through the wetland buffer;
- The existing and proposed culverts under Lynx Avenue conveying water between the onsite wetland and the downstream Vermont Salt Pan;
- The existing overflow pipe beneath Lynx Road connecting the central wetland depression to the downstream wetland system;
- Sewer, water, and utility service pipelines where they cross or run through the 32 m wetland buffer;
- Any boundary fencing, demarcation structures installed within or at the edge of the wetland and its buffer.

IMPORTANT: All maintenance and repair of infrastructure within the regulated area must be limited to like-for-like replacement only. This means that any damaged, deteriorated, or failed infrastructure component may only be repaired or replaced with an identical or functionally equivalent component of the same material, size, alignment, and footprint as the original approved infrastructure. No upgrading, expansion, repositioning, or new construction of infrastructure within the regulated area is permitted without a new Environmental Authorisation or amendment thereof. Any proposed deviation from like-for-like replacement must be referred to the ECO and freshwater specialist for assessment, and to DEADP for a determination on whether a new authorisation is required.

Why?

Infrastructure within the regulated area of a wetland presents an ongoing risk of ecological impact through physical disturbance, altered hydrology, contamination, and habitat fragmentation. Routine maintenance ensures that infrastructure functions as designed and does not incrementally expand the development footprint within the sensitive wetland environment. Limiting all repairs to like-for-like replacement ensures that no additional wetland area or buffer zone is encroached upon beyond what was authorised.

Where?

Within the delineated UVB wetland and its 32 m regulated buffer zone on Erf 1486, specifically:

- The eastern and southern boundary access road (Erf 7) where it coincides with or abuts the wetland edge;
- All stormwater infrastructure within the buffer zone and within Erf 8 (private open space);

- Culverts and drainage structures under Lynx Avenue;
- Utility service crossings within the buffer zone; and
- Any structures within Erf 8 (open space erf).

When?

- Routine inspection of all infrastructure within the regulated area must be undertaken at least twice per year (once in summer and once after the winter rain season) and immediately after any major storm or flood event.
- Maintenance must be carried out promptly upon identification of deterioration or failure.
- Like-for-like replacement of failed components must be completed as soon as practically possible to prevent extended periods of uncontrolled stormwater discharge, erosion, or structural failure within the regulated area.
- Planned maintenance works within the regulated area must be scheduled to avoid the Western Leopard Toad breeding season (late July to September) and must preferably occur during the dry summer months (November to March) to minimise disturbance and risk of sedimentation.

How?

Access Roads

- Inspect road surface, kerbing, stormwater inlets, and road drainage channels adjacent to the wetland boundary twice yearly and after significant rain events.
- Patch potholes and repair road surface defects promptly to prevent stormwater concentration and channelised runoff into the wetland.
- Replace damaged kerbing, road edge protection, or drainage channel sections on a like-for-like basis using the same material, dimensions, and alignment as the original approved design.
- Do not widen, realign, resurface with impermeable material, or otherwise alter the road or its drainage structures beyond their original approved configuration.
- Any sediment deposited on road surfaces adjacent to the wetland must be removed promptly to prevent wash-off into the wetland during rain events.

Stormwater Infrastructure (Swales, Permeable Paving, Pipes, Culverts, Sediment Traps)

- Inspect all stormwater infrastructure within the regulated area twice yearly and after major storm events.
- Clear accumulated sediment, debris, and vegetation from swales, pipes, culverts, sediment traps, and outfall structures as required to maintain design capacity.
- Replace cracked, collapsed, or blocked stormwater pipes on a like-for-like basis with the same material (e.g., HDPE, concrete), same diameter, same alignment, and same invert level as the original approved design.
- Replace failed or blocked culverts with structurally equivalent culverts of the same size, invert level, and hydraulic capacity as the original approved culvert. Culvert replacement must be overseen by a civil engineer in consultation with a freshwater specialist.
- Replace failed permeable paving units on a like-for-like basis using the same paving type, aggregate specification, and sub-base design as the original approved system.
- Replace damaged energy dissipaters and erosion protection structures (e.g., rock aprons, gabions, reno-mattresses) with identical structures of the same material and dimensions. Do not reduce the size or coverage of energy dissipaters during replacement.
- Revegetate any areas disturbed during infrastructure maintenance with locally indigenous species in accordance with Method Statement 4 immediately after works are complete.

Lynx Avenue Culverts and Overflow Pipe

- Inspect culverts and the overflow pipe beneath Lynx Road at least twice yearly (preferably after winter rains and at end of summer) and after major flood events.

- Clear accumulated sediment, vegetation, and debris from culvert barrels, inlets, and outlets to maintain hydraulic capacity and flow connectivity between the onsite wetland and the downstream Vermont Salt Pan.
- Repair or replace damaged culvert components (headwalls, wing walls, aprons, barrel sections, scour protection) on a like-for-like basis in accordance with the original engineer-approved design. No reduction in culvert diameter, number, or flow capacity is permitted during like-for-like replacement.
- Report any structural failure, collapse, or significant blockage of culverts or the overflow pipe to the Overstrand Municipality and the freshwater specialist immediately.

Utility Services (Sewer, Water Pipelines)

- Inspect exposed utility service infrastructure within the regulated area twice yearly and after any flood event.
- Report any evidence of sewer leakage, pipe failure, or contamination within the regulated area to the relevant service authority immediately. Contamination of the wetland from sewer leakage must be treated as an environmental emergency.
- Replace failed utility pipes on a like-for-like basis – same material, diameter, depth, and alignment as the original approved installation. Trench reinstatement after pipe replacement must restore the original soil profile and must be revegetated immediately with indigenous species.
- No trenching or excavation for utility maintenance or replacement may take place during the Western Leopard Toad breeding season (late July to September).

Boundary Fencing

- Inspect boundary fencing, and any pedestrian paths within the open space twice yearly.
- Replace damaged fencing panels, posts, or gates on a like-for-like basis – same material, height, and alignment as originally installed. Do not extend the footprint of boundary fencing into the wetland beyond the approved alignment.
- Replace damaged path sections on a like-for-like basis. Do not widen, extend, or relocate pedestrian infrastructure beyond the originally approved alignment and footprint.
- Servitude boundary markers that are damaged or missing must be replaced in the same position, using the same materials, to maintain the integrity of the conservation servitude.

General Requirements for All Infrastructure Maintenance in the Regulated Area

- All works within the regulated area must be preceded by notification to and approval from the ECO. The ECO must confirm that the proposed works constitute like-for-like replacement before works commence.
- Works that are likely to significantly disturb the wetland substrate, vegetation, or hydrology must also be reviewed by the appointed freshwater specialist before commencement.
- The minimum practicable footprint must be used for all access and working areas during maintenance works. Machinery and vehicles must not enter the permanent wetland zone.
- All material removed during maintenance (old pipe sections, rubble, sediment, etc.) must be removed from the site and disposed of at a designated offsite waste facility. No material may be stockpiled within the wetland or its buffer zone.
- All areas disturbed during infrastructure maintenance must be reinstated to their pre-works condition and revegetated with indigenous species within 30 days of completion of the maintenance works.
- Photographic records must be maintained of the pre-works condition, during-works progress, and post-works reinstatement for all infrastructure maintenance activities within the regulated area.
- Any infrastructure maintenance activity that cannot be confirmed as like-for-like replacement must be referred to DEADP for a determination on whether a new or amended Environmental Authorisation is required before works may proceed.

Timeframe

Twice-yearly routine inspections (summer and post-winter rain season); immediate response to storm damage or infrastructure failure; like-for-like replacement completed as soon as practicably possible after identification of failure.

Responsible Party

HOA for routine inspections and minor maintenance; Civil Engineer for design review of replacement components; Freshwater Specialist for sign-off on works within the wetland and for compliance verification; ECO for approval of all works within the regulated area; DEADP notification where works may exceed like-for-like scope.

8. MONITORING PROGRAMME

8.1 Desired State

The desired state for the offset UVB wetland on Erf 1486 is a PES of upper Category C with a minimum PES score of 79%. Once this target is achieved, the wetland must be managed to maintain or gradually improve the PES in perpetuity.

8.2 Rehabilitation Phase Monitoring

A minimum of two site visits from a freshwater specialist are required to ensure rehabilitation success:

- Site visit 1: After removal of fill material, rubble, and reshaping is complete to confirm the result is in line with this MMP before revegetation begins.
- Site visit 2: Twelve (12) months after planting has taken place to assess vegetation cover and species assemblage.
- If the PES target has not been met, annual site visits must continue until the required PES score is obtained.
- All rehabilitation phase site visits must include fixed-point photography.

8.3 Post-Rehabilitation Phase Monitoring

Once rehabilitation has been completed and signed off by a freshwater specialist, an independent audit must be conducted once every five (5) years from the date of commencement of initial wetland rehabilitation. The independent auditor must:

- Be an environmental auditor with specialist knowledge of wetland ecology, or a SACNASP-registered freshwater specialist.
- Evaluate compliance with this MMP and applicable environmental legislation.
- Assess the PES of the offset wetland using WET-Health Version 2.0 (Macfarlane et al., 2020).
- Assess changes in estimated vegetation cover, presence of erosion, and presence of alien vegetation, using fixed-point photography and aerial/satellite imagery.
- Note any significant emerging ecological problems (new alien species, senescence, etc.) and provide recommendations.

9. MANAGEMENT OBJECTIVES AND IMPLEMENTATION STRATEGY

The aim of this MMP is to allow for the long-term management of the site which is located within the regulated area in terms of NEMA. This includes both the rehabilitation of the site as well as response to storm or flood events where maintenance actions may be required.

9.1 Implementation Responsibilities

The landowner (Water Use Licence holder), and the Homeowners' Association (HOA), are responsible for the implementation of this MMP and the provisions thereof:

- The landowner must either undertake maintenance works directly or appoint contractors on an ad hoc basis.

- The landowner must ensure that all maintenance workers and contractors are informed of the requirements of this MMP.
- The landowner must appoint, on an ad hoc basis, professionals as required – including a Civil Engineer and/or Freshwater Ecologist – to provide specialist input as prescribed in the original EA.
- The landowner must timeously notify DEADP of significant damage to structures or infrastructure as a result of heavy rainfall or floods.
- The legal obligation of ongoing environmental management must be transferred to any future property owners.

9.2 Compliance

The landowner is expected to remain legally compliant with relevant environmental legislation and the Environmental Authorisation at all times. Compliance with MMP procedures does not absolve the landowner from compliance with any other legislation. Costs of rehabilitation of any environmental damage resulting from non-compliance are the responsibility of the responsible party.

9.3. Recording Maintenance Activity

The accurate and consistent recording of all maintenance activities undertaken within the regulated area of the wetland (open space) constitutes a fundamental requirement of this Maintenance Management Plan (MMP). Comprehensive maintenance records serve multiple essential functions, including providing an auditable trail of compliance with the environmental management requirements of this MMP, enabling the early identification of recurring infrastructure defects or environmental risks, supporting the preparation of the compliance reports required, and providing the relevant Competent Authority with the evidence necessary to assess whether the prescribed mitigation measures are being implemented effectively and are achieving the desired outcomes in relation to the protection of the adjacent UVB wetland system.

All parties with maintenance responsibilities under this MMP namely the Applicant, and the Homeowners Association (HOA) in respect of its ongoing environmental management obligations are required to maintain accurate, up-to-date, and complete records of all maintenance activities undertaken within their respective spheres of responsibility, in the manner and to the standard prescribed in this section.

Form A and Form B (attached under **Annexure A** below) must be completed by the Contractor/Developer for all activities to be undertaken in terms of this MMP. A copy of each completed form must be retained by the Proponent for record-keeping. The DEA&DP may request to review maintenance activities and inspect maintenance sites based on the adopted MMP, with reasonable notice (i.e., 7 working days)

Form A: Pre-Maintenance Activity Recording

The Pre-Maintenance Activity Form is used to record details of a planned maintenance activity before it begins. The Proponent and/ Municipality must ensure that the Contractor completes this form prior to commencing any activity under this MMP. Form A must be completed and submitted to DEA&DP at least 7 working days before starting the maintenance activity.

Information required:

- Type of the maintenance activity (as per the adopted MMP).
- Description of the planned maintenance.
- Location of the maintenance activity (including photo references).
- Two photographs required from different viewpoints
- Coordinates for each photo location.

Form B: Post-Maintenance Activity Recording

The Post-Maintenance Activity Form is used to record details of a maintenance activity after completion. The Proponent must ensure that the Contractor completes this form at least 10 working days following the completion of the maintenance activity (ies).

Information Required:

- Type of the maintenance activity (as per the adopted MMP).
- Description of the completed maintenance.
- Location of the maintenance activity (including photo references).
- Reference the photographs.

ANNEXTURE A



FORM A | REPORTING FOR INTENT TO UNDERTAKE MAINTENANCE ACTIVITIES

Section A

Landowner Details

Name	Surname	Farm No.	Erf No.	Today's date

Section B

Details of the proposed maintenance activity

WUA/GA reference number and DEA&DP reference number for MMP	Activity Type:	Footprint area (m²)	Volume of material (m³)
Equipment to be used	Description of method for planned activity	Commencement date	
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

<p>Before A Coordinates: S E</p>	
<p>Before B Coordinates: S E</p> <p>Date of photos taken:</p>	

FORM B | REPORTING FOR COMPLETION OF MAINTENANCE ACTIVITIES

**Section A
Landowner Details**

Name	Surname	Farm No.	Erf No.	Today's date

**Section B
Details of the proposed maintenance activity**

WUA/GA reference number and DEA&DP reference number for MMP.	Activity Type	Footprint area (m ²)	Volume of material (m ³)
Equipment to be used	Description of method for planned activity		End date
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 before maintenance**

Before A Coordinates: S E	
Before B Coordinates: S E Date of photos taken:	

