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MAINTENANCE MANAGEMENT PLAN (MMP)

THE REHABILITATION OF STORM-DAMAGED LAGOON EMBANKMENTS AND THE RESTORATION OF LAGOON ACCESS AT POORTJIES, LAGOON DRIVE, PLETTENBERG BAY

POORTJIES, LAGOON DRIVE, PLETTENBERG BAY



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Prepared for	Bitou Local Municipality
Report status	Draft for public participation
Date	05/11/2026
DEA&DP reference	TBC
DEA&DP case officer	TBC

Document Control and Administrative Details

Client / Proponent	Bitou Local Municipality
Responsible person for the activity	Bitou Local Municipality, Directorate: Community Services / Infrastructure Services
Locality	Poortjies, Lagoon Drive, Plettenberg Bay
Local Municipality	Bitou Local Municipality (WC047)
District Municipality	Garden Route District Municipality
Name of watercourse	Keurbooms Estuary (Keurbooms / Bitou estuarine system)
Competent authority	Western Cape Department of Environmental Affairs & Development Planning (DEA&DP)
Co-referral / coastal authority	Department of Forestry, Fisheries & the Environment (DFFE: Oceans & Coasts), ICM Act; CapeNature
Triggering event	Cut-off low storm event, 6–8 May 2026 and June 2026 (classified a national disaster in terms of the Disaster Management Act, 2002)

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1. Definitions and Acronyms

Table 1-1: Definitions and acronyms used in this MMP.

Term	Meaning
Hessian / geotextile	A permeable, woven fabric used as a buried separation / reinforcement layer beneath placed sand; a soft material
CBA	Critical Biodiversity Area
DEA&DP	(Western Cape) Department of Environmental Affairs & Development Planning
DFFE	Department of Forestry, Fisheries & the Environment
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
Estuary / EFZ	An estuary as defined in the ICM Act; the Estuarine Functional Zone is the area of estuarine influence
ICM Act	National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008)
Littoral active zone	Land adjacent to the shore that is dynamic under wave, tidal, current and wind action
MMP	Maintenance Management Plan
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
Embankment / dune cordon	The vegetated dune / coastal-thicket bank forming the natural buffer between the lagoon and inland areas and infrastructure
Scarp	The near-vertical erosion face cut into a bank or dune by wave / current attack during a storm

2. Relevant Legislation

The activities described in this MMP may qualify for the applicable maintenance exclusions only after this MMP has been accepted or adopted by the competent authority and only where each event remains within the approved maintenance envelope, quantities, materials and methods. Approval of this MMP does not authorise new development, an enlarged footprint, a changed infrastructure capacity or any activity not expressly assessed herein.

2.1 National Environmental Management Act (NEMA) and the EIA Regulations, 2014 (as amended)

The activities addressed by this MMP fall within the following listed activities. In each case the EIA Regulations expressly exclude the activity from the requirement for environmental authorisation where it is undertaken for maintenance purposes in accordance with an approved MMP:

2.1.1 Summary of triggered listed activities

Table 2-1: Listed activities potentially triggered by the maintenance works and their applicability.

Listing Notice	Activity	Trigger / description	Applicable?
LN 1 (GN R983)	Activity 18	The planting of vegetation or placing of any material on dunes or exposed sand surfaces of more than 10 square metres, within the littoral active zone, for the purpose of preventing the free movement of sand, erosion or accretion, excluding where — (i) the planting of vegetation or placement of material relates to restoration and maintenance of indigenous coastal vegetation undertaken in accordance with a maintenance management plan; or	Yes — embankment reshaping, revegetation, brush-packing and sand-trapping. Maintenance exclusion applies.

		(ii) (ii) such planting of vegetation or placing of material will occur behind a development setback.	
LN 1 (GN R983)	Activity 19A	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from— (i) the seashore; (ii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater; or (iii) the sea; — (iv) but excluding where such infilling, depositing , dredging, excavation, removal or moving— (v) (f) will occur behind a development setback; (vi) (g) is for maintenance purposes undertaken in accordance with a maintenance management plan; (vii) (h) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (viii) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (ix) 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.	Yes —reshaping the eroded bank. Maintenance exclusion applies.
LN 3 (GN R985)	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. i. Western Cape i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or v. On land designated for protection or conservation purposes in an Environmental Management Framework	No clearance of intact indigenous vegetation is authorised. Where disturbance of indigenous vegetation is demonstrably unavoidable and necessary for maintenance, the area and species concerned must be quantified in Form A, confirmed against the applicable LN3 geographical criteria and kept within the approved maintenance footprint. Disturbance not expressly allowed by the approved MMP, or cumulative clearance reaching an applicable threshold, requires prior legal screening and any necessary authorisation.

		adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister	

2.2 National Environmental Management: Integrated Coastal Management Act (ICM Act)

The works occur within the coastal zone and may partly occur on coastal public property. The status and boundary of coastal public property must be confirmed from cadastral information and the best available delineation of the high-water mark before work commences. Nothing in this MMP confers ownership, exclusive occupation or a right to restrict public access.

Measures intended to prevent or promote erosion or accretion on coastal public property must comply with section 15 of the ICM Act and any other applicable law. The Municipality must obtain any required landowner, custodial, coastal or coastal-use consent before implementation. The works must preserve reasonable public access except for temporary safety closures.

The NEMA section 28 duty of care continues to apply. Approval of this MMP does not displace any requirement under the ICM Act.

2.3 National Water Act (NWA, 1998)

The Keurbooms Estuary is a watercourse and water resource for purposes of the National Water Act. Reshaping or rebuilding its bank, placing material against the bank, operating within the regulated area, and repairing the stormwater outlet may constitute water uses under sections 21(c) and/or 21(i).

Before implementation, the Municipality must obtain written confirmation from the responsible Breede-Olifants Catchment Management Agency of the applicable authorisation route. This may require a risk assessment, registration under the prevailing General Authorisation, or a Water Use Licence.

2.4 Estuary-specific management instruments

In addition to the statutes above, the Keurbooms/Bitou estuarine system is governed by estuary-specific management instruments adopted under Chapter 4 of the ICM Act. The works described in this MMP fall within the estuarine functional zone of that system and must be undertaken in accordance with the following:

- Keurbooms Estuary Estuarine Management Plan (EMP), finalised January 2023 and adopted in terms of the National Estuarine Management Protocol (GN 341 of 2013). The EMP is the primary management instrument for the estuary and its functional zone. The activities proposed here — reshaping of the bank using in-situ shore sand, revegetation with locally indigenous species, and the express exclusion of dredging, excavation and hard structures (Section 6.8) — are consistent with the EMP objectives of maintaining estuarine habitat integrity, bank stability and natural sediment dynamics;
- National Estuarine Management Protocol (GN 341 of 2013), issued under section 33 of the ICM Act, which sets the standards for the management of estuaries and requires that activities within the estuarine functional zone be consistent with the applicable EMP; and
- Garden Route Coastal Management Programme (CMP), prepared in terms of section 49 of the ICM Act, which provides the district-level coastal management objectives applicable to the Bitou coastline.

Protection status: The Keurbooms/Bitou estuarine system is ranked among the twenty most important estuaries in South Africa in terms of conservation importance (National Biodiversity Assessment 2018, Estuarine Realm), on the basis of size, habitat and zonal-type rarity and biodiversity importance, but it

does not presently enjoy formal estuarine protected-area status. Management of the system therefore rests on the EMP and the instruments listed above rather than on a protected-area declaration.

3. Introduction, Background and Location

Eco Route Environmental Consultancy has been appointed to compile this Maintenance Management Plan on behalf of Bitou Local Municipality to enable the remedial repair and ongoing maintenance of storm-damaged lagoon embankments of Keurbooms Estuary at Poortjies, off Lagoon Drive, Plettenberg Bay. The purpose of this MMP is to guide the recovery works that restore the protective vegetated bank after storm events and to establish a repeatable maintenance regime, using existing shore sand and revegetation rather than replacing the bank with hard structures.

3.1 The May 2026 storm event

During the severe cut-off low-pressure system that moved across the southern Cape between 6 and 8 May 2026, elevated estuary water levels and wave action undercut and steepened the embankment along several sections of the Poortjies frontage. This resulted in near-vertical erosion scarps, the collapse and toppling of mature coastal-thicket trees onto the foreshore, exposure of root masses, exposure and partial dislodging of an existing municipal stormwater outlet pipe, and the wash-out of the informal boat / canoe access to the lagoon. Residents placed emergency sandbags at one location to arrest further loss. The continued headward (landward) retreat of the scarp now threatens Lagoon Drive, adjoining erven and municipal services, and has rendered the boat-launching access unsafe and largely unusable.

The event was a slow-moving cut-off low that stalled over the southern and Eastern Cape from 4 May 2026, with the most destructive conditions along the Bitou coastline occurring between 6 and 8 May 2026. Parts of the Garden Route recorded in excess of 300 mm of rainfall over three days. Plettenberg Bay and Knysna were placed under Orange Level 6 disruptive-rainfall warnings, with damaging coastal winds and waves warnings in force and deep-water wave heights reported in the 5–8 m range. The combination of elevated estuary water levels from catchment run-off, storm surge and sustained wave attack is the direct cause of the bank erosion described in Section 5. *(Sources: South African Weather Service impact-based warnings, May 2026; Garden Route District Municipality Multi-Agency Command Centre updates, 5–12 May 2026.)*

The Garden Route District Municipality described the event as the most severe flooding experienced in the district in approximately thirty years, with George, Bitou and Kannaland the worst-affected municipalities and up to 45 roads closed simultaneously across the eastern Garden Route on 7 May 2026. The event was classified as a national disaster under the Disaster Management Act. That classification provides factual context and may support disaster-recovery coordination, but does not by itself exempt remedial work from NEMA, the NWA, the ICM Act or other applicable approval requirements.

3.2 Locality

Poortjies is a sheltered tidal beach and long-established recreational boating and canoe-launching node on the western bank of the Keurbooms Estuary, within Bitou Local Municipality. The affected embankment and access lie within the littoral active zone and coastal protection zone.

3.3 Site Locality Map

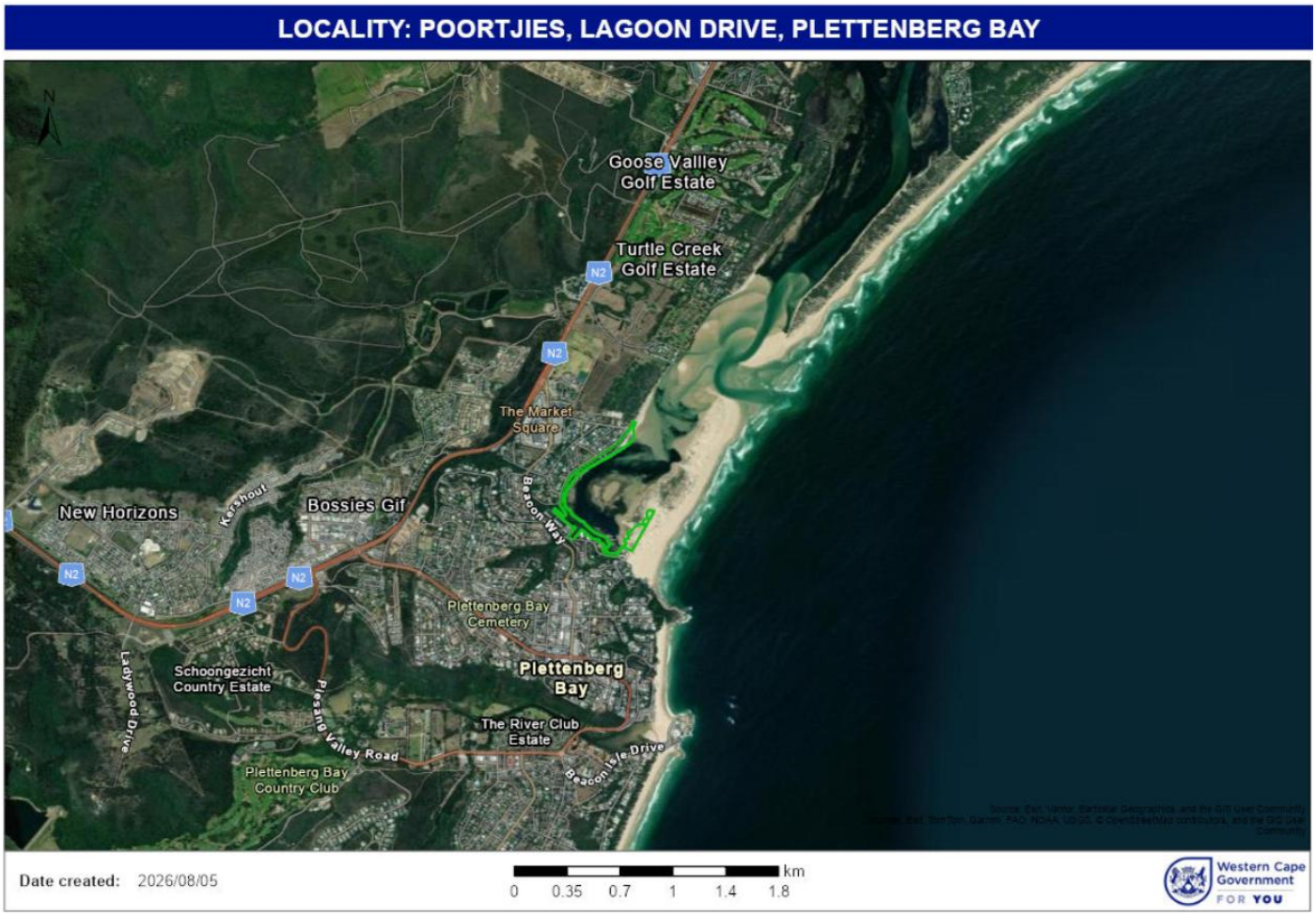


Figure 3-1: Poortjies locality. Aerial view of the subject embankment and access along Lagoon Drive on the western bank of the Keurbooms Estuary, Plettenberg Bay, with the site outlined in green.

4. Objectives of the MMP

The objectives of this MMP are to:

- Reshape the eroded and collapsed embankment sections to a stable, naturally-battered profile using sand already present within the immediate work zone;
- Re-establish a continuous, indigenous, vegetated dune / thicket cordon that binds the reshaped bank and resumes its erosion-buffering role;
- Protect Lagoon Drive, the adjoining erven and the existing municipal stormwater infrastructure from continued erosion and undermining;
- Achieve the above without excavation, without the dredging or removal of sand from the lagoon, and without the placement of any hard or permanent structures; and
- Provide a clear framework of roles, monitoring and reporting so the embankment can be repaired like-for-like after future storm events.

5. Site Description and Storm-Damage Assessment

The damage described below was recorded during a site inspection on 17 July 2026. A full photographic record is provided in Annexure A. Representative observations are summarised below.

5.1 Poortjies lagoon frontage

The vegetated embankment along the Poortjies frontage separates Lagoon Drive and the adjoining residential erven from the estuary foreshore and provides the primary erosion buffer for this infrastructure. Wave and current attack during the May 2026 storm undercut and collapsed several sections of the bank, producing near-vertical scarps and toppling mature coastal-thicket trees onto the beach, with exposed root masses and driftwood accumulating on the foreshore. A storm-cut gully / informal access has been eroded through the cordon down to beach level.

At the central section, an existing municipal stormwater outlet pipe and its rock surround have been exposed and partially dislodged where the bank has been washed away, with dwellings on the erven immediately above the scarp now at risk. At the boat / canoe launching node, the bank has been cut back to a near-vertical face immediately below the boat-storage area; residents have placed sandbags and debris to arrest further loss. The public launching area, no-wake signage and stored craft remain in use immediately landward of the eroded bank.

6. Description of the Proposed Maintenance Activities

6.1 General approach

The guiding principle of this MMP is to work with natural coastal and estuarine processes. The primary means of protecting the affected infrastructure is the reshaping and reinstatement of the vegetated embankment using sand already present on the adjacent shore, together with revegetation. All works are undertaken by hand or with light vehicles; no heavy earthmoving plant, excavation or dredging is proposed.

6.2 Reshaping and rebuilding of the eroded embankment using existing sand

The near-vertical erosion scarps are reshaped to a stable, naturally-battered slope and the lost embankment volume reinstated using dry wind-blown and back-beach sand that has accumulated on the adjacent foreshore above the water line. Sand is moved by hand or light machinery, placed against the scarp, lightly compacted and shaped to tie in with the adjacent un-eroded bank. This returns sand that would naturally re-deposit onto the bank, keeping the sediment within the local system.

- Only loose, dry sand lying above the active water line within the demarcated work zone may be used;
- No sand may be taken from, or won by dredging or excavation of, the lagoon bed, channel or intertidal / submerged zone;
- Reshaping is limited to re-establishing the pre-storm bank profile — the bank may not be extended seaward of, or raised above, its natural former position.

6.3 Optional geotextile (Hessian) separation / reinforcement

Where a scarp is particularly deep or subject to concentrated scour (for example adjacent to the exposed stormwater outlet), a permeable non-woven geotextile (hessian) separation layer may optionally be laid against the reshaped face beneath the replaced sand, with its upper edge keyed in and buried. The geotextile is a soft, flexible fabric that reduces internal erosion of the fine bank material and helps retain the placed sand while vegetation establishes. It is fully buried beneath sand, is intended to be colonised by vegetation roots, and does not present a rigid face, footing or wall; it is therefore not a hard or permanent structure. Its use is optional and site-specific, at the discretion of the ECO / engineer.

6.4 Revegetation, access reinstatement and sand-trapping

- Revegetation: re-establish indigenous dune pioneer and thicket species across the reshaped bank; re-set toppled but living plants and salvageable root-stock; plant local cuttings and seed. Revegetation is the primary long-term stabilisation measure.
- Sand-trapping / brush-packing: pack brushwood over newly planted areas, and install low rows of brushwood or sand fencing perpendicular to the prevailing wind to trap wind-blown sand and rebuild the fore-dune profile.
- Existing services: re-cover the exposed municipal stormwater outlet with the reshaped, vegetated bank; any pipe repair is a like-for-like municipal maintenance activity by hand within the work zone.

6.5 Equipment, methods and timeframes

- All works are undertaken by hand or with light vehicles / plant appropriate to sand movement; no heavy earthworks plant on the bank or beach is required.
- Detailed methods, quantities and timeframes for the work will be set out in the contractor's method statement and tender documentation, to be approved by the appointed engineer and the ECO before works commence.
- Embankment repair and reinstatement are event-driven and follow storm erosion on an as-needed basis; the initial post-2026 works will be the most extensive, with subsequent maintenance expected to be minor and ad hoc.

6.6 Maintenance frequency and triggers

- Routine inspection of the frontage before summer / at the start of the storm season.
- Inspection after any significant storm event that scarps the bank or exposes services or infrastructure.
- Emergency repairs — immediate hazard-reduction works (removal of unstable/collapsed material, temporary sand return) where a hazard is identified, reported under the Form A / Form B procedure.
- The initial post-2026 works are the most extensive; subsequent maintenance is expected to be minor and tied to the triggers above.

6.7 Maintenance process flow

Sequence of each maintenance event
Storm / erosion event
Municipal inspection & scoping of works
Notify DEA&DP (Form A, ≥ 7 working days before works)
ECO site inspection; tag plants; demarcate no-go areas
Maintenance / repair works (hand or light plant)
Revegetation & monitoring against success criteria
Final ECO compliance report (Form B) to DEA&DP

Figure 6-1: Maintenance process flow, from storm damage to final reporting.

6.8 Activities expressly excluded from this MMP

Table 6-1: Activities expressly excluded from this MMP.

- **No excavation of the embankment, foreshore or estuary;**
- **No dredging, mining or removal of sand from the lagoon bed, channel or intertidal zone;**
- **No placement of any hard or permanent structures — no revetments, gabions, retaining walls, sea walls, groynes, concrete or masonry works;**
- **No use of imported or foreign material (rubble, building sand, spoil) in the reshaped bank.**

7. Environmental Attributes

The subject area comprises the vegetated embankment (dune / coastal thicket) and foreshore of the Keurbooms Estuary, within the littoral active zone and coastal protection zone. The embankment provides an important ecological support and coastal-protection function. The works proposed are restorative in intent: their purpose is to re-establish indigenous dune / thicket vegetation and the natural dune buffer.

7.1 Coastal and estuarine processes

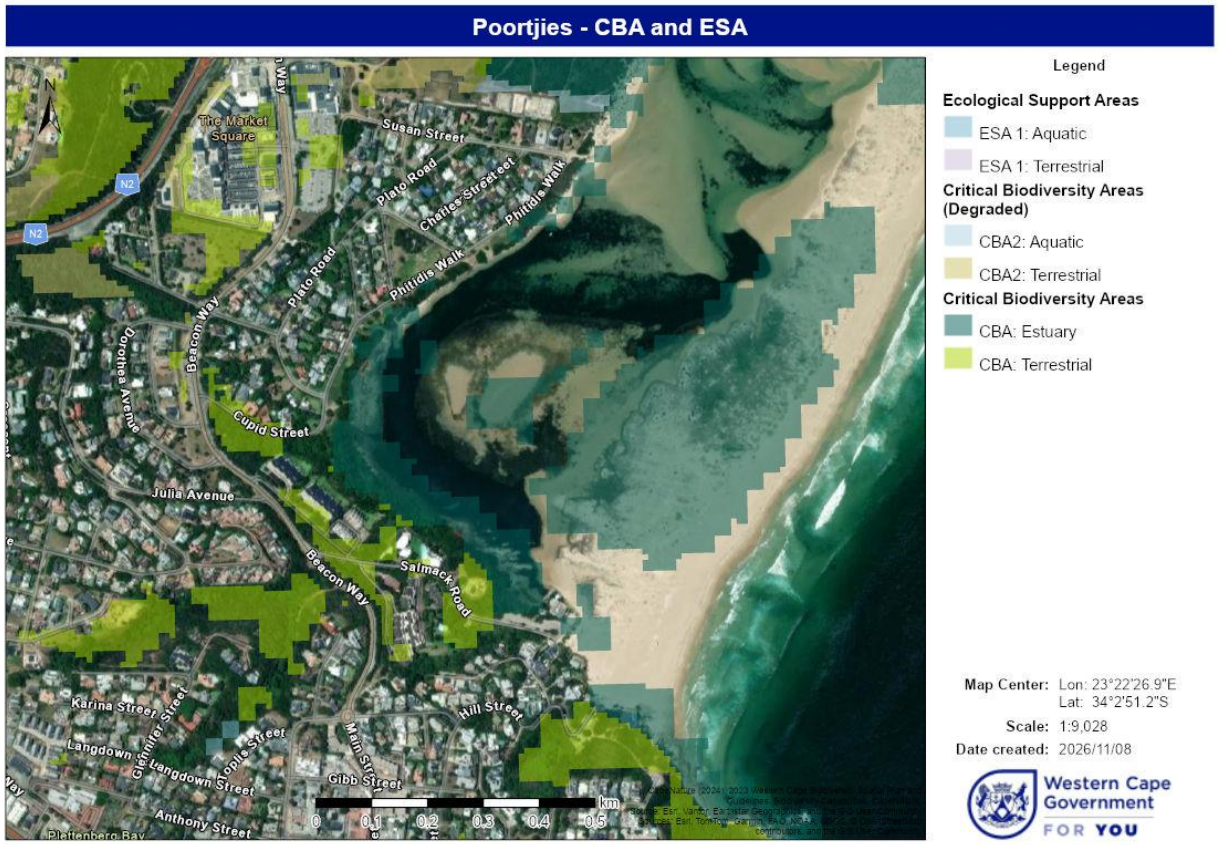
The Keurbooms Estuary is a dynamic system in which bank position and beach width naturally oscillate between eroded and accreted states. Storm-wave and current attack scarps the bank; subsequent aeolian (wind-driven) transport and vegetation trapping rebuild it over time. The maintenance regime is designed to assist this natural erosion–accretion cycle rather than to fix the bank position with hard structures.

7.2 Biodiversity importance and threatened species

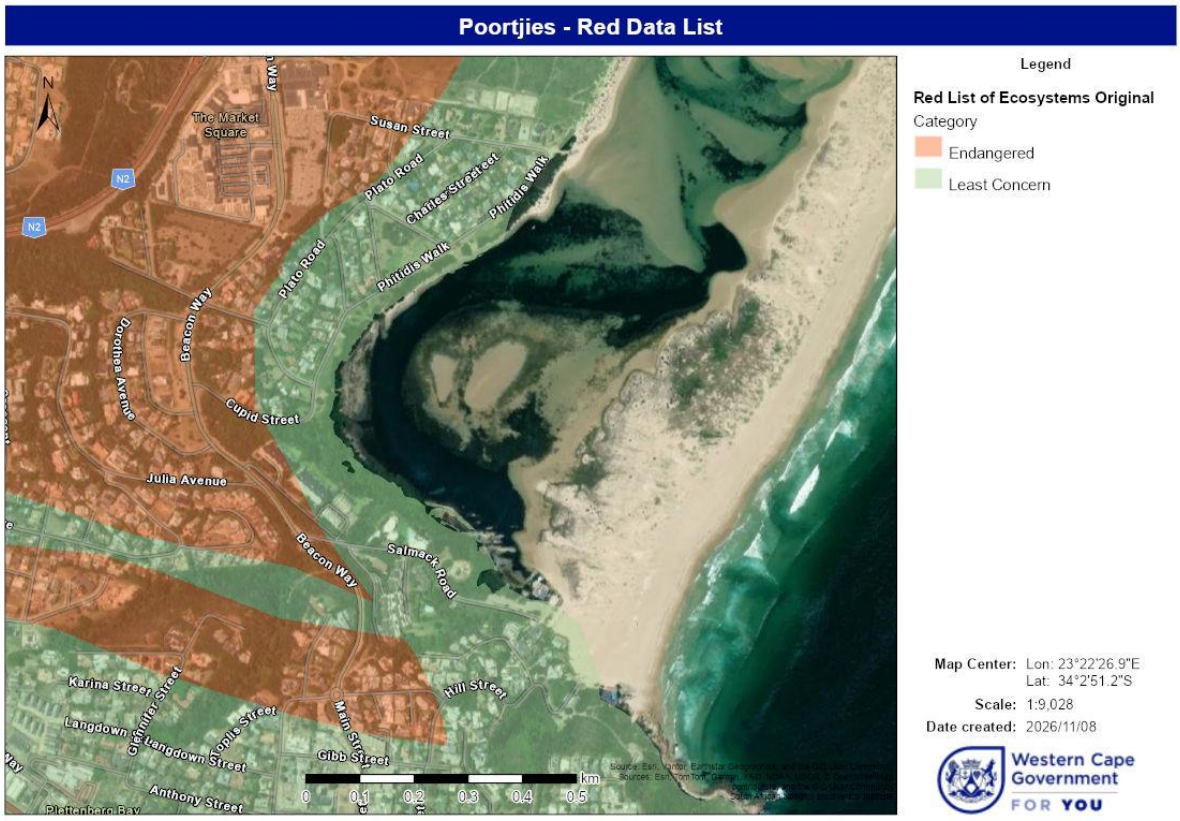
Mapped status. The site falls within the estuarine functional zone of the Keurbooms/Bitou estuarine system. Biodiversity priority areas for this area are mapped in the Western Cape Biodiversity Spatial Plan (WCBSP) 2023 — Garden Route (CapeNature, informed by the SANBI National Biodiversity Assessment), which supersedes the 2017 WCBSP. The estuarine functional zone and the adjoining vegetated margin along the Poortjies frontage are mapped as biodiversity priority areas in that plan, and the mapped extents applying to the works footprint are shown in Figures 7-1 to 7-2 below.

Conservation importance and protection status. The Keurbooms/Bitou estuarine system is ranked among the twenty most important estuaries in South Africa in terms of conservation importance (National Biodiversity Assessment 2018, Estuarine Realm), and supports one of the largest recorded extents of *Zostera capensis* (Cape eelgrass) of any South African estuary. The system is not a formally declared estuarine protected area and is managed through the Keurbooms Estuary Estuarine Management Plan (2023) — see Section 2.4.

Vegetation and species of conservation concern. The embankment at Poortjies supports indigenous southern Cape dune thicket and forms part of the vegetated ecological corridor along the western margin of the estuary. The works are confined to the already-disturbed, storm-scarped section of that corridor and are restorative in intent. Species of conservation concern that may be present — including nesting shorebirds, protected dune flora, and *Sideroxylon inerme* (white milkwood), protected in terms of the National Forests Act, 1998 (Act No. 84 of 1998). Before final demarcation, a suitably qualified botanist must map every protected tree and determine whether any vegetation constitutes natural forest. No cutting of roots or branches, disturbance, transplanting, removal, stockpiling or disposal of protected-tree material may occur unless authorised under the National Forests Act. An ECO's instruction does not substitute for a forestry licence.



Figures 7-1 Critical Biodiversity Areas and Ecological Support Areas. CBA, degraded CBA and ESA mapping at Poortjies (Western Cape Biodiversity Spatial Plan).



Figures 7-2 Red List of Ecosystems. Terrestrial ecosystem threat status at Poortjies (Western Cape Biodiversity Spatial Plan / SANBI).

7.3 Ecological functioning and coastal-protection role

The vegetated embankment dissipates wave and current energy, buffers landward infrastructure against storm surge, stores and supplies sand to the beach through the natural sediment budget, and provides habitat continuity along the estuary margin. Maintaining a naturally-profiled, vegetated bank therefore protects both the ecological functioning of the system and the public infrastructure behind it.

7.4 Existing disturbance

The site is already substantially developed for public recreation, with a road reserve, residential erven, boat storage and a public launching node. Long-standing seasonal use pressure and informal access paths have reduced the resilience of sections of the cordon. The May 2026 storm has left fresh erosion scarps, dislodged timber / debris and exposed services. The proposed works are confined to the already-disturbed footprint and do not extend into intact, undisturbed dune / estuary habitat.

8. General Environmental Management and Mitigation Measures

8.1 Environmental Control Officer (ECO)

An ECO must be appointed to oversee compliance with this MMP. The ECO must induct all contractors before works commence, must approve method statements before work begins, must inspect the site during the works and on completion (see Section 10), and must have the authority to stop work and instruct remedial action. The applicant is responsible for the appointment and remuneration of the ECO. For routine post-storm maintenance the Municipality may appoint a suitably briefed responsible official to fulfil this role.

8.2 Pre-construction phase

8.2.1 Environmental education / induction

All personnel must receive an environmental induction from the ECO covering the sensitivities of the site (no-go areas, waste management, emergency procedures). Induction registers are to be kept.

8.2.2 Method statement

No activity may commence until a written method statement for that activity has been submitted to, and approved in writing by, the ECO and the appointed engineer. Each method statement must identify the work area and access route, the sequencing and programme, the plant and materials to be used, materials storage, erosion and sediment control measures, and the responsible site supervisor. Method statements are required, as a minimum, for the following activities:

- Embankment reshaping and sand re-profiling — the identified sand source(s) within the demarcated work zone, the volume of sand to be moved (m³), the target bank profile and batter angle, the sequence of placement and compaction, and written confirmation that no sand will be sourced from the lagoon bed, channel or intertidal/submerged zone;
- Geotextile (hessian) placement, if used — product specification and grade, the extent and position of the layer, depth of sand cover, anchoring and overlap detail, and confirmation that the material will be fully buried and that no hard or permanent structure results;
- Sand movement and the use of light plant on the bank and foreshore — plant type, mass and ground pressure, approved access route and turning areas, tracking and speed restrictions, refuelling and maintenance arrangements and their location behind the bank, and measures to prevent compaction, rutting and disturbance outside the demarcated footprint;

- Vegetation rescue, salvage and transplanting — the identification and tagging protocol, the lifting, heeling-in and temporary holding method, watering arrangements, the maximum permissible holding period before replanting, and the person responsible;
- Revegetation and rehabilitation — the species list and plant provenance, planting densities and layout, cutting and seed collection method and rates, brush-packing and sand-trapping detail, and the aftercare programme (watering, replacement of failed plants, alien clearing) and its duration, referenced to the success criteria in Section 8.4.1;
- Waste management and removal — the waste streams anticipated (including storm debris, sandbags, tyres, dislodged pipe sections and other foreign material removed from the bank), on-site storage arrangements, frequency of removal, and the approved disposal facility to be used, with disposal certificates retained for the compliance record; and
- Emergency and hazard-reduction works — the scope of works that may be undertaken as immediate hazard reduction ahead of full approval, the person authorised to instruct them, the environmental controls that nonetheless apply, and the reporting route under the Form A / Form B procedure (Section 10).

Approved method statements must be kept on site for the duration of the works and form part of the ECO's compliance record. Any material deviation from an approved method statement requires a revised method statement, approved in writing before the affected work continues.

8.2.3 Site demarcation

- The approved work zone and single access route must be clearly demarcated; all areas outside are no-go areas.
- Public access to the active work area must be safely controlled while general beach / lagoon access is maintained via signage and an alternative route.

8.2.4 Access, site camp and materials

- A single access route is used; any laydown / storage area must be approved by the ECO and located away from the estuary margin.
- Chemical ablution facilities are to be provided and maintained if required; no accommodation on site.

8.2.5 Plant rescue and vegetation

The ECO is to identify and tag indigenous dune / thicket plants for rescue and re-use in rehabilitation. Clearing of intact indigenous vegetation is to be avoided; only vegetation unavoidably within the repair footprint may be disturbed, and such material is to be salvaged for replanting where viable.

8.3 Construction (maintenance) phase

- All sand handling by hand or light vehicle only, restricted to dry sand above the water line within the demarcated zone; no lagoon sand, no dredging, no excavation.
- No hard or permanent structures to be placed; optional buried geotextile (hessian) only, fully covered by sand.
- Signage: appropriate safety and public-information signage to be maintained at all work areas and access closures.
- Protection of surrounding habitat: confine all activity to the demarcated footprint; the estuary, foreshore and standing vegetation beyond the work zone are off-limits.

8.4 Rehabilitation requirements

Once reshaping is complete, all exposed sand areas are to be stabilised and revegetated with locally indigenous, naturally-occurring species. Species suitable for rescue and re-use, and for planting from cuttings and seed, include (subject to local availability and specialist confirmation):

- *Arctotheca populifolia* (sea pumpkin); *Gazania rigens* (trailing gazania); *Carpobrotus edulis* (sour fig); *Tetragonia decumbens* (dune spinach); *Sporobolus virginicus* (brakgras);
- *Passerina rigida* (seekoppiesgonna); *Searsia* (Rhus) *crenata* (dune crow-berry); *Chrysanthemoides monilifera* (bietou); *Sideroxylon inerme* (white milkwood — protected; no removal).

Cuttings of local creepers and creeping succulents are to be planted into the rehabilitated areas; brushwood is packed to protect them from wind erosion and to prevent foot access; and local seed is collected and distributed to increase diversity. No alien invasive vegetation is to be introduced, and any alien species encountered are to be controlled by accepted clearing methods.

8.4.1 Rehabilitation success criteria

- At least 80% indigenous vegetation cover established over rehabilitated sand areas within 12 months;
- No active blow-outs or unvegetated deflation hollows in the rehabilitated bank;
- A stable, naturally-profiled bank re-established (no over-steepened scarps in the maintenance footprint);
- Safe, functioning single access reinstated to the lagoon; and
- No erosion or scour around reinstated services, with no introduced alien invasive species.

8.5 Maintenance requirements

This is a maintenance management plan: the initial (post-storm) works correct the current damage, while ongoing maintenance keeps the embankment intact. After each significant storm event the frontage is inspected and, where necessary, sand returned to the bank and vegetation re-established on a like-for-like basis in accordance with this MMP, using Forms A and B (Section 10 / Annexure B).

8.6 Emergency response procedures

The following procedures apply for the duration of the works. A copy must be kept on site with the emergency contact list, and each procedure must be covered in the ECO's induction (Section 8.2.1). All incidents must be recorded in the site incident register and reported to the ECO.

- **Fuel and oil spills.** A spill kit (absorbent material, drip tray, sealable containers, shovel and bags) must be kept on site at all times. Fuel, oil and lubricants must be stored in a bunded, hardened store located behind the bank and away from the estuary margin, on an impermeable surface; drip trays must be placed beneath all stationary plant, generators and refuelling operations. Response: stop the source, contain immediately with absorbent material or a sand berm, and prevent any discharge to the estuary; remove contaminated sand or soil to an approved disposal facility. Report to the ECO and the Municipality within 24 hours and record in the incident register; report spills of a reportable quantity to DEA&DP.
- **Injuries.** A stocked first-aid kit and a trained first-aider must be present whenever work is in progress. A legible emergency contact list (ambulance, NSRI, nearest hospital, municipal emergency services, ECO, engineer and site agent) must be posted at the site entrance and carried by the site supervisor. All works must comply with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the Construction Regulations. Response: administer first aid and summon emergency services; make the area safe and suspend work in the affected area pending investigation; record and report the incident to the ECO and the Municipality.
- **Fire.** No open fires are permitted on site. A serviced fire extinguisher must be available at the work area and at any fuel store, with fire beaters or a knapsack sprayer where standing vegetation is present. Hot work (cutting, grinding, welding) requires a permit from the site supervisor, a fire watch during the work and for 30 minutes afterwards, and must not be undertaken in high wind. Response: evacuate the work area, alert the fire service and the ECO immediately, and attempt suppression only where it is safe to do so.

- **Archaeological and heritage chance finds.** Shell middens, human remains, artefacts and structural remains may be exposed by erosion or by reshaping works. Response: stop work in that area immediately, cordon off the find and leave it undisturbed, and notify the ECO. The ECO must notify Heritage Western Cape without delay and, where human remains are involved, the South African Police Service. Work may resume in the affected area only on the written instruction of Heritage Western Cape. Finds must not be removed, collected, cleaned or handled.
- **Pollution incidents.** Cement and concrete washings, contaminated water, chemical toilet effluent and general waste must not be permitted to enter the estuary. Any mixing or washing of tools must take place in a lined, bunded area behind the bank, with the wash water contained and removed from site; run-off from the work area must be controlled with silt screens or sand berms. Waste must be stored in covered, wind-proof containers and removed to an approved facility. Response: contain at source, prevent discharge to the estuary, notify the ECO immediately and record the incident. The ECO may stop work and instruct remediation at the contractor's cost.
- **Severe storms or high water during works.** Works must be suspended when a severe weather warning is issued for the area, or when high estuary levels, heavy rainfall, spring high tides or large seas are forecast. Before suspension: move or secure all plant, materials, fuel and waste containers above the anticipated water level; batter down and cover any open or over-steepened faces; and secure silt screens, brush-packing and demarcation. Response after the event: the site supervisor and the ECO must inspect the site, assess any new damage or hazard, and review the works and the approved method statement before work resumes.

8.7 Impact assessment and significance

The principal impacts associated with the maintenance activities are assessed below, with significance expressed both without and with the mitigation measures set out above. All identified impacts are of low significance once mitigation is applied, and the works carry a net positive environmental benefit through restoration of the vegetated estuarine bank.

8.7.1 Disturbance of estuarine water quality (turbidity / sedimentation)

Table 8-1: Impact 1, disturbance of estuarine water quality — nature and description.

Nature & description	Reshaping the bank and placing sand near the estuary could mobilise fine sediment, causing localised, temporary turbidity — mitigated by working above the water line, using silt screens, and vegetating promptly.

Table 8-2: Impact 1, disturbance of estuarine water quality — significance rating.

Criterion	Without mitigation	With mitigation
Nature	Negative	Low negative
Duration	Short term (0–5 yrs)	Very short (< 1 yr)
Extent	Localised (site)	Localised (site)
Intensity	Low–Moderate	Low
Probability	Probable	Improbable
Reversibility	Fully reversible	Fully reversible
Significance	**MINOR**	**NEGLIGIBLE**

Cumulative impact: Insignificant; confined to the work zone and short in duration.

8.7.2 Disturbance to / loss of indigenous coastal-thicket vegetation

Table 8-3: Impact 2, disturbance to and loss of indigenous coastal-thicket vegetation — nature and description.

Nature & description	Reshaping and access forming may disturb vegetation and expose sand to alien colonisation; however the works are fundamentally rehabilitative and re-establish cover already lost to the storm.

Table 8-4: Impact 2, disturbance to and loss of indigenous coastal-thicket vegetation — significance rating.

Criterion	Without mitigation	With mitigation
Nature	Negative	Low negative / Positive
Duration	Short term (0–5 yrs)	Short term, then positive
Extent	Localised (site)	Localised (site)
Intensity	Low–Moderate	Low
Probability	Probable	Improbable
Reversibility	Fully reversible	Fully reversible
Significance	**MINOR**	**NEGLIGIBLE / POSITIVE**

Cumulative impact: Net positive; restores indigenous cover on an eroding, de-vegetated bank.

8.7.3 Bank instability, erosion and disturbance from site works and access use

Table 8-5: Impact 3, bank instability, erosion and disturbance from site works and access use — nature and description.

Nature & description	Movement of people, light vehicles and materials, and access reinstatement, could cause localised compaction, rutting or renewed scour if poorly managed; mitigated by a single demarcated route, stable batters and dispersed stormwater discharge.

Table 8-6: Impact 3, bank instability, erosion and disturbance from site works and access use — significance rating.

Criterion	Without mitigation	With mitigation
Nature	Negative	Low negative
Duration	Short term (0–5 yrs)	Very short (< 1 yr)
Extent	Localised (site)	Localised (site)
Intensity	Moderate	Low
Probability	Probable	Improbable
Reversibility	Fully reversible	Fully reversible
Significance	**MINOR**	**NEGLIGIBLE**

Cumulative impact: Insignificant to positive; a consolidated access and revegetated bank reduce long-term erosion risk to the road, services and erven.

9. Penalties for Non-Compliance

Penalties in terms of the applicable environmental legislation (NEMA and associated provincial legislation) apply to any action that causes avoidable damage to the natural environment. In the event of avoidable environmental damage, the contractor will be responsible for the cost of clean-up, repair or rehabilitation, in addition to any fine. The polluter-pays principle applies throughout.

10. Monitoring and Reporting

10.1 Reporting procedure

- Reporting Form A (Annexure B) must be completed and submitted to DEA&DP at least seven (7) working days before the commencement of any maintenance activity, describing the intended activity, method, footprint and volumes, and including 'before' photographs with coordinates.
- Reporting Form B (Annexure B) must accompany the ECO's compliance report on completion of the maintenance activity.

10.2 Maintenance-work monitoring procedure

- An induction meeting between the ECO / municipal environmental officer and the contractor is to be held before activities commence; induction registers to be kept.
- The ECO is to inspect the site before commencement to tag plants for rescue and demarcate no-go areas.

- The ECO is to inspect the site at least weekly during the works and rehabilitation phase and submit a monthly compliance report to the contractor, applicant and DEA&DP.
- On completion, the ECO is to submit a final compliance report signing off environmental compliance to DEA&DP, the engineer and the applicant within one (1) month of completion of the works, irrespective of the status of ongoing revegetation.

10.3 Monitoring schedule

Table 10-1: Monitoring schedule.

Activity	Frequency	Responsible
ECO site inspections	Weekly during works	ECO
Photographic (fixed-point) monitoring	Monthly	ECO
Vegetation establishment / success	Quarterly	ECO
Storm-damage inspection	After every storm event	Municipality / ECO
Compliance reporting	Monthly during works; final within 1 month of completion	ECO
Annual dune / infrastructure review	Annually (pre-storm season)	Municipality / ECO

10.4 Authority notification process

The Form A / Form B procedure follows the sequence below for each maintenance event:

Authority notification process for each maintenance event
Storm / erosion event or reported damage
Municipal inspection & scoping of works
Form A notification to DEA&DP (≥ 7 working days before works)
Maintenance works undertaken
ECO monitoring & compliance report
Form B — final ECO compliance report to DEA&DP

Figure 10-1: Authority notification process for each maintenance event.

11. Conclusion

The May 2026 storm caused significant erosion and localised collapse of the vegetated lagoon embankment at Poortjies, undercutting Lagoon Drive and the adjoining erven, exposing municipal stormwater infrastructure and rendering the boat / canoe access unsafe. The works described in this MMP are maintenance and remedial in nature: they reshape and rebuild the eroded embankment using sand already present on the shore, re-establish the indigenous vegetated cordon, and reinstate a single safe access — without excavation, without dredging or removal of lagoon sand, and without any hard or permanent structure. Subject to competent-authority acceptance of this MMP, confirmation of the applicable NWA authorisation route, receipt of any required coastal, forestry and biodiversity permissions, and strict compliance with the approved maintenance envelope, the defined activities may qualify for the relevant maintenance exclusions. Any enlargement, relocation, change in capacity, hardening, new stabilisation system, imported fill, work below the approved beach limit or deviation from the approved envelope must be screened separately before implementation.

12. References

- Republic of South Africa. National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), and the EIA Regulations, 2014 (as amended), Listing Notices 1, 2 and 3.
- Republic of South Africa. National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) (ICM Act).
- Republic of South Africa. National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA).
- Republic of South Africa. National Water Act, 1998 (Act No. 36 of 1998).
- Garden Route District Municipality. Garden Route Coastal Management Programme (CMP).
- Western Cape Department of Environmental Affairs & Development Planning (DEA&DP). Guideline on Maintenance Management Plans.
- Western Cape Government. Western Cape Biodiversity Spatial Plan (CBA / ESA mapping).
- Republic of South Africa. Disaster Management Act, 2002 (Act No. 57 of 2002).
- Republic of South Africa. National Forests Act, 1998 (Act No. 84 of 1998) (protected tree species).
- Republic of South Africa. National Estuarine Management Protocol, GN 341 of 2013, published in terms of the National Environmental Management: Integrated Coastal Management Act, 2008.
- Western Cape Government, Department of Environmental Affairs & Development Planning. Keurbooms Estuary Estuarine Management Plan. Final, January 2023.
- CapeNature. Western Cape Biodiversity Spatial Plan and Guidelines, 2023 (Garden Route CBA / ESA map series).
- South African National Biodiversity Institute (SANBI). National Biodiversity Assessment 2018, Volume 3: Estuarine Realm. Technical Report, 2019.
- South African Weather Service. Impact-based severe weather warnings, Western and Eastern Cape, May 2026.
- Garden Route District Municipality. Multi-Agency Command Centre situational updates, 5–12 May 2026.

Annexure A, Photographic Damage Record

Photographs taken during the site inspection of 17 July 2026 by Eco Route Environmental Consultancy. Plates are numbered A.1 to A.8 and are referenced in Section 5.1. Camera date and time stamps are retained on each image.

Table A-1: Photographic damage record, Poortjies lagoon frontage (site inspection, 17 July 2026).



Plate A.1: Near-vertical erosion scarp along the northern section of the Poortjies frontage. The coastal-thicket cordon has been undercut, exposing root masses and leaving toppled and dead branches overhanging the scarp face. Storm debris and driftwood are strewn across the foreshore at the toe of the bank. Photograph taken 17 July 2026.



Plate A.2: Central section: the municipal stormwater outlet pipe has been exposed and its sections dislodged onto the foreshore, together with the rock surround that formerly protected it. The embankment behind has collapsed to a raw, near-vertical face, with a dwelling on the adjoining erf immediately above the scarp. Photograph taken 17 July 2026.



Plate A.3: Detail of the dislodged municipal stormwater outlet pipe lying on the foreshore, with a further pipe section and the outlet opening visible in the collapsed bank behind. The thicket above the outlet is undercut and its root mass exposed. Photograph taken 17 July 2026.



Plate A.4: Boat and canoe launching node: the embankment has been cut back to a near-vertical face immediately below the boat-storage area. Stored craft, the public launching area and the adjoining erven sit directly above the scarp; emergency sandbags placed by residents are visible at the scarp face. Photograph taken 17 July 2026.





Plate A.5: Emergency sandbags and a tyre placed by residents against the eroded scarp below the boat-storage area, arresting further loss of the bank. The scarp face is unvegetated and over-steepened, with the erven, parking and stored craft immediately landward. Photograph taken 17 July 2026.

Plate A.6: Near-vertical scarp cut through the vegetated dune / thicket cordon south of the launching node, with the thicket canopy undercut and root masses exposed along the full height of the face. Photograph taken 17 July 2026.



Plate A.7: Extended length of near-vertical erosion scarp along the frontage, showing continuous undercutting of the coastal-thicket cordon, exposed and desiccated root masses, and collapsed vegetation on the beach at the toe of the bank. Photograph taken 17 July 2026.



Plate A.8: Storm-cut informal access / gully eroded through the cordon down to beach level at the lagoon edge, with stored canoes and craft on the bank above. Storm debris, burst sandbags and dislodged material lie across the eroded surface, and the informal access track is no longer safely usable. Photograph taken 17 July 2026.

Annexure B, Reporting Forms

Form A must be completed and submitted to DEA&DP at least seven (7) working days before the commencement of any maintenance activity.

Table B-1: Form A, intent to undertake maintenance activities.

FORM A — Intent to undertake maintenance activities	
Landowner / applicant	Bitou Local Municipality
MMP / DEA&DP reference	[TBC]
Activity type & reference to MMP	[e.g. 6.2 Embankment reshaping / 6.4 Access reinstatement]
Footprint area (m²) / Volume of sand (m³)	[____ m² / ____ m³]
Equipment to be used	Hand tools / light vehicle
Method (summary)	[Describe per approved method statement]
Date work will commence	[____ / ____ / 20__]
Date of last storm / flood event	[____ / ____ / 20__]
Photographs before maintenance (coordinates)	[Attach Before/After A & B with S / E coordinates and date]

Form B must accompany the ECO's compliance report on completion of each maintenance activity, with before-and-after photographs and coordinates.

Table B-2: Form B, completion of maintenance activities.

FORM B — Completion of maintenance activities	
Landowner / applicant	Bitou Local Municipality
MMP / DEA&DP reference	[TBC]
Activity type & reference to MMP	[e.g. 6.2 Embankment reshaping / 6.4 Access reinstatement]
Footprint area (m²) / Volume of sand (m³)	[____ m² / ____ m³]
Equipment to be used	Hand tools / light vehicle
Method (summary)	[Describe per approved method statement]
Date activity completed	[____ / ____ / 20__]
Date of last storm / flood event	[____ / ____ / 20__]
Photographs after maintenance (coordinates)	[Attach Before/After A & B with S / E coordinates and date]

Form C — ECO compliance checklist

The checklist below must be completed and signed by the ECO and submitted with the final compliance report and Form B on completion of each maintenance activity. Every item must be marked compliant (✓), non-compliant (X) or not applicable (N/A); any non-compliance must be explained in the Comment column, together with the corrective action taken and the date of close-out.

Table B-3: ECO compliance checklist for the Poortjies MMP.

Requirement	Compliant ✓ / X / N/A	Comment
ECO appointed in writing, and environmental induction completed for all site personnel (induction register retained)		
Method statements submitted and approved in writing by the ECO and engineer before each activity commenced (Section 8.2.2)		

Requirement	Compliant ✓ / ✗ / N/A	Comment
Work zone, single access route and no-go areas demarcated on site and maintained for the duration of the works		
Sand sourced only from dry sand lying above the active water line within the demarcated work zone		
No dredging, excavation or removal of sand from the lagoon bed, channel or intertidal / submerged zone		
Silt screens deployed at the water's edge where required, and maintained in serviceable condition		
No hard or permanent structures placed; any geotextile (hessian) fully buried beneath sand		
Indigenous plants identified, tagged and rescued by the ECO before works, and held and watered in accordance with the approved method statement		
Revegetation completed to specification (species, provenance, densities and layout) across all rehabilitated areas		
Brush-packing and sand-trapping installed over newly planted and rehabilitated areas		
Exposed municipal stormwater outlet re-covered by the reshaped, vegetated bank		
All waste, storm debris, sandbags and foreign material removed to an approved disposal facility (disposal certificates retained)		
Site rehabilitated and a single safe public access to the lagoon reinstated		
Form A submitted to DEA&DP at least seven (7) working days before commencement		
Form B submitted together with the ECO's final compliance report on completion		
ECO name and professional registration		
ECO signature		
Date		