

5. DESIRED STATE OF ENVIRONMENT (MANAGEMENT ZONES)

The zone assessments have identified the attributes that are sensitive and which require special management interventions. It has also identified the priorities for environmental management.

In principle, any activity that is able to advance the EMF objectives and that can develop within the Limits of Change can be regarded as a preferred or desirable activity. The converse is also true.

The outcome statement that defines the Desired State of Environment for the study area (**Figure 48**) was used as a benchmark to inform this section. The purpose is to identify proactive management measures for the priorities identified during the zone assessments.

Global change and landscape sustainability:

NEMA requires that "*the disturbance of landscapes be avoided, or where it cannot be avoided that it be minimised or remedied*". While sustainability of the future landscape will be strongly influenced by the proactive management measures adopted henceforth there are forces *external* to the study area associated with global change that will also determine the extent to which sustainability of the landscape could be achieved into the future. Potential external threats must constantly be identified and kept in mind when the future is planned.

Management of the environmental asset system:

The EMF supports the protection and management of the environmental asset system of the study area in accordance with the municipal guidelines in the Environmental Services Management Plan.

5.1 Zone 1: Lake Areas

Sustainability of the landscape is strongly dependent on hydrological health and quantity of water in the system. The anticipated growth for the study area means that water will remain the most limiting factor for development. Water consumption and use should therefore be minimised through measures that promote improved management and monitoring of the water resource. Any form of abstraction from the underground aquifer must be discouraged and strict measures must apply to protect the groundwater aquifer.

South Africa is a water scarce country and the availability of water from the upstream catchments is not guaranteed over the short-term. Water efficiency technologies must therefore be at the forefront of development decisions in the area.

The prevention, rather than mitigation of the effects of poor water quality has to be given greater emphasis in the area, specifically considering the vulnerability of the aquatic systems, the limited information available on water quality, and the uncertainty about changes which could be tolerated. The sensitivity of the area and the few options that exist for mitigating the effects of poor water quality also underscores the need for the most stringent management control to minimise risks.

There is an urgent need to improve coordination between the institutions that are involved in the management of the water resource.

The following parameters must guide planning and decision-making in the area.

ISSUE	DESIRED STATE OF ENVIRONMENT: LAKE AREAS
Hydrology	<ul style="list-style-type: none"> • Retain sustainable yield (economic) and maintain ecological functioning (water quantity and quality). • Ensure the RDM of aquatic function. • There should not be increased risk of sedimentation. • Protect streams and rivers feeding the lakes. • Protect groundwater quantity and quality.
Ecosystem Types	<ul style="list-style-type: none"> • Ensure the buffering ability of riparian environments by maintaining their vegetation.
Atmosphere	<ul style="list-style-type: none"> • Maintain air quality within set standards (LAC) • Compliance with national emission standards (LAC).
Land use	<ul style="list-style-type: none"> • Land-based activities must not negatively impact water use/yield or increase sedimentation.
Sustainable Livelihoods	<ul style="list-style-type: none"> • Human vulnerability is reduced by ensuring that water quality is maintained, and access to natural resources is secured. • Upmarket developments that restrict access to water bodies should not be encouraged.
Governance	<ul style="list-style-type: none"> • Facilitate cooperation in respect of the environmental priorities in the area to ensure the achievement of the desired state of the environment.

5.2 Zone 2: Floodplain Area

The zone is important for the national, regional and local economy as it supports the Port of Richards Bay, and large-scale commercial sugar cane production. It should accordingly be managed to facilitate long-term economic growth. The proposed port expansion plan, which spans more than 50 years, will however destroy critical ecological assets and have the potential to significantly harm the ecological sustainability base for downstream economies. A precautionary approach should guide the management of this proposal. There are undesirable and illegal activities in this zone that influence the resource capacity required for advancing sustainable port expansion. Remediation and rehabilitation of these activities, for example the gypsum slimes dams, must commence and achieve an acceptable level of quality *before* port expansion is allowed. Strict management control with a strong focus on compliance and enforcement with existing environmental standards should therefore be a short-term priority.

Any development in the immediate, short or medium term that is proposed on the floodplain must be considered in accordance with the proposed port expansion and offset proposals. In other words no development other than port expansion should be advanced on the floodplain.

Port expansion should only be supported AFTER land has been acquired and the recreation of habitats for off-sets has started (and have achieved certain levels of functionality).

The following parameters must guide planning and decision-making in the area. The table also provide guidance in terms of appropriate development types.

ISSUE	DESIRED STATE OF ENVIRONMENT: FLOODPLAIN
Hydrology	<ul style="list-style-type: none"> • The ability to attenuate and route floods (floods, cyclones, storms, tsunamis) is retained by ensuring enough storage capacity. • Maintain water quality (manage sediments) • No net loss of wetland functionality (LAC)
Ecosystem Types	<ul style="list-style-type: none"> • Current biodiversity integrity is maintained through the maintenance of linkages, corridors and critical habitats • No net loss of ecosystem integrity (LAC) • No net loss of intertidal habitat productivity (LAC)
Atmosphere	<ul style="list-style-type: none"> • Maintain air quality within set standards (LAC) • Compliance with national emission standards (LAC)
Land use	<ul style="list-style-type: none"> • Maintain the Port estuary for facilitating trade • Land-based activities must not negatively impact hydrological functioning, marine or estuarine resources. • Maintain justifiable and appropriate agricultural production in the short and medium term. • No release of land for development that would compromise offset areas (LAC) • Compliance to existing environmental standards (LAC) • Contaminated sites identified (LAC)
Sustainable Livelihoods	<ul style="list-style-type: none"> • Human vulnerability is reduced by ensuring that environmental quality is maintained, and sustainable access to natural resources and recreational activities is secured.
Governance	<ul style="list-style-type: none"> • Facilitate cooperation in respect of the environmental priorities in the area to ensure the achievement of the desired state of the environment.

5.3 Zone 3: Estuary, Marine and Seashore Area

The zone is equally important for the national, regional and local economy as it supports the Port of Richards Bay. It should accordingly be managed to facilitate long-term economic growth while the significance of the port estuary as an ecosystem type is maintained. The proposed port expansion plan, which spans more than 50 years, will however destroy critical ecological assets and have the potential to significantly harm the ecological sustainability base for downstream economies. A precautionary approach should guide the management of this proposal.

The following parameters must guide planning and decision-making in the area. The table also provide guidance in terms of appropriate development types.

ISSUE	DESIRED STATE OF ENVIRONMENT: ESTUARY, MARINE AND SEASHORE AREA
Hydrology	<ul style="list-style-type: none"> • Maintain hydrological functioning through the protection of hydrological linkages (streams, groundwater, flow and quality) and buffers (riparian zones) • Maintain the established freshwater RDM (quantity and quality) • Maintain tidal prism (mouth not to close) • Compliance to water quality guidelines (LAC)
Ecosystem Types	<ul style="list-style-type: none"> • The ecological function and diversity of the estuary and marine environment is maintained. • Maintain vegetation cover. • Maintain hydrological functioning, especially the pattern of temporal variability. • The biodiversity of the beach habitats is maintained. • Maintain ecological integrity of the land-sea interface. • No net loss of ecosystem integrity (LAC) • No net loss of intertidal habitat productivity (LAC)
Atmosphere	<ul style="list-style-type: none"> • Maintain air quality within set standards (LAC) • Compliance with national emission standards (LAC)
Land use	<ul style="list-style-type: none"> • Maintain the Port estuary for facilitating trade • Activities must not negatively impact marine and estuarine resources • Compliance to existing environmental standards (LAC)
Sustainable Livelihoods	<ul style="list-style-type: none"> • Human vulnerability is reduced by ensuring that environmental quality is maintained. • Access to recreational areas is secured (LAC)
Governance	<ul style="list-style-type: none"> • Facilitate cooperation in respect of the environmental priorities in the area to ensure the achievement of the desired state of the environment.

5.4 Zone 4: Dune Cordon

The protection of dune stability precludes any development in the northern and southern parts of the zone. The central dune cordon of the area is however highly fragmented and transformed and is extensively used by port-related activities. This area could be considered as a potential exclusion zone (i.e. an area in which specified activities may be excluded from environmental authorization subject to prescribed norms and standards).

The following parameters must guide planning and decision-making in the area. The table also provide guidance in terms of appropriate development types.

ISSUE	DESIRED STATE OF ENVIRONMENT: DUNE CORDON
Hydrology	<ul style="list-style-type: none"> Maintain and manage groundwater levels. Compliance to water quality guidelines (LAC)
Ecosystem Types	<ul style="list-style-type: none"> The biodiversity of the dune cordon is maintained in order to ensure geomorphological stability.
Atmosphere	<ul style="list-style-type: none"> Maintain air quality within set standards (LAC) Compliance with national emission standards (LAC)
Land use	<ul style="list-style-type: none"> Protect dune stability through maintaining natural vegetation (LAC)
Sustainable Livelihoods	<ul style="list-style-type: none"> Reduce human vulnerability by ensuring that environmental quality does not compromise human health and well-being and access to significant natural resources is maintained and promoted.
Governance	<ul style="list-style-type: none"> Facilitate cooperation in respect of the environmental priorities in the area to ensure the achievement of the desired state of the environment.

5.5 Zone 5: Coastal Plain Residential Area

The communities in this area are a priority for management. In the northern areas densification should not encroach into open spaces in order to maintain the ecological functioning of the area and its sense of place. The industrial-residential buffers must be maintained to protect ecological linkages, visual impacts, and sense of place, noise and light pollution. In the southern residential area development should focus on the formalisation of infrastructure and services to minimise environmental degradation.

The following parameters must guide planning and decision-making in the area. The table also provide guidance in terms of appropriate development types.

ISSUE	DESIRED STATE OF ENVIRONMENT: COASTAL PLAIN-RESIDENTIAL AREA
Hydrology	<ul style="list-style-type: none"> Maintain and manage groundwater levels. 100% compliance to water quality guidelines (LAC) No net loss of wetland functionality (LAC)
Ecosystem Types	<ul style="list-style-type: none"> Maintain ecological functioning and biodiversity assets in the open spaces. No net loss of ecosystem integrity (LAC)
Land use	<ul style="list-style-type: none"> Maintain this area as the focus of residential development in the study area. Maintain open space system.
Sustainable Livelihoods	<ul style="list-style-type: none"> Human vulnerability is reduced by ensuring that environmental quality is maintained. Access to recreational activities is secured (LAC)
Governance	<ul style="list-style-type: none"> Facilitate cooperation in respect of the environmental priorities in the area to ensure the achievement of the desired state of the environment.

5.6 Zone 6: Coastal Plain Subsistence Farming Area

Sustainable livelihoods should be at the forefront of decisions in this zone. The community's reliance on the resources of the adjacent estuary must be recognised and formally managed. Sustainable harvesting of the natural resource based must be secured.

The following parameters must guide planning and decision-making in the area. The table also provide guidance in terms of appropriate development types.

ISSUE	DESIRED STATE OF ENVIRONMENT: COASTAL PLAIN-SUBSISTENCE FARMING AREA
Hydrology	<ul style="list-style-type: none"> Maintain and manage groundwater levels.
Ecosystem Types	<ul style="list-style-type: none"> Maintain ecological functioning and biodiversity assets for benefit of sustainable livelihoods.
Land use	<ul style="list-style-type: none"> Maintain this area for sustainable livelihoods.
Sustainable Livelihoods	<ul style="list-style-type: none"> Human vulnerability is reduced by ensuring that environmental quality is maintained, and sustainable access to natural resources and recreational activities is secured.
Governance	<ul style="list-style-type: none"> Facilitate cooperation in respect of the environmental priorities in the area to ensure the achievement of the desired state of the environment.

5.7 Zone 7: Coastal Plain Commercial-Industrial Area

The strategic location of the port is the main local driving force for economic development in this zone. The opportunities offered by the IDZ should be optimized to promote backward linkages with the rest of the district's economy. The clustering concept of an IDZ has the potential, with support from the Department of Trade and Industry and a Technological Partner, to facilitate *Environmental Clustering Programmes* for improved environmental performance and efficiency. The City and their strategic partners should also take advantage of the recently announced Industrial Policy (IPAP2) that advances "green energy saving industries" and "green jobs" as new focus areas for industrial policy. This will also support the need for more labour-intensive production processes.

The land and environmental limitations in this zone will force decision-makers to start looking outside this area for industrial opportunities unless they are willing to risk "unsustainability" of the landscape over the short- term. Considering the limitations against the economic priorities of this zone it is imperative that the status of grasslands be determined at a district level to identify areas where this critical habitat type could be set aside for conservation.

Air quality capacity has already been reached under existing circumstances. Port expansion and additional industrial development activities will worsen this situation. The associated growth in population, and urban expansion, will also contribute to the air quality situation through an increase in transport emissions. The area should preferably be identified as a national air quality hotspot.

The following parameters must guide planning and decision-making in the area. The table also provide guidance in terms of appropriate development types.

ISSUE	DESIRED STATE OF ENVIRONMENT: COASTAL PLAIN COMMERCIAL-INDUSTRIAL
Hydrology	<ul style="list-style-type: none"> Maintain hydrological functioning through the protection of hydrological linkages (streams, groundwater, flow and quality) and buffers (riparian zones) 100% compliance to water quality guidelines (LAC) No net loss of wetland functionality (LAC)
Ecosystem Types	<ul style="list-style-type: none"> Maintain ecological functioning and biodiversity assets by consolidating the core areas as a priority and by establishing and protecting ecological linkages and buffers.
Air Quality	<ul style="list-style-type: none"> Maintain air quality within set standards (LAC) Compliance with national emission standards (LAC)
Land use	<ul style="list-style-type: none"> Maintain this area as the focus of economic development in the study area through the promotion

ISSUE	DESIRED STATE OF ENVIRONMENT: COASTAL PLAIN COMMERCIAL-INDUSTRIAL
	<ul style="list-style-type: none"> of "green industry" that is non-polluting and labour-intensive. No release of land for development that would compromise offset areas (LAC) Compliance to existing environmental standards (LAC) Contaminated sites identified (LAC)
Sustainable Livelihoods	<ul style="list-style-type: none"> Reduce human vulnerability by ensuring that environmental quality does not compromise human health and well-being and access to significant natural resources is maintained and promoted.
Governance	<ul style="list-style-type: none"> Facilitate cooperation in respect of the environmental priorities in the area to ensure the achievement of the desired state of the environment.

5.8 Zone 8: Coastal Plain External Linkages

The rehabilitation potential of the areas immediately west of Lake Nsezi has already been identified for future inclusion in a conservation zone. This area will play a more significant role in the sustainability of the area as a whole in the medium to long-term and should therefore be reserved for resource base activities until such time that its full potential for conservation is realised. Industrial type developments are therefore not suitable or preferred in this area. The buffering ability of the riparian environment in this area must be improved in order to protect the stream and drainage lines that feed Lake Nsezi.

The opportunities for industrial development west of the N2 should be further investigated.

5.9 Zone 9: Linkages & Corridors Zone

The zone is critical for minimizing potential systematic risks in the landscape and to act as a buffer of resilience. As such it is highly sensitive to development and should as far as possible be promoted as a "no go" area for development.

Sustainability of the zone will be achieved if the following parameters guide decision-making:

ISSUE	DESIRED STATE OF ENVIRONMENT: LINKAGES AND CORRIDORS
Hydrology	<ul style="list-style-type: none"> Hydrological and ecological functioning of rivers, streams and adjacent riparian habitats are maintained. Groundwater component of streams (baseflow) must be protected from erosion. Protect streambeds. Variability of river flow and quality must be maintained according to RDM requirements. No development in floodline areas.
Ecosystem Types	<ul style="list-style-type: none"> Provide corridors and linkages to ensure maintenance of biodiversity integrity Appropriate management plans need to be prepared for each of the natural units (e.g. burning of grasslands etc). Protect riparian zone vegetation. Corridors must include altitudinal and latitudinal gradients, habitat diversity and be of an appropriate size and configuration for the biodiversity elements.
Air Quality	<ul style="list-style-type: none"> Maintain air quality within set standards.
Land use	<ul style="list-style-type: none"> Land-based activities must not negatively impact the functioning of linkages and corridors.
Sustainable Livelihoods	<ul style="list-style-type: none"> Human vulnerability is reduced by ensuring that environmental quality is maintained, and sustainable access to natural resources and recreational activities is secured.
Governance	<ul style="list-style-type: none"> Facilitate cooperation in respect of the environmental priorities in the area to ensure the achievement of the desired state of the environment.