

Project Name: **Port of Port Elizabeth
Minor Works for maintenance of Port
structures, infrastructure, services and
equipment**

Specification Title: **Standard Environmental Maintenance
Management Plan for Maintenance Works**

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List of Terminology and Definitions

Terminology	Explanation
Activity	Any action needed for the design, construction, maintenance and completion of a project.
Alien species	A species occurring in an area outside of its historically known natural range as a result of intentional or accidental dispersal by human activities.
Environmental aspect	An element of an organization's activities or products or services that can interact with the environment.
Communication register	A register aimed at tracking all communication activities within the project.
Contaminated water	Water that contains pollutants from on or off-site activities rendering it unfit for release into the natural receiving environment.
	Contaminated water must be treated to ensure that water released into the receiving environment meets the minimum standards and guidelines.
	Treated water should be recycled where possible (e.g. used for dust suppression).
National Department of Environmental Affairs (DEA)	The competent authority responsible for the review and /or approval of an Environmental Management Plan.
Department of Mineral Resources (DMR)	The competent authority responsible for mineral and petroleum resources management.
Department of Water and Sanitation (DWS)	The competent authority responsible for water management.
Development	Means the building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that is necessary for the undertaking of a listed or specified activity, including any associated post development monitoring, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.
Employer	Transnet SOC (LTD) Registration number 1990/000900/30
Environment	The surroundings in which humans exist and an organization operates and includes the land, water, atmosphere; natural resources, micro-organisms, plant and animal life, any part or combination and interrelationships; and the physical, chemical, aesthetic, historical, cultural and economic properties and conditions of the foregoing that can influence human health and wellbeing.
Environmental Audit	Systematic, documented, regular and objective evaluation to see how well an organisation or facility is operating in terms of the Environmental Management Plan and is complying with statutory requirements and the organisation's Environmental Policy.
Environmental Authorisation	The authorisation issued by a competent environmental authority for commencement of listed activities in terms of the National Environmental Management Act (Act 107 of 1998).
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially that results from an organisation's environmental aspects.
Environmental Impact Assessment	The process of collecting, organising, analysing, interpreting and communicating information in accordance with the environmental legal

	requirements set out in GNR. No 982, GNR. 983, GNR. 984 and GNR 985 as published in Government Gazette No. 38282 of 4 December 2014 (as amended), promulgated in terms of Chapter 5 of the National Environmental Management Act (Act 107 of 1998), for the purposes of obtaining an Environmental Authorisation in accordance with Chapter 5 of the National Environmental Management Act.
Environmental Management Inspector	A person designated as an Environmental Management Inspector in terms of Section 31B or 31C of the National Environmental Management Act (Act 107 of 1998).
Environmental Management Plan	A tool used to prescribe management mechanisms or methods for the prevention of undue or reasonably avoidable adverse environmental impacts and for the enhancement of the positive environmental benefits of a development.
Environmental objectives	The overall environmental goal arising from the Environmental Policy that an organisation sets itself to achieve, and is quantified where practicable.
Ergonomic	Defined as the design; making usable, user-friendly; or comfortable and safe to minimize physical effort and discomfort, thereby maximizing efficiency
Fauna	All animals, living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
Fire danger index	A relative number denoting an evaluation of rate of spread or suppression difficulty for specific combinations of fuel, fuel moisture and wind speed.
Fire hazard	The relative combination of fuel, oxygen and heat that will lead to the start and spread of a potential fire.
Flood line	The line or mark to which a flood could rise every 50 (1:50 year flood line) or 100 (1:100 year flood line) years.
Flora	All living plants, grasses, shrubs, trees, etc. that are typically incapable of easy natural motion and capable of photosynthesis.
Groundwater	Water that is found beneath the earth's surface and fills the natural openings in below-surface rock or unconsolidated sands.
Hazardous waste	Waste that, because of its chemical reactivity, toxic, explosive, corrosive, radioactive or other characteristics, causes danger or is likely to cause danger to health or the environment.
Heritage resources	Any place or object of cultural, archaeological or paleontological significance in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999).
Induction training	The training provided to new / existing employees to (re)acquaint them with the company structure, their specific job requirements, practical or organisational issues and occupational health, safety and environmental considerations required on the project.
Integrated Environmental Management	<ul style="list-style-type: none"> the promotion of the integration of the principles of environmental management as set out in Section 2 of the National Environmental Management Act (Act 107 of 1998) in making decisions that may have a significant effect on the environment; the identification, prediction and evaluation of the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts and maximising benefits; ensuring that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them; ensuring an adequate and appropriate opportunity for public participation in decisions that may affect the environment;

	<ul style="list-style-type: none"> ensuring the consideration of environmental attributes in management and decision making, which may have a significant effect on the environment; and identifying and employing the modes of environmental management best suited to ensure that a particular activity is pursued in accordance with the principles of environmental management as set out in Section 2 of the National Environmental Management Act (Act 107 of 1998).
Interested and Affected Parties (I&AP)	Any person or group of people concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, customers and consumers, environmental interest groups, and the general public (after the Environmental Impact Assessment Regulations of September 1997 and Guideline Document: Environmental Impact Assessment Regulations of April 1998).
Land Use	The arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it. This definition establishes a direct link between the land cover and the actions of people in their environment.
Maintenance	Actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint. It does not include an increase in the footprint or throughput capacity. It includes reconstruction, if on the same location, capacity and footprint.
Materials	All kinds of items (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.
Mitigate	The implementation of practical measures to reduce any adverse impacts or to enhance the beneficial impacts of an action
No-go area	An area where construction and maintenance activities are prohibited.
Non-compliance	Failure to comply with the requirements of the EMP.
Non-conformance report	A report outlining a deviation from process, procedure or compliance specifications.
Plant	The apparatus, machinery and vehicles used during Permanent Works.
Pollution	Any change in the environment caused by substances or noise, malodours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future
Potentially hazardous substance	A substance that can have a deleterious effect on the environment. Hazardous chemical substances are defined in the Regulations for Hazardous Chemical Substances, published in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).
Precautionary principle	The basic principle that, when in doubt or when there is insufficient or unreliable information, actions must be undertaken that have minimum risk.
Quality management system	A set of interrelated or interacting elements that organisations use to direct and control how quality policies are implemented and quality objectives are achieved.
Rehabilitation	Re-establishment or restoration to a healthy sustainable capacity or state.
Resource recovery	Recycling of waste or the recovery of energy.
Sensitive receptors	Locations or areas that are likely to experience an impact more than other locations or areas; for example, schools and residential areas.
Solid waste	All solid waste, including construction / maintenance debris, chemical

	waste, excess cement / concrete, wrapping materials, timber, steel, drums, wire, nails, food and domestic waste (e.g. plastic bags and wrappers).
Target	The detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.
Waste minimisation	The reduction of the volume of waste during maintenance by means of different processes or clean technology.
Waste prevention	The prevention and avoidance of the production of a waste.
Wastewater	Water containing cement washings, oil, fuel or other contaminants.
Water resource	Includes the sea, a watercourse, surface water, estuary, or aquifer.
Works	Means the Permanent Works and the Temporary Works, or either of them as appropriate.

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Explanation
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EMP	Environmental Management Plan
EO	Environmental Officer
FDI	Fire Danger Index
I&AP(s)	Interested and Affected Party(ies)
NEMA	National Environmental Management Act (Act 107 of 1998)
NEM:ICMA	National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NID	Notice of Intent to Develop
NWA	National Water Act, 1998 (Act 36 of 1998)
PCO	Pest Control Officer
PEM	Project Environmental Manager
PPE	Personal Protective Equipment
SAHRA	South African Heritage Resource Agency
SANS	South African National Standard
CEMP	Construction Environmental Management Plan
SES	Standard Environmental Specification
PES	Project Environmental Specification

1. Background and Introduction

The Port of Port Elizabeth is located at the southern end of Algoa Bay, which is one of the many half-heart Bays along the south coast at Latitude 34° 01'S and Longitude 25° 42'E. The Port of Port Elizabeth is an established port in the central region, comprising of a container terminal, the tanker berth, multi-purpose terminal and the manganese terminal. The port also supports fishing related activities for birthing, ship repair as well as leisure vessels (see figure 1).

The port is protected by the 1.1 km South Breakwater and the Charl Malan Quay and the entrance channel is 14.10 m with the width of 3210 metres wide. The port essentially comprises three basins, namely the northern, southern and turning basins, and an entrance channel (see figure 1). The northern and southern basins are separated by the Citrus Terminal, the eastern most point of which is taken as defining the northern basin from the turning basin, while an imaginary line extending between the Citrus Terminal and the Tanker Berth is taken as defining the southern basin from the turning basin.

The port handles over 11 million tonnes of cargo per year (approximately 950 commercial cargo vessel calls), with the 30 year forecast predicting volumes to increase to over 18 million tonnes per year. The import and export activities, demand for the ship repair facility as well as repair and maintenance activities are exacting a heavy toll on the port infrastructure. As a result, the Port experience various infrastructural challenges which include among others damage on sea walls, underpinning, and sand accumulation on the western end of the breakwater and fence area bordering the Port. Additionally, the harsh marine environment has a negative corrosive and chemical reactive effect upon various structures, infrastructure and facilities within the Port. Regular maintenance activities are therefore required to counter the afore-mentioned effects. Most equipment pivotal to sustain port business and services is old and require replacement.

According to NEMA: EIA Regulations 2014 "maintenance means actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint". Maintenance in the regulations refers to activities performed to keep a structure or system functioning or in service by reconstruction on the same location, same capacity and footprint, and replacing like for like. Maintenance does not include an increase in the footprint, capacity or throughput capacity.

Some of the required maintenance activities within the Port of Port Elizabeth may require clearance of an area of 20 hectares or more of indigenous vegetation, or 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-within a 100m of the high water mark of the sea. The Department of Environmental Affairs has indicated that Activity 15, 18 and 19 of Listing Notice 1, GNR 983 of the EIA Regulations 2014 will not be triggered where activities are undertaken for maintenance purposes in accordance with a management plan *agreed to by the relevant competent environmental authority*.

Activity No.	Triggered Activity	Applicability
15	<p>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-</p> <p>(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>Applicable – the clearance of vegetation may be required for maintenance of structure in vegetated areas in the Port.</p>
18	<p>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 -</p> <p>(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;</p>	<p>Applicable – the planting of vegetation or placing of material may be required to stabilise the movement of sand in operation areas in the Port.</p>
19	<p>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-</p> <p>(iii) 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</p> <p>but excluding where such infilling, depositing , dredging, excavation, removal or moving-</p> <p>(a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or</p>	<p>Applicable – the infilling or depositing of material maybe required for maintenance of sea walls, quay walls etc. in the Port.</p>

This Environmental Management Plan has been developed in line with this requirement to govern activities undertaken for maintenance purposes and must be approved by DEA prior to implementation.

All activities to be undertaken in terms of this Environmental Management Plan (EMP) have been aligned with the definition of maintenance and will not increase the capacity or footprint of the Port or the individual components requiring maintenance.

Typical maintenance activities will include:

- refurbishment of roads and associated infrastructure, stacking areas and berth top surfaces;
- refurbishment of buildings (to adequately provide support services to port maintenance operations);
- repair to ageing services and / or alignment of such services to new and improved technologies;
- consolidation and or reconstruction of services / facilities / infrastructure / structures;
- implementing measures to align with current regulatory and / or best management practices; and
- improvement of ergonomic approach to optimize human well-being and overall system performance.
- repair of jetties, quay walls and break water infrastructure
- replacement of aging port equipment and rails
- maintenance dredging

2. Purpose of Document

The EMP describes environmental management requirements for activities associated with maintenance of services, equipment, structures, infrastructure and facilities within the Port of Port Elizabeth.

Compliance with the environmental management requirements of this EMP is compulsory for all Transnet personnel and representatives, contractors and sub-contractors that may be involved with these works.

3. Environmental Management Objective

The main objective of the EMP is to ensure the implementation of environmental practices that are aimed at the best form of environmental protection. The aim is to ensure that Transnet takes reasonable measures to protect the environment and to remedy impacts to the environment as required by the Duty of Care principle as stated in Section 28 of the National Environmental Management Act, 107 of 1998, as amended (NEMA). The EMP also takes specific recognition of the monitoring, auditing and corrective actions needed when activities are undertaken under this EMP. Therefore, the other objectives¹ of the EMP are to:

- Avoid, minimize or correct the disturbance of ecosystems and loss of biodiversity;
- Avoid, minimize or correct pollution and degradation of the environment;
- Avoid or minimize waste, to reuse or recycle waste where possible and to dispose of waste in a responsible manner;
- Apply a risk-averse and cautious approach; and

¹ As defined by the National Environmental Management Act (No. 107 of 1998).

- Anticipate and prevent negative impacts on the environment and on people's environmental rights. Where impacts cannot be prevented, such impacts must be minimized and mitigated.

4. Description of Typical Maintenance Projects

Maintenance activities that may be required at the Port of Port Elizabeth from time-to-time are provided below:

4.1 Refurbishment of Roads, car parking areas and associated infrastructure

Excavations and infilling will be required for the refurbishment of existing roads within the port. Some of the roads and associated infrastructure within the Port of Port Elizabeth have deteriorated with increased road use frequency and vehicle cargo weight and require urgent maintenance work to be undertaken. As such, existing road layers will be removed and replaced with new layer works and surfacing that incorporates a suitable top layer.

Additionally, further excavations and infilling may also be required for the removal, replacement and/or placement of *inter alia* storm water infrastructure. Such infrastructure may include car park, v-drains, culverts, manholes, outlet structures, and others that are required to protect the roads, services and infrastructure from possible flood damage.

The proposed works are considered to be maintenance and falls within the definition of maintenance as provided by the Department of Environmental Affairs.

4.2 Refurbishment of Quay pavement surfaces, stacking areas, berth top surfaces and other surfaces

Top and pavement surfaces have, at various localities, reached the end of their useful design life and have consequently deteriorated making the use of heavy port equipment unsafe. The objective is to remove the old pavement surface; together with its associated pavement layers in order to provide a safe working environment for the operational staff at the Port.

The proposed activity will entail:

- Excavations of the existing concrete / asphalt surfacing, underlying granular pavement layers and fill material to the bottom of the new, proposed pavement structure.
- Selection and stockpiling of material from the existing pavement that can be re-used.
- Removal of the existing services.
- Spoiling of materials that will not be re-used.
- Replacement of jointed reinforced concrete track slabs.
- Placing of the replacement services.
- Replacement of the pavement layer-works including a 400 mm thick plain jointed concrete pavement.

- Tie into the existing asphalt surfacing by using asphalt wearing course infill layer where there are level differences.

The final level of concrete pavement and track slab will tie in with the existing adjoining asphalt surfacing, concrete quay wall and crane rail beam. The levels were designed with a fall towards the quay wall edge for storm water management purposes.

The proposed works are considered to be maintenance and falls within the definition of maintenance as provided by the Department of Environmental Affairs.

4.3 Refurbishment of ageing equipment

The refurbishment of existing system components and equipment may require the replacement of old components and equipment with new components and equipment of a similar nature to perform a similar function. The placement of the components and equipment may require excavations for *inter alia* foundation placement, for example replacement of rails. This is required as replacement components and equipment may not have the same foundation footings as the existing components and equipment requiring replacement.

The proposed works are considered to be maintenance and falls within the definition of maintenance as provided by the Department of Environmental Affairs.

4.4 Repair or replacement and installation of infrastructure and services including telecoms, high masts, electricity cables, water and sewer pipelines and product pipelines

Activities include the replacement of existing services that will be impacted on by the proposed maintenance activities.

The activity may include the excavation of trenches for the removal of existing infrastructure or services. Structures such as culverts and pipe sleeves may be placed wherein the services will be reinstalled. These structures provide effective protection against potential damage; and allow maintenance crews ease of access to remove portions of the services without the need for further excavations. The trenches (containing buried services) will then be backfilled with selected fill, where-after the top surfaces will be re-instated.

The replacement of sewer and product pipelines will only commence once the pipe contents have been removed from the pipe and the pipe is secured. Typically a temporary by-pass pipeline will be placed to redirect pipe contents, prior to pipe replacement, to prevent potential leaks. This has an added benefit of allowing the service capacity to be maintained during maintenance work.

Where required, the placement of maintenance services for the continued operation of existing infrastructure will be included.

The proposed works are considered to be maintenance and falls within the definition of maintenance as provided by the Department of Environmental Affairs. An example is the routine maintenance of various services.

4.5 Refurbishment of structures and infrastructure including reconstruction

Several structures and infrastructure have been identified to be ageing / no longer fit for purpose / defective and require intervention to ensure a continued service life. Additionally, improvements to the ergonomic approach (to optimize human well-being) and overall system performance may be required.

Refurbishment may entail the excavation of foundations or infilling of the excavation footprint, earthworks, rock revetment, scour protection, concrete and formwork reinforcement, masonry, waterproofing, ceilings, partitions and flooring, floor covering, wall lining, glazing, ironmongery, plastering and paintwork, electrical - and plumbing work.

Where no further maintenance works can be implemented, demolition and removal from site may be an option. In the event of demolition, reconstruction of functionally similar structures and infrastructure will be undertaken.

The proposed works are considered to be maintenance and falls within the definition of maintenance as provided by the Department of Environmental Affairs.

4.6 Refurbishment of Various Buildings

Various buildings within the port require refurbishment in order to *inter alia* ensure these meet prevailing Environmental Health and SANS 10400 X and XA (The application of the National Building Regulations Part X: Environmental sustainability Part XA: Energy usage in buildings) requirements. Additionally, the Port wishes to reconfigure and refurbish existing identified buildings to improve the security and aesthetics to comply with Transnet's corporate identity. The scope to be executed involves the re-design, refurbishment and re-construction of various facets of the identified buildings.

The proposed work will include:

- The internal configuration to be restructured to provide better flow and use of space.
- External alterations to existing buildings
- Provision of new finishes.
- Lighting and electrical aspects to be improved.
- Toilets to be upgraded.
- Signage to be upgraded.
- Fire detection/suppression to be upgraded.
- Emergency lighting to be installed.
- Air conditioning to be upgraded.

- Improvement of ergonomic approach to optimize human well-being and overall system performance.

Refurbishment may entail the excavation of foundations or infilling of excavation footprints, earthworks, concrete and formwork reinforcement, masonry, waterproofing, ceilings, partitions and flooring, floor covering, wall lining, glazing, ironmongery, plastering and paintwork, electrical and plumbing work.

The proposed works are considered to be maintenance and falls within the definition of maintenance as provided by the Department of Environmental Affairs.

5. Project Area Description

The Port of Port Elizabeth is man-made and lies in Algoa Bay on the South Eastern coast of South Africa. The characteristic feature of this bay is a cape or promontory that occurs at the western or southern section of the bay which forms the cusp of the heart and the bay curves in an arc to the north or east where another cape or promontory forms base of the heart. For Algoa Bay this is Cape Recife in the South and Woody Cape in the North East. This bay is also called log-spiral bays and the capes are composed of the resistant quartzites of the Cape Supergroup, which outcrop at Cape Recife. In Algoa Bay there are less resistant rocks, the Cretaceous sediments of the Uitenhage Group (Illgner, 2008).

There are no specific biological studies have been conducted within the harbour, however a long term water monitoring programme is conducted, and reports on the ecological status (including water quality) and sediment quality are generated bi-annually and annually respectively. The heavy metal concentrations in water and sediments of the Port Elizabeth harbour, are low, but are also indicative of pollution from point sources in and around the harbour and from diffuse sources such as urban runoff (CSIR, 2015). Most of the fair to poor water quality is attributed to inputs from the Baakens River which flows into the north-western portion of the southern basin. The Baakens River is short (about 23 km in length) and consequently has a relatively small catchment and a low volume base flow. However, during periods of heavy rainfall, large volumes of water are discharged into the port. Of significance in the context of the survey described in this report is that the Baakens River receives surface runoff (e.g. stormwater) from urbanised and industrialised areas along much of its length and contaminants and other material in this runoff are ultimately discharged into the Port of Port Elizabeth.

The north side of the port experiences a wave action, tides and storm surge causing the erosion at the coastline and compromise the harbour sea walls. These actions require regular maintenance of the shoreline to prevent damage to Transnet's port and rail infrastructure. Whereas to the south of the port, the establishment of Breakwaters for the Harbour has led to the build-up of sand and the establishment of a large beach (King's Beach) as the sand moves from the West to the East in the half-heart bay; the build-up of this sand also need a regular maintenance as it compromises the port security and cause operational risks. The port quay structures are subject to regular propeller

wash from vessel movements and the sediments within the Port are routinely disturbed through maintenance dredging of berthing area and navigation channels.



Figure 1: Locality Map of the Port of Port Elizabeth

6. Applicable Legislation

Transnet will ensure that all relevant environmental legislation is complied with during maintenance works. This will include ensuring:

- The principles as outlined in section 2 of NEMA are implemented as and where applicable;
- Responsible waste management including measures to avoid or reduce waste generation, encouraging re-use, ensure appropriate disposal and prevent littering; and
- Disturbance of marine life is avoided.

6.1 National Environmental Management Act 107 of 1998

The proposed works do not require an Environmental Authorization in terms of Section 24 of NEMA and the associated EIA Regulations, as amended. The EIA Regulations provides for the development of an EMP *in lieu* of a formal EIA process where listed activities are undertaken for maintenance purposes. The EMP is subject to approval by the relevant authority (DEA). Horse

Section 28(1) of NEMA prescribes that a Duty of Care be bestowed upon those who cause, have caused or may in future cause pollution or degradation of the environment. Non-compliance with this Section (Duty of Care) is a criminal offence and may lead to criminal prosecution.

6.2 National Heritage Resources Act 25 of 1999

The National Heritage Resources Act (Act No. 25 of 1999) (NHRA) directs the protection and management of heritage resources in South Africa. An application to demolish or alter structures older than 60 years will be submitted to the relevant Heritage Resource Agency in terms of Section 34 of the NHRA, where proposed maintenance activities require such submission. The maintenance work in some areas in the Port is expected to have an impact on heritage resources, e.g. buildings or quay walls older than 60 years.

6.3 National Environmental Integrated Coastal Management Act 24 of 2008

All maintenance work will comply with the relevant requirements of the National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008) (NEM: ICMA). As such, no maintenance related activities shall be permitted to impact upon the marine environment.

6.4 National Environmental Management: Waste Act 59 of 2008

All maintenance activities will comply with National Environmental Management: Waste Act (Act 59 of 2008). Reasonable measures must be taken to avoid the generation of waste and where such generation cannot be avoided, minimise the toxicity and amounts of waste that are generated; reduce, re-use, recycle and recover waste; where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner.

6.5 National Environmental Management: Biodiversity Act 10 of 2004

This Act provides for the management and conservation of South Africa’s biodiversity, the appropriate environmental management tools are required in order to ensure integrated environmental management of activities thereby ensuring that all developments within the Port further loss of biodiversity and conserve endangered ecosystems. The maintenance works in some areas in the port may require removal of protected species; therefore no protected species may be removed or damaged without a permit.

6.6 Applicable By-laws

Due consideration shall be given to the By-laws of Nelson Mandela Bay Metropolitan Municipality that may be relevant and applicable to these Projects.

The Nelson Mandela Bay Metropolitan Municipality by-laws that may be applicable to the Project are listed in Table 1 below.

Table 1: Applicable By-laws

Nelson Mandela Metro By-Laws	SECTION	RELATES TO
Air Pollution Control By-Law	3. Duty to take care	Any person who is wholly or partially responsible for causing air pollution or creating a risk of air pollution occurring must take all reasonable measures: <ul style="list-style-type: none"> a) To prevent any potential air pollution from occurring b) To mitigate and, as far as reasonable possible, to remedy any air pollution that has occurred.
	13. Emissions caused by open burning	1) Subject to subsection (4), any person who carries out open burning of any material on any land or premises is guilty of an offence, unless the prior written authorisation of the municipality which may include the imposition of further conditions which the person requesting authorisation must comply, has been granted.

Nelson Mandela Metro By-Laws	SECTION	RELATES TO
	14. Prohibition – Emissions from compressed ignition powered vehicles	1) No person may drive or use, or cause to be driven or used, a compressed ignition powered vehicle that emits dark smoke.
	18. Prohibition – Emission that cause nuisance	1) No person may create or permit emissions that cause a nuisance. 2) Any person who contravenes subsection (1) commits an offence.
	22. Control of dust	1) The occupier owner of any premises must take all reasonable steps to prevent the nuisance by dust caused by any activity on such premises.
Noise Control By-Law	5. Prohibition of disturbing Noise	No person may make, produce or cause a disturbing noise, or allow it to be made, produced or caused by any person, animal, machine, device or apparatus or any combination thereof.
Public Places and Nuisances By-Law	3. Behaviour and conduct	1) No person may – a) do work on or use any premises in such a manner that it interferes with the convenience or comfort of other people or that it becomes a source of damage to any person; 4) Any person who contravenes or fails to comply with any provisions of this section or fails to comply with any notice lawfully given there under, is guilty of an offence.
Waste Management By-Law	6. Provision of receptacles for storage of waste	1) The owner of property must provide on such property at his or her own expense a sufficient number of portable, covered receptacles of size and design approved by the municipality for the reception of the maximum quantity of waste that is likely to accumulate on the property during any period of seven days. 7) The owner or occupier of the property must ensure that any waste which is blown off the property by wind is promptly retrieved.
	11. Collection of Waste	1) A person requiring commercial services must ensure that the waste collector is registered with municipality to collect and disposed of the category of waste, and such person must take reasonable steps to ensure that the relevant waste is collected and disposed in terms of this by-law.

Nelson Mandela Metro By-Laws	SECTION	RELATES TO
	18. Collection of waste	<p>1)(3) the owner or occupier of property on which industrial or commercial waste is generated must ensure that –</p> <p>a) the container in which the waste is stored not be kept in a public place except as required for collection</p> <p>b) such waste is kept in a secure, designated refuse area on the property; and</p> <p>c) the waste is collected by a registered waste collector within a reasonable time after the generation of waste</p>
	21. Building waste	<p>1) the owner or occupier of property on which building waste is generated must ensure that-</p> <p>a) until disposal, all building waste, is kept on the property on which the waste was generated; or</p> <p>b) a container, approved by the municipality, that maybe used for the storage, collection or disposal of building waste, subject to the provisions of any other law, be kept on the verge adjoining the property on which the waste was generated; or</p> <p>d) such building waste be removed within 14 days from completion of the construction in respect of which such waste was generated.</p> <p>2) the owner or occupier of property on which building waste is generated may himself or herself dispose of the waste or must ensure that the waste is collected and disposed of by a registered waste collector.</p> <p>3) All building waste must be disposed at a waste disposal facility designated for that purpose by the municipality, unless the municipality has given written consent for the building waste to be used for the purpose of land reclamation or for recycling.</p>
	24. Dumping	<p>1) No person may –</p> <p>a) except with the permission of the owner or of the person or authority having control thereof dump, accumulate, place, deposit, leave or cause or allow to be dumped, accumulated, placed, deposited or left any waste whatsoever, whether for gain or otherwise, on or in –</p> <p>i) a public road; ii) a public place; iii) any drain, watercourse, flood prone areas, tidal or other water in or abutting on any such road, highway, street, lane, public footway or pavement, roadside or other open space to</p>

Nelson Mandela Metro By-Laws	SECTION	RELATES TO
		which the public have access; or private or municipal land.
Nelson Mandela Bay Zoning Scheme: Part iii - Use Of Land And Buildings	3.15 Noxious Use	1) No Noxious Use may be established in the Use Zone Industrial 3 without the prior consent of the Council.
		2) Upon the production of a certificate from the Medical Officer of Health, in consultation with the Inspector of Factories, that the process it is intended to employ in the conduct of the use will not cause nuisance or danger to health, the Council may consent to the erection and use of buildings for such Noxious Use in Use Zone Industrial 2.

7. EMP Framework

7.1 Institutional and Functional Arrangements

During maintenance works it is Transnet’s responsibility to ensure that all parties involved in maintenance related activities receive a copy of the EMP and ensure compliance with it. The EMP is to be included as part of all contract documents. The appointed Contractor will be required to comply with the management regulations set out in this EMP. The Contractor will be responsible for ensuring that all contracting staff adhere to the EMP specifications. A copy of the EMP will be kept on site at the Contractor’s site office and made available to all Contractor staff, regulatory authorities, port users and tenants upon request.

7.2 Environmental Management: Roles and Responsibilities

7.2.1 Transnet Project Environmental Manager (PEM)

The Transnet PEM will be responsible for ensuring that the EMP and associated specifications or requirements are complied with during construction. The Transnet PEM will report functionally to the Transnet National Environmental Manager and provide support to the Transnet Project Manager.

The specific tasks during the maintenance will include:

- Liaison with the authorities
- Preparation of the Project Environmental Specification (PES)
- Tender evaluation, development of environmental criteria and adjudication thereof

- Review all reports from the Environmental Specialist /Officer, including sign off on Method Statements
- Conduct any environmental incident enquiries
- Identify, with support from the Project Manager, the need for corrective or remedial measures with regard to proposed works
- Ensure induction material includes project appropriate environmental issues
- Approve training programmes and other awareness initiatives
- Coordinate or facilitate internal environmental audits
- Prepare environmental monitoring protocols (if monitoring to be done by Environmental Specialist and not an outside consultant)

The Transnet PEM may delegate part or all of these responsibilities to the Transnet Project Environmental Officer (EO), based on the merits of the particular project at hand.

7.2.2 Transnet Project Manager (TPM)

The Transnet Project Manager has overall responsibility for environmental management on site to ensure all project activities comply with environmental legislation and this includes as a minimum the implementation of the EMP, permit and license conditions. The Transnet Project Manager is supported by the Transnet PEM.

The specific environmental tasks during the construction phase will include:

- Reviewing the reports compiled by the Transnet Project Environmental Officer
- Communicating directly with the Contractors
- Issuing non-conformance notification to Contractors that do not comply with the requirements of the EMP and associated requirements or documents, including EA, EMP, permits and licenses
- The Transnet Project Manager may delegate some responsibilities to the Transnet Construction Manager

7.2.3 Transnet Environmental Specialist (TES)

The role of the Transnet Environmental Specialist is essentially the same as that of an Environmental Control Officer (ECO) but with some additional responsibilities. In instances where the EA requires an independent ECO, an outside consultant will be contracted to undertake the environmental audits of the project. The Transnet Environmental Specialist functionally reports to the Transnet National Environmental Manager, and provides mainly quality assurance with respect to the implementation of the overall environmental governance framework during construction. The Transnet Environmental Specialist will conduct audits on projects periodically. The scope of these audits will include both conformances to the Transnet Environmental Governance Framework, as well as legal compliance.

7.2.4 Transnet Project Environmental Officer

The Transnet Project Environmental Officer (EO) reports functionally to the Transnet Project Manager and Transnet PEM and is responsible for conducting the tasks required to ensure that the EMP, including permits and licenses are implemented on the construction site.

The Transnet Project Environmental Officer will conduct the following tasks:

- Ensure that environmental issues receive adequate attention in the Transnet SHE induction training
- Request awareness training (e.g. tool box talks, signage) from the contractor through the SHE File approval process
- Monitor the Contractor's compliance with the EA, EMP and any permits and licences on site
- Conduct monthly observations and environmental audits of all Contractor's and work areas
- Ensure that all environmental monitoring programmes (sampling, measuring, recording, etc. when specified) are carried out according to protocols and schedules
- Measurement of completed work (e.g. areas top-soiled, re-vegetated, stabilised, etc.)
- Maintain site documentation related to environmental management (permits, CEMP, method statements, EA, reports, audits, monitoring results, receipts for waste removal etc.). Documentation to be maintained on the relevant site Document Control System
- Inspect and report on environmental incidents and check corrective action
- Keep a regular photographic record of environmental incidents
- Management of complaints & incident registers
- Review and Sign off Method Statements prepared by Contractors
- Audit compliance to Environmental Method Statements

The key deliverables will include the compilation of:

- Monthly inspection/environmental audit report
- Monitoring results
- Site close-out reports
- Incident reports
- Environmental Incident Register
- Environmental Non-Conformance Register
- Complaints Register
- Site Close Out Inspection

7.2.5 Contractor's Environmental Officer

The Contractor will appoint an Environmental Officer whose role is to ensure implementation of the EMP, where applicable. The Contractor will submit the name and

CV of the Environmental Officer as well as an Environmental Management Plan detailing roles and responsibilities with their tender submission. This will be for Transnet's approval and no work can commence on site if this has not been done.

The Contractor's Environmental Plan will include, but not be limited to:

- Description of environmental management responsibilities of the Contractor's Project Manager, Contractor's Site Manager and the Contractor's Environmental Officer
- Organisational Environmental Policy
- Environmental Method Statements
- EMP

The Contractor's Environmental Officer will liaise with the Transnet Project Environmental Officer on site. It will be the responsibility of the Contractor's Environmental Officer to ensure that all work is conducted according to approved Environmental Method Statements and that the roles and responsibilities as set out in this document are fulfilled. The Contractor's Environmental Officer tasks will include:

- Daily, weekly and monthly inspections of the work area(s) as per schedule or authorised through written instruction by Transnet PEM or Environmental Officer. The Contractor is referred to Section 8.4 for an example of the items that will need to be inspected and which items will be audited by the Transnet Environmental Officer
- Prepare activity/aspect based Environmental Method Statements
- Identify local, provincial and national environmental legislation that applies to the Contractor's activities
- Monitor compliance with the EMP, Environmental Method Statements and environmental legal instruments (permits, licenses, etc) applicable to the project
- Ongoing Environmental Awareness Training of the Contractor's site personnel
- Reporting, investigating and recording of any environmental complaints, non-conformances, incidents caused by the Contractor or due to the Contractor's activities, including their sub-contractors
- Ensure close out of project specific environmental incidents, complaints and non-conformances
- Maintenance of Environmental Incident Register , Environmental Non-Conformance Register and Complaints Register
- Attendance at all SHE meetings and induction programmes, and toolbox talks where possible
- Waste Management
- Project Start Up Checklist
- Method Statements Register
- Hazardous Substances Register
- Ensure that environmental signage and barriers are correctly placed
- Taking required corrective action within specified time frame

The Contractor's Environmental Officer will be expected to submit daily, weekly and monthly checklists to the Transnet Project Environmental Officer.

Should the Contractor's Environmental Officer change from that person identified during either tender stage, or construction period, the Contractor will submit a CV of a replacement Environmental Officer for approval by the Transnet Project Environmental Officer and Construction Manager. No work can proceed until the replacement Environmental Officer has been approved.

7.3 Organisational structure

The organisational structure identifies and defines the responsibilities and authority of the various entities involved in the project. All instructions and official communications regarding environmental matters will follow the organisational structure shown in **Figure 2**.

All instructions that relate to the CEMP will still be given to the Contractor via the TNPA Project Manager. In an emergency situation, however, the TNPA Project Environmental Officer may give an instruction directly to the Contractor. Environmental Management of the site will be an item on the agenda of the monthly site meetings, and the Transnet Project Environmental Officer will attend these meetings. If at any time the Transnet Project Manager is uncertain in any way with respect to an environmentally related issue or any specification in the CEMP, he will consult with the Transnet Project Environmental Manager.

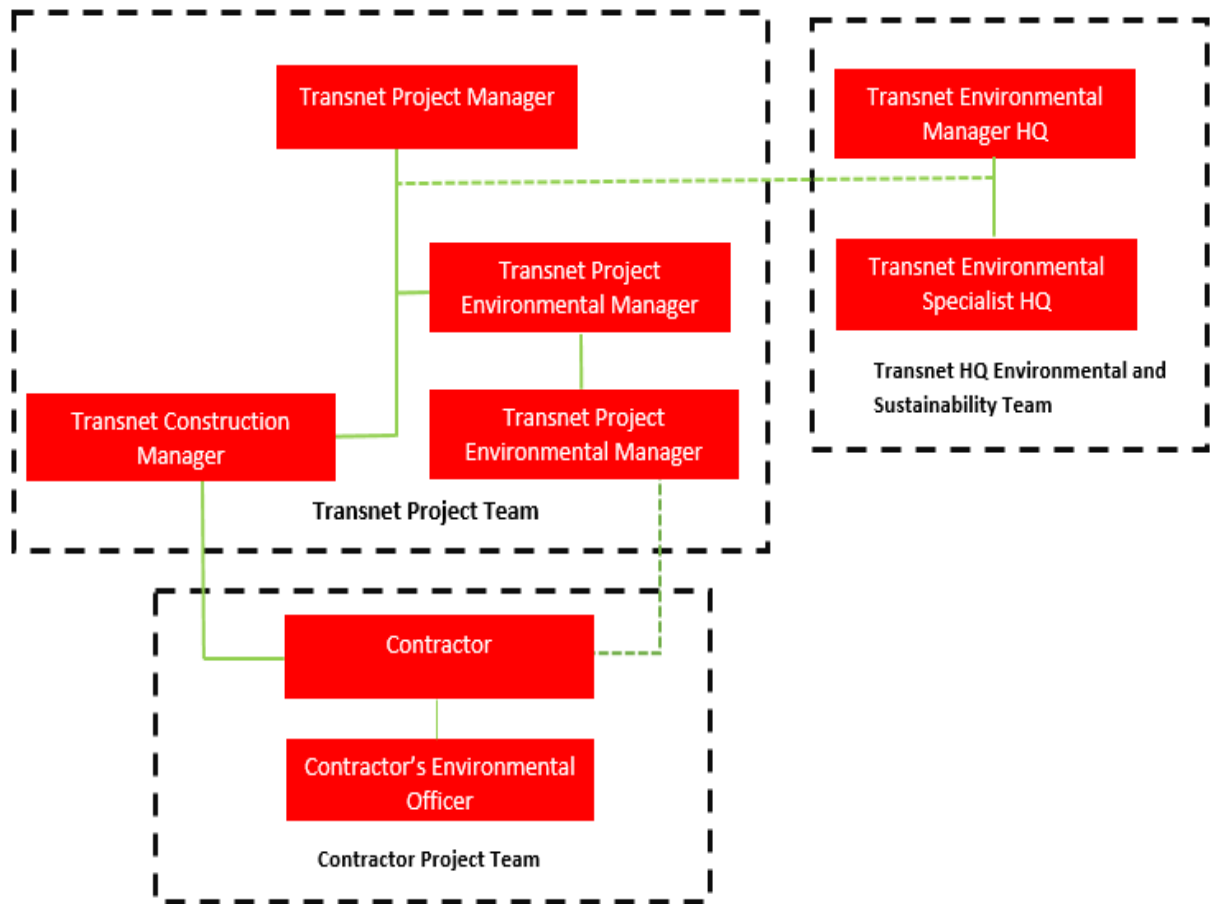


Figure 1: Typical Organogram for Construction

7.4 The Contractor

The Contractor will comply with the requirements of the EMP and abide by the Transnet Construction Manager’s instructions regarding the implementation of the EMP.

The contractor must prior commencement of construction provide a well-documented EMP based on Transnet Environmental Specification. The Contractor EMP will be reviewed and approved by Transnet Project Environmental Officer.

8. Environmental Documentation, Reporting and Compliance

8.1 Prior to Commencement

The Transnet Project Manager must ensure that the requirements below are requested from the Contractor in the Project Construction Contract Document, the Letter of

Appointment and any other relevant correspondence with the Contractor prior to the start of works, as relevant.

8.1.1 Declaration of Understanding (DoU)

The Declaration of Understanding in the Contractor's Guideline Document will be signed and provided by the Contractor as part of his / her Tender Document. The signed DoU is a written confirmation by the Contractor that the requirements of the CEMP are understood and will be complied with for the duration of their works on site.

The pro forma DoU to be signed by the Contractor has been included as **Annexure C**.

8.1.2 Appointment of Contractor's Environmental Officer

The Contractor will appoint an Environmental Officer or assign to a competent person roles and responsibilities for environmental management during construction. The Contractor will forward details of the appointment to the Transnet Project Manager and Transnet Project Environmental Officer for their review and approval. Should the Contractor's Environmental Officer or the person originally assigned with responsibilities for environmental management change from that person identified during either the tender stage, or the construction period, the Contractor will submit the details of such appointment or assignment for the Transnet Project Manager's approval. No work will proceed until the new Environmental Officer is assigned or appointed.

The pro forma appointment letter for the Environmental Officer to be appointed by the Contractor has been included as **Annexure D**.

8.1.3 Environmental Management Plans and Method Statements

It is a statutory requirement to ensure the wellbeing of employees and of the environment. Therefore, the Contractor must submit a method statement to the Transnet Project Manager and the Transnet Project Environmental Officer for approval prior to the commencement of construction related activities.

A method statement is a document detailing how a particular process will be carried out. It should detail the possible dangers/risks associated with the particular part of the project and the methods of control to be established and to show how the work will be managed in a safe and environmentally responsible manner. The method statement shall also include the following applicable information:

- the type of construction activity;
- timing and location of the activity;
- construction procedures;
- materials and equipment to be used;
- transportation of the equipment to and from site;
- how the equipment/material will be moved while on site;

- location and extent of construction site office and storage areas;
- identification of impacts that might result from the construction activity;
- population impacts;
- community/institutional arrangements;
- conflicts between local residents and newcomers;
- individual and family level impacts;
- community infrastructure needs;
- consequential impacts;
- methodology and/or specifications for impact prevention or containment and for environmental monitoring;
- emergency/disaster incident and reaction procedures (required to be demonstrated);
and
- rehabilitation procedures and continued maintenance of the impacted environment.

The Contractor will be accountable for all actions taken in non-compliance of the approved Method Statements. The Contractor shall keep all the method statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

The Contractor will be required to submit, the applicable method statements listed in Table 2 as identified in the contract, for approval by the Transnet Project Manager and the Transnet Environmental Officer prior to the start of construction activities. Please note these are typical method statements associated with the works proposed within this EMP. Therefore not all the method statements may be applicable to each specific maintenance project. The Transnet Project Manager, Transnet Project Environmental Officer and the Contractor are to assess which are applicable for submission.



Table 2: List of Method Statements required prior to Construction

Method Statement	Objective	Target	Criteria
Access	To institute adequate access agreements and measures to ensure the safety of landowners and integrity of the gates/fences.	No damage to existing gates and fences. All gates equipped with locks to prevent unauthorised access. No complaints about open gates. Compliance with regulatory requirements.	Access agreements between Contractor and landowner. Implementation of suitable access and fencing requirements.
Aesthetics	Reduce construction impacts upon the aesthetics of the surrounding environment.	No complaints from I&APs.	Implementation of measures to reduce impacts upon the aesthetics of the surrounding landscape.
Bunding	To contain and manage all hazardous substance releases into the environment.	No environmental pollution occurring. Management according to agreed procedures.	Method of bunding and covering for static and mobile plant
Construction Site and Office / Yard Establishment	To ensure site infrastructure, plant, materials and equipment are contained within a suitably secure locality that is adequately zoned and authorised in terms of regulatory requirements.	No complaints from landowners No damage to private property Compliance to regulatory requirements. No unplanned disturbance to construction related activities.	Site office/yard layout and preparation Method of installing fences required for no-go areas, working areas and construction areas Preparation of the working area Removal of vegetation
Cement Mixing / Concrete Batching / Bentonite Mixing	Provide measures to contain cementitious products impacting upon the surrounding environment.	All cementitious mixing to occur within demarcated localities. No indiscriminate spoiling of cementitious products in non-designated areas. No impacts upon receiving water resources.	Location, layout and preparation of cement / concrete batching facilities, including the methods employed for mixing concrete and the management of run-off water from such areas.
Contaminated Water	Ensure no contamination or pollution of water impacted upon by construction related activities.	All waste and contaminated water must be monitored and comply with regulatory requirements.	Contaminated water management, including the containment of run-off and polluted water



Method Statement	Objective	Target	Criteria
Dust	Reduce construction related dust impacts on the surrounding environment. Prevent dust nuisance and health impacts on people and animals in the area.	No complaints from I&APs. Dust emissions must be monitored and comply with regulatory requirements.	Dust control and monitoring measures
Environmental Monitoring	Implement a programme whereby impacts upon the surrounding can be monitored and implement measures to mitigate such impacts.	Compliance with regulatory requirements: <ul style="list-style-type: none"> • Dust: NEM AQA Air Quality Regulations; • Noise: NEM: AQA Air Quality Regulations; and • Water: NWA Water Quality Guidelines. Ensure no incidents or accidents occur which negatively impact upon the surrounding environment.	Monitoring construction-related impacts upon the surrounding environment is kept within the environmental specifications and applicable legislation. The following variables are to be monitored: <ul style="list-style-type: none"> • Dust (e.g. by using reused water) • Noise (increase of 7dB above ambient is considered disturbing noise) • Contaminated water (through dewatering operations, etc) • Waste: waste manifests for waste disposal including waste sent for recycling
Erosion control	Prevent erosion and reduce potential impacts upon the surrounding environment.	Slopes > 1:1 must have additional anti-erosion mechanisms. No evidence of erosion. No evidence of disturbance outside of project area.	Method(s) of erosion control, including erosion of spoil material
Fire, Hazardous and Poisonous Substances	Impose a "no fire" rule on the entire project unless otherwise indicated in writing by the Transnet Project Manager. Reduce potential impacts in the event of a fire incident. To manage, mitigate and control the potential occurrence of an incident /	Zero (0) fires. Proof of annual update and approval of the fire management Method Statement. Proof of management review of fire preparedness and response before onset of the fire season. Storage of hazardous/flammable materials and	Handling and storage of hazardous substances Emergency spillage procedures and compounds to be used Fire management plan and emergency procedures in case of fire Use of herbicides, pesticides and other



Method Statement	Objective	Target	Criteria
	accident involving hazardous and poisonous substances.	substances to comply with national, provincial and local regulatory requirements	poisonous substances Methods for the disposal of hazardous building materials Material Safety Data Sheets to be included where applicable
Flora and Fauna	Preserve fauna and flora through control of construction activities, particularly in sensitive environments, and through search and rescue operations. Reduce the impact of the project on the surrounding vegetation during construction. Prevent infestation of alien species during construction.	No evidence of disturbance outside of project area. All sensitive environments are to be demarcated as no-go areas unless otherwise indicated by the Transnet Project Manager. No construction related activities or facilities allowed within sensitive environments, unless prior approval is attained from the Transnet Project Manager. Proof of removal of alien invasive species.	Implementation of measures to protect the flora and fauna identified within the project footprint.
Fuels and Fuel Spills	Manage and contain all refuelling activities to prevent and mitigate potential impacts.	All refuelling to occur within designated areas. All hydrocarbons to be contained within approved bunded facilities. Identified staff to undergo suitable spill clean-up training.	Methods of refuelling vehicles Details of methods for fuel spills and clean-up operations
Heritage	Limit and mitigate potential heritage impacts on chance findings should they occur.	No damage to heritage structures, unless proof of consultation with a heritage specialist and approval from the SAHRA is in place. Records of chance finds must be kept. Where chance finds are unearthed, proof of work being stopped immediately and proof of consultation with a heritage specialist and the SAHRA must be kept on site.	Measures to be implemented to identify, manage and protect "chance finds" and known items of historical or cultural value.



Method Statement	Objective	Target	Criteria
Noise	Reduce construction related noise affecting the surrounding environment.	Noise levels shall be monitored to ensure they comply with regulatory requirements. Noise generating activities shall not increase by more than 7dB above ambient noise levels. No complaints from I&AP's	Implement measures to reduce noise impacts generated through construction related activities
Rehabilitation	To rehabilitate impacted areas to a suitable land capability class similar to that of the surrounding environment. Rehabilitation will take existing land uses into consideration. Rehabilitation should start on sections immediately after work is completed.	Reinstatement of areas affected through construction related activities. Proof of removal of alien invasive species re-establishing on cleared areas. The final placement of layers of soil on disturbed areas must match the pre-construction profile. Minimum of 60% mature vegetation cover being achieved during the first growth season. Minimum of 80% mature vegetation cover achieved at the end of the maintenance period.	Rehabilitation of disturbed areas and re-vegetation after completion of construction related activities.
Solid and Liquid Waste Management	Implement measures to reduce, monitor and manage waste generation, whilst maximising recycling efficiency. The method statement must reflect the principles of integrated waste management as contained within the NEM: WA.	Ensure all waste products are disposed of at a registered waste landfill site designed to cater for said waste product. Proof of waste generated, reused, recycled and disposed of, including disposal certificates, must be kept on site. Contain all waste with in approved designated areas and stored in marked containers. Containers of hazardous waste and waste oils must be stored in a bunded, covered area. No evidence of contamination by waste.	Solid and liquid waste control and removal of waste from site. Methods for the disposal of vegetation, paper and plastics and/or building materials Methods for the recycling of oils etc.



Method Statement	Objective	Target	Criteria
		Bins provided at regular intervals. No evidence of litter.	
Social	Maximise social benefits and minimise negative social impacts	No complaints from affected landowners No project delays due to landowner interference All landowners signing release forms within 1 month of completion of the contract.	Methods for avoiding danger and causing the least possible inconvenience to the public (including pedestrians), traffic and vehicle traffic
Sources of Materials	Source materials which have been legally mined or manufactured.	Provision of all Material Safety Data Sheets (MSDSs) for all products used on site.	Details of materials imported to the site. MSDS are to be included.
Topsoil and Subsoil Management	Manage the removal and stockpiling of topsoil and subsoil during the contract for use during rehabilitation.	Soil horizons (stockpile separately). Stockpiles should not be higher than 2 m. Stockpiles will be kept free of alien invasive species. No stockpiles shall be located within the 1:100 floodline. No stockpiles shall be located outside of areas indicated in the construction servitude diagrams.	Removal of topsoil and subsoil. Storage of topsoil and subsoil, including erosion prevention methods
Traffic	Minimise the impacts and extent of construction related traffic on the surrounding road network and environment, whilst maximising road user safety.	No accidents or incidents. No complaints from the public. Proof of notification of landowner for closure of access roads. Alternative access roads always provided at partial road closures and other traffic disruptions.	To ensure construction related transport activities do not impact upon landowners and the surrounding environment. Ensure activities associated with the transportation of materials and staff are not negatively impacted upon by construction related requirements.



Method Statement	Objective	Target	Criteria
		Compliance with regulatory requirements.	
Training	Foster construction related skills transfer, environmental awareness, health and safety awareness, and materials and equipment skills.	Proof of training provided, including training materials that meet the requirements of Transnet. Proof of attendance of staff at training. Records of training evaluation results. Results must reflect that training has been effective.	Logistics for the environmental awareness course for all of the Contractor's employees and temporary labour, as well as for the Contractor's management staff.
Wash Areas	To ensure plant and equipment used on site are kept clean whilst containing and preventing the release of potential contaminants into the receiving environment.	No contamination of the receiving environment through the washing and cleaning of equipment and plant. Compliance with regulatory requirements.	Location, layout, preparation and operation of all wash areas, including vehicle washing, workshop washing, paint washing and clearing Method for the treatment of wastewater prior to discharge

Where relevant, Environmental Method Statements will be provided by the Contractor as part of their Tender Documentation. Required method statements will be specified in the Quality Criteria of the tender.

Emergency construction activity Environmental Method Statements may also be required. The activities requiring Environmental Method Statements cannot commence if they have not been approved by the Transnet Project Manager and Transnet Project Environmental Officer.

8.2 Documentation

The following documentation must be kept on the project site for the full duration of the contract:

- Environmental Management Plan;
- Environmental Policy of the Contractor;
- Environmental Method Statements compiled by the Contractor;
- Daily, weekly and monthly environmental monitoring reports;
- Minutes and record of attendance of all environmental meetings;
- Environmental Incident Book Register & Reports;
- Environmental Non-conformance Register & Environmental Non-conformance Reports;
- Environmental Complaints Register;
- Communications Register;
- Register of audits;
- Contractor registers (awareness training, waste disposal, etc.);
- Waste manifests; and
- Relevant legislation.

8.3 Responsibility Matrix and Organogram

The Contractor must develop a Responsibility Matrix and Organogram which must be approved by the Transnet Project Manager and displayed in an appropriate location. This will identify responsible parties, their contact details, and highlight their roles and responsibilities. This document must be updated on a regular basis to ensure that information is correct.

8.4 Environmental Inspections and Audits

Audits will be conducted by the Transnet Project Environmental Officer to monitor compliance with the requirements of the EMP. Photographic records of the site will support the visual assessment. The Transnet Project Environmental Officer will submit all audits to the Transnet Project Manager. These findings will be kept on file on the project site.

External auditing may take place at unspecified times by the DEA and/or other relevant authorities. The DEA may, from time to time, also ask to view copies of audit reports drafted by the Transnet Project Environmental Officer.

Environmental inspections and audits are conducted using five basic techniques:



- Interviews with Contractor’s staff including Sub-contractors and suppliers
- Document checks
- Observations
- Monitoring
- Measurement and verification

This document sets out the areas and aspects of the construction site that will be inspected or audited, the frequency of such audits, the auditor and auditee.

It should be noted that these lists are not exhaustive and that each site will have specific issues that will need to be audited.

For each construction project, the auditor and auditee are as follows:

Place	Inspector/Auditor	Auditee	Inspection/audit frequency
Work places	Contractor’s Environmental Officer	Contractor’s team	Daily/Weekly Inspection
Construction site	Transnet Project Environmental Officer	Contractor’s Environmental Officer	Monthly Audit
Construction site (entire area)	Environmental Specialist: Assurance	Entire Project	Quarterly & As required

8.5 Work Place Inspection

The Contractor’s Environmental Officer will be required to conduct weekly inspections of all work places for which the Contractor is responsible, including but not limited to the following:

- Contractor’s camp, recreational and canteen facilities
- Material lay down areas
- Liquid and solid waste storage facilities (general, hazardous, recycling and scrap)
- Workshops
- Oil traps
- Wash bays
- Construction work area
- Spray Booths
- Haul roads
- No-go areas
- Storm water drains
- Any other construction area for which the SHE Officer is responsible

At each of these sites, the Contractor’s Environmental Officer will be required on a daily basis to check for the following, where relevant:

By observation:

- Litter
- Separation of solid waste as per system
- Hydrocarbon spills
- Effectiveness of dust control measures
- Illegal washing out of containers in drains
- Wash bay drainage systems are working
- Correct usage of drip trays
- Effectiveness of oil separators
- Water use and wastage
- Pollution of rivers and sea
- Provision and use of toilet facilities
- Any other illegal activities

By document check:

- Removal of oil for recycling as per schedule
- Removal of packaging as per agreements with suppliers
- Removal of hazardous waste by specialist Contractors as per schedule
- Correct placement of environmental signage and posters
- Document board listing emergency numbers, hazmat info sheets, etc.

The following records must also be kept up to date (information must include that of sub-contractors where relevant):

- Fuel consumption for entire contract measured in litres (including plant, generators, other equipment, vehicles etc.)
- Electricity consumption for entire contract measured in Watt hours
- Quantities of general waste submitted for recycling measured in kilograms
- Quantities of general waste disposed of to landfill measured in kilograms
- Quantities of hazardous waste submitted for recycling measured in kilograms
- Quantities of hazardous waste disposed of to landfill measured in kilograms
- Water consumption, including water used for construction and human consumption measured in litres

8.6 Construction Site Audit

The Transnet Project Environmental Officer will be required to conduct monthly inspections of the entire construction site, which may involve more than one Contractor and may include, but not be limited to the following:

- Entire site
 - Fencing
 - Environmentally sensitive areas
 - Contractor's camp, recreational and canteen facilities
 - Material lay down areas
 - Scrap yard
 - Workshops
 - Oil traps
 - Wash bays
 - Sewage plant
-

- Quarries and borrow pits used for fill and construction material
- Spoil dumping areas
- Solid waste disposal areas
- Liquid waste disposal areas
- Bioremediation site
- Area for the temporary storage of hazardous waste
- Fuel depot and hydrocarbon storage areas
- Construction work area
- Concrete batching plant
- Spray booths
- Haul roads
- No-go areas
- Storm water drains
- And any other construction areas not listed

At each of these sites, the Transnet Project Environmental Officer will be required to check for the following, where relevant:

By observation:

- Litter
- Separation of solid waste as per system
- Hydrocarbon spills
- Use of bunding, hard standing and other protection measures
- Illegal dumping
- Effectiveness of dust control measures
- Illegal washing out of containers in drains
- Wash bay drainage systems are working
- Correct usage of drip trays
- Effectiveness of oil separators
- Illegal use of tracks and off-road driving in no-go areas
- Correct procedures are followed for topsoil removal and stockpiling
- Effectiveness of erosion protection measures
- Excess noise and vibration
- Water use and wastage
- Pollution of rivers and sea
- Provision and use of toilet facilities
- Any other illegal activities

By document check:

- All receipts for the collection of old oil, general recycled waste and hazardous waste
- Correct placement of environmental signage and posters
- Document board listing emergency numbers, hazmat info sheets, etc.
- Complete and accurate record of Contractor's Environmental File

By measurement:

- Amount of water used by each Contractor (where practical)
 - Amount of topsoil removed and stockpiled
 - Amount of land stabilisation completed
 - Area re-vegetated
-

- Amount of waste recycled, sent to scrap yard or disposed of in a landfill site
- Amount of material treated through bioremediation

By monitoring:

- Effectiveness of dust control systems
- Effectiveness of pollution control systems
- Effectiveness of rehabilitation and re-vegetation programmes
- Effectiveness of erosion control methods
- Effectiveness of noise control barriers

A site-specific inspection checklist will be provided to the Transnet Project Environmental Officer prior to site establishment.

8.7 Construction Site and Documentation Compliance Audit

The Transnet Environmental Specialist: Assurance will conduct quarterly audits of the entire construction site and documentation system, which may include, but not be limited to the following:

- Site entrance
- No-go areas
- Environmentally sensitive areas
- All work areas
- Liquid and Solid waste storage facilities
- All workshops
- Refuelling depots
- Contractor's camp area and lay down place
- Any other place which needs to be audited

By observation:

- Litter
 - Liquid and Solid waste storage facilities
 - Hydrocarbon spills
 - Use of bunding, hard standing and other protection measures
 - Illegal dumping
 - Effectiveness of dust control measures
 - Illegal washing out of containers in drains
 - Wash bay drainage systems are working
 - Correct usage of drip trays
 - Effectiveness of oil separators
 - Illegal use of tracks and off-road driving in no-go areas
 - Correct procedures are followed for topsoil removal and stockpiling
 - Effectiveness of erosion protection measures
 - Excess noise and vibration
 - Water use and wastage
 - Pollution of rivers and sea
 - Provision and use of toilet facilities
-

- Any other illegal activities

By document check:

- Complaints register is available and up to date
- Method Statements are filed correctly and up to date
- All environmental permits are available
- Copy of the EA is available on site
- Copies of the CEMP, SES and PES are available on site
- Copies of all daily, weekly inspections and audits, monthly reports, minutes, incident reports and corrective action reports are filed correctly
- Copies of all close-out reports are available
- The monitoring programme is being adhered to and the monitoring results are no more than one month late
- Chains of custody for samples can be provided on request
- Sampling protocols are followed
- Emergency numbers and procedures are clearly displayed
- Photographic record
- Records of Environmental Awareness Training of Contractor's staff
- Any other documentation necessary to ensure effective environmental management of the site

By verification (if necessary):

- Spot samples to check water quality (e.g. storm water runoff)
- Map/plan measurements to check areas disturbed/re-vegetated
- Check dust collection buckets are working
- Check oil separators
- Any other aspect which gives cause for concern

By interview:

- Transnet Project Manager
- Transnet Project Environmental Officer
- Contractor's Environmental Officer
- Contractor's staff at random

A specific site audit protocol will be formulated prior to the first audit and sent to the Transnet PEM two weeks in advance of the quarterly audit.

8.8 Weekly Environmental Monitoring Report

The Contractor's Environmental Officer will be required to provide the Transnet Project Manager with a weekly environmental monitoring report covering the events of the past week. This will highlight key performance areas and provide feedback on corrective and preventive actions taken. The Contractor's Environmental Officer will have the weekly reports signed off by the Contractor's Manager prior to submission to the Transnet Project Manager.

8.9 Environmental Site Meetings



Environmental Site Meetings shall take place as per the schedule contained within the Tender Data. These meetings shall be chaired by a Senior Site Representative with the Transnet Project Manager, Contractor(s) and the Contractor's Environmental Officer(s) in attendance.

8.10 Non-conformance Report

The following information should be recorded in the NCR:

- details of non-conformance;
- any plant or equipment involved;
- any chemicals or hazardous substances involved;
- work procedures not followed;
- any other physical aspects; and
- nature of the risk.

Actions agreed to by all parties following consultation should adequately address the identified non-conformance. This may take the form of specific control measures and should take the hierarchy of controls into account. This must accompany the NCR for filing purposes.

All parties must agree on the timeframe by which the Contractor should have implemented the actions. The Transnet Project Manager should verify that the agreed actions have taken place on or soon after the agreed completion date. Where the actions are complete, the Transnet Project Manager and Contractor should sign the Close-Out portion of the Non-Conformance Form and file it with the contract documentation.

In the event of an environmental incident, the Contractor will follow the following procedure:

- Step 1: Immediately take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons;
- Step 2: Notify the Transnet Project Environmental Officer in writing including the following information: the nature of the incident and initial classification; substances involved with quantities; initial measures taken to minimise impacts; causes of the incident; measures taken and those proposed to avoid the reoccurrence of the incident;
- Step 3: Include the incident on the Transnet Environmental Incident Register Step 4: Undertake clean-up procedures;
- Step 5: Remedy the effects of the incident; and
- Step 6: Assess the immediate and long-term effects of the incident on the environment and on public health;

In the event of any Level 1 or 2 environmental incidents, the Contractor's Environmental Officer must complete a Transnet Environmental Incident Report

In the event of any Level 1 or 2 environmental incidents, the Transnet Environmental Officer will:

- Ensure that an Incident Report has been compiled and that it contains the necessary information;
 - Ensure that Contractor has complied with Transnet Occurrence Reporting and Investigation Procedure; and
-

- Report, record, investigate and analyse the incident and communicate the required action plans to be implemented to the Transnet Construction Manager as specified in the above-mentioned procedure.

An environmental incident is classified under four levels: 1, 2, 3 and 4. They are defined as follows:

8.10.1 Level 1 Environmental Incident

An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in:

- A significant impact on the physical or biological environment (air, ground, water and habitat) with extensive or long term impairment of ecosystem function or surface and ground water resources.
- An inconvenience/ disturbance/disruption/annoyance (including odour, dust, noise, traffic problem, loss of water supply) of a long duration or with a long term impact on interested and affected parties. A release of material (gas, liquid, solid) or energy that will cause chronic illness, permanent lost time injury, fatality or extensive property damage experienced by interested and affected parties.
- Irreparable damage to highly valued structures and sacred locations.
- Public or national / international media outcry
- Instances where inspections undertaken by or for the regulator to check legal compliance, were found to be outside the permitted limits and have resulted in prosecution.
- Any incident with NEMA section 30(1) – and/or NWA section 20(1) reporting requirements (In the even where all administrative requirements have been complied with and the incident has been closed out by the authorities, it may be re-classified as a Level 2 environmental incident)

Where the environmental impact of a Level 2 environmental incident is still present 120 days after occurrence, the incident will be reclassified as a Level 1 incident.

NOTE: A Level 1 environmental incident usually should be reported to the authorities, usually result in a significant pollution and may entail risk of public danger. Level 1 environmental incidents usually cause an irreversible impact even with the involvement of long-term external intervention i.e. expertise, best available technology, remedial actions, excessive financial cost, etc.

8.10.2 Level 2 Environmental incident

An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in:

- A moderate impact on the physical or biological environment (air, ground, water or habitat) with limited impairment of ecosystem function and/or surface and ground water resources.
-

- An inconvenience disturbance/ disruption/annoyance (including odour, dust, noise, traffic problems, loss of water supply) of moderate or with medium effect on interested and affected parties.
- A release of material (gas, liquid, solid) or energy that causes severe but reversible illness, non-lost time injury or moderate property damage experienced by interested and affected parties.
- Damage to rare structures of cultural significance or significant infringement of cultural values / sacred locations.
- Attention from local media or widespread complaints
- Instances where inspections undertaken by or for the regulator to check legal compliance have been outside the permitted limits and an official pre-directive or directive was issued.
- Inability of Contractors to close out corrective actions in an NCR without proper reason

Where the environmental impact of a Level 3 environmental incident is still present 3 days after occurrence, the incident will be reclassified as a Level 2 incident.

NOTE: A Level 2 environmental incident may be reported to the authorities, can result in significant pollution or may entail risk of public danger. The impact of Level 2 environmental incidents should be reversible within a short to medium term with or without intervention.

8.10.3 Level 3 Environmental incident

An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in:

- A minor impact on the physical or biological environment (air, ground, water or habitat), with no significant or long-term impairment to the ecosystem function or surface/ground water resources.
- An inconvenience / disturbance / disruption / annoyance (including odour, dust, noise, traffic problems, loss of water supply) of short duration and with no long-term effect on the employees and the community.
- A release of material (gas, liquid, solid) or energy that has the potential to cause illness, or that causes short term discomfort or reversible health effect to interested and affected parties.
- Isolated complaints by interested and affected parties.
- Instances where inspections undertaken taken by or for the regulator to check for legal compliance, have been outside the permitted limits and a non-compliance notice was issued.
- Blatant negligence of EMP leading to the issuing of an NCR

NOTE: A Level 3 environmental incident is not reportable to authorities, should not result in pollution and may not have a risk of public danger. The impact of Level 3 environmental incidents should be insignificant immediately after occurrence and/or once-off intervention on the day of occurrence.

8.10.4 Level 4 Environmental incident

A minor incident with lesser significance that did not necessarily result in damage or injury but that had the potential to cause damage to the environment, including:

- Could result in service disruption with a lesser significance
- Did not necessarily result in damage
- Had the potential , under different circumstances, to cause major damage to the environment

or:

- Instances where inspections undertaken internally by Transnet to check for conformance with the Transnet Environmental Governance Framework have been outside the required limits (e.g. an environmental compliance score of less than 80%).

8.10.5 Non-Conformances

A non-conformance may be issued to the Contractor by the Transnet Project Manager/Environmental Officer where:

- The incident response procedure described above (including administrative requirements) were not successfully implemented; or
- There are repeated incidents because of inadequate environmental practices on site;
- Documentation required to comply with the EMP is not prepared or maintained adequately on site; or
- Any non-compliances with the requirements of the Environmental Authorisations, the EMP and Environmental Specifications are identified

The following information should be recorded in the NCR:

- details of non-conformance;
- any plant or equipment involved;
- any chemicals or hazardous substances involved;
- work procedures not followed;
- any other physical aspects; and
- nature of the risk.

Actions agreed to by all parties following consultation should adequately address the identified non-conformance. This may take the form of specific control measures and should take the hierarchy of controls into account. This must accompany the NCR for filing purposes.

All parties must agree on the timeframe by which the Contractor should have implemented the actions. The Transnet Project Manager should verify that the agreed actions have taken place on or soon after the agreed completion date. Where the actions are complete, the Transnet Project

Manager and Contractor should sign the Close-Out portion of the Non-Conformance Form and file it with the contract documentation.

8.11 Environmental Emergency Response

The Contractor's environmental emergency procedures must ensure that there will be an appropriate response to unexpected or accidental actions or incidents that could cause environmental impacts. Such incidents may include:

- accidental discharges to water (i.e. into the sea) and land;
- accidental spillage of hazardous substances (typically oil, petrol, and diesel);
- accidental toxic emissions into the air; and
- specific environmental and ecosystem effects from accidental releases or incidents.

The Environmental Emergency Response Plan is separate to the Health and Safety Plan as it is aimed at responding to environmental incidents and must ensure and include the following:

- all employees shall be adequately trained in terms of incidents and emergency situations;
- details of the organisation (manpower) and responsibilities, accountability and liability of personnel;
- a list of key personnel and contact numbers;
- details of emergency services (e.g. the fire department, spill clean-up services) shall be listed;
- internal and external communication plans, including prescribed reporting procedures;
- actions to be taken in the event of different types of emergencies;
- incident recording, progress reporting and remediation measures to be implemented; and
- information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

The Contractor(s) will comply with the environmental emergency preparedness and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act (Act No. 85 of 1993), the National Environmental Management Act (Act No. 107 of 1998), the National Water Act (Act No. 36 of 1998), and/or any other relevant legislation listed in Section 6.

8.12 Incident Management

Using the Impact/Aspect Risk register, the Contractor must identify the types of environmental incidents that are likely to occur on site and ensure measures are put in place to prevent or mitigate the effects of such incidents. The Contractor is required to put in place an effective management system that will prevent or mitigate the occurrence of an incident. The method statement for this must be submitted to the Transnet Project Manager for approval prior to the commencement of works. This method statement must be reviewed and up dated on a six monthly basis.

All the Environmental, Health and Safety incidents must be reported to the Contractor. The Contractor shall immediately report the incident to the Transnet Project Manager and put into place management mechanisms to deal with the incident as quickly as possible. A formal report

must be submitted within seven days to the Transnet Project Manager, including all remediation measures undertaken to repair any damage caused and to prevent the incident from re occurring.

Once the incident has been stabilised and initial notifications have been issued to the relevant parties, a full incident investigation is required complete with detailed corrective and preventive measures. The Contractor is required to provide an incident report to the Transnet Project Manager, which, as a minimum, must include the following:

- Nature of incident.
- Damages, injuries or fatalities sustained and the parties involved.
- Any risks such incident poses.
- Toxicity of the substances involved.
- Steps taken to avoid or minimise the effects of the incident and any future incidents.
- Clean-up procedures, remedial actions and assessment of immediate and long term effects.

8.13 Environmental Method Statements

The Contractor must submit environmental method statement to the Transnet Manager for approval prior to the commencement of maintenance related activities.

A method statement is a document detailing how a particular process will be carried out. It should detail the possible dangers/risks associated with the particular part of the project and the methods of control to be established and to show how the work will be managed in a safe and environmentally responsible manner. The method statement shall also include the following information (where applicable):

- the type of maintenance activity;
 - timing and location of the activity;
 - maintenance procedures;
 - materials and equipment to be used;
 - transportation of the equipment to and from site;
 - how the equipment/material will be moved while on site;
 - location and extent of Contractors site office and storage areas;
 - identification of impacts that might result from the maintenance activity;
 - population impacts;
 - community/institutional arrangements;
 - conflicts between local residents and newcomers;
 - individual and family level impacts;
 - community infrastructure needs;
 - intrusion impacts;
 - methodology and/or specifications for impact prevention or containment and for environmental monitoring;
 - emergency/disaster incident and reaction procedures (required to be demonstrated); and
 - rehabilitation procedures and continued maintenance of the impacted environment.
-

The Contractor will be accountable for all actions taken in non-compliance of the approved Method Statements. The Contractor shall keep all the method statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

The Contractor will be required to submit method statements for approval by the Transnet Project Manager prior to the start of maintenance activities. Method statements that are required during maintenance must be submitted to the Transnet Project Manager for approval at least 14 days prior to the proposed commencement of the activity. Emergency maintenance activity method statements may also be required. The activities requiring method statements cannot commence if they have not been approved by the Transnet Project Manager.

8.14 Communications Register

All complaints or communications that are received from port users and tenants or any other stakeholder must be recorded in a Communications Register. These complaints and communications will be brought to the attention of the Transnet Project Manager, whereupon it will be investigated and a response to the Complainant will be given within 10 days / within a practically achievable timeframe in line with the merits of each case received. The Communications Register shall include the following information:

- Record the time and date of the complaint/communication;
- A detailed description of the complaint/communication;
- Action and resources used to correct the complaint;
- Photographic evidence of the complaint (where possible);
- A written response to the Complainant indicating rectification of the complaint; and
- Information regarding the relevant authority that was contacted or notified in writing (person, time and date).
- The relevant authorities include:
 - Department of Water and Sanitation (e.g. for any incidents involving the contamination of water resources);
 - Department of Environmental Affairs (competent authority for government departments);
 - Department of Environmental Affairs and Development Planning (DEA&DP) (e.g. for any significant incident of pollution of the soil and air);
 - Department of Agriculture, Forestry and Fisheries (e.g. uses of appropriate herbicides for eradication of alien invasive species);
 - Department of Health (e.g. for incidents such as contamination of water resources, accidental spill of hazardous substances);
 - Department of Transport and Public Works (e.g. for the diversion of traffic due to construction activities);
 - Department of Labour (e.g. for labour disputes);
 - Eastern Cape: Department of Agriculture;
 - Eastern Cape Heritage Resource Agency
 - Nelson Mandela Bay Metropolitan Municipality: Fire Emergency Services

- Nelson Mandela Bay Metropolitan Municipality: Health Department (e.g. for control of nuisances);
- Nelson Mandela Bay Metropolitan Municipality: Electricity Department (e.g. impacts upon electricity provision);
- Nelson Mandela Bay Metropolitan Municipality : Environmental Resources Management (e.g. issues pertaining to environmental management);
- Nelson Mandela Bay Metropolitan Municipality : Catchment, Stormwater and River Management (e.g. issues pertaining to drainage and stormwater management);
- Nelson Mandela Bay Metropolitan Municipality : Transport (e.g. road closures and diversions);
- Nelson Mandela Bay Metropolitan Municipality : Solid Waste Management (e.g. waste derived from demolition activities); and
- Nelson Mandela Bay Metropolitan Municipality: Water and Sanitation (e.g. impacts pertaining to reticulation services).

8.15 Photographic Record

The Construction Manager and Contractor's Environmental Officer will be required to compile a photographic record of all activities on site prior to maintenance related activities starting, during the maintenance process and on completion of maintenance related works. This will include photographs for:

- Monthly environmental audit reports;
- Weekly environmental monitoring reports;
- Corrective action;
- Progress of environmental works; and
- Non-conformance reports.

8.16 Waste Manifests

The Contractor shall ensure that all solid (including any hazardous) waste removed from site is disposed of at a registered landfill site or nearby waste transfer station with capacity to accept the project generated waste. The waste manifest shall be kept on record for auditing purposes. The Contractor shall ensure the waste manifests contain all the legally required information and the records are kept in line with the time frames prescribed in the NEM: Waste Act.

8.17 Good Housekeeping

The Contractor is to practice good housekeeping throughout the maintenance works. This should eliminate disputes about responsibility and facilitate efficient and timeous running of the project. Over and above practicing accepted construction methods in accordance with SANS 10120, this should include measures to preserve the environment inside the work area. Records of such actions taken to ensure the maintenance and management of housekeeping must be recorded.

The Contractor is to implement environmental management in a reasonable manner and should such management not prove effective, shall implement measures to the satisfaction of the Transnet Project Manager.

Appropriate measures shall include:

- Appointment of necessary resources to monitor and manage environmental requirements.
- Implement aspect-specific method statements to deal with emergency situations.
- Provision of adequate emergency response equipment to mitigate and manage an incident or emergency.
- Provision of specific training related to implementation of environmental management requirements.

8.18 Recording and Reporting

The Contractor shall maintain detailed records of parameters monitored. These detailed records shall demonstrate the effectiveness of the management actions implemented to mitigate potential environmental impacts. The Contractor shall submit a monthly database/report of management works implemented to the Transnet Project Manager, as part of the Contractor's monthly report.

8.19 Monitoring

The Contractor shall submit an Environmental Monitoring Method Statement which details the scope, nature, process, schedule and templates for environmental monitoring. The monitoring results shall be used to determine the effectiveness of the management programme. All complaints, compliments or other comments relating to environmental management parameters are to be recorded by the Contractor and reported to the Transnet Project Environmental Officer.

Monitoring results and the associated required management and mitigation actions for the coming monitoring period are to be presented in the monitoring section of the Contractors Monthly Report. The daily and weekly reports (as required) are to detail observations and information relating to requested management actions and their effectiveness. The Contractor shall monitor and maintain *inter alia* the following on an on-going basis:

- Fire management requirements associated with maintenance related activities
 - Stormwater systems
 - Soil and backfill volumes
 - Access road condition
 - Dust
 - Noise
 - Water quality and quantity
 - Spoil management
-

Site clearance monitoring results and the associated required management and mitigation actions for the coming monitoring period are to be presented in the monitoring section of the Contractor's Monthly Report.

The weekly report and daily reports are to detail observations and information relating to requested management actions and their effectiveness.

8.20 Final Environmental Compliance Report

A Final Environmental Compliance Report will be compiled by the Transnet Environmental Specialist for submission to Transnet at the end of maintenance works. The report will include details of:

- the completion of all environmental conditions and mitigation measures listed in the EMP;
- all environmental incidents and completed corrective actions;
- the findings of the Environmental Audits;
- conclusions as to whether environmental constraints, guidelines, norms and stipulations have been met and, if not, reasons why they have not been met;
- an indication of the outcomes of the environmental monitoring conducted;
- all Monthly Environmental Monitoring Reports (as an attachment);
- a copy of all Method Statements (as an attachment);
- a copy of the Environmental Incident Book (as an attachment); and
- a copy of the Communications Register.

9. Training and Induction of Employees

The Contractor is to take responsibility for the management of staff on the project site during the maintenance related works and supervise them closely at all times. The onus is on the Transnet Project Manager and the Contractor to make sure that all staff and Sub-Contractors fully comprehend the contents of the EMP. The environmental awareness training programmes should, therefore, be targeted at the two levels of employment: management and labour. Environmental awareness training programmes need to be formulated for these levels and must comprise:

- A record of all names, positions and duties of staff to be trained;
- A framework for the training programmes;
- A summarised version of the training course(s); and
- An agenda for the delivery of the training courses.

Such programmes will set out the training requirements which need to be conducted, prior to any construction works and will include:

- Acceptable behaviour with regard to flora and fauna;
 - Management and minimising of waste, including waste separation;
 - Maintenance of equipment to prevent the accidental discharge or spill of fuel, oil, lubricants, cement, mortar and other chemicals;
 - Responsible handling of chemicals and spills;
 - Environmental emergency procedures and incident reporting; and
-

- General code of conduct towards port users and tenants.

The Transnet Project Environmental Officer may be requested to provide additional training (in a first language) on-site regarding environmental aspects that are unclear to the personnel. A translator may be required and requested to assist in this additional training. The cost for the translator will be borne by the Contractor. The Contractor shall implement the training programme at own cost. Training shall be undertaken prior to the commencement of maintenance related activities and on a six monthly follow up roster thereafter.

10. Suspension of Works

If the Contractor has not complied with one or more of the clauses of the EMP, the Transnet Project Manager may order the suspension of works. This may be conducted after having served the Contractor with a NCR / Project Managers Instruction (PMI) and until the Contractor complies with the clauses of the EMP. All delays resulting from such suspension shall be at the Contractor's expense.

11. Implementation of the EMP

The EMP provides an integrated approach to environmental management. This approach is designed to guide the appropriate allocation of human resources, assign responsibilities, develop procedures and ensure project compliance with regulatory and best practice requirements.

Where conflict exists between this and any other document / specification, the following shall apply in descending order of applicability:

- DEA authorized EMP;
- Transnet Environmental Management Construction Environmental Management Plan (CEMP) and
- Standard Environmental *Specifications*

The Standards for Environmental Management below describes the aspect-specific requirements for achieving environmental best practice.

11.1 Standards for Environmental Management

The Contractor shall identify the potential environmental impacts that may occur as a result of his/her activities and accordingly prepare separate Method Statements describing how each of these impacts will be prevented or managed so that the standards set out in this document are achieved. These method statements will be prepared in accordance with the requirements set out in the EMP.

The Contractor will comply with the standards described below.

11.2 Site Planning and Establishment

The Contractor shall establish his construction camps, offices, workshops, staff accommodation and any other facilities on the site in a manner that does not adversely affect the environment. These facilities must not be sited in close proximity to sensitive areas.

Site plan

Before the onset of construction, the Contractor shall submit to the Transnet Project Manager for his approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the Contractor proposes to put in place.

The Site Plan must as a minimum include but not be limited to:

- Detailed layout of the construction works areas including access roads, site offices, material laydown areas, temporary stockpile areas and parking areas
- Detailed locality and layout of all waste storage and handling facilities for litter, kitchen refuse and workshop-derived effluents
- Proposed areas for the stockpiling of topsoil and excavated spoil material
- Demarcation of the construction footprint including areas not to be disturbed by the development
- Location of sewage and sanitary facilities at the site offices and staff accommodation and at all localities on the site where there will be a concentration of labour. Sanitary arrangements should be to the satisfaction of the Construction Manager.

The site offices should not be sited in close proximity to steep areas. It is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles be located as far away as possible from the sea as possible.

11.2.1 Identification and establishment of suitable access routes/roads

Existing access routes to the construction/works areas must be used as far as possible. The building of access roads must be restricted to within the development footprint to prevent unnecessary disturbance of the surrounding environment. Access tracks must be maintained in a good condition at all times during construction to minimise erosion and dust generation.

11.2.2 Demarcation of site limits

Prior to the commencement of construction, the actual site to be developed must be clearly demarcated by means of highly visible barriers such as fences and orange snow netting.

Vegetation within the demarcated zone may be cleared. Disturbance of vegetation outside of the demarcated development footprint is not permitted.

All plant, material and equipment required for construction must be located within the designated areas. Laydown areas must be clearly demarcated within the site limits. No activities are allowed outside of the demarcated development footprint.

11.2.3 Eating Areas

The Contractor is responsible for providing temporary weatherproof and shaded areas within the works area to ensure that workers do not leave the site to eat during working hours. Refuse bags must be provided at all established eating areas.

11.2.4 Effluent Management

All effluent water from site shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water resources. Only domestic type wastewater shall be allowed to enter the designated system.

11.3 Sewage and Sanitation

The Contractor is responsible for providing adequate sanitary facilities to all workers on site and for enforcing the proper use of these facilities. Safe and effective sewage treatment will require one of the following sewage handling methods: conservancy tanks or the use of chemical toilets which are supplied and maintained by a suitably qualified sub-contractor. The type of sewage treatment will depend on the location of the site and the surrounding land uses, the duration of the contract and proximity (availability) of providers of chemical toilets.

Toilets shall be easily accessible and shall be positioned within walking distance (*viz* 50 m) from wherever employees are employed on the works. Use of open areas (i.e. the veld) shall not, under any circumstances, be allowed.

Chemical toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. The toilets shall also be placed in areas protected from flooding and high winds. The Contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such facilities in a clean, orderly and hygienic condition to the satisfaction of the Transnet Project Manager.

The Contractor shall ensure that there are separate toilet facilities for male and females on site at a ratio of one facility for every 10 employees.

11.4 Waste Management

Waste is grouped into "general" or "hazardous", depending on its characteristics. The classification determines handling methods and the ultimate disposal of the material.

General waste to be expected during construction includes the following:

- Trash (waste paper, plastics, cardboard, etc.) and food waste from offices, warehouses and construction personnel
- Uncontaminated construction debris such as used wood and scrap metal
- Uncontaminated soil and non-hazardous rubble from excavation or demolition

Hazardous waste means any waste that contains organic or inorganic elements or compounds that may, owing to its inherent physical, chemical characteristics, such as toxic, ignitable, corrosive, carcinogenic or other properties or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

The Contractor shall classify all wastes expected to be generated during the construction period.

Examples of typical construction waste which could be expected on the site and how they should be classified are indicated in the following table:

TABLE 2: EXAMPLE OF CONSTRUCTION WASTE CLASSIFICATION

WASTE	CLASSIFICATION	
	HAZARDOUS	GENERAL
Aerosol containers	X	
Batteries, light bulbs, circuit boards, etc.	X	X
Clean soil		X
Construction debris contaminated by oil or organic compounds	X	
Domestic waste		X
Empty drums (depends on prior use)	X	X
Empty paint and coating containers		X
Explosive waste	X	
PCB waste	X	
Rubble (not contaminated by oil or organic compounds)		X
Waste Cable		X
Waste plastic		X
Waste paint and/or solvent	X	
Waste oil	X	
Waste concrete		X
Waste containing fibrous asbestos	X	
Waste timber		X
Sewerage sludge	X	
Scrap metal		X
Chemically-derived sanitary waste	X	

A hierarchical control approach to waste management is encouraged. Waste should preferably be managed in the following order of preference:

- 1. Avoidance:** using goods in a manner that minimises their waste components
- 2. Reduction:** reduction of the quantity and toxicity of waste generated during construction
- 3. Re-use:** removing an article from a waste stream for use in a similar or different purpose without changing its form or properties
- 4. Recycling:** separating articles from a waste stream and processing them as products or raw materials
- 5. Recovery:** reclaiming particular components or materials, or using the waste as a fuel
- 6. Treatment:** processing of waste by changing its form or properties in order to reduce toxicity and quantity
- 7. Disposal:** burial, deposit, discharge, abandoning or release of waste

The Contractor is responsible for the removal of all waste from site generated through the Contractor's activities. The Contractor shall ensure that all waste is removed to appropriate licensed waste management facilities. (For the identification of an appropriate facility, the following source may be utilized: www.sawic.org.za).

The Contractor shall manage HAZARDOUS WASTE anticipated to be generated by his operations as follows:

- Characterise the waste to determine if it is general or hazardous
- Obtain and provide an acceptable container with correct classification label
- Place hazardous waste material in allocated container
- Inspect the container on a regular basis as prescribed by the Contractor's waste management plan
- Track the accumulation time for the waste
- Haul the full container to the disposal site
- Provide documentary evidence of proper disposal of the waste

The Contractor's Environmental Officer will work in conjunction with the Contractor's construction safety and industrial hygiene personnel to create a Hazardous Materials Management Program. This program will establish the necessary protocol for proper handling and removal of hazardous materials on the site.

Information on each hazardous substance will be available to all persons on site in the form of Material Safety Data Sheets (MSDS). Training and education about the proper use, handling, and disposal of the material will be provided to all workers handling the material.

The Contractor's Environmental Officer must be informed of all activities that involve the use of hazardous substances to facilitate prompt response in the event of a spill or release.

The Contractor shall manage GENERAL WASTE that is anticipated to be generated by operations as follows:

- Determine if waste is non-hazardous and obtain containers for waste storage
-

- Notify waste hauler when container is full so that it can be removed and replaced with an empty
- No littering is allowed on site. In the event where staff mobility is high, refuse bags will be made available by the Contractor
- Provide documentary evidence of proper disposal of waste

The Contractor shall recycle GENERAL WASTE (as far as practically possible) that is anticipated to be generated by its operations as follows:

- Obtain and label recycling containers for the following (whichever relevant) and locate them within temporary office building and trailers:
 - Office Waste;
 - Aluminium;
 - Steel;
 - Glass;
 - Ferrous Metals;
 - Non Ferrous Metals; and
 - Waste Timber
- Establish recycled material collection schedule
- Arrange for full bins to be hauled away

Spent batteries, circuit boards, and bulbs, while non-hazardous, require separate storage, special collection and handling.

No burning, burying or dumping of waste of any kind will be permitted.

The Contractor shall quantify all waste disposed of, whether general or hazardous (including waste disposed of by any sub-contractors) and keep record of these quantities on site.

11.5 Workshops, equipment maintenance and storage

All vehicles and equipment must be kept in good working order to maximise efficiency and minimise pollution. Maintenance, including washing and refuelling of plant on site must be done at designated locations at workshop areas. These designated areas must be agreed with the Transnet Project Manager and Transnet Project Environmental Officer. The Contractor must ensure that no contamination of soil or vegetation occurs around workshops and plant maintenance facilities. All machinery servicing areas must be (impermeable) bunded. Drip trays should be used to collect used oil, lubricants and other during maintenance. Drip trays must be provided for all stationary plant. The use of "geyser drip trays" will not be permitted. Steel drip trays shall be of the appropriate size with sufficiently high side walls to contain a spill. Handles shall be placed on each of the four corners to provide safe handling. Washing of equipment should be restricted to urgent maintenance requirements only. Adequate wastewater collection facilities must be provided.

11.6 Vehicle and Equipment Refuelling

11.6.1 Stationary/Designated Refuelling

No vehicles or machines shall be serviced or refuelled on site except at designated servicing or refuelling locations. No oil or lubricant changes shall be made except at designate locations, or in case of breakdown or emergency repair.

The Contractor shall store fuel and oil at a secure area, which shall be bunded to contain 110% of the total volume within the bund and designed with an impervious layer or liner to prevent spillage from entering the ground. The bund shall not be constructed from bricks and mortar.

The Contractor shall provide details of its proposed fuel storage and fuelling facility to the Transnet Project Environmental Officer for approval. The design shall comply with the regulations of the National Environmental Management Act (Act 107 of 1998), National Water Act, (Act 36 of 1998), the Hazardous Substances Act, (Act 15 of 1973), and the Occupational Health and Safety Act, (Act 85 of 1993), Construction and Hazardous Chemical Substances Regulations and applicable SANS standards.

11.6.2 Mobile Refuelling

In certain circumstances, the refuelling of vehicles or equipment in a designated area is not a viable/practicable option and refuelling has to be done from a tank, truck or container moved around on site. In such circumstances, the Contractor may request approval from the Construction Manager to conduct mobile refuelling subject to the following control measures:

- Secondary containment equipment shall be in place. This equipment shall be sized to contain the most likely volume of fuel that could be spilt during transfer.
 - Absorbent pads or drip trays are to be placed around the fuel inlet prior to dispensing.
 - Mobile refuelling units are to be operated by a designated competent person.
 - The transfer of fuel must be stopped prior to overflowing. Fuel tanks or refuelling equipment on vehicles may only be filled to 90% carrying capacity.
 - Mobile fuelling tanks must be stored in an area where they are not susceptible to collisions. The fuel storage area must be located away from drainage channels.
 - Mobile refuelling operations shall not take place within 7.5 meter from structures, property lines, public ways or combustible storage.
 - All mobile refuelling tanks are to be properly labelled and fire extinguishers shall be located near the fuel storage areas. These extinguishers must be of a suitable type and size.
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11.7 Spill Response

The Contractor shall have adequate spill response materials/equipment on site which must be aligned with the volumes of hazardous substances used on site and the risk of pollution to sensitive environmental attributes.

The Contractor shall provide details for approval by the Transnet Project Manager of its spill response plan in the event of any spills of fuel, oils, solvents, paints or other hazardous materials. The plan will show measures to be taken in removing contaminated material from site and demonstrate complete removal of contamination.

The Contractor shall instruct construction personnel on the following spill prevention and containment responsibilities:

- Immediately repair all leaks of hydrocarbons or chemicals
- Take all reasonable means to prevent spills or leaks
- Do not allow sumps receiving contaminated water to overflow
- Prevent storm water runoff from contamination by leaking or spilled drums of oil or chemicals
- Do not discharge oil or contaminants into storm water or sewer systems

If a spill occurs on land, the Contractor must:

- Immediately stop or reduce the spill
- Contain the spill
- Recover the spilled product
- Remediate the site
- Implement actions necessary to prevent the spill from contaminating groundwater or off-site surface water
- Dispose of contaminated material to a location designated thereto

Any spill to water has the potential to disperse quickly, therefore, the spill must be contained immediately using appropriate containment equipment.

If a spill to water occurs, the Contractor must:

- Take immediate action to stop or reduce the spill and contain it
 - Notify the appropriate on-site authorities
 - Implement actions necessary to prevent the spread of the contamination by deploying booms and/or absorbent material
 - Recover the spilled product
 - Properly dispose of spilled material
-

11.8 Spray Painting and Sandblasting

Spray painting and sandblasting should be kept to a minimum. All painting should, as far as practicable, be done before equipment and material is brought on site. Touch-up painting is to be done by hand painting or by an approved procedure. A Method Statement shall be submitted to the Transnet Project Environmental Officer for approval.

The relevant Contractor will inform his Environmental Officer of when and where spray painting or sandblasting is to be carried out prior to commencement of work. The Environmental Officer will monitor these activities to ensure that adequate measures are taken to prevent contamination of the soil.

If the area is in confined or high (elevated) areas, a protection plan must be issued for approval by TNPA.

11.9 Dust Management

Material in transit should be loaded and contained within the load bin of the vehicle in such a way as to prevent any spillage onto the roads and the creation of dust clouds. If necessary, the load bin of the vehicle shall be covered with a tarpaulin to prevent dust.

Dust is to be controlled on unpaved access roads and site roads using sprayed water. Contractors are responsible for managing dust generated as a result of their activities.

Some dust control measures which are normally applied during maintenance are presented in this section for inclusion by the Contractor in his Dust Control Method Statement:

- Operate vehicles within speed limits, where no speed limit has been specified the limit shall be 20km/h
- Wash paved surfaces within the works area twice a week
- Minimise haulage distances
- Apply water to gravel roads with a spraying truck when required
- Environmentally friendly soil stabilisers may be used as additional measures to control dust on gravel roads and construction areas
- Dust suppression measures will also apply to inactive works areas.
- Building material being transported by trucks must be suitably moistened or covered to prevent dust generation
- Minimise disturbance of natural vegetation during right-of-way maintenance (e.g. transmission lines and erection of fences) to reduce potential erosion, runoff, and airborne dust
- Implement a system of reporting excessive dust conditions by maintenance personnel (as instructed through Environmental Awareness Training)

Water for dust control shall only be taken from approved sources.

11.10 Storm water and Dewatering Management

The Contractor shall be aware that, apart from runoff from overburden emplacements and stock piles, storm water can also be contaminated from batch plants, workshops, vehicle wash-down pads, etc., and that contaminants during maintenance may include hydrocarbons from fuels and lubricants, sewerage from employee ablutions and excess fertiliser from rehabilitated areas, etc.

The Contractor shall take note that discharges to controlled waters such as the sea, groundwater or to sewerage systems are controlled under South African Water Legislation. The following specific measures are required:

- Temporary drainage must be established on site during the maintenance period until permanent drainage is in place. Contractors are responsible for maintaining the temporary drainage in their areas. Contractors must provide secondary drainage that prevents erosion
- Contractors must employ good housekeeping in their areas to prevent contamination of drainage water
- The Contractor shall clear stagnant water
- The Contractor shall ensure that no contaminated surface water flows off-site as a result of Contractor operations. Silt traps shall be constructed to ensure retention of silt on site and cut-off ditches shall be constructed to ensure no runoff from the site except at points where silt traps are provided. The Contractor shall be responsible for checking and maintaining all silt traps for the duration of the project.
- If applicable, the Contractor shall be responsible for collection, management, and containment within the site boundaries of all dewatering from all general site preparation activities. The dewatering water shall be contained within the site boundaries by sequentially pumping or routing water to and from sub-areas within the site as the construction activities proceed. No discharge/dewatering to off-site land or surface water bodies will be allowed
- On-site drainage shall be accomplished through gravity flow. The surface drainage system shall consist of mild overland slopes, ditches, and culverts. The graded areas adjacent to buildings shall be sloped away with a 5% slope. Other areas shall have a minimum slope of 0,2% or as otherwise indicated
- Ditches shall be designed to carry a 25-year storm event with velocities in accordance to minimise erosion. Erosion protection shall consist of suitable stabilising surfaces in all ditches
- Culverts shall be designed to ensure passage of the 50-year storm peak runoff flow

11.11 Erosion Control

Both structural and non-structural (vegetative) erosion control measures will be designed, implemented, and properly maintained in accordance with best management practices which will include the following:

- Scheduling of activities to minimise the amount of disturbed area at any one time
 - Implementation of re-vegetation as early as feasible
-

- Limiting traffic and/or avoidance thereof on access roads and areas to be graded to the extent feasible at drainage ditches
- Compacting loose soil as soon as possible after excavation, grading, or filling
- Using silt fences, geo-textiles, temporary rip-rap, soil stabilisation with gravel, diversionary berms or swales, small sedimentation basins, and gravelled roads to minimise transport of sediment
- Implementing the erosion and sedimentation control plan and ensuring that construction personnel are familiar with and adhere to it
- Managing runoff during construction
- The Contractor shall be responsible for checking and maintaining all erosion and sedimentation controls

11.12 Rehabilitation

Contractors shall rehabilitate the entire site upon completion of work. A rehabilitation plan will be submitted to the Construction Manager for approval at least six weeks before completion. The following are critical issues to be included in the rehabilitation plan:

- Details of soil preparation procedures including proposed fertilisers or other chemicals being considered for use
- A list of the plant species that will be used in the rehabilitation process. Note that these should all be indigenous species, and preferably species that are endemic to the area. The assistance of an appropriately qualified botanist should be sought in developing this list
- Procedures for watering the planted areas (frequency of watering, methodology proposed etc).
- An indication of the monitoring procedures that will be put in place to ensure the successful establishment of the plants (duration and frequency of monitoring, proposed criteria for declaring rehabilitation as being successful)
- Procedures for the prevention of the establishment and spread of alien invasive species.

11.13 Noise Management

- Keep all equipment in good working order
 - Operate equipment within its specification and capacity and don't overload machines
 - Apply regular maintenance, particularly with regards to lubrication
 - Operate equipment with appropriate noise abatement accessories, such as sound hoods
 - Sensitive social receptors shall be notified of any excessive noise-generating activities that could affect them.
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- Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, *SANS 10103:2004*, so that it will not produce excessive or undesirable noise when released
- All the Contractor's equipment shall be fitted with effective exhaust silencers and shall comply with the South African Bureau of Standards recommended code of practice, *SANS 10103:2004*, for construction plant noise generation
- All the Contractor's vehicles shall be fitted with effective exhaust silencers and shall comply with the Road Traffic Act, (Act 29 of 1989) when any such vehicle is operated on a public road
- If on-site noise control is not effective, protect the victims of noise (e.g. ear-plugs) by ensuring that all noise-related occupational health provisions are met. (Occupational Health and Safety Act, (Act 85 of 1993).

11.14 Protection of heritage resources

11.14.1 Archeological Sites

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the engineer of such a discovery. The South African Heritage Resources Agency (SAHRA) is to be contacted and will appoint an archaeological consultant. Work may only resume once clearance is given in writing by the archaeologist.

11.14.2 Graves and middens

If a grave or midden is uncovered on site, or discovered before the commencement of work, all work in the immediate vicinity of the graves/middens shall be stopped and the Transnet Project Manager informed of the discovery. The SAHRA should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The undertaker will, together with the SAHRA, be responsible for attempts to contact family of the deceased and for the site where the exhumed remains can be re-interred.

11.15 Fire prevention

Fires shall only be allowed in facilities or equipment specially constructed for this purpose. A firebreak shall be cleared and maintained around the perimeter of the camp and office sites. All conditions incorporated in the requirements of the Occupational Health and Safety Act shall be implemented.

11.16 Water Protection and Management

No water shall be abstracted from any water resource (stream, river, or dam) without the express permission of the Construction Manager. Such permission shall only be granted once it can be shown that the water is safe for use, that there is sufficient water in the resource to meet the demand, and once permission has been obtained from the Department of Water Affairs and Sanitation in accordance with the requirements of the National Water Act (Act 36 of 1998).

Water for human consumption shall be available at the site offices and at other convenient locations on site. The generally acceptable standard is that a supply of drinking water shall be available within 200m of any point on the construction site.

The Contractor shall keep record of the quantities of water used during construction (including use by sub-contractors), irrespective of the purpose of use.

All water released into the receiving environment and potentially containing contaminants shall be monitored to ensure compliance with the requirements of the National Water Act. All samples monitored shall be sent to a SANS 17025 certified laboratory.

11.17 Protection of Fauna and the collection of firewood

On no account shall any hunting or fishing activity of any kind be allowed. This includes the setting of traps, or the killing of any animal caught in construction works.

On no account shall any animal, reptile or bird of any sort be killed. This specifically includes snakes or other creatures considered potentially dangerous discovered on site. If such an animal is discovered on site an appropriately skilled person should be summoned to remove the creature from the site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members.

The Contractor shall provide adequate facilities for all his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The Contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

11.18 Environmental Awareness Training

An Environmental Awareness Program is considered a necessary part of the EMP for the Project. Training of the appropriate construction personnel will help ensure that all environmental regulations and requirements are followed which must be defined in the relevant Method Statement to be prepared by the Contractor.

Objectives of environmental awareness training are:

- Environmental Management – protecting the environment from the effects of construction by making personnel aware of sensitive environmental resources.
 - Regulatory compliance – complying with requirements contained in project – specific permit conditions, also complying with requirements in regional and local regulations.
-

- Problem recognition and communication – training personnel to recognise potential environmental problems, i.e. spills, and communicate the problem to the proper person for solution.
- Liability control - non-compliance with regulatory requirements can lead to personal and corporate liability.

All individuals on the Project construction site will need to have a minimum awareness of environmental requirements and responsibilities. However, not all need to have the same degree of awareness. The required degree of knowledge is greatest for personnel in the Safety, Health, and Environmental Sections and the least for the manual personnel.

The Contractor shall present environmental awareness programmes on a weekly/bi-monthly basis and keep record of all the environmental related training of the personnel.

11.19 Handling and Batching of Concrete and Cement

Concrete batching shall only be conducted in demarcated areas which have been approved by the Transnet Construction Manager.

Such areas shall be fitted with a containment facility for the collection of cement-laden water. This facility shall be bunded and have an impermeable surface protection so as to prevent soil and groundwater contamination. Drainage of the collection facility will be separated from any infrastructure that contains clean surface runoff.

The batching facility will not be placed in areas prone to floods or the generation of stagnant water. Access to the facility will be controlled so as to minimise potential environmental impacts.

Hand mixing of cement and concrete shall be done on mortarboards and/or within the bunded area with impermeable surface or concrete slab.

Bulk and bagged cement and concrete additives will be stored in an appropriate facility at least 10m away from any watercourses, gullies and drains.

Waste water collected in the containment facility shall be left to evaporate. The Contractor shall monitor water levels to prevent overflows from the facility. Water can be pumped into sealed drums for temporary storage and must be disposed of as liquid hazardous waste.

All concrete washing equipment, such as shovels, mixer drums, concrete chutes, etc. shall be done within the washout facility. Water used for washing shall be restricted as far as practically possible.

Ready-mix concrete trucks are not allowed to wash out anywhere other than in an area designated for this purpose.

The Contractor shall periodically clean out hardened concrete from the wash-out facility or concrete mixer, which can either be reused or disposed of as per accepted waste management procedures.

Empty cement and bags, if temporarily stored on site, must be collected and stored in weatherproof containers. Used cement bags may not be used for any other purpose and must be disposed of on a regular basis in accordance with the Contractor's solid waste management system.

Sand and Aggregates containing cement will be kept damp to prevent the generation of dust.

Concrete and cement or any solid waste materials containing concrete and cement will be disposed of at a registered disposal facility. Where disposal facilities for general waste are utilised, written consent from the relevant municipality must be obtained.

11.20 Stockpiling, Soil Management and Protection of Flora

Clearance of vegetation shall be restricted to that which is required to facilitate the execution of the works

Stockpiling may only take place in designated areas indicated on the approved site layout plan. Sensitive areas shall be avoided in this regard.

The Contractor shall measure the extent of all areas cleared for construction purposes and keep this figure updated.

Any area to be used for stockpiling or material laydown shall be stripped of all topsoil.

Vegetation clearance shall occur in a planned manner, and cleared areas shall be stabilised as soon as possible.

The detail of vegetation clearing shall be subject to the Construction Manager's approval and shall occur in consultation with the Transnet Project Environmental Officer.

Stockpiles must be positioned in areas sheltered from the wind and rain to prevent erosion and dispersion of loose materials.

Stockpiled soil shall be protected by adequate erosion-control measures.

Soil stockpiles shall be located away from drainage lines, watercourses and areas of temporary inundation.

Topsoil shall be stockpiled separately from other materials and kept moist.

Excavated subsoil, where not contaminated, must be used for backfilling and topsoil for landscaping and rehabilitation of disturbed areas.

Where topsoil has become mixed with subsoil or is not up to the original standard, fertiliser or new topsoil shall be provided by the Contractor.

Stockpiles (excluding ballast stockpiles) shall not exceed 2m in height unless otherwise permitted by Transnet.

No vegetation located outside the construction site shall be destroyed or damaged.

As far as is reasonably practicable, existing roads must be used for access to site and right of way.

Before site clearance takes place, vegetation surveys will be conducted and protected species identified.

No protected plant species shall be removed without written consent from the relevant authorities.

The development of new embankments or fill areas must be undertaken in consultation with the Transnet Project Environmental Officer.

No dumping of solid waste or refuse shall not be allowed within or adjacent to areas of natural vegetation.

The Contractor shall identify and eradicate all declared alien and invasive plant species occurring on site.

11.21 Traffic Management

Vehicles are not permitted to leave access roads.

Turning of vehicles should only take place within a clearly demarcated "turn area" located within the approved construction footprint

The contractor must co-ordinate the loading and offloading of material during the construction phase so as to ensure that vehicular movement is in one direction only at any one time and that side-tracks are not created on the site.

Vehicles should only be parked within designated parking areas as demarcated on the site layout plan

11.22 Transportation of Materials

The Contractor is responsible for ensuring that all suppliers and delivery drivers are aware of procedures and restrictions (e.g. no-go areas) in terms of the EMP Material must be appropriately secured to ensure safe passage between destinations during transportation. Loads must have appropriate cover to prevent spillage from the vehicles. The Contractor will be held responsible for any clean-up resulting from the failure to properly secure transported materials.

11.23 Borrow Pits and Quarries

The contractor shall make use of commercial suppliers for all rock and sand raw materials.

The Contractor shall ensure that any supplier is in possession of the required permit/license and keep record of the quantity of material supplied.

The Contractor will not make direct use of any borrow pits and quarries unless he has obtained written approval from the Construction Manager and Method Statement has been submitted and approved.

The abovementioned Method Statement will provide the detailed description of the location of the borrow pits and/or quarries and the procedures that will be followed to adhere to any pertinent national or local legislation (e.g. mineral extraction, safety and noise levels).

11.24 Social and Labour Issues

The criteria for and selection of labourers, sub-contractors and suppliers for the project shall demonstrate preference for the local community and shall be aligned with the criteria set by Transnet in appointing the Contractor. The Contractor shall keep records of the identity of all staff.

Under no circumstances shall the Contractors engage in formal discussions with landowners without prior consent by the Transnet Project Manager.

No activity on private property shall be allowed without written consent by the relevant landowner and the Transnet Project Manager.

Any damage to private property caused by the Contractor during the construction period, shall be repaired to the satisfaction of the Transnet Construction Manager.

The Contractor shall keep record of any complaint raised during the construction period relating to the Contractor's activities.

No job-seekers shall be allowed on site.

11.25 Energy Management

The Contractor shall measure and keep updated records of the following:

- Electricity consumption (to be measured in Watt Hours)
 - Fuel consumption (to be measured in litres)
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The Contractor shall utilize energy saving lights / devices within all buildings under his control.

11.26 Handling, Storage and Management of Hazardous Substances

All hazardous materials/substances shall be stored in a secured, designated area that is fenced and has restricted entry.

All storage shall take place using suitable containers to the approval of the Transnet Project Manager.

All hazardous liquids shall be located in a secure, demarcated area and an adequate bund wall (110% of the total volume stored) shall be provided. The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled/leaked liquids into the soil.

No possible spillages or accumulated stormwater within this bunded area will be allowed to be flushed from the bund into the surrounding area. All fluids accumulated within the bunded area shall be removed and disposed of in accordance with Section 13.4.

Hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure.

Weighbills of hazardous substances shall be sourced from suppliers and kept on site for inspection by the Transnet Project Environmental Officer.

The Contractor must provide a method statement detailing the hazardous substances that are to be used during construction, as well as the storage, handling and disposal procedures for each substance. Emergency procedures in the event of misuse or spillage that might negatively affect the environment must be specified.

12. References

1. DEAT (2002) Screening, Information Series 3, Department of Environmental Affairs and Tourism, Pretoria.
 2. DEAT (2004a) EMPs, Integrated Environmental Management, Information Series 12, Pretoria.
 3. DEAT (2004) Environmental Auditing, Integrated Environmental Management, Information Series 14, Pretoria.
 4. DWAF, February 2005. Environmental Best Practice Guidelines: Construction. Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.
 5. DWAF, February 2005. Environmental Site Management and Rehabilitation Awareness Course: General Level. Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.
 6. DWAF, February 2005. Environmental Monitoring and Auditing Guideline. Integrated Environmental Management Sub-Series No. IEMS 1.7. Third Edition. Pretoria.
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ANNEXURE A:

MAIN ACTIONS REQUIRED BY THE CONTRACTOR FOR COMPLIANCE WITH THE EMP

MAIN ACTIONS REQUIRED BY THE CONTRACTOR FOR COMPLIANCE WITH THE EMP

PRIOR TO COMMENCEMENT

Method Statements

The Contractor shall submit project and task specific method statements to the Transnet Construction Manager within 14 days of receipt of the Letter of Acceptance.

Activities shall only be allowed to commence once the method statements have been approved by the Transnet Construction Manager.

Environmental Management Plans

The Contractor shall submit an EMP for approval to Transnet Construction Manager before commencement of activities.

Environmental Awareness Training preparation

The Contractor shall be required to present the Environmental Awareness Training to all personnel within 7 days of the project commencing. The Contractor shall manage and implement all the requirements associated with the presenting of the training programme with the Transnet Construction Manager before the Commencement Date.

TWO WEEKS AFTER COMMENCEMENT

Demarcation of the Site

The Contractor shall be required to establish a site office within the project footprint or alternatively at a locality appropriately zoned and/or authorised for such use and approved by the Transnet Construction Manager. The Contractor shall be required to erect and maintain a temporary fence along the boundary perimeter and at all sites identified as "no-go" areas, to the satisfaction of the Transnet Construction Manager.

The Contractor shall select a location that has easy access and which has already been cleared or disturbed by previous human activity (e.g. previous Contractor camps or stockpile areas). All maintenance activities, materials, equipment and personnel will be restricted to within the area specified.

Environmental Awareness Course

The Contractor shall ensure all staff members attend the environmental awareness training to be held in or before the first week after the commencement date.

FOLLOW-ON FROM THE ENVIRONMENTAL AWARENESS COURSE

The contractor shall be responsible for presenting follow up training on a six monthly

basis.

During maintenance, if new personnel come onto site, the Contractor shall be responsible for providing awareness training and thus ensure these personnel are aware of the environmental specifications on site.

Method statement awareness

Where applicable, the Contractor shall provide task-specific training on an *ad hoc* basis when workers are engaged in activities, which require method statements.

Emergency preparedness

The Contractor shall ensure all measures required to prevent, mitigate, manage and control an emergency situation are implemented. This activity shall require regular review during maintenance.

DURING CONSTRUCTION

Contractor Familiarisation of the EMP

The Contractor shall ensure a copy of the EMP and its relevant Project Specification clauses are available on Site, and shall ensure that all the personnel associated with the project (including sub-contractors and suppliers), are familiar with and understand the specifications contained in the EMP.

Method Statements

All other task specific method statements, required during the course of maintenance, shall be submitted to the Transnet Construction Manager for approval 14 days prior to the proposed commencement of the activity.

Site Security

The Contractor shall, where applicable, ensure that measures are implemented to secure the site during all nonworking hours, including public holidays.

Materials Handling, Use and Storage

The Contractor shall ensure all materials delivered, handled, used or stored are done in compliance with the requirements of the EMP. Additionally, the Contractor shall ensure all measures are in place to manage, mitigate and control an emergency situation should one arise.

The Contractor shall ensure all staff members are adequately trained in all elements pertaining to such materials.

AFTER CONSTRUCTION-RELATED ACTIVITIES ARE COMPLETE

Site Clean up

Within 7 days of the completion of maintenance related activities, the Contractor shall commence with the clearing and cleaning of the site, ensuring everything not forming part of the permanent works is removed from site.

ANNEXURE B:

BASIC ENVIRONMENTAL AWARENESS TRAINING

DO'S AND DON'T'S



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



Do not swim in the sea
Do not throw oil, petrol, diesel, concrete or rubbish in the sea
Do not work in the sea without direct instruction



Protect animals on the site
Ask your supervisor or Contract's Manager to remove animals found on site



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



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



Try to avoid producing dust - wet dry ground & soil



Do not make loud noises around the site
Report or repair noisy vehicles



Use the toilets provided
Report full or leaking toilets



Only eat in demarcated eating areas
Never eat near the sea
Put packaging & leftover food into rubbish bins



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



Always keep to the speed limit
Drivers - check & report leaks
Ensure loads are secure & do not spill



Know all the emergency phone numbers



Spot fines of between R20 and R2000
Removal from site
Construction may be stopped



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

MOETS EN MOENIES



Werkers en gereedskap moet ten alle tye binne die terreingrense bly.



Moenie in die swem nie.
Moenie olie, petrol, diesel, sement of rommel in see gooi nie.
Moenie in die see werk sonder direkte instruksie nie.



Beskerm diere op die konstruksieterrein.
Vra u toesighouer of Kontrakbestuurder om diere van die terrein te verwyder.



Gooi sigaretstompies in 'n asblik.
Moenie rook naby gas, verf of petrol nie.
Moenie sonder toestemming enige vure maak nie.
Weet waar brandbestrydingstoerusting gestoor word



Meld alle vure onmiddelik aan.
Moenie rommel verbrand sonder toestemming.
Werk slegs in gemerkte areas met petrol, olie & diesel.



Meld alle petrol, olie en diesel lekkasies aan.
Gebruik 'n drupbak onder voertuie en masjienerie.
Maak drupbakke leeg na reën, maar nie in riviere nie



Probeer om nie stof te maak nie.
Maak droë grond nat met water.



Moenie harde geluide maak op die terrein nie, veral naby skole en huise.
Meld raserige voertuie aan of herstel dit.



Gebruik die toilette wat voorsien is.
Meld vol of lekkende toilette aan.



Eet slegs in gemerkte gebiede.
Moenie naby riviere of strome eet nie.
Gooi verpakking en orige kos in vullisblikke.



Moenie vullis rondstrooi nie - gooi alle vullis (veral sementsakke) in vullishouers.
Mel vol vullishouers aan by u toesighouer.
Vullishouers moet gereeld leeggemaak word.



Moet nooit die spoedperk oorskry nie.
Bestuurders - gaan voertuie na en meld lekkasies of rokerige voertuie aan.
Maak seker dat alle vragte stewig is en nie mors nie.



Maak seker dat u alle nood telefoonnummers ken.



Boetes tussen R20 en R2000
Verwydering vanaf die konstruksieterrein.
Konstruksie mag gestop word.



Meld alle brekasies, vure, vloede, lekkasies en beserings aan by u toesighouer.
Vra vrae!

EMAZENZIWE NE MAZINGENZIWA



Abasebenzi nezixhobo abazisebenzisayo mabangaphumi nazo ngaphaya kwesayiti



Sukuqubha okanye usele amanzi omlambo Sukugalela ioil, petrol, diesel, concrete okanye inkukuma emlanjeni
Sukonakalisa iindonga (zomlambo) okanye izintyalo



Khusela izilwanyana ezilapho esayitini Xelela isupervisor ukuba zimkiswa ezozilwanyana



Ungonakalisi okanye ugawule imithi ngaphandle kwemvume Sukwemba izityalo Xa ugqibile ukutshayo galela emgqomeni (izitimpi zecuba)



Sukutshaya kufuphi negesi, ipeyinti ne petroli Sukubasa umlilo ngaphandle kwemvume Zazi izicima mlilo apho zikhoyo Sukutshisa inkukuma naaphandle kwemvume



Sebenzisa ipetrol, oil ne diesel endaweni yayo Faka isitya sokukhonzela phansi kwemashini Ungagaleli oil emlanjeni



Zama ungenzi uthuli fefa ngamanzi emhlabeni



Sukwenza ingxolo eshayitini ngakumbi kufuphi nesikolo nezi ndlu Yazisa ulungise isithuthi esonakeleyo



Sebenzisa itoilet (izindlu zangasese) Xela xa zizeleyo



Tyela kwindawo eyenzelwe oko Sukutshala kufuphi nomlambo Lahla emgqomeni yonke inkukuma



Sulahla inkukuma phantsi Galela emgqomeni yonke inkukuma xela xa izele imigqomo Xela xa umgqomo uzele



Gcina isantya umqhubi makayilungise inqwelo xa yonakele Qononondisa umthwalo ubotshwe enqweleni



Zazi inombolo zengozu



Intlawulo ngokwaphula umthetho yi R20 - R2000 Okanye ugqothwe emsebenzini Contract leyo imiswe



Ripota wonke umanakalo ofana nokuqhekeza, isiphango umlilo, ukuvuza kwemashini nengozi kwi supervisor Buza xa unombuzo



ANNEXURE C:

DECLARATION OF UNDERSTANDING

ANNEXURE D:

CONTRACTOR'S ENVIRONMENTAL OFFICER