



TRANSNET GROUP CAPITAL
ENVIRONMENT AND SUSTAINABILITY

**STANDARD ENVIRONMENTAL
SPECIFICATION (SES)
ENV-STD-002 Rev04**

Document Control

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Table of Contents

1 Purpose	1
2 Scope	1
3 Abbreviations and Definitions	1
3.1 Abbreviations	1
3.2 Definitions	2
4 Minimum Standards for Environmental Management	5
4.1 Site Planning and Establishment	5
4.1.1 Site plan	5
4.1.2 Identification and establishment of suitable access routes/roads	6
4.1.3 Demarcation of site limits	6
4.1.4 Eating Areas	7
4.1.5 Liquid waste Management	7
4.2 Sewage and Sanitation	7
4.3 Waste Management	8
4.4 Workshops, equipment maintenance and storage	12
4.5 Vehicle and Equipment Refueling	13
4.5.1 Stationary/Designated Refueling	13
4.5.2 Mobile Refueling	13
4.6 Spill Response	14
4.7 Spray Painting and Sandblasting	15
4.8 Dust Management	15
4.9 Storm water and Dewatering Management	16
4.10 Erosion Control	17
4.11 Noise Management	18
4.12 Protection of heritage resources	19
4.12.1 Archaeological Sites	19
4.12.2 Graves and middens	19
4.13 Fire prevention	19
4.14 Water Protection and Management	20
4.15 Protection of Fauna and the collection of firewood	20
4.16 Environmental Awareness Training	21
4.17 Handling and Batching of Concrete and Cement	21
4.18 Stockpiling, Soil Management and Protection of Flora	23
4.19 Traffic Management	24
4.20 Transportation of Materials	24
4.21 Borrow Pits and Quarries	25
4.22 Social and Labour Issues	25
4.23 Energy Management	26
4.24 Handling, Storage and Management of Hazardous Substances	26
4.25 Housekeeping	27
4.26 Rehabilitation	27
5 Documentation	28
6 Records	28

1 Purpose

This specification describes the minimum standards for environmental management to which Contractors and Sub-contractors on a construction site must comply. It is a generic standard for use across all construction works executed by Transnet Group Capital (TGC).

There may be project specific environmental standards in addition to the standards in this document that exceed the standards prescribed here. The project specific environmental standards will be described in the Project Environmental Specification (PES) that will be issued separately for each project (where relevant).

This document must be read in conjunction with the TGC Construction Environmental Management Plan (CEMP).

2 Scope

This standard applies to Contractors that work on site under the authority of TGC.

3 Abbreviations and Definitions

3.1 Abbreviations

Abbreviation	Meaning
CEMP	Construction Environmental Management Plan
CM	Construction Manager
DEA	Department of Environmental Affairs
EA	Environmental Authorisation
EO	Environmental Officer
EGF	Environmental Governance Framework
NEMA	National Environmental Management Act 107 of 1998 (as amended)
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004
NWA	National Water Act 36 of 1998
PEM	Project Environmental Manager

PM	Project Manager
PES	Project Environmental Specification
SES	Standard Environmental Specification
SHEQ	Safety, Health, Environment and Quality
TGC	Transnet Group Capital

3.2 Definitions

Fauna	A group of animals specific to a certain region or time period.
Flora	A group of plants specific to a certain region or time period.
General waste	<p>Waste that does not pose an immediate hazard or threat to health or to the environment; and includes:</p> <ul style="list-style-type: none"> (a) domestic waste; (b) building and demolition waste; (c) business waste; (d) inert waste; or (e) any waste classified as non-hazardous waste in terms of NEMWA, 59 of 2008.
Hazardous waste	Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles.
Indigenous vegetation	Plants that naturally occur in an area.
Liquid waste	Waste that appear in liquid form such as used oil, grease and/or contaminated water or waste water.

Method statement	A document that describes how the Contractor will implement environmental management measures associated with a particular environmental aspect during construction. It is a written submission by the Contractor to the TGC Environmental Officer/Construction Manager in response to this Specification or a request by the Engineer, an ECO or Authorities setting out the equipment, plant, materials, labour and method the Contractor proposes to use to carry out an activity identified by this Specification or the TGC EO when requesting the Method Statement, in such detail that the TGC EO is able to assess whether the Contractor's proposal is in accordance with this Specification and/ or will produce results in accordance with this Specification.
Natural Vegetation	All existing species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on the site.
Rehabilitation	Refers measures that must be put in place to restore the site to its pre-construction or enhanced state, subsequent to construction taking place.
Responsible Authority	A Responsible Authority, according to the National Water Act 36 of 1998, relates to specific power or authority in respect of water uses that is assigned by the Minister to a Catchment Management Agency or to a Regional Office.
Sensitive area	Any area that is denoted as sensitive by this Specification due to its particular attributes, which could include the presence of rare or endangered vegetation, the presence of heritage resources (<i>e.g.</i> archaeological artefact or graves), the presence of a unique natural feature, the presence of a watercourse or water body, the presence of steep slopes.

Solid waste	All solid waste, including construction debris, chemical waste, excess cement/ concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
Spoil	Excavated material which is unsuitable for re-use as material in the Works or any other use; or is material which is surplus to the requirements of the Works.
Temporary Storage	A once-off storage of waste for a period not exceeding 90 days.
Topsoil	Means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility appearance, structure, agricultural potential, fertility and composition of the soil.
Waste	Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes. Waste or a portion of waste ceases to be a waste only once the waste is, or has been re-used, recycled or recovered.
Watercourse	Means: <ul style="list-style-type: none"> a) a river or spring; b) a natural channel in which water flows regularly or intermittently; c) a wetland, lake or dam into which, or from which, water flows; and d) any collection of water gazetted by the National Water Act, 36 of 1998 as a watercourse and a reference to a watercourse includes, where relevant, its bed and banks

Wetland

Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

4 Minimum Standards for Environmental Management

The Contractor shall identify the potential environmental aspects and 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 CEMP.

The Contractor will comply with the standards described below.

4.1 Site Planning and Establishment

The Contractor shall establish his construction camps, offices, workshops, eating areas 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. Where required a buffer must be determined by the ecological requirements of the fauna/flora found on-site.

The Contractor shall ensure that a most recent Transnet SHEQ Policy is displayed on the notice-board at all times.

4.1.1 Site plan

Before the onset of construction, the Contractor shall submit to the TGC Construction Manager and TGC Environmental Officer for their approval, plans of the exact location, extent and construction details of the proposed facilities and the impact mitigation measures the Contractor proposes to put in place. Any changes to the location of the facilities and site activities as per the approved site layout plan shall be re-submitted for approval prior to implementation of changes.

The Site Plan must as a minimum include but not necessarily 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 liquid waste;
- 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; and
- 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 TGC Construction Manager and Environmental Officer.

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 any watercourse. Should this not be possible, approval for the location of these facilities must be granted by the TGC Environmental Officer.

4.1.2 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. However, prior to making a decision about a new access road, the TGC Environmental Officer must assess the proposed access road against the prevailing environmental legislation to confirm/rule out possible EIA triggers. Access tracks must be maintained in a good condition at all times during construction to minimize erosion and dust generation.

4.1.3 Demarcation of site limits

Prior to the commencement of construction, the actual site to be developed must be clearly demarcated through the most effective means. Vegetation within the demarcated zone may be

cleared only upon obtaining approval from the TGC Environmental Officer. 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.

4.1.4 *Eating Areas*

The Contractor is responsible for providing adequate eating facilities within the works area to ensure that workers do not leave the site to eat during working hours. Refuse bags/bins must be provided at all established eating areas and when full it should be disposed as required by Section 4.3 below.

4.1.5 *Liquid waste Management*

Liquid waste water from site shall be stored on-site in a properly designed and constructed system, situated so as not to adversely affect water courses (streams, rivers, pans, dams etc.). Only domestic type wastewater, i.e. toilet, shower, basin, kitchen water shall be allowed to enter the designated system.

4.2 *Sewage and Sanitation*

The Contractor is responsible for providing adequate sanitary facilities including toilets, toilet paper, wash basins etc. 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: dry-composting toilets such as “enviro loos” 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.

Toilet facilities shall be serviced regularly and the waste material generated from these facilities shall be disposed of at a registered waste water treatment works/macerator and proof of servicing and disposal shall be made available in the Contractor EO’s File.

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on the works. Use of open areas (i.e. the veldt) shall not, under any circumstances, be allowed. For projects of high mobility a mobile toilet facility shall be made available by the Contractor.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. Toilets must not be placed in areas susceptible to flooding or 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 TGC Construction Manager.

4.3 Waste Management

Waste is grouped into "general" or "hazardous", depending on its characteristics. The classification determines handling methods and the ultimate disposal of 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; and
- Uncontaminated soil and non-hazardous rubble from excavation or demolition.

The Contractor shall classify all waste 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 1: 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	

WASTE	CLASSIFICATION	
	HAZARDOUS	GENERAL
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 cement powder	X	
Waste empty cement bags (must be thoroughly decanted)		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:

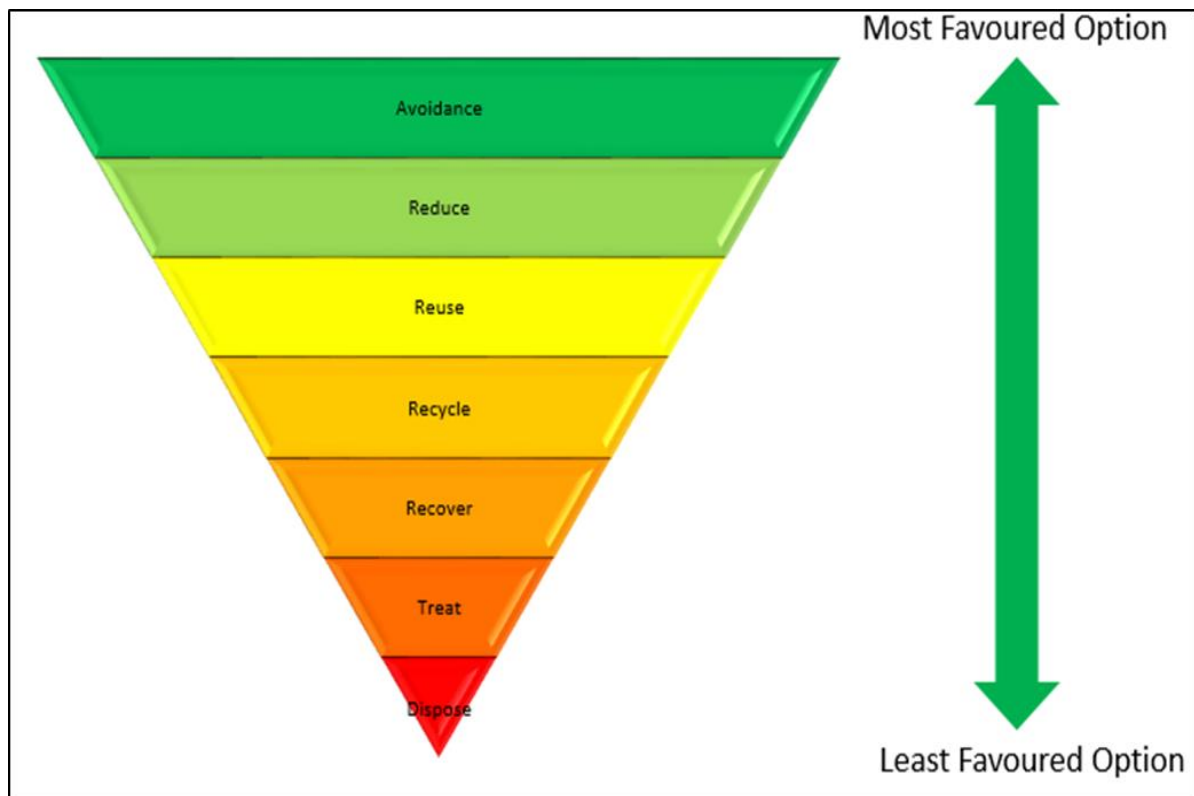


FIGURE 1: THE WASTE MANAGEMENT HIERARCHY

(Transnet Environmental Risk Management Strategy and Framework, 2015:42)

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

The Contractor is responsible for the removal of all waste from site generated through the construction 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: <http://sawic.environment.gov.za/>).

The Contractor's Environmental Officer will work in conjunction with the Contractor's Safety and Health 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.

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

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

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 manage **HAZARDOUS WASTE** anticipated to be generated by his operations as follows:

- Obtain and provide an acceptable container with correct and visible 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 registered hazardous disposal site;
- Notify the waste hauler when container is full so that it can be removed and replaced with an empty container/skip; and
- Provide documented evidence of proper waste disposal of the waste (Waste Disposal Certificate).

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.

4.4 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 refueling of plant on site must be done at designated locations at workshop areas. These designated areas must be agreed with the TGC Construction Manager and TGC 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 bunded. Drip trays should be used to collect used oil, lubricants at all times. Drip trays must be provided for all stationary plant. Washing of equipment should be restricted to urgent maintenance requirements only. Adequate wastewater collection facilities must be provided and the wastewater should be disposed of at a registered hazardous waste disposal site.

4.5 Vehicle and Equipment Refueling

4.5.1 Stationary/Designated Refueling

No vehicles or machines shall be serviced or refuelled on site except at designated and approved 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 or paved surface to prevent spillage from entering the ground.

The Contractor shall provide details of its proposed fuel storage and fuelling facility to the TGC Environmental Officer for approval. The design shall comply with the regulations of the National Water Act, (Act 36 of 1998), the Hazardous Substances Act, (Act 15 of 1973), the Environmental Conservation Act, (Act 73 of 1989), National Environmental Management Act, (Act 107 of 1998), and the Occupational Health and Safety Act, (Act 85 of 1993), mainly the Construction - and Hazardous Chemical Substances Regulations.

4.5.2 Mobile Refueling

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, bowser or container moved around on site. In such circumstances, the Contractor may request approval from the TGC 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 30 meters of any watercourses or 7.5 meter from other structures, property lines, public ways or combustible storage.
- All mobile refuelling tanks are to be properly labelled and fire extinguishers with valid service dates shall be located near the fuel storage areas. These extinguishers must be of a suitable type and size.

4.6 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 TGC Construction Manager and TGC Environmental Officer 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 oil or oily water to overflow;
- Prevent storm water runoff from contamination by leaking or spilled drums of oil or chemicals; and
- 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 at a registered hazardous waste disposal site and provide proof thereof (SDCs)

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
- Dispose of spilled material at a registered hazardous waste disposal site and provide SDCs
- Water samples to be taken downstream from where the spill took place to trace the extent of pollution

4.7 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 TGC 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 Contractor's 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 the TGC Environmental Officer.

4.8 Dust Management

Contractors are responsible for managing dust generated as a result of their activities. The use of water for dust management must be minimised as far as practically possible. Discretion must be applied on a site-by-site basis in terms of dust control. Dust control measures must be agreed upon by the TGC EO prior to commencement of the Works.

Below are some dust control measures which can be applied during construction:

- Operate vehicles within speed limits, where no speed limit has been specified, the limit shall be 20km/h;
- Minimise haulage distances where possible;
- Environmentally friendly soil stabilisers may be used as additional measures to control dust on gravel roads and construction areas;
- The introduction of hydro-seeding and mulch due to its ability to bind soil particles together and thus reduce fugitive dust on-site;
- Dust suppression measures will also apply to inactive construction areas. (An inactive construction site is one on which construction will not occur for a month or more);
- Minimise disturbance of natural vegetation during right-of-way construction (e.g. transmission lines and erection of fences) to reduce potential erosion, runoff, and airborne dust;
- 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;
- Implement a system of reporting excessive dust conditions by construction personnel (as instructed through Environmental Awareness Training);
- In cases where water is to be used for dust control; it shall be ensured that only authorised sources are used; and
- Apply water to gravel roads with a spraying truck when required

4.9 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 construction 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, rivers, groundwater or to sewerage systems are controlled under the South African Water Legislation. The following specific measures are required:

- Temporary drainage must be established on site during the construction 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, where necessary.

- Contractors must employ good housekeeping in their areas to prevent contamination of drainage water.
- The Contractor shall clear stagnant water at all times.
- The Contractor shall ensure that no contaminated surface water flows off-site as a result of Contractor operations. Where necessary, 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.
- The removal from groundwater is defined as a water-use under the National Water Act 36 of 1998. Therefore, it must be ensured that the project has been authorised by the Responsible Authority to remove groundwater prior to dewatering taking place. 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.
- 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.

4.10 Erosion Control

All structural and non-structural (vegetative) erosion control measures will be designed, implemented, and properly maintained in accordance with best management practices which will include, but not limited to 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 construction 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; and
- The Contractor shall be responsible for checking and maintaining all erosion and sedimentation controls.

4.11 Noise Management

The Contractor must implement the following measures, as a minimum, to manage noise pollution resulting from his/her activities:

- 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;
- Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, *SANS 10103:2004* or the latest at the time, 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* or the latest at the time, 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 by ensuring that all noise-related occupational health provisions are met. (Occupational Health and Safety Act, (Act 85 of 1993).

4.12 Protection of heritage resources

4.12.1 *Archaeological 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 TGC CM and TGC EO of such a discovery. The South African Heritage Resources Agency (SAHRA) or relevant Authority is to be contacted and will appoint an Archaeologist to investigate the find. Work may only resume once clearance is given in writing by the Archaeologist.

4.12.2 *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 TGC Construction Manager and EO informed of the discovery. The South African Heritage Resources Agency (SAHRA) or relevant Authority 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.

4.13 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 where and when necessary in accordance with relevant legislative requirements.

All conditions incorporated in the requirements of the Occupational Health and Safety Act shall be implemented.

4.14 Water Protection and Management

No water shall be abstracted from any water course (stream, river, or dam) without the expressed permission of the TGC Construction Manager and TGC Environmental Officer. 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 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.

Method Statement(s) must be prepared by the Contractor for the various water uses. The Contractor shall keep a record of the quantities of water used during construction (including use by sub-contractors), irrespective of the purpose of use.

4.15 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.

4.16 Environmental Awareness Training

An Environmental Awareness Program is considered a necessary part of the Construction Environmental Management Plan 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 Contractor's EO for a 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 (depending on project requirements) and keep record of all the environmental related training of the personnel.

4.17 Handling and Batching of Concrete and Cement

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

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. It is acknowledged that all waste water will evaporate; it must be ensured that the remaining 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 and approved by the TGC Construction Manager and EO 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 relevant registered disposal facility and SDCs kept on the file. Where disposal

facilities for general waste are utilised, written consent from the relevant municipality must be obtained by the Contractor and proper records kept.

4.18 Stockpiling, Soil Management and Protection of Flora

The Contractor shall measure the extent of all areas cleared for construction purposes and keep this figure updated. Sensitive areas shall be cordoned off and avoided in this regard.

Stockpiling may only take place in designated areas indicated on the approved site layout plan. Any area to be used for stockpiling or material laydown shall be stripped of all topsoil.

Clearance of vegetation shall be restricted to that which is required to facilitate the execution of the works. Vegetation clearance shall occur in a planned manner, and cleared areas shall be stabilised as soon as possible when and where necessary. The detail of vegetation clearing shall be subject to the TGC Construction Manager's approval and shall occur in consultation with the TGC 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. Stockpiles containing topsoil shall not exceed 2m in height unless otherwise permitted by Transnet.

Topsoil shall be stockpiled separately from other materials and prevented from movement. Excavated subsoil, where not contaminated, must be used for backfilling, if possible, 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.

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 the site. Before site clearance takes place, vegetation surveys must 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 TGC Environmental Officer.

No dumping of solid waste or refuse shall 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.

4.19 Traffic Management

Vehicles usage is permitted **only** on access roads. Vehicles should only be parked within designated parking areas as demarcated on the site layout plan.

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.

4.20 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 CEMP and this Specification. Material must be appropriately secured to ensure safe passage between destinations during transportation. Loads must have appropriate cover, where ADTs are not utilised, 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.

4.21 Borrow Pits and Quarries

The Contractor shall ensure that suppliers of rock and sand raw materials are 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 the borrow pit has a valid permit, he has obtained written approval from the TGC Construction Manager and Method Statement has been submitted and approved. The 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, rehabilitation, safety and noise levels).

4.22 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 TGC 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 TGC Construction Manager.

No activity on private property shall be allowed without written consent by the relevant landowner and TGC Construction Manager/TGC Environmental Officer.

Any damage to private property caused by the Contractor during the construction period, shall be repaired to the satisfaction of the TGC CM and the TGC EO and the land-owner.

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 and signs reflecting such shall be displayed on the notice boards.

All public complaints received shall be dealt with as per the CEMP.

4.23 Energy Management

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

- Electricity consumption (to be measured in Kilowatt Hours)
- Fuel consumption (to be measured in liters)

4.24 Handling, Storage and Management of Hazardous Substances

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

All storage shall take place using suitable containers to the approval of the TGC Construction Manager and EO.

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 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 4.3 above.

Hazard signs indicating the nature and volume 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 TGC 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.

Information on each hazardous substance will be available to all persons on site in the form of Material Safety Data Sheets (MSDS)/Safety Data Sheets (SDS). 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.

4.25 Housekeeping

The Contractor must ensure proper housekeeping of the site for the duration of the project. If practical the contractor shall amongst construction personnel, assign one to be responsible for good housekeeping

Materials shall be stored in a neat and tidy manner in designated areas as per the approved site layout plan.

4.26 Rehabilitation

Contractors shall rehabilitate the entire site upon completion of work. A rehabilitation plan will be submitted to the TGC Construction Manager and EO for approval at least six weeks before project completion. The following, but not limited 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/Horticulturist 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); and
- Procedures for the prevention of the establishment and spread of alien invasive species.

5 Documentation

Refer to the Construction Environmental Management Plan.

6 Records

All documents generated in terms of this procedure will be classed as records and retained for the life of the project for handover by the contractor to TGC (electronic and hard copies).