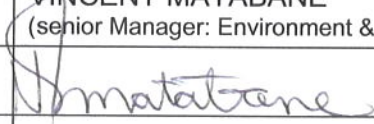


RISK MANAGEMENT: ENVIRONMENT AND SUSTAINABILITY

NAME OF DOCUMENT:

TFR STANDARD ENVIRONMENTAL SPECIFICATIONS (SES)



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SUMMARY REVISION CONTROL

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1. DEPARTMENT CODES

Description	Code
Corporate Safety Office	CSO
Environment and Sustainability	E&S
Enterprise Risk Management	ERM
Finance	FIN
Human Capital Management	HCM
Information and Communications Technology	ICTM
TFR Operations	OPS
School-of-Rail	SoR

2. MANAGEMENT SYSTEM CODES

Description	Code
Environmental Management System	EMS
Integrated Management System	IMS
Occupational Health and Safety Management System	OHSA
Quality Management System	QMS
Safety Management System	SMS

3. DOCUMENTATION TYPE CODES

Description	Code
Certificate	CR
Contract	CT
Form	FM
Guideline	GU
Learner Guide	LG
List	LI
Manual	ML
Memorandum	MM
Policy	P
Policy Manual	PM
Procedure	PR
Process	PS
Work Instruction	WI
Standard Operation Procedure	SOP

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4. PURPOSE

This standard describes the minimum environmental management standards to which TFR project managers, contractors and sub-contractors must conform to while undertaking construction work on construction site. It is a generic standard for use across all construction works within Transnet Freight Rail.

Construction works have the potential to adversely impact the environment. The purpose is to assess, rectify and manage the activities that have potential to cause environment degradation.

One of Transnet Freight Rail (hereinafter referred to as “TFR”) environmental strategies is the establishment and maintenance of an Environmental Management System, aligned to the International Standard, ISO 14001. Linked to this is a commitment to the development and implementation of Environmental Management Plans (EMP) for TFR construction activities. The purpose therefore can be summarised as follows:

The main purpose of this standard is to foster environmental due diligence and sustainability into contractor's activities which can be achieved by:

Managing potential negative environmental impacts of activities,
Identifying management plans to mitigate these impacts,
Allocating responsibilities and resources to implement identified plans,
Monitoring the effectiveness of these measures.

5. SCOPE AND APPLICABILITY

This standard applies to all contractors that perform construction, maintenance and renovations works on Transnet Freight Rail (TFR) properties.

6. LEGISLATIVE REQUIREMENTS

A numbers of environmental laws and regulations present TFR with an obligation to monitor, interpret and implement systems to comply with legal requirements.

The list of environmental legislation below was compiled to ensure that contractors working on TFR land properties are aware of legal responsibilities and liabilities. Complying with these laws and regulations will assist in minimising the risks, both legal and financial (claims).

Non-compliance to environmental law is a criminal offence and if prosecuted offenders will be liable for any environmental damage incurred. Moreover, TFR subscribes to polluter-pays and duty of care principles.

ASPECT	REFERENCE/LEGISLATION
Socio cultural issues & Environmental Management	<ul style="list-style-type: none"> Constitution of the republic of South Africa 108 of 1996 Occupational Health and Safety Act No. 85 of 1993
Environmental Authorizations – applicable to the project	National Environmental Management Act (Act 107 of 1998)
Dust Management	<ul style="list-style-type: none"> National Environmental Management Act – Air

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	<p>Quality (Act 39 of 2004)</p> <ul style="list-style-type: none"> Atmospheric Prevention Pollution Act No. 45 of 1965
Work close to protected areas	National Environmental Management Act – Protected Areas Act (Act 57 of 2003)
Work along coastline	National Environmental Management Act – Integrated coastal management Act (Act 24 of 2008)
Fire Hazards	National Veld and Forest Fires Act No. 101 of 1998
Applicable Minimum Standards	<ul style="list-style-type: none"> Standard Acts No. 29 of 1993 ISO 14001-2004 ISO 9001 – 2008 OHSAS 18001 – 2007 SANS 10103:2004
Site establishment and Access	<ul style="list-style-type: none"> Fencing Act No. 31 of 1963 <ul style="list-style-type: none"> ⇒ Prohibition of damage to a property owner's gate and fences ⇒ Climbing or crawling over or through fences without permission ⇒ Closing of gates. Conservation of Agricultural Resources Act No. 43 of 1983 <ul style="list-style-type: none"> ⇒ Soil conservation Atmospheric Pollution Prevention Act No. 45 of 1965 <ul style="list-style-type: none"> ⇒ Control all forms of air pollution – dust, vehicle fumes
Water Management	<ul style="list-style-type: none"> National Water Act No. 36 of 1998 <ul style="list-style-type: none"> ⇒ All aspects relating to pollution of surface and ground water. National Water Services Act No. 108 of 1997 <ul style="list-style-type: none"> ⇒ Permits required for use of water and disposal of water effluent.
Flora & Fauna	<ul style="list-style-type: none"> National Environmental Management Act – Biodiversity Act (Act 10 of 2004) Sea Shore Act No. 21 of 1995 National Forest Act No. 84 of 1998 <ul style="list-style-type: none"> ⇒ Control of veld, forest and mountain fires ⇒ The protection of biota and ecosystems ⇒ Protected trees ⇒ Fire control areas. Conservation of Agricultural Resources Act No. 43 of 1983 <ul style="list-style-type: none"> ⇒ Control of alien invasive

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	<ul style="list-style-type: none"> • Environment Conservation Act No. 73 of 1989 ⇒ Protected natural environment. • National Environmental Management Act No. 107 of 1998 ⇒ Duty of care & remediation of environmental damage.
Waste Management	<ul style="list-style-type: none"> • National Environmental Management Act – Waste Act (Act 59 of 2008) • Dumping at Sea Control Act No. 73 of 1980 • Marine Living Resources Act 18 of 1998 • National Water Act No. 36 of 1998 ⇒ All aspects relating to pollution of surface and ground water. • Advertising on Roads and Ribbon Development Act No. 21 of 1940 ⇒ Prohibition of depositing or leaving of certain articles or material near certain roads. ⇒ Waste near roads. • Environmental Conservation Act No. 73 of 1989 ⇒ Controls for the effective protection and utilisation of the environment ⇒ Littering, waste disposal, noise and various other activities which may have a detrimental effect on the environment. • Occupational Health and Safety Act No. 85 of 1993 ⇒ Exposure of workers to waste products. ⇒ Transportation and disposal of hazardous chemical substances. • Health Act No. 63 of 1977 ⇒ Control of health aspects of waste disposal and water treatment.
Spillages of Hazardous Substances	<ul style="list-style-type: none"> • Hazardous Substances Act No. 15 of 1973
Protection of heritage resources	<ul style="list-style-type: none"> • National Heritage Resources Act 25 of 1999 • Environmental Conservation Act No. 73 of 1989
	<ul style="list-style-type: none"> • Transnet Freight Rail Safety, Health and Environmental Policy
	<ul style="list-style-type: none"> • Transnet Freight Rail Construction Environmental Management Plan (CEMP)

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7. STANDARDS FOR ENVIRONMENTAL MANAGEMENT

The contractor shall identify the potential environmental impacts that may occur as a result of their activities and accordingly prepare method statement describing how each of the impacts will be managed or prevented so that the standards set out in this document are achieved.

7.1 SITE ESTABLISHMENT AND ACCESS

7.1.1. Objective

To ensure that environmental issues are taken into account during the establishment of site offices and all other facilities on site.

7.1.2. Scope

This standard applies to all activities relating to the planning, site establishment, operation and closure of the site.

7.1.3. Site plan

The contractor shall establish his construction camps, offices, workshops, staff accommodation and any other facilities on site in a manner that does not adversely affect the environment. However, before construction can commence, the contractor shall submit to the Construction Manager for his approval; plans of the exact location extend and construction details of these facilities and the impact mitigation measures the contractor proposes to put in place to remedy any effects.

The plans shall detail the locality as well as the layout of all waste management facilities for litter, kitchen refuse, sewage and workshop-derived effluents. 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 are located as far away as possible from any water course. Regardless of the chosen site, the contractor's intended mitigation measures shall be indicated in the plan. Such a site plan shall be submitted for Construction Manager's approval.

7.1.4. Provision of sanitary facilities

- Particular reference in the site establishment plan shall be given to any need for handling of sewage to be generated at the site offices, 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 Environmental Manager.

Safe and effective sewage treatment will require one of the following sewage handling methods: Septic tanks and soak – away, dry-composting toilets such as “enviro loos”, or the use of chemical toilets which are supplied and maintained by a subcontractor. The type of sewage facility 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. The location shall be decided with input from Environmental Manager. Should a soak-away system be used, it shall not be closer than 800 metres from any natural water course or water retention system. The waste material generated from these facilities shall be serviced on a regular basis.

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Toilet 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 veld) shall not, under any circumstances, be allowed.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from being blown. The toilets shall also be placed outside areas susceptible to flooding. 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 construction manager.

7.1.5. Access

If private property has to be crossed in order to access the construction site, the landowner(s) should be approached to request access.

No fences or gates that provide access to the construction sites may be cut, lowered, removed or damaged in any way. Private gates should be left as they are found (open or closed). Any irregularities caused by the construction team concerning fences and gates (e.g. an open gate or lowered fence) should be investigated.

7.1.6 Water supply for human use

7.1.6.1. Objective

To ensure that there is adequate, safe water supply for all personnel on site.

7.1.6.2. Scope

Managing the water supply on site and controlling the abstraction of water from natural resources in the area.

7.1.6.3 Water Management

Oil, petrol, diesel, herbicides, cleaning solvents, etc. must not be allowed to contaminate any surface water, ground water and / or drainage systems. Storm water shall be managed to ensure that it does not become polluted. If the substation site is located close to a river, stream, dam, borehole, or the water table is high; contingency plans must be in place to minimise the impact of accidental oil or toxic spillages. All water contaminated by oil or toxic spills must be reported to the Department of Water Affairs and Forestry, via approved reporting procedures.

Storm water run-off must be efficiently managed and must not cause erosion or damage to surrounding property. Guidance on methods to improve drainage of the site erosion should be directed to TFR Infra for Civil Engineering inputs.

Drainage systems must be kept clean and clear of any debris at all times.

7.1.7 Collection of water from natural resources

No water for domestic use (drinking water, for bathing or washing) shall be abstracted from any water resource (stream, river, or dam) without the express permission of the TFR Project 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 obtained from the Department of Water Affairs in accordance with the requirements of the National Water Act (Act 36 of 1998).

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7.1.8 Provision of drinking water

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.

7.1.9 Provision of energy for camp site

7.1.9.1. Objective

To prevent illegal and unauthorized collection of firewood.

7.1.9.2. Scope

This is applicable to all activities that may require collection of firewood.

7.1.9.3. Collection of firewood

The contractor shall provide adequate facilities for all 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 heating and cooking purposes. No open fires shall be allowed.

7.2. WASTE MANAGEMENT.

7.2.1. Objective

To ensure that all waste generated during construction and commissioning of the facilities is properly disposed of.

7.2.2. Scope

This standard applies to all construction, commissioning and site activities that may lead to the generation of waste.

7.2.3. Approach

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 the 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.

7.2.4. Waste Hierarchy

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

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Prevent: waste avoidance and minimisation during production

Recycle: waste recycling, recovery and utilisation

Treat: waste treatment in order to reduce toxicity and to minimise the quantities of waste

Disposal: waste disposal, probably by incineration, destruction or landfill.

7.2.5. Waste management

Littering is prohibited at all times. The contractor is responsible for the removal of all waste from site generated through the contractor's activities. The construction works site should have a proper waste collection facility and a disposal system in place. Waste should only be disposed of at a registered facility – this refers to municipal dumps. The latest list of waste sites in the region is available from the Department of Water Affairs, Department of Environmental Affairs and www.sawic.org.za.

The classification of waste determines handling methods and ultimate disposal of the material. The contractor shall manage hazardous wastes that are anticipated to be generated by his operations as follows:

- Characterise the waste to determine it is general or hazardous
- Obtain and provide an acceptable container with label
- Place hazardous waste material in 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 to TFR Environmental Management.

The contractor's Environmental Officer must work in conjunction with the contractor's Safety and Industrial Hygiene personnel to create a hazardous materials management program.

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This program will establish the necessary protocol for proper handling and removal of hazardous material on site.

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

All hazardous waste must be suitably enclosed, labelled and stored. The storage area must be properly demarcated and cordoned-off as per legislation. General and hazardous waste must be stored in separate bins. Recycling and re-use is mandatory. Under no circumstances is waste, including cleared vegetation, is to be burnt at the construction work site.

The contractor is obliged to control waste generating activities of both Hazardous and non-Hazardous waste by:

- Eliminating waste generation or reducing the total volume,
- Reducing the degree of contamination of waste generated,
- Reclaiming materials otherwise considered waste.

The contractor shall recycle general waste that is anticipated to be generated by its operations as follows:

- Obtain and label recycling containers for:
 - Office waste
 - Aluminium
 - Steel
 - Glass
 - Ferrous metals
 - Non Ferrous metals
 - Waste timber
 - And locate them within temporary office building and trailers
- Establish recycled material collection schedule
- Arrange for full bins to be hauled away

7.2.6. Effluent management

All effluent water from the camp/office sites shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water courses (streams, rivers, pans dams etc.). Only domestic type waste water shall be allowed to enter the designated system. Any release of contaminated waste water shall be in accordance with applicable water release standards and permits.

7.3. VEHICLE & EQUIPMENT REFUELLING

7.3.1. Objective

To eliminate or control fuel and oil spillage at refuelling facilities

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7.3.2. Scope

This standard applies to all refuelling, lubrication and oil changing requirements on all vehicles and machinery.

7.3.3. Refuelling

The use of engine driven compressors, pumps, air conditioners and arc welders could generate leaks (usually oil) that can accumulate to become spills, which require clean-up. These leaks become more evident if the equipment remains in the same place for an extended period of time. Damaged fuel tanks, fuel hoses, and fuel pumps can be sources of significant fuel leaks. Hydraulic systems can blow gaskets or hoses resulting in large quantities of hydraulic fluid spilled to the ground.

7.3.3.1. Control

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, unless in case of breakdown or emergency repair. As part of the method statement, the contractor shall submit to TFR, a standard operating procedure for fuelling.

The contractor shall store fuel and oil at a designated area, which shall be banded to contain 110% of the total volume, the bund wall shall be designed or constructed with an impervious layer or liner or paved surface to prevent spillage from entering the ground.

As part of the method statement, the contractor shall provide details of its proposed fuel storage and fuelling facility to the TFR Environmental Officer for approval. The design shall comply with the regulations of the National Water Act No. 36 of 1998. The Hazardous Substances Act No. 15 of 1973, the Environmental Conservation Act No. 73 of 1989 and the Occupational Health and Safety Act No. 85 of 1993, with special reference to the requirements of the Hazardous Chemical Substances Regulations.

7.3.3.2. Spill Response

The contractor shall comply with the regulations of the National Water Act No. 36 of 1998, the Hazardous Substances Act No. 15 of 1973, the Environmental Conservation Act No. 73 of 1989 and the Occupational Health and safety Act No. 85 of 1993, when responding to spillage incidences.

The contractor shall provide details for approval by the TFR Environment, Fire and Hazmat Manager of its spill response plan prior to commencing work on site. The plan will show measures to be taken to remove contaminated soils from site and demonstrate complete removal of contamination in the event of spills.

The contractor shall instruct own 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,
- Do not discharge oil or contaminants into storm water or sewer systems.

If the spill occurs on land, the contractor must:

- Immediately stop or reduce the spill,

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- 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 and submit disposal certificate to TFR Environment, Fire and Hazmat Manager.

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,
- Complete section 30 Report and Notify the appropriate on-site authorities,
- Implement actions necessary to prevent the spread of the contamination by deploying booms and/or absorbent material,
- Recovery of the spilled product,
- Proper disposal of spilled material.

7.4. SPRAY PAINTING & SAND BLASTING

7.4.1. Objective

To ensure that all the spray painting and sand blasting on site is conducted in a controlled manner where appropriate measures are taken to prevent paint contamination of the soil and to ensure that sandblasting grit/media is properly contained and disposed of.

7.4.2. Scope

Applicable to all spray painting and sandblasting on site.

7.4.3. Spray Painting and Sand Blasting

Spray painting and sand blasting 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. This should form part of the method statement to be submitted to the TFR Environmental Manager for approval.

The relevant contractor will inform his Environmental Officer of when and where the spray painting or sand blasting 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.

NB: if the area is in confined or high (elevated) areas, a protection plan must be issued for approval.

7.5. DUST MANAGEMENT

4.5.1. Objective

To prevent/control the generation of dust on the construction site and access roads.

4.5.2. Scope

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Contractors (associated with activities such as earthworks, geotechnical surveys, pilling storm water drainage, construction of roads and railways, foundations, brick building, operation workshops, fencing, erecting construction camps and batch plant activities, etc.) shall submit a dust control plan for approval by the TFR Environmental Manager.

7.5.3. Management of 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.

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. The contractor will be responsible for dust control of the entire construction area.

Some dust control measures which are normally applied during construction are presented in this section for inclusion by the contractor in his dust control method statement.

The dust mitigating procedures include the following:

- Limit vehicle speeds on unpaved roads to 20km/h
- Wash paved surfaces within the construction 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
- Construction material being transported by trucks must be suitably moistened or covered to prevent dust generation.
- Strip and store topsoil in separate stockpiles with mounds not exceeding 2meters in height to, among other things, prevent wind-blown dust.
- Minimise disturbances of natural vegetation during right of way construction (e.g. erection of fences) to reduce potential erosion, runoff and air-borne dust.
- Implement a system of reporting excessive dust conditions by construction personnel (as instructed through Environmental Awareness Training)

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

7.6. STORM WATER & DEWATERING MANAGEMENT

7.6.1. Objective

To ensure that storm water and dewatering drainage across the site occurs in a manner that will negate contamination by oils, fuels, litter and other waste to prevent erosion of the construction terrace.

7.6.2. Scope

All runoff and dewatering activities.

7.6.3. Storm Water and dewatering management

Water is a valuable resource. Both the quality and quantity of the water used by the contractor should be considered in making resource conservation plans.

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Construction activities that may potentially impact on surface water and groundwater are: runoff and percolation; dewatering activities; and miscellaneous liquid wastes associated with construction activities.

In general, construction activities may affect water quality and/or quantity of groundwater and/or surface water of the area.

The contractor shall be aware that, apart from runoff from overburden emplacements and stockpiles, 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 fertilizer and rehabilitated areas, etc.

The contractor shall take note that discharges to controlled waters such as sea, rivers, and groundwater or to sewerage systems are controlled under South African water Legislation.

7.6.3.1 Surface runoff

Construction activities such as surface grading and excavation will disturb surface areas on site. This will increase the potential for soil erosion and subsequent sediment transport during periods of precipitation runoff or when excavation dewatering is required. Construction activities have a potential to change local surface drainage and sediment transport patterns, site floodplain delineation, and percolation rates into soil.

7.6.3.2 Dewatering

Dewatering during groundwork produces a surface water discharge that will require collection and sedimentation. Dewatering also has a potential to affect groundwater quality and quantity.

7.6.3.3 Management Requirements

Temporary drainage must be established on site during 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.

Contractors must employ good housekeeping in their areas to prevent contamination of drainage water.

The contractor shall clear stagnant water.

Specific water management measures (surface and groundwater) for incorporation by Civil/Earthworks contractors into their EMP's include the following:

The Contractor shall ensure that no contaminated surface water shall flow 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 runoff from the site except at point where silt traps are provided.

If applicable, the Contractor shall be responsible for collection, management and containment within the site boundaries of all the dewatering from all general site preparation activities. The dewatering water shall be contained within the site boundaries by subsequently pumping or routing water to and from sub-areas within the site as the

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construction activities precede. 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 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 25-year storm peak runoff flow.

Both structural and non-structural (vegetation) 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 areas 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 extend feasible at drainage ditches.

Compacting loose soil as soon as possible after excavation, grading and filling.

Using silt fences, geo-textiles, temporary rip-rap, soil stabilisation with gravel, diversionary beams and swales, small sedimentation basins, and gravelled roads to minimise transport of sediment.

Implementing the erosion and sedimentation control plan and ensuring that the construction personnel are familiar with and adhere to.

Managing runoff during construction

The contractor shall be responsible for checking and maintaining all erosion and sedimentation control.

7.7. NOISE MANAGEMENT

7.7.1. Objective

To maintain construction noise at the site within legal limits

7.7.2. Scope

Any noise generated at the construction site.

7.7.3. Noise Management

Keep all equipment in good working order.

Operate equipment within specifications and capacity and don't overload the machines.

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Apply regular maintenance, particularly with regards to lubrication

Operate equipment with appropriate noise abatement accessories, such as sound hoods and ear plugs.

Noise control measures for incorporation by the contractor in its noise control plan shall include the following:

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 and undesirable noise when released.

The entire 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))

7.8. PROTECTION OF HERITAGE RESOURCES

7.8.1. Objective

To ensure the protection of archaeological, historical artefacts, or heritage resources discovered during construction activities.

7.8.2. Scope

Archaeological, Historical Artefacts, or Heritage resources discovered on or near the site.

7.8.3. 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 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 given in writing by the Archaeologist.

7.8.4 Graves and Middens

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

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7.9. PROTECTION OF LIVESTOCK & GAME

7.9.1. Objective

To prevent illegal activities potentially perpetrated by staff and to prevent the killing of any animals trapped in the construction works or discovered on the construction site or surroundings.

7.9.2. Scope

Managing the activities of site staff during work and after hours.

7.9.3. Poaching of Livestock or Game

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

7.9.4 Killing of animals

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 person prior to site establishment. If no-one is available, training should be provided to at least two site staff members.

7.10. FIRE PREVENTION

7.10.1. Objective

To minimise the risk of uncontrolled fires.

7.10.2. Scope

All activities on or near the site that could initiate and uncontrolled fire.

7.10.3. Fire Control

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.

7.11. SPILLAGE OF HAZARDOUS SUBSTANCES

7.11.1. Hazardous Spillages Reporting & Records Keeping

In the event of a spillage, the incident will be reported (according to the TFR Occurrence Procedure: IMS PR 014). The investigation report should be copied to the Environmental Manager for record keeping.

Mobile oil clean-up kits must be available for accidental spills. The mobile kit should be available on any vehicle transporting oil containing materials.

In the event of an oil spill, the first priority is to contain the spill. The emergency programme for oil spills, as developed during the Method statement must then be followed. It is preferred that spillages and contaminated areas are treated on site. However, circumstances may necessitate the removal of contaminated soil for treatment – this area must be clearly demarcated and cordoned off.

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Bund walls should be secure from leaks and damage. Oil traps must be pumped out regularly and remain free of debris. Oil taps should be securely closed unless it is necessary for water to be drained from the bund area.

7.12. HANDLING & BATCHING OF CONCRETE AND CEMENT

7.12.1. Objective

To control cement and concrete batching activities so as to prevent the spillage of cement waste water and potential contamination of soil, groundwater and marine environment (where applicable). To avoid or substantially reduce dust emissions caused by cement and concrete activities on site ensure that no noise nuisance results from batching activities.

7.12.2. Scope

Cement and concrete batching activities commonly produce cement-laden (contaminated) runoff, mainly from washing of mixing equipment. The contaminated runoff is alkaline and contains high levels of chromium, which causes leachate that may ultimately contaminate groundwater. Cement contaminated water can also increase the pH level of marine waters and cause detrimental damage to aquatic life.

Fine dust particles containing cement and concrete are pollutants and can cause damage to neighbouring amenities when allowed to spread. Excessive noise during batching may cause stress to employees on site and other people within the construction vicinity.

This standard applies to all cement and concrete batching activities, delivery of ready mix concrete and small scale mechanical & hand mixing of concrete and cement, as well as the washing of equipment used in these activities on construction sites managed by TFR.

7.12.3. Handling and batching of concrete and cement

7.12.3.1. Siting

Concrete batching shall only be conducted in demarcated areas which have been approved by the TFR Project Manager. Such areas shall be fitted with a contaminated 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.

7.12.3.2. Handling and Storage

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

Bulk and bagged cement & concrete additives will be stored in an appropriate facility at least 10meters 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.

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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.

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 practices and procedures.

Empty cement and concrete bags, if temporarily stored on site, will be secured with adequate binding material.

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

7.12.3.3. Disposal

Concrete or 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.

7.13. EROSION PREVENTION

7.13.1. Objective

To prevent Soil Erosion

7.13.2. Scope

All bare soil ground areas susceptible to erosion including gravel roads.

7.13.3. Erosion Prevention

All vehicle movements must be along existing roads and tracks. Vehicles should be driven at moderate speeds and within legal limits. Special care should be taken (especially in wet weather) to avoid eroding tracks. A single access track / road is to be used and multiple tracks are to be avoided at all times. In urban areas, access roads should be treated, where necessary, to avoid dust pollution.

Erosion of the access road, which cannot be remedied by simple compaction methods, should be referred to the TFR Infra for further assessment and recommendations. Soil binding agents and gabions are frequent methods used to combat erosion.

7.14. REHABILITATION

7.14.1. Objective

To ensure that all areas affected by the project are appropriately rehabilitated and re-vegetated in a manner congruent with the surrounding biophysical environment. The prevention of spread of alien invasive species.

7.14.2. Scope

All areas affected by the project including lay down areas.

7.14.3. Rehabilitation

Contractors shall rehabilitate their lay-down area/s upon completion of work on site. 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:

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Details of soil preparation procedures including proposed fertilizers or other chemicals being considered for use.

A list of plant species that will be used in the rehabilitation process. Note these should be indigenous species, and preferably species that are endemic to the area. The assistance of an appropriately qualified Botanist should be sought in developing the 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 establishment and spread of alien invasive species.

7.15. SOCIO CULTURAL ISSUES

In the event that private property is damaged, it must be reported immediately to TFR and the landowner(s). Damage must be repaired to the satisfaction of the landowner (written proof of satisfaction must be obtained). Records of any complaints should be kept.

Local communities must be treated with the utmost respect and courtesy at all times. Infringement of their rights is strictly forbidden.

Stock, crops or activities on the surrounding private property should not be interfered with or disturbed. Wandering around the properties is not permissible (remain within the permitted working areas).

A list of the property owner's names, addresses and telephone numbers must be established and kept updated. A plan of action should be drawn up with the property owners. In case of an emergency (veld fire, vegetation problems etc.) The Contractor's contact names and telephone numbers must be given to these landowners.

The culture and lifestyles of the communities living in close proximity to the work sites must be respected.

Removal (pilfering) of agricultural products (sugar cane, fruit, vegetables, stock, firewood, poaching etc.) is prohibited. Receipts must be obtained for any merchandise purchased or received from land- owners (i.e. for meat, vegetables, wood).

Vehicles must be driven carefully in hazardous road conditions (sharp bends, narrow roads, bad weather, children playing on or near the road, domestic animals on or near the road etc.). Vehicle movement should be kept to a minimum during rain to avoid damage to access and farm roads.

Tribal graves, archaeological sites and sites of historical interest in close proximity to work sites are to be treated with respect and protected.

No firewood is to be collected except with the written consent of the landowner.

A register must be maintained of all complaints or queries received as well as action taken.

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Insure that affected property owners are informed of planned TFR activities on their land.

No off-road travelling is permitted in environmentally sensitive areas (Karoo, fynbos, coastal dunes, vleis and wetlands etc.).

7.16. ENVIRONMENTAL AWARENESS TRAINING

7.16.1. Objective

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 the regional and local regulations.

Problem recognition and communication – training personnel to recognise potential environmental, 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.

7.16.2. Scope

All Personnel on the construction site.

7.16.3. Environmental Awareness training

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

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 a 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 keep a record of all the environmental related training of the personnel.

8. DOCUMENTATION

The Contractor must produce a method statement.

9. RECORDS

All documents generated in terms of this standard will be classes as records and retained for the life of the project.