
PROPOSED REMEDIATION OF ASBESTOS CONTAMINATED LAND ON TWO RAILWAY STATIONS IN LIMPOPO PROVINCE

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

Submitted as part of the Final Basic Assessment Report
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PROJECT DETAILS

DEA Reference No. : 12/9/11/L687/5

Title : Environmental Basic Assessment Process for a Waste
Licence: Environmental Management Programme:
Proposed Remediation of Asbestos Contaminated Land on
Two Railway Stations in Limpopo

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DEFINITIONS AND TERMINOLOGY

Asbestos: An indigenous fibrous mineral that has been mined because of its resistance to heat and has been used for the manufacturing of various products since the 1900s. Many studies have described a link between occupational exposure to various types of asbestos and lung cancer and associated diseases. Asbestos has therefore been designated as a known human carcinogen and hazardous substance.

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Environment: the surroundings within which humans exist and that are made up of:

- i. The land, water and atmosphere of the earth;
- ii. Micro-organisms, plant and animal life;
- iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental impact assessment: Environmental Impact Assessment (EIA), as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme: An operational plan that organises and coordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Indigenous: All biological organisms that occurred naturally within the study area prior to 1800

Indirect impacts: Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

Respirator zone: A respirator zone is an area where the concentration of regulated asbestos fibres in the air is, or is likely to be greater than the Occupation Exposure Limit for asbestos.

Significant impact: An impact that by its magnitude, duration, intensity, or probability of occurrence may have a notable effect on one or more aspects of the environment.

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PURPOSE & OBJECTIVES OF THE EMP

CHAPTER 1

An Environmental Management Programme (EMP) is defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of a project are prevented or mitigated and that the positive benefits of the projects are enhanced”¹. The objective of this EMP is to provide consistent information and guidance for implementing the management and monitoring measures established in the permitting process. The purpose of an EMP is to help ensure continuous improvement of environmental performance, reducing negative impacts and enhancing positive effects during the asbestos clean-up at Polokwane – Ledwaba Railway Station, situated in Polokwane and the Apiesdoring Railway Station, which is situated approximately 3km north-east of the town of Burgersfort in Limpopo. An effective EMP is concerned with both the immediate outcome as well as the long-term impacts of a project.

The EMP provides specific environmental guidance and measures to be taken during the asbestos clean-up at the railway stations. It is intended to manage and mitigate the remediation activities so that unnecessary or preventable environmental impacts and human health-risks do not occur.

The EMP has been developed as a set of environmental specifications (i.e. principles of environmental management for the proposed asbestos clean-up at TFR properties), which are appropriately contextualised to provide clear guidance in terms of the on-site implementation of these specifications.

The EMP has the following objectives:

- » To outline mitigation measures and environmental specifications which are required to be implemented during the asbestos clean-up in order to minimise the extent of environmental impacts, and to manage the environmental impacts associated with the clean-up activities.
- » To ensure that the asbestos clean-up does not result in undue or reasonably avoidable adverse environmental and human health impacts, and ensure that any potential environmental benefits are enhanced.
- » To identify entities who will be responsible for the implementation of the measures and outline functions and responsibilities.
- » To propose mechanisms and frequency for monitoring compliance, and preventing long-term or permanent environmental degradation or human-health risks.

¹ Provincial Government Western Cape, Department of Environmental Affairs and Development Planning: *Guideline for Environmental Management Plans*. 2005

- » To facilitate appropriate and proactive responses to unforeseen events or changes in project implementation that was not considered in the environmental basic assessment process.

The mitigation measures identified within the Environmental Basic Assessment process are systematically addressed in the EMP, ensuring the minimisation of adverse environmental impacts to an acceptable level.

TFR must ensure that the implementation of the project complies with the requirements of any environmental authorisations and permits, and obligations emanating from other relevant environmental legislation. This obligation is partly met through the development and implementation of the EMP through its integration into the contract documentation. Since this EMP is part of the Environmental Basic Assessment process undertaken, it is important that this document be read in conjunction with the Basic Assessment Report (Savannah Environmental, October 2011), as well as the waste licence (once issued). This will contextualise the EMP and enable a thorough understanding of its role and purpose in the integrated environmental management process. This EMP for the asbestos clean-up has been compiled in accordance with the EIA Regulations and will be further developed in terms of specific requirements listed in any authorisations issued for the proposed project.

To achieve effective environmental management, it is important that contractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMP. Contractors are responsible for informing their employees and sub-contractors of any environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts and reduce human health risks. The contractor's obligations in this regard include the following:

- » Ensuring that employees have a basic understanding of the key environmental features and human-health risks involved in the removal of asbestos.
- » Ensuring that a copy of the EMP is readily available on-site, and that all site staff are aware of the location and have access to the document. Employees will be familiar with the requirements of the EMP and the environmental specifications.

The EMP is a dynamic document, which must be updated when required. It is considered critical that this draft EMP be updated to include site-specific information and specifications, if required.

PROJECT DETAILS

CHAPTER 2

Transnet Freight Rail (TFR) plans to embark on a country-wide clean-up and remediation of asbestos contaminated land along their operational footprint. The asbestos clean-up initiative is proposed in order to remediate the impacts of historical pollution caused by incidental spillage of asbestos-containing products during TFR's earlier years of transportation of processed asbestos and asbestos ores from mines to harbours for export in South Africa (note that TFR no longer transports asbestos since the banning of Asbestos in 2008). These railway stations (amongst others in the country), have been identified as pollution hotspots in the country-wide Asbestos Risk Assessment report undertaken between 2008 and 2010 by Conservation Support Services on behalf of TFR. This EMP is relevant to the asbestos clean-up for the following railway stations in Limpopo (refer to locality map in **Figure 1**):

- » Polokwane – Ledwaba Railway Station, Polokwane
- » Apiesdoring Railway Station, near Burgersfort

The Asbestos Risk Assessment (Conservation Support Services, 2010) identified areas of asbestos contamination at these Railway Stations in Limpopo (in the form of mixed asbestos waste, amosite and chrysotile) visible on the ground and in the soil. This EMP should be read together with the following documents:

- » Transnet Freight Rail Environment, June 2010. Safety and Health Plan for the Remediation of Asbestos Contaminated Sites: Phase 1 (depots, yards, sidings and mainlines)
- » Conservation Support Services, August 2010. A National Asbestos Contamination Assessment. A GIS-Based Model Approach To Guide Remediation Options And Comparative Study (Final Report)
- » Savannah Environmental (2011) Final Basic Assessment Report: Proposed Remediation of Asbestos Contaminated Land on Railway Stations in Limpopo
- » Department of Labour, 2008. Asbestos Regulations
- » Department of Labour, 2003. Occupational Health and Safety Act, Act 85 of 1993

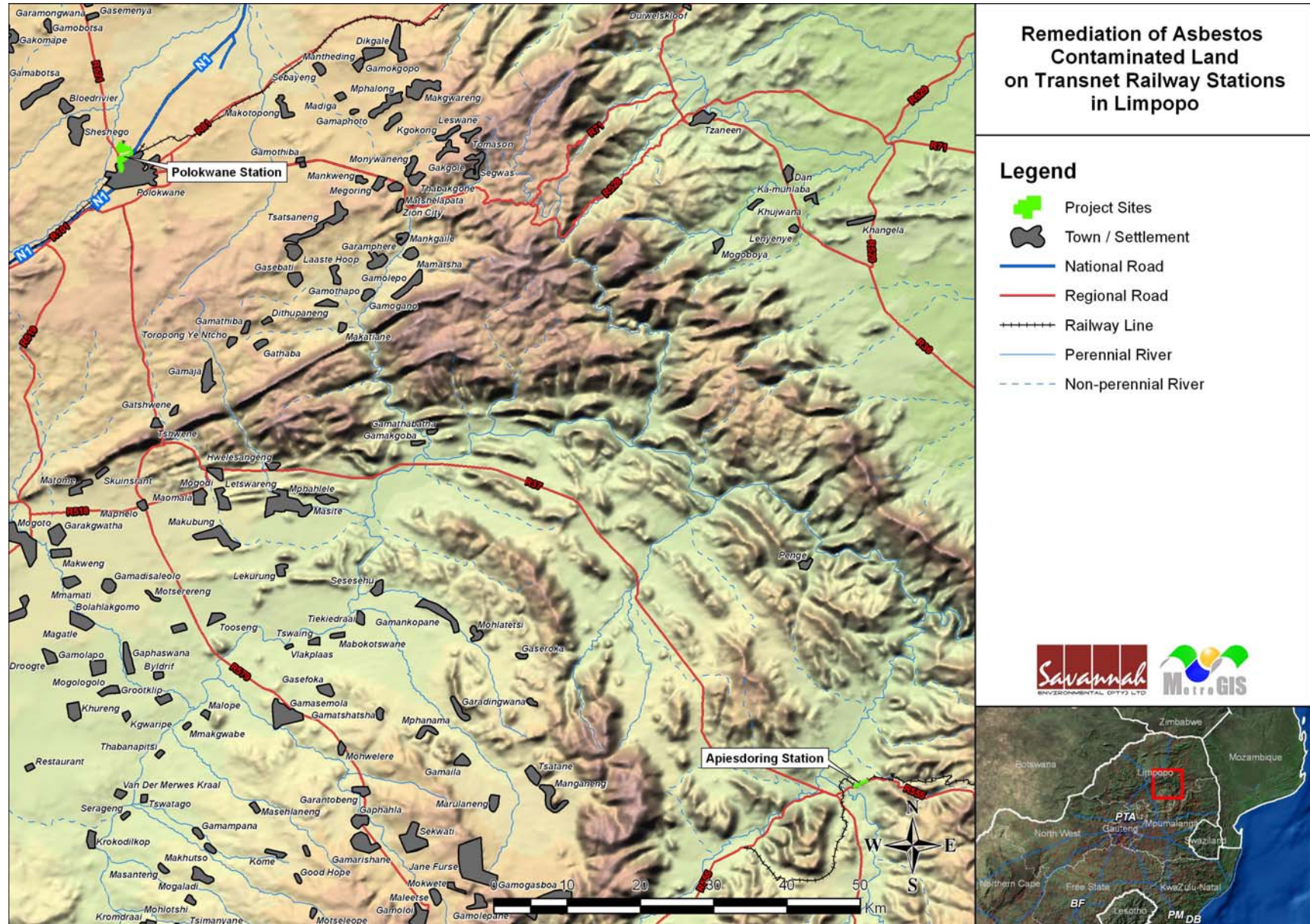


Figure 1: Locality Map showing Polokwane – Ledwaba Railway Station and Apiesdoring in Limpopo

In terms of the National Environmental Management: Waste Act (No 59 of 2008), a waste licence is required from the National Department of Environmental Affairs² (DEA) for the proposed asbestos clean-up. In terms of this legislation, this application process is required to be supported by a Basic Assessment process undertaken in terms of sections 24 and 24D of NEMA, as read with the EIA Regulations of GNR 543.

In this regard, the proposed project has been registered with the DEA a under its own unique reference number, i.e. **12/9/11/L687/5**.

2.1 Details of Environmental Assessment Practitioner and Expertise for Compilation of the EMP

Savannah Environmental was contracted by Transnet Freight Rail (TFR) as the independent environmental consultant to undertake the basic environmental assessment for the proposed asbestos clean-up. Neither Savannah Environmental nor any its specialist sub-consultants on this project are subsidiaries of or are affiliated to TFR. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

The Savannah Environmental team who compiled this draft EMP has extensive knowledge and experience in environmental impact assessment and environmental management, having been involved in EIA processes over the past twelve (12) years. They have managed and drafted Environmental Management Plan and programmes for various projects throughout South Africa. The EAPs from Savannah Environmental undertook the basic assessment process and compiled the EMP are:

- » Jo-Anne Thomas - a registered Professional Natural Scientist and holds a Master of Science degree. She has 13 years' experience consulting in the environmental field. Her key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. She is currently responsible for the project management of EIAs for several renewable energy projects across the country, as well as several waste license application processes.
- » Ravisha Ajodhapersadh – the principle author of the EMP and BA report, holds an Honours Bachelor of Science degree in Environmental Management and has 4 years' experience in environmental management. She has undertaken various basic

² The DEA serves as the competent (authorising) authority for waste licencing of hazardous waste in South Africa

assessment and EIA processes in South Africa for a variety of projects. She also performs environmental auditing and environmental compliance monitoring. Under previous employment, Ravisha has been involved in general waste clean-ups and recycling projects for the provincial government in Gauteng.

In order to adequately identify and assess potential environmental impacts associated with the proposed project, Savannah Environmental has appointed the following specialist sub-consultants for input into the BA report:

- » Petrus Russouw - Soil Scientist from TerraSoil Science for input on soils on the sites for remediation.
- » Robert Randolph and Melissa van Niekerk - Occupational Hygienists from Apex Environmental for input on airborne asbestos and asbestos handling and removal.

Savannah Environmental was appointed as the independent environmental consultants to undertake the Environmental Basic Assessment to obtain a waste licence and to identify and assess any potential environmental impacts of the asbestos clean-up. As part of this study, interested and affected parties (I&APs) have been actively involved through a public involvement process.

This EMP has been developed based on the findings of the Basic Assessment, and must be implemented through management of activities associated with the asbestos clean-up at the railway stations to avoid any detrimental effect on the environment and human health. The removal of asbestos and asbestos containing materials, including soil, is anticipated to be high risk work. Suitable precautionary measures must be implemented during asbestos removal or even the disturbance of asbestos contaminated soil in order to minimise the potential for the release of the fibres into the air, in line with the Asbestos Regulations of 2008.

2.2 Asbestos Clean-up Process Overview and Project Components Covered in this EMP

The asbestos present at the TFR railway stations comprises of mixed asbestos waste (mainly amosite and chrysotile) due to incidental spillage of asbestos-containing products during earlier years of transportation of processed asbestos and asbestos ores by rail during the transit of the products via railway lines, from mines to harbours for export. The composition of waste includes mixed asbestos waste (Loose Amphibole asbestos - amosite and chrysotile fibres present in soil, asbestos cement pipes, asbestos cement sheets, asbestos rope, asbestos lagging) and asbestos fibres (Amosite and Chrysotile) present in the soil.

The asbestos waste material has been identified via visual inspections and soil sampling undertaken as part of the Asbestos Risk Assessment study (Conservation Support Services, 2010). In total, approximately 105 578 tonnes (Breakdown: 1 704 tonnes for Apiesdoring and 103 874 tonnes for Polokwane) of asbestos contaminated soil is estimated to be removed from the railway stations. These estimated volumes were extracted from the asbestos risk assessment study (CSS, 2010). It must be noted that these are conservative estimate volumes of asbestos contaminated soil to be removed, and is at best a conservative "worst-case" scenario of the volume of soil to be removed. The asbestos waste will be disposed of at the nearest H: H Landfill Sites (High hazardous landfill sites) or H:h Landfill Sites (Low hazardous sites - if clean soil is added to the waste). The hazardous asbestos waste may be taken to one of the following landfills (or a suitably licensed alternative site):

- » Grootvlei (H: H)
- » Kriel (H: H)
- » Blinkpan (H: H)

The possibility exists for TFR to commission their own H:H landfill, which is outside the scope of this waste licence and EMP (a separate EIA application and process is currently underway for a site in the Northern Cape). A flow chart of the Asbestos Clean-up / remedial activities are shown in **Figure 2** and are discussed in more detail below.

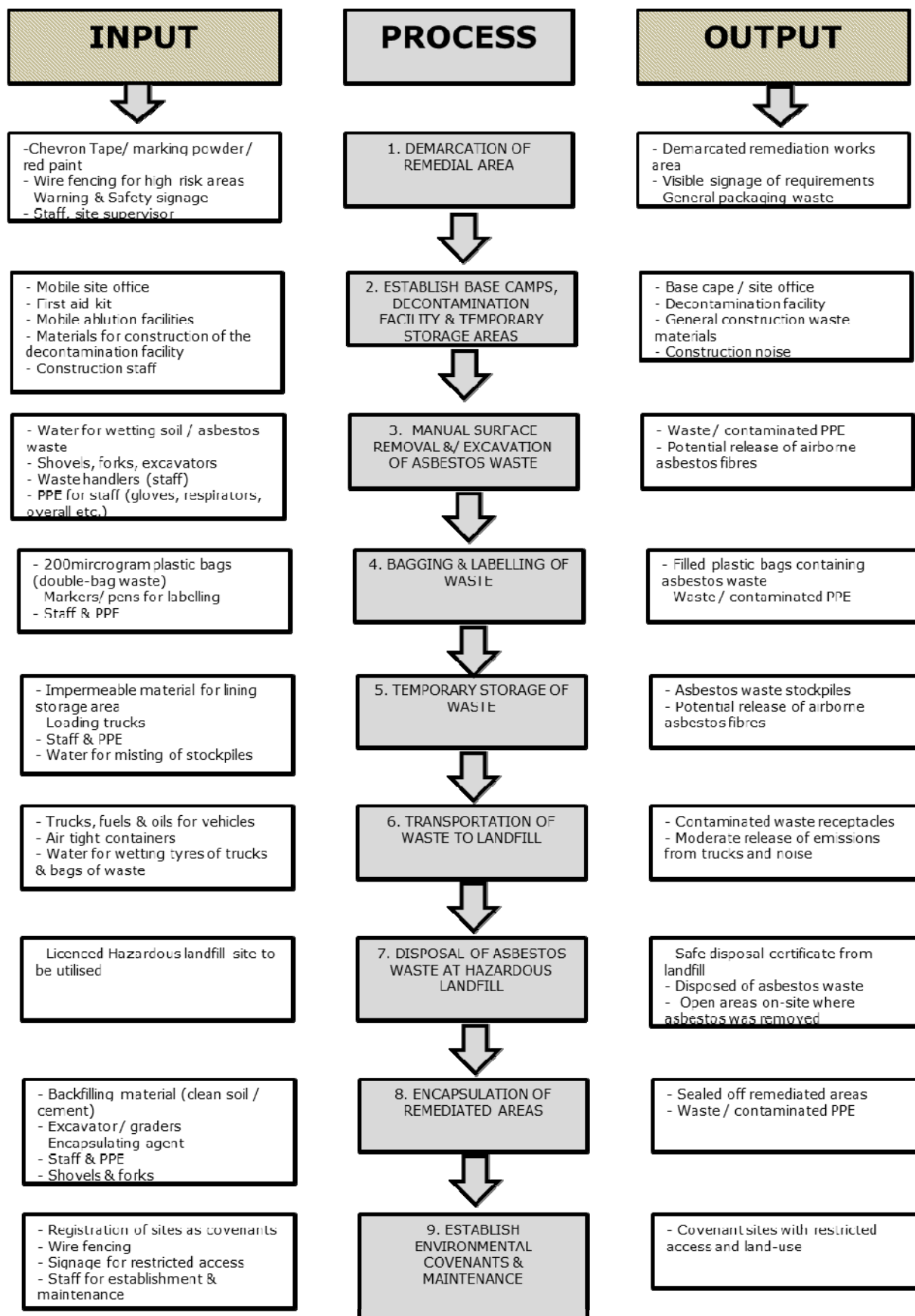


Figure 2: Flow chart of the Asbestos Clean-up / remedial activities at Railway Stations in Limpopo

» **Demarcation of Remedial Area**

Chevron Tape/ marking powder / red paint will be used to demarcate the areas for removal of contaminated soil. Wire fencing will be used for high risk areas. Warning & Safety signage will be placed at the areas within the railways station for clean-up. Skilled staff will be required as well as a site supervisor (an approved inspection authority (approved by the Department of Labour)) and will use the required personal protection equipment (PPE). Warning/hazard signs will also be placed on the site. No member of the public will be allowed within 100m of the works area. All personnel involved with the asbestos remediation process will be subjected to medical surveillance as per the Transnet Freight Rail's Medical Code Of Practice as well as compliance to the requirements of the Asbestos Regulations under the Occupational Health and Safety Act, Act 85 of 1993.

» **Establish base camps, decontamination facility & temporary storage areas**

A mobile site office will be established and mobile ablution facilities will also be brought onto the site. Base camps will be installed near contamination sites and shall be of movable nature to ensure that these will be placed upwind of the work being carried out, thus minimising any chance of dust contamination caused by disturbance of asbestos fibre during the work process. Base camps will be constructed outside the area earmarked for remediation. Temporary storage areas will be established at the railway station.

» **Decontamination Facility for workers**

The asbestos workers coming into direct contact with asbestos waste will need to shower (using clean-water) to remove any asbestos fibres from their PPE – decontamination suits - on a daily basis (at least twice a day (i.e. before lunch breaks, and at the end of the working day and prior to leaving the site)). A fully functioning decontamination unit or trailer will be utilised at each site. The decontamination unit will be located within 100 feet (roughly 30 metres) of the property and as near the removal area as practical. The decontamination unit will consist of 3 chambers and will have a fully operational hot and cold running water system, adjustable at the shower tap, and a functioning water filtration unit that will filter the waste water down to 5 microns prior to being drummed for offsite disposal, or discharged into the contaminated soil loaded truck. Workers should wear a clean outer protective suit as they exit from the work area to the decontamination area. Workers should either wear double suits and remove the exterior suit or don a second, clean suit over the single suit within the work area prior to moving into the decontamination unit. The decontamination unit should be utilised by the workers each time they exit the work area. Workers may not wear street clothes under suits.

» **Manual surface removal and/or excavation of asbestos waste**

Prior to commencement of the clean-up, the asbestos contaminated site shall be sprayed with water to suppress the release of fibres. Stockpiled asbestos waste shall be continuously sprayed with a mist of water during the clean-up so as to effectively reduce and control the release of fibres. **The depth of excavation varies from site to site, and the risk assessment report recommended removal of soil at a depth of between 4cm – 30cm and removal of soil within one metre of the contaminated areas (horizontally), which TFR has adopted.** Damp asbestos should be manually lifted by the use of shovels, forks, or by hand and placed into 200 micro-plastic bags (double bagged and labelled) as per Asbestos Regulations. Clearing of asbestos at any site shall be completed entirely before moving onto a new working site as per asbestos regulations. Any remaining fibres or contaminated ballast or other material remaining shall be manually lifted and disposed of as per Asbestos Regulations. Cleaned areas will then be marked off with green paint over the existing red paint marks, to ensure that no spill areas are missed. Asbestos contaminated sites shall be excavated as per the scope of work to be provided by the TFR Project Manager. The depth of underlain contamination differs from site to site and within individual sites as per the risk assessment report done by CSS. The areas where soil has been removed will be backfilled with clean soil and compacted. The areas between the railway lines into the railway station can be back filled with stone for active railway stations that utilise ballast.

» **Bagging**

Bags shall be of a size large enough to accommodate semi-intact asbestos bales without having to break them up where applicable. Intact bales (without bags) may be suitably punctured to promote water uptake. Where asbestos has spilled over the sides of embankments or cuttings this shall be removed, bagged and appropriately disposed of. Where applicable, intact or semi intact bags or bales should be picked up, double bagged and labelled for disposal, to prevent further spread of the spillage. Bags available on site shall be large enough to accommodate the intact or semi intact bales thereby avoiding unnecessary breaking up of bales to fit into smaller bags. Encapsulated or damp asbestos shall be placed into 200 micro-plastic bags (double bagged and labelled) as per Asbestos Regulations. A dedicated and demarcated temporary storage area for bags shall be provided within the remediation site.

» **Temporary storage of waste**

Temporary storage of waste shall be in accordance with the requirements of the NEM: Waste Act, No 59 of 2008. The area earmarked for stockpiling of excavated material shall be lined with impermeable material.

» **Handling and Transportation**

The handling and transportation of Asbestos contaminated waste shall be in accordance with SANS code 10228 and 10229 and Asbestos Regulations. All machinery involved in an asbestos remedial process will be jet-washed to remove asbestos contaminated material from the truck prior to leaving site.

» **Disposal**

Disposal of asbestos waste shall be at a licensed disposal site specifically designated for this purpose and in accordance with the requirements of NEM: Waste Act, No 59 of 2008 and Asbestos Regulations. The Asbestos Contractor shall furnish TFR with a safe disposal certificate as issued by the management of the Licensed Waste Disposal site.

» **Encapsulation**

Encapsulation will ensure that asbestos fibres are not emitted from sites. The same quantity of fill material will be used to replace the vacuum left by the excavation of contaminated material. All affected areas with a high social or worker risk (other than the clean-up workers) shall be encapsulated with an approved encapsulating agent that is capable of providing long term binding of asbestos fibres. This product shall be non-biodegradable and penetration of product into the asbestos substrate shall be approximately 2 to 3 millimetres.

In addition, all employees will wear protective clothing. Each asbestos worker will be provided and equipped with:

- o An approved unused disposable overall
- o Clean gum boots
- o Clean PVC gloves
- o New approved dust mask (FF2)

» **Air quality monitoring**

Asbestos air sampling will be conducted on a daily basis during clean-up activities by the Approved Inspection Authority. The results will be provided to the contractor on site daily. The consolidated air sampling report will be provided to the contractor and TFR Risk Management on weekly basis. The AIA shall supply the regional office of the Department of Labour concerned with copies of all monitoring results and inspection reports, regularly as they are issued. When there is a visible dust or winds in excess of 20 knots, any asbestos remedial process will be stopped.

» **Establishment of Environmental Covenant Sites**

An Environmental Covenant is an administrative device that restricts activities of tenants and contractors on sites where some asbestos contaminated soil remains in place. It restricts land-uses that involves the digging of foundations or those that might result in the exposure of asbestos to the surface. The purpose of an

Environmental Covenant is to limit potential future occupational and environmental liability for residual asbestos contaminated soil. Areas that are to be encapsulated with asbestos still underneath, shall be declared Environmental Covenant Areas and the future management will involve the following:

- o Placing of signage around the sites to notify business operators and to declare the sites as Environmental Covenant sites.
- o Sites will be capped with concrete or a layer of 300mm clean soil compatible with the surrounding soil type and free of alien infestation.
- o No digging or excavation within the demarcated area would be allowed in the future.
- o Environmental Covenants shall be registered in accordance with the National Environmental Management: Waste Act, 2008.

The declaration of remediated areas as covenant sites will be a separate process undertaken by TFR.

» **Completion Of Work And Closure Of Rehabilitation Process**

Before closure and hand-over, it must be certified that the work sites are deemed clear of asbestos as defined, prior to AIA final inspection. Decontamination of the marshalling yards or spillage on open lines shall continue until a close visual inspection confirms that there are no signs of asbestos spillage nor asbestos fibres at each working site, and two static samples taken at least 48 hours after the completion of the clean confirm that less than 0.1 fibres per millilitre air are present. Clearing of asbestos at any specific location will be deemed complete only once the Approved Inspection Authority has issued a written certification to this effect. As a first step in the approval process, the TFR Environmental Manager must ensure that the Clean-up terms of reference have been met by both the contractor and the Approved Inspection Authority. In all instances, completion of work and clearing of asbestos shall be deemed to have occurred only when random sampling within 48 hours by the AIA at cleared sites shall confirm that no work site is capable of releasing fibres contrary to the legal limit of 0.1 fibres per ml of air.

2.3 Potential Environmental Impacts

In terms of the findings of the Basic Assessment Report, the following environmental impacts and risks could due to the remediation activities:

- » Potential impact on health of asbestos workers and TFR employees during the asbestos clean-up.
- » Safety risk to asbestos workers while working at railway stations.
- » Potential public health risk during the transportation of the asbestos contaminated soil and waste to the hazardous landfill.
- » Potential soil erosion Impact on soil during asbestos clean-up.

- » Generation of waste (general and hazardous waste) during the clean-up.
- » Creation of job opportunities during the clean-up.
- » Long-term positive impact on environment (soil, air quality) due to the remedial activities – post clean-up.

LEGAL REQUIREMENTS UNDERPINNING THIS EMP

CHAPTER 3

This EMP is guided by the legal requirements of the legislation listed in **Table 1**. Note that asbestos is a regulated substance in terms of the Asbestos Regulations of 2008.

Title of legislation, policy or guideline	Administering authority	Date	Relevance to the Asbestos Clean-up
Legislation			
National Environmental Management Act (Act No 107 of 1998)	National Department of Environmental Affairs	1998	<ul style="list-style-type: none"> » Principle 4 (a) of NEMA Principles provides for Sustainable development. It requires the consideration of all relevant factors including the following: <ul style="list-style-type: none"> o That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; o that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; o that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner. » Principle 4 (p) of NEMA (Polluter- Pay-Principle) advocates that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment. » Section 28 of NEMA (Duty of Care) states that "Every person who causes, has caused or may cause significant

Title of legislation, policy or guideline	Administering authority	Date	Relevance to the Asbestos Clean-up
			pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or insofar as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment."
National Environmental Management: Waste Act (Act No 59 of 2008)	National Department of Environmental Affairs	2008	<ul style="list-style-type: none"> » The Act reforms the law regulating waste management in order to protect health, and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecological sustainable environment, to provide for specific waste management measures, to provide for the control of waste management activities, to provide for the remediation of contaminated land and to provide for the national waste management system. » The Act covers a wide range of subjects that include storage, collection, transportation, treatment, re-use and recycling, processing and the disposal of waste. » The asbestos clean-up triggers the need for a waste licence in terms of Schedule A, Activity 12 - "The remediation of contaminated land". In this regard, the EIA Regulations of June 2010 applies (i.e. Basic Assessment process and report).
EIA Regulations, published under Chapter 5 of the NEMA (GNR	National Department of Environmental Affairs	2010	<ul style="list-style-type: none"> » Specifies the process to be followed to conduct a Basic environmental assessment. » Specifies the content of the basic

Title of legislation, policy or guideline	Administering authority	Date	Relevance to the Asbestos Clean-up
R545, GNR 546 in Government Gazette 33306 of 18 June 2010)			assessment report » Requires public consultation with interested and affected parties. » Requires independent environmental assessment by an EAP
Environment Conservation Act (Act No 73 of 1989): Regulations for the prohibition of the use, Manufacturing, import, and Export of Asbestos and Asbestos containing material.	National Department of Environmental Affairs	1989	Asbestos Regulations were promulgated in terms of Government Notice No. 878 under Section 20 of the Environment Conservation Act, 1989. » Schedule 2 (1) of the regulations states that no person may acquire, process or repackage asbestos; manufacture asbestos containing material, or distribute asbestos containing material (i.e. the banning of use of asbestos in South Africa) » Schedule 2 (2) of the regulations states that no person may import asbestos or asbestos containing material into the republic or export asbestos containing material from the Republic. » Schedule 3 states that the provisions of Schedule 2 shall not apply to persons importing asbestos or asbestos containing material which is in transit from a state outside South Africa to another State outside the South Africa, unless further repackaging or processing of the asbestos or asbestos containing material is performed in the South Africa.
Occupational Health and Safety Act, 1993: Asbestos Regulations, 2001	Department of Labour	2001	» Asbestos Regulations 2001 promulgated in terms of the Occupational Health and Safety Act, 1993 applies to every employer or self-employed person who carries out work at a work place that may expose any person to asbestos dust at that workplace.

Title of legislation, policy or guideline	Administering authority	Date	Relevance to the Asbestos Clean-up
			<ul style="list-style-type: none"> » Regulation 4 states that no employer or self-employed person shall require or permit any person to work in an environment in which he or she would be exposed to asbestos in excess of the prescribed Occupation Exposure Limit (OEL) for airborne asbestos is 0.2 regulated fibres per cubic centimetre of air or 0.2 f/ml, averaged over a 4-hour working period, measured in accordance with MDHS 39/4. » Regulation 21 requires any person who intends to carry out “demolition work” involving asbestos, such as cleaning –up spilt raw asbestos, must be a Registered Asbestos Contractor, registered with the Department of Labour. In addition, asbestos contractors must ensure that that a Plan of Work is submitted to an Approved Asbestos Inspection Authority for approval before commencing with the demolition work. In TFR’s case, the handling of asbestos contaminated soil. » Regulations 7 – 13 require that an assessment for potential exposure, air monitoring is undertaken, medical surveillance of employees is undertaken, a respiratory zone is demarcated and that exposure to asbestos is controlled. » Regulation 13 (1) states that an employer shall ensure that the release of asbestos dust into any environment complies with the provisions of the Atmospheric Pollution Prevention Act, 1989 (Act. No. 73 of 1989), the National Water Act, 1998 (Act No. 36 of 1998) and the National Environmental Management Act, 1998 (Act. No.107 of 1998).

Title of legislation, policy or guideline	Administering authority	Date	Relevance to the Asbestos Clean-up
			<ul style="list-style-type: none"> » Regulation 14 (1) (a) and (b) regulate asbestos that forms part of structures of workplace, building, plant or premises. These regulations require that steps be undertaken to identify the location of asbestos in workplace areas and make and maintain a written inventory of the location of asbestos. » 200 micron plastic bags (double bagged and labelled) to be used for asbestos removal.
Hazardous Substances Act, 1973 (Act No. 15 of 1973)	Department of Health	1973	The object of the Hazardous Substances Act 15 of 1973 ("the Hazardous Substances Act") is to provide for the control of substances which may cause injury or ill health to or death of human beings by reason of the toxic, corrosive, irritant, strongly sensitising or flammable nature or a generation of pressure thereby in certain circumstances, and for the control of certain electronic products.
South African National Standard 10288: 2010	SABS	2010	Class 6: Toxic and infectious substances.
South African National Standard: The identification and classification of dangerous goods for transport	SABS	2010	Section 12 of this standard deals with the transportation of toxic and infectious substances.
South African National Standard: Transport of dangerous goods — Packaging and large packaging	SABS	2010	This standard specifies the requirement of the packing of dangerous goods, in the case of asbestos waste from the clean-up.

Title of legislation, policy or guideline	Administering authority	Date	Relevance to the Asbestos Clean-up
for road and rail transport			
Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste	DWA	, 1998	This document sets out a systematic framework for identifying a Hazardous Waste and classifying it in accordance with the degree of risk that it poses. From the classification, requirements are set that will ensure Hazardous Waste is treated and safely disposed of. These requirements represent the lowest acceptable standard and are therefore termed Minimum Requirements.
Guidelines			
Companion to the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations of 2010 (Draft Guideline; DEA, 2010)	National Department of Environmental Affairs	Draft: 2010	Provides guidelines on the application of the EIA Regulations of June 2010.
Public Participation in the EIA Process	National Department of Environmental Affairs	2010	Provides guidelines to undertake public consultation in EIA / basic assessment processes in terms of the EIA Regulations of June 2010.
Guide: Asbestos Regulations 2001	Department of Labour	2003	Provides guidance on the application and interpretation of the Asbestos Regulations of 2001.
Framework for the Management of Contaminated Land	National Department of Environmental Affairs	2010	» This Framework was compiled in support of Part 8 of the National Environmental Management: Waste Act (Act 59 of 2008) in order to provide norms and standards for the practical implementation of remediation activities

Title of legislation, policy or guideline	Administering authority	Date	Relevance to the Asbestos Clean-up
			in compliance with Section 7 (2) (d) of the Waste Act (2008) for 'the remediation of contaminated land'. » Site Remediation Plan required.

3.1 Content of EMP in terms of the EIA Regulations of June 2010

A draft environmental management programme must comply with section 24N of NEMA and Regulation 33 of the EIA Regulations of June 2010. A reference guide for how this EMP covers the requirements of the EIA Regulations is provided in Table 2 below.

EMP requirements	Reference in EMP document
(a) details of – (i) the person who prepared the environmental management programme; and (ii) the expertise of that person to prepare an environmental management programme.	Contained in Section 2.1
(b) information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of— (i) planning and design; (ii) pre-construction and construction activities; (iii) operation or undertaking of the activity; (iv) rehabilitation of the environment; and (v) closure, where relevant.	Contained in Section 2.2 (Note that the asbestos clean-up is a once-off activity to remove contaminated soil and asbestos waste, and will not entail construction or operation or decommissioning).
(c) a detailed description of the aspects of the activity that are covered by the draft environmental management programme.	Section 2.2
(d) an identification of the persons who will be responsible for the implementation of	Chapter 4

EMP requirements	Reference in EMP document
the measures contemplated in (b)	
e) Proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon.	Chapter 5
(f) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development, including, where appropriate, concurrent or progressive rehabilitation measures.	Chapter 6
(g) a description of the manner in which it intends to— (i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) remedy the cause of pollution or degradation and migration of pollutants; (iii) comply with any prescribed environmental management standards or practices; (iv) comply with any applicable provisions of the Act regarding closure, where applicable; (v) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Chapter 6
(h) time periods within which the measures contemplated in the environmental management programme must be implemented;	Chapter 6
(i) the process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity	Chapter 6
(j) an environmental awareness plan describing the manner in which—	Chapter 7

EMP requirements	Reference in EMP document
i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment;	
k) Where appropriate, closure plans, including closure objectives.	Section 6.7

3.2 Environmental Clearance Limit and Background levels for Asbestos

The Environmental Clearance Limit for asbestos is generally taken as < 0.01 f/ml. This is the lowest level of detection for analysis by Phase Contrast Microscopy (PCM) (MDHS 39/4 Asbestos fibres in air - Sampling and evaluation by phase contrast microscopy (PCM) under the Control of Asbestos at Work Regulations). The Occupational Exposure Limit (OEL) for airborne asbestos is 0.2 f/ml (Asbestos Regulations, 2001). It is possible that the quantity of airborne asbestos fibres during the asbestos clean-up may be higher than the OEL, therefore stringent controls have been adopted by TFR in their EHS plan, which have been incorporated into this EMP (See Chapter 6).

ROLES AND RESPONSIBILITIES

CHAPTER 4

As the Proponent, TFR must ensure that the EMP is implemented and that the asbestos clean-up is undertaken in line with the requirements of the waste licence and obligations emanating from other relevant legislation. Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the project team with regard to the EMP are outlined below.

4.1 TFR Environmental Manager

The Environmental Manager (from TFR) will:

- » Ensure of all specifications and legal constraints specifically with regards to the environment are highlighted to the Contractor(s) so that they are aware of these.
- » Ensure that the contents of this EMP are communicated to the Contractor site staff and that the Site Manager and Contractor are constantly made aware of the contents through discussion.
- » Ensure that TFR employees and its Contractor(s) are made aware of all stipulations within the EMP.
- » Ensure that the EMP is correctly implemented throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes.
- » Be fully conversant with the Basic Environmental Assessment for the project, the EMP, the conditions of the Waste Licence (once issued), and all relevant legislation.
- » Responsible for compiling the scope of work for the clean-up.
- » Ensure that the compliance of the EMP is monitored through regular and comprehensive inspection of the site and surrounding areas. It is suggested that these audit reports are submitted to DEA on a monthly basis for the duration of the clean-up. A close-out report should also be compiled and submitted to DEA, when remediation is complete at each railway station.
- » Ensure that if the EMP conditions or specifications are not followed then appropriate measures are undertaken to address this.
- » Ensure that activities on site comply with all relevant environmental legislation.
- » Ensure that any non-compliance or remedial measures that need to be applied are reported.
- » Report to DEA in terms of progress and implementation of the EMP and conditions of the waste licence (once issued), at a frequency determined by DEA.

4.2 Site Manager

The **Site Manager** (Asbestos Contractor) will:

- » Be fully knowledgeable with the contents of the Basic Environmental Assessment.
- » Be fully knowledgeable with the contents and conditions of the Waste Licence (once issued).
- » Be fully knowledgeable with the contents of the Environmental Management Programme.
- » Be fully knowledgeable with the contents of all relevant environmental legislation, and ensure compliance with these.
- » Have overall responsibility of the EMP and its implementation.
- » Ensure there is communication with the TFR Environmental Manager, AIA and relevant discipline Engineers on matters concerning the environment.
- » Ensure that no actions are taken which will harm or may indirectly cause harm to the environment, and take steps to prevent pollution on the site.
- » Confine activities to the demarcated construction site.

4.3 Approved Inspection Authority

An approved inspection authority (AIA) is one that is registered at the Department of Labour and approved to monitor asbestos and the asbestos clean-up.

- » The AIA will conduct the relevant environmental monitoring during the clean-up to check and document the levels of asbestos in the air.
- » The AIA will approve the asbestos contractors method statements for the handling and disposal of asbestos.
- » Be fully knowledgeable with the contents of the Environmental Management Programme.
- » Be fully knowledgeable with the contents of all asbestos legislation, and ensure compliance with these.

4.4. Safety, Health and Environmental Representative

Should more than 20 employees occur on the site a **Safety, Health and Environmental Officer** (SHE officer) will:

- » Develop and compile environmental policies and procedures.
- » Direct and liaise with the TFR Environmental Manager regarding monitoring and reporting on the environmental performance of the construction phase.
- » Conduct internal environmental audits and co-ordinate external environmental audits.
- » Liaise with statutory bodies on environmental performance and other issues as required.

4.6 Contractors and Service Providers

All contractors (including sub-contractors and staff) and service providers are ultimately responsible for:

- » Ensuring adherence to all environmental management specifications contained within this EMP (and the waste licence, once issued), as well as any specific specifications detailed by TFR.
- » Ensuring that Method Statements are submitted to the Site Manager (and AIA) for approval before any work is undertaken. Any lack of adherence to this will be considered as non-compliance to the specifications of the EMP.
- » Ensuring that any instructions issued by the Site Manager on the advice of the AIA are adhered to.
- » Ensuring that a report is tabled at each site meeting, which will document all incidents that have occurred during the period before the site meeting.
- » Ensuring that a register is kept in the site office, which lists all transgressions issued by the AIA.
- » Ensuring that a register of all public complaints is maintained.
- » Ensuring that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the successful implementation of the EMP (i.e. ensure their staff are appropriately trained as to the environmental obligations).

ENVIRONMENTAL MONITORING

CHAPTER 5

During the asbestos clean-up the following environmental monitoring is to be undertaken on site:

- » Asbestos air sampling by an Approved Inspection Authority (AIA)
- » Environmental Manager by TFR's environmental manager.

5.1 Asbestos air sampling

Asbestos air sampling will be conducted on site on a daily basis during the asbestos clean-up by an Approved Inspection Authority (AIA). An AIA will be present at all times during the clean-up. The results will be provided daily to the contractor on site. The consolidated air sampling report will be provided to the contractor and TFR Risk Management on a weekly basis. The AIA shall supply the regional office of the Department of Labour concerned with copies of all monitoring results and inspection reports, regularly as they are issued. Employers must not allow anybody to work in or to enter an environment in which they may be exposed to asbestos that will exceed the exposure limit for asbestos. The exposure limit is currently set at 0,2 fibres per millilitre of air averaged over a four-hour working period. The employer must introduce a formal measurement program to establish the airborne concentration of asbestos in a particular work place when there is a possibility that workers could be exposed to airborne asbestos in excess of half the OEL ($0.2/2 = 0,1$ regulated fibre).

As a general guideline:

- » The employer must first inform the relevant health and safety representative or health and safety committee of the proposed monitoring and give them a reasonable opportunity to comment on the SHE requirements.
- » The monitoring should be conducted by either an approved asbestos inspection authority (AIA), or a person who is registered with the South African Institute of Occupational Hygienists (SAIOH) and whose ability to do the measurements is verified by the AIA.
- » The AIA is accountable for the entire process of monitoring and takes full responsibility for the validity, accuracy and correctness of measurement results.
- » The decision regarding the number and duration of samples lies with the AIA. The sampling strategy must, however, be representative of the exposure of all employees. If measurement of a representative employee shows that the exposure is above the OEL, then the exposure of all employees that will have the same exposure must be measured.

After the remedial activities, it is recommended that bi-annual asbestos air samples of the remediated areas should be taken for at least two years after completion of remedial

activities, and the results compiled into a report for submission to DEA such that they can confirm the success of the remedial activities and close the file.

5.2 Environmental Compliance Monitoring

A monitoring programme must be in place not only to ensure conformance with this EMP, but also to monitor any environmental issues and impacts which have not been accounted for in the EMP that are, or could result in significant environmental impacts for which corrective action is required. The period and frequency of monitoring will be stipulated by the waste licence (once issued by DEA). Where this is not clearly dictated, TFR will determine and stipulate the period and frequency of monitoring required in consultation with relevant stakeholders and authorities. The TFR Environmental Manager will ensure that the monitoring is conducted and reported.

The aim of the monitoring and auditing process would be to routinely monitor the implementation of the specified environmental specifications, in order to:

- » Monitor and audit compliance with the prescriptive and procedural terms of the environmental specifications.
- » Ensure adequate and appropriate interventions to address non-compliance.
- » Ensure adequate and appropriate interventions to address environmental degradation.
- » Provide a mechanism for the lodging and resolution of public complaints.
- » Ensure appropriate and adequate record keeping related to environmental compliance.
- » Determine the effectiveness of the environmental specifications and recommend the requisite changes and updates based on audit outcomes, in order to enhance the efficacy of environmental management on site.
- » Aid communication and feedback to authorities and stakeholders.

The AIA and/or SHE officer (if more than 20 employees) will ensure compliance with the EMP, and will conduct monitoring activities. The AIA and/or SHE officer must have the appropriate experience and qualifications to undertake the necessary tasks. The AIA and/or SHE officer will report non-compliances to the Site Manager and/or any other monitoring body stipulated by the regulating authorities.

MANAGEMENT PLAN: ASBESTOS CLEAN-UP

CHAPTER 6

This chapters set out the procedures necessary for TFR (and the appointed asbestos contractor) to achieve environmental compliance during clean-up activities at the Polokwane – Ledwaba Railway Station and the Apiesdoring Railway Station located within Limpopo Province.

6.1 Prevention of Asbestos related diseases to the asbestos workers and TFR employees present at the sites for clean-up

The removal of asbestos and asbestos containing materials, including soil, is anticipated to be high risk work. Suitable precautionary measures must be implemented during asbestos removal or even the disturbance of asbestos contaminated soil in order to minimise the potential for the release of the fibres into the air, in line with the Asbestos Regulations of 2001 and are detailed below. Mitigation measures are essential to avoid exposure of the asbestos workers, TFR employees who operate at the railway stations and members of the public that may use the railway stations or reside in close proximity to the sites, when the asbestos is being excavated by an excavator or manually using shovels and forks (the depth of soil to be excavated will vary and ranges between 4cm – 30cm). In the absence of mitigation measures, and if people (mainly employees conducting the clean-up) inhale or ingest asbestos fibres while the asbestos clean-up is underway, the following negative human health effects may occur in the long term (note that it takes years before these effects could materialise and can cause death):

- » Asbestosis (note that asbestosis is incurable).
- » Lung Cancer (can be treated but however can also result in death).
- » Mesothelioma (can be treated but however can also result in death).
- » Cancer of bronchus, Cancer of intestines (can be treated but however can also result in death).
- » Warts or corns (Dermal).

Activities/risk sources	<ul style="list-style-type: none"> » Demarcation of Remedial Area » Manual surface removal and/or excavation of asbestos waste » Bagging of asbestos waste and contaminated soil » Temporary storage of waste » Handling of asbestos waste » Encapsulation of cleaned areas
Potential Impact	<ul style="list-style-type: none"> » Asbestos related diseases (asbestos workers and TFR employees present at the sites for clean-up)
Mitigation: Target/Objective	<ul style="list-style-type: none"> » No exposure to asbestos fibres by asbestos workers or TFR employees operating at the site

	» No asbestos related diseases are contracted by asbestos workers of TFR staff operating at the sites during the clean-up due to the release of airborne asbestos fibres
Monitoring	» On-going inspection of control measures during the asbestos clean-up » Air quality monitoring by AIA (detailed under Section 5.1)

Mitigation: Action/Control	Responsibility	Timeframe
The AIA will be responsible for the approval of the Plan of Work for each site, as well as the submission thereof to the provincial office of the Department of Labour.	AIA	Prior to commencement of the clean-up
Contaminated soil should be handled in a slow and careful manner preventing any unnecessary generation of dust.	Contractor	Entire duration of the asbestos clean-up
The specific areas of the railway stations where the asbestos clean-up will take place (as demarcated in the CSS report) will experience "shut-down" for a temporary period of time.	TFR	Entire duration of the asbestos clean-up
All employees will wear protective clothing at all times during the asbestos clean-up. Each day, each asbestos worker will be provided and equipped with: » An approved unused disposable overall » Clean gum boots » Clean PVC gloves » New approved dust mask (FF2)	» Contractor » asbestos workers.	PPE to be worn at all times during the asbestos clean-up
Chevron Tape, marking powder, or red paint to be used to demarcate the areas for removal of contaminated soil at each railway station.	Contractor	Prior to commencement of the asbestos clean-up
Respirator zones ³ should be mapped prior to the asbestos clean-up commencing for each area to be remediated. Respirator zones must be clearly demarcated and identified to prevent accidental and chance, albeit brief, entry.	» Contractor » Sign-off of respirator zones from the AIA and TFR	Prior to commencement of the asbestos clean-up
No persons should be allowed to enter the area without wearing respiratory protective equipment and protective clothing. Even if a person passes through the area or there is little work being conducted in that area, a respirator must be worn.	SHE officer or AIA	Entire duration of the asbestos clean-up
All access routes should be demarcated and identified by SABS symbolic warning signs that are clearly visible.	Contractor	Prior to commencement of the asbestos clean-up

³ A respirator zone is an area where the concentration of regulated asbestos fibres in the air is, or is likely to be greater than the OEL for asbestos.

Mitigation: Action/Control	Responsibility	Timeframe
Where deemed necessary, wire fencing to be used for high risk areas, as determined by the AIA.	<ul style="list-style-type: none"> » Contractor » sign off by AIA 	Prior to commencement of the asbestos clean-up
Warning & safety signage will be placed at the areas within the railways station for clean-up and on the site. SHE officer to determine what safety signage if required.	<ul style="list-style-type: none"> » SHE officer » contractor 	Prior to commencement of the asbestos clean-up
No member of the public to be allowed within 100m of the works area.	Contractor	Entire duration of the asbestos clean-up
All personnel involved with the asbestos remediation process will be subjected to medical surveillance as per the Transnet Freight Rail's Medical Code of Practice as well as compliance to the requirements of the Asbestos Regulations under the Occupational Health and Safety Act, Act 85 of 1993. Medical Surveillance should be conducted by an Occupational Medicine Practitioner (OMP).	Contractor	Frequency of Medical surveillance to be determined by TFR
<p>Thorough, complete and up to date records should therefore be kept of:</p> <ul style="list-style-type: none"> » Medical surveillance of asbestos clean-up staff for a minimum period of 40 years; » Maintenance of control measures within the clean-up areas for a period of 3 years; » Asbestos inventory to be kept by TFR for minimum period of 40 years; » Training given to employee in terms of Asbestos Regulations for as long as the employee remains employed at the workplace in which he or she is being exposed to asbestos dust; and » Assessments and air monitoring for the sites for a period of 40 years. 	Contractor	Post clean-up for up to 40 years
Asbestos contaminated areas shall be sprayed with water to suppress the release of fibres.	Contractor	Entire duration of the asbestos clean-up
Stockpiled asbestos waste shall be continuously sprayed with a mist of water during the clean-up so as to effectively reduce and control the release of fibres.	Contractor	Entire duration of the asbestos clean-up
Damp asbestos should be manually lifted by the use of shovels, forks, or by hand and placed into 200 micron plastic bags (double bagged and labelled) as per Asbestos Regulations. Encapsulated or damp asbestos shall be placed into 200 micron plastic bags	Contractor	Entire duration of the asbestos clean-up

Mitigation: Action/Control	Responsibility	Timeframe
(double bagged and labelled) as per Asbestos Regulations. Bags shall be of a size large enough to accommodate semi-intact bales without having to break them up where applicable. Intact bales (without bags) may be suitably punctured to promote water uptake.		
Intact or semi intact bags or bales should be picked up, double bagged and labelled for disposal, to prevent further spread of the spillage. These bags should be stored in a suitably sign-posted and demarcated area.	Contractor	Entire duration of the asbestos clean-up
Clearing of asbestos at any site shall be completed entirely before moving onto a new working site as per the asbestos regulations.	» Contractor » AIA to sign off on completion of each remedial area	Entire duration of the asbestos clean-up
Cleared areas will be marked off with green paint over the existing red paint marks, to ensure that no spill areas are missed.	Contractor	Entire duration of the asbestos clean-up
Where asbestos has spilled over the sides of embankments or cuttings this shall be removed, bagged and appropriately disposed of.	Contractor	Entire duration of the asbestos clean-up
Temporary storage of waste: the area earmarked for stockpiling of excavated material shall be lined with impermeable material.	Contractor	Entire duration of the asbestos clean-up
Machinery involved in an asbestos remedial process will be jet-washed and tested prior to leaving site.	Contractor	Entire duration of the asbestos clean-up
Disposal of asbestos waste shall be at a licensed waste disposal site specifically designated for this purpose and in accordance with the requirements of NEM: Waste Act, No 59 of 2008 and Asbestos Regulations. The Asbestos Contractor shall furnish TFR with a safe disposal certificate as issued by the management of the Licensed Waste Disposal site.	Contractor	Entire duration of the asbestos clean-up
All affected areas with a high social or worker risk (other than the clean-up workers) shall be encapsulated with an approved encapsulating agent that is capable of providing long term binding of asbestos fibres. This product shall be non-biodegradable and penetration of product into the asbestos substrate shall be approximately 2 to 3 millimetres.	Contractor	Immediately after completion of excavation
The same quantity of fill material is to be used to replace the vacuum left by the excavation of contaminated material.	Contractor	Immediately after completion of excavation

Mitigation: Action/Control	Responsibility	Timeframe
When there is a visible dust or winds in excess of 20 knots, any asbestos remedial process to be stopped.	<ul style="list-style-type: none"> » Contractor » AIA 	Entire duration of the asbestos clean-up
Decontamination facility - The wash and change room facilities must consist of at least the following: <ul style="list-style-type: none"> » A clean change room: This is a room where employees take off their own clothes and put on clean protective clothing and equipment. In this room, facilities must also be provided for the protection of clean protective equipment as well as private clothes. » Showers and washing facilities: No employee may enter a clean change room from an asbestos area or respirator zone without showering. The showers should preferably have cold and hot water mixed, in other words, coming out of the same tap, and be activated immediately when a person passes under it. Soap should also be provided for each employee. » A dirty change room: All asbestos-contaminated protective clothing and equipment must be removed and left in this room. Facilities for the protection and removal of protective equipment and clothing must also be provided. 	Contractor	Entire duration of the asbestos clean-up
Air quality monitoring must be undertaken as detailed in Section 5.1.	AIA	Entire duration of the asbestos clean-up
Asbestos workers coming into direct contact with asbestos waste will need to shower (using clean-water) to remove any asbestos fibres from their PPE – decontamination suits - on a daily basis (at least twice a day (i.e. before lunch breaks, and at the end of the working day and prior to leaving the site)).	All asbestos workers	Decontamination of staff atleast twice a day
If there is a re-surface of asbestos on these railway stations at any time, it should be reported to TFR, to initiate remedial activities as set out in their EHS plan for the asbestos clean-up.	TFR	As and when required

6.2 Management of Safety risk to asbestos workers while working at railway stations

Conducting work at an active railway station has safety risks attached to it. The following hazards exist while working at a TFR railway station / railway line:

- » Heavy machinery and fast moving trains with multiple tracks.

- » High voltage areas (electrical line above the railway track)
- » Uneven walkways
- » Unmanned level crossings
- » Noise from the trains
- » Dust
- » The handling and transportation of dangerous substances

These hazards have the potential to cause injury or death to the contractors will be undertaking the asbestos-clean-up. In this regard, TFR has a Safety, Health and Environmental Quality (SHEQ) policy that will apply to the asbestos clean-up contractor to avoid and minimise injuries or fatalities on their premises (the main precautionary measures, as taken from TFRs SHEQ policy is listed in the table below and list is not exhaustive). In addition, the specific areas of the railway stations where the asbestos clean-up will take place and which are actively used will experience “shut-down” for a temporary period of time, to reduce the safety risks associated with moving trains during the clean-up.

Activities/risk sources	<ul style="list-style-type: none"> » Heavy machinery and fast moving trains with multiple tracks. » High voltage areas (electrical line above the railway track) » Uneven walkways » Unmanned level crossings » Noise from the trains » Dust » The handling and transportation of dangerous substances
Potential Impact	» Injury or death
Mitigation: Target/Objective	<ul style="list-style-type: none"> » Zero injuries » Zero fatalities
Monitoring	» SHE officer (if more than 20 employees) to be appointed OR TFR railway station safety representative to do daily safety inspections

Mitigation: Action/Control	Responsibility	Timeframe
TFR's Safety, Health and Environmental Quality (SHEQ) policy will apply to the asbestos contractors and is to be included in the tender documentation.	Contractor	Entire duration of the asbestos clean-up
All employees will wear protective clothing during the clean-up. Each asbestos worker will be provided and equipped with: <ul style="list-style-type: none"> » An approved unused disposable overall » gum boots » PVC gloves » dust mask (FF2) 	<ul style="list-style-type: none"> » Contractor » Asbestos workers 	Entire duration of the asbestos clean-up
All asbestos workers to wear reflective vests at all times	» Contractor	Entire duration of the asbestos clean-up

Mitigation: Action/Control	Responsibility	Timeframe
The asbestos project team who will access the railway station must be in possession of a valid TFR access card.	» Contractor » Asbestos workers	Entire duration of the asbestos clean-up
If more than 20 employees are employed, the contractor must have a Health and Safety representative (1 per 50 employees).	» Contractor	Entire duration of the asbestos clean-up
The asbestos contractor shall establish a health and safety committee. The committee shall comprise of the following personnel: » Site manager » SHE representative » TFR representative » First Aider	» Site manager » SHE representative » TFR representative » First aider	Safety committee to meet on a monthly basis
The contractor must have a health and safety plan that is kept onsite and must contain appropriate safety measures. Employees must be trained on the contents of the health and safety plan and TFR's requirements.	Contractor	Entire duration of the asbestos clean-up
Contractors must familiarise themselves with TFR's emergency plan, evacuation procedures and fire alarm procedure.	Contractor	Entire duration of the asbestos clean-up
TFR's first aider must be available to the asbestos contractor if the contractor does not have their own first aider.	First aider	Entire duration of the asbestos clean-up
A first aid kit must be kept on-site.	» SHE representative » First aider	Entire duration of the asbestos clean-up
No climbing on or underneath stationery trains or wagons is permitted.	Contractor	Entire duration of the asbestos clean-up
Employees to walk alongside tracks (minimum 2m from the edge of the track).	All asbestos workers	Entire duration of the asbestos clean-up
Vehicles must be parked clear of tracks.	All asbestos workers utilising vehicles	Entire duration of the asbestos clean-up
When exposed to noisy machinery, use hearing protection.	All asbestos workers, when exposed to noisy machinery	Entire duration of the asbestos clean-up
No work near overhead electrical installations is allowed, without the permission from the TFR electrical department.	» Contractor » TFR	Entire duration of the asbestos clean-up
A distance of 3m away is required when working near overhead wires. If there are areas below the railway	All asbestos workers	Entire duration of the asbestos

Mitigation: Action/Control	Responsibility	Timeframe
lines that require asbestos removal – this must be approved by TFR.		clean-up
All chemicals brought onto site must be labelled and stored in safe containers within a designated area.	» Contractor	Entire duration of the asbestos clean-up

6.3 Risks during the Transportation of the asbestos contaminated soil and waste to the hazardous landfill

The excavated asbestos waste and contaminated soil will be placed in covered wagons suitable for disposal of contaminated waste and transported by road to a licenced hazardous landfill (such as Grootvlei, Kriel or Blinkpan hazardous landfills). The transportation of Asbestos contaminated waste will have to be in accordance with SANS code 10229 (Transport of dangerous goods — Packaging and large packaging for road and rail transport) and the Asbestos Regulations of 2001. However, the risk of spillage of the asbestos en-route to the landfill still exists. In the event that one of the trucks containing the asbestos has an accident due to mechanical failure or if the truck has a collision with another vehicle, this may cause additional exposure to asbestos by members of the public in the vicinity (up to 500m) of the vehicle containing the asbestos. The potential public health risk (of contracting asbestos-related diseases) can be avoided through the use of precautionary measures. Protocols will be in place for the safe transportation of the asbestos material and this risk can be adequately managed.

Activities/risk sources	» The transportation of asbestos contaminated soil and mixed asbestos waste by truck to the nearest hazardous landfill
Potential Impact	» Spillage of asbestos waste on public roads
Mitigation: Target/Objective	» Zero truck accidents » Zero spillage of asbestos waste during transportation
Monitoring	» SHE officer (if more than 20 employees) to be appointed OR TFR railway station safety representative to do daily safety inspections of trucks containing when leaving and returning to the sites

Mitigation: Action/Control	Responsibility	Timeframe
The truck transporting the asbestos must be securely covered using a suitable material.	<ul style="list-style-type: none"> » Contractor » Operator of the truck » Check by SHE officer 	Entire duration of the asbestos clean-up
Trucks transporting the asbestos must have labels/signs indicating that they are transporting hazardous substances, in line with SANS code 10229 (Transport of dangerous goods — Packaging and large packaging for road and rail transport).	<ul style="list-style-type: none"> » Contractor » Operator of the truck » Check by SHE officer 	Entire duration of the asbestos clean-up
Regulation 20 of the Asbestos Regulations of 2001 requires that, the employer must ensure that asbestos dust is not released during transportation to the landfill, by using tightly sealing containers.	<ul style="list-style-type: none"> » Contractor » Operator of the truck » Check by SHE officer 	Entire duration of the asbestos clean-up
All machinery / trucks involved in an asbestos remedial process to be jet-washed prior to leaving site. The area for jet washing machinery / trucks to be clearly demarcated.	<ul style="list-style-type: none"> » Contractor 	<ul style="list-style-type: none"> » Entire duration of the asbestos clean-up » Area for jet washing to be approved by AIA
The Asbestos Contractor shall furnish TFR with a safe disposal certificate as issued by the management of the Licensed Waste Disposal site as a record that the waste was transported to the appropriate landfill.	<ul style="list-style-type: none"> » Contractor 	Entire duration of the asbestos clean-up
All employees who are involved in the transportation of asbestos waste must be provided with the required respirators and protective clothing and they must be properly trained in the procedure to be followed in the event of spillage or similar emergency or situation that could arise by accident.	<ul style="list-style-type: none"> » Contractor 	Prior to the start of remedial activities
All equipment / vehicles must be thoroughly cleaned after disposal to the landfill (at a demarcated wash bay). This includes vehicles and protective clothing.	<ul style="list-style-type: none"> » Contractor 	Entire duration of the asbestos clean-up
An emergency procedure to be developed by the Contractor detailing a procedure in the event of accidental spillage of asbestos waste on public roads. This procedure should contain contact details of the nearest police station, hospital and fire department (Hazardous Materials Unit).	<ul style="list-style-type: none"> » Contractor 	Prior to the start of remedial activities

Mitigation: Action/Control	Responsibility	Timeframe
All incidental spillage of asbestos waste must be cleaned up immediately. The driver of the vehicle carrying asbestos waste must have the necessary training and be conversant with the instructions to handle such cases.	» Contractor	As and when required

6.4 Soil management

The soils at the railway stations have been transformed due to occurrence of the railway stations therefore no naturally occurring soils at the two railway stations. During the clean-up activities, the contaminated soil will be removed and disposed of at a hazardous landfill – this will result in a loss of soil (albeit, not naturally occurring soils) ,which will be replaced with either clean soil or stone at the relevant areas. The loss of soil can be completely reversed by the addition of clean soil. Due to the soil currently being intact, the excavation will loosen the soil and make it susceptible to erosion by wind and water, until it is back-filled with soil or stone. Therefore soil erosion is a potential impact of the asbestos clean-up albeit limited to the site itself (on transformed soil) and which can be mitigated. The risk of erosion occurring may be higher if excavated areas are left exposed (without soil or stone cover) for long periods of time.

Activities/risk sources	» Excavations via excavator or manually using a shovel for the removal of contaminated soil.
Potential Impact	» Soil erosion
Mitigation: Target/Objective	» No soil erosion – post-clean-up
Monitoring	» TFR environmental manager to do regular monitoring of soil erosion and determine if mitigation required

Mitigation: Action/Control	Responsibility	Timeframe
Excavated areas should be backfilled with soil or stone as soon as possible once work in an area is complete in order to prevent exposure of bare areas to wind or water that may be agents of soil erosion.	» Contractor	Entire duration of the asbestos clean-up
Should bare areas be exposed for more than 7 days, then the areas should be covered with hessian or other suitable material to prevent further soil loss until backfilling can take place.	» Contractor	As and when required, after excavations
In the event of heavy rainfall, bare areas should also be covered with hessian or other suitable material to prevent further soil loss until backfilling can take place.	» Contractor	If required, after heavy rainfall
Should major erosion features arise, such as gully erosion, then permanent erosion control measures	» Contractor » TFR environmental	» Erosion control, as

Mitigation: Action/Control	Responsibility	Timeframe
may be required. For inactive stations such as Apiesdoring railway station as the vegetative cover is sparse and the soils are of a fine texture. The area is also relatively dry and the natural soils show signs of dispersion and clay transport.	manager to determine the need and areas for erosion control – may be post-clean-up	and when required, to be implemented as soon as possible after clean-up

6.5 Waste Management - Hazardous and General Waste and Waste Water

Apart from the mixed asbestos waste and asbestos contaminated soil, other waste may be generated by the asbestos clean-up activities, including the following:

- » Hazardous waste:
 - Asbestos contaminated PPE that will be discarded will become hazardous waste, and if disposed incorrectly on the site or in surrounding areas may pose health risk to people who come into contact with the waste.
 - Wastewater will be generated from the decontamination facility where asbestos workers will shower (on a daily basis, until the clean-up is complete). This water will not go into the municipal system and will be collected in receptacles - drums) and will be treated as hazardous waste, and disposed to a hazardous landfill.

- » General waste:
 - food wrappers
 - Eating utensils
 - Paper
 - plastic
 - used equipment

- » Waste water from decontamination facility:

Liquid effluent in the form of wastewater will be produced from the asbestos clean-up itself, as the asbestos workers coming into direct contact with asbestos waste will need to shower (using clean-water) to remove any asbestos fibres from their PPE – decontamination suits - on a daily basis (at least twice a day (i.e. before lunch breaks, and at the end of the working day and prior to leaving the site)). A decontamination unit or trailer will be utilised at each site. Water for the unit will be sourced from TFR’s existing municipal supply at the railway station. The decontamination unit will be located within 100 feet (roughly 30 metres) of the property and as near to the removal area as practical. The decontamination unit will consist of 3 chambers, will have a have fully operational hot and cold running water system, adjustable at the shower tap, and a functioning water filtration unit that will filter the waste water down to 5 microns prior to being drummed for offsite disposal,

or discharged into contaminated soil loaded trucks. The amount of wastewater to be generated (only during the clean-up (once-off activity) from the decontamination unit / trailer) cannot be determined at this stage, as the number of employees onsite has not been determined, and will be determined when the project goes out for tender. The asbestos contractor will make financial provisions for the disposal of the wastewater to a hazardous waste landfill site.

General waste can be disposed to a general landfill by the asbestos contractor to avoid cross-contamination with general waste from the daily operations at the active landfills. If general waste is dumped in the surrounding area, it may impact the environment and people who live there, by creating a breeding ground for pests and disease.

If hazardous waste is incorrectly disposed of into the surrounding environment (onto uncontaminated soil, which then can result in the release of asbestos fibres into air), this will create an exposure route for asbestos related disease and could pose health risks to people in the vicinity of the waste. With proper general and hazardous waste disposal, the impacts of the general and hazardous waste that is generated by the clean-up can be avoided.

Activities/risk sources	<ul style="list-style-type: none"> » Hazardous waste - Excavation or removal of asbestos contaminated soil and mixed asbestos waste. » General waste – from asbestos workers
Potential Impact	<ul style="list-style-type: none"> » Hazardous waste – contamination of previously uncontaminated areas » General waste – litter and a source of a breeding ground for germs / pests
Mitigation: Target/Objective	<ul style="list-style-type: none"> » No further contamination of the railway station and public areas » No litter
Monitoring	<ul style="list-style-type: none"> » Daily inspection by SHE officer (if more than 20 employees) to be appointed OR Site Manager

Mitigation: Action/Control	Responsibility	Timeframe
General waste will be taken to a registered landfill by the contractor.	» Contractor	Weekly basis
Littering on the site (general waste) is prohibited.	» All asbestos employees	Duration of contract
Waste receptacles for general waste should occur in designated areas, at least 100m away from the areas that are undergoing remediation.	» All asbestos employees	Duration of contract
General waste should be collected on a weekly basis.	» All asbestos employees	Daily general waste collection for the duration of contract

Mitigation: Action/Control	Responsibility	Timeframe
Ablution facilities must be provided for the asbestos clean-up workers. These should be located in a designated area and serviced regularly to avoid overflow.	» Contractor	Duration of contract
The asbestos contaminated soil and other hazardous waste (such as used PPE and wastewater) from the asbestos clean-up will be disposed to a hazardous landfill by the asbestos contractor.	» Contractor	Duration of contract
The asbestos contractor will make financial provisions for the disposal of the wastewater to a hazardous waste landfill site.	» Contractor	Duration of contract
The decontamination unit will be located within 100 feet (roughly 30 metres) of the property and as near to the removal area as practical.	» Contractor	Duration of contract
Wastewater from the decontamination facility will be treated as hazardous waste and disposed at a hazardous landfill and not be allowed to enter the site or surrounds.	» Contractor	Duration of contract
The decontamination unit will have fully operational hot and cold running water systems, adjustable at the shower tap, and a functioning water filtration unit that will filter the waste water down to 5 microns prior to being drummed for offsite disposal, or discharged into contaminated soil loaded trucks.	» Contractor	Duration of contract
The drums containing the wastewater should be checked on a regular basis (daily) to ensure that are no leaks and when the containers are filled to capacity.	» Contractor » Inspection by TFR environmental manager	Duration of contract
The drums containing the wastewater must be placed on an impervious surface or bunded area (to avoid spillage directly onto the soil / surfaces) within a designated area.	» Contractor » Inspection by TFR environmental manager	Duration of contract
Should any spillage of the asbestos waste occur, it must be clean-up up immediately and the affected areas appropriately remediated. An emergency procedure to be developed by the contractor	» Contractor » Approval of emergency spill procedure by SHE officer	Duration of contract

6.6 Covenant Sites - Management

An Environmental Covenant is an administrative device that restricts activities of tenants and contractors on sites where some asbestos contaminated soil remains in place. It restricts land-uses that involve the digging of foundations or those that might result in the exposure of asbestos to the surface. The purpose of an Environmental Covenant is to limit potential future occupational and environmental liability for residual asbestos contaminated soil. Areas that are to be encapsulated with asbestos still underneath shall be declared Environmental Covenant Areas. The declaration of remediated areas as covenant sites will be a separate internal TFR process undertaken by TFR.

Activities/risk sources	» Establishment and maintenance of environmental covenant sites
Potential Impact	» Disturbance or destruction of remediated areas
Mitigation: Target/Objective	» Zero disturbance to convent sites
Monitoring	» TFR environmental manager to undertake quarterly monitoring of covenant sites.

Mitigation: Action/Control	Responsibility	Timeframe
The areas that are remediated should be encapsulated, by spraying an encapsulating agent and thereafter covered by stone (if within railway lines) or soil (if in yards)	» Contractor » AIA to approve encapsulation at each site	After the asbestos clean-up is complete
TFR should limit future use of these areas.	» TFR	Post-clean-up
The covenant sites should have clear signage that is maintained on an annual basis.	» Contractor	After the asbestos clean-up is complete
Sites will be capped with concrete or a layer of 300mm clean soil compatible with the surrounding soil type and free of alien infestation.	» Contractor	Immediately after clean-up at one area is complete
Signage to be placed around the covenant sites to declare the sites as Environmental Covenant sites.	» Contractor	Immediately after clean-up at one area is complete
No digging or excavation within the demarcated area will be allowed in the future.	» TFR	Post-clean-up

6.7 Completion of Work and Closure of Remediation Process

Once the asbestos clean-up is completed at each site within the railway stations, the site should undergo a 'close-out and handover" process as detailed below.

Activities/risk sources	» Closure of Remediation Process
Potential Impact	» Remediated sites are left open and covenant sites are not completed.
Mitigation: Target/Objective	» Successful completion of the asbestos clean-up and hand-over of the remediated sites to TFR
Monitoring	» AIA (sign off on remediated areas) » TFR environmental manager

Mitigation: Action/Control	Responsibility	Timeframe
Where applicable, provide details (e.g. a register or inventory of quantities and locations (GPS co-ordinates of the removal and final storage sites)) of any asbestos contaminated soil / items removed from any TFR owned site to TFR.	» Contractor	After remedial work has been completed
As a first step in the approval process, the TFR Environmental Manager must ensure that the Clean-up terms of reference have been met by both the contractor and the Approved Inspection Authority.	» TFR environmental manager	Post-clean-up
Before closure and hand-over of the sites that were remediated by TFR, it must be certified that the work sites are deemed clear of asbestos as defined, prior to AIA final inspection.	» TFR environmental manager	Post-clean-up
The AIA shall produce a close-out report for each site, to be submitted to the National Department of Environmental Affairs: Waste Directorate and the provincial Department of Labour.	» AIA	Post-clean-up
In all instances, completion of work and clearing of asbestos shall be deemed to have occurred only when random sampling within 48 hours by the AIA at cleared sites shall confirm that no work site is capable of releasing fibres contrary to the legal limit of 0.1 fibres per ml of air.	» AIA	Post-clean-up
Clearing of asbestos at any specific location will be deemed complete only once the Approved Inspection Authority has issued a written certification to this effect.	» AIA » Contractor	(Immediately after) Post-clean-up
After the remedial activities, it is recommended that bi-annual asbestos air samples of the remediated areas should be taken for at least two years after	» AIA » TFR	Post-clean-up

Mitigation: Action/Control	Responsibility	Timeframe
completion of remedial activities, and the results compiled into a report for submission to DEA such that they can confirm the success of the remedial activities and close the file.		

6.8 Communication with External Parties / Adjacent Landowners

Based on the consultation with the local municipalities and general public, a concern was raised regarding how TFR will communicate with the public so that they are aware of the asbestos clean-up. Therefore, the principles of how TFR should communicate with External Parties or Adjacent Landowners are provided below.

Activities/risk sources	<ul style="list-style-type: none"> » Demarcation of Remedial Area » Manual surface removal and/or excavation of asbestos waste » Bagging of asbestos waste and contaminated soil » Temporary storage of waste » Handling of asbestos waste » Encapsulation of cleaned areas
Potential Impact	» Asbestos related diseases – risk to the public / adjacent landowners
Mitigation: Target/Objective	<ul style="list-style-type: none"> » No exposure to asbestos fibres by asbestos workers to the public. » No asbestos related diseases are contracted by the public during / after the clean-up due to the release of airborne asbestos fibres.
Monitoring	<ul style="list-style-type: none"> » On-going inspection of control measures during the asbestos clean-up. » Air quality monitoring by AIA (detailed under Section 5.1).

Mitigation: Action/Control	Responsibility	Timeframe
Prior to the asbestos clean-up being initiated, TFR or the asbestos contractor must notify adjacent landowners and the relevant local municipalities, district municipalities and provincial municipalities of the commencement of works for the clean-up.	TFR / Asbestos Contractor	Before the start of remedial activities
The AIA to determine if any adjacent landowners are at risk during the clean-up and determine mitigation measures to be employed, and communicate this with the relevant landowner/s.	AIA	Before the start of remedial activities
No persons should be allowed to enter the area without wearing appropriate respiratory protective equipment and protective clothing. Even if a person passes through the area or there is little work being conducted in that area, a respirator must be worn. Appropriate signage in this regard must be erected and maintained on site during the clean-up activities.	SHE officer or AIA	Entire duration of the asbestos clean-up

Mitigation: Action/Control	Responsibility	Timeframe
All access routes should be demarcated and identified by SABS symbolic warning signs that are clearly visible.	Contractor	Prior to commencement of the asbestos clean-up
Where deemed necessary, wire fencing must be used to limit access to high risk areas, as determined by the AIA.	» Contractor » Sign off by AIA	Prior to commencement of the asbestos clean-up
Warning & safety signage must be placed at the areas within the railway stations for clean-up and on the site. SHE officer to determine what safety signage is required.	» SHE officer » Contractor	Prior to commencement of the asbestos clean-up
No member of the public to be allowed within 100m of the works area.	Contractor	Entire duration of the asbestos clean-up
Adjacent landowners to be informed when the asbestos clean-up is completed.	Contractor	Once the asbestos clean-up is completed.

ENVIRONMENTAL AWARENESS PLAN

CHAPTER 7

The purpose of this environment awareness programme for the asbestos clean-up is to describing the manner in which:

- » The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
- » Risks must be dealt with in order to avoid pollution or the degradation of the environment.

It is maintained in the Basic Assessment Report and this EMP, that the asbestos clean-up is high risk work for the asbestos workers and TFR employees that operate at the railway stations. Therefore an environmental awareness programme on the asbestos clean-up is essential for the asbestos workers and TFR staff (only staff who operate at the active railway stations).

The environmental awareness programme will be the joint responsibilities of the following parties:

- » TFR Environmental Manager (overall responsibility for the asbestos clean-up project)
- » Contractor (conducting the clean-up and doing training of asbestos staff)
- » Safety, Health and Environmental Representative (should more than 20 employees be appointed for the asbestos clean-up, then the SHE representative can do environmental training for the asbestos clean-up crew)
- » TFR Environmental Manager (auditing of the EMP, and training on the EMP, if required)

The measures to be implemented as part of the environmental awareness programme are detailed below.

Action/Control	Responsibility	Timeframe
The contractor's employees must be trained on the contents of the health and safety plan and TFR's requirements. All employees, including those of sub-contractors to receive training before the commencement of construction in order that they can constructively contribute towards the successful implementation of the EMP (i.e. ensure their staff are appropriately trained as to the environmental obligations).	» SHE representative / site manager	Prior to the commencement of the asbestos clean-up
Tool box talks to be held for contractor's employees on the Asbestos Regulations for as long as the	SHE representative / site manager	Prior to the commencement

Action/Control	Responsibility	Timeframe
employee remains employed at the workplace in which he or she is being exposed to asbestos dust		of the asbestos clean-up (weekly for the duration of the asbestos clean-up)
Prior to commencing any site works, all employees and sub-contractors to attend an Environmental Awareness Training course on the EMP. The course must provide the site staff with an appreciation of the project's environmental requirements, and how they are to be implemented.	» TFR environmental manager	Prior to the commencement of the asbestos clean-up
Communication tools to be developed to outline the environmental "do's" and "don'ts" (as per the environmental awareness training course) to employees.	» TFR environmental manager » SHE Representative » Contractor	Prior to the commencement of the asbestos clean-up
Contractors must familiarise themselves with TFR's emergency plan, evacuation procedures and fire alarm procedure.	Contractor	Prior to the commencement of the asbestos clean-up
All employees who are involved in the transportation of asbestos waste must be properly trained in the emergency procedure to be followed in the event of spillage or similar emergency or situation that could arise by accident. Regular tool box talks to be held	Contractor	» Prior to the commencement of the asbestos clean-up » Tool box to be held regularly
The drivers of the trucks carrying asbestos waste must have the necessary training and be conversant with the instructions to handle incidental spillage of asbestos waste.	Contractor	» Prior to the commencement of the asbestos clean-up » Tool box to be held regularly