TRANSNET

SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT

Scoping and Environmental Impact Assessment for the proposed Manganese Export Facility and Associated Infrastructure in the Coega Industrial Development Zone, Port of Ngqura and Tankatara area

DRAFT EIA REPORT

PART B:

DRAFT Environmental Management Programme

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1 INTRODUCTION

This Draft Environmental Management Programme (EMP) is prepared as part of the requirements of the EIA Regulations promulgated under the National Environmental Management Act (NEMA, Act 107 of 1998) as amended 2010. The Draft EMP is to be submitted to the National Department of Environmental Affairs as part of the Application for Environmental Authorisation for the proposed Transnet Manganese Ore Export Facility and Associated Infrastructure within Zones 8, 9, 11 and 13 of the Coega IDZ, the Port of Ngqura and the adjacent Tankatara property located north-east of the Coega IDZ (i.e. Remainder Farm Tankatara Trust 643) (DEA Reference Number: 14/12/16/3/3/2/319). This Draft EMP is made available for public comment, as part of the Draft EIA Report. Following the incorporation of comments from stakeholders, this EMP is intended as a "living" document and should be incorporated into the Transnet environmental specifications.

1.1 Background to the proposed activities

In line with the global uses, needs and demands for Manganese Ore, the proposed Transnet Manganese Ore Export Facility at the Port of Ngqura and Coega IDZ has been conceptualized based on the need to secure and enhance the Manganese export potential and concurrent supply to the international market. The proposed project is required to service the Manganese Mining Sector in South Africa in terms of exporting and future development, as well as to provide new mining companies with access to an efficient exporting facility. In line with this, the overarching objective of the proposed project is to increase the export volumes of Manganese Ore currently exported via the existing facility at the Port Elizabeth Harbour.

After making a commitment in Parliament in 2009, Transnet is planning to decommission the existing Manganese Facility at the Port Elizabeth Harbour once the proposed new Manganese Ore Facility at the Port of Ngqura is ready to operate at full capacity. This impending decommissioning also forms motivation towards the construction of the new Manganese Export Facility.

The proposed project will comprise a Manganese Ore Export Terminal, a Rail Compilation Yard (including the doubling of the railway line between the proposed Coega compilation and the existing marshaling yard in Zone 9 of the Coega IDZ), as well as Ancillary Infrastructure and Services. A detailed description of the proposed Transnet Manganese Ore Export Facility is contained in Chapter 2 of the Draft EIA Report; and a description of the affected environment is provided in Chapters 3 and Chapters 5 to 14 of the Draft EIA Report.

1.2 Authors of the draft EMP

The main authors of this Draft EMP are the CSIR Project Manager (Annick Walsdorff) and Project Leader (Paul Lochner) undertaking the EIA for the proposed Transnet Manganese Ore Export Facility. The co-authors of this Draft EMP are the specialists involved in the assessment of potential impacts identified during the EIA process. The name and role of all authors and co-authors are included in Table 1. Please note that the expertise of the authors and co-authors are highlighted in Appendix A of the Draft EIA Report.

Table 1: EMP Authors and Co-Authors

EIA MANAGEMENT TEAM		
Paul Lochner	CSIR	Project Leader (EAPSA Certified)
Annick Walsdorff	CSIR	Project Manager
SPECIALIST TEAM		
Dr Robin Carter	Lwandle Technologies	Marine Ecology Assessment
Jamie Pote	Private Consultant	Terrestrial Ecology (Particularly Vegetation)
Dr Brian Colloty	Scherman Colloty and Associates	Aquatic Ecology
Brett Williams	Safetech	Noise Impact Assessment
Henry Holland	Map(this)	Visual Impact Assessment
Philip De Souza	Emanti Management	Integrated Water Management Study
Julian Conrad	GEOSS	Groundwater Assessment
Dr Mark Zunckel and Atham Raghundan **Rietha Oosthuizen**	Umoya-Nilu Consulting CSIR	Air Quality Assessment (including human health)
Pat Morant	CSIR	Avifauna Assessment
Dr Johan Binneman	Eastern Cape Heritage Consultants	Archaeological Impact Assessment
Dr John Almond	Natura Viva	Palaeontological Impact Assessment

2 APPROACH TO PREPARING THE EMP

2.1 Compliance with relevant legislation

In terms of legal requirements, a crucial objective of the EMP is to satisfy the requirements of Regulation 33 of the NEMA EIA Regulations of 18 June 2010 which came into effect on 2 August 2010. These regulations regulate and prescribe the content of the EMP and specify the type of supporting information that must accompany the submission of the report to the authorities. An overview of where the requirements are addressed in this EMP is presented in Table 2.

Table 2: Compliance with Section 33 of the EIA Regulations (Government Gazette 18 June 2010, as amended) and Section 24N of the National Environmental Management Act, 1998 (Act No. 107 of 1998)

Requirements of Section 33 of the EIA Regulations (Government Gazette 18 June 2010, as amended) and section 24N of the National Environmental Management Act, 1998 (Act No. 107 of 1998)	Where it is included in this Draft EMP
a. (i) the person who prepared the environmental management programme; and (ii) the expertise of that person to prepare an environmental management programme;	Section 1 of the Draft EMP
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.	Mitigation objectives and management actions columns in Sections 4, 5, 6 and 7
c. a detailed description of the aspects of the activity that are covered by the draft environmental management programme;	Section 1 of the Draft EMP
d. an identification of the persons who will be responsible for the implementation of the measures contemplated in paragraph (b);	Section 3 of the Draft EMP and Monitoring - Responsibility column of Sections 4, 5, 6 and 7
e. proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon;	Monitoring - Methodology column of Sections 4, 5, 6 and 7
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	Sections 4, 5, 6 and 7
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;	Sections 4, 5, 6 and 7

Requirements of Section 33 of the EIA Regulations (Government Gazette 18 June 2010, as amended) and section 24N of the National Environmental Management Act, 1998 (Act No. 107 of 1998)	Where it is included in this Draft EMP
h. time periods within which the measures contemplated in the environmental management programme must be implemented;	Monitoring - Frequency column of Sections 4, 5, 6 and 7
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;	Management actions column of Sections 4, 5, 6 and 7
j. an environmental awareness plan 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;	Sections 4, 5, 6 and 7
k. where appropriate, closure plans, including closure objectives.	n/a (a closure plan will need to be prepared if and when the facility is decommissioned, in accordance with best practice and legislative requirements applicable at the time)

2.2 Transnet Capital Projects Environmental Management Plans

This project specific Draft Environmental Management Programme (EMP) is aligned with the Transnet Capital Projects Construction Environmental Management Plan (CEMP) (ENV-STD-001 Rev00) dated September 2011 and the Transnet Capital Projects Standard Environmental Specification (SES) (ENV-STD-002 Rev00) dated September 2011, and must be read in conjunction with these documents.

This Draft EMP has been compiled to include the project specific requirements that are not captured in the Transnet CEMP and SES. Both the Transnet CEMP and SES, together with this project specific Draft EMPr (as an annexure), will be submitted to the DEA for decision making. Furthermore, this Draft EMPr will form the basis of the Project Environmental Specification which will be developed by Transnet based on the recommendations provided in the specialist studies and EIA Report, as well as the conditions of the Environmental Authorisation.

The structure of the project specific Draft EMPr is as follows:
- Transnet Capital Projects CEMP: ENV-STD-001 Rev00;
- Transnet Capital Projects SES: ENV-STD-002 Rev00; and
- Project Specific Draft EMP (this document).

2.3 Content of the draft EMP

The Draft EMP includes the findings and recommendations of the EIA process and specialists impact assessments. However, the Draft EMP is considered a "live" document and must be incorporated into the Project Environmental Specification which will be updated with additional information or actions during the detailed design and construction phases. An operational management plan, incorporating the required operational procedures and operational management requirements will be drafted during the commissioning and operational phases and will incorporate requirements of this draft EMP. It is important to note that the Transnet CEMP and SES are only applicable to the construction phase of the proposed project.

The EMP follows an approach of identifying an over-arching goal and objectives, accompanied by management actions that are aimed at achieving these objectives. The management actions are presented in a table format in order to show the links between the goal and associated objectives, actions, responsibilities, monitoring requirements and targets.

The management plans for the design, construction, operation and decommissioning phases consist of the following components:

- Impact: The potential positive or negative impact of the development that needs to be enhanced, mitigated or eliminated;
- Mitigation/Management Action: The actions needed to achieve the objectives of enhancing, mitigating or eliminating impacts;
- Monitoring: The key monitoring actions required to check whether the objectives are being achieved, taking into consideration methodology, frequency and responsibility.

2.4 Goal of environmental management

The overall goal for environmental management for the proposed Transnet Manganese Ore Export Facility project is to construct and operate the project in a manner that:

- Minimises the ecological footprint of the project on the local environment;
- Minimises impacts on fauna, flora, marine and freshwater ecosystems;
- Minimises impacts on the surrounding communities;
- Facilitates harmonious co-existence between the project and other land uses in the area; and
- Contributes to the environmental baseline and understanding of environmental impacts of Manganese Export Ore Facilities in a South African context.

3 ROLES AND RESPONSIBILITIES

The following roles and responsibilities for the construction phase of the project are defined in accordance with the NEMA EIA Regulations and the Transnet CEMP (Section 5, pages 4 – 9):

- TCP Environmental Manager
- TCP Construction Manager;
- TCP Environmental Officer (EO); and
- Contractor Environmental Officer.

An operational Environmental Management Plan will be drafted during the commissioning phase that will define the roles and responsibilities of the terminal operator, including an organogram with reporting responsibilities and communication channels.

3.1 Project developer ("applicant")

The Project Developer (i.e. Transnet) is the current 'owner' of the project and the applicant in terms of the NEMA EIA Regulations. Transnet is therefore responsible for ensuring that the conditions of the environmental authorisation issued in terms of NEMA (should the project receive such authorisation) are fully adhered to, as well as ensuring that any other necessary permits or licenses are obtained and complied with. Transnet intend to manage this responsibility through its environmental control documents (e.g. CEMP, SES and PES).

If Transnet appoint a terminal operator, the operator must be informed of the required conditions of environmental authorization that must be satisfied, and incorporate these requirements into the operational EMP. Should Transnet transfer ownership of the facility at any time, they will need to transfer the environmental authorization (including any conditions of authorisation) to the new legal entity.

3.1.1 TCP Environmental Manager

TCP Environmental Manager (TCP EM) will be responsible for ensuring that the CEMP and associated documents or requirements are complied with on the construction site. The Employer's Environmental Manager will report functionally to Transnet Capital Projects GM: Legal, Risk, Quality & Sustainability and relevant Project Manager.

The specific tasks during the construction stage will include:

- Liaison with the authorities
- Preparation of the project specific PES
- Tender evaluation, development of environmental criteria and adjudication thereof
- Review all reports from the Environmental Specialist / Officer, including sign off on Method Statements
- Conduct any environmental incident enquiries
- Ensure induction material includes project appropriate environmental issues
- Approve training programmes and other awareness initiatives
- Coordinate or facilitate internal environmental audits

- Prepare environmental monitoring protocols (if monitoring to be done by Environmental Specialist and not an outside consultant)

The Environmental Manager may delegate part or all of these responsibilities to the Transnet Capital Projects Environmental Officer, based on the merits of the particular project at hand.

3.1.2 TCP Construction Manager

The Transnet Capital Projects Construction Manager (TCP CM) has overall responsibility for environmental management on site which includes the implementation of the CEMP, SES, PES, permits and licenses and reports to the Project Manager. The Employer's Construction Manager is supported by the TCP Environmental Manager. The specific tasks during the construction phase will include:

- Reviewing the monthly reports compiled by Environmental Officer
- Identifying the need for remedial measures with regard to proposed works
- Communicating directly with the Contractors
- Issuing non-conformance notification to Contractors that do not comply with the requirements of the CEMP and associated requirements or documents, including EA, EMP, permits and licenses.

3.1.3 TCP Environmental Officer

The TCP Environmental Officer (TCP EO) reports functionally to the TCP Construction Manager and is responsible for conducting the day-to-day tasks required to ensure that the EA, EMP, CEMP and any permits and licenses are correctly implemented on the construction site.

The Employer's Environmental Officer will conduct the following tasks:

- Ensure that environmental issues receive adequate attention in the site induction training
- Prepare and conduct awareness training (e.g. posters, tool box talks, signage)
- Conduct monthly observation & inspections and audit of all work places
- Monitor the Contractor's compliance with the EA, EMP, CEMP and any permits and licenses on site
- Conduct monthly observations and environmental audits of all Contractor's and work areas
- Ensure that all environmental monitoring programmes (sampling, measuring, recording etc. when specified) are carried out according to protocols and schedules
- Measurement of completed work (e.g. areas top soiled, re-vegetated, stabilised etc.)
- Maintain site documentation related to environmental management (permits, CEMP, method statements, EA, reports, audits, monitoring results, receipts for waste removal etc.). Documentation to be maintained on the relevant site Document Control System
- Attendance at scheduled SHE meetings and project coordination meetings
- Inspect and report on environmental incidents and check corrective action
- Keep a regular photographic record of all environmental incidents
- Implementation of environmental-related actions arising out of the minutes from scheduled meetings
- Management of complaints register
- Review and Sign off Method Statements prepared by Contractor's
- Audit Environmental Method Statements

- Collate information received, including monitoring results into a monthly report to the Construction Manager showing progress against targets
- The compilation of the Project Environmental Management File

The key deliverables will include the compilation of:

- Project Start Up Checklist
- Monthly inspection / environmental audit report
- Monitoring results
- Site close-out reports
- Incident reports
- Environmental Incident Register
- Environmental Non-Conformance Register
- Complaints Register
- Method Statements Register
- Hazardous Substances Register
- Site Close Out Inspection

3.2 The Contractor

The Contractor shall comply with the requirements of the CEMP and abide by the Employer's Construction Manager's instructions regarding the implementation of the CEMP. At the time of preparing this EMP, the appointment of a lead contractor has not been made and will depend on the project proceeding to the construction phase.

The Contractor shall appoint an Environmental Officer whose role is to ensure compliance with the requirements of the CEMP. The Contractor shall submit the name and CV of the Environmental Officer as well as an Environmental Plan detailing roles and responsibilities. This will be for the Employer's Construction managers' approval and no work can commence on site if this has not been done.

The Contractor's Environmental Plan will typically consist of:

- Environmental Plan describing environmental management responsibilities of the Contractor's Project Manager, Contractor's Site Manager and the Contractor's Environmental Officer
- Organisational Environmental Policy
- Environmental Method Statements
- CEMP
- SES
- PES, where applicable

The Contractor's Environmental Officer will liaise with the TCP Environmental Officer onsite. It will be the responsibility of the Contractor's Environmental Officer to ensure that all work is conducted according to approved Environmental Method Statements and that the requirements of the CEMP are implemented in a timeous and proper manner in his / her work area. The Contractor's Environmental Officer tasks will include:

- Daily, weekly and monthly inspections of the work area(s) as per schedule. The Contractor is referred to **Annexure 3** of the Transnet CEMP for an example of the items that will need to be inspected and which items will be audited by the Employer's Environmental Officer
- Prepare activity based Environmental Method Statements
- Monitor compliance with the CEMP and Environmental Method Statements
- Ongoing Environmental Awareness Training of the Contractor's site personnel
- Reporting and recording of any environmental incidents caused by the Contractor or due to the Contractor's activities
- Close out of environmental incidents
- Attendance at all SHE meetings, toolbox talks and induction programmes
- Waste Management
- Ensure that environmental signage and barriers are correctly placed
- Taking required corrective action within specified time frame

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

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

4 MANAGEMENT PLAN FOR DESIGN PHASE

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. Air Quality Impacts					
1. Dust deposition (including PM10 and PM2.5) in the neighbouring environment as a result of the operation of the Mn Ore Export Facility.					
Meet air quality standards (ito dust, PM10 and PM2.5)	Inadequate design of the facility would lead to elevated levels of dust, PM10 and PM2.5	a) Fully enclose the tippler.	Include in tippler design	Once-off during design phase.	Project Developer (Transnet)
		b) Install high pressure water fog system at hopper feeder chutes.			
		c) Install automated water cannons at the stockpiles.	Include in stockyard design		
		d) Equip stackers with water sprayers and dynamic chute.	Include in stacker design		
		e) Equip reclaimers with water sprayers and dynamic chute.	Include in reclaimer design		
		f) Install a wind barrier to the west of the stockyard to further reduce dust emission from stockpiles.	Include in stockyard design		
		g) Cover overland conveyor.	Include in conveyor system design		
		h) Install wind board on stockyard conveyor and shiploader conveyors.			
		i) Enclose transfer points.			
		j) Enclose surge bins.			

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		k) Install water sprayers at transfer points and surge bins.			
		l) Equip shiploader with loading spouts.	Include in shiploader design		
B. Terrestrial Ecology Impacts					
2. Fragmentation of Ecological Corridors and disruption of Ecological processes and animal movement as a result of artificial barriers.					
Minimise fragmentation and disruptions to ecological corridors and maximise corridor continuity/free movements of fauna Minimise road and rail related faunal mortalities.	Inadequate design of culverts, bridges, roads and railway line	Design of the railway line and access road to compilation yard must allow for the migration of fauna, e.g. lattice bridges, culverts, drainage pipes, fencing:	Ensure that these recommendations are taken into consideration during the design phase of the railway and roads. These management actions must be incorporated into the detailed project layout plan and the final Construction EMP.	Design phase	Project Developer (Transnet)
		a) Open lattice bridge crossing structures and box-culverts (or stormwater pipes) must be implemented and included in the design of the rail link route as proposed by Transnet (refer to Chapter 2, section 2.3.4. of the EIA report).			
		b) Construction of roads over stormwater drainage infrastructure must be designed so that the water is allowed to flow under the road, to secure corridor continuity for amphibians, without exposing them to excessive vehicular traffic.			
		c) Fenced off areas that are directly adjacent to or within animal movement corridors (i.e. the IDZ Open Space corridor) must not have barbed wire strands or mesh and must either provide facilities for smaller faunal species (tortoises) to pass through or must direct them to underpass or culvert areas.			

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		d) Appropriate game fencing to be used in areas where large mammals may be present. The Compilation Yard should be separated from the Sundays River Conservancy with a suitable game proof fence (approximately 2.4 m high). Internal palisade fencing can still be utilised if required for security.			
		e) The final layout plan for the railway link line should be presented to the Coega ELC and submitted to DEA for sign-off before the start of construction.			
		f) Where lattice bridges are constructed for the rail line, the impact of the service road is to be avoided by having the road cross on the lattice bridge (if possible); or the impact is to be minimised by having the road located in the servitude of the bridge, in already disturbed areas (if possible) and with minimal infilling so as to avoid impacts on surface run-off.			
		g) The final layout plan must take cognisance of the trade-offs and Biodiversity Offsets requirements presented in the regional planning/biodiversity offset guidelines.	Present the detailed layout plan (including the approach to trade-offs and biodiversity offsets) to authorities for comment (e.g. NMBM, DEDEAT and CDC) via the Coega ELC or EMC.	As required prior to construction	Project Developer (Transnet) and ECO

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
3. Increased risk of alien plant invasion					
Prevent the establishment and spread of alien invasive plants due to the project activities.	Introduction and dispersal of plant propagules (seeds) from outside the site due to increased traffic	a) Develop a construction phase Alien Management Plan, particularly within the Railway and Conveyor servitudes, including measures to appropriately remove alien invasive species during construction. b) Ensure this plan take cognisance of Transnet Environmental Specifications and Construction EMP as well as the Coega IDZ Alien Vegetation Management plan or with the Port of Ngqura Alien Invasive Vegetation Management Plan if within the port of Ngqura.	Prepare a construction phase Alien Invasive Management Plan prior to construction, as part of the final Construction EMP.	Once-off during design phase.	Project Developer (Transnet)
4. Road mortality of fauna from trucks, trains and other service vehicles activities					
Minimise road and rail related faunal mortalities.	Inadequate design of fencing, roads and rail underpasses or culverts would result in an increase in mortality of fauna	a) Design fencing to steer fauna towards rail underpasses or culverts. Prevent using electric fencing as far as is practically feasible. However, the location and design of fencing must be done in a way to not restrict movement of terrestrial fauna in the open space system. b) Where possible, avoid the construction of a road between two wetlands closely connected to aestivation sites unless the road is not directly on the ground surface.	Ensure that this is taken into consideration during the design phase, and incorporated into the detailed project layout plan and the final Construction EMP.	Once-off during design phase.	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
C. Aquatic Ecology Impacts					
5. Potential loss of wetland habitat (physical destruction)					
To ensure that no other wetland areas are affected.	Site clearing at the compilation yard would result in the loss of wetland habitat	a) Avoid all remaining wetland areas and their delineated buffer areas (50m) as per the recommendations of the provincial guidelines. Include the buffer areas as no-go areas.	Ensure that this is taken into consideration during the design phase, and incorporated into the detailed project layout plan.	Once-off during design phase.	Project Developer (Transnet)
6. Potential changes to the hydrological regime (impeding or diverting flow). **7. Aquatic Habitat Fragmentation and Potential loss of riverine habitat (physical destruction) and aquatic Species of Special Concern**					
To minimise changes in the hydrological regime of the Coega River and tributaries and to minimise loss of riverine habitat and aquatic SSC	Inadequate design of the new bridge over the Coega River and the culverts Inadequate design of the stormwater system	a) Ensure that the longitudinal profile of the Coega River, following the construction of the bridge for the proposed access road, is close to natural with little or no impoundment resulting on the upstream side of the proposed crossing. The concept bridge design as proposed by Transnet (Figure 2.10 in Chapter 2) should be implemented.	Ensure that this is taken into consideration during the design phase and incorporated into the detailed project layout plan.	Once-off during design phase.	Project Developer (Transnet)
		b) Use of culverts and lattice structures to minimise disruption of surface water flow where the new railway line crosses water courses/drainage lines that feed into the Coega River. The 15 culverts and the two lattice bridges positions as identified by Transnet in the project proposal (Refer to Table 2.1 and Figure 2.7 in Chapter 2) should be implemented.			

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		c) Run-off should not be allowed to directly enter any natural wetland areas. Use of the two proposed Sustainable Urban Drainage Systems, to retain and filter run-off and thereby reduce potential impacts of run-off on other wetland systems in the vicinity of the compilation yard.			
		d) All erosion control / energy dissipation structures must be installed as shown in the proposed design provided by Transnet, e.g. reno mattress and suitable wing walls. (refer to Chapter 2, section 2.3.4)			
D. Groundwater/geohydrological Impacts					
8. Impact of stockpile leachate on groundwater					
Ensure no soil or groundwater is impacted by stockpile leachate.	Leachate from the stockpiles is a potential threat to groundwater.	a) Ensure that the stockpiles are placed on an impermeable barrier as proposed by the proponent (e.g. PVC layer) – refer to Chapter 2 Section 2.4.11.1. b) Ensure that leachate generated from the stockpile is not discharged into the ground or enter surface water bodies or infiltrate directly into groundwater and remains within the closed stormwater system. c) Determine a groundwater quality baseline in the study area	Ensure that this is taken into consideration during the design phase. Install monitoring boreholes (refer to Chapter 8, Table 8.9 for locations) Monitor groundwater quality	Once-off during design phase. Once off prior to construction 1 year data prior to construction	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
E. Noise Impacts					
9. Noise impacts on surrounding communities					
Minimise noise from operation.	Mainly rail operations, shunting operations consolidation and deconsolidation of wagon trains	a) If possible, consider the relocation of the workers cottage located on Tankatara farm close to the railway line (refer to Noise Sensitive Area 3 in Chapter 3). Alternative management actions could include the construction of a noise screen or double glaze windows. b) Investigate the use of brake wagons to minimise the coupling and decoupling noise.	Ensure that this is taken into consideration during the design phase.	Once-off during design phase.	Project Developer (Transnet), Tankatara
F. Avifauna Impacts					
10. Avifauna					
Minimise impacts of the facility operation on avifauna	Lighting of the terminal and compilation yard	a) Lighting should be restricted to the minimum necessary for safe operations.	Ensure that this is taken into consideration during the design phase.	Once-off during design phase.	Project Developer (Transnet)
Minimise bird death/injury due to collisions with powerlines/rail overhead cables	Powerlines pose a real threat to the movement of large bird species through the project area. Collisions with overhead cables at the compilation yard	b) Ornithologist to walk along the proposed powerline/rail overhead cables routes (prior to construction) to identify whether any sections of the powerline/cables require bird flight diverters to be installed.[1]	Site walk, visual inspection	Once off site visit by ornithologist prior to construction	Project Developer (Transnet), CDC, NMBM

[1] Note that this action falls under the responsibility of a 3rd party and that Transnet cannot guarantee that it will be implemented

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
	are also possible given that one of the main bird flight path crosses the compilation yard	c) Install bird flight diverters that are visible both by day and by night at all locations where known bird flight paths intersect powerline/overhead cables routes.	Ensure that this is taken into consideration during the design phase.	Once-off during design phase.	
G. Integrated Water Management					
11. Contaminated stormwater discharge into the environment					
Reduce the impact associated with the accidental release of contaminated stormwater into the environment.	Stormwater contamination could result from accidental spillages and deposition ("dust fallout") onto the site from emissions in the Coega IDZ.	a) Design of an effective stormwater management system, at least the following: • keep clean stormwater separate from potentially contaminated stormwater, • 2 attenuation ponds (SUDs) to allow controlled release of stormwater at the compilation yard, • stormwater control dams to recycle contaminated stormwater via silt traps at the stockyard and quay • v-drain at the middle of each stockpile that collects the dust suppression water overflows and any stormwater run-off • apron slab around the tippler will slope towards the side drains available on either side of the existing railway line. • access road to the quay will have a concrete lined side drain that flows into a pipe leading to the quayside stormwater control dam b) Construct a concrete floor on the gallery under the overland conveyor to contain any potential spillage, which will then be collected manually and taken back	Ensure that this is taken into consideration during the design phase.	Once-off during design phase.	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		to the stockyards c) Construct oil/water separators to treat workshop and washbay wastewaters d) Line stormwater control dams at the stockyard and the quay with an impermeable clay layer or geosynthetic material			
H. Visual Impacts					
12. Potential scarring/intrusion caused by cut-and-fill operations on steep slopes (conveyor system, railway).					
Minimise intrusion of conveyor on sensitive receptors	Intrusion of Conveyor System.	a) Adherence to CDC Visual Guidelines for Development[2] with regard to painting of structures – no glossy or reflective surfaces. Muted shades such as olive, ochre or rust to be used. b) A suitable specialist (e.g. landscape architect) to be consulted on planting and rehabilitation of the cut-and fill areas and other steep slopes.	Ensure that this is taken into consideration during the design phase Appoint landscape architect to advise on minimising scarring caused by cut-and-fill operations.	Once-off during design phase.	Project Developer (Transnet)
13. Visual impact of night lighting of the facility on the nightscape of the region.					
Minimise visual impact of night lighting of the facility on the nightscape of the region.	Lighting of the Manganese Ore Export Terminal and compilation yard on the nightscape of the region.	The lighting design should minimise nightscape impacts such as sky glow, light spill and glare. Particular attention should be paid to lighting that may pose a risk to motorists driving along the N2 and R334 and to visual receptors in the GAENP (elevated views from the north). Ensure that, where lighting for the facility is included in	Ensure that this is taken into consideration during the design phase	Once-off during design phase.	Project Developer (Transnet)

[2] CKA. 2002. Coega Industrial Development Zone Visual Guidelines for Development. Guidelines. Pretoria: Cave Klapwijk and Associates.

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		the design, the following measures are adhered to: a) Bright lights are below the southern and northern river banks. b) Where external light fixtures are used they have light screening features which will minimise uplighting and glare, and that they face in such a direction that light spill beyond the project boundary will be minimised. c) Include timer switches or motion detectors for areas that are not occupied continuously. d) External light fixtures that may direct glaring light onto the N2 or R334 and up and towards GAENP (i.e. facing a northerly direction) should have screening features installed to prevent this, should be directed to avoid this or should be removed. These lights should be noted for further monitoring/investigation after construction and prior to operational phase. e) Adherence to CDC Visual Guidelines for Development			
14. General					
Ensure that all recommended management actions are included in design phase. Minimise all	All recommended management actions not considered	Ensure that the final construction EMP and the detailed project layout plan that includes all the design phase management actions are approved by the authorities prior to construction. It is recommended that the final construction EMP and detailed project layout plan also be	Develop a detailed project layout plan Submit to the detailed plan and the final construction EMP to	Once off prior to construction	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
environmental impacts associated with project		presented to the Coega ELC or EMC.	the authorities for sign-off (DEA)		
Ensure that household members located across the unfenced railway yard (informal settlement) are not exposed to unacceptable health and safety risks	Uninformed community could lead to unacceptable health and safety risks	a) Undertake a consultation with the household members before construction b) Educate the household members regarding the details of the proposed development, the type of construction activities they can expect and safety matters c) Ensure save access to ceremonial and grave sites, shops and other community activities through awareness d) Resettle the household, if the development may prevent the community of living in a safe social environment or if their sense of place are significantly impacted upon	Organise a meeting and awareness training with this community Develop a resettlement plan.	Once off prior to construction Once off if required	Project Developer (Transnet)

5 MANAGEMENT PLAN FOR CONSTRUCTION PHASE

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. Archaeology					
15. Potential impact of the Manganese Ore Export Facility on above and below ground archaeology					
Identify and protect archaeological features/materials that may occur on the construction sites.	Probable concentration of stone tools in areas around the dry pans/wetlands	a) Construction of the compilation yard in Zone 11: Initiate a Phase 2 AIA around the dry pans/wetlands in Zone 11 before the start of construction activities. Record any archaeological material before destruction and submit a report to SAHRA for review (with further recommendations). Following that process, Transnet may apply for a destruction permit.	Appointment of archaeologist to undertake a Phase 2 AIA for compilation yard Phase 2 AIA report and recommendations from SARAH	Once off prior to construction of the compilation yard in Zone 11.	Project Developer (Transnet)
	Damage to or destruction of archaeological sites/remains that may occur on the proposed site as a result of construction activities.	b) Ensure that the Transnet Heritage Management Plan is incorporated into the Project Environmental Specifications developed for the construction phase	Review PES	Once off before construction	Project Developer (Transnet)
		c) Construction of the Stockyard (Zone 9), Conveyor between stockyard and harbour (Zone 8) and compilation yard (Tankatara farm): • Construction managers/foremen should be informed, before construction starts, on the possible types of heritage sites which may be encountered during construction. • Train a site monitor (such as TCP Environmental Officer) to report to the construction manager when archaeological sites are found (for the	Ensure that a site monitor has been trained by an archaeologist (attendance register) Monitoring to be conducted during the vegetation clearing.	Once-off training prior to construction. During vegetation clearing.	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		entire development). Reference should be made to Appendix 14.B of the Heritage Impact Assessment (Chapter 14 of the Draft EIA Report) for a list of possible archaeological sites that may be found in the area. • An archaeologist must be present during the vegetation clearing in areas that have been identified as having potential for archaeological sites/materials.			
		d) Report any concentrations of archaeological material uncovered during construction (e.g. human remains, and/or accumulations of fossil bone, concentrations of marine shell and stone tools) to the archaeologist at the Albany Museum (046 622 2312) or to the Eastern Cape Provincial Heritage Resources Authority (043 642 2811) immediately. All work must stop to allow an archaeologist to conduct a systematic and professional investigation. Sufficient time must be allowed to excavate/collect such material should it be necessary (for the entire development). Relevant permits must be granted to a professional archaeologist by the SAHRA to remove such material.	Monitor the construction activities for the presence or discovery of any archaeological sites and human remains, and report the finds accordingly.	As required/ necessary during construction	Project Developer (Transnet)
		e) Construction of the compilation yard and doubling of the railway in Zone 13: • An archaeologist needs to be on site during the vegetation clearing of selected strips (selected by the archaeologist).	Monitoring to be conducted during the vegetation clearing.	During vegetation clearing.	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		• For the clearing of the vegetation small machineries or the least invasive methods must be used, where possible. • If sensitive sites/materials are exposed, then a Phase 2 investigation must be conducted and a report must be submitted to SAHRA for review (with further recommendations).			
B. Palaeontology					
16. **Destruction, disturbance or sealing-in of fossils exposed on the ground or buried beneath the surface during excavations and other construction work**					
Identify and protect palaeontological features/materials that may occur on the site.	Damage to or destruction of palaeontological features (e.g. fossils) that may occur on the site as a result of construction activities.	a) General monitoring at least on a daily basis of all excavations for newly exposed fossil material is undertaken (where sizeable bedrock excavations not required).	Monitor all excavations for newly exposed fossil material.	Daily (at least)	Project Developer (Transnet)
		b) A qualified palaeontologist must be appointed in the case of substantial new excavations (e.g. more than 200 m^3) into the potentially fossil-rich Kirkwood Formation, Sundays River Formation and Salnova Formation. Professional palaeontological monitoring recommended in the case of: • Deeper (>3m) excavations within the compilation yard footprint (Zones 11 and 13 of the IDZ, and a portion of Tankatara Farm), should these intersect the underlying Sundays River Formation. Reference should be made to the areas highlighted in Figure 14.12 of the Heritage Impact Assessment in Chapter 14 of this Draft EIA Report.	Appoint a suitably qualified palaeontologist to inspect excavations within defined areas.	During excavations.	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		• Any new cuttings into the Sundays River Formation in the Brak River and Coega River Valleys along the doubled-up railway line between the proposed compilation and existing marshalling yards (Zones 13 and 9 of the IDZ). Reference should be made to the green dashed line highlighted in Figures 14.2 and 14.3 of the Heritage Impact Assessment in Chapter 14 of this Draft EIA Report. • Excavations (> 200 m^3) into the shell rich Salnova Formation estuarine deposits within the footprints of the stockyard, storm water retention pond and evaporation dam, and ancillary structures (Zone 9 of the IDZ). Reference should be made to the small black polygons in Figure 14.3 of the Heritage Impact Assessment in Chapter 14 of this Draft EIA Report. • New excavations into Kirkwood and Sundays River Formation rocks along the conveyor line route in Zone 8 of the IDZ. Reference should be made to Figures 14.4 and 14.5 of the Heritage Impact Assessment in Chapter 14 of this Draft EIA Report.			

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		c) The EO should be alerted to the possibility of significant buried fossil heritage by familiarizing themselves with the recent palaeontological report for the Coega IDZ (Almond 2010a).	Review the recent palaeontological reports for the Coega IDZ and Port of Ngqura in order to familiarize themselves with the types of buried fossil heritage	Prior to construction	Project Developer (Transnet)
		d) If any substantial fossil remains are found these should be safeguarded, preferably *in situ*, and the Eastern Cape Provincial Heritage Resources Authority (ECPHRA) must be contacted as soon as possible. A qualified palaeontologist should be commissioned to record and sample the occurrence of these fossil remains (according to best academic practice and properly curated in an accredited fossil collection, such as the Albany Museum in Grahamstown), and also to advise on any further mitigation actions or further studies needed. Palaeontologist to apply for a fossil collection permit from ECPHRA beforehand.	Contact ECPHRA and the identified palaeontologist if any palaeontological features are uncovered.	As required/ necessary during construction	Project Developer (Transnet)
		e) Two important palaeontological sites have been identified in this zone: one in the cliff section at the west end of the paired stormwater tunnels beneath the N2 and another one on the deep railway cutting west of the N2 to the south of the marshalling yard. If any development had to take place around these two sites, a palaeontologist or an ECO trained by a palaeontologist must monitor during excavations, to ensure protection of these deposits from disturbance	Contact ECPHRA and the identified palaeontologist if any palaeontological features are uncovered.	As required/ necessary during construction	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
C. Air Quality Impacts					
17. Increased dust and other pollutants during construction					
Minimise the effect of dust on workers and the surrounding environment.	Dust emissions as a result of construction activities such as vehicle movements and vegetation clearing.	a) Implement dust management actions included within Transnet General Construction EMP and SES - Refer to section 4.5 in SES (ENV-STD-002) b) Additional recommendations include: • Loads on vehicles carrying dusty construction materials should be covered on public roads (whether empty or not). While travelling on-site, the trucks must use practical mitigation for dust management • Limit access to construction site to construction vehicles only • Maintain high moisture content on exposed surface and roads by spraying with water • Ensure a maintenance programme for construction vehicles is in place, to ensure optimum performance reduced emissions	Monitor via site audits and record incidents. Include dust management in contractors contract conditions Site audit	Monthly Once-off prior to construction Monthly	Project Developer (Transnet)
D. Terrestrial Ecology					
18. Direct loss of vegetation					
Minimise the loss of vegetation (Bontveld, Sundays Valley Thicket, Motherwell Karroid thicket, Sundays Doringveld Thicket and Coega Estuary) during construction activities.	Construction not limited to demarcated footprint area and "no go" areas for construction are not enforced.	a) Minimise and delineate construction boundaries, and ensure that disturbances are kept within construction boundaries. • Demarcate areas of disturbance. • Keep clearance and disturbance of indigenous vegetation (such as Open Space Management Plan (Revision 9) areas 1.5 (Ecological process) and 1.6 (MST)) to a minimum/limit to agreed	Visual site inspections Monitor vegetation removal and clearing during construction.	Daily Weekly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		area on approved layout plans. Keep the width and length of earthworks to a minimum. Refer to Chapter 6 (Appendix 6C, Figure 6.42) of the project specific Draft EMPr for the project layout in terms of the Coega Open Space Management Plan (Revision 9). • Sensitive habitats should be clearly demarcated (using fencing and appropriate signage) as no go areas before construction starts and during the entire duration of the construction phase to avoid accidental impacts. • Contractors and construction workers must be informed of the "no-go" areas and held accountable for any infringements that may occur. A suitable control measure must be implemented to discourage infringement. Activities including, but not restricted to the following, must not be permitted in designated "no-go" areas: Dumping of any material during and after construction; Turning of vehicles; Trampling and urination by construction workers; and Lighting fires. • Unnecessary impacts on surrounding natural vegetation must be avoided during construction. All construction vehicles should remain on clearly demarcated roads. • Any additional lay-down and similar areas that may be required outside of the development footprint must be limited to minimum	Training/information sessions register	Once-off prior to construction and for all new workers	

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		necessary and sited in transformed or degraded areas.			
		b) Where possible, existing access roads/servitudes must be used and should be located along the boundaries of existing disturbed areas, if possible.	Compile plan pre-construction.	When finalizing layout plan	Project Developer (Transnet)
19. Direct Loss of species of special concern (SSC) and SSC habitat					
Minimise the loss of species of special concern (SSC) and SSC habitat (Grassridge Bontveld, Sundays Valley Thicket and Motherwell Karroid Thicket)	Loss of species of special concern through poor on-site management during construction.	a) Implement an extensive Search and Rescue before construction. Agree on areas of plants relocation with DEDEAT.	Appoint a search and rescue team before construction commences. Site clearance audit after search and rescue to be issued.	Once off prior to construction Prior to construction and when required thereafter	Project Developer (Transnet)
		b) SSCs must be removed from the affected site footprint to be safeguarded from destruction and relocated either to undeveloped areas or off-site in consultation with conservation authorities and relevant botanical specialists (refer to the species list included in Chapter 6, Tables 6.2 and 6.5). The plants will be replanted in agreed areas and/or used in rehabilitation. Relocation of protected flora must be undertaken by an appointed professional service provider.	Appointment of professional service provider Monitor vegetation removal and relocation during construction.	Once off prior to construction Daily	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		c) Permission must be obtained from the relevant authorities to destroy or remove any protected plant species. Tables 6.2 and 6.5 of the Terrestrial Ecology Assessment (Chapter 6 of the EIA Report) indicate the species that will require permits prior to removal or destruction (prior to construction commencing). These species, where possible, should then be relocated to the suitable nursery or transplanted directly into landscaped or open space areas.	Ensure that the relevant permits have been obtained prior to vegetation removal.	As required during site clearing and construction	Project Developer (Transnet)
20. Increased risk of alien plant invasion in disturbed areas					
Minimise proliferation of alien invasive species (and other exotic weed).	Introduction and dispersal of plant propagules (seeds) from outside the site due to increased traffic during construction activities	a) Ensure ongoing monitoring to detect and quantify any alien species that may become established and identify the problem species (as per the Conservation of Agricultural Resources Act and Biodiversity Act).	Monitor the presence of alien invasive species on the development site as per the Alien Vegetation Management Plan requirements	Monthly during construction and rehabilitation.	Project Developer (Transnet)
		b) Ensure proper management of soil stockpiles. Do not import soil stockpiles from areas with alien plants to ensure proper management of stockpiles.			
		c) Control any alien plants that become established using registered control methods.	Take action to control alien plants as per requirements in the Transnet Construction EMP, SES and Port of Ngqura Alien Invasive Vegetation Management Plan.	Immediately	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		d) Cleared alien vegetation/ seed bearing alien plant material must not be dumped on adjacent intact vegetation during clearing but should be temporarily stored in a demarcated area (in consultation with the relevant botanical specialist). e) Cleared vegetation must be removed from site or mulched for use in rehabilitation of the reserves cleared during construction. Any mulched material must be weed seed free.	Monitor the removal and resulting storage of cleared alien vegetation. Monitor the spread and removal of seed bearing material.	Quarterly	Project Developer (Transnet)
		f) Implement a rehabilitation plan (to be developed in line with CDC IDZ Re-vegetation guidelines). g) Undertake rehabilitation in a phased manner directly after construction. Stockpile the shallow topsoil layer separately from the subsoil layers. Reinstate the topsoil layers (containing seed and vegetative material) when construction is complete to allow the plants to rapidly re-colonise the bare soil areas. Kikuyu grass and other invasive or exotic grasses must not be utilised during re-grassing of any areas affected by the development particularly adjacent to riparian and/wetland habitats.	Monitor the implementation of the rehabilitation/ re-vegetation plan Monitor the re-grassing activities.	Quarterly	Project Developer (Transnet)
		h) Chopped brushwood can be used to stabilise steep areas that may be susceptible to erosion during clearing activities.	Monitor erosion during clearing activities.	Monthly or after any major rainfall	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
21. Change in the natural fire regime					
Minimise risk of fire.	Fire regime changes may be possible as a result of increased vehicular and other traffic into the area as well as proliferation of grasses in disturbed areas during construction.	a) Develop and implement a Fire management plan, including an action plan for accidental fires.	Check that fire management plan recommendations are implemented.	Bi-annually	Project Developer (Transnet)
		b) Grassy Road and railway verges outside of rehabilitated areas as well as areas where dry grasses may accumulate should be regularly mowed to reduce the risk of runaway fires.	Monitor fire breaks/dry grasses areas.	Quarterly during dry periods Bi-annually during wet periods	Project Developer (Transnet)
		c) Remove flammable litter and discarded glass bottles regularly, especially along servitudes.	Visual site inspections.	Weekly	Project Developer (Transnet)
22. Fragmentation of Ecological Corridors and disruption of Ecological processes and animal movement as a result of artificial barriers.					
Minimise fragmentation and disruptions to ecological corridors.	Clearing of vegetation will result in both the fragmentation of ecological corridors and artificial disruptions to ecological processes.	a) Railway and rail link/loop servitudes must be kept to a minimum width to minimise disruptions to ecological processes.	Monitor vegetation clearing during construction to remain within footprint. Monitor construction to remain within footprint.	Daily during clearing Monthly during remaining of construction	Project Developer (Transnet)
		b) Post construction rehabilitation and planting of trees and thicket clumps in areas around the lattice bridges can promote an environment conductive to re-establishing a corridor for displaced fauna. Post construction areas not required during operational phase to be rehabilitated under supervision of suitably	Monitor the implementation of the re-vegetation/ rehabilitation plan. Rehabilitation audit	Weekly Bi-annually	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		qualified specialist to enhance corridor connectivity. These movement corridors must be re-vegetated appropriately to provide shelter to faunal species moving through the corridor.			
		c) Where possible, materials, such as rocks, removed during the construction phase must be kept aside and used later for the rehabilitation. This will be beneficial for the re-creation of habitat for small mammals where rehabilitating in Open Space areas and areas outside of operational area. Materials which will attract reptiles must however not be left on site.	Visual site inspections.	Adhoc site visits (at least monthly)	Project Developer (Transnet)
23. Faunal mortality as a result of bush clearing and earthmoving activities during site preparation **24. Habitat destruction may affect faunal diversity and composition**					
Minimise faunal mortality during site bush clearing. Minimise loss of faunal diversity and composition.	Site clearing such as bush clearing and earthmoving activities will destroy habitats and have an impact on the less mobile faunal species.	a) Search and Rescue before/during construction. Animals (i.e. amphibians, reptiles, tortoises, mammals etc.) must be relocated to places similar to those where they were found.	Appoint search and rescue team before construction commences. Monitor the presence of animals on the construction site and keep records.	Site clearance audit after search and rescue to be issued. Daily	Project Developer (Transnet)
		b) Habitats near the construction site where no construction is to take place must be clearly demarcated as no-go areas (Site boundaries to be delineated and fenced). Restrict construction	Check delimitation of no-go areas	During site preparation	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		activities to the required footprint.	Visual inspections	Monthly	
Ensure safety of fauna due to open excavations at the construction site.	Fauna may fall into and be trapped in open excavations during the construction period.	a) The excavated trenches/open areas will be visually inspected prior to construction works commencing on each day to determine the presence of trapped medium to large size fauna. The visual inspection will be conducted during daylight hours; b) Any fauna found within any excavated trench will be removed and relocated without harm to a minimum distance of 50 m from the site or trench; and c) The trench will only be left open for the minimum required time to minimise the chance of fauna entering the trench and becoming trapped.	Visual checks to ensure that barriers are in place. Record trapped fauna to assess efficiency of the barriers.	At the end of each working day When required	Project Developer (Transnet)
25. Fauna mortality due to road/rail incidents (trucks, trains and other service vehicles)					
Minimise faunal mortalities due to road/rail incidents.	Frequent truck/vehicle road and train activity resulting in an increase in mortality of fauna.	a) Monitor regularly for injured animals and death or injury (DoR) incidents.	Site Audit and regular visual inspections Record incidents	Weekly (daily during rainfall for amphibians).	Project Developer (Transnet)
		b) Slow driving on the site; speed limits should be enforced, especially during rainfall periods.	Monitor construction activities via site audits.	Monthly audit of construction activities	Project Developer (Transnet)
		c) Keep the grass/vegetation short next to the road to reduce mammal activity near the road.			
		d) Killed animals must be removed from the road as this will attract scavengers which may also be harmed on the road.			
		e) Do not feed animals anywhere in the construction area.			

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
26. Faunal mortalities resulting from fences (mammals and reptiles)					
Minimise fence related faunal mortalities.	The establishment of construction fencing and "no go" areas.	a) Check fences regularly for mortalities.	Visual checks and incidents record	Monthly	Project Developer (Transnet)
		b) Implement measures in problem areas.			
		c) Access gates into the fenced off areas to be closed at all times.	Visual checks	Daily	Project Developer (Transnet)
27. Mortalities resulting from poaching (mammals)					
Minimise poaching related faunal mortalities.	Construction personnel not trained adequately in terms of environmental awareness.	a) Check fences regularly for snares.	Visual checks	Bi-Monthly	Project Developer (Transnet)
		b) The workers on site must be educated about the laws protecting wildlife. Penalties should be used as a deterrent. Ensure that all new construction staff are inducted.	Training registers for Environmental Awareness Training.	Repeated every six months	Project Developer (Transnet)
E. Avifauna Impacts					
28. Habitat fragmentation/reduction (Grassridge Bontveld and Sunday Valley Thicket)					
Ensure that the project footprint is kept to the absolute minimum in order to maintain as much natural habitat as possible	Clearing and construction activities will lead to habitat fragmentation and reduction	Refer to D.17			

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
29. Impact on avifauna as a result of fugitive manganese ore dust on vegetation					
Ensure that atmospheric emissions (ore dust) are fully compliant with the required standards. Minimise impact of dust deposition on avifauna	Dust generation during the operation phase of the manganese facility is likely to be low	a) Establish a baseline: Transects through the vegetation/areas which will potentially receive the greatest quantity of manganese ore dust deposition should be monitored for their use by birds (mainly northeast and southwest of the stockyard).	Site walks and visual inspections/birds count	During the breeding season prior to any construction	Project Developer (Transnet)
30. Impact on Avifauna as a result of sedimentation from stormwater run-off affecting the Coega River and saltpans.					
Ensure that stormwater generated during construction is properly controlled and managed.	Stormwater runoff containing sediments mobilised during construction.	a) Implement bunding and other stormwater management measures to ensure soil is not washed into the Coega River during the construction phase.	Visual inspections to assess the effectiveness of these measures	During and after any rainfall event.	Project Developer (Transnet)
31. Impact on avifauna as a result of increased disturbance caused by the project activities.					
To reduce the impact on avifauna as a result of disturbance caused during construction.	Noise, vehicular movement, and lights will have an adverse effect on bird species sensitive to disturbance.	a) The numbers and breeding success of the large grassland bird species should be monitored to provide an indication of the degree to which project actions affect or disturb these birds.	A comparison between pre- and post-construction conditions should be made and ongoing monitoring of these species should be undertaken.	Ongoing during construction phase.	Project Developer (Transnet)
		b) Construction staff/drivers should be educated about the important bird species, and the need to be aware of their presence on site and to avoid collision and other disruptive activities which could affect the birds (i.e. implementation of a wildlife (birds) awareness programme as part of	Undertake training	Once off at the beginning of construction and every six months during	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		the Environmental Awareness Training). Ensure that all new construction staff/driver is inducted.	Audit of training register	construction. Bi-annually	
		c) Monitoring of collision mortalities along the construction haulage routes, and after completion of construction, should be undertaken to enable the quantification of this potential impact.	Visual inspections for mortalities and record incidents.	Daily	Project Developer (Transnet)
F. Integrated Water Management					
32. Increased water use during construction impacts regional water balance.					
Reduce water usage during construction.	Lack of water conservation techniques practiced by construction staff.	a) Implement management actions included within Transnet General Construction EMP and SES	Monitor via site audits and record incidents.	Monthly	Project Developer (Transnet)
		b) Site wide water audit/balance.	Meter water use and ensure within specified requirements throughout construction.	Weekly	Project Developer (Transnet)
		c) Implement water conservation techniques (e.g. equipment) as noted below: • Where possible, implement water saving devices (dual flush toilets, automatic shut-off taps, etc.). • Install self-closing taps, automatic shut-off valves, spray nozzles, pressure reducing valves, and water conserving fixtures (e.g. low flow shower heads, faucets, toilets, urinals; and spring loaded or sensored faucets). • Pressure management: Process water system	Meter water use and ensure within specified requirements throughout construction.	Weekly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		pressure management (i.e. lower pressure = lower flow = lower leakage/usage). • Cleaning: Cleaning methods utilised for cleaning vehicles, floors, etc. should aim to minimise water use (e.g. sweep before wash-down). • Irrigation: As far as possible, potable water should not be used for irrigation purposes. Ideally, landscapes should be designed to absorb rainwater runoff (stormwater) rather than having to carry it off-site in stormwater systems. Furthermore, the following should be noted: o Proper irrigation scheduling will limit evaporation losses. o Indigenous plants generally require less water than alien species. o Gardens should be structured as to minimise surface run-off. • Elimination of leakage: o Regularly maintain plumbing, and identify and repair leaks o Shut off water to unused areas o Regular audits of water systems should be conducted to identify possible water leakages. • Metering and measurement: Proper metering and measurement of water use and wastewater discharges will enable proper performance			

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		review and management. • Education and awareness: Awareness campaigns focussing on spillages and the effects thereof on stormwater quality and the environment should be launched in all areas of the facility. These campaigns must be aimed at all levels of the organisation (including contractors). Furthermore, water system operating personnel need to have extensive knowledge of the various water control systems, to allow for optimum operation thereof.			
33. Domestic effluent collection in portable toilets/tanks for transport to appropriate treatment facility enters environment.					
Avoid spillage of domestic effluent and minimise the impact thereof on the environment.	Collection and transportation of domestic effluent from portable toilets/tanks.	a) Implement management actions included within Transnet General Construction EMP and SES.	Site audit of domestic effluent removal and disposal	Weekly	Project Developer (Transnet)
34. Stormwater discharge into environment during construction.					
Reduce the impact of the accidental discharge of (contaminated) construction stormwater on the environment. Avoid soil erosion within and in the vicinity of the construction area	Stormwater contamination could result from contact with, for example, chemicals, oils, fuels, sewage, solid waste, litter. Disturbed areas are left un-rehabilitated for a long period, leading to erosion, especially if on	a) Implement stormwater and dewatering management actions (including structural and non-structural erosion control measures) as per Transnet General Construction EMP and SES.	Site audit of stormwater management practices and record of incidents.	Weekly	Project Developer (Transnet)
		Erosion measures as proposed by the proponent need to be implemented, e.g. b) Protection from erosion should be provided by properly grading any susceptible slopes and by paving or reinforcing exposed surfaces (as needed). Where possible re-vegetate disturbed	Site audits and record of incidents.	Weekly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
	steep slopes.	areas promptly c) Reinforcement of soil slopes with suitable materials to minimise erosion. d) Performing periodic inspections and maintenance of soil erosion measures and stormwater control structures. e) Uncontaminated waste water and excess run off must not be concentrated but allowed to dissipate and seep slowly into the soil in a manner which inhibits soil erosion.			
		f) The construction of the stormwater control dams/ponds should be scheduled as early as possible.	Include in project schedule	Once off	Project Developer (Transnet)
		g) Monitor stormwater quality prior to any discharge off-site, if discharge into natural environment	Sampling and analyses by an accredited laboratory	After a storm (as required)	Project Developer (Transnet)
G. Groundwater/Geohydrology Impacts					
35. Altering of natural drainage lines, river channel flow lines and river banks.					
Ensure minimal disturbance occurs to the natural hydrological and geohydrological setting.	Construction activities, including site clearing and earthworks.	a) Minimise damage to river banks and drainage lines/wetland areas, noting that terracing requires filling in of floodplain area and the conveyor route requires a small filling in of the salt pans.	Visual inspection of the site	Weekly	Project Developer (Transnet)
		b) Existing monitoring boreholes should remain intact if at all possible. If a monitoring borehole is damaged or has to be removed it needs to be replaced as close as possible to the borehole			

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		damaged/destroyed.			
H. Aquatic Ecology Impacts					
36. Erosion and Sedimentation of aquatic habitat					
Prevent downstream erosion and sedimentation of aquatic habitats.	Erosion and sedimentation as a result of the changes in the hydrological regime due to the construction of hard engineered surfaces or structures within a water course or wetland area.	a) During construction, erosion should be monitored while areas of vegetation are being cleared. Hard engineered surfaces that increase surface water run-off should be limited. Where possible, avoid the delineated riverine/water course areas and wetlands and their buffer areas.	Visual site inspection	Weekly	Project Developer (Transnet)
I. Noise					
37. Potential impact of the construction noise on sensitive areas (dwellings on Tankatara Farm and Coega Hotel)					
Minimise noise from construction	Vehicles, earth moving and terracing of sites, construction of access roads and hard standing areas.	a) Noise monitoring must be conducted during the construction phase to determine if the noise emissions are within prescribed limits. b) Noisy construction activities exceeding the prescribed night time noise levels as per SANS 10103 or later should be limited to daylight hours. As a precautionary measure, piling should not occur at night.	Noise monitoring must comply with SANS 10103: 2008	Twice in the construction phase	Project Developer (Transnet)
J. Visual impacts					
38. Intrusion of activities associated with construction of the facility on existing views of sensitive visual receptors.					
Minimise intrusion of construction activities on	Construction of the manganese ore export	a) Night lighting of construction sites should be minimised within requirements of safety and	Monitor night lighting to ensure only minimum	Weekly	Project Developer

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
existing views of sensitive visual receptors.	facility may affect sensitive visual receptors	efficiency.	required lights are used.		(Transnet)
		b) Laydown areas and construction camps to be located in low visibility areas where possible (i.e. not unnecessarily exposed to external visual receptors).	Visual inspection	Once off at the beginning of construction	Project Developer (Transnet)
		c) Minimise vegetation clearance since the site contains relatively high thicket which should be used to conceal/screen construction activities and equipment as much as possible. d) Implement rehabilitation plan drawn up by landscape architect for sites where scarring can occur due to construction activities (e.g. conveyor route, access and haulage roads and railway tracks).	Monitor cleared areas Adherence to rehabilitation plan	Daily during clearing and monthly thereafter Quarterly	Project Developer (Transnet)
K. General Construction Activities					
39. Impacts on the environment associated with contractors management					
Ensure construction is carried out according to best practices.	Contractors not implementing best practices and good housekeeping during construction activities may create impacts on the environment.	a) Implement management actions included within Transnet General Construction EMP and SES b) Contractor's yard and offices shall be restricted to the area agreed upon; c) No laydown areas or construction camps should be placed within the 1:100 floodline. d) The area shall be fenced in; e) On completion of the works, the Contractor shall restore the area to its original condition; f) The Contractor shall keep the yard neat and tidy at all times;	Visual inspection to ensure good housekeeping is maintained (no litter, neat, toilets serviced regularly)	Weekly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		g) No pollution or littering of any kind will be tolerated. h) The Contractor shall make arrangements with a registered waste service provider who will be responsible for collecting, removing and disposing of construction waste.; i) The Contractor shall provide sufficient latrine facilities at site (one latrine for every 10 persons working on the site)			
40. Risks to the public if accessing the site					
Reduce the risk to public accessing the construction site.	The construction works involve deep earthworks, materials storage and handling, and heavy machinery and equipment that could pose a risk to members of the public if accessing the site.	a) The public will be excluded from accessing all construction areas where practicable. Open excavations (such as trenches) will be fenced or otherwise demarcated where there is a risk of public access. b) Only official visitors to be allowed on site. They must be issued with personal protective equipment. c) Warning boards identifying hazards, risks, safety requirements and emergency phone numbers will be installed at each entry to all construction areas. d) Machinery and plant that is located in publicly accessible locations will be secured (in a locked area where practicable) when the construction site is not occupied.	Check that the construction site is properly fenced with formal access control. Check that warning boards are up and that public does not access the site.	At the start of construction and then monthly.	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
41. Impact of accidental oil/chemical spillage/fuel leakages on surface and groundwater, terrestrial and aquatic ecology					
Minimise or prevent accidental spillage or leakage of fuel, chemicals or lubricants. Minimise the potential for any pollutants from reaching the riverine, estuarine and marine environments, groundwater and terrestrial/aquatic environment.	Introduction of a number of potentially toxic macro-elements during the construction phase, such as the use of machinery/ plant (fuels, oils & grease), concrete and chemicals. Spillages of dangerous goods due to inadequate handling and storage also have the potential to impact personnel and public safety.	a) Implement management actions re. vehicles and equipment refuelling included within Transnet General Construction EMP and SES. b) Ensure a good house-keeping practice is in place. c) Regular sweeping of roadways and work areas.	Site audits Visual inspections to ensure that a good housekeeping is maintained.	Monthly Daily	Project Developer (Transnet)
		d) Ensure a safe storage of chemicals, including for example (*checklist to be developed*): o Chemicals (paints, solvents etc.) are to be contained in a bunded area (be it fixed or portable) o A liquid-tight wall, or permanently installed secure bunds (an embankment or wall of brick, stone, concrete, etc.); o The floor sloping to a sump, and use of drain covers; o Run-off draining system to an external holding pit or tank where chemicals can be collected for recycling; o Collapsible and flexible pillow tanks can also be used for storage of liquid chemicals; o Material Safety Data Sheets (MSDS) will be maintained for each dangerous good stored. The MSDS will be located outside of the compound in which the material is stored; o Deliveries of dangerous goods will only be	Complete the checklist for the safe storage of chemicals.	Daily	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		accepted if they are accompanied by a MSDS for that dangerous good or explosive, or, if there is an existing and current MSDS for that dangerous good or explosive already held on the site; o Dangerous goods will be stored in a locked compound to prevent unauthorised access; and o Ignition sources (e.g. welding equipment, cigarettes, lighters) will be prohibited within any storage area used for dangerous goods or explosives. o Bulk materials (cement, sand, etc.) to be kept in enclosed storage, sheltered from wind.			
		e) Use the appropriate equipment to transport and handle chemicals; f) All vehicles transporting fuel and other hazardous materials should comply with SABS standards for the transport of such materials, and carry a relevant certificate to show compliance.	Audit of transport companies	Bi-annually	Project Developer (Transnet)
		g) Construction vehicles/generators to be regularly serviced and checked for oil leaks. Any engine that stands in one place must have drip trays.	Follow equipment service/maintenance schedule	As required per maintenance schedule	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		h) Adequate containers for the cleaning of equipment and materials (paint, solvent) must be provided as to avoid spillages. i) No batching plants, vehicle refuelling or vehicle maintenance should occur within 32m of a water course or 50m from wetlands. j) Any fuel dispensing stations should be provided with an impervious area and a secondarily contained area.	Site audits	Weekly	Project Developer (Transnet)
		k) A spill kit (peatsorb/ drip trays) should be available at strategic locations (including onboard of vehicles used for the construction activity, fuel dispensing stations etc.); l) In case of a spillage of hazardous chemicals where contamination of soil occurs, depending on the degree of contamination, excavation and removal to a hazardous waste disposal site, such as at Aloes, might be necessary. If the spillage is widespread, a specialist will need to be appointed to deal with the issue.	Check that spill kits are readily available and complete.	Weekly	Project Developer (Transnet)
42. Environmental impacts and visual amenity associated with waste management					
Ensure wastes are managed and disposed of in a lawful and an environmental friendly manner.	Incorrect disposal of construction solid waste such as excess fill materials from grading and excavation activities, scrap wood and metals, small concrete spills,	a) Implement management actions included within Transnet General Construction EMP and SES.	Procedure for waste removal and disposal to be assessed	Once-off prior to construction	Project Developer (Transnet)
		b) Develop a waste management plan and initiate a waste minimisation system; c) Reuse and recycle waste materials where possible;	Visual check to ensure wastes are managed according to the waste	Weekly	Project Developer

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
	liquid waste (used oil, paints, lubricating compounds and grease) etc.	and d) Dispose of construction wastes in an acceptable manner. e) Wastewater from construction and painting activities (grey water) must be collected in a designated container and disposed off at a suitable disposal point off site. f) Oils, filters, lubricants are to be correctly disposed of when equipment is maintained in the field (e.g. emergency repair);	management plan		(Transnet)
43. Environmental awareness and training					
Minimise environmental impacts through staff awareness	Unawareness of staff	d) Conduct training for all construction staff/drivers/contractors and keep attendance registers up to date. Ensure that all new staff is inducted. Training should include as a minimum: • Housekeeping, hazardous materials/dangerous goods, MSDS • Dust management and enhance awareness • Water savings. • Important bird species, and the need to be aware of their presence on site to avoid collision and other disruptive activities which could affect the birds • Awareness campaigns focussing on spillages and the effects thereof on stormwater quality and the environment. These campaigns must be aimed at all levels of the organisation (including contractors).	Training undertaken. Assess training material and Audit of attendance registers	Once-off prior to construction and every six months. Monthly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Ensure that members of the household located across the unfenced graveyard (Informal settlement) are kept informed to ensure their safety	This community could be at risk if not regularly informed of the construction activities	a) Ensure regular consultations with the household members during construction	Organise a meeting	Monthly	Project Developer (Transnet)

6 MANAGEMENT PLAN FOR OPERATIONS PHASE

Note: This is a provisional Operations EMP (based on the findings and recommendations of the EIA process) and will need to be incorporated into the operational procedures to be drawn up as part of the Operational Management Plan (OMP) to be prepared during the commissioning of the facility. Responsibilities will need to be confirmed once the Terminal Operator is appointed. Hence, the following responsibilities may change.

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. AIR QUALITY IMPACTS					
1. Dust deposition and ambient PM_{10} and $PM_{2.5}$ concentrations in the neighbouring environment					
Meet air quality standards and minimise impacts associated with air quality	Operation of the Manganese Ore Export facility.	a) Operate and maintain high pressure water fog system at hopper feeder chutes. b) Apply dust suppressant systems resulting in a capping of approximately 21 days. c) Ensure maximum stacker drop height of 1.5 m. d) Operate and maintain moisture addition during stacking and reclaiming e) Operate and maintain sprayer at transfer points and surge bins. f) Ensure ore is as wet as possible and minimise drop heights. g) Implement traffic control measures on the stockyard and limit access. h) Implement wetting programme for unpaved roads and open areas.	Develop SOPs Site audit to ensure conformance to SOP Monitor air quality parameters at existing stations to ensure compliance with standards Monitor dust Fall out at 8 wind directions on site boundary, including Mn analysis	Once off prior to operations Monthly Daily (ongoing) As per Environmental Authorisation	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		i) Design and implement spill management programme to effectively clean spilt ore (e.g. vacuum spilt ore on paved surfaces to avoid ore and dust accumulation)			
		j) Vegetate open unused areas with suitable ground cover. Implement and maintain planting programme	Site audit	Bi-annually	Project Developer (Transnet)
		k) Ensure that the dust abatement equipment is maintained as per designed parameters. Develop a maintenance schedule.	Visual inspection of the abatement. Accumulations of dust on the quay would be an indication that it is not functioning correctly and that corrective action is required Audit of maintenance schedule	Monthly Bi-annually	Project Developer (Transnet)
		l) Develop and implement an SOP for the following: • In the event of water restrictions being imposed, suppress dust on stockpiles using chemical suppressant. • In severe drought (no available water), cease operations at the facility when the wind speed exceeds a predetermined threshold at which dust is visibly entrained	Visual inspection Determine threshold during commissioning	When required Once off	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
B. TERRESTRIAL ECOLOGY					
2. Increased risk of alien plant invasion in disturbed areas					
Minimise proliferation of alien invasive species (and other exotic weed).	The potential risk of increased alien invasive (and other exotic weed) invasion will persist during the operational phases as a result of the introduction and dispersal of plant propagules (seeds) from outside the site via increased traffic through these servitudes.	a) Develop and implement an Alien Vegetation Management plan for the operation phase (including specifications regarding clearing methodologies for various species). . Appoint a suitably qualified service provider to monitor and remove alien vegetation in accordance with an approved plan.	Monitor the presence of alien invasive species on site in line with the Alien Vegetation Management Plan.	Bi-annually	Project Developer (Transnet)
		b) Control any alien plants that become established using registered control methods.	Take action to control alien plants	Immediately	Project Developer (Transnet)
		c) Cleared alien vegetation/seed bearing alien plant material must not be dumped on adjacent intact vegetation during clearing but should be temporarily stored in a demarcated area (in consultation with the relevant botanical specialist). d) Cleared vegetation during ongoing maintenance must be removed from site or mulched for use in rehabilitation of the servitudes cleared during construction. Any mulched material must be weed seed free.	Monitor the removal and resulting storage of cleared alien vegetation. Monitor the spread and removal of seed bearing material.	Quarterly	Project Developer (Transnet)
3. Change in natural fire regime					
Minimise risk of fire.	Fire regime changes may be possible as a result of	d) Implement a Fire management plan, including an action plan for accidental fires.	Check that fire management plan recommendations are	Bi-annually	Project Developer

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
	increased vehicular and other traffic into the area during operation.		implemented.		(Transnet)
		e) Grassy Road and railway verges outside of rehabilitated areas should be regularly mowed.	Monitor fire breaks/dry grasses areas.	Quarterly during dry periods Bi-annually during wet periods	Project Developer (Transnet)
		f) Flammable litter and discarded glass bottles should be removed regularly, especially along servitudes.	Visual site inspections.	Monthly	Project Developer (Transnet)
4. Long-term effects of Manganese dust on adjacent vegetation and butterfly reserves					
Minimise wind borne Manganese dust.	Windborne Manganese dust emanating mainly from the Stockyard during the Operational Phase.	Refer to A.1			
		a) Long-term monitoring (for change in vegetation health) of the effect of Mn dust on the vegetation, especially butterfly host plants within the Butterfly reserve(s) and designated Open Space network for excessive accumulation and severe toxicity effects on fauna and flora. Should severe long term effects be noted, then remedial measures will need to be further investigated	Visual inspection/ monitoring	Monthly for the first 2 years. This frequency can be reduced thereafter depending on the findings of the monitoring.	Project Developer (Transnet)
5. Fragmentation of Ecological Corridors and disruption of Ecological processes and animal movement as a result of artificial barriers.					
Minimise fragmentation and disruptions to ecological	Disruption of areas outside the facility will result in both, further fragmentation of	a) Fences to be kept in adequate condition. b) Ensure staff remains within demarcated areas	Visual site inspection and record of incidents	Monthly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
corridors.	ecological corridors and artificial disruptions to ecological processes.				
6. Fauna mortality due to road/rail incidents (trucks, trains and other service vehicles)					
Minimise faunal mortalities due to road/rail incidents.	Frequent truck/vehicle road and train activity resulting in an increase in mortality of fauna.	a) Monitor regularly for injured animals and death or injury (DoR) incidents.	Site Audit and regular visual inspections Record incidents	Weekly (daily during rainfall for amphibians)	Project Developer (Transnet)
		b) Slow driving on the site; speed limits should be enforced, especially during rainfall periods.	Site audits	Monthly	Project Developer (Transnet)
		c) Keep the grass/vegetation short next to the road to reduce mammal activity near the road.			
		d) Killed animals must be removed from the road as this will attract scavengers which may also be harmed on the road.			
		e) Do not feed animals anywhere within the project site.			
		f) Materials which will attract reptiles must not be left on site as this will increase the presence of reptiles			
7. Faunal mortalities resulting from fences (mammals and reptiles)					
Minimise fence related faunal mortalities.	The establishment and installation of fencing around the Manganese Ore Export Terminal and	d) Check fences regularly for mortalities.	Visual checks and incidents record	Monthly	Project Developer (Transnet)
		e) Implement measures in problem areas.			

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
	supporting infrastructure.	f) Access gates into the fenced off areas to be closed at all times.	Visual checks	Daily	Project Developer (Transnet)
8. Mortalities resulting from poaching (mammals)					
Minimise poaching related faunal mortalities.	Staff not trained adequately in terms of environmental awareness.	c) Check fences regularly for snares.	Visual checks	Monthly	Project Developer (Transnet)
		d) The workers on site must be educated about the laws protecting wildlife. Penalties should be used as a deterrent. Ensure that all new staff is inducted.	Training registers for Environmental Awareness Training.	Repeated every six months during the operations phase.	Project Developer (Transnet)
C. INTEGRATED WATER MANAGEMENT					
9. Impact on regional water balance as a result of increased water used during normal operation.					
Reduce water usage during operation.	Stress on potable water resources within the municipality due to the use of potable water for industrial purposes Lack of water conservation techniques practiced by construction staff.	a) Review the available service water supply sources and identify the best option in collaboration with CDC and relevant authorities (e.g. potable water, return effluent, effluent from other industries within the IDZ etc.)	Organise a meeting with CDC and relevant authorities.	After 2 years of operation	Project Developer (Transnet)
		b) Site wide water audit/balance.	Meter water use and ensure within specified requirements throughout operation.	Monthly	Project Developer (Transnet)
		c) Minimise water use by closely monitoring weather	Arrange access to rainfall data	As required,	Project

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		for rainfall (i.e. no need for dust suppression water), maximising stormwater utilisation for dust suppression and through the use of surfactant	from a local weather station and use this data to set limits for when dust suppression is required.	depending on rainfall	Developer (Transnet)
		d) Implement water conservation techniques (e.g. equipment) as noted below: • Irrigation: As far as possible, potable water should not be used for irrigation purposes. Ideally, landscapes should be designed to absorb rainwater runoff (stormwater) rather than having to carry it off-site in stormwater systems. Furthermore, the following should be noted: o Proper irrigation scheduling will limit evaporation losses. o Indigenous plants generally require less water than alien species. o Gardens should be structured as to minimise surface run-off. • Cleaning: Cleaning methods utilised for cleaning vehicles, floors, etc. should aim to minimise water use (e.g. sweep before wash-down). • Fire fighting: Proper pressure management within fire water systems will limit water use. • Elimination of leakage: o Regularly maintain plumbing, and identify and repair leaks	Meter water use and ensure within specified requirements throughout operation.	Weekly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		o Shut off water to unused areas o Regular audits of water systems should be conducted to identify possible water leakages. • Metering and measurement: Proper metering and measurement of water use and wastewater discharges will enable proper performance review and management.			
10. Domestic effluent accidental discharge into sewer enters the environment					
Avoid the spillage of domestic effluent and the impact thereof on the environment.	Discharge of domestic wastewater via the sewage network.	a) Ensure that normal sewage management practices are implemented (e.g. regularly inspect systems/septic tanks, system maintenance, employee training, etc.). b) Where applicable, sewerage (e.g. at the compilation yard) should be removed by a licenced contractor to an approved site	Site audit and record incidents Monitor disposal and request wastes disposal certificates	Monthly As required	Project Developer (Transnet)
11. Service wastewater accidental discharge into environment					
Avoid the accidental discharge of service wastewater into the environment.	Service wastewater generated from truck washing and from workshops.	a) Ensure no service wastewater can be discharged/disposed by inappropriate means (e.g. system design, fail-safes).	Site audit and record incidents	Monthly	Project Developer (Transnet)
		b) Ensure that an agreement is in place if wastewater is discharged into CDC sewer.	Put agreement in place	Once off prior to operations	
		c) Ensure that effluent discharged in the CDC sewer system complies with CDC discharge standards. If the service wastewater is not of an acceptable quality, it will need to be disposed of at an appropriate facility or undergo on-site treatment.	Record service wastewater quantity and quality (as per agreement, if discharged to sewer).	Monthly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
			Wastewater sampling Conduct audits and record non-compliance	Monthly	
12. Contaminated stormwater accidental discharge to environment					
Avoid the impact of contaminated stormwater discharge into the environment, including avifauna, groundwater, surface water etc.	Stormwater contamination could result from: • Accidental or other spillages of ore, materials, oils, chemicals, litter, etc. • Accidental discharge of service wastewater into the stormwater system. • Deposition ("dust fallout") Stormwater containing sediments has the potential of changing the in-stream characteristics of the Coega River and causing sedimentation of saltpans should it be released as such in the environment.	a) Develop and Implement a Stormwater Management Plan, including a checklist for audits. b) Ensure that the "dirty" stormwater (potentially contaminated by ore dust, oil, spillages, etc.) is kept separated from "clean" stormwater. No manganese ore washed into the Coega River.	Compile Stormwater Management Plan. Site inspection/audits and record incidents.	Prior to operations Monthly	Project Developer (Transnet)
		c) Monitor stormwater quality prior to any discharge off-site (i.e. at the compilation yard mainly), if applicable. d) Where infiltration of uncontaminated stormwater occurs (i.e. to contribute to the river base flow), it needs to be of acceptable quality (General authorisation GN399, 2004). A water sample of the "clean stormwater" should be collected at a site just before the point at which the stormwater enters the environment.	Stormwater quality within control dams/attenuation ponds should be monitored on a regular basis. Stormwater quality run-off should be monitored after a storm event	Monthly After each significant rain-event (for at least Year 1) and then every three months.	Project Developer (Transnet)
		e) Ensure that all potentially contaminated stormwater is channelled into the stormwater control dams/attenuation ponds to trap sediment and manganese ore dust.	Site inspection/audits and record incidents.	Monthly	Project Developer (Transnet)
		f) Develop and implement a railway/stockyard and	Audit the management plans	Prior to	Project

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		quay operation management plan, including procedures and day-to-day activities	Site audits and record incidents.	operation Monthly	Developer (Transnet)
D. AVIFAUNA IMPACTS					
13. Impact on avifauna as a result of increased disturbance caused by the project activities.					
To reduce the impact on avifauna as a result of disturbance caused during operation.	Noise, vehicular movement (trains, road transport etc.), and lights will have an adverse effect on bird species sensitive to disturbance.	a) The numbers and breeding success of the large grassland bird species should be monitored to provide an indication of the degree to which project actions affect or disturb these birds.	A comparison between pre- and post- operation conditions should be made and monitoring of these species should be undertaken.	Monthly for 2 years and then annually at end of breeding season	Project Developer (Transnet)
		b) Lighting should be directed to illuminate areas requiring light for safety purposes only	Site audit	Weekly	Project Developer (Transnet)
14. Impact on avifauna as a result of collision with new powerlines/overhead rail electricity network					
Minimise bird injuries/death due to collisions	Powerlines/rail overhead cables pose a threat to the movement of large bird species through the project area, especially at night or in the windy conditions which occur frequently in the Coega area.	a) Monitor powerline routes for dead birds. Reviewed situation after a year when the inspection programme can be modified to be appropriate for long-term monitoring.[3]	Patrols of powerline routes, records incidents and locations and assess the effectiveness of bird flight diverters.	Daily (1st month & main breeding season), then weekly.	Project Developer (Transnet)
		b) Keep up-to-date with developments in improving the effectiveness of bird flight diverters, throughout the life of the project.[3]	Attending conferences, desktop surveys etc.	Annually	
		c) Consideration should be given to installing webcam monitors at key locations.[3]			

[3] Note that this action falls under the responsibility of a 3rd party and that Transnet cannot guarantee that it will be implemented

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
15. Impact on avifauna as a result of atmospheric emissions (i.e. fugitive manganese ore dust on vegetation and on Jalheel Island)					
Ensure that atmospheric emissions (ore dust) are fully compliant with the required standards.	The area to the north east and south west of the Manganese Stockyard can be subject to some deposition of fugitive manganese dust albeit at a low level. However the situation may be aggravated in drought years when the vegetation will experience limited washing by rainfall.	a) Refer to A.1			
		Transects through the vegetation which potentially receive the greatest quantity of manganese ore dust deposition should be monitored for their use by birds. b) Continue the establishment of the baseline started prior to construction (consider using SABAP2 methodology)	Visual inspection/count of birds	Monthly for at least two years after commencement of operations.	Project Developer (Transnet)
		c) Conduct a breeding season survey in the long-term Monitoring requirements to be included in the operations conditions.	Visual inspection/count of birds	Annually.	Project Developer (Transnet)
16. Impact on avifauna as a result of fugitive manganese ore dust on Coega River and Saltpans					
Ensure that atmospheric emissions (ore dust) are fully compliant with the required standards.	Manganese ore dust from the terminal operations could, if present in quantity, reduce the feeding efficiency of filter feeders (e.g. brine shrimps) which are fed upon by flamingos, avocets and other waders.	a) It is recommended that monitoring of the avifauna and of the breeding colonies on the saltpans be continued.	Coordinated Water Bird Counts	Bi-annually	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
E. MARINE ECOLOGY IMPACTS					
17. Potential toxic effects of dissolved manganese and trace metals on marine organisms (i.e. bioaccumulation and biomagnification of trace metals, smothering of sessile organisms). **18. Alterations of the chemical composition of the harbour sediment with implications on the disposal of dredge spoil.**					
Minimise the amount of Manganese ore particles/dust reaching the marine environment.	Accidental spillage of Mn ore, contaminated runoff and windblown dust from shiploaders and from small temporary piles of ore on the quay awaiting transport back to the main stockpiles.	Refer to A.1 and C.12			
		a) Reduce the amount of time any ore is resident on the quay by removing ore spills as soon as possible	Visual inspection of the quay.	Daily	Project Developer (Transnet)
19. Alteration of water and sediment quality/Release of alien species associated with the discharge of ballast water in the port					
Prevent discharge of ballast water inside the Ngqura Harbour.	During loading of the manganese ore, ships will discharge ballast water containing pollutants other than manganese and alien species into the harbour, thereby altering the chemical composition of the harbour water body and sediments and possibly introducing invasive species.	a) As per IMO ballast water management requirements, TNPA needs to require presentation of the ballast water log by each ship's master before any loading takes place to prove compliance with exchanging ballast at sea. In the event such an exchange has NOT taken place, the ship may not discharge ballast water in the Harbour.	Audit of ship's ballast log	On entry of the ship into the Port and before commencement of loading.	Project Developer (Transnet)
		b) Ongoing biological monitoring of the harbour and adjacent ecosystems to detect any invasive species. Once detected, suitable management interventions need to be applied to prevent or restrict range expansions.	The existing biological monitoring programmes must be continued which include sampling of populations in the Harbour and checking for alien species.	Annually	TNPA

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
20. Oil/fuel spills as a result of collisions (small scale spill in the harbour)					
Reduction in the number and volume of spills and rapid clean-up if they do occur.	Increase in the number of ships entering the Port of Ngqura due to the commissioning of the manganese berth. This will increase the risk of collision and release of fuels and oils as a consequence. Small amounts of fuels spilled during refuelling.	a) Ensure that the Port of Ngqura Oil Spill Contingency Plan includes the use of bubble barriers around ships and, where possible, the deployment of skimmers during cargo transfer to improve the speed and efficiency of clean-up in the unlikely event of a spill occurring.	Visual inspection and recording of incidents	Prior to any loading or offloading	Project Developer (Transnet)
		b) Recommend that the Port of Ngqura Oil Spill Contingency Plan includes specifications for the removing of the hydrocarbon film from harbour walls and breakwater rock where possible using jets of high pressure sea water. (Note: the use of detergents and/ or dispersants in the water jet is not recommended). Ensure the plan is up to date and effective.	Audit Oil spill contingency plan for its effectiveness	Annually	Project Developer (Transnet), TNPA
		c) Adherence to policies and procedures in place at the port, i.e. all vessels to be MARPOL compliant	Include MARPOL compliance in specifications for manganese ore carriers	On-going, establish MARPOL status of vessels	Project Developer (Transnet)
		e) Conduct training for all staff (housekeeping, clean-up of spillages, etc.) and keep attendance registers up to date. Ensure that all new staff is inducted	Training undertaken. Audit of attendance registers	Once-off prior to operation, the bi-annually Monthly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
21. Oil/fuel spills as a result of collisions (large scale spill in Algoa Bay)					
Reduction in the number and volume of spills and rapid clean-up if they do occur.	The commissioning of the manganese berth will increase the number of ships entering the Port of Ngqura. This increases the risk of collision and release of fuels and oils as a consequence. A large spill in Algoa Bay causing disruption to the marine communities on the shoreline including the vulnerable offshore islands and in particular the penguin colonies.	a) TNPA needs to implement a rigorous environmental management and control plan to limit ecological risks from operational accidents coupled with ensuring efficient and safe operation of shipping in the port approaches to the port. b) TNPA must ensure that shipping in the Ngqura Harbour and in Algoa Bay at large are continuously monitored to ensure that potential collisions are detected and actions taken to avoid them especially in the approach channels.	Site inspection and audit of the Oil Spill Planning for the Port of Ngqura and Algoa Bay (Diaz Zone plan). Audit of the continuous monitoring of shipping safety in the Bay	Annual Annual	TNPA SAMSA, TNPA
		c) Develop an emergency response procedure, in consultation with SANParks, that addresses handling of oiled seabirds and marine mammals (e.g. in the event of a spill, oiled seabirds must be collected and sent to SANNCOB, or similar entity, for cleaning and feeding. In severe spills non-oiled penguins can be caught and relocated to, e.g. Robben/Dassen/Dyer island to allow the spill in Algoa Bay to dissipate whilst they migrate back to Algoa Bay (as done in reverse with the Treasure Spill, Wolfaardt *et al* 2009)).	The existing oil spill contingency plan must be reviewed to ensure that these provisions are addressed and updated as required.	Once off prior to operations and then annual review	TNPA
		d) In addition, the oil spill contingency plan which is currently being reviewed must be kept up to date. All equipment used for the oil spill response must be kept in good order and all personnel adequately trained and drilled by TNPA.	The effectiveness of these provisions must be monitored in the event of a spill and the plan modified if necessary.	As required	TNPA

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
22. Physical disturbance of whales and dolphins at Southern African population level					
Reduction in the physical disturbance of whales and dolphins.	Increased shipping in Algoa Bay (in general and not specific to vessels entering the port for the sole purpose of use of the Manganese Export Facility).	a) Vessels to travel at lowest, navigationally safe, speeds to give whales time to move away. WSP (2001) recommends that whale sightings be reported to port authorities so that ships can be warned to avoid collisions. In addition, awareness raising efforts by port authorities are recommended to sensitise ship's masters to the presence of whales and dolphins.	On-going Marine Mammal Monitoring Plan	Continuously	TNPA
F. GROUNDWATER/GEOHYDROLOGY IMPACTS					
23. Impact of dust fall out and contaminated stormwater on groundwater as a result of operational activities.					
To minimize the dust being generated by the operation of the Manganese facility. Ensure no soil or groundwater is impacted by poor quality storm water.	Manganese ore dust can accumulate on the ground and other surfaces. During a rainfall event, it can be washed off and percolate into the ground and possibly reach the saturated zone. Potentially polluted stormwater from the operations	Refer to A.1 and C.12			
24. Impact of stockpile leachate on groundwater					
Ensure no soil or groundwater is impacted by stockpile	Leachate from the stockpiles is a potential threat to groundwater	a) Ensure that all leachate generated from the stockpile is recycled to the stormwater control dam and is not discharged into the ground or enter surface water bodies or infiltrate directly	Visual inspections	After significant rainfall events	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
leachate.		into groundwater.			
		b) Implement a soil and groundwater monitoring programme and use an accredited laboratory for the analysis	Develop sampling programme Sampling undertaken and compare with agreed parameters	Once off prior to operation As per sampling schedule (i.e. monthly)	Project Developer (Transnet)
G. AQUATIC ECOLOGY IMPACTS					
25. Potential impacts associated with the Manganese ore export facility on water quality and risk to the aquatic environment.					
Minimise the potential for any pollutants from reaching the riverine and estuarine environments.	Introduction of a number of potentially toxic macro-elements during the operation of the proposed facility including spillages and accidents (e.g. Potential spill from the wagons or dust from storage areas entering any of the surrounding water courses),	Refer to A.1 and C.12	Refer to the CDC water quality monitoring programme for detailed description of sampling parameters and sites. Assess and discuss results obtained from the CDC water quality monitoring programme.	Once off prior to operation Weekly	Project Developer (Transnet) in collaboration with the Coega CDC/IDZ
		a) Transnet should co-ordinate their efforts with the CDC/IDZ water quality monitoring plan in order to monitor the operational phase of the project. The current monitoring plan should adequately capture any potential issues based on the assessment of the current localities in relation to this project. b) This programme already describes the baseline concentrations of the variables being measured and the accepted limits of variation			
26. Erosion and Sedimentation					
Prevent downstream erosion and	Changes in the hydrological regime due to the operation of hard	Refer to C.6			
		a) All potential erosion sources such as bridge or culvert areas should be monitored and any areas	Visual inspections	Monthly or after heavy rain	Project Developer

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
sedimentation of aquatic habitats.	engineered surfaces or structures within a water course or wetland area.	that become destabilised should either be re-vegetated or erosion control mechanism such as gabions should be installed.		events	(Transnet)
H. NOISE IMPACTS					
27. Impact of the manganese handling operational noise on the Noise Sensitive Areas					
Minimise noise from operation.	Mn ore export terminal, rail operations and ancillary infrastructures	a) Ambient noise monitoring must be conducted during the operational phase to determine if the noise emissions are within prescribed limits. Monitoring should be conducted around the site and at the closest residential areas to determine the actual environmental noise impact.	Noise monitoring must comply with SANS 10103: 2008.	Every 6 months for at least 2 years	Project Developer (Transnet)
I. VISUAL IMPACTS					
28. Visual impact of night lighting of Manganese facility on the nightscape of region.					
Minimise visual impact of night lighting of facility on the nightscape of region.	Lighting of Compilation Yard and terminal.	b) Monitor effectiveness of lighting plan	Drive along N2 and R334 at night to assess risk posed by night lights at stockyard and conveyor system. Night drive in GAENP along southern routes to establish effectiveness of lighting plan to minimise impact on visual receptors in GAENP.	End of Construction Phase/Start of Operational Phase	Project Developer (Transnet)
29. Visual impact/intrusion of the facility on sensitive receptors					
Minimise visual impact/intrusion of the facility on	Visual impact of Manganese Terminal and	a) Monitor adherence to Coega IDZ Visual guidelines for Developments. Set up a checklist of items that should be monitored, including:	Visual inspection and site audit	Beginning of operation	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
sensitive receptors	Compilation Yard on sensitive visual receptors.	• Signage – must be discreet and restrained; • Roofs and buildings should reflect minimal sunlight or artificial light during day or night.		As part of maintenance process for buildings and facades.	
	Landscaping and appearance of the facility could be visually unattractive if poorly maintained and then be unnecessarily intrusive on the local environment.	a) Maintain the appearance of the building and the landscaping programme.	Verify that the appearance of the building is well maintained and that the landscaping programme is undertaken.	Annual review	Project Developer (Transnet)
L. General Operational Activities					
44. Risks to the public if accessing the site					
Reduce the risk to public accessing the site.	The operation of the facility will entail materials storage and handling, and heavy machinery and equipment that could pose a risk to members of the public if accessing the site.	a) The public will be excluded from accessing the site where practicable. b) Only official visitors to be allowed on site. They must be issued with personal protective equipment. c) Warning boards identifying hazards, risks, safety requirements and emergency phone numbers will be installed at each entry to the site.	Check that the site is properly fenced with formal access control. Check that warning boards are up and that public does not access the site.	At the start of operation and then monthly.	Project Developer (Transnet)
45. Impact of accidental oil/chemical spillage/fuel leakages on surface and groundwater, terrestrial and aquatic ecology					
Minimise or prevent	Introduction of a number of potentially toxic macro-	a) Ensure a good house-keeping practice is in place; b) Regular sweeping of roadways and work areas.	Visual inspections to ensure that a good housekeeping is	Daily	Project Developer

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
accidental spillage or leakage of fuel, chemicals or lubricants. Minimise the potential for any pollutants from reaching the riverine, estuarine and marine environments, groundwater and terrestrial/aquatic environment.	elements, such as the use of machinery/ plant (fuels, oils & grease) and chemicals. Spillages of dangerous goods due to inadequate handling and storage also have the potential to impact personnel and public safety.		maintained		(Transnet)
		c) Ensure a safe storage of chemicals, including for example (*checklist to be developed*): o Chemicals (paints, solvents etc.) are to be contained in a covered and bunded area (be it fixed or portable) o A liquid-tight wall, or permanently installed secure bunds (an embankment or wall of brick, stone, concrete, etc.). Bunding is required to contain 110% of total volume of stored material; o The floor sloping to a sump, and use of drain covers; o Run-off draining system to an external holding pit or tank where chemicals can be collected for recycling; o Collapsible and flexible pillow tanks can also be used for storage of liquid chemicals; o Material Safety Data Sheets (MSDS) will be maintained for each dangerous good. The MSDS will be located outside of the compound in which the material is stored; o Deliveries of dangerous goods will only be accepted if they are accompanied by a MSDS for that dangerous good or explosive, or, if there is an existing and current MSDS for that dangerous good or explosive already	Complete the checklist for the safe storage of chemicals.	Daily	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		held on the site; o Dangerous goods will be stored in a locked compound to prevent unauthorised access; o Ignition sources (e.g. welding equipment, cigarettes, lighters) will be prohibited within any storage area used for dangerous goods. o Bulk materials (cement, sand, etc.) to be kept in enclosed storage, sheltered from wind. d) Fuels need to be stored above ground, in the correct containers, in a bunded area and on an impermeable surface. Any diesel driven pumps should always be covered. e) All vehicles transporting fuel and other hazardous materials should comply with SABS standards for the transport of such materials, and carry a relevant certificate to show compliance.	Audit of transport companies	Bi-annually	
		f) Preventative maintenance of equipment (vehicles, generators etc.) should be performed on a routine basis to reduce the potential for leaks; g) Vehicles/machinery parked needs to have drip trays or be parked on impermeable surfaces; h) Refuelling and maintenance activities to be undertaken in designated locations; i) No vehicle refuelling or vehicle maintenance should occur within 32m of a water course or 50m from wetlands. Any fuel dispensing stations should be provided with an impervious area and a secondarily contained area.	Follow equipment service/maintenance schedule Site inspections/audits and record of incidents	As required per maintenance schedule Weekly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
		j) Develop a spill response plan required for spill events (fuel, oil, paints or other hazardous materials) and to contain mitigation measures. This plan should also include a response plan in the event of an accidental spillage of Manganese on land, within the Port and the marine environment. k) A spill kit (peatsorb/ drip trays) should be available at strategic locations (including onboard of vehicles, fuel dispensing stations etc.); l) In case of a spillage of hazardous chemicals/fuels/oil wastes where contamination of soil occurs, depending on the degree of contamination, excavation and removal to a hazardous waste disposal site, such as at Aloes, might be necessary. If the spillage is widespread, a specialist will need to be appointed to deal with the issue.	Develop spill response plan taking into account the current Port of Ngqura Oil Spill Contingency Plan Review spill response plan to assess adequacy Check that spill kits are readily available and complete.	Once off prior to operations Annually or after a major spill incident Weekly	Project Developer (Transnet)
46. Environmental impacts and visual amenity associated with waste management					
Ensure wastes are management and disposed of in a lawful and an environmental friendly manner.	Incorrect disposal of general wastes, scrap wood and metals, liquid waste (used oil, chemicals, lubricating compounds and grease), manganese ore mud etc.	a) Develop and implement appropriate Waste Management Plan and initiate a waste minimisation system (i.e. reuse and recycle waste materials where possible).Develop a checklist if applicable.	Compile Waste Management Plan. Review plan to assess adequacy Monitor quantity of wastes generated	Once-off prior to operations Annually Monthly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		b) Storage of wastes in dedicated containers and disposal thereof by a licenced contractor at a licensed waste disposal facility.	Inspection of waste separation and handling as per Waste management plan Monitor disposal and request wastes disposal certificates	Weekly As required	Project Developer (Transnet)
		c) Oils, filters, lubricants are to be correctly disposed of when equipment is maintained in the field (e.g. emergency repair);	Site inspection/audits of waste management practices and record incidents	Monthly	Project Developer (Transnet)
		d) Silts and containments should be removed from the stormwater control dams and attenuation ponds on a regular basis and disposed of at a suitable landfill site, in order to maintain the depth and capacity of the dams/ponds.	Site inspection to assess level of sedimentation in dams	Monthly	Project Developer (Transnet)
		e) Undertake a hazard classification rating for the Manganese mud to verify if the resultant mud is classified as a hazardous waste or general waste.	Appoint waste specialist to undertake classification	Once off as soon as manganese mud is available	Project Developer (Transnet)
		f) Investigate potential beneficial uses for the manganese ore mud (e.g. sacrificial layer at stockpile, brick manufacturing process etc.)	Meeting with potential users	When the mud has been classified	Project Developer (Transnet)
47. Environmental awareness and training					
Minimise environmental impacts through staff awareness	Unawareness of staff	f) Conduct training for all staff and keep attendance registers up to date. Ensure that all new staff is inducted. Training should include as a minimum: • Housekeeping, hazardous materials/dangerous goods, MSDS	Training undertaken.	Once-off prior to construction and every six months.	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		• Dust management and enhance awareness • Water savings. Furthermore, water system operating personnel need to have extensive knowledge of the various water control systems, to allow for optimum operation thereof. • Important bird species, and the need to be aware of their presence on site to avoid collision and other disruptive activities which could affect the birds (i.e. implementation of a wildlife (birds) awareness programme as part of the Environmental Awareness Training). • Awareness campaigns focussing on spillages and the effects thereof on stormwater quality and the environment. These campaigns must be aimed at all levels of the organisation (including contractors).	Audit of attendance registers	Monthly	
48. Accidents due to an increase in traffic					
Avoid accidents due to increased traffic.	Daily trips to and from the site leading to changing traffic conditions around Coega IDZ.	a) Ensure that all vehicles are equipped with warning lights and that headlights are always switched on to enhance visibility; b) Ensure that trip generations be limited through the use of larger buses to transport workers; c) Limit workers to use private transport and supply of the necessary traffic information to the road users; and d) Staff will not be transported on tippers.	Ensure that the checklist is completed prior to each trip.	Daily	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		e) Develop a safety checklist for transport/vehicles (covering the above requirements)			

7 MANAGEMENT PLAN FOR DECOMMISSIONING

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. NOISE IMPACTS					
1. Impact of the decommissioning phase noise on the Noise Sensitive Areas (as a result of the decommissioning of the compilation yard (preferred and alternative layout)).					
Minimise noise from decommissioning	Vehicles, earth moving and decommissioning of infrastructure at the compilation yard.	a) Noisy construction activities exceeding the prescribed night time noise levels as per SANS 10103 or later should be limited to daylight hours.	Noise monitoring must comply with SANS 10103: 2008	Twice in the decommissioning phase	Project Developer (Transnet)
B. GROUNDWATER/GEOHYDROLOGY IMPACTS					
2. Impact of accidental oil spillage/fuel leakage on groundwater.					
Ensure no soil or groundwater is impacted	Accidental oil spills or fuel leakages associated with the decommissioning activities (i.e. from storage of fuels and hazardous materials on site etc.).	a) Ensure that all material that has the potential to contaminate the soil or groundwater is removed from site. During this process it must be ensured that spillages are prevented.	Visual assessment and continued sampling of groundwater and surface water sampling points.	Monthly	Project Developer (Transnet)
C. AQUATIC ECOLOGY IMPACTS					
3. Potential changes to the hydrological regime (impeding or diverting flow).					
To ensure that instream or river bed areas are disturbed or altered physically	Decommissioning of the hard engineered surfaces for the proposed project infrastructure.	a) All potential sources of pollutants and past contaminated areas should be cleared and disposed of at a suitable site. b) All potential impacts that were constructed adjacent to any delineated riverine/water course areas and	Visual inspections	Weekly for a period of three months after the sites have been cleared.	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		wetlands and their buffer areas as should be removed.			
4. Potential impact on water quality and risk to the aquatic environment. **5. Erosion and Sedimentation**					
Minimise the potential for any pollutants from reaching the riverine, estuarine and marine environments. Prevent downstream erosion and sedimentation of aquatic habitats	Use of machinery/ plant and potential associated releases of oils & grease etc. within the water courses Erosion and sedimentation as a result of the changes in the hydrological regime due to the decommissioning of hard engineered surfaces or structures within a water course or wetland area.	a) All potential erosion sources such as old bridge or culvert areas should be monitored while areas are re-vegetated. Hard engineered surfaces that increase surface water run-off should be removed as far as possible. b) Avoid all the delineated riverine/water course areas and wetlands and their buffer areas as some of these areas contain terrestrial plants that have conservation concern.	Visual inspections	Weekly for a period of three months after the sites have been cleared.	Project Developer (Transnet)
D. INTEGRATED WATER MANAGEMENT IMPACTS					
6. Increased water used during decommissioning impacts regional water balance.					
Reduce water usage during construction.	Lack of water conservation techniques practiced by staff during the decommissioning phase.	a) Site wide water audit/balance	Meter water use and ensure within specified requirements throughout decommissioning.	Weekly	Project Developer (Transnet)
7. Domestic effluent collection in portable toilets/tanks for transport to appropriate treatment facility enters environment.					
Reduce the spillage of domestic effluent and the impact	Collection and transportation of domestic effluent from portable toilets/tanks.	a) Implement principles contained within Transnet General Construction Site Management Requirements/ Environmental Management Plan and apply to decommissioning.	Domestic waste removal and disposal to be monitored throughout	Weekly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
thereof on the environment.		b) Implement normal sewage management practices (e.g. regularly empty toilets, safe transport and disposal of sewage at an appropriate designated area, employee training, etc.). The Contractor is responsible for establishing and maintaining appropriate sewage facilities, such as: • Septic tanks and soak-aways (if > 800 m from natural water course/water retention system), or • Dry composting toilets (enviro loos), or • Chemical toilets.	decommissioning.		
8. Contaminated stormwater discharge to environment.					
Reduce the impact of contaminated stormwater discharge on the environment during decommissioning.	Stormwater contamination could result from contact with, for example, chemicals, oils, fuels, sewage, solid waste, litter.	a) Implement principles contained within Transnet General Construction Site Management Requirements/ Environmental Management Plan and apply to decommissioning.	Stormwater quality run-off should be monitored after a storm event.	After a storm (as required)	Project Developer (Transnet)
		b) Stormwater control dams future to be carefully considered prior to decommissioning.			
		c) Monitor stormwater quality prior to any discharge off-site.			
		d) The following stormwater management measures should be considered during decommissioning and implemented where required and as needed: • Providing secure storage for oil, chemical and other waste materials to prevent contamination of stormwater runoff. • Diverting stormwater runoff from uncovered bulk construction waste pile to suitable collection/treatment systems.	Monitor via site audits and record incidents.	Monthly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		• Performing periodic inspections and maintenance of soil erosion measures and stormwater control structures. • Decommissioning work areas, including diesel storage tanks/ other chemical stores and heavy vehicle parking, should be situated as far as possible from surface water (e.g. Coega River) and groundwater (e.g. borehole) features.			
9. Demolition solid waste enters environment.					
Reduce environmental impacts associated with incorrect disposal of solid waste.	Incorrect disposal of demolition solid waste such as excess fill materials from grading and excavation activities, scrap wood and metals, and small concrete spills. Potential leakage/ spillage of petroleum based products (e.g. fuels, lubricants, hydraulic fluids) or chemicals	a) Implement principles contained within Transnet General Construction Site Management Requirements/ Environmental Management Plan and apply to decommissioning.	Waste removal and disposal to be monitored throughout decommissioning.	Weekly	Project Developer (Transnet)
		b) All demolition waste (concrete, steel, rubbles etc.) to be removed from the site.			
		c) Other non-hazardous solid waste (e.g. packaging material) to be disposed of at a licensed landfill.			
		d) All liquid waste (used oil, paints, lubricating compounds and grease) to be packaged and disposed of by appropriate means.			
		e) The following stormwater management measures should be considered during –decommissioning and implemented where required and as needed: • Providing adequate secondary containment for fuel storage tanks and for the temporary storage of other fluids (e.g. lubricating oils, hydraulic fluids). • Using impervious surfaces for refuelling areas and other fluid transfer areas.	Monitor via site audits and record non-compliance and incidents.	Monthly	Project Developer (Transnet)

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		• Providing portable spill containment and clean-up equipment on site and training in the equipment deployment. • Assessing the presence of hazardous substances in or on building materials and decontaminating or properly managing contaminated building materials.			
E. TERRESTRIAL ECOLOGY IMPACTS					
10. Permanent loss of habitat and disruptions to Ecological Processes					
Reduce the overall impact of the proposed Manganese Export facility on the surrounding habitats.	Construction and operation of the Manganese Ore Export Facility.	a) Measures to remove infrastructure, replace topsoil (including calcrete) and rehabilitate cleared areas to be implemented.	Monitor removal of infrastructure and rehabilitation via site audits and record non-compliance and incidents.	Monthly	Project Developer (Transnet)