

## **ENVIRONMENTAL MANAGEMENT PROGRAMME**

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# **PROPOSED MANGANESE EXPORT FACILITY AND ASSOCIATED INFRASTRUCTURE IN THE COEGA SPECIAL ECONOMIC ZONE (SEZ) AND PORT OF NGQURA, GQEBERHA, EASTERN CAPE**

**DFFE REFERENCE NO: 14/12/16/3/3/2/319/AM3**

11 September 2023

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## 1. INTRODUCTION

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This Environmental Management Programme (EMPr) is based on the EMPr that was 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 for the EIA undertaken in 2013. The EMPr was submitted to the then National Department of Environmental Affairs (DEA) 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 Special Economic Zone (SEZ, previously the IDZ), the Port of Ngqura and the adjacent Tankatara property located north-east of the Coega SEZ (i.e. Remainder Farm Tankatara Trust 643) (DEA Reference Number: 14/12/16/3/3/2/319). The EMPr was approved in the Environmental Authorisation issued on 10 July 2014. The EMPr is intended as a “living” document and should be incorporated into the Transnet environmental specifications.

The approved EMPr has been updated to reflect the amendments proposed in the Application for Amendment to an Environmental Authorisation submitted in July 2023 to the Department of Forestry, Fisheries and Environment (DFFE) as well as conditions from the Environmental Authorisation. These updates are reflected in blue and underlined, deletions are not shown. The updated EMPr forms part of this 2023 Application for Amendment.

### 1.1. Background and Overview of the Proposed Activities

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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 SEZ 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 amended project will comprise a Manganese Ore Export Terminal as well as Ancillary Infrastructure and Services.

Transnet SOC Ltd. (Transnet) received the following authorisations with regards to the Ngqura Manganese Export Terminal and associated infrastructure:

Environmental Authorisation issued by the then Department of Environmental Affairs (DEA):

- Environmental Authorisation on 10 July 2014 (DEA Reference: 14/12/16/3/3/2/319). This is the original Environmental Authorisation issued.
- Environmental Authorisation Amendment #1 on 27 March 2015 (14/12/16/3/3/2/319/AM1). The amendments to the EA related to: Proposed infrastructure and the respective geographical co-ordinates, Description of key components of the project, Condition 17 relating to the Environmental Management Committee (EMC), Condition 18 relating to any changes to the EMPr, Condition 19.4 relating to employment of an ECO for the entire lifecycle, Condition 20 relating to reporting responsibilities of the ECO.
- Environmental Authorisation Amendment #2 on 24 March 2020 (14/12/16/3/3/2/319/AM2). The amendments related to the extension of the validity period and change of contact

details of the Environmental Authorisation holder. The validity of authorisation expires on 27 March 2025.

**Provisional Atmospheric Emissions Licence** issued by the Nelson Mandela Bay Municipality:

- Provisional Atmospheric Emissions Licence (AEL) on 1 August 2014 (NMBM AEL 13/32). This is the original Provisional AEL issued.
- Provisional AEL Renewal issued on 1 June 2020 (NMBM AEL 13/32(1)). The validity of renewed licence expires on 27 March 2025.

**Water Use Licence** issued by the Department of Water and Sanitation:

- Water Use Licence (WUL) on 19 November 2015 (Licence Number: 15M30B/ACGI/3736). This is the original WUL issued.
- Water Use Licence Amendment on 9 March 2021 (15M30B/ACGI/3736). The amendment related to extension of commencement of water uses.

The Ngqura Manganese Export Terminal (NMET) and associated infrastructure will consist of a manganese ore handling and export facility that will enable the realisation of an annual throughput capacity of delivering 16 million tonnes per annum (mtpa) and scalable to reach 22 mtpa. The following key components are included in the NMET:

- Railway infrastructure from the mainline take-off to the Tippler Yard adjacent to the Manganese Stockyard which is to comprise of the rail lines, lines feeding and exiting the Tipplers and any other tracks required for shunting, inspection, train preparation, crewing and rolling stock maintenance, as may be identified through the operational readiness process.
- Rail Unloading and Stockyard Feed Infrastructure complete with all the equipment, machinery and instrumentation required to operate the NMET Project.
- Access and Service Roads. An Access Road from the nearby MR435 to the Stockyard.
- A Closed / Covered Manganese Stockyard for temporarily stockpiling manganese before it is exported.
- Manganese Handling Plant and Equipment. Requisite plant and equipment to handle the manganese throughout the process (offloading from the train wagons, handling in from tippler house and conveying to stockyard, and transportation to quayside to be loaded onto vessels for export markets), thereby ensuring effective and efficient operations. The proposed equipment to take redundancy into account.
- A Piped/Closed Overland Conveyor Belt System based on the principle of duality and to ensure that the overall operations are not affected when one of the conveyors is under repairs.
- 2 x Ship-loaders at the Quayside, complete with all necessary railway tracks and ancillaries at the Quayside to enable effective and efficient loading of the vessels. The related ship-loading conveyors to transfer ore into the vessel are to be designed supplied and installed complete with dust collection and suppression system.
- Required Bulk Services including inter alia, water, sewerage system, power, telecoms, and ICT/Digital infrastructure (including but not limited to SCADA, CCTC, Fire Detection and Protection Systems, in-motion weighing systems).
- Buildings / Ancillary Top Structures and External Works.

## **1.2. Authorised Operations / Activities**

The Final Environmental Impact Assessment Report (FEIAR) submitted as part of the application for Environmental Authorisation in 2013 indicated that the stockyard will cover an area of approximately 40 hectares in Zone 9 of the Coega SEZ and will hold a volume of approximately 1.8 million tons of Manganese Ore. The 2013 assessment considered the throughput capacity of 16 million tons per annum and assessed an area of approximately 82ha for the manganese export terminal. The remaining 42ha would include the stormwater control pond, buildings and

construction laydown areas.

The following project description is provided in the existing Environmental Authorisation (dated 27/03/2015 (AM1)) regarding the key components of the project:

**Manganese Export Terminal:** The construction and operation of a bulk terminal for handling Manganese Ore, including a stockyard, conveyor systems linking the stockyard to the tippler and to the ship loader as well as the associated infrastructure such as a tippler, stackers, reclaimers, ship loaders, surge bins, office buildings, bulk services infrastructure and additional rail infrastructure from the existing marshalling yard linking into the tippler.

**Rail compilation yard and doubling of railway line:** The rail compilation yard comprising five yard lines to allow for the consolidation and de-consolidation of four 200 wagon trains per day. A triangle is also included to allow for the locomotives to turn around. The complete rail yard will include back roads to access the locomotive and wagon maintenance workshops, a diesel locomotive refuelling station (2 self-contained aboveground storage tanks with a total capacity of approximately 150 m<sup>3</sup>), a locomotive sanding facility and wash bay. Electrical locomotives will be used to haul the 200 wagon trains on the mainline from Hotazel to the compilation yard. From the compilation yard, diesel locomotives will haul the 100 wagon sets to and from the tippler. A security building, two shunter cabins, a Transnet Freight Rail operations building, and three signalling relay rooms are planned to be constructed at the rail compilation yard.

**Ancillary infrastructure and services:** A storm water control dam constructed at the stockyard with a storage capacity of approximately 50 Ml (mega litres) and will be constructed to accommodate a 1:100 year flood. In addition, a second storm water control dam with a storage capacity of approximately 10 Ml will be constructed at the quay area to collect all storm water runoff from this area and prevent it to enter the marine environment. Two attenuation ponds (i.e. simulated wetlands or Sustainable Urban Drainage Systems) will be constructed at the rail compilation yard to collect all storm water runoff from this area and will have a storage capacity of approximately 7514 kl and 200 kl respectively. The proposed project will also include the construction of access roads at the stockyard area, including a road bridge over the Coega River and the proposed compilation yard as well as necessary crossings and rail bridges. In addition, a service road will be constructed along the proposed rail loop and rail link at the compilation yard. Suitable erosion control measures will be included at all culverts to ensure that sediment is not washed away, e.g. reno mattress and suitable wing walls.

### **1.3. Proposed Amendments**

The proposed amendments to the Environmental Authorisation relate to the following only:

- Increase in manganese ore throughput capacity from 16 to 22 million tons per annum.
- Change from an open manganese stockyard to an enclosed stockyard.
- Change to a covered conventional belt conveyor and piped conveyors.
- Removal of the rail compilation yard and associated works.

No amendments are proposed for the footprint of the conveyor from the terminal area (stockyard) to the Port of Ngqura.

Limited information is available on the layout of the structures within the footprint of the enclosed stockyard. As a result, it has been considered that the enclosed stockyard and associated infrastructure (e.g. buildings and stormwater pond) will occupy the full extent of the approximate 80-82ha indicated for the manganese export terminal.

The amendments to the proposed operations in terms of an increase in the throughput capacity to 22 million tons per annum relates to:

- The Ngqura Manganese Export Terminal project is the development of a Manganese (Mn)

Stockyard that has a capacity of handling 16 million tons per annum (mtpa) that is expandable to 22 mtpa in future.

- The improvement of the predictability and increased reliability of the Mn Mining Sector Value chains to export markets, thereby impacting positively on investor confidence;
- Contribute towards the rejuvenation of the South African economy and sustainable job-creating economic growth.

The amendments to the proposed operations in terms of enclosed structures for the stockyard and conveyors are required for the implementation of an environmental best practice approach which considers:

- Reduce the environmental liability for stockpiled materials and the risk of abandonment.
- Prevent and minimise the risk of harm to the environment and human health; and
- Support the most preferable use of waste and secondary materials in accordance with the waste management hierarchy

The following relates to changes in the project description in the Environmental Authorisation (EA):

- Removal of the “Rail Compilation Yard and Doubling of Railway Line” description in the key components section on Page 11 of EA dated 27/03/2015 (AM1).
- Amendment to the “Ancillary Infrastructure and Services” description in the key components section on Page 12 of EA dated 27/03/2015 (AM1) to reflect the removal of the compilation yard infrastructure from:

Ancillary infrastructure and services: A storm water control dam constructed at the stockyard with a storage capacity of approximately 50 MI (mega litres) and will be constructed to accommodate a 1:100 year flood. In addition, a second storm water control dam with a storage capacity of approximately 10 MI will be constructed at the quay area to collect all storm water runoff from this area and prevent it to enter the marine environment. Two attenuation ponds (i.e. simulated wetlands or Sustainable Urban Drainage Systems) will be constructed at the rail compilation yard to collect all storm water runoff from this area and will have a storage capacity of approximately 7514 kl and 200 kl respectively. The proposed project will also include the construction of access roads at the stockyard area, including a road bridge over the Coega River and the proposed compilation yard as well as necessary crossings and rail bridges. In addition, a service road will be constructed along the proposed rail loop and rail link at the compilation yard. Suitable erosion control measures will be included at all culverts to ensure that sediment is not washed away, e.g. reno mattress and suitable wing walls.

Changing to:

Ancillary infrastructure and services: A storm water control dam constructed at the stockyard with a storage capacity of approximately 50 MI (mega litres) and will be constructed to accommodate a 1:100 year flood. In addition, a second storm water control dam with a storage capacity of approximately 10 MI will be constructed at the quay area to collect all storm water runoff from this area and prevent it to enter the marine environment. The proposed project will also include the construction of access roads at the stockyard area, including a road bridge over the Coega River as well as necessary crossings and rail bridges. Suitable erosion control measures will be included at all culverts to ensure that sediment is not washed away, e.g. reno mattress and suitable wing walls.

The co-ordinates for the manganese stockyard to be corrected on page 10 of EA dated 27/03/2015 (AM1) as follows:

A 33° 46' 7,262" S 25° 40' 18,125" E

B 33° 46' 11,740" S 25° 40' 7,967" E

C 33° 46' 17,545" S 25° 40' 0,454" E

D 33° 46' 19,708" S 25° 39' 56,260" E

E 33° 45' 58,722" S 25° 39' 43,782" E

F 33° 45' 57,612" S 25° 39' 43,555" E

G 33° 45' 53,738" S 25° 39' 41,249" E

H 33° 45' 54,330" S 25° 39' 39,815" E

J 33° 45' 46,804" S 25° 39' 31,187" E

K 33° 45' 45,911" S 25° 39' 29,395" E

L 33° 45' 41,489" S 25° 39' 26,775" E  
N 33° 45' 37,403" S 25° 39' 24,172" E  
P 33° 45' 24,685" S 25° 39' 23,345" E  
V 33° 45' 16,679" S 25° 39' 27,964" E  
X 33° 45' 14,837" S 25° 39' 31,591" E  
Z 33° 45' 22,901" S 25° 39' 28,320" E  
B1 33° 45' 25,160" S 25° 39' 35,137" E  
D1 33° 45' 32,437" S 25° 39' 33,392" E  
F1 33° 45' 45,669" S 25° 39' 47,920" E  
H1 33° 45' 39,697" S 25° 40' 3,344" E

M 33° 45' 41,055" S 25° 39' 27,043" E  
O 33° 45' 29,982" S 25° 39' 22,996" E  
U 33° 45' 21,827" S 25° 39' 24,375" E  
W 33° 45' 12,763" S 25° 39' 32,115" E  
Y 33° 45' 19,580" S 25° 39' 28,494" E  
A1 33° 45' 26,778" S 25° 39' 30,675" E  
C1 33° 45' 29,308" S 25° 39' 37,591" E  
E1 33° 45' 44,645" S 25° 39' 40,656" E  
G1 33° 45' 45,434" S 25° 39' 49,101" E  
J1 33° 46' 5,351" S 25° 40' 18,650" E

The removal of the co-ordinates for the Compilation Yard and Doubling Railway Yard on page 11 of EA dated 27/03/2015 (AM1).

The co-ordinates for the Ship Loading, Conveyor Route and Manganese Terminal – Storm Water Dam as listed in the EA dated 27/03/2015 (AM1) remains the same with no changes proposed.

With the removal of the Compilation Yard and Doubling of Railway Line, the following changes are required in terms of property details in the EA:

- Page 1 of EA dated 27/03/2015 (AM1), Location of Activity requires the removal of Tankatara area, remainder of the Farm Tankatara Trust 643; and changes to:

“Eastern Cape Province: In the Coega Special Economic Zone and Port of Ngqura within the Nelson Mandela Bay Metropolitan Municipality”.

- Page 11 of EA dated 27/03/2015 (AM1), description of ‘the property’ requires the removal of Remainder of the Farm Tankatara Trust and Zone 11; and changes to:

“for the construction of manganese export terminal and its associated infrastructure within the Coega Special Economic Zone (SEZ) Zones 8, 9 and 13 within the Nelson Mandela Bay Metropolitan Municipality in the Eastern Cape Province, hereafter referred to as “the property””.

With the removal of the Compilation Yard and Doubling of Railway Line, the following changes are required in terms of listed activity descriptions in the EA:

- Listed Activity GN R. 545 Item 11 – Activity / Project Description: Railway infrastructure from the mainline take-off to the Tippler Yard adjacent to the Manganese Stockyard will occur within the Coega SEZ, and comprise of the rail lines, lines feeding and exiting the Tiplers and any other tracks required for shunting, inspection, train preparation, crewing and rolling stock maintenance, as may be identified through the operational readiness process.
- Listed Activity GN R. 545 Item 15 - Activity / Project Description: The proposed project will result in the physical alteration of more than 20 hectares of undeveloped land for industrial use. The proposed stockyards will cover an area of approximately 80 hectares.
- Listed Activity GN R. 546 Item 12: The development footprint of the proposed project will exceed 300m2. The stockyards will cover an area of approximately 80 hectares. Project activities may take place within 100 metres inland of the high water mark of the sea or an estuary. The clearance of vegetation will occur within a critical biodiversity area as identified by the Eastern Cape Biodiversity Conservation Plan (2007) and NMBM Bioregional Plan (2015).

Amendments to the following conditions in the EA dated 27/03/2015 (AM1):

- Condition 25, Page 16, bullet point 5: ‘turbine sites’ to be replaced with ‘along the conveyor route’ – “Cut and fill areas along the conveyor route and access roads indicating the expected volume of each cut and fill”.
- Condition 26, Page 16: Replace ‘archaeologist’ with ‘palaeontologist’ – The applicant must appoint a qualified botanical, fauna specialist, palaeontologist and an ornithologist to

ground-truth every footprint and their recommendations must form part of the final layout plan to be submitted to this Department for approval.

- Condition 39, Page 17: Removal of the condition relating a biodiversity offset agreement due to the removal of the compilation yard and associated infrastructure located within CBAs of the NMBM Bioregional Plan and open space areas of the CDC OSMP.
- Condition 43, Page 18: Removal of Zone 9 as graves within the stockyard area has been relocated. “No activities will be allowed to occur within 20m from the perimeter of the fence of the cemeteries identified in Zones 5 and 13.”

The request for removal of the Compilation Yard and Doubling of the Railway Line is due to the compilation yard and railway components being included in a new EIA application by Transnet Freight Rail. This separate and new EIA process is anticipated to commence in 2024.

#### 1.4. Authors of the EMP<sub>r</sub>

The main authors of the EMP<sub>r</sub> compiled during the 2013 EIA are the CSIR Project Manager (Annick Walsdorff) and Project Leader (Paul Lochner) who undertook the EIA for the proposed Transnet Manganese Ore Export Facility. The co- authors of the EMP<sub>r</sub> were 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 were highlighted in Appendix A of the Final EIA Report of September 2013.

The approved EMP<sub>r</sub> has been updated by Lucille Behrens of CEN IEM Unit and forms part of the 2023 Application of Amendment to the Environmental Authorisation. Refer to **Appendix 6** for the EAP CV. The name and role of all authors and specialists are included in Table 2.

**Table 1: EMP<sub>r</sub> Authors and Co-Authors - EIA Process in 2013**

<b>EIA MANAGEMENT TEAM - 2013</b>		
<b>Paul Lochner</b>	CSIR	Project Leader (EAPSA Certified)
<b>Annick Walsdorff</b>	CSIR	Project Manager
<b>SPECIALIST TEAM - 2013</b>		
<b>Dr Robin Carter</b>	Lwandle Technologies	Marine Ecology Assessment
<b>Jamie Pote</b>	Private Consultant	Terrestrial Ecology (Particularly Vegetation)
<b>Dr Brian Colloty</b>	Scherman Colloty and Associates	Aquatic Ecology
<b>Brett Williams</b>	Safetech	Noise Impact Assessment
<b>Henry Holland</b>	Map(this)	Visual Impact Assessment
<b>Philip De Souza</b>	Emanti Management	Integrated Water Management Study
<b>Julian Conrad</b>	GEOSS	Groundwater Assessment
<b>Dr Mark Zunckel and Atham Raghundan Rietha Oosthuizen</b>	Umoya-Nilu Consulting CSIR	Air Quality Assessment (including human health)
<b>Pat Morant</b>	CSIR	Avifauna Assessment
<b>Dr Johan Binneman</b>	Eastern Cape Heritage Consultants	Archaeological Impact Assessment
<b>Dr John Almond</b>	Natura Viva	Palaeontological Impact Assessment

**Table 2: EMP<sub>r</sub> Authors and Co-Authors - Amendment Process in 2023**

<b>AMENDMENT APPLICATION TEAM - 2023</b>		
<b><u>Dr Michael Cohen</u></b>	<u>CEN IEM Unit</u>	<u>Project Director</u>
<b><u>Lucille Behrens</u></b>	<u>CEN IEM Unit</u>	<u>Author</u>
<b>SPECIALIST TEAM - 2023</b>		
<b><u>Jamie Pote</u></b>	<u>Private Consultants</u>	<u>Terrestrial Biodiversity and Vegetation</u>



<b><u>AMENDMENT APPLICATION TEAM - 2023</u></b>		
<b><u>Dr Marietjie Landman</u></b>		<b><u>Terrestrial Animal Species</u></b>
<b><u>Dr Brian Colloty</u></b>	<b><u>EnviroSci</u></b>	<b><u>Aquatic Ecology</u></b>
<b><u>Barend van der Merwe</u></b>	<b><u>dBAcoustics</u></b>	<b><u>Noise Assessment</u></b>
<b><u>Richard Williamson</u></b>	<b><u>GHT Consulting Scientists</u></b>	<b><u>Integrated Water Management</u></b>
<b><u>Chris Albertyn</u></b>	<b><u>Lethabo Air Quality Specialists</u></b>	<b><u>Air Quality Assessment</u></b>
<b><u>Dr Gerhard H Verdoorn</u></b>	<b><u>Griffon Poison Information Centre</u></b>	<b><u>Human and Environmental Health Risk</u></b>
<b><u>Dr Paul Martin</u></b>	<b><u>Private Consultant</u></b>	<b><u>Avifauna Assessment</u></b>
<b><u>Celeste Booth</u></b>	<b><u>Booth Heritage Consulting</u></b>	<b><u>Archaeological Assessment</u></b>
<b><u>Dewald Wilken</u></b>	<b><u>Private Consultant</u></b>	<b><u>Palaeontological Assessment</u></b>

## 2. APPROACH TO PREPARING THE EMP<sub>r</sub>

### 2.1 Compliance with Relevant Legislation

In terms of legal requirements, a crucial objective of the EMP<sub>r</sub> 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<sub>r</sub> and specify the type of supporting information that must accompany the submission of the report to the authorities.

[The content requirement for an EMP<sub>r</sub> as per Appendix 4 of the EIA Regulations, 2014 as amended, has also been considered in this updated EMP<sub>r</sub>.](#)

An overview of where the requirements are addressed in [the EMP<sub>r</sub>](#) is presented in Table 3.

*Table 3: 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); and Appendix 4 of the EIA Regulations 2014 as amended*

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)	<u><a href="#">Content Requirement for an Environmental Management Programme (Appendix 4 of the EIA Regulations, 2014, as amended)</a></u>	Where it is included in this EMP <sub>r</sub>
a. (i) the person who prepared the environmental management programme; and (ii) the expertise of that person to prepare an environmental management programme;	<u><a href="#">(a) details of– (i) the EAP who prepared the EMP<sub>r</sub>; and (ii) the expertise of that EAP to prepare an EMP<sub>r</sub>, including a curriculum vitae</a></u>	Section 1 of the EMP <sub>r</sub> <u><a href="#">Appendix 6</a></u>
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.	<u><a href="#">(d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including– (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities</a></u>	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 environmental management programme;	<u><a href="#">(b) a detailed description of the aspects of the activity that are covered by the EMP<sub>r</sub> as identified by the project description</a></u>	Section 1 of the EMP <sub>r</sub>
d. an identification of the persons who will be responsible for the implementation of the measures contemplated in paragraph (b);	<u><a href="#">(i) an indication of the persons who will be responsible for the implementation of the impact management actions</a></u>	Section 3 of the EMP <sub>r</sub> and Monitoring - Responsibility column of 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)	<u>Content Requirement for an Environmental Management Programme (Appendix 4 of the EIA Regulations, 2014, as amended)</u>	Where it is included in this EMPr
e. proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon;	<u>(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);</u> <u>(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);</u>	Monitoring - Methodology column of Sections 4, 5, 6 and 7 <u>Section 8</u>
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	n/a	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;	<u>(f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to —</u> <u>(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;</u> <u>(ii) comply with any prescribed environmental management standards or practices;</u> <u>(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and</u> <u>(iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;</u>	Sections 4, 5, 6 and 7
h. time periods within which the measures contemplated in the environmental management programme must be implemented;	<u>(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);</u> <u>(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented</u>	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;	n/a	Management actions column of 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)	<a href="#">Content Requirement for an Environmental Management Programme (Appendix 4 of the EIA Regulations, 2014, as amended)</a>	Where it is included in this EMP <sub>r</sub>
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;	<a href="#">(m) an environmental awareness plan describing the manner in which—</a> <a href="#">(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and</a> <a href="#">(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and</a>	Sections 4, 5, 6 and 7 <a href="#">Section 8</a>
k. where appropriate, closure plans, including closure objectives.	<a href="#">n/a</a>	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)
<a href="#">n/a</a>	<a href="#">(c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers</a>	<a href="#">Appendix 5</a>
<a href="#">n/a</a>	<a href="#">(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;</a>	<a href="#">Section 8</a>

## 2.2 Transnet Environmental Management Plans

This project specific Environmental Management Programme (EMP<sub>r</sub>) is aligned with the Transnet Construction Environmental Management Plan (CEMP) (ENV-STD-001 Rev04) dated [November 2017](#) and the Transnet Standard Environmental Specification (SES) (ENV-STD-002 Rev04) dated [November 2017](#), and must be read **in conjunction** with these documents.

This EMP<sub>r</sub> 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 EMP<sub>r</sub> (as an annexure), [were](#) submitted to the [then](#) DEA for decision making [and the EMP<sub>r</sub> approved as part of the Environmental Authorisation](#). Furthermore, this EMP<sub>r</sub> 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 EMP<sub>r</sub> is as follows:

- Transnet CEMP: ENV-STD-001 Rev04;
- Transnet SES: ENV-STD-002 Rev04;
- [Construction EMP<sub>r</sub> for Port of Ngqura: Rev 04, February 2018;](#)
- [EMP<sub>r</sub> for the Operation of the Port of Ngqura: Version 2, February 2020;](#) and
- Project Specific EMP<sub>r</sub> (this document).

### 2.3 Content of the EMP<sub>r</sub>

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The EMP<sub>r</sub> includes the findings and recommendations of the EIA process and specialists impact assessments, and, where relevant, has been updated with the specialist recommendations that formed part of the 2023 amendment process as well as the Conditions of the Environmental Authorisation dated 27 March 2015. However, the EMP<sub>r</sub> is considered a “live” document and must be incorporated into the Project Environmental Specification which may 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 operational aspects in this EMP<sub>r</sub>. It is important to note that the Transnet CEMP and SES are only applicable to the construction phase of the proposed project.

The EMP<sub>r</sub> 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.

Note: Aspects related to the Compilation Yard and Doubling of the Railway have been deleted as the amendment application relates to the removal of these components for the project.

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

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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.

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### 3. ROLES AND RESPONSIBILITIES

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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):

- [Transnet](#) Environmental Manager;
- [Transnet](#) Construction Manager;
- [Transnet](#) Environmental Officer (EO); and
- Contractor Environmental Officer.

[This EMPr incorporates a framework for the operational Environmental Management Programme which may require updating](#) during the commissioning phase [in order to](#) define the roles and responsibilities of the terminal operator, including an organogram with reporting responsibilities and communication channels.

#### 3.1 Project Developer (“applicant / [environmental authorisation holder](#)”)

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The Project Developer (i.e. Transnet) is the current ‘owner’ of the project and the applicant / [Environmental Holder](#) 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 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. 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 [Transnet](#) Environmental Manager

[Transnet](#) Environmental Manager ([Transnet](#) 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 Environmental Officer, based on the merits of the particular project at hand.

### 3.1.2 Transnet Construction Manager

The Transnet Construction Manager (Transnet 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 Transnet 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 Transnet Environmental Officer

The Transnet Environmental Officer (Transnet EO) reports functionally to the Transnet 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 Contractors
- 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

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The Contractor shall comply with the requirements of the CEMP<sub>r</sub> and abide by the Employer's Construction Manager's instructions regarding the implementation of the CEMP<sub>r</sub>. At the time of preparing this EMP<sub>r</sub>, 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<sub>r</sub>. 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, [refer also to Section 8.2](#):

- 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 [Transnet](#) 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<sub>r</sub> 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.

### **3.3 Independent Environmental Control Officer**

An independent ECO is to be appointed by the Developer to monitor compliance regarding the implementation of the EMPr. The ECO reports to the Developer. The ECO role is to be fulfilled by a person with previous experience in environmental management and compliance monitoring regarding construction processes.

The ECO's duties during construction include:

- a) Undertaking monthly environmental compliance site audits for the duration of the construction phase.
- b) If required, attending Monthly Site Progress Meetings to report on environmental compliance.
- c) Providing a monthly report on environmental compliance to the Developer.

The ECO's duties during operation include:

- a) Undertaking environmental compliance audits for the duration of the operational phase.
- b) Providing an environmental audit report on environmental compliance to Transnet.

It must be noted that the ECO is responsible for providing an independent evaluation of compliance with the EMPr and not for enforcement of the conditions of the EMPr. The responsibility of enforcement of the conditions of the EMPr lies with the Developer, while the Environmental Management Inspectors may also enforce conditions through compliance notices.

As per Condition 19 of the Environmental Authorisation 2015:

- The applicant must appoint an independent Environmental Control Officer (ECO) for the construction, operational and decommissioning phases of the development that will have the responsibility to ensure that the mitigation/rehabilitation measures and recommendations referred to in this authorisation are implemented and to ensure compliance with the provisions of the EMPr.
- The ECO must be appointed before commencement of any authorized activities.
- Once appointed, the name and contact details of the ECO must be submitted to the Director: Compliance Monitoring of the Department of Forestry, Fisheries and Environment.
- The ECO must keep record of all activities on site, problems identified, transgressions noted and a task schedule of tasks undertaken by the ECO.
- The ECO must remain employed for the entire lifecycle of the development.

### **3.4 Environmental Management Committee**

As per Condition 17 and 18 of the Environmental Authorisation 2015:

- An Environmental Management Committee (EMC) must be established for the construction, operational and decommissioning phases of the project. If there is an existing EMC, the Terms of Reference (TOR) of the EMC must be amended to accommodate the requirements of this environmental authorisation and its associated conditions. The amended TORs must be sent to this Department for approval prior to the commencement of the construction phase of this project.
- The EMC must consist of, inter alia, representatives from all Departments that have jurisdiction over the area, relevant organs of state and key stakeholders identified during the public participation process.
- The purpose, outcomes, role and function of the EMC must be submitted to the Department for approval within one month from the date of issue of this environmental authorisation.
- The EMC must be responsible for the ongoing and continuous monitoring of compliance

- with the EMPr applicable to the construction, operational and decommissioning phases of the development.
- Any changes to the EMPr must be submitted to the EMC for review and comment and subsequently to the Department for approval. Once approved, the EMPr must be implemented and adhered to.

## 4. MANAGEMENT PLAN FOR DESIGN PHASE

<u>DESIGN PHASE</u>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. Air Quality Impacts</b>					
<b>1. Dust deposition (including PM10 and PM2.5) in the neighbouring environment as a result of the operation of the Mn Ore Export Facility.</b>					
Meet air quality standards (to dust, PM10 and PM2.5) <u>Minimise potential health impacts associated with air quality</u>	Inadequate design of the facility would lead to elevated levels of dust, PM10 and PM2.5	a) Fully enclose the tippler and install a surfactant spraying system at the tippler <u>Irrigation or sprinkler lines must be as close as possible to the rail trucks to minimise water usage, to prevent creation of excessive run-off water and to prevent workers from being drenched in irrigation water.</u>	Include in tippler design	Once-off during design phase.	Project Developer (Transnet)
		b) Install high pressure water fog system <u>or similar dust suppression systems</u> at hopper feeder chutes.			
		c) <u>A series of air intakes along the walls of the enclosed structure are included in the engineering design of the storage facility associated with extractors on the roof (whirly birds) with fine dust filters. This system should generate an indoor pressure that is slightly lower than the ambient air pressure, allowing fresh air intake and filter any dust that may be airborne from the vented air.</u>	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		
		g) Cover overland conveyor.	Include in conveyor		

**DESIGN PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		i) Enclose transfer points. j) Enclose surge bins. k) Install water sprayers <a href="#">and dust extraction systems</a> at transfer points and surge bins.	system design		
		l) Equip shiploader with loading spouts, <a href="#">dust extraction and suppression systems</a> . m) Undertake an air quality baseline monitoring to inform the monitoring during construction and the operational monitoring that would take place as part of the operational control to monitor dust around the terminal boundaries.	Include in shiploader design  Monitor dust fallout and Mn concentration within the dust	<a href="#">Three months of monitoring</a> prior to construction	Project Developer (Transnet)
<b>B. Terrestrial Ecology Impacts</b>					
<b>2. Fragmentation of Ecological Corridors and disruption of Ecological processes and animal movement as a result of artificial barriers.</b>					
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 <a href="#">across the Coega River and conveyor system across the drainage lines</a> must allow for the migration of fauna, e.g. lattice bridges, culverts, drainage pipes, fencing: <ul style="list-style-type: none"> <li>• <a href="#">Bridges rather than culverts are used</a></li> <li>• <a href="#">Any embankments are outside of the floodline areas</a></li> <li>• <a href="#">No bridge piers occur within the instream areas</a></li> </ul> 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.	Ensure that these recommendations are taken into consideration during the design phase of the railway and roads <a href="#">across the Coega River and conveyor system across the drainage lines</a> . These management actions must be incorporated into the detailed project layout plan.	Design phase	Project Developer (Transnet)

<b>DESIGN PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p><u>Fence capable of providing adequate security, allow animal movement, promote biodiversity and ecological sustainability can be installed</u></p> <p>e) The final layout plan <u>to</u> be presented to the Coega ELC and submitted to <u>DFFE</u> for sign-off before the start of construction.</p> <p>f) Where lattice bridges are constructed for the rail line <u>(over the Coega River)</u>, 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.</p>			
<b>3. Increased risk of alien plant invasion</b>					
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	<p>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.</p> <p>b) Ensure this plan take cognisance of Transnet Environmental Specifications and Construction EMP as well as the Coega <u>SEZ</u> Alien Vegetation Management plan or with the Port of Ngqura Alien Invasive Vegetation Management Plan if within the port of Ngqura.</p>	Prepare a construction phase Alien Invasive Management Plan prior to construction.	Once-off during design phase.	Project Developer (Transnet)

## DESIGN PHASE

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>4. Road mortality of fauna from trucks, trains and other service vehicles activities</b>					
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	<p>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. <u>If electric fencing is necessary, fence design should be modified to avoid animals (especially tortoises) getting trapped and electrocuted. This can be achieved by lifting the lowest electrified strand 30 cm from the ground</u></p> <p><u>Fence capable of providing adequate security, allow animal movement, promote biodiversity and ecological sustainability can be installed</u></p>	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>C. Aquatic Ecology Impacts</b>					
<b>6. Potential changes to the hydrological regime (impeding or diverting flow).</b>					
<b>7. Aquatic Habitat Fragmentation and Potential loss of riverine habitat (physical destruction) and aquatic Species of Special Concern</b>					
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	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)
	Inadequate design of the stormwater system	b) Use of culverts and lattice structures to minimise disruption of surface water flow where the new railway line crosses the Coega River <u>and the conveyor system crosses drainage lines.</u>			

**DESIGN PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		c) 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.			
<b>D. Groundwater/geohydrological Impacts</b>					
<b>8. Impact of stockpile leachate on groundwater</b>					
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 <u>within the enclosed stockyard</u> are placed on an impermeable barrier. 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 <sup>1</sup>  Monitor groundwater quality	Once-off during design phase.  Once off prior to construction  1 year data prior to construction	Project Developer (Transnet)
<b>E. Noise Impacts</b>					
<b>9. Noise impacts on surrounding communities</b>					
Minimise noise from operation.	Mainly rail operations, shunting operations of wagon trains <u>at the Tippler Yard</u>	Ensure that the locomotives proposed are the latest models or equivalent and are fitted with noise abatement equipment (e.g. silencers).	Ensure that this is taken into consideration during the design phase.	Once-off during design phase.	Project Developer (Transnet),

<sup>1</sup> Note that any drilling in the upper aquifer (i.e. for monitoring purposes) must be undertaken very carefully and not go into the clay layer (or even worse through it)

**DESIGN PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>F. Avifauna Impacts</b>					
<b>10. Avifauna</b>					
Minimise impacts of the facility operation on avifauna	Lighting of the terminal and <a href="#">conveyor system</a>	a) Lighting should be restricted to the minimum necessary for safe operations. b) <a href="#">Design infrastructure (especially the structure enclosing the stockyard) to minimize nesting and roosting by urban adapted bird species. Passive bird deterrents may be required (e.g. spikes, reflective rotating prisms). Urban raptor principles (using owls and raptors to prevent nuisance bird problems) may be required.</a>	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.	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. <sup>2</sup>	Site walk, visual inspection	Once off site visit by ornithologist prior to construction	Project Developer (Transnet), CDC, NMBM
		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.	
<b>G. Integrated Water Management</b>					
<b>11. Contaminated stormwater discharge into the environment</b>					
Reduce the impact associated with the accidental release of contaminated	Stormwater contamination could result from accidental spillages and deposition (“dust fallout”)	a) Design of an effective stormwater management system, at least the following: <ul style="list-style-type: none"> <li>keep clean stormwater separate from potentially</li> </ul>	Ensure that this is taken into consideration during the design phase.	Once-off during design phase.	Project Developer (Transnet)

<sup>2</sup> Note that this action falls under the responsibility of a 3<sup>rd</sup> party and that Transnet cannot guarantee that it will be implemented



**DESIGN PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
stormwater into the environment.	onto the site from emissions in the Coega <a href="#">SEZ</a> .	<p>contaminated stormwater,</p> <ul style="list-style-type: none"> <li>• stormwater control dams to recycle contaminated stormwater via silt traps at the stockyard and quay</li> <li>• v-drain at the middle of each stockpile that collects the dust suppression water overflows and any stormwater run-off</li> <li>• apron slab around the tippler will slope towards the side drains available on either side of the existing railway line.</li> <li>• access road to the quay will have a concrete lined side drain that flows into a pipe leading to the quayside stormwater control dam</li> </ul> <p>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 to the stockyards</p> <p>c) Construct oil/water separators to treat workshop and washbay wastewaters</p> <p>d) Line stormwater control dams at the stockyard and the quay with an impermeable clay layer or geosynthetic material</p>			

**DESIGN PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>H. Visual Impacts</b>					
<b>12. Potential scarring/intrusion caused by cut-and-fill operations on steep slopes (conveyor system).</b>					
Minimise intrusion of conveyor on sensitive receptors	Intrusion of Conveyor System.	a) Adherence to CDC Visual Guidelines for Development <sup>3</sup> 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)
<b>13. Visual impact of night lighting of the facility on the nightscape of the region.</b>					
Minimise visual impact of night lighting of the facility on the nightscape of the region.	Lighting of the Manganese Ore Export Terminal and <a href="#">conveyor system</a> 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 the design, the following measures are adhered to: a) Bright lights are below the southern and northern river banks. b) Where possible, keep bright lights below the level of the terrace above the stockyard site. c) Lighting of the facility should not exceed, in number of lights and brightness, the minimum required for safety and security.	Ensure that this is taken into consideration during the design phase	Once-off during design phase.	Project Developer (Transnet)

<sup>3</sup> CKA. 2002. Coega Industrial Development Zone Visual Guidelines for Development. Guidelines. Pretoria: Cave Klapwijk and Associates

**DESIGN PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		d) Minimal lighting for the conveyor system. e) Uplighting and lights in elevated positions should be avoided f) 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. g) Include timer switches or motion detectors for areas that are not occupied continuously. h) 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. i) Adherence to CDC Visual Guidelines for Development			
<b>14. General</b>					
Ensure that all recommended management actions are included in design phase. Minimise all environmental impacts associated with	All recommended management actions not considered	Ensure that 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 detailed project layout plan also be presented to the Coega ELC or EMC.	Develop a detailed project layout plan Submit the detailed plan to the authorities for sign-off ( <a href="#">DFFE</a> )	Once off prior to construction	Project Developer (Transnet)

**DESIGN PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
project					
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	<ul style="list-style-type: none"> <li>a) Undertake a consultation with the household members before construction</li> <li>b) Educate the household members regarding the details of the proposed development, the type of construction activities they can expect and safety matters</li> <li>c) Ensure safe access to ceremonial and grave sites, shops and other community activities through awareness</li> <li>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</li> </ul>	<p>Organise a meeting and awareness training with this community</p> <p>Develop a resettlement plan.</p>	<p>Once off prior to construction</p> <p>Once off if required</p>	Project Developer (Transnet)

## 5. MANAGEMENT PLAN FOR CONSTRUCTION

<u>CONSTRUCTION PHASE</u>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. Archaeology</b>					
<b>15. Potential impact of the Manganese Ore Export Facility on above and below ground archaeology</b>					
Identify and protect archaeological features/materials that may occur on the construction sites.	Damage to or destruction of archaeological sites/remains that may occur on the proposed site as a result of construction activities.	<p>a) Construction of the Stockyard (Zone 9), Conveyor between stockyard and harbour (Zone 8):</p> <ul style="list-style-type: none"> <li>Construction managers/foremen <a href="#">and ECO</a> should be informed, before construction starts, on the possible types of heritage sites <a href="#">and cultural material</a> which may be encountered during construction <a href="#">and the procedures to follow when sites are found</a>.</li> <li>Train a site monitor (such as <a href="#">Transnet</a> Environmental Officer) to report to the construction manager when archaeological sites are found (for the entire development). Reference should be made to Appendix 14.B of the Heritage Impact Assessment (Chapter 14 of the EIA Report) for a list of possible archaeological sites that may be found in the area.</li> </ul>	<p>Ensure that a site monitor has been trained by an archaeologist (attendance register)</p> <p>Monitoring to be conducted during the vegetation clearing.</p>	<p>Once-off training prior to construction.</p> <p>During vegetation clearing.</p>	Project Developer (Transnet)
		<p>b) 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</p>	<p>Monitor the construction activities for the presence or discovery of any archaeological sites and human remains, and report the finds accordingly.</p>	As required/necessary during construction	Project Developer (Transnet)

<u>CONSTRUCTION PHASE</u>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		development). Relevant permits must be granted to a professional archaeologist by the SAHRA to remove such material. <u>Phase 2 mitigation in the form of test-pitting / sampling or systematic excavations and collections of the findings will then be conducted to establish the contextual status of the sites and remove the archaeological deposit before development activities continue.</u>			
Identify and protect historical and cultural features that may occur on the construction sites.	Presence of graves within the proposed development footprint	<p>a) A buffer zone of at least <u>20</u> m must be maintained between the fence around the graves and any proposed development <u>in Zones 5 and 13 (Condition 43 of EA 2015).</u></p> <p>b) In the event that historical structures are located within the development footprint, a permit application for demolition will be applied for from ECPHRA</p> <p>c) A sampling and monitoring permit will be applied for that will allow the professional archaeologist to remove heritage objects/artefacts from the site before and during construction</p>	<p>Monitoring to be conducted during the vegetation clearing.</p> <p>Monitor the construction activities for the presence or discovery of any historical and cultural features, and report the finds accordingly.</p>	<p>During vegetation clearing.</p> <p>As required/ necessary during construction</p>	Project Developer (Transnet)

<b>CONSTRUCTION PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>B. Palaeontology</b>					
<b>16. Destruction, disturbance or sealing-in of fossils exposed on the ground or buried beneath the surface during excavations and other construction work</b>					
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 <a href="#">bush clearing and</a> 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 <sup>3</sup> ) into the potentially fossil-rich Kirkwood Formation, Sundays River Formation and <a href="#">Alexandria</a> Formation.  <u>The appointed palaeontologist must be informed timeously prior to excavations and bush clearing.</u>  Professional palaeontological monitoring recommended in the case of: <ul style="list-style-type: none"> <li>Excavations (&gt; 200 m<sup>3</sup>) 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 <a href="#">SEZ</a>).</li> <li>New excavations into Kirkwood and Sundays River Formation rocks along the conveyor line route in Zone 8 of the <a href="#">SEZ</a>.</li> </ul>	Appoint a suitably qualified palaeontologist to inspect excavations within defined areas.	During excavations.	Project Developer (Transnet)
		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 <a href="#">SEZ</a> (Almond 2010a).	Review the recent palaeontological reports for the Coega <a href="#">SEZ</a> and Port of Ngqura in order to familiarize themselves with the types of buried fossil heritage	Prior to construction	Project Developer (Transnet)

<b>CONSTRUCTION PHASE</b>					
<b>Management Objectives</b>	<b>Risk Sources</b>	<b>Management Actions</b>	<b>Monitoring</b>		
			<b>Methodology</b>	<b>Frequency</b>	<b>Responsibility</b>
		d) If any fossil remains are found these should be safeguarded, <i>in situ</i> , 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)



**CONSTRUCTION PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>C. Air Quality Impacts</b>					
<b>17. Increased dust and other pollutants during construction</b>					
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-004) b) Additional recommendations include: <ul style="list-style-type: none"> <li>• Loads on vehicles carrying dusty construction materials <u>to</u> be covered on public roads (whether empty or not). While travelling on-site, the trucks must use practical mitigation for dust management</li> <li>• Limit access to construction site to construction vehicles only</li> <li>• Maintain high moisture content on exposed surface and roads by spraying with water</li> <li>• Ensure a maintenance programme for construction vehicles is in place, to ensure optimum performance reduced emissions</li> </ul>	Monitoring of dust fallout and Mn concentration within the dust.  Monitor via site audits and record incidents.  Include dust management in contractors contract conditions	Monthly  Monthly  Once-off prior to construction	Project Developer (Transnet)
<b>D. Terrestrial Ecology</b>					
<b>18. Direct loss of vegetation</b>					
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. <ul style="list-style-type: none"> <li>• Demarcate areas of disturbance <u>and construction activities must be restricted to these demarcated areas to restrict impact on vegetation, birds and animals (Condition 38 of EA 2015).</u></li> <li>• Keep clearance and disturbance of indigenous vegetation (such as Open Space Management</li> </ul>	Visual site inspections  Monitor vegetation removal and clearing during construction.  Training/information sessions register	Daily  Weekly  Once-off prior to	Project Developer (Transnet)

**CONSTRUCTION PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>Plan (Revision 10) <a href="#">Core Ecological Process areas of the Coega River</a> to a minimum/limit to agreed area on approved layout plans. Keep the width and length of earthworks to a minimum. Refer to <a href="#">Appendix 4</a> for the project layout in terms of the Coega Open Space Management Plan (Revision 10).</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Unnecessary impacts on surrounding natural vegetation must be avoided during construction. All construction vehicles should remain on clearly demarcated roads.</li> <li>• Any additional lay-down and similar areas that may be required outside of the development footprint must be limited to minimum necessary and sited in transformed or degraded areas.</li> </ul>		construction and for all new workers	

**CONSTRUCTION PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		b) Where possible, existing access roads/servitudes must be used and should be located along the boundaries of existing disturbed areas, if possible. c) <u>Cleared vegetation should be stockpiled on degraded and previously cleared areas.</u> d) <u>Locate construction camps and laydown areas on degraded and previously cleared areas that must be above the 1:100 year floodline and outside of the Coega OSMP.</u> e) <u>Habitat destruction must be kept to an absolute minimum by keeping the lay-down areas as small as possible, reducing the number and size/length of roads and reducing the final extent of the developed area (Condition 35 of EA 2015)</u>	Compile plan pre-construction.	When finalizing layout plan	Project Developer (Transnet)
<b>19. Direct Loss of species of special concern (SSC) and SSC habitat</b>					
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. b) <u>A "Plant Rescue and Protection" plan which allows for the maximum transplant of conservation important species from areas to be transformed must be compiled by a vegetation specialist familiar with the site in consultation with the ECO. This plan must be implemented prior to commencement of the construction phase (Condition 36 of EA 2015).</u>	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	Appointment of professional service provider  Monitor vegetation removal and relocation during	Once off prior to construction  Daily	Project Developer (Transnet)

**CONSTRUCTION PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		be undertaken by an appointed professional service provider.	construction.		
		<p>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.</p> <p>d) <u>Before the clearing of the site, the appropriate permits must be obtained from the Department of Forestry, Fisheries and Environment (DFFE) for the removal of trees listed in the National Forest Act and from the relevant provincial department for the destruction of species protected in terms of the specific provincial legislation. Copies of the permits must be submitted to the DFFE for record keeping (Condition 37 of EA 2015).</u></p>	Ensure that the relevant permits have been obtained prior to vegetation removal.	As required during site clearing and construction	Project Developer (Transnet)
<b>20. Increased risk of alien plant invasion in disturbed areas</b>					
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	<p>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).</p> <p>b) Ensure proper management of soil stockpiles. Do not import soil stockpiles from areas with alien plants to ensure proper management of stockpiles.</p>	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>CONSTRUCTION PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		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)
		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 <a href="#">SEZ</a> Re-vegetation guidelines). g) Undertake rehabilitation in a phased manner directly after construction. Stockpile the shallow topsoil layer separately from the subsoil layers. Reinststate 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. h) <a href="#">Rehabilitate disturbed areas that are not part of the infrastructure footprints with appropriate indigenous vegetation.</a>	Monitor the implementation of the rehabilitation/ re-vegetation plan  Monitor the re-grassing activities.	Quarterly	Project Developer (Transnet)
		i) Chopped brushwood can be used to stabilise steep	Monitor erosion during	Monthly or	Project

**CONSTRUCTION PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		areas that may be susceptible to erosion during clearing activities.	clearing activities.	after any major rainfall	Developer (Transnet)
<b>21. Change in the natural fire regime</b>					
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)
<b>22. Fragmentation of Ecological Corridors and disruption of Ecological processes and animal movement as a result of artificial barriers.</b>					
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 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 conducive 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.	Weekly  Bi-annually	Project Developer (Transnet)

<b>CONSTRUCTION PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>qualified specialist to enhance corridor connectivity. These movement corridors must be re-vegetated appropriately to provide shelter to faunal species moving through the corridor.</p> <p><u>A comprehensive habitat rehabilitation plan must be developed for the site. Restoration must be undertaken as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats (Condition 40 of EA 2015).</u></p>	Rehabilitation audit		
		<p>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.</p>	Visual site inspections.	Adhoc site visits (at least monthly)	Project Developer (Transnet)
<b>23. Faunal mortality as a result of bush clearing and earthmoving activities during site preparation</b>					
<b>24. Habitat destruction may affect faunal diversity and composition</b>					
<p>Minimise faunal mortality during site bush clearing.</p> <p>Minimise loss of faunal diversity and composition.</p>	<p>Site clearing such as bush clearing and earthmoving activities will destroy habitats and have an impact on the less mobile faunal species.</p>	<p>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 <u>by the Environmental Control Officer (ECO) or other suitably qualified person. Permits for the removal of animal species must be obtained from the relevant authorities where appropriate.</u></p> <p>b) <u>An ornithologist to ground truth every footprint. A walk through of areas to be cleared of vegetation should be undertaken prior to clearing commencing to check for breeding by Priority Species. If evidence of breeding is found the area around the nest should</u></p>	<p>Appoint search and rescue team before construction commences.</p> <p>Monitor the presence of animals on the construction site and keep records.</p>	<p>Site clearance audit after search and rescue to be issued.</p> <p>Daily</p>	<p>Project Developer (Transnet)</p>

<b>CONSTRUCTION PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p><u>not be disturbed until breeding has finished.</u></p> <p>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 activities to the required footprint. <u>Limit habitat clearing to a minimum.</u></p> <p>c) <u>Use existing roads and access routes as far as possible and only use designated roads and tracks; avoid driving off-road.</u></p> <p>d) <u>Construction camps and construction staff: i) ensure strict control of the movements of construction staff, ii) prohibit fuel-wood collection and campfires; provide alternative fuels, iii) prohibit the feeding of all animals, iv) develop and implement a suitable Waste Management Plan to prevent increases in the incidence of opportunistic species (e.g., vervet monkeys, pied crows, starlings, sparrows, rats and mice) that displace other indigenous animal species and come into conflict with humans.</u></p>	<p>Check delimitation of no-go areas</p> <p>Visual inspections</p>	<p>During site preparation</p> <p>Monthly</p>	<p>Project Developer (Transnet)</p>
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.	<p>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;</p> <p>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;</p> <p>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.</p>	<p>Visual checks to ensure that barriers are in place.</p> <p>Record trapped fauna to assess efficiency of the barriers.</p>	<p>At the end of each working day</p> <p>When required</p>	<p>Project Developer (Transnet)</p>



<b>CONSTRUCTION PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>25. Fauna mortality due to road/rail incidents (trucks, trains and other service vehicles)</b>					
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. The speed limits on haul roads will be determined according to best practice ( <a href="#">e.g. &lt;40km/h</a> ) and speed limits on existing roads will be adhered to.	Monitor construction activities via site audits.	Monthly audit of construction activities	Project Developer (Transnet)
		c) <a href="#">Ensure appropriate vegetation management along roads for early detection of the presence of animal species.</a> <a href="#">Ensure appropriate stormwater management to prevent the formation of wetlands (i.e., foci of animal activity) along roads.</a>			
		d) Killed animals must be removed from the road as this will attract scavengers which may also be harmed on the road. Note: A permit is required to dispose a carcass of a wild animal. Dispose of it in the same way that domestic animals are dealt with in the Metro.			
		e) Do not feed animals anywhere in the construction area. All bins will be scavenger proof. Keep food in lockers and no food kept in vehicles. Site offices and other offices will have secure windows that monkeys cannot climb through. Keep the doors of all unoccupied vehicles shut.			
		f) <a href="#">Use existing roads and access routes as far as possible and only use designated roads and tracks; avoid driving off-road.</a>			

<b>CONSTRUCTION PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>26. Faunal mortalities resulting from fences (mammals and reptiles)</b>					
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)
<b>27. Mortalities resulting from poaching (mammals)</b>					
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) <a href="#">Construction camps: i) ensure strict control of the movements of construction staff to reduce animal disturbances, ii) ensure strict poaching control, iii) exclude all domestic/feral dogs and cats.</a>			
		c) 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)
<b>E. Avifauna Impacts</b>					
<b>28. Habitat fragmentation/reduction (Grassridge Bontveld and Sunday Valley Thicket)</b>					
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.18 <a href="#">and D.23 / 24</a>			

<b>CONSTRUCTION PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>30. Impact on Avifauna as a result of sedimentation from stormwater run-off affecting the Coega River and saltpans.</b>					
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)
<b>31. Impact on avifauna as a result of increased disturbance caused by the project activities.</b>					
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.	<p>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.</p> <p>b) <a href="#">A bird monitoring programme must be implemented to document the effect of the operation of the manganese export facility on avifauna and penguins. This should commence prior to construction, and continue during operation of the export facility (Condition 32 of EA 2015).</a></p> <p>c) <a href="#">Reports regarding bird monitoring must be submitted to the relevant provincial environmental department, Birdlife South Africa, the Endangered Wildlife Trust (EWT) and DFFE on a quarterly basis (Condition 33 of EA 2015).</a></p> <p>d) <a href="#">The baseline data collected and documented during the survey must be shared with the EWT and Birdlife South Africa for a better understanding of the distribution or breeding behaviour of any of the priority species (Condition 34 of EA 2015).</a></p>	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)
		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	Undertake training	Once off at the beginning of construction and every six months during	Project Developer (Transnet)

**CONSTRUCTION PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		programme as part of the Environmental Awareness Training). Ensure that all new construction staff/driver is inducted.	Audit of training register	construction Bi-annually	
		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: <ul style="list-style-type: none"> <li>• Where possible, implement water saving devices (dual flush toilets, automatic shut-off taps, etc.).</li> <li>• 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 sensed faucets).</li> <li>• Pressure management: Process water system pressure management (i.e. lower pressure = lower flow = lower leakage/usage).</li> <li>• Cleaning: Cleaning methods utilised for cleaning vehicles, floors, etc. should aim to minimise water use (e.g. sweep before wash-down).</li> </ul>	Meter water use and ensure within specified requirements throughout construction.	Weekly	Project Developer (Transnet)

**CONSTRUCTION PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<ul style="list-style-type: none"> <li>• 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:                             <ul style="list-style-type: none"> <li>○ Proper irrigation scheduling will limit evaporation losses.</li> <li>○ Indigenous plants generally require less water than alien species.</li> <li>○ Gardens should be structured as to minimise surface run-off.</li> </ul> </li> <li>• Elimination of leakage:                             <ul style="list-style-type: none"> <li>○ Regularly maintain plumbing, and identify and repair leaks</li> <li>○ Shut off water to unused areas</li> <li>○ Regular audits of water systems should be conducted to identify possible water leakages.</li> </ul> </li> <li>• Metering and measurement: Proper metering and measurement of water use and wastewater discharges will enable proper performance review and management.</li> <li>• Education and awareness: Awareness campaigns focusing 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.</li> </ul>			

**CONSTRUCTION PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>33. Domestic effluent collection in portable toilets/tanks for transport to appropriate treatment facility enters environment.</b>					
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)
<b>34. Stormwater discharge into environment during construction.</b>					
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 steep slopes. Resulting silting of watercourses could occur.	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 areas promptly. c) Where possible, undertake clearing of vegetation in parallel with the construction process to limit erosion and/or runoff d) Reinforcement of cut and fill slopes with suitable materials to minimise erosion e) Performing periodic inspections and maintenance of soil erosion measures and stormwater control structures. Maintain and reapply erosion control measures until vegetation is successfully reestablished f) 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	Site audits and record of incidents.	Weekly	Project Developer (Transnet)

**CONSTRUCTION PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		soil erosion.			
		g) The construction of the stormwater control dams/ponds should be scheduled as early as possible.	Include in project schedule	Once off	Project Developer (Transnet)
		h) 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)
<b>G. Groundwater/Geohydrology Impacts</b>					
<b>35. Altering of natural drainage lines, river channel flow lines and river banks.</b>					
Ensure minimal disturbance occurs to the natural hydrological and geohydrological setting.	Construction activities, including site clearing and earthworks.	<p>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.</p> <p>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 damaged/destroyed</p> <p>c) <u>Construction must include appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of storm water run-off (Condition 44 of EA 2015).</u></p>	Visual inspection of the site	Weekly	Project Developer (Transnet)
<b>H. Aquatic Ecology Impacts</b>					
<b>36. Erosion and Sedimentation of aquatic habitat</b>					
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	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	Visual inspection of the site	Weekly	Project Developer (Transnet)

**CONSTRUCTION PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
	engineered surfaces or structures within a water course or wetland area.	riverine/water course areas and wetlands and their buffer areas.			
<b>I. Noise</b>					
<b>37. Potential impact of the construction noise on sensitive areas (dwellings on Tankatara Farm and Coega Hotel)</b>					
Minimise noise from construction	Vehicles, earth moving and terracing of sites, construction of access roads and hard standing areas.	<p>a) Noise monitoring must be conducted during the construction phase to determine if the noise emissions are within prescribed limits, <u>at the boundaries of the site.</u></p> <p>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.</p> <p>c) <u>Construction machinery and equipment or any other machinery to comply with the manufacturer's specifications on recommended noise levels for specific applications</u></p>	Noise monitoring must comply with SANS 10103: 2008	<u>Quarterly basis during the construction phase</u>	Project Developer (Transnet)
<b>J. Visual impacts</b>					
<b>38. Intrusion of activities associated with construction of the facility on existing views of sensitive visual receptors.</b>					
Minimise intrusion of construction activities on existing views of sensitive visual receptors.	Construction of the manganese ore export facility may affect sensitive visual receptors	a) Night lighting of construction sites should be minimised within requirements of safety and efficiency.	Monitor night lighting to ensure only minimum required lights are used	Weekly	Project Developer (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)



<b>CONSTRUCTION PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>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.</p> <p>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).</p>	<p>Monitor cleared areas</p> <p>Adherence to rehabilitation plan</p>	<p>Daily during clearing and monthly thereafter</p> <p>Quarterly</p>	<p>Project Developer (Transnet)</p>
<b>K. General Construction Activities</b>					
<b>39. Impacts on the environment associated with contractors management</b>					
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.	<p>a) Implement management actions included within Transnet General Construction EMP and SES</p> <p>b) Contractor's yard and offices shall be restricted to the area agreed upon;</p> <p>c) No laydown areas or construction camps should be placed within the 1:100 floodline. No construction camps within the <a href="#">SEZ</a></p> <p>d) The area shall be fenced in;</p> <p>e) On completion of the works, the Contractor shall restore the area to its original condition;</p> <p>f) The Contractor shall keep the yard neat and tidy at all times;</p> <p>g) No pollution or littering of any kind will be tolerated.</p> <p>h) The Contractor shall provide sufficient latrine facilities at site (one latrine for every 10 persons working on the site);</p> <p>i) Minimise the construction of new roads</p> <p>j) The speed limits on haul roads will be determined according to best practice and speed limits on existing roads will be adhered to.</p>	Visual inspection to ensure good housekeeping is maintained (no litter, neat, toilets serviced regularly)	Weekly	Project Developer (Transnet)

**CONSTRUCTION PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		k) Fire extinguishers will be deployed in all stores and in areas where ignition sources are used l) Smoking restricted to designated areas where fire extinguishers are present m) No fires permitted on site. Only gas used for cooking			
<b>40. Risks to the public if accessing the site</b>					
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. All visitors must report to the site office as a manner of good etiquette and for safety reasons. 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 (including a phone number for complaints). 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)
<b>41. Impact of accidental oil/chemical spillage/fuel leakages on surface and groundwater, terrestrial and aquatic ecology</b>					
Minimise or prevent accidental spillage or leakage of fuel, chemicals or lubricants.	Introduction of a number of potentially toxic macro-elements during the construction phase, such as the use of machinery/ plant (fuels, oils & grease),	a) Implement management actions re. vehicles and equipment refuelling and handling/batching of concrete and cement 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)

<b>CONSTRUCTION PHASE</b>					
<b>Management Objectives</b>	<b>Risk Sources</b>	<b>Management Actions</b>	<b>Monitoring</b>		
			<b>Methodology</b>	<b>Frequency</b>	<b>Responsibility</b>
Minimise the potential for any pollutants from reaching the riverine, estuarine and marine environments, groundwater and terrestrial/aquatic environment.	concrete and chemicals. Spillages of dangerous goods due to inadequate handling and storage also have the potential to impact personnel and public safety.	<p>d) Ensure a safe storage of chemicals, including for example (<i>checklist to be developed</i>):</p> <ul style="list-style-type: none"> <li>○ Chemicals (paints, solvents etc.) are to be contained in a bunded area (be it fixed or portable)</li> <li>○ A liquid-tight wall, or permanently installed secure bunds (an embankment or wall of brick, stone, concrete, etc.);</li> <li>○ The floor sloping to a sump, and use of drain covers;</li> <li>○ Run-off draining system to an external holding pit or tank where chemicals can be collected for recycling;</li> <li>○ Collapsible and flexible pillow tanks can also be used for storage of liquid chemicals;</li> <li>○ 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;</li> <li>○ 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 held on the site;</li> <li>○ Dangerous goods will be stored in a locked compound to prevent unauthorised access;</li> <li>○ Ignition sources (e.g. welding equipment, cigarettes, lighters) will be prohibited within any storage area used for dangerous goods or explosives.</li> <li>○ Bulk materials (cement, sand, etc.) to be kept</li> </ul>	Complete the checklist for the safe storage of chemicals.	Daily	Project Developer (Transnet)

**CONSTRUCTION PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		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. h) Operate generators and portable equipment in drip trays	Follow equipment service/maintenance schedule	As required per maintenance schedule	Project Developer (Transnet)
		i) Adequate containers for the cleaning of equipment and materials (paint, solvent) must be provided as to avoid spillages. j) No batching plants, vehicle refuelling or vehicle maintenance should occur within 32m of a water course or 50m from wetlands. k) Any fuel dispensing stations should be provided with an impervious area and a secondarily contained area.	Site audits	Weekly	Project Developer (Transnet)
		l) 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.); m) 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)

<b>CONSTRUCTION PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>42. Environmental impacts and visual amenity associated with waste management</b>					
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, liquid waste (used oil, paints, lubricating compounds and grease) etc.	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 d) The Contractor shall make arrangements with a registered waste service provider who will be responsible for collecting, removing and disposing of construction waste. Safe disposal certificates should be obtained for any disposal of waste. e) Dispose of construction wastes in an acceptable manner. No waste to be burned or buried on site. f) Wastewater from construction and painting activities (grey water) must be collected in a designated container and disposed of at a suitable disposal point off site. g) Oils, filters, lubricants are to be correctly disposed of when equipment is maintained in the field (e.g. emergency repair); h) <u>An integrated waste management approach must be implemented that is based on waste minimization and must incorporate reduction, recycling, re-use and disposal where appropriate. Any solid waste shall be disposed of at a landfill licensed in terms of section 20 (b) of the National Environment Management Waste Act, 2008 (Act 59 of 2008) (Condition 45 of EA 2015).</u>	Visual check to ensure wastes are managed according to the waste management plan	Weekly	Project Developer (Transnet)

<b>CONSTRUCTION PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>43. Environmental awareness and training</b>					
Minimise environmental impacts through staff awareness	Unawareness of staff	<p>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:</p> <ul style="list-style-type: none"> <li>• Housekeeping, hazardous materials/dangerous goods, MSDS</li> <li>• Dust management and enhance awareness</li> <li>• Water savings.</li> <li>• 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</li> <li>• Awareness campaigns focusing 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).</li> </ul>	<p>Training undertaken.</p> <p>Assess training material and Audit of attendance registers</p>	<p>Once-off prior to construction and every six months.</p> <p>Monthly</p>	Project Developer (Transnet)
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	Ensure regular consultations with the household members during construction	Organise a meeting	Monthly	Project Developer (Transnet)
<b><u>L. Environmental Authorisation Conditions</u></b>					
<a href="#">Adherence to EA Conditions</a>	<a href="#">Condition 17, Condition 19 Condition 25, Condition 26 Condition 29, Condition 30</a>	<a href="#">Submission of documentation specified in the Environmental Authorisation to the DFFE</a>	<a href="#">Documentation requested in EA</a> as	<a href="#">Pre-construction</a>	<a href="#">Project Developer (Transnet)</a>

## 6. MANAGEMENT PLAN FOR OPERATIONS PHASE

Note: This is a provisional Operations EMP (based on the findings and recommendations of the [2013 EIA process and subsequent 2023 Amendment 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.

<u>OPERATIONAL PHASE</u>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. AIR QUALITY IMPACTS</b>					
<b>1. Dust deposition and ambient PM10 and PM2.5 concentrations in the neighbouring environment</b>					
Meet air quality standards and minimise impacts associated with air quality	Nuisance and health impacts may occur should dust management not be efficient during the operation of the Manganese Ore Export facility.	<ul style="list-style-type: none"> <li>a) Operate and maintain high pressure water fog system at hopper feeder chutes.</li> <li>b) Apply dust suppressant systems resulting in a capping of approximately 21 days.</li> <li>c) Ensure maximum stacker drop height of 1.5 m.</li> <li>d) Operate and maintain moisture addition during stacking and reclaiming</li> <li>e) Operate and maintain sprayer at transfer points and surge bins.</li> <li>f) Ensure ore is as wet as possible and minimise drop heights.</li> <li>g) Implement traffic control measures on the stockyard and limit access.</li> <li>h) Implement wetting programme for unpaved roads and open areas.</li> <li>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)</li> </ul>	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 / monthly  As per Environmental Authorisation	Project Developer (Transnet)

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>j) <u>Suitable monitors are installed in the stacks serving all baghouses or similar air pollution control device filtration systems that use air filters to collect dust and separate it from air molecules with similar minimum control efficiencies, e.g. broken bag detectors. This will allow monitoring of the operation of the baghouses or similar equipment on a continuous basis so that effective emission controls are maintained.</u></p> <p>k) <u>An alternative method to dust fall-out buckets is employed in which the concentration of airborne dust is measured on a continuous basis at one or more point of the terminal site, specifically the site's southern boundary. Such results can be compared directly to official ambient air quality standards as published in GN 1210</u></p>			
		<p>j) Vegetate open unused areas with suitable ground cover. Implement and maintain planting programme</p>	Site audit	Bi-annually	Project Developer (Transnet)
		<p>k) Ensure that the dust abatement equipment is maintained as per designed parameters. Develop a maintenance schedule.  <u>Doorways to the enclosed stockyard should only be opened when necessary and closed as soon as possible afterwards.</u>  <u>Maintain the enclosed conveyor belt system to prevent fugitive emissions.</u></p>	<p>Visual inspection of the abatement. Accumulations of dust on the quay / <u>neighbouring environment</u> would be an indication that it is not functioning correctly and that corrective action is required</p> <p>Audit of maintenance schedule</p>	<p>Monthly</p> <p>Bi-annually</p>	Project Developer (Transnet)



<u>OPERATIONAL PHASE</u>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>l) Develop and implement an SOP for the following:</p> <ul style="list-style-type: none"> <li>In the event of water restrictions being imposed, suppress dust on stockpiles using chemical suppressant.</li> </ul> <p>In severe drought (no available water, including unavailability of water from identified alternative sources), cease ore handling activities such as tipping, stacking and reclaiming and ship loading at the facility when the wind speed exceeds a predetermined threshold at which dust is visibly entrained</p>	<p>Visual inspection</p> <p>Determine threshold during commissioning and present it to the Coega Environmental Monitoring Committee for their review</p> <p>The threshold will be determined from analysis of actual dust levels at the site boundary in comparison to legislated standards, to determine at what wind speed the mitigation (including use of surfactant) may be ineffective in complying with the air quality standards. This analysis will also consider the number exceedances allowed per year.</p>	<p>When required</p> <p>Once off</p>	<p>Project Developer (Transnet)</p>
<p><u>Health impacts associated with air quality</u></p>	<p><u>Health impacts may occur should dust management not be efficient during the operation of the Manganese Ore Export facility.</u></p>	<ul style="list-style-type: none"> <li><u>A dust suppressing agent such as an oligosaccharide or light polymer during off-loading and loading if water suppression and related dust extraction is inadequate.</u></li> <li><u>A series of air intakes along the walls of the enclosed structure are included in the storage facility associated with extractors on the roof (whirly birds) with fine dust filters. This system should generate an indoor pressure that is slightly lower than the ambient air pressure, allowing fresh air intake and filter any dust that may be airborne from the vented air.</u></li> <li><u>Protective clothing and equipment for workers: Light</u></li> </ul>	<p><u>Site audit</u></p>	<p><u>Monthly</u></p>	<p><u>Project Developer (Transnet)</u></p>

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p><u>weight cotton overalls (one or two piece), light weight cotton head cover such as small-brimmed cotton hat or totally covered golf cap, footwear (may be steel capped leather boots or rubber boots) and gloves (preferably long length isobutylene (isoprene) or neoprene rubber gloves) are essential and will protect worker bodies adequately against MnO<sub>2</sub> dust. Company policy may dictate wearing protective helmets instead of normal hats. Comfortable eye cover made form polycarbonate that protects the eyes from direct dust contamination is essential to prevent eye irritation. Such eyewear must not have venting ports because fine dust particles can penetrate through the ports. Comfortable dust masks to cover the nose and mouth are also essential to prevent even the slightest possibility of oral intake or inhalation of MnO<sub>2</sub> dust and must be worn by all workers who work with the ore at all times.</u></p> <ul style="list-style-type: none"> <li><u>Protective clothing and equipment for Management and Administrative Staff: Pressurised office spaces are essential to prevent MnO<sub>2</sub> dust from penetrating into the offices. When entering the stockpiling section of the storage facility, management and administrative staff must wear eye protection and dust masks.</u></li> <li><u>Protective clothing and equipment for Visitors: Unless visitors such as state authority inspectors that have a mandate to inspect facility have good reason to enter the storage section of the facility, they should be denied access to this section. Visitors that must enter the storage section of the facility for whatever reason must wear appropriate full body clothing, head cover, eye protection and a dust mask</u></li> </ul>			

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>B. TERRESTRIAL ECOLOGY</b>					
<b>2. Increased risk of alien plant invasion in disturbed areas</b>					
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).	Monitor the removal and resulting storage of cleared alien vegetation. Monitor the spread and removal of seed bearing material.	Quarterly	Project Developer (Transnet)
		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.			
<b>3. Change in natural fire regime</b>					
Minimise risk of fire.	Fire regime changes may be possible as a result of increased vehicular and other traffic into the area during operation.	a) Implement a Fire management plan, including an action plan for accidental fires.	Check that fire management plan recommendations are implemented. Liaise with the Metro fire department regarding action plans	Bi-annually	Project Developer (Transnet)

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		b) Grassy Road and railway verges outside of rehabilitated areas should be regularly	Monitor fire breaks/dry grasses areas.	Quarterly during dry periods Bi-annually during wet periods	Project Developer (Transnet)
		i) Flammable litter and discarded glass bottles should be removed regularly, especially along servitudes. j) No fires permitted on site, only gas used for cooking	Visual site inspections	Monthly	Project Developer (Transnet)
<b>4. Long-term effects of Manganese dust on adjacent vegetation and butterfly reserves</b>					
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)
<b>5. Fragmentation of Ecological Corridors and disruption of Ecological processes and animal movement as a result of artificial barriers.</b>					
Minimise fragmentation and disruptions to ecological corridors	Disruption of areas outside the facility will result in both, further fragmentation of ecological corridors and artificial disruptions to ecological processes	a) Fences to be kept in adequate condition. b) Ensure staff remains within demarcated areas c) <a href="#">Use existing roads and access routes</a>	Visual site inspection and record of incidents	Monthly	Project Developer (Transnet)

OPERATIONAL PHASE					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>6. Fauna mortality due to road/rail incidents (trucks, trains and other service vehicles)</b>					
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 (<40km/h); speed limits should be enforced, especially during rainfall periods. <u>Use existing roads and access routes; avoid driving off-road.</u>	Site audits	Monthly	Project Developer (Transnet)
		c) <u>Ensure appropriate vegetation management along roads for early detection of the presence of animal species.</u> <u>Ensure appropriate stormwater management to prevent the formation of wetlands (i.e., foci of animal activity) along roads</u>			
		d) Killed animals must be removed from the road as this will attract scavengers which may also be harmed on the road. Note: A permit is required to dispose a carcass of a wild animal. Dispose of it in the same way that domestic animals are dealt with in the Metro.			
		e) Do not feed animals anywhere within the project site. All bins will be scavenger proof. Keep food in lockers and no food kept in vehicles. Site offices and other offices will have secure windows that monkeys cannot climb through. The doors of all unoccupied vehicles will be kept shut.			
		f) Materials which will attract reptiles must not be left on site as this will increase the presence of reptiles			

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>7. Faunal mortalities resulting from fences (mammals and reptiles)</b>					
Minimise fence related faunal mortalities.	The establishment and installation of fencing around the Manganese Ore Export Terminal and supporting infrastructure	a) Check fences regularly ( <a href="#">every 2-days</a> ) for mortalities <a href="#">or for trapped animals</a> .	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. <a href="#">Animals entering the stockyard should be removed to similar habitat within proximity of the project area by a suitably qualified person</a>	Visual checks	Daily	
<b>8. Mortalities resulting from poaching (mammals)</b>					
Minimise poaching related faunal mortalities.	Staff not trained adequately in terms of environmental awareness.	a) Check fences regularly for snares.	Visual checks	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 staff is inducted.	Training registers for Environmental Awareness Training.	Repeated every six months during the operations phase.	Project Developer (Transnet)
<b>C. INTEGRATED WATER MANAGEMENT</b>					
<b>9. Impact on regional water balance as a result of increased water used during normal operation.</b>					
Reduce water usage during operation.	Stress on potable water resources within the municipality due to the use of potable water for industrial purposes	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 <a href="#">SEZ</a> etc.)	Organise a meeting with CDC and relevant authorities.	After 2 years of operation	Project Developer (Transnet)
	Lack of water conservation techniques practiced by	b) Site wide water audit/balance. <ul style="list-style-type: none"> <li>• <a href="#">Flow Meters must be installed at all source points for water being sourced for the project.</a></li> <li>• <a href="#">The installation and calibration of flow meters must be done by a SABS certified calibration technician and</a></li> </ul>	Meter water use and ensure within specified requirements throughout operation.	Monthly	Project Developer (Transnet)

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
	<u>operational</u> staff.	<p><u>certificates must be made available upon calibration.</u></p> <ul style="list-style-type: none"> <li>The location coordinates and serial numbers for the new flow meters, following calibration, must be recorded and kept in a database so that future water balancing can be done.</li> </ul>			
		<p>c) Minimise water use by closely monitoring weather for rainfall <u>to maximize</u> stormwater utilisation for dust suppression and through the use of surfactant</p>	<p>Arrange access to rainfall data from a local weather station and use this data to set limits for when dust suppression is required.</p>	<p>As required, depending on rainfall</p>	<p>Project Developer (Transnet)</p>
		<p>d) Implement water conservation techniques (e.g. equipment) as noted below:</p> <ul style="list-style-type: none"> <li>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:                             <ul style="list-style-type: none"> <li>Proper irrigation scheduling will limit evaporation losses.</li> <li>Indigenous plants generally require less water than alien species.</li> <li>Gardens should be structured as to minimise surface run-off.</li> </ul> </li> <li>Cleaning: Cleaning methods utilised for cleaning vehicles, floors, etc. should aim to minimise water use (e.g. sweep before wash-down).</li> <li>Firefighting: Proper pressure management within fire water systems will limit water use.</li> <li>Elimination of leakage:                             <ul style="list-style-type: none"> <li>Regularly maintain plumbing, and identify and</li> </ul> </li> </ul>	<p>Meter water use and ensure within specified requirements throughout operation</p>	<p>Weekly</p>	<p>Project Developer (Transnet)</p>

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		repair leaks ○ Shut off water to unused areas ○ 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.			
<b>10. Domestic effluent accidental discharge into sewer enters the environment</b>					
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 should be removed by a licensed contractor to an approved site	Site audit and record incidents  Monitor disposal and request wastes disposal certificates	Monthly  As required	Project Developer (Transnet)
<b>11. Service wastewater accidental discharge into environment</b>					
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). Wastewater sampling Conduct audits and record non-compliance	Monthly	Project Developer (Transnet)



<u>OPERATIONAL PHASE</u>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>12. Contaminated stormwater accidental discharge to environment</b>					
Avoid the impact of contaminated stormwater discharge into the environment, including avifauna, groundwater, surface water etc.	<p>Stormwater contamination could result from:</p> <ul style="list-style-type: none"> <li>Accidental or other spillages of ore, materials, oils, chemicals, litter, etc.</li> <li>Accidental discharge of service wastewater into the stormwater system.</li> <li>Deposition (“dust fallout”)</li> </ul> <p>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.</p>	<p>a) Develop and Implement a Stormwater Management Plan, including a checklist for audits to assess the effectiveness of the stormwater management system.</p>	Compile Stormwater Management Plan.	Prior to operations	Project Developer (Transnet)
		<p>b) <a href="#">A comprehensive storm water management plan must be developed for the site to ensure compliance with applicable regulations and to prevent off-site migration of contaminated storm water or increased soil erosion. The comprehensive storm water management plan should form part of the EMPr (Condition 42 of EA 2015).</a></p>	Site inspection/audits and record incidents.	Monthly	
		<p>c) 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.</p>			
		<p>c) Monitor stormwater quality prior to any discharge off-site (i.e. at the compilation yard mainly), if applicable.</p>	Stormwater quality within control dams/attenuation ponds should be monitored on a regular basis.	Monthly	Project Developer (Transnet)
		<p>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.</p>	Stormwater quality run-off should be monitored after a storm event	After each significant rain-event (for at least Year 1) and then every three months.	
	<p>e) Ensure that all potentially contaminated stormwater is channelled into the stormwater control dams/attenuation ponds to trap sediment and manganese ore dust.</p>	Site inspection/audits and record incidents.	Monthly	Project Developer (Transnet)	

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		f) Develop and implement a railway/stockyard and quay operation management plan, including procedures and day-to-day activities	Audit the management plans  Site audits and record incidents	Prior to operation  Monthly	Project Developer (Transnet)
<b>D. AVIFAUNA IMPACTS</b>					
<b>13. Impact on avifauna as a result of increased disturbance caused by the project activities.</b>					
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.  b) <u>A bird monitoring programme must be implemented to document the effect of the operation of the manganese export facility on avifauna and penguins. This should commence prior to construction, and continue during operation of the export facility (Condition 32 of EA 2015).</u>  c) <u>Reports regarding bird monitoring must be submitted to the relevant provincial environmental department, Birdlife South Africa, the Endangered Wildlife Trust (EWT) and DFFE on a quarterly basis (Condition 33 of EA 2015).</u>	A comparison between pre- and post- operation conditions should be made and monitoring of these species should be undertaken.	<u>Quarterly</u> 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)

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>14. Impact on avifauna as a result of collision with new powerlines/overhead rail electricity network</b>					
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. <sup>4</sup>	Patrols of powerline routes, records incidents and locations and assess the effectiveness of bird flight diverters.	Daily (1 <sup>st</sup> 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. <sup>4</sup>	Attending conferences, desktop surveys etc.		
		c) Consideration should be given to installing webcam monitors at key locations. <sup>4</sup>			
<b>15. Impact on avifauna as a result of atmospheric emissions (i.e. fugitive manganese ore dust on vegetation and on Jalheel Island)</b>					
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.	Visual inspection/count of birds	<u>Quarterly</u> for at least two years after commencement of operations.	Project Developer (Transnet)
		b) Continue the establishment of the baseline started prior to construction (consider using SABAP2 methodology)			
		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)
		d) Ensure a continuous communication/collaboration with relevant organisations undertaking monitoring of the penguins on the three islands of the St Croix group for Aspergillosis. Should increased levels of fungal infections amongst penguins on St Croix Island be correlated with increased dust deposition from the proposed manganese facility,	Participate in efforts to control fungal growth (i.e. application of fungicide) in areas of problematic dust deposition	As requested	

<sup>4</sup> Note that this action falls under the responsibility of a 3<sup>rd</sup> party and that Transnet cannot guarantee that it will be implemented

<u>OPERATIONAL PHASE</u>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		areas of problematic dust deposition will need to be treated with the appropriate fungicide			
<b>16. Impact on avifauna as a result of fugitive manganese ore dust on Coega River and Saltpans</b>					
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. <a href="#">Refer to C.12.</a>	Coordinated Water Bird Counts	Bi-annually	Project Developer (Transnet)
<b>E. MARINE ECOLOGY IMPACTS</b>					
<b>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). Alterations of the chemical composition of the harbour sediment with implications on the disposal of dredge spoil.</b>					
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)

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>18. Alteration of water and sediment quality / Release of alien species associated with the discharge of ballast water in the port</b>					
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
<b>19. Oil/fuel spills as a result of collisions (small scale spill in the harbour)</b>					
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

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		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, then bi-annually  Monthly	Project Developer (Transnet)
<b>20. Oil/fuel spills as a result of collisions (large scale spill in Algoa Bay)</b>					
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) 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.	Site inspection and audit of the Oil Spill Planning for the Port of Ngqura and Algoa Bay (Diaz Zone plan).	Annual	TNPA
		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.	Audit of the continuous monitoring of shipping safety in the Bay	Annual	SAMSA, TNPA
	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.	c) Develop an emergency response procedure, in consultation with relevant stakeholders (e.g. SANParks, etc.) 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 <i>et al</i> 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

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Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		d) In addition, the oil spill contingency plan 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
<b>21. Physical disturbance of whales and dolphins at Southern African population level</b>					
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 sensitize ship's masters to the presence of whales and dolphins.	On-going Marine Mammal Monitoring Plan	Continuously	TNPA
<b>F. GROUNDWATER/GEOHYDROLOGY IMPACTS</b>					
<b>22. Impact of dust fall out and contaminated stormwater on groundwater as a result of operational activities.</b>					
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			
		<a href="#">Implement a soil and groundwater monitoring programme and use an accredited laboratory for the analysis</a>	<a href="#">Develop sampling programme Sampling undertaken and compare with agreed parameters</a>	<a href="#">Once off prior to operation As per sampling schedule (i.e. quarterly)</a>	<a href="#">Project Developer (Transnet)</a>

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Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>23. Impact of stockpile leachate on groundwater</b>					
Ensure no soil or groundwater is impacted by stockpile leachate	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 into groundwater.	Visual inspections	After significant rainfall events	Project Developer (Transnet)
		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)
<b>G. AQUATIC ECOLOGY IMPACTS</b>					
<b>24. Potential impacts associated with the Manganese ore export facility on water quality and risk to the aquatic environment.</b>					
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 CDC
		a) Transnet should co-ordinate their efforts with the CDC 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			



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Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>25. Erosion and Sedimentation</b>					
Prevent downstream erosion and sedimentation of aquatic habitats	Changes in the hydrological regime due to the operation of hard engineered surfaces or structures within a water course or wetland area	Refer to C.6			
		a) All potential erosion sources such as bridge or culvert areas should be monitored and any areas that become destabilised should either be re-vegetated or erosion control mechanism such as gabions should be installed.	Visual inspections	Monthly or after heavy rain events	Project Developer (Transnet)
		b) Clean and/or reinstate any erosion protection measures, swales where necessary	Visual inspections	Bi-annually	
<b>H. NOISE IMPACTS</b>					
<b>26. Impact of the manganese handling operational noise on the Noise Sensitive Areas</b>					
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)
		b) Based on the noise monitoring results, consider the construction of a noise screen or double glaze windows at the Coega Hotel informal dwellings and the Transnet property dwelling near the railway to ensure that noise levels are within acceptable limits. Should these alternative management actions prove to be ineffective, consider the relocation of the workers cottage and dwellings.	Visual inspection. If relocation is required, it needs to be undertaken in compliance with legal requirements	Once off	Project Developer (Transnet)
		c) Regular maintenance of the diesel locomotives to minimise noise impacts	Maintenance programme	As per maintenance schedule	Project Developer (Transnet)
		d) <a href="#">Processes, machinery and equipment or any other machinery to comply with the manufacturer's specifications on recommended</a>			

<u>OPERATIONAL PHASE</u>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<a href="#">noise levels for specific applications</a>			
<b>I. VISUAL IMPACTS</b>					
<b>27. Visual impact of night lighting of Manganese facility on the nightscape of region.</b>					
Minimise visual impact of night lighting of facility on the nightscape of region.	Lighting of terminal_ <a href="#">and conveyor system.</a>	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)
<b>28. Visual impact/intrusion of the facility on sensitive receptors</b>					
Minimise visual impact/intrusion of the facility on sensitive receptors	Visual impact of Manganese Terminal and <a href="#">Conveyor System</a> on sensitive visual receptors	a) Monitor adherence to Coega <a href="#">SEZ</a> Visual guidelines for Developments. Set up a checklist of items that should be monitored, including: <ul style="list-style-type: none"> <li>• Signage – must be discreet and restrained;</li> <li>• Roofs and buildings should reflect minimal sunlight or artificial light during day or night.</li> </ul>	Visual inspection and site audit	Beginning of operation As part of maintenance process for buildings and facades.	Project Developer (Transnet)
	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)

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Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>L. General Operational Activities</b>					
<b>44. Risks to the public if accessing the site</b>					
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. All visitors must report to the site office as a manner of good etiquette and for safety reasons. 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)
<b>45. Impact of accidental oil/chemical spillage/fuel leakages on surface and groundwater, terrestrial and aquatic ecology</b>					
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, 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.	a) Ensure a good house-keeping practice is in place; b) Regular sweeping of roadways and work areas.  c) Ensure a safe storage of chemicals, including for example ( <i>checklist to be developed</i> ): <ul style="list-style-type: none"> <li>o Chemicals (paints, solvents etc.) are to be contained in a covered and bunded area (be it fixed or portable)</li> <li>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;</li> <li>o The floor sloping to a sump, and use of drain covers;</li> <li>o Run-off draining system to an external holding pit or tank where chemicals can be collected for recycling;</li> </ul>	Visual inspections to ensure that good housekeeping is maintained  Complete the checklist for the safe storage of chemicals.	Daily  Daily	Project Developer (Transnet)  Project Developer (Transnet)

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<ul style="list-style-type: none"> <li>○ Collapsible and flexible pillow tanks can also be used for storage of liquid chemicals;</li> <li>○ 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; 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 held on the site;</li> <li>○ Dangerous goods will be stored in a locked compound to prevent unauthorised access;</li> <li>○ Ignition sources (e.g. welding equipment, cigarettes, lighters) will be prohibited within any storage area used for dangerous goods.</li> <li>○ Bulk materials (cement, sand, etc.) to be kept in enclosed storage, sheltered from wind.</li> </ul> <p>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.</p> <p>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.</p>			
		f) Preventative maintenance of equipment (vehicles, generators etc.) should be performed on a routine	Follow equipment service/maintenance schedule	As required per maintenance	Project Developer

<b>OPERATIONAL PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		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.	Site inspections/audits and record of incidents	schedule  Weekly	(Transnet)
		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)
<b>46. Environmental impacts and visual amenity associated with waste management</b>					
Ensure wastes are managed and disposed of in a	Incorrect disposal of general wastes, scrap wood and metals,	a) Develop and implement appropriate Waste Management Plan and initiate a waste minimisation system (i.e. reuse and recycle	Compile Waste Management Plan.	Once-off prior to operations	Project Developer (Transnet)

PART B – ENVIRONMENTAL MANAGEMENT PROGRAMME

<b>OPERATIONAL PHASE</b>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
lawful and an environmental friendly manner.	liquid waste (used oil, chemicals, lubricating compounds and grease), manganese ore mud etc.	waste materials where possible). Develop a checklist if applicable. <u>An integrated waste management approach must be implemented that is based on waste minimization and must incorporate reduction, recycling, re-use and disposal where appropriate. Any solid waste shall be disposed of at a landfill licensed in terms of section 20 (b) of the National Environment Management Waste Act, 2008 (Act 59 of 2008) (Condition 45 of EA 2015).</u>	Review plan to assess adequacy  Monitor quantity of wastes generated	Annually  Monthly	
		b) Storage of wastes in dedicated containers and disposal thereof by a licensed 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)

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>47. Environmental awareness and training</b>					
Minimise environmental impacts through staff awareness	Unawareness of staff	<p>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:</p> <ul style="list-style-type: none"> <li>• Housekeeping, hazardous materials / dangerous goods, MSDS</li> <li>• Dust management and enhance awareness</li> <li>• Water savings. Furthermore, water system operating personnel need to have extensive knowledge of the various water control systems, to allow for optimum operation thereof.</li> <li>• 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).</li> <li>• Awareness campaigns focusing 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).</li> <li>• Awareness campaign for diesel locomotive operators, including the fact that they are driving through a sensitive area and they should operate in such a way to minimize noise</li> </ul>	<p>Training undertaken.</p> <p>Audit of attendance registers</p>	<p>Once-off prior to construction and every six months.</p> <p>Monthly</p>	Project Developer (Transnet)

**OPERATIONAL PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>48. Accidents due to an increase in traffic</b>					
Avoid accidents due to increased traffic.	Daily trips to and from the site leading to changing traffic conditions around Coega <a href="#">SEZ</a> .	<ul style="list-style-type: none"> <li>a) Ensure that all vehicles are equipped with warning lights and that headlights are always switched on to enhance visibility;</li> <li>b) Ensure that trip generations be limited through the use of larger buses to transport workers;</li> <li>c) Limit workers to use private transport and supply of the necessary traffic information to the road users;</li> <li>d) Staff will not be transported on tippers.</li> <li>e) Develop a safety checklist for transport/vehicles (covering the above requirements)</li> </ul>	Ensure that the checklist is completed prior to each trip.	Daily	Project Developer (Transnet)



## 7. MANAGEMENT PLAN FOR DECOMMISSIONING

<u>DECOMMISSIONING PHASE</u>					
Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. NOISE IMPACTS</b>					
<b>1. Impact of the decommissioning phase noise on the Noise Sensitive Areas.</b>					
Minimise noise from decommissioning	Vehicles, earth moving and decommissioning of infrastructure.	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>B. GROUNDWATER/GEOHYDROLOGY IMPACTS</b>					
<b>2. Impact of accidental oil spillage/fuel leakage on groundwater.</b>					
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.).	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)
<b>C. AQUATIC ECOLOGY IMPACTS</b>					
<b>3. Potential changes to the hydrological regime (impeding or diverting flow).</b>					
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 wetlands and their buffer areas should be removed	Visual inspections	Weekly for a period of three months after the sites have been cleared.	Project Developer (Transnet)

**DECOMMISSIONING PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>4. Potential impact on water quality and risk to the aquatic environment.</b>					
<b>5. Erosion and Sedimentation</b>					
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)
<b>D. INTEGRATED WATER MANAGEMENT IMPACTS</b>					
<b>6. Increased water used during decommissioning impacts regional water balance.</b>					
Reduce water usage	Lack of water conservation techniques practiced by staff during the decommissioning phase.	Site wide water audit/balance	Meter water use and ensure within specified requirements throughout decommissioning.	Weekly	Project Developer (Transnet)
<b>7. Domestic effluent collection in portable toilets/tanks for transport to appropriate treatment facility enters environment.</b>					
Reduce the spillage of domestic effluent and the impact thereof on the environment.	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.  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	Domestic waste removal and disposal to be monitored throughout decommissioning	Weekly	Project Developer (Transnet)

**DECOMMISSIONING PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		responsible for establishing and maintaining appropriate sewage facilities, such as: <ul style="list-style-type: none"> <li>• Septic tanks and soak-aways (if &gt; 800 m from natural water course/water retention system), or</li> <li>• Dry composting toilets (enviro loos), or</li> <li>• Chemical toilets.</li> </ul>			
<b>8. Contaminated stormwater discharge to environment.</b>					
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: <ul style="list-style-type: none"> <li>• Providing secure storage for oil, chemical and other waste materials to prevent contamination of stormwater runoff.</li> <li>• Diverting stormwater runoff from uncovered bulk construction waste pile to suitable collection/treatment systems.</li> <li>• Performing periodic inspections and maintenance of soil erosion measures and stormwater control structures</li> <li>• 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</li> </ul>	Monitor via site audits and record incidents.	Monthly	Project Developer (Transnet)

**DECOMMISSIONING PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		(e.g. borehole) features.			
<b>9. Demolition solid waste enters environment.</b>					
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: <ul style="list-style-type: none"> <li>• Providing adequate secondary containment for fuel storage tanks and for the temporary storage of other fluids (e.g. lubricating oils, hydraulic fluids).</li> <li>• Using impervious surfaces for refuelling areas and other fluid transfer areas.</li> <li>• Providing portable spill containment and clean-up equipment on site and training in the equipment deployment.</li> <li>• Assessing the presence of hazardous substances in or on building materials and decontaminating or properly managing contaminated building materials.</li> </ul>	Monitor via site audits and record non-compliance and incidents.	Monthly	Project Developer (Transnet)

**DECOMMISSIONING PHASE**

Management Objectives	Risk Sources	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>E. TERRESTRIAL ECOLOGY IMPACTS</b>					
<b>10. Permanent loss of habitat and disruptions to Ecological Processes</b>					
Reduce the overall impact of the proposed Manganese Export facility on the surrounding habitats.	<a href="#">Decommissioning</a> 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)

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## 8. ENVIRONMENTAL COMPLIANCE AND DOCUMENTATION

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### 8.1 Environmental Compliance Monitoring and Auditing

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Environmental compliance audits are to be undertaken at least once a month by the Transnet EO together with the Contractor EO for the duration of the construction phase. The audit outcomes presented in a report are to be tabled at the monthly construction site meetings.

Environmental compliance audits are to be undertaken quarterly by the ECO.

Environmental compliance audits are to be undertaken by an independent ECO for the duration of the operational phase. The audit outcomes presented in a report are to be tabled at the environmental meetings.

The ECO is to provide digital photographic evidence as part of the environmental compliance audits.

The environmental audit reports are to be compiled according to the requirements in the EIA Regulations, 2014, as amended; or to any subsequent legislative requirement.

As per Conditions 20 to 23 of the Environmental Authorisation 2015:

- All documentation, e.g. audit/monitoring/compliance reports and notifications, required to be submitted to the DFFE in terms of this authorisation, must be submitted to the Director: Compliance Monitoring at the DFFE.
- The ECO must report quarterly to the EMC during construction and reports must be made available to the DFFE's representative in the EMC.
- The ECO must report bi-annually to the EMC during operation and decommissioning and reports must be made available to the DFFE's representative in the EMC.
- The holder of the authorisation must submit an environmental audit report to the DFFE within 30 days of completion of the construction phase (i.e. within 30 days of site handover) and within 30 days of completion of rehabilitation activities.
- The environmental audit report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions as well as the requirements of the EMPr.
- Records relating to monitoring and auditing must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.

As per Conditions 46 to 48 of the Environmental Authorisation 2015:

- A copy of the environmental authorisation and the approved EMPr must be kept at the property where the activity will be undertaken. The authorisation and approved EMPr must be produced to any authorized official of the DFFE who requests to see it and must be made available for inspection by any employee or agent of the holder of the authorisation who works or undertakes work at the property.
- The holder of the authorisation must notify both the Director: Integrated Environmental Authorisations and the Director: Compliance Monitoring at the DFFE, in writing and within 48 (forty eight) hours, if any condition of the environmental authorisation cannot be or is not adhered to. Any notification in terms of this condition must be accompanied by reasons for the non-compliance.
- National government, provincial government, local authorities or committees appointed in terms of the conditions of this authorisation or any other public authority shall not be held responsible for any damages or losses suffered by the applicant or his successor in title in any instance where construction or operation subsequent to construction be temporarily or permanently stopped for reasons of non-compliance by the applicant with the conditions of authorisation as set out in the environmental authorisation or any other subsequent document emanating from these conditions of authorisation.

## 8.2 Record Keeping and Documentation

The Developer or his representative is responsible for an Environmental Management (EM) File in order to keep related environmental documents in a filing system. This EM File may consist of a printed and electronic copy; is to be available on site at all times and updated as required.

The EM File must be available for any environmental audits and provided to Competent Authorities when requested.

The following documentation is to be kept on site during the construction and operational phases:

- Environmental Authorisation, EMPr and other applicable licences e.g. Atmospheric Emissions Licence, Water Use Licence, etc.
- Method statements (refer to **Appendix 1**)
- Environmental awareness training and signed registers
- Environmental Incident Register / Log / Diary (refer to **Appendix 2**)
- Environmental Complaints Register (refer to **Appendix 3**)
- ECO audit reports
- Waste disposal records and manifests
- Environmental instructions, directives or non-compliances issued and the related corrective actions undertaken.
- Weekly or monthly checklists
- Minutes of environmental site meetings

## 8.3 Corrective and Preventative Action

The Developer must devise a Corrective Action Procedure for implementing corrective and preventive action. The Corrective Action Procedure is to be implemented by all contractors and subcontractors on site. This system should:

- a) Report non-compliance with procedures or targets identified during monitoring and inspections.
- b) Report other failures creating environmental problems.
- c) Report imminent non-compliance and potential environmental problems.
- d) Delegate responsibility for corrective and preventive action.
- e) Document the resolution of the reported non-compliance or environmental problem.
- f) Impose disciplinary action where persistent non-compliance occurs.

All contractors and sub-contractors must retain copies of the Corrective Action Procedure and other appropriate documentation and submit copies of all documentation to the Developer or his representative at a frequency to be determined by the Developer or his representative.

Transgressions relate to actions by the Contractor, Sub-contractor or Contractor team member whereby damage or harm is inflicted upon the environment or any feature of the environment and where any of the conditions or specifications of the EMPr are infringed upon.

In the instance of environmental damage, the damage, where possible, is to be repaired and rehabilitated using appropriate measures, as specified and undertaken by appropriate specialists, for the account of the Contractor or other guilty party.

Where infringement of the specifications or conditions of the EMPr is registered, appropriate remedial action or measures are to be implemented for the account of the Contractor. Where non-repairable damage is inflicted upon the environment or non-compliance with any of the EMPr conditions is registered, the Contractor may face a monetary penalty to an amount specified by the Developer. A first offence warning may be implemented.

## **8.4 Method Statements**

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Method Statements indicate how the procedures will be applied in order to meet the relevant targets and are central to the proper implementation of the EMPr. It is anticipated that in addition to assessing the systems and performance of the EMPr, the ECO will review the formulation of, and adherence to "Method Statements".

The Contractors must submit Method Statements to the Developer or his representative and ECO outlining proposed construction and operational activities procedures and methods.

Method Statements must be submitted before any work on the project is undertaken. Method Statements are to be submitted at least 14 days prior to the commencement of the activity.

The various method statements must be approved by the Developer or his representative, in consultation with the ECO. The Developer or his representative and Contractor must keep copies of these Method Statements and letters of approval (including conditions attached) in the EM file, and be located on site.

The Developer or his representative, and the ECO, must approve any deviations from the approved Method Statements. All amendments must be in writing and must be submitted to the Developer or his representative.

Method Statements to be submitted for the following activities:

- Site establishment
- Vegetation clearing, including on-going alien and invasive management
- Access management
- Fire plan
- Waste management
- Water management, including source, disposal, potable use
- Watercourse crossings
- Handling, transport and storage of hazardous substances
- Emergency preparedness
- Dust and noise management
- Fauna management
- Archaeological and palaeontological management

Refer to **Appendix 1** for an example of a Method Statement.

## **8.5 Meetings**

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It is anticipated that Progress Meetings, attended by the Developer or his representative and other members of the project team will be held on a regular basis during the construction phase. It is recommended that a minimum of one meeting every month be held where the compliance to the EMPr can be discussed, this can be done during the Monthly Site Progress Meeting.

The discussions on compliance to the EMPr must continue during the operations of the NMET.

The Developer or his representative may call for additional meetings in response to particular environmental problems. The ECO will attend progress meetings if requested to do so by the Developer or his representative.

Minutes of environmental site meetings are to be kept in the EM File.



## **8.6 Response to Public Complaints**

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The Developer, together with the Contractor, must respond to queries and complaints from the public within 14 days.

In responding to such queries and / or complaints all such communications must be documented in a complaints register. All remedial action taken on a complaint must be recorded in the complaints register.

Refer to **Appendix 3** for an example of a complaints register.

## **8.7 Environmental Awareness Training**

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The Developer or his representative is responsible for ensuring that all personnel have a general environmental awareness as well as specific knowledge of the potential environmental impacts associated with their work activities. All personnel associated with the project must understand the purpose and benefits of the EMPr. The appropriate training must occur as part of an induction programme, i.e. before commencing on-site work, and should also focus on the benefits of sound environmental management.

Specific elements of environmental awareness training should include (list is not intended to be exclusive or exhaustive):

1. Ability to recognise archaeological and palaeontological artefacts.
2. Awareness on the importance of site rehabilitation.
3. Management and minimising of waste, including waste separation. Instruction in temporary waste storage and disposal systems and facilities.
4. Water conservation and water quality protection.
5. Awareness of existing social problems in the area.
6. Instruction in erosion control measures.
7. Acceptable behaviour with regard to flora and fauna.
8. Maintenance of equipment to prevent the accidental discharge or spill of fuel, oil, lubricants, and other chemicals.
9. Responsible handling of chemicals and spills.
10. Environmental emergency procedures and incident reporting.

In the event that new personnel are brought onto site by the Contractor during the project, these personnel are to undergo environmental awareness training prior to any work being undertaken. The Contractor is to include environmental awareness training in the toolbox talks on a monthly basis.

## APPENDIX 1: EXAMPLE - METHOD STATEMENTS

<u>Method Statement for: (e.g. vegetation clearing)</u>					
<u>WHO</u>	<u>Compiled by:</u>	<u>Submitted to:</u>	<u>Date submitted:</u>	<u>Approved by:</u>	<u>Date approved:</u>
<u>PERIOD</u>	<u>Commencement date:</u>	<u>Completion date:</u>	<u>Indication of phasing:</u>		
<u>LOCATION</u>	<u>Where to be implemented on site (site plan):</u>	<u>Indicate any restricted areas/environmentally sensitive areas:</u>			
<u>RISKS</u>	<u>Identify and describe any potential risks associated with construction activity:</u>				
<u>METHOD</u>	<u>Explain how activity will be done to meet requirements of the EMPr and Environmental Authorisation. Demonstrate how risks will be prevented through the suggested construction method.</u>				
<u>COMMENTS</u>	<u>Any additional notes/comments</u>				

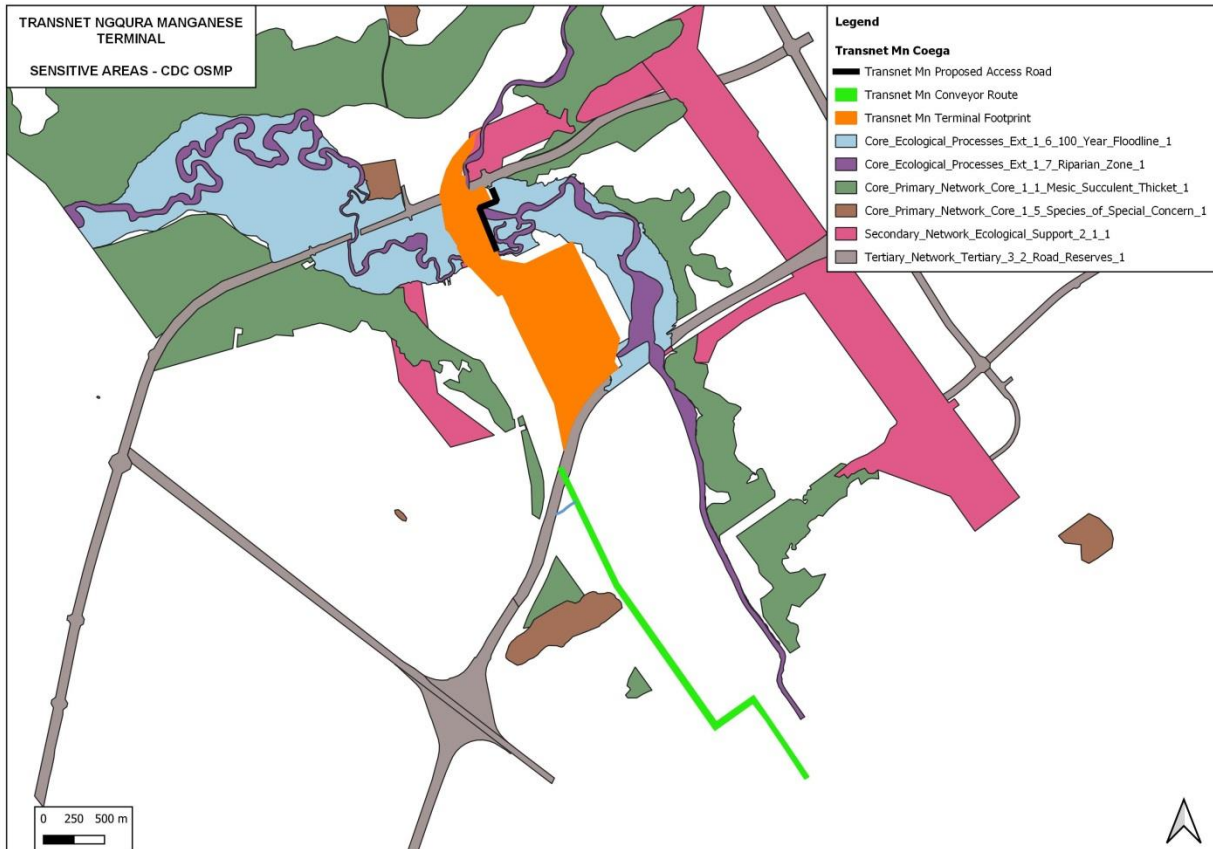
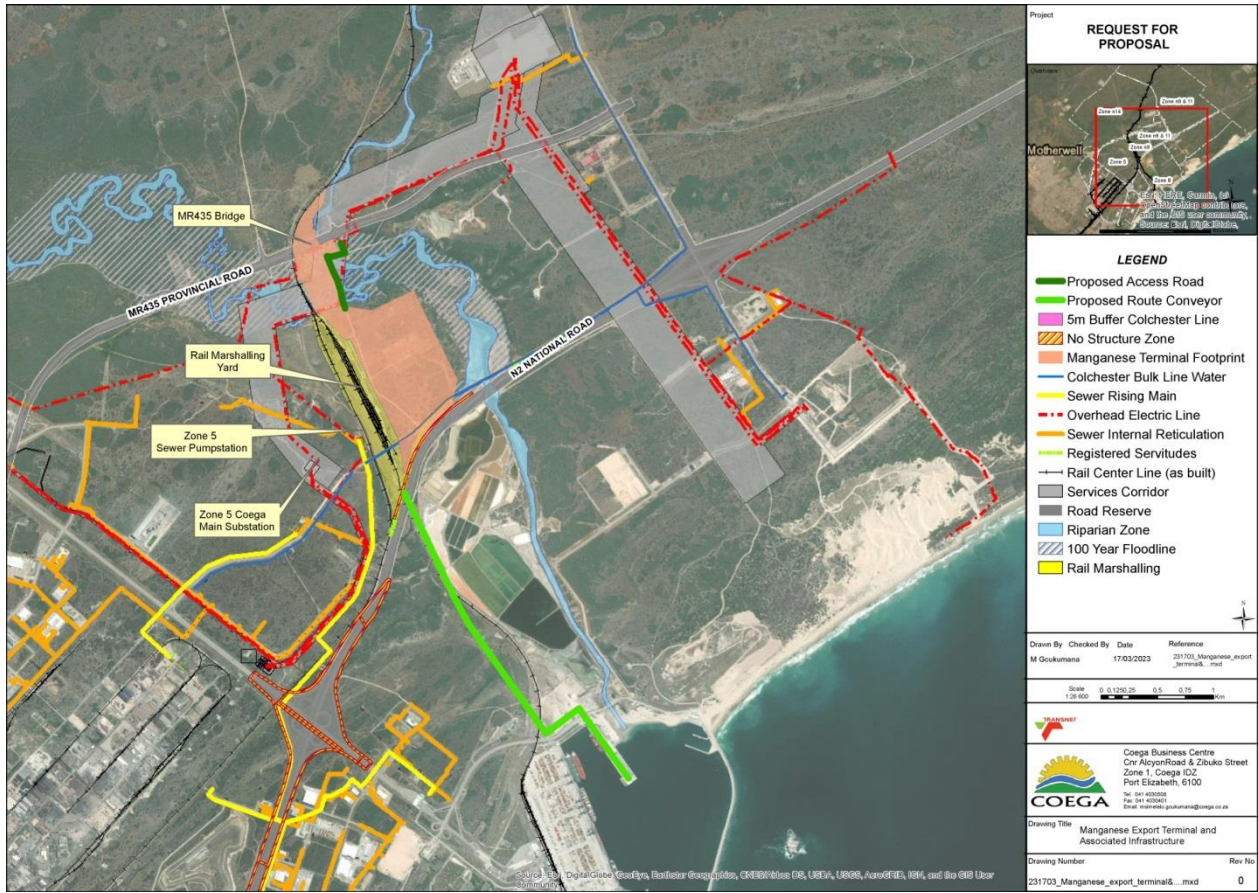
**APPENDIX 2: EXAMPLE - ENVIRONMENTAL INCIDENT REGISTER**

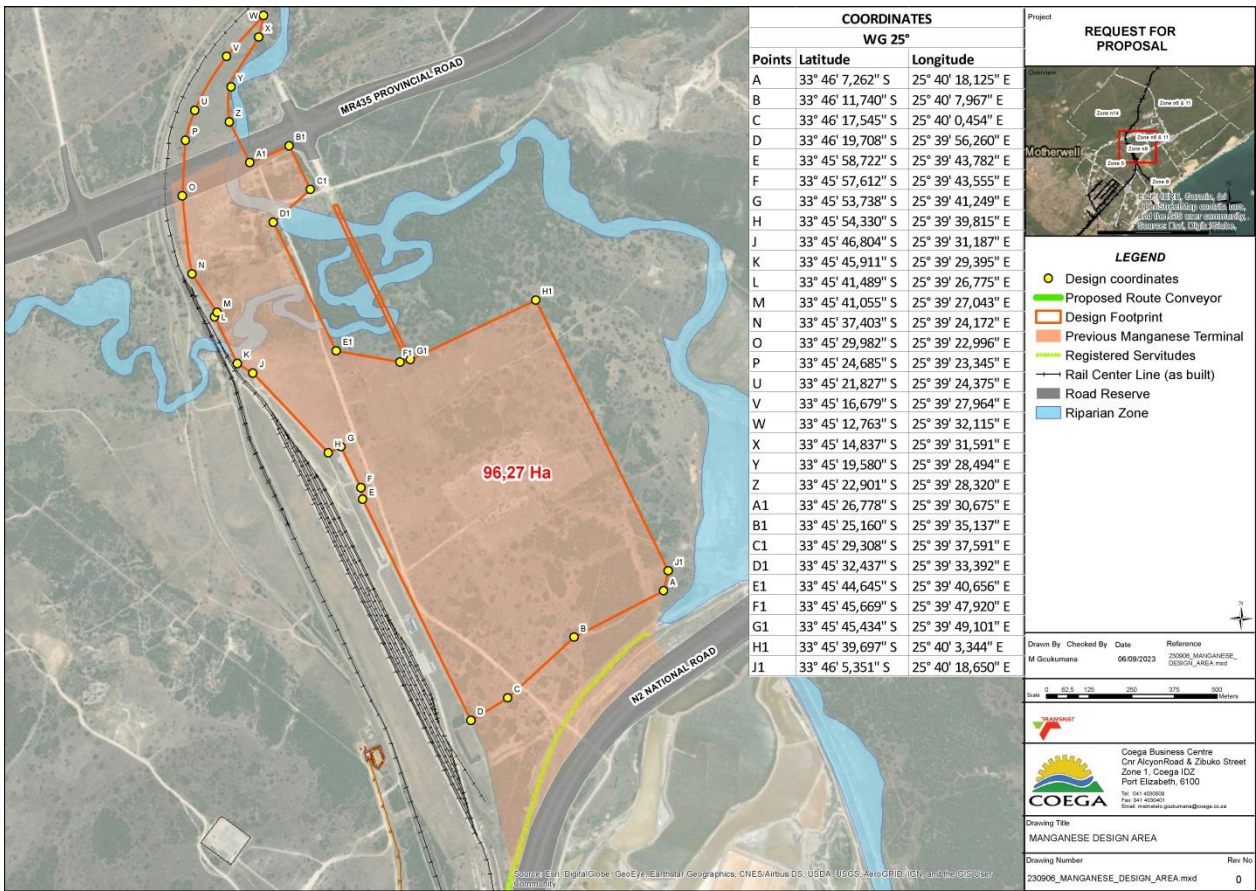
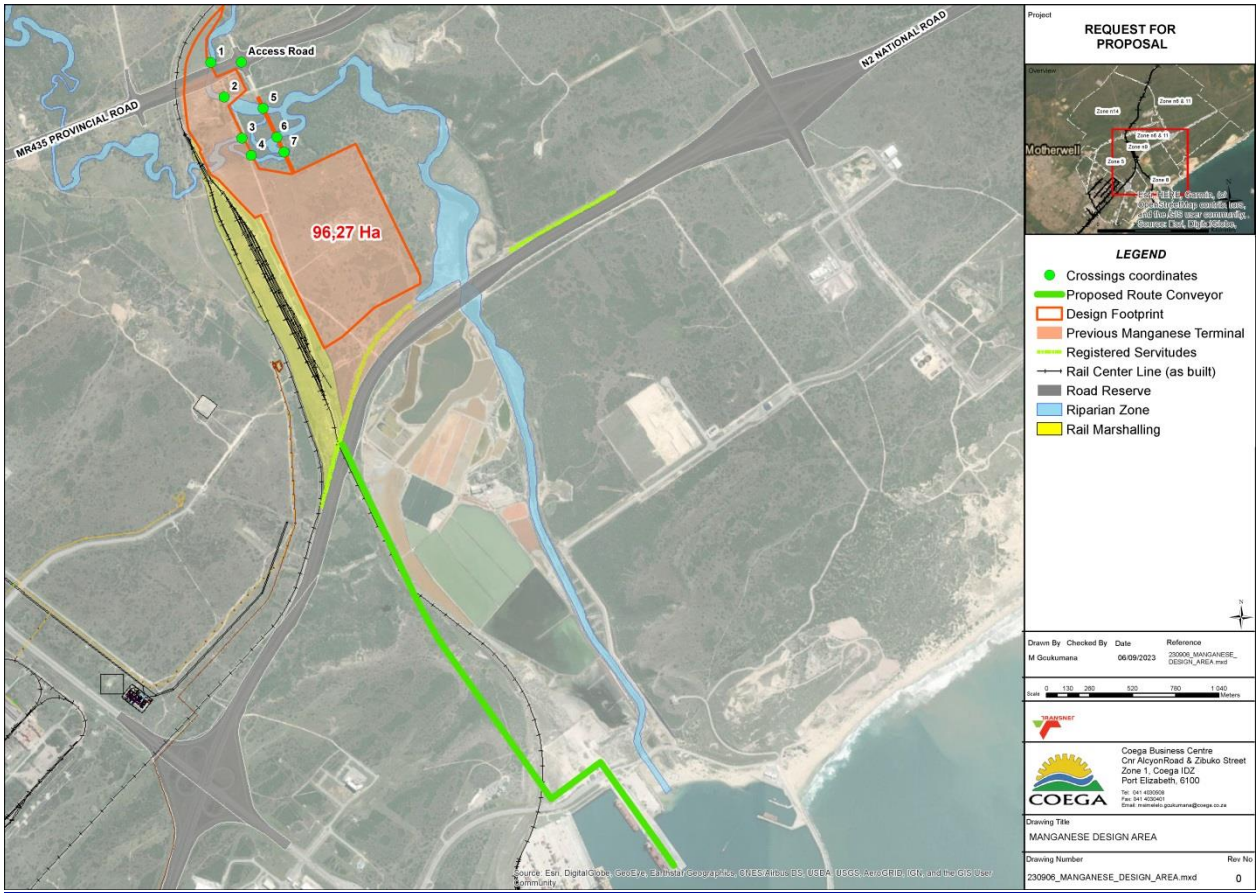
<u>Environmental Incident Register</u>					
<u>Compiled by:</u>	<u>Submitted to:</u>	<u>Date submitted:</u>	<u>Remedial / Corrective Actions Approved by:</u>	<u>Date approved:</u>	<u>Closed out by &amp; Date:</u>
<u>Signature:</u>			<u>Signature:</u>		<u>Signature:</u>
<b><u>Details of Incident</u></b>	<p><u>Date &amp; time incident occurred:</u></p> <p><u>Describe locality and detail of incident which occurred:</u></p> <p><u>Person's involved in incident:</u></p> <p><u>Significant / Minor Incident</u></p> <p><u>Non-Compliance Notice issued (for significant incidents):</u></p> <p><u>Photographic evidence provided (where relevant and appropriate):</u></p>				
<b><u>Action</u></b>	<p><u>Describe remedial / corrective actions required:</u></p> <p><u>Date remedial actions are to be addressed by:</u></p> <p><u>Date remedial actions were undertaken:</u></p>				
<b><u>Comments</u></b>	<u>Any additional notes/comments</u>				

**APPENDIX 3: EXAMPLE - COMPLAINT REGISTER**

<u>Complaints Register</u>					
<u>Compiled by:</u>	<u>Submitted to:</u>	<u>Date submitted:</u>	<u>Remedial / Corrective Actions Approved by:</u>	<u>Date approved:</u>	<u>Closed out by &amp; Date:</u>
<u>Signature:</u>			<u>Signature:</u>		<u>Signature:</u>
<b><u>Details of Complaint</u></b>	<u>Name and contact details of complainant:</u>  <u>Date &amp; time of complaint:</u>  <u>Description of complaint:</u>  <u>Photographic evidence provided (where relevant and appropriate):</u>				
<b><u>Action</u></b>	<u>Describe remedial / corrective actions required:</u>  <u>Date remedial actions are to be addressed by:</u>  <u>Date remedial actions were undertaken:</u>  <u>Response provided to complainant:</u>				
<b><u>Comments</u></b>	<u>Any additional notes/comments</u>				

# APPENDIX 4: SITE MAP





## APPENDIX 5: EAP CV

CEN  
Integrated Environmental Management Unit  
Reg No: 1996/032402/23



Lucille Behrens: 082 922 1645 [lucille@environmentcen.co.za](mailto:lucille@environmentcen.co.za)

### CURRICULUM VITAE

#### LUCILLE BEHRENS (maiden name Van Staden)

Name of Firm	CEN Integrated Environmental Management Unit
Date of birth	20 August 1976
Position in Firm	Senior Environmental Scientist
Specialisation	Environmental Management
Nationality	South African
Years of experience	18
HDI Status	White female, no disabilities
Languages	English, Afrikaans

#### KEY QUALIFICATIONS

Lucille has 18 years' experience in the Environmental Management field. Lucille has undertaken a number of Environmental Impact Assessments (i.e. Basic Assessments; Scoping and EIA) under the EIA Regulations of 2006, 2010 and 2014. Her roles have included being the Environmental Assessment Practitioner (EAP), Assistant EAP, Project Manager and Environmental Scientist for EIA related projects. Her responsibilities have included undertaking environmental assessments, compilation of regulated EIA's (i.e. scoping reports, EIA reports, Basic assessments and EMPs) and incorporating specialists into the EIA team for any required specialist studies. Lucille has also undertaken and been involved with the regulated public participation process required for EIAs.

Her experience in compiling environmental management plans relate to construction, maintenance operations and wildlife management. Lucille has been involved in environmental compliance monitoring and auditing (environmental control officer) on a number of construction sites and borrow pits. She has also gained experience in GIS mapping.

Lucille has also been involved in waste studies and sustainable development projects, for example green procurement, elimination of illegal dumping strategies and water conservation and demand management plan.

#### EDUCATION

Qualification	Institution	Year
BSc (Hons) (Environmental Monitoring and Modelling)	UNISA	2008
BSc (Environmental Management)	UNISA	2005
BA (Hons) (Criminology)	University of Pretoria	1998
BA	University of Pretoria	1997

#### COURSES & CONFERENCES

Course / Conference	Date
Management Training Session – Nelson Mandela Metropolitan University: Business School	2006
The Environment And the Project Cycle	March 2008

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Technical and Business Report Writing	March 2009
Institute of Waste Management South Africa – Eastern Cape Mini Conference	August 2009
Project Management, Incl. MS Projects	March 2010
Legal Workshop on the Key Implications of the National Environmental Management: Integrated Coastal Management Act	April 2010
Environmental Awareness and Legal Liability for Management	May 2010
Green Star SA Accredited Professional Course	September 2011
WASTECON	October 2012
Contaminated Land Workshop	February 2013
Water Law in South Africa Workshop	August 2013
Institute of Waste Management of Southern Africa – Eastern Cape Conference: The Green Revolution	September 2013
National Wetlands Indaba	October 2013
IWRM, the NWA, and Water Use Authorisations, focusing on Water Use License Applications – Procedures, Guidelines, IWWMP's and Monitoring, Carin Bosman Sustainable Solutions	September 2014
Water Use Licence Training – Section 21 c and i water use activities	August 2016
ISO 14001:2015 Environmental Management Systems Implementation	August 2016
Renewable Energy Workshop	June 2020
IAIAsa Virtual Symposium	October 2020
Council for Geoscience Conference 2021	March 2021
Environmental Law Update Workshop	April 2021
IAIAsa Climate Impact Assessment Webinar	May 2021

**PROFESSIONAL MEMBERSHIP / REGISTRATION**

Institution Name	Membership	Year Joined
International Association of Impact Assessments (South Africa)	Member (No. 2668)	2010
Environmental Assessment Practitioners Association of South Africa (EAPASA)	Registered EAP 2016/38	2019

**EMPLOYMENT RECORD****August 2013 – Present: CEN IEM Unit**

On 1 August 2013, Lucille joined the CEN Integrated Environmental Management Unit as **Senior Environmental Scientist**. Her responsibilities include:

- Project management,
- Environmental Impact Assessments (basic assessment, scoping and EIA and associated public participation),
- Co-ordinating and assessing specialist studies,
- Environmental Management Plans/Programmes,
- Environmental Compliance Monitoring,
- GIS mapping.

**July 2007 – July 2013: BKS (Pty) Ltd / AECOM SA (Pty) Ltd**

On 1 October 2012 Lucille was appointed as a **Senior Environmental Scientist** for the Infrastructure and Management Sector of BKS in Port Elizabeth after BKS and its subsidiaries rebranded on 1 November 2012 to become AECOM SA (Pty) Ltd. Her responsibilities included:

- Project management, including financial management on projects,
- Environmental Impact Assessments (basic assessment, scoping and EIA and associated public participation),
- Co-ordinating and assessing specialist studies,
- Environmental Management Plans/Programmes,
- Environmental Compliance Monitoring,



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- Waste and Sustainability Strategies,
- Business development focusing within the Eastern Cape, KwaZulu Natal.
- GIS mapping.

In 2009, Lucille was promoted to **Senior Environmental Scientist** and was responsible for project management, environmental impact assessments (basic assessment, scoping and EIA and associated public participation), environmental management plans, environmental compliance monitoring, waste and sustainability strategies within the Eastern Cape.

In 2007, Lucille joined BKS (Pty) Ltd as an **Environmental Scientist**. Her responsibilities included undertaking environmental impact assessments (basic assessment, scoping and EIA and associated public participation), compiling environmental management plans and undertaking environmental compliance monitoring.

#### **August 2000 – June 2007: Shamwari Game Reserve (Mantis Collection)**

Lucille was the **Wildlife / Environmental Co-Ordinator** for Shamwari Game Reserve (Mantis Collection) from November 2003 – June 2007. During this time, her responsibilities included the following:

Compiling environmental management plans for construction operations and wildlife management for reserves in South Africa, United Arab Emirates and Morocco. Undertaking environmental compliance monitoring of construction sites within game reserves. Monitoring environmental aspects (e.g. water usage) within Mantis game reserves and organising related wildlife permits.

In November 2001, Lucille transferred to the Wildlife Department as the PA to the Wildlife Director.

In 2000, Lucille joined Shamwari Game Reserve and during this time her roles included Personal Assistant to the General Manager, Switchboard Operator and Reservationist.

#### **June 1999 – July 2000: Formax**

Computer room supervisor, Data Capturer

#### **1997: University of Pretoria**

Practical Tutor, Information Science Department

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### **EXPERIENCE RECORD – SELECTED PROJECTS**

#### **ENVIRONMENTAL IMPACT ASSESSMENTS:**

- Scoping and Environmental Impact Assessment for the Proposed Seraphim Solar Cell Facility in the Coega SEZ, Nelson Mandela Bay Municipality – *Seraphim Energy*
  - Scoping and Environmental Impact Assessment for the Proposed Newlyn Manganese Storage and Conveyor Facility in Coega SEZ, Nelson Mandela Bay Municipality – *Newlyn Group*
  - Basic Assessment for the Proposed Beenleegte Hydro Power Facility in Somerset East - *Navitas*
  - Basic Assessment for the Proposed Little Fish Hydro Power Facility in Somerset East - *Navitas*
  - Basic Assessment for the Proposed Coegakop Wellfield and Water Treatment Works – *NMBM*
  - Basic Assessment for the Upgrading of the Emsengeni Access Road, Kirkwood – *LA Consulting Engineers*
  - Basic Assessment for the Proposed Stormwater Management Infrastructure in Colchester, Nelson Mandela Bay Municipality - *NMBM*
  - Basic Assessment for the Proposed Alexandria Community Health Centre - *Archworxs*
  - Scoping & Environmental Impact Assessment for the Kei Road Water Conveyance (pipeline and water treatment works) - *Aurecon*
  - Basic Assessment for the St Francis Stormwater Upgrade - *Aurecon*
  - Basic Assessment for the Patensie Prison Waste Water Treatment Works - *Aurecon*
  - Basic Assessment for the Proposed SACE Ranger PV Plant, Uitenhage – *SACE*.
-

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- Basic Assessment of the Proposed Clearing of Vegetation for Fence Construction at SAPS Training Institute, Addo, Sundays River Valley Municipality – *Engineering Advice & Services*.
- Basic Assessment for Construction and Operation of a Filling Station with Rest and Retail Facilities, an Agri-Business Retail / Wholesale Facility adjacent to the Nanaga Farm Stall on the Remainder of Portion 8 Nanaga Hoogte No 229, Sundays River Valley Municipality – *Pantheon Trust*
- Scoping & Environmental Impact Assessment for the Malabar Extension 6 Phase 2 Housing Development, Nelson Mandela Bay Municipality, Eastern Cape – *NMBM (undertaken whilst in employ at AECOM)*
- Scoping & Environmental Impact Assessment for the Residential Development on Farm Grants Valley 396/2, Ndlambe Municipality – *ACME Capital (undertaken whilst in employ at BKS)*

**ENVIRONMENTAL MANAGEMENT PROGRAMMES:**

- Environmental Management Programme for the Kirkwood Revitalisation Programme within the Sundays River Valley Municipality - *LA Consulting Engineers*
- Environmental Management Programme for the Rural Roads Prioritized Infrastructure Project within the Sundays River Valley Municipality - *LA Consulting Engineers*
- Coastal Management Programme for the Nelson Mandela Bay Municipality

**ENVIRONMENTAL COMPLIANCE MONITORING:**

- Environmental Control Officer: Coegakop Wellfield Phase 1: Drilling of boreholes and installation of bulk water pipelines in Port Elizabeth – *Aurecon*
- Environmental Control Officer: Upgrading of Roads and Stormwater in Valencia, Addo – *LA Consulting Engineers*
- Environmental Control Officer: Upgrading of Roads and Stormwater in Emsengeni, Kirkwood – *LA Consulting Engineers*
- Environmental Control Officer: Construction of the Kuyga Rising Main – *Hatch Goba*
- Environmental Control Officer: Upgrading of Access Roads in Moses Mabida, Kirkwood – *LA Consulting Engineers*
- Environmental Control Officer: Upgrading of Stormwater Infrastructure in Summerstrand – *Hatch Goba*
- Environmental Control Officer: Upgrading of Roads and Stormwater in Nomathamsanqa, Addo – *LA Consulting Engineers*

**WATER USE LICENCE APPLICATIONS (WULA):**

- WULA for the Proposed Beenleegte Hydro Power Facility in Somerset East - *Navitas*
- WULA for the Proposed Little Fish Hydro Power Facility in Somerset East - *Navitas*
- WULA for the Proposed Coegakop Wellfield and Water Treatment Works – *NMBM*
- WULA for the Upgrading of the Emsengeni Access Road, Kirkwood – *LA Consulting Engineers*
- WULA for the Proposed Malabar Phase 2 Extension 6 Housing Development - *NMBM*
- WULA for Proposed Gqunu Village Bridge Crossing and Road Upgrades - *Department of Land Reform and Rural Development*.

**SUSTAINABILITY / OTHER PROJECTS:**

- Due Diligence for Zone 10 of the Coega Special Economic Zone – *Coega Development Corporation*
- Environmental Sensitivity Review for the Kirkwood Revitalisation Programme within the Sundays River Valley Municipality - *LA Consulting Engineers*
- Environmental Sensitivity Review for the Rural Roads Prioritized Infrastructure Project within the Sundays River Valley Municipality - *LA Consulting Engineers*
- Environmental Screening Assessment for Portion 62 of Ongegunde Vryheid No 746, St Francis – *Aurecon*

**Environmental Assessment  
Practitioners Association  
of South Africa**



Registration No. 2016/38

***Herewith certifies that***

Lucille Behrens

***is registered as an***

**Environmental Assessment Practitioner**

***Registered in accordance with the prescribed criteria of Regulation 15. (1)  
of the Section 24H Registration Authority Regulations  
(Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the  
National Environmental Management Act (NEMA), Act No. 107 of 1998, as  
amended).***

Effective: 01 March 2023

Expires: 29 February 2024

Chairperson

Registrar

