PART B:

DRAFT ENVIRONMENTAL MANAGEMENT PLAN

Contents

Tables

1 INTRODUCTION

This Draft Environmental Management Plan (EMP) is prepared as part of the requirements of the EIA Regulations promulgated under the National Environmental Management Act (NEMA, Act 107 of 1998) as amended 2010. The Draft EMP is to be submitted to the Eastern Cape Provincial Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) as part of the Application for Environmental Authorisation for the proposed OTGC Bulk Liquid Storage and Handling Facility within Zone 8 of the Coega Industrial Development Zone, Port of Ngqura (Reference Number: ECm1/LN2/M/11-57). This Draft EMP is made available for public comment, as part of the Draft EIA Report. Following the incorporation of comments from stakeholders, this EMP is intended as a "living" document and should continue to be updated regularly by OTGC.

1.1 ASPECTS OF THE PROPOSED ACTIVITIES

In 2009, Transnet National Ports Authority (TNPA) carried out a tender process in line with Section 56 of the National Ports Act No. 12 of 2005 and invited appropriate service providers to submit proposals to plan, design, fund, construct and operate a new Bulk Liquid Storage and Handling Facility on the designated 20 hectare tank farm site in the Port of Ngqura. Oiltanking Grindrod Calulo (PTY) Ltd (OTGC) were selected as the preferred bidder to construct and operate the Bulk Liquid Storage and Handling Facility in Zone 8 of the Coega Industrial Development Zone (IDZ) in the Port of Ngqura, located approximately 15 km north-east of Port Elizabeth within the Nelson Mandela Bay Municipality (NMBM) in the Eastern Cape Province.

The proposed project will comprise a Bulk Liquid Storage and Handling Facility, also referred to as a tank farm, which will consist of:

- storage tanks with a total combined capacity of approximately 790 000 m^3;
- road tanker loading gantries;
- rail tanker loading gantries (if the demand arises in the future);
- pipelines extending between the tank farm and the berth(s); and
- marine loading arms and other related infrastructure at the berth(s).

A detailed description of the proposed OTGC Bulk Liquid Storage and Handling Facility is contained in Chapter 2 of the Draft EIA Report; and a description of the affected environment is provided in Chapters 3 and Chapters 7 to 15 of the Draft EIA Report.

1.2 AUTHORS OF THE DRAFT EMP

The main authors of this Draft EMP are the CSIR Project Leader (Paul Lochner), Project Manager (Ismail Banoo), and Project Consultant (Rohaida Abed) undertaking the EIA for

the proposed OTGC Bulk Liquid Storage and Handling Facility. The co-authors of this Draft EMP are the specialists involved in the assessment of potential impacts identified during the EIA process. The name and role of all authors and co-authors are included in Table 1. Please note that the expertise of the authors and co-authors are highlighted in Appendix A of the Draft EIA Report.

Table 1: EMP Authors and Co-Authors

EIA MANAGEMENT TEAM		
Paul Lochner	CSIR	Project Leader (EAPSA) Certified
Ismail Banoo	CSIR	Project Manager (EAPSA) Certified
Rohaida Abed	CSIR	Project Consultant
SPECIALIST TEAM		
Alison Dehrman	Peak Practice	Oil Spill Contingency Plan Review
Dr. Robin Carter	Lwandle Technologies	Marine Ecology Assessment
Jamie Pote	Private Consultant	Terrestrial Ecology (Particularly Vegetation)
Michael Oberholzer	RisCom	Risk Assessment
Benton Pillay	Umoya-Nilu Consulting	Air Quality Assessment
Philip De Souza	Emanti Management	Integrated Water Management Study
Roy Bowman	SSI Engineers and Environmental Consultants	Traffic Impact Assessment
Dr. Johan Binneman	Eastern Cape Heritage Consultants	Heritage Impact Assessment: Archaeological Impact Assessment
Dr. John Almond	Natura Viva	Heritage Impact Assessment: Palaeontological Impact Assessment
Ronelle Potgieter	Poltech EC	Waste Specialist Study

2 APPROACH TO PREPARING THE EMP

2.1 Compliance with relevant Legislation

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

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

Requirements of Section 33 of the EIA Regulations (Government Gazette 18 June 2010, as amended) and section 24N of the National Environmental Management Act, 1998 (Act No. 107 of 1998)	Where it is included in this Draft EMP
(i) the person who prepared the environmental management programme; and (ii) the expertise of that person to prepare an environmental management programme;	Section 1 of the Draft EMP
b. information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of - (i) planning and design; (ii) pre-construction and construction activities; (iii) operation or undertaking of the activity; (iv) rehabilitation of the environment; and (v) closure, where relevant.	Mitigation objectives and management actions columns in Sections 4, 5, 6 and 7
c. a detailed description of the aspects of the activity that are covered by the draft environmental management programme;	Section 1 of the Draft EMP
d. an identification of the persons who will be responsible for the implementation of the measures contemplated in paragraph (b);	Section 3 of the Draft EMP and Monitoring - Responsibility column of Sections 4, 5, 6 and 7
e. proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon;	Monitoring - Methodology column of Sections 4, 5, 6 and 7
f. as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development, including, where appropriate, concurrent or progressive rehabilitation measures	Sections 4, 5, 6 and 7
g. a description of the manner in which it intends to - (i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) remedy the cause of pollution or degradation and migration of pollutants; (iii) comply with any prescribed environmental management standards or practices; (iv) comply with any applicable provisions of the Act regarding closure, where applicable; (v) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Sections 4, 5, 6 and 7
h. time periods within which the measures contemplated in the environmental management programme must be implemented;	Monitoring - Frequency column of Sections 4, 5, 6 and 7
i. the process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity;	Management actions column of Sections 4, 5, 6 and 7
j. an environmental awareness plan describing the manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work; and risks must be dealt with in order to avoid pollution or the degradation of	Sections 4, 5, 6 and 7

Requirements of Section 33 of the EIA Regulations (Government Gazette 18 June 2010, as amended) and section 24N of the National Environmental Management Act, 1998 (Act No. 107 of 1998)	Where it is included in this Draft EMP
the environment;	
k. where appropriate, closure plans, including closure objectives.	n/a (a closure plan will need to be prepared if and when the facility is decommissioned, in accordance with best practice and legislative requirements applicable at the time)

2.2 Content of the Draft EMP

The Draft EMP includes the findings and recommendations of the EIA process and specialists impact assessments. However, the Draft EMP is considered a "live" document and must be updated with additional information or actions during the design, construction and operational phases if applicable.

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

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

- Goal: Over-arching environmental goal proposed for the OTGC Bulk Liquid Storage and Handling Facility Project in the Port of Ngqura.
- Objectives: The objectives necessary in order to meet the goal; these take into account the findings of the specialist studies.
- Management actions: The actions needed to achieve the objectives, taking into consideration factors such as responsibility, methods, frequency, resources required and prioritisation.
- Monitoring: The key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods and reporting.
- Criteria/targets: The criteria or targets that indicate the efficacy of the management plan. The targets should be readily measurable, understandable to the layperson, cost-effective to monitor, and meet legal requirements.
- Remedial actions: Where necessary, actions to be undertaken if the targets are not being met; or if there is a catastrophic event.

2.3 Goal of Environmental Management

The overall goal for environmental management for the proposed OTGC Bulk Liquid Storage and Handling 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 and freshwater ecosystems;
- 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 Bulk Liquid Storage and Handling Facilities in a South African context.

3 ROLES AND RESPONSIBILITIES

For the purposes of the EMP, the generic roles that need to be defined are those of the:

- Project Developer;
- Environmental Control Officer (ECO)/ Environmental Health and Safety (EHS) Manager;
- Construction Manager;
- Terminal Manager.

Note: It is acknowledged that the specific titles for these functions will vary from project to project. The intent of this section is to give a generic outline of what these roles typically require. It is expected that this will be appropriately defined at a later stage.

3.1.1 PROJECT DEVELOPER

The Project Developer (i.e. Oiltanking Grindrod Calulo (PTY) Ltd) is the 'owner' of the project and as such is responsible for ensuring that the conditions of the environmental authorisation issued in terms of NEMA (should the project receive such authorisation) are fully satisfied, as well as ensuring that any other necessary permits or licenses are obtained and complied with. It is expected that the Project Developer will appoint the Construction Manager and the Terminal Manager.

3.1.2 ENVIRONMENTAL CONTROL OFFICER/EHS MANAGER

The responsibility of the Environmental Control Officer (ECO) or Environmental Health and Safety (EHS) Manager include overseeing the implementation of the EMP during the construction and operations phases, and monitoring environmental impacts, record-

keeping and updating of the EMP as and when necessary. In addition to the responsibility for implementing the EMP, the ECO is also responsible for monitoring compliance with the conditions of the Environmental Authorisation that may be issued to Oiltanking Grindrod Calulo (Pty) Ltd.

The lead contractor and sub-contractors may have their own ECOs, or designate ECO functions to certain personal.

During *construction*, the Project Developer's Environmental Control Officer will be responsible for the following:

- Meeting on site with the Construction Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones;
- Weekly or bi-weekly (i.e. every two weeks) monitoring of site activities during construction to ensure adherence to the specifications contained in the EMP, using a monitoring checklist that is to be prepared by the ECO at the start of the construction phase;
- Preparation of the monitoring report based on the weekly or bi-weekly site visit;
- Reporting of any non-conformances within 48 hours of identification of such non-conformance to the relevant agents;
- Conducting an environmental inspection on completion of the construction period and 'signing off' the construction process with the Construction Manager.

During *operation*, the Environmental Control Officer will be responsible for:

- Overseeing the implementation of the EMP for the operation phase;
- Ensure that the necessary environmental monitoring takes place as specified in the EMP; and
- Update the EMP and ensure that records are kept of all monitoring activities and results.

During *decommissioning*, the Environmental Control Officer will be responsible for:

- Overseeing the implementation of the EMP for the decommissioning phase; and
- Conducting an environmental inspection on completion of decommissioning and 'signing off' the site rehabilitation process.

At the time of preparing this EMP, the ECO appointment is still to be made by the proponent. The appointment is dependent upon the project proceeding to the construction phase.

3.1.3 LEAD CONTRACTOR

The lead contractor will be responsible for the following:

- Overall construction programme, project delivery and quality control for the construction of the proposed Bulk Liquid Storage and Handling Facility project.
- Overseeing compliance with the Health, Safety and Environmental Responsibilities specific to the project construction.
- Promoting total job safety and environmental awareness by employees, contractors and sub-contractors and stress to all employees and contractors and sub-contractors the importance that the project proponent attaches to safety and the environment.
- Ensuring that each subcontractor employ an ECO (or have a designated ECO function) to monitor and report on the daily activities on-site during the construction period;
- Ensuring that safe, environmentally acceptable working methods and practices are implemented and that sufficient plant and equipment is made available, is properly operated and maintained in order to facilitate proper access and enable any operation to be carried out safely.
- Meeting on site with the Environmental Control Officer prior to the commencement of construction activities to confirm the construction procedure and designated activity zones;
- Ensuring that all appointed contractors and sub-contractors are aware of this EMP and their responsibilities in relation to the programme;
- Ensuring that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMP, to the satisfaction of the Project Developer's Environmental Control Officer.

At the time of preparing this EMP, the appointment of a lead contractor has not been made and will depend on the project proceeding to the construction phase.

3.1.4 TERMINAL MANAGER

The Terminal Manager will be responsible for the following:

- Operation of the Bulk Liquid Storage and Handling Facility.
- Required maintenance of the facility.

4 MANAGEMENT PLAN FOR DESIGN PHASE

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
A. RISK ASSESSMENT							
1. Design of the Pipelines from the berth to the tank farm							
Prevent pipeline failures and loss of containment.	Fires and explosions.	a) It is recommended that the transferring pipelines between the berth and the tank farm are fully compliant with the ASME B31 code or an equivalent code to prevent pipeline failures.	Ensure that the pipelines are designed to be compliant with the ASME B31 code or an equivalent code. Ensure that the pig lines are clean of product when not in operations.	Once-off during design phase.	Project Developer (OTGC)	Zero pipeline failures.	None identified.
		b) Evaluate the potential of burying the pipeline which would reduce the fire and explosion distances.	Ensure that this is taken into consideration during the design phase (this however could result in accelerated corrosion).	Once-off during design phase.	Project Developer (OTGC)		
		c) It is recommended that the engineers demonstrate that pressure surges would not occur due to the operation of the pipeline, or that maximum pressure surges have been incorporated into the design such that the pipeline or associated equipment would not be	Ensure that this is taken into consideration during the design phase.	Once-off during design phase. Test pipeline on yearly basis.	Project Developer (OTGC)		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		damaged and would not result in a loss of containment of the transported material.					
		d) It is recommended that the pipeline designs ensure that reverse flow from the storage containment is not a plausible scenario.	Ensure that this is taken into consideration during the design phase.	Once-off during design phase.	Project Developer (OTGC)		
2. Design of the LPG Storage and Road Tanker Filling							
Prevent failures and loss of containment.	Fires and explosions.	a) Ensure full compliance with SANS 10087 standard.	Ensure that the pipelines are designed to be compliant with the SANS 10087 code.	Once-off during design phase.	Project Developer (OTGC)	Zero failures.	None identified.
		b) Ensure full compliance with SANS 10108 covering the types of electrical instrumentation required for the process in order to reduce ignition sources.	Ensure that the pipelines are designed to be compliant with the SANS 10108 code.	Once-off during design phase.	Project Developer (OTGC)		
		c) It is recommended that compliance with the IEC 61508/11 code is achieved.	Ensure that this is taken into consideration during the design phase. Ensure operation of overfill protection.	Once-off during design phase.	Project Developer (OTGC)		
3. Design of Bulk Atmospheric Storage at the tank farm and road gantry							
Prevent failures and loss of containment.	Fires and explosions.	a) Ensure full compliance with SANS 10089 standard.	Ensure that the pipelines are designed to be compliant with the SANS 10089 code.	Once-off during design phase.	Project Developer (OTGC)	Zero failures.	None identified.
		b) Ensure full compliance with	Ensure that the pipelines are	Once-off	Project		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		SANS 10108 covering the types of electrical instrumentation required for the process in order to reduce ignition sources.	designed to be compliant with the SANS 10108 code.	during design phase.	Developer (OTGC)		
		c) It is recommended that compliance with the IEC 61508/11 code is achieved.	Ensure that this is taken into consideration during the design phase.	Once-off during design phase.	Project Developer (OTGC)		
		d) It is recommended that the Buncefield recommendations are applied to the OTGC Tank Farm where applicable. Mitigation against overfilling is applicable to the OTGC Tank Farm project.	Ensure that this is taken into consideration during the design phase.	Once-off during design phase.	Project Developer (OTGC)		
4. Design of Rail Gantry							
Reduce overfilling and concomitant spillage, fire and explosions.	Fires and explosions.	a) Inclusion of a fully-automated loading system at the rail gantry would reduce the probability of overfilling and associated fires and explosions.	Ensure that this is taken into consideration during the design phase.	Once-off during design phase.	Project Developer (OTGC)	Zero failures/ overfilling.	None identified.

5 MANAGEMENT PLAN FOR CONSTRUCTION PHASE

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
A. OIL SPILL CONTINGENCY							
1. Minimise the risk of oil spills as a result of leaks from construction vehicles during equipping the berth, construction activities and pipeline installation.							
Prevent spillages from construction vehicles and equipment during construction.	Contamination of the Port of Ngqura through spillage of fuels and oils during construction activities.	a) Undertake orientation training for all construction staff. Ensure that new construction staff are inducted.	Conduct staff environmental awareness training.	Once-off training and ensure all new staff are inducted.	ECO	Minimal spillage of fuel, oil or grease on site.	Rapid removal, cleaning and replacement of any soil contaminated by fuel, oil or grease.
		b) Ensure good vehicle maintenance.	Construction equipment is checked daily (by Contractor) and weekly (by the ECO) to ensure that no fuel spillage takes place from construction vehicles or machinery.	Daily and Weekly	Contractor and ECO		
		c) Ensure that a standby oil response kit (to remedy spills) is kept on site and is available and ready for use as required.	ECO to monitor that a standby oil response kit is kept on site and is maintained in a working order.	Weekly	ECO		
		d) Ensure immediate cleanup of spills.	Spilled fuel, oil or grease etc. is retrieved where possible, and contaminated soil removed, cleaned and replaced. Contaminated soil to be collected by the Contractor (under observation of ECO) and	Daily and Weekly	Contractor and ECO		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
			disposed of at a waste site designated for this purpose.				
		e) Ensure that debriefing takes place after spill events.	OTGC Project Manager to report to the Port Environmental Manager after spill events. Debriefing reports must be compiled and spill data recorded.	After all spill events.	Project Developer (OTGC)		
		f) Bunded containment to be provided below and around any fuel storage containers.	ECO to monitor the bunding requirements.	Weekly	ECO		
B. MARINE ECOLOGY							
2. Disruption of benthic communities alongside the quay wall in the Port of Ngqura as a result of being smothered by concrete/cement slurry or debris.							
Reduce the disruption of benthic communities alongside the quay wall in the Port of Ngqura as a result of being smothered by concrete/cement slurry or debris.	Incorrect disposal of concrete, cement or debris during the construction phase.	a) The Construction Phase Environmental Management Plan must detail how waste cement and concrete will be handled and prohibit unauthorized disposal off the quay. The Transnet Capital Projects Construction EMP and Standard Environmental Specifications must be taken into consideration.	The Contractor and the Project Developer must ensure that the Construction Phase EMP is rigorously implemented.	Weekly	Project Developer (OTGC), Contractor and ECO	No waste storage or disposal on site and all waste should be disposed of as specified in the Environmental Authorisation and relevant regulations (as applicable).	The ECO to be notified within 24 hours of any waste spillage incidents on site (e.g. fuel spillage). ECO and Construction Manager to ensure necessary clean-up actions taken.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
C. TERRESTRIAL ECOLOGY							
3. Loss of Vegetation Habitat							
Minimise the loss of vegetation habitat (Grassridge Bontveld, Sundays Valley Thicket, and Riparian and Salt Marsh Vegetation).	Construction impacts not properly managed and "no go" areas for construction are not enforced.	a) Search and Rescue to be undertaken before/during construction. Endemic and protected plants must be removed from the 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. These plants can be replanted in adjacent areas, moved to the IDZ nursery (or any suitable nursery) or used in rehabilitation.	Search and Rescue to be audited and species recorded.	Daily/Weekly	ECO and Search and Rescue Contractor	Negligible impact on the designated conservation networks and areas.	None identified.
		b) Permission must be obtained from the provincial authorities to destroy or remove any protected plant species.	ECO and Project Developer to ensure that the relevant permits and licenses are applied for and obtained.	Once-off prior to vegetation removal of protected species.	ECO and Project Developer (OTGC)		
		c) Vegetation clearing must be limited to the required construction footprint.	ECO to monitor vegetation removal and clearing during construction.	Daily/Weekly	ECO and Contractor		
		d) Post construction rehabilitation to be undertaken.	ECO to monitor post construction rehabilitation (existing rehabilitation documents compiled by Transnet National Ports Authority (TNPA) should be	Weekly	ECO and Contractor		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
			consulted).				
		e) The construction site must be clearly demarcated prior to the commencement of construction. "No-go" areas must be demarcated clearly (using fencing and/or appropriate signage) before construction commences.	ECO to monitor demarcation of construction and no-go areas.	Weekly	ECO and Contractor		
		f) Contractors and construction workers must be clearly informed of the "no-go" areas on site and held accountable for any infringements that may occur. A suitable control measure (such as a penalty system) should be implemented to discourage infringement by contractors on the "no-go" areas.	ECO to monitor infringements on no-go areas.	Weekly	ECO and Contractor		
		g) 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.	ECO to monitor activities in no-go areas.	Weekly	ECO and Contractor		
		h) Any additional project footprint (e.g. for construction and lay-down areas) should be sited in areas approved in consultation with the ECO of the Coega IDZ and Port of Ngqura, and preferably in areas where habitat is	ECO to monitor infringements on no-go areas.	Weekly	ECO and Contractor		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		already transformed.					
4. Loss of Species of Special Concern and SSC Habitat							
Minimise the loss of species of special concern (SSC) and SSC habitat (Grassridge Bontveld, Sundays Valley Thicket habitat, and floral SSC).	Loss of species of special concern through poor on-site management during construction.	a) Vegetation clearing must be limited to the required footprint.	ECO to monitor vegetation removal and clearing during construction.	Daily/Weekly	ECO and Contractor	Zero or close to zero loss of readily identifiable species of special concern on the project site species.	None identified.
		b) A plant search, rescue and relocation plan/operation must be conducted before any site clearing and construction occurs, especially within areas having intact vegetation.	A list of relocated flora to be compiled as part of the site audit.	Daily/Weekly	ECO		
		c) Relocation of protected flora to be undertaken with necessary permits by appointed professional.	If SSC have to be moved or relocated, the relevant permits need to be obtained. The ECO must ensure that the Project Developer (OTGC) has obtained the relevant permits prior to vegetation removal.	Once-off (prior to vegetation clearing).	ECO and Project Developer (OTGC)		
		d) Species of Special Concern (SCC) and protected plant species must be removed from the site prior to development taking place, in so far as reasonably possible. Plants that can be used during rehabilitation should be identified and stored appropriately off-site for use after construction and alien vegetation clearing. A suitable timeframe must be allowed before construction commences to undertake the plant	ECO to monitor vegetation removal and clearing during construction.	Daily/Weekly	ECO and Contractor		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		rescue and relocation.					
		e) Post construction rehabilitation to be undertaken.	ECO to monitor post construction rehabilitation (existing rehabilitation documents compiled by Transnet National Ports Authority should be consulted).	Weekly	ECO and Contractor		
5. Fragmentation of Habitats							
Reduce fragmentation of habitats.	Changes to ecological processes and functioning.	a) Vegetation clearing must be limited to the required footprint and rehabilitated immediately after construction.	ECO to monitor vegetation removal and clearing during construction, as well as rehabilitation.	Daily/Weekly	ECO and Contractor	Zero or close to zero fragmentation of habitats.	None identified.
		b) Construction areas to be kept to a minimum by limiting clearing of vegetation and demarcating the construction area appropriately.	Construction activities to be monitored and audited.	Daily/Weekly	ECO and Contractor		
6. Increased Risk of Alien Invasion							
Reduce alien plant invasion within the construction area.	Alien plant species may pose a threat to the re-establishment of indigenous species.	a) A long-term alien plant management plan to remove, monitor and control invasive plant species must be implemented in conjunction with a suitably qualified expert. Alien plants must be removed from within the site surrounds, the pipeline servitude, and no-go areas.	An alien plant management plan must be developed, implemented within the site surrounds and pipeline servitude. Audit alien plant management and monitor occurrence of weedy and alien species.	Once-off prior to construction. Monthly	ECO, Specialist and Project Developer (OTGC) ECO	Removal of all alien species within the construction area.	None identified.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		b) Particular care must be given to seed bearing material minimising potential spread into surrounding areas. Any seed bearing alien plant material should be removed from site to prevent the spread of seed.	ECO to monitor the spread and removal of seed bearing material.	Monthly	ECO		
		c) Cleared alien vegetation 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).	ECO to monitor the removal and consequent storage of alien vegetation.	Weekly/ Monthly	ECO		
		d) Cleared vegetation must be removed from site or mulched for use in rehabilitation of the pipeline servitude. Any mulched material must be seed free.	ECO to monitor the removal of cleared vegetation.	Weekly/ Monthly	ECO		
		e) Kikuyu grass must NOT be utilised during re-grassing of any areas affected by the Tank Farm and pipeline development, particularly adjacent to riparian and/wetland habitats.	ECO to monitor the re-grassing activities and record non-compliance.	Weekly/ Monthly	ECO		
		f) Chopped brushwood can be used to stabilise steep areas that may be susceptible to erosion during clearing activities.	ECO to monitor activities and record non-compliance.	Weekly/ Monthly	ECO		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		g) A suitable revegetation or rehabilitation plan must be implemented after alien vegetation clearing.	ECO to monitor the implementation of the revegetation plan.	Prior to construction.	ECO		
7. Changes in Natural Fire Regime							
Reduce changes to natural fire regime.	Flammable litter and discarded glass bottles generated during the construction phase.	a) A fire management plan and awareness signage must be implemented.	ECO to carry out regular monitoring to ensure that the fire management plan recommendations are implemented, particularly within the pipeline servitude.	Monthly	ECO	Minimal changes to the natural fire regime.	None identified.
		b) Install signage along roads and pipeline to indicate potential fire risk in the area.	ECO to monitor the installation of signage along roads and the pipeline.	Monthly	ECO		
		c) Remove flammable litter and discarded glass bottles regularly.	ECO to monitor activities and record non-compliance.	Weekly/ Monthly	ECO		
8. Reduction in Ecosystem Functioning							
Improve ecosystem functioning.	Spread of alien plant species and loss of natural vegetation.	a) Pipeline servitude width to be kept to minimum.	Construction activities to be monitored and audited.	Daily/Weekly	ECO	Minimal changes in ecosystem functioning.	None identified.
		b) Alien species should be monitored and cleared when necessary.	Audit alien plant management and monitor occurrence of weedy and alien species.	Monthly	ECO		
		c) Avoid direct loss of natural vegetation outside of required footprint.	ECO to monitor vegetation removal and clearing during construction.	Daily/Weekly	ECO		
9. Loss of Faunal Habitat							

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
Reduce loss of faunal habitat.	Incomplete search and rescue.	a) Search and Rescue to be undertaken before/during construction and rehabilitation.	Pre-construction search and rescue.	Daily during implementation	Faunal Specialist	Minimal loss of faunal habitat.	None identified.
		b) Carry out monitoring for trapped/displaced fauna.	ECO to monitor activities via site audits and record non-compliance.	Weekly	ECO		
		c) Carry out monitoring for injured animals and death or injury (DoR) incidents.	ECO to monitor activities via site audits and record non-compliance.	Weekly	ECO		
10. Road Mortality from Trucks and other Service Vehicles							
Reduce the incidence of faunal road mortalities during the construction phase.	Construction vehicles travelling at excessive speed limits.	a) Carry out monitoring for injured animals and death or injury (DoR) incidents.	ECO to monitor activities via site audits and record non-compliance.	Weekly (and during rainfall for amphibians)	ECO	Zero or close to zero faunal road mortalities.	None identified.
11. Poaching							
Reduce the occurrence of poaching during the construction phase.	Construction personnel not trained adequately in terms of environmental awareness.	a) Carry out monitoring and checks of fences for snares.	ECO to monitor activities via site audits and record non-compliance.	Weekly	ECO	Zero poaching incidents.	None identified.
12. Impact of Fences on Fauna							
Reduce the harm of fauna by fences.	Establishment of construction fencing.	a) Carry out monitoring and checks of fences for trapped animals.	ECO to monitor via site audits and record non-compliance and incidents.	Weekly	ECO	Minimal harm to fauna.	None identified.
13. Faunal Corridor Disruptions as a result of Habitat Fragmentation							

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
Reduce the disruption of faunal corridors as a result of habitat fragmentation.	Inconsistent relocation of fauna that enter the construction area.	a) Carry out monitoring for displaced fauna.	ECO to monitor via site audits and record non-compliance and incidents.	Weekly	ECO	Minimal disruption of corridors.	None identified.
D. ARCHAEOLOGY							
14. Impact of the proposed construction on archaeological sites/remains (expose, disturb and displace archaeological sites/material).							
Identify and protect archaeological features/materials that may occur on the tank farm and pipeline sites.	Damage to or destruction of archaeological sites/remains that may occur on the tank farm and pipeline sites as a result of construction activities.	a) Appoint an archaeologist to inspect and survey the construction footprint for any archaeological sites/materials once the surface vegetation has been removed.	Monitoring to be conducted by an archaeologist prior to construction (when site has been cleared) and during bulk earthworks.	After vegetation clearing has taken place.	Project Developer (OTGC) and professional archaeologist.	Ensure that all archaeological finds are reported to South African Heritage Resources Agency (SAHRA), or nearest museum/ archaeologist.	If archaeological features are uncovered unexpectedly during construction, stop construction and consult an archaeologist or SAHRA.
		b) A site monitor should be trained to report to the site foreman when archaeological sites are found during construction (EHS Manager to be trained).	Monitor all levelling and trenching activities during the construction phase and report to the site foreman accordingly.	Throughout construction	Project Developer (OTGC) and Contractor		
		c) ECO to provide training for contractors and sub-contractors on site (prior to construction commencing) to assist them in identifying potential features of archaeological value which may be encountered during construction (in line with Appendix 14.E of the Draft EIA Report).	ECO to conduct training for all construction personnel.	Once-off during construction and ensure that all new staff are inducted.	ECO		
		d) All work must cease immediately if any human remains or	Monitor construction activities for the presence or	As required/ necessary	Project Developer (OTGC), ECO and		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		concentrations of archaeological material are exposed/ uncovered during construction and it must be reported immediately to the nearest museum/ archaeologist or to the SAHRA so that systematic and professional investigation/excavations can be undertaken. Relevant permits must be granted to a professional archaeologist by the SAHRA to remove such material.	discovery of any archaeological sites and human remains, and report the finds accordingly.	during construction	Contractor		
E. PALAEONTOLOGY							
15. Impact of the proposed construction on palaeontological features (destruction, disturbance or sealing-in of fossils on the ground or buried beneath the surface during excavations and other construction work).							
Identify and protect palaeontological features/materials that may occur on the tank farm and pipeline sites.	Damage to or destruction of palaeontological features (e.g. fossils) that may occur on the tank farm and pipeline sites as a result of construction activities.	a) A qualified palaeontologist must be appointed to inspect excavations: • greater than 3 m deep (while still open) within the tank farm footprint; • greater than 2 m deep (while still open) along the proposed pipeline route that lies close to the eastern bank of the Coega River at elevations of less than 20m amsl; and • greater than 2 m deep (while still open) for the proposed pipeline route east of the Coega River leading to the proposed new A-series berth.	Appoint a suitably qualified palaeontologist to inspect the excavations within the stipulated regions.	During stipulation excavations.	Project Developer (OTGC) and professional palaeontologist	No damage to any significant palaeontological features on site. Examination, documentation and/or removal of fossils by a palaeontologist.	ECO to inform the palaeontologist if any damages occur to features on site, and investigate options for mitigating damage.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		b) New excavations should be monitored for fossil material by the ECO throughout the construction phase.	ECO to monitor new excavations from fossil material.	Weekly during earthworks	ECO		
		c) If any substantial fossil remains are found these should be safeguarded, preferably *in situ*, and the Eastern Cape Provincial Heritage Resources Authority (ECPHRA) must be contacted and a qualified palaeontologist must be appointed 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). The palaeontologist will need to apply for a fossil collection permit from ECPHRA.	Contact ECPHRA and the identified palaeontologist if any palaeontological features are uncovered.	As required/ necessary during construction	Project Developer (OTGC), ECO and Contractor		
		d) The ECO must be alerted to the possibility of buried fossil heritage by familiarizing themselves with the recent palaeontological report for the Coega IDZ (Almond 2010a).	ECO to review the recent palaeontological reports for the Coega IDZ and Port of Ngqura in order to familiarize themselves with the types of buried fossil heritage	Prior to construction	ECO		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		e) ECO to provide training for contractors and sub-contractors on site to assist them in identifying potential features of palaeontological value.	ECO to conduct training for all construction personnel.	Once-off during construction and ensure that all new staff are timeously inducted.	ECO		
F. AIR QUALITY							
16. Degradation of air quality as a result of dust emissions during the construction phase.							
Reduce dust emissions during construction activities.	Dust emissions as a result of construction activities such as vehicle movements and vegetation clearing.	a) Ensure that removal of vegetation is limited to accommodate construction activities only.	ECO to monitor vegetation removal and clearing during construction.	Daily/Weekly	ECO and Contractor	Limited dust emissions.	None identified.
		b) Ensure unpaved site roads and access roads remain sufficiently moist throughout the construction period to suppress dust. Water can be used as a wetting or binding agent on the unpaved roads.	ECO to monitor dust suppression mechanisms and record non-compliances. ECO to maintain an incidents/complaints register, in which any complaints from the community must be logged. The date, time, nature of complaint, name of complainant and corrective actions must be logged for all complaints. Complaints must be investigated and, if appropriate, acted upon.	Weekly	ECO and Contractor		
		c) Implement traffic control measures on the construction site to limit vehicle-entrained dust from unpaved	ECO to monitor traffic control measures and report	Weekly	ECO and Contractor		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		roads. Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.	non-compliances.				
		d) Ensure that verges, cuttings, lay down areas and construction camps are re-vegetated immediately after the completion of the construction.	ECO to monitor re-vegetation of disturbed areas subsequent to construction.	After construction is complete.	ECO and Contractor		
G. INTEGRATED WATER MANAGEMENT							
17. Impact on regional water balance as a result of increased water use during construction.							
Reduce water usage during construction	Lack of water conservation techniques practiced by construction staff.	a) Water conservation to be practiced in line with Energy Saving Policies that the Project Developer has and as follows: • Implement water saving devices (dual flush toilets, automatic shut-off taps, etc.). • Avoid using potable water for irrigation purposes. Ideally, landscapes should be designed to absorb rainwater runoff (stormwater) and gardens should be structured so as to minimise surface run-off. Proper irrigation scheduling must be implemented in order to limit evaporation losses. • Cleaning methods utilised for cleaning vehicles, floors, etc. should aim to minimise water use (e.g. sweep before wash-down).	ECO to monitor via site audits and record non-compliance and incidents.	Monthly	ECO	Water conservation is practiced throughout construction.	None identified.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		• Ensure that regular audits of water systems are conducted to identify possible water leakages. • Proper metering and measurement of water use and wastewater discharges will enable proper performance review and management.					
		e) Carry out environmental awareness training to focus on water usage and spillages and the effects thereof on stormwater quality and the environment.	ECO to conduct training for all construction personnel.	Once-off during construction and ensure that all new staff are inducted.	ECO		
18. Domestic effluent collection in portable toilets/tanks for transport to appropriate treatment facility enters environment.							
Reduce the spillage of domestic effluent and the impact thereof on the environment.	Collection and transportation of domestic effluent from portable toilets/tanks.	a) Ensure that normal sewage management practices are implemented during construction such as regularly emptying toilets and ensure safe transport and disposal of sewage.	ECO to monitor via site audits and record non-compliance and incidents.	Monthly	ECO	Minimal spills of domestic effluent during transportation.	None identified.
		b) Ensure that all domestic effluent/wastewater is disposed at an appropriate location (i.e. sewage water treatment works) for treatment. Ensure that no discharge of wastewater to the land surface is permitted.	ECO to monitor via site audits and record non-compliance and incidents. ECO to audit disposal slips.	Monthly	ECO		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		c) Carry out environmental awareness training to ensure that all personnel on-site are aware of environmental requirements and only make use of the provided facilities for sanitation purposes.	ECO and Contractor's EHS Officer to conduct training for all construction personnel.	Once-off during construction and ensure that all new staff are inducted.	ECO and Contractor		
		d) Ensure that sufficient toilet and latrine facilities are provided on site (one facility for every 10 persons working on the site).	ECO and Contractor to monitor via site audits and record non-compliance and incidents.	Monthly	ECO and Contractor		
		e) Ensure that the toilet/sanitation facilities are maintained in a clean, orderly and sanitary condition.	ECO to monitor via site audits and record non-compliance and incidents.	Monthly	ECO and Contractor		
		f) Ensure that the toilet/sanitation facilities are regularly serviced and emptied.	ECO to monitor via site audits and record non-compliance and incidents.	Monthly	ECO		
		g) Ensure that the toilet/sanitation facilities are placed outside areas susceptible to flooding.	ECO to monitor via site audits and record non-compliance and incidents.	Monthly	ECO		
19. Construction wastewater discharge into the environment during construction.							
Reduce construction wastewater discharge into the environment and the impact thereof on the environment	During construction, the only process wastewater that will be generated will be from hydrostatic testing of tanks, pipes, etc.	a) Implement proper construction site management actions such as the installation of containment structures, good on-site housekeeping (regular sweeping of roadways and work areas, reporting systems and environmental awareness training), and spillage management. Spillage management may include the implementation of	ECO to monitor via site audits and record non-compliance and incidents.	Monthly	ECO	Minimal impact of construction wastewater discharge.	None identified.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		the following (where applicable and required): • correct storage of chemicals to ensure that packages and containers do not fall outside of the bunded area (e.g. pyramid packing, guardrails, wire meshes/shields). • a liquid-tight wall, or permanently installed secure bunds (an embankment or wall of brick, stone, concrete, etc). • a speed hump surrounding the storage area. • The floor sloping to a sump and using drain covers. • run-off draining system to an external holding pit or tank where chemicals can be collected for recycling. • an ultra spill-berm to stop chemicals from flowing (where required). • collapsible and flexible pillow tanks for storage of liquid chemicals. • Absorbents should be at hand to absorb chemicals during spillages. • Use the appropriate equipment to transport and handle chemicals. • Regular monitoring of any water leaving the site (quality/quantity).					
20. Construction stormwater discharge into the environment during construction.							

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
Reduce the impact of construction stormwater discharge into the environment.	Stormwater contamination could result from contact with, for example, chemicals, oils, fuels, sewage, solid waste, litter.	a) The turbidity of the stormwater runoff should be monitored after a rainfall event to ensure that acceptable levels are maintained. The CDC stormwater quality requirements will need to be adhered to.	ECO and Contractor's EHS Officer to monitor via site audits and record non-compliance with the CDC stormwater quality requirements.	After a major rainfall event	ECO and Contractor	Minimal impact of construction stormwater discharge.	None identified.
		b) The following stormwater management measures should be considered during construction and implemented where required and as needed: • Installation of silt fencing at the perimeters of actively disturbed areas. • Grading of exposed soil surfaces to minimise runoff and increase infiltration. • Reinforcement of soil slopes with suitable materials to minimise erosion. • Diversion of runoff to sedimentation basins or grit removal chambers. • Providing secure storage for oil, chemical and other waste materials to prevent contamination of stormwater runoff. • Diverting stormwater runoff from uncovered bulk construction waste pile to suitable collection/treatment systems. • Performing periodic inspections and maintenance of soil erosion	ECO and Contractor's EHS Officer to monitor via site audits and record non-compliance and incidents.	Monthly	ECO and Contractor		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		measures and stormwater control structures.					
H. TRAFFIC MANAGEMENT							
21. Reduction in road-based level of service due to increase in traffic volumes during construction (staff).							
Reduce the impact on road-based level of service by reducing the number of private cars on the road.	Increased traffic volumes (private cars) on the road network during construction.	a) Ensure the provision of a reliable public transport service during construction to encourage extensive use by workers.	Appointed inspectors must record arrival and departure times at designated pick-up points and the number of passengers, and must also check that the contracted public transport service is provided as per agreement by monitoring adherence to trip schedule.	Once a week on a randomly selected day.	CDC, TNPA, Project Developer (OTGC) and Contractor	Limited use of private cars.	None identified.
22. Reduction in road-based level of service due to increase in traffic volumes during construction (materials).							
Reduce the impact on road-based level of service by reducing the number of trucks and construction vehicles on the road.	Traffic volumes (trucks) on the road network.	a) Ensure that ready-mix concrete or material delivery (sand and stone) for the on-site batch plant from commercial suppliers in Port Elizabeth is done using large vehicles or truck-trailer combinations in order to reduce the number of trucks on the roads.	OTGC Construction Project Manager to request contractors to arrange deliveries in larger vehicles where possible. Construction monitoring staff to record number and size of vehicles making these deliveries to site.	Record daily and report effectiveness at weekly site meetings with contractors.	Project Developer (OTGC) and Contractor	Limited use of small delivery trucks.	None identified.
23. Accelerated degradation of road structure due to construction traffic and increased number of road accidents due to increased traffic during construction.							

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
Reduce degradation of road structure due to construction traffic and increased number of road accidents.	Poorly maintained construction vehicles and inadequately trained drivers.	a) Traffic enforcement officials to conduct random vehicle inspections to monitor overloading.	Nelson Mandela Bay Traffic Department to use the Kinkelbos weighbridge to check suspected overloaded vehicles.	Selected vehicles to undergo safety inspections weekly.	Nelson Mandela Bay Traffic Department	No overloading of construction vehicles. Use of experienced drivers.	None identified.
		b) Ensure that well maintained vehicles and sufficiently trained drivers are used during the construction phase. Traffic enforcement officials to conduct random safety inspections of vehicles (for roadworthiness) and drivers (for correct licenses/permits).	Traffic enforcement officials to conduct vehicle/driver safety checks to randomly selected vehicles entering and leaving site.				
24. Reduction in road-based level of service due to cumulative traffic impacts.							
Mitigate the cumulative impact of peak hour traffic congestion at the northern and southern interchange terminals on Ring Road 1 (if warranted, i.e. If the rate of development of the IDZ has generated sufficient traffic at the stage that the tank farm	Cumulative impact of peak hour traffic.	a) Authorities to install and operate traffic signals (when warranted based on vehicle volumes) can improve level of service/congestion.	Peak hour traffic counts to be conducted at the Ring Road 1 Interchange to determine if signal warrants are met. Observe and monitor peak hour traffic operation.	During the peak of construction activity (Phases 1 and 2).	Project Developer (OTGC) and CDC	Efficient control of traffic.	None identified.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
construction activities commence).							
I. GENERAL							
25. Site Establishment							
Ensure that environmental issues are taken into consideration in the planning for site establishment.	Lack of planning around site establishment.	a) Ensure that the site establishment is designed and carried out in line with the requirements of the Transnet Capital Projects Construction EMP and relevant specifications.	ECO to monitor compliance with the Transnet Capital Projects Construction EMP.	Before construction	ECO	Compliance with the Transnet Capital Projects Construction EMP.	None identified.
26. Soil erosion							
Avoid soil erosion within and in the vicinity of the construction area.	Disturbed areas are left un-rehabilitated for a long period, leading to erosion, especially if on steep slopes.	a) Uncontaminated waste water and excess run off must not be concentrated but allowed to dissipate and seep slowly into the soil in a manner which inhibits soil erosion.	ECO to monitor via site audits and record non-compliance and incidents.	Weekly	ECO	Minimal erosion inside the construction area and surroundings.	ECO to inform the Construction Manager if erosion occurs and investigate options to mitigate the damage.
27. Reduction of fire risk during construction							
Prevent fire on site resulting of workers smoking in undesignated areas.	Potential risk of fire due to construction activities or behaviour of staff	a) Designate smoking areas where the fire hazard could be regarded as insignificant.	Adhoc checks to ensure workers are smoking only in designated areas.	Daily	Contractor and ECO	No fires on site due to negligence and smoking.	None identified.
		b) Educate workers on the dangers of open and/or unattended fires.	Ensure fire safety requirements are well	On-going	Contractor and ECO		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
	on site during the construction phase.	c) Open fires must be prohibited. Appropriate fire safety training should also be provided to staff that will be on the site for the duration of the construction phase.	understood and respected by workers.				
		d) Fire-fighting equipment must be made available at various appropriate locations on the construction site.					
28. Generation of noise during construction							
Reduce noise impacts during construction.	Generation of noise as a result of construction activities and the use of diesel powered equipment and machinery, as well as construction vehicles.	a) Keep all equipment and machinery in good working order in line with the Transnet Capital Projects Construction EMP and Standard Environmental Specifications.	ECO must monitor activities and record and report non-compliance.	Monthly	ECO and Contractor	SANS 10103:2008 maximum limit for ambient noise for industrial areas of 75 dB(A).	None identified.
29. Liquid waste water and sewerage waste disposed of on the site and spills can cause soil pollution and groundwater pollution.							
Ensure correct disposal of liquid waste water and sewerage waste during the construction phase.	Incorrect disposal of construction liquid waste water and sewerage waste which may cause soil pollution and groundwater	a) A waste area for construction waste to be designated and adequate liquid waste containers (so as to avoid spillages) to be provided.	On-site inspection for spillages.	Daily	Contractor/ECO	Correct disposal of waste throughout the construction.	None identified.
		b) Frequent sewerage waste collection to be established with the contractor.	Sewerage waste collection and disposal.	As required	ECO/Contractor		
		c) Impermeable surfaces to be	On-site inspection for	Daily	Contractor/ECO		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
	pollution.	provided for areas where oils, lubricants and chemicals are decanted or machining cleaning takes place.	spillages.				
		d) A spill prevention plan to be in place with adequate spill control equipment.	On-site inspection for spillages.	Daily	Contractor/ECO		
		e) Ensure waste contractors are approved by TNPA prior to their appointments.	Liquid waste collection and disposal.	As required	ECO		
		f) Frequent collection and disposal of liquid waste to approved landfill sites to be in place. Record of collection and disposal to be kept.	Liquid waste collection and disposal.	As required	ECO		
30. Solid waste from construction such as rubble, general waste, containers etc. disposed of incorrectly could cause environmental pollution.							
Reduce environmental impacts associated with incorrect disposal of solid waste.	Incorrect disposal of construction solid waste which may cause pollution.	a) A waste area for construction waste to be designated and adequate containers to be available for the storage of general waste.	• On-site inspection of waste area • Collection and disposal • Waste Audit as part of Environmental Audit	• Daily/Weekly • As required • Monthly	• Supervisor/ECO • ECO • Consultant/Specialist	Correct disposal of waste throughout the construction.	None identified.
		b) Establish a waste management system. Waste collection and disposal to be as frequent as required. Records of collection and disposal to be kept on-site.					
		c) Containers to be closed at all times to ensure that wind-blown waste is eliminated.					

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		d) Ensure management of waste at the selected landfill sites are according to requirements. e) No solid waste may be burned or buried on site.					
31. Incorrect disposal of hazardous waste (used oils, chemicals) can cause water and soil pollution.							
Ensure correct disposal of hazardous waste during the construction phase.	Incorrect disposal of construction hazardous waste which may cause soil pollution and water pollution.	a) Segregation of hazardous waste from general waste to be in place at the origin of waste generation. b) Building contractor to design and implement a waste management plan. c) Frequent collection and disposal of hazardous waste to approved landfill sites to be in place. d) Record of collection and disposal to be kept. e) Auditing of construction site to ensure compliance to legislation and conformance to own procedures	• On-site inspection of waste segregation • Disposal of hazardous waste • Waste Audit as part of Environmental Audit	• Weekly • As required • Monthly	• ECO • ECO • Consultant/Specialist	Correct disposal of waste throughout the construction.	None identified.
32. Visual impacts during construction							
Reduce visual impacts during the construction phase.	Construction activities (and equipment and vehicles) will be visible by users of the N2 National Road. The visual intrusion will be	a) Undertake sequential removal of vegetation as opposed to once-off removal.	ECO must monitor activities and record and report non-compliance.	Monthly	ECO and Contractor	Minimal visual impacts	None identified.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
	relatively low since the construction will take place among many other developments in the Port and within an industrial area.						
33. Contamination of soil and risk of damage to vegetation and/or fauna through spillage of concrete							
To control concrete and cement batching activities in order to prevent spillages and concomitant contamination of soil, groundwater and the marine environment.	Contamination of soil and risk of damage to vegetation and/or fauna through spillage of concrete.	a) If any concrete mixing takes placed on site, this must be carried out on an impermeable surface (such as on mortarboards or plastic sheeting and/or within a bunded area with an impermeable surface), which is to be removed from the site once concrete mixing is completed. b) Concrete mixing areas for concrete batching plants must be fitted with a containment facility for the collection of cement-laden water. This facility must be bunded and impervious (have an impermeable surface protection) to prevent soil and groundwater contamination, with drainage of the containment facility separated from infrastructure containing clean runoff (and water contained therein left to evaporate, with associated water level	Monitor the handling and storage of sand, stone and cement as instructed.	Daily	Project Developer (OTGC), Contractor and ECO	Minimal spillage of concrete.	None identified.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		monitoring) (in line with the Transnet Capital Projects Construction EMP and Standard Environmental Specifications, September 2011).					
		c) Bulk and bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains (as mentioned in the Transnet Capital Projects Construction EMP and Standard Environmental Specifications).					
		d) A washout facility must be provided for washing of concrete associated equipment. Water used for washing shall be restricted. Ready-mix concrete trucks are not allowed to wash out anywhere other than in an area designated for this purpose (as mentioned in the Transnet Capital Projects Construction EMP and Standard Environmental Specifications).					
		e) Hardened concrete from wash-out facility or concrete mixer can either be reused or disposed of at an appropriate licensed disposal facility (as mentioned in the Transnet Capital Projects Construction EMP and Standard Environmental Specifications).					

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		f) Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site. Sand and aggregates containing cement must be kept damp to prevent the generation of dust (as mentioned in the Transnet Capital Projects Construction EMP and Standard Environmental Specifications). g) Any excess sand, stone and cement must be removed from site at the completion of the construction period and disposed at a registered disposal facility.					
34. Contamination of soil and risk of damage to vegetation and/or fauna through spillage of fuel/oils							
To control handling of fuels and oils in order to prevent spillages and concomitant contamination of soil, groundwater and the marine environment.	Contamination of soil and risk of damage to vegetation and/or fauna through spillage of fuel/oils.	a) The Contractor must store fuel and oil within a secure, bunded area that is able to contain 110 % of the total volume within the bund and designed with an impervious layer or liner or paved surface to prevent spillage from entering the ground. The Contractor must provide the details of the proposed fuel storage and fuelling facility to the TCP Environmental Officer for approval and the design shall comply with relevant regulations. MSDS to be kept on file (as mentioned in the Transnet Capital Projects	Monitor the handling and storage of fuels and oils and monitor if spillages have taken place as instructed.	Weekly	Project Developer (OTGC), Contractor and ECO	Minimal spillage of oils/fuel.	None identified.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		Construction EMP and Standard Environmental Specifications, September 2011). b) Monitor construction equipment and machinery daily to ensure that no fuel spillage takes place. c) The Contractor must compile a spill response plan to use in the event of any spills of fuel, oils, solvents, paints and hazardous materials. The plan must include measures for removal of contaminated soils. d) The Contractor must instruct construction personnel on the following spill prevention and containment responsibilities (as mentioned in the Transnet Capital Projects Construction EMP and Standard Environmental Specifications, September 2011): • Immediately repair all leaks of hydrocarbons or chemicals. • Take all reasonable means to prevent spills or leaks. • Do not allow sumps receiving oil or oily water to overflow. • Prevent stormwater runoff from contamination by leaking or spilled drums of oil or chemicals. • Do not discharge oil or contaminants into stormwater or sewer systems.					

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		If a spill occurs on land, , the Port Oil Spill Contingency Plan must be followed and the Contractor must: • Immediately reduce or stop the spill. • Contain the spill. • Recover the spilled product. • Remediate the spilled product. • Implement actions necessary to prevent the spill from contaminating groundwater or off-site surface water. • Dispose of contaminated material to a location designated thereto. If a spill occurs to water, the Port Oil Spill Contingency Plan must be followed and the Contractor must: • Take immediate action to stop or reduce the spill and contain it. • Notify the appropriate on-site authorities. • Implement actions necessary to prevent the spread of the contamination by deploying booms and/or absorbent material. • Recovery of the spilled product. • Proper disposal of spilled material. e) Spilled fuel, oil or grease must be retrieved where possible, and the contaminated soil removed, cleaned and replaced.					

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		f) Contaminated soil must be collected by the Contractor (under observation of ECO) and disposed of at a registered waste facility designated for this purpose.					
35. Rehabilitation							
Ensure that all disturbed areas are rehabilitated using indigenous species.	Disturbed areas are not rehabilitated. Use of alien species for rehabilitation (e.g. grasses).	a) Disturbed areas will be rehabilitated with the placement of *in situ* material (topsoil, where available) and the planting with indigenous species, in line with the Port of Ngqura Environmental Specifications and Alien Vegetation Management Plan.	ECO to carry out a visual inspection to ensure that rehabilitation has been undertaken for all accessible disturbed areas.	After construction.	ECO	Disturbed areas are rehabilitated immediately after the construction phase and adequately maintained.	None identified.

6 MANAGEMENT PLAN FOR OPERATIONS PHASE

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
A. OIL SPILL CONTINGENCY PLAN REVIEW							
1. Minimise the risk of oil spills as a result of leaks from vehicles such as trucks, cranes, and straddles on quayside and subsequent overflow into water.							
Prevent spillages from vehicles such as trucks, cranes, and straddle on the quayside and subsequent overflow into the water/Port of Ngqura.	Contamination of the Port of Ngqura through spillage of fuels and oils.	a) Undertake training for all operational staff. Ensure that new operational staff are trained.	Conduct staff environmental awareness training.	Once-off training and ensure all new staff are inducted.	Project Developer (OTGC)	Minimal spillage of fuel, oil or grease on site.	Rapid removal, cleaning and replacement of any soil contaminated by fuel, oil or grease.
		b) Ensure good vehicle maintenance.	Operational equipment and vehicles must be checked daily to ensure that no fuel spillage takes place.	Daily	Project Developer (OTGC)/ECO/ Contractor		
		c) Ensure that a standby oil response kit (to remedy spills) is kept on site and is available and ready for use as required.	Monitor that a standby oil response kit is kept at the facility and is maintained in a working order.	Weekly	Project Developer (OTGC)/ECO/ Contractor		
		d) Ensure immediate cleanup of potential spills.	Spilled fuel, oil or grease etc. is retrieved where possible, and contaminated soil removed, cleaned and replaced. Contaminated soil to be collected by a Contractor and disposed of at a registered waste disposal site designated for this purpose.	Weekly	Project Developer (OTGC)/ECO/ Contractor		
		e) Ensure that debriefing takes place after spill events.	OTGC Project Manager to report to the Port Environmental Manager after all spill events. Debriefing reports must be compiled and data	After all spill events.	Project Developer (OTGC)/ECO/ Contractor		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
			recorded.				
		f) Bunded containment to be provided below and around any fuel storage containers.	Terminal Manager to monitor the bunding requirements.	Weekly	Project Developer (OTGC)/ECO/ Contractor		
		g) Implement the Port of Ngqura Oil Spill Contingency Plan.	Operator of the Bulk Liquid Storage and Handling Facility and Port of Ngqura Environmental Manager to ensure compliance with the Ngqura Oil Spill Contingency Plan.	During all spill events	Project Developer (OTGC) and Port Environmental Manager		
2. Collision with another vessel or berth, or fire or explosion during arrival and berthing or departure of tanker in Port of Ngqura – Operations.							
Prevent spillages resulting from the collision of a tanker and the berth or another vessel, or fire or explosion during arrival and berthing or departure of a tanker in the Port of Ngqura.	Contamination of the Port of Ngqura through spillage of fuels and oils as a result of collision of tankers and the berth, or with another tanker, as well as fire or explosion.	a) The Port of Ngqura must provide pilotage that is experienced and well trained.	Monitor the pilotage provided by the Port of Ngqura.	Daily or when vessels enter the Port to make use of the OTGC Bulk Liquid Storage and Handling Facility	Port of Ngqura, South African Maritime Safety Authority (SAMSA) and National Department of Environmental Affairs (DEA)	Minimal spillage of fuel, oil or grease in the Port of Ngqura.	Rapid removal, cleaning and replacement of any soil contaminated by fuel, oil or grease.
		b) Ensure that Emergency Response and the Port of Ngqura Oil Spill Contingency Plan are implemented strictly.	Operator of the Bulk Liquid Storage and Handling Facility and Port of Ngqura Environmental Manager to ensure compliance with the Ngqura Oil Spill Contingency Plan.	During all spill events	Project Developer (OTGC) and Port Environmental Manager/ Terminal Manager		
		c) Provide adequate booms and skimmers.	Operator of the Bulk Liquid Storage and Handling Facility to ensure and monitor that adequate booms and skimmers are provided by the Port of Ngqura.	Weekly	Project Developer (OTGC) and Port Environmental Manager. SAMSA and National DEA to oversee operations and ensure compliance.		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		d) Ensure that containment and recovery and cleanup equipment is deployed immediately in the event of spillages.	Ensure that spilled fuel, oil or grease etc. is retrieved where possible, and contaminated soil is removed, cleaned and replaced. Contaminated soil to be collected by a Contractor and disposed of at a registered waste disposal site designated for this purpose.	Weekly	EHS Manager		
		e) Ensure that debriefing reports are compiled and lessons learned from spill events are disseminated.	OTGC Project Manager to report to the Port Environmental Manager after all spill events. Debriefing reports must be compiled and data recorded.	After all spill events.	EHS Manager.		
3. Spills resulting from a leaking flange/pipeline or overfilling of the storage tanks at the tank farm whilst discharging of product from the tanker, as well as poor housekeeping on the deck and jetty.							
Minimise spills during discharging of vessels (leaking flange/ pipeline) and poor housekeeping on deck and jetty.	Contamination of the Port of Ngqura through spillage of fuels and oils due to poor housekeeping on the jetty and leaking pipelines.	a) Ensure adherence to strict operational procedures.	Port of Ngqura Officials to verify compliance with operational procedures.	Weekly	Transnet National Ports Authority (TNPA)	Minimal spillage of fuel, oil or grease in the Port of Ngqura.	Rapid containment, removal and cleaning of any spillages.
		b) Ensure that the boom is ready and available for deployment around the tanker or between the tanker and quay should a spill occur. This should not be done to contain petrol due to risk of fire.	The Port Environmental Officer must attend all loading and discharging operations associated with the OTGC Bulk Liquid Storage and Handling Facility.	During all loading and discharging operations	Port of Ngqura Environmental Officer		
		c) Ensure that the design safety parameters such as bunding and Radar Tank Gauging system etc. are implemented.	The Project Developer must ensure that the high level and high-high level alarms are fully operational and that operational staff are properly trained to monitor tank filling operations.	Daily	Terminal Manager		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		d) Implement the Port of Ngqura Oil Spill Contingency Plan.	Operator of the Bulk Liquid Storage and Handling Facility and Port of Ngqura Environmental Manager to ensure compliance with the Ngqura Oil Spill Contingency Plan.	During all spill events	EHS Manager and Port Environmental Manager		
4. Spills resulting from loading of the tanker from the tank farm, leaking flange/pipeline or overfilling of the storage tanks at the tank farm.							
Minimise spills resulting from loading of tankers from the tank farm, or leaking flange/pipeline or overfilling of tanks.	Leaks on the pipelines/flange, overfilling of tanks at the tank farm and spills during loading of the tanker from the tank farm.	a) Ensure that the boom is ready and available for deployment around the tanker or between the tanker and quay should a spill occur. This should not be done to contain petrol due to risk of fire.	The Port Environmental Officer must attend all loading and discharging operations associated with the OTGC Bulk Liquid Storage and Handling Facility.	During all loading and discharging operations	Port of Ngqura Environmental Officer	Minimal spillage of fuel, oil or grease in the Port of Ngqura.	Rapid containment, removal and cleaning of any spillages.
		b) Ensure that the Port Oil Spill Contingency Plan is operational and kept up to date.	Port of Ngqura Officials to ensure that the Port Oil Spill Contingency Plan is kept up to date and reviewed regularly.	Regularly as depicted in the Port of Ngqura Oil Spill Contingency Plan	Port of Ngqura Officials (TNPA)		
		c) Ensure adherence to strict operational procedures.	Port of Ngqura Officials to verify compliance with operational procedures.	Weekly	TNPA		
5. Spills resulting from operations on deck.							
Minimise spills resulting from operations on deck.	Operations on deck resulting in spills.	a) Ensure compliance to standard operational procedures and onboard spill contingency measures.	Port of Ngqura Environmental Officers to carry out an inspection and verify compliance with operational procedures.	Weekly	TNPA	Minimal spillage of fuel, oil or grease in the Port of Ngqura.	Rapid containment, removal and cleaning of any spillages.
		b) Ensure that sorbent materials are readily available.	Port of Ngqura Environmental Officers to carry out an inspection and verify compliance.	Weekly	TNPA		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
6. Spills resulting from bunkering operations at jetties (no bunkering operations will be permitted at the OTGC jetty) and leaking of pipelines or overfilling of tanks at the tank farm.							
Minimise spills resulting from bunkering operations at jetties and leaking pipelines or overfilling of tanks.	Spills resulting from bunkering operations and leaking pipelines and overfilling of tanks.	a) Ensure adherence to strict compliance measures and operational procedures.	Compliance monitoring to be undertaken by the Port Environmental Officer.	Weekly	Port of Ngqura Environmental Officer	Minimal spillage of fuel, oil or grease in the Port of Ngqura.	Rapid containment, removal and cleaning of any spillages.
		b) Ensure monitoring and observance by the Port Environmental Officer.	Compliance monitoring to be undertaken by the Port Environmental Officer.	During all loading and discharging operations	Port of Ngqura Environmental Officer		
		c) Implement prosecution of repeat offenders.	Oil spills to be recorded and data to be compiled.	After all spill events	Terminal Manager and Port of Ngqura Environmental Officer		
		d) Ensure that the boom is ready and available for deployment should a spill occur. This should not be done to contain petrol due to risk of fire.	The Port Environmental Officer must attend all loading and discharging operations associated with the OTGC Bulk Liquid Storage and Handling Facility.	During all loading and discharging operations	Port of Ngqura Environmental Officer		
7. Deficiencies in the Port Oil Spill Contingency Plan which results in inadequate response to oil spills.							
Improve the Port Oil Spill Contingency Plan in order to adequately respond to oil spills.	Inadequate capacity to improve response to oil spills.	a) The Oil Spill Contingency Plans must be revised and improved in conjunction with the Operator of Bulk Liquid Storage and Handling Facility (OTGC).	DEA to ensure compliance of International Convention on Oil Pollution Preparedness, Response and Cooperation Port Plans.	As agreed between Transnet National Ports Authority and OTGC.	EHS Manager, TNPA and National DEA	Improve the Oil Spill Contingency Plan in order to adequately respond to oil spills resulting from Port operations as well as the tank farm.	None identified.
8. Lack of Manpower and Equipment Resources to deal effectively with oil spills within the Port of Ngqura.							

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
Improve manpower and equipment resources to deal effectively with oil spills within the Port.	Lack of manpower, capacity and equipment resulting in ineffective response to spills within the Port of Ngqura.	a) Resources need to be upgraded to deal with the increased risk in conjunction with Operator of Bulk Liquid Storage and Handling Facility (OTGC).	DEA and SAMSA to ensure adequate resources are in place.	As agreed between Transnet National Ports Authority, DEA and SAMSA and OTGC.	Terminal Manager, TNPA, SAMSA and National DEA	Improve the Oil Spill Contingency Plan in order to adequately respond to oil spills resulting from Port operations as well as the tank farm.	None identified.
9. Port staff and Operators lack of capacity to respond to oil spills efficiently.							
Improve the capacity of the Port of Ngqura and OTGC staff in order to respond to oil spills efficiently.	Port staff and operators lack capacity to respond to oil spills efficiently.	a) Staff and operators need to be trained up to required standards for their roles to improve response to oil spills.	DEA and SAMSA to ensure that the training is up to required standards.	Regularly and/or as agreed between TNPA, DEA and SAMSA and OTGC.	Terminal Manager, TNPA, SAMSA and National DEA	Improve the Oil Spill Contingency Plan in order to adequately respond to oil spills resulting from Port operations as well as the tank farm.	None identified.
		b) Regular exercises need to be held to test response equipment and activities.	DEA and SAMSA to ensure that exercises are held regularly.	Regularly and/or as agreed between TNPA, DEA and SAMSA and OTGC.	Terminal Manager, TNPA, SAMSA and DEA		
10. Non compliance of Operators within the Port leading to operational spills.							
Reduce spills during operations as a	Non compliance of operators resulting in	a) The Port of Ngqura Officials must ensure strict compliance and adherence to standard operating	The Port of Ngqura Environmental Manager must carry out compliance monitoring to reduce	Weekly	Port of Ngqura Environmental Manager	Improve compliance with the Port	None identified.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
result of non compliance of Operators within the Port.	oil spills.	procedures, especially where independent Port Operators are concerned.	operational spills.			of Ngqura Oil Spill Contingency Plan.	
11. Oil spill incidents poorly recorded resulting in lack of reliable data.							
Improve the recording of oil spill incidents to provide reliable data.	Lack of compliance with requirements of recording data after oil spills.	a) Ensure that all oil spills are reported according to the requirements of the form provided in the Port Plan. This data must include the type of oil, estimated quantity, location, cause and response required. The data must be recorded and compiled in order to create useful baseline information.	Transnet National Port Authority and Project Developer to record all data after all spill events.	After all spill events	Terminal Manager and TNPA	Reporting to be carried out after all oil spills.	None identified.
12. Impact on penguin colonies and neighbouring bird islands.							
Reduce impact on penguin colonies and neighbouring bird islands,	Spills within the Port of Ngqura.	a) Ensure that SANParks are provided with ample notice when a tanker is due to arrive in Port of Ngqura.	The Port of Ngqura Environmental Manager to liaise with SANParks.	Throughout operational phase of the Bulk Liquid Storage and Handling Facility	Port of Ngqura Environmental Manager	Minimal impact on penguin colonies	None identified.
		b) Provide logistical support to SANParks for offloading oiled penguins in the event of a major spill.	The Port of Ngqura Environmental Manager to liaise with SANParks.	During spill events throughout the operational phase of the Bulk Liquid Storage and Handling	Port of Ngqura Environmental Manager		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
				Facility			
		c) Provide support to South African National Foundation for the Conservation of Coastal Birds (SANCCOB) for rehabilitation of oiled birds.	The Port of Ngqura Environmental Manager to liaise with SANCCOB.	During spill events throughout the operational phase of the Bulk Liquid Storage and Handling Facility	Port of Ngqura Environmental Manager		
13. Containment of spills within the Port of Ngqura.							
Ensure containment of spills within the Port of Ngqura.	Spills from vessels within the Port of Ngqura.	a) Undertake procurement of additional equipment such as booms and skimmers to deal with the increased risk of oil spills.	OTGC to monitor and liaise with TNPA regarding equipment requirements.	Throughout operational phase of the Bulk Liquid Storage and Handling Facility	EHS Manager and TNPA	Thorough containment of spills within the Port of Ngqura	Rapid containment, removal and cleaning of any spillages.
		b) Train staff to deploy equipment and hold regular exercises to test the Oil Spill Contingency Plan and associated response times.	Compile an exercise and training schedule.				
14. Response to oil spills which occur or move outside of the confines of the Port of Ngqura.							
Improve the response to oil spills that occur or move outside the boundary of the Port of Ngqura.	Spills from vessels.	a) DEA and SAMSA to provide effective response.	Ensure that DEA and SAMSA are informed of spills which occur or move outside the boundary of the Port of Ngqura.	During all spills that occur outside the confines of the Port of Ngqura	SAMSA and National DEA	Thorough containment of spills within the Port of Ngqura	Rapid containment, removal and cleaning of any spillages.
		b) Dispersant spraying operations to be discussed with DEA and site specific standing orders issued.	DEA to be engaged on policy regarding spraying of dispersant in order to protect seabird colonies.	Once-off	National DEA and TNPA		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
B. MARINE ECOLOGY							
15. Minor disruption of the benthic communities in Ngqura Harbour as a result of small-scale hydrocarbon spills during cargo transfer.							
Reduce disruption of the benthic communities in the Port of Ngqura as a result of small-scale hydrocarbon spills during cargo transfer.	Hydrocarbon spillages during cargo transfer.	a) Make use of bubble barriers around the ships and deploy skimmers during cargo transfer to improve the speed and efficiency of clean-up in the unlikely event of a spill occurring. Recovery can be expedited by the oil spill response team removing 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).	Port of Ngqura Port Authority, (TNPA), to monitor cargo transfer and the use of bubble barriers around ships and skimmers.	During loading and offloading operations (cargo transfer)	TNPA	Minimal disruption of the communities in the Port of Ngqura	Rapid containment, removal and cleaning of any spillages.
		b) OTGC to implement the IEC61511 standard for replacement of worn components and undertake a comprehensive planned maintenance and inspection program to ensure that all pollution prevention and containment measures are functioning correctly.	OTGC to carry out maintenance and inspection programme	Regular intervals as per the BOOT agreement with Transnet National Ports Authority.	Terminal Manager		
		c) OTGC staff must be in attendance for the entire duration of loading and offloading operations in order to monitor and	Monitor loading and offloading operations to detect and monitor spills.	Entire duration of all offloading and loading operations.	Terminal Manager		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		detect spills efficiently and speedily.					
16. Major disruption of the marine communities in the Port of Ngqura as a result of catastrophic release of hydrocarbons in the Ngqura Harbour.							
Reduce disruption of the marine communities in the Port of Ngqura as a result of catastrophic release of hydrocarbons in the Port of Ngqura.	Hydrocarbon spills during catastrophic release of products and/or fuels and associated ecological damage in the Port of Ngqura.	a) Implement effective management of ship movements in the Port and the employ an updated oil spill contingency plan.	TNPA to ensure that ship movements within the Port of Ngqura are monitored and managed effectively.	Throughout the operational phase.	TNPA	Minimal disruption of the marine communities in the Port of Ngqura	Rapid containment, removal and cleaning of any spillages.
		b) Ensure that recovery from large scale spills is expedited by the removal of hydrocarbon film from harbour walls and breakwater rock using high pressure hoses and raw seawater where possible.	Oil spill response teams to ensure that recovery and removal of the film is implemented after all large scale spills within the Port of Ngqura are used.	After all large scale spills within the Port of Ngqura are used.	TNPA		
17. Major disruption of the marine communities in Algoa Bay as a result of catastrophic release of hydrocarbons.							
Reduce major disruption of the marine communities in Algoa Bay as a result of catastrophic release.	A collision between two ships resulting in the release of fuel and/or hydrocarbon cargo.	a) Implement a rigorous environmental management and control plan to limit ecological risks from operational accidents and ensure efficient and safe operation of shipping in the Port of Ngqura and approaches to the port.	TNPA to monitor the implementation of the environmental management and control plan.	Throughout operations	TNPA	Minimal disruption of the marine communities in Algoa Bay	Rapid containment, removal and cleaning of any spillages.
		b) Oiled seabirds must be collected and sent to SANCCOB, 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	TNPA to monitor the collection and transportation of oiled seabirds and liaise with SANCCOB.	During all large spills within Algoa Bay	TNPA		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		to allow the spill in Algoa Bay to dissipate whilst they migrate back to Algoa Bay.					
		c) The Port of Ngqura 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 the Port Authorities.	TNPA to monitor the implementation of the Port Oil Spill Contingency Plan and all equipment used for oil spill response. TNPA to conduct training for all parties involved in oil spill response.	Throughout operations	TNPA		
18. Cumulative Marine Ecology Impacts							
Reduce likelihood of acute and chronic effects on marine and avian communities as a consequence of increased numbers of ships carrying hydrocarbon cargoes as a direct consequence of the commissioning of the OTGC facilities in	Increased numbers of ships carrying hydrocarbon cargoes in combination with other berth activities.	a) Implement a rigorous ship traffic management plan to limit the possibility of such accidents occurring.	TNPA to ensure that ship movements within the Port of Ngqura are monitored and managed effectively.	Throughout the operational phase.	TNPA	Minimal disruption of the marine and avian communities in Algoa Bay	Rapid containment, removal and cleaning of any spillages.
		b) Implement a rigorous environmental management and control plan to limit ecological risks from operational accidents as well as ensuring efficient and safe operation of the port.	TNPA to monitor the implementation of the environmental management and control plan.	Throughout the operational phase.	TNPA		
		c) 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.	TNPA to monitor the collection and transportation of oiled seabirds and liaise with SANCCOB.	During all large spills within Algoa Bay	TNPA		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
combination with other berth activities in the Port of Ngqura.		d) The Port of Ngqura 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 the Port Authorities.	TNPA to monitor the implementation of the Port Oil Spill Contingency Plan and all equipment used for oil spill response. TNPA to conduct training for all parties involved in oil spill response.	Throughout operations	TNPA		
		e) Carry out recovery by removing the hydrocarbon film from harbour walls and breakwater rock using high pressure hoses and raw seawater where possible.	Oil spill response teams to ensure that recovery and removal of the film is implemented	Throughout operations	TNPA		
C. TERRESTRIAL ECOLOGY							
19. Reduction or changes in ecological processes and functioning.							
Minimal changes to ecological processes and functioning.	Loss of riparian vegetation and servitudes not kept to a minimal width	a) Servitudes to be kept to minimum width during operational phase and rehabilitation of edges to be implemented after construction.	Carry out monitoring via a site audit to verify if mitigation recommendations have been implemented and adhered to.	Biannually	Terminal Manager	Servitudes kept to the stipulated width.	None identified.
20. Increased Risk of Alien Invasion in Drainage Lines and Disturbed Areas.							
Reduce alien plant invasion within the operational area.	Alien plant species may pose a threat to the re-establishment of indigenous species.	a) Alien invasive plant management plan to be implemented during operational phase.	Audit alien plant management and monitor occurrence of weedy and alien species.	Biannually	Terminal Manager	Removal of all alien species within the operational area.	None identified.
21. Changes in Natural Fire Regime.							
Reduce changes to	Flammable litter and discarded glass	a) A fire management plan must be	Regular audit of fire management plan implementation and record	Biannually and record location	Terminal Manager	Minimal changes to	None

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
natural fire regime	bottles generated during the operational phase.	implemented.	any fires	and extent after each fire and actions implemented		the natural fire regime	identified.
22. Loss of Faunal Habitat.							
Reduce loss of faunal habitat	Incomplete search and rescue.	a) Carry out monitoring for trapped/displaced fauna.	Monitor activities via site audits and record non-compliance.	Biannually	Terminal Manager	Minimal loss of faunal habitat.	None identified.
23. Road Mortality from Trucks and other Service Vehicles.							
Reduce the incidence of faunal road mortalities during the operational phase.	Vehicles travelling at excessive speeds.	a) Carry out monitoring for injured animals and death or injury (DoR) incidents. b) Implement traffic calming measures where necessary.	ECO to monitor activities via site audits and record non-compliance.	Monthly (and during rainfall events for amphibians)	Terminal Manager	Zero or close to zero faunal road mortalities.	None identified.
24. Poaching							
Reduce the occurrence of poaching during the operational phase.	Operations staff not trained adequately in terms of environmental awareness.	a) Carry out monitoring and check animal paths within the servitude for snares.	Monitor activities via site audits and record non-compliance.	Monthly	Terminal Manager	Zero poaching incidents.	None identified.
25. Impact of Fences on Fauna							
Reduce the harm of fauna by fences.	Establishment of fencing.	a) Carry out monitoring and checks of fences for trapped animals.	Monitor via site inspections and record non-compliance and incidents.	Monthly	Terminal Manager	Minimal harm to fauna.	None identified.
26. Faunal Corridor Disruptions as a result of Habitat Fragmentation							
Reduce the	Inconsistent	a) Carry out monitoring for displaced	Monitor via site audits and record	Monthly	Terminal Manager	Minimal	None

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
harm of fauna by fences.	relocation of fauna entering the tank farm site and pipeline area.	fauna.	non-compliance and incidents.			disruption of faunal corridors.	identified.
D. AIR QUALITY							
27. Deterioration of air quality as a result of BTEX emissions during the operational phase							
Reduce the emissions of BTEX during the operational phase.	Emissions as a result of loading and offloading of Bulk Liquids.	a) Ensure that the mitigation measures to reduce BTEX emissions from storage tanks (internal floating roofs, fixed roofs and free venting roofs) and loading gantries are incorporated into the design.	Ensure that the mitigation measures to reduce emissions are implemented in the design.	Prior to operation.	Project Developer (OTGC)	Limited BTEX emissions during operations and optimal operation and maintenance of the tank farm.	None identified.
		b) Plant engineers and operators are to ensure that the abatement technology installed is always in working order and maintained on a regular basis in order to ensure the reliability of the equipment.	Ensure that the Maintenance Programme is implemented stringently in line with the BOOT agreement.	In line with the BOOT agreement.	Project Developer (OTGC)/Terminal Manager		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		c) Undertake ambient air quality monitoring of BTEX group of compounds.	Conduct annual ambient monitoring campaigns with measurements taken in autumn or spring to obtain an average seasonal measurement at selected monitoring points (such as along on the fenceline of the tank farm and close to the berth). A total of six sites (four at the tank farm and 2 at the berth) are considered to be adequate. The passive sampling campaign should be conducted in accordance with a rigorous quality assurance/quality control programme. The analyses should be conducted by a SANAS accredited laboratory.	Ambient BTEX monitoring should be in the form of passive sampling and be conducted for a period of two weeks, in accordance with the prescribed timeframe for passive sampling.	Coega Development Corporation and Project Developer (OTGC)		
		d) A leak detection and repair (LDAR) programme must be implemented after commissioning of the OTGC Bulk Liquid Storage and Handling Facility.	Ensure that a LDAR programme is implemented and maintained throughout operations.	In line with Maintenance Programme as stipulated in the BOOT agreement.	Project Developer (OTGC)		
E. INTEGRATED WATER MANAGEMENT							
28. Impact on regional water balance as a result of increased water use during operations.							
Reduce water usage during operations.	Lack of water conservation techniques practiced by operational staff.	a) Water conservation to be practiced in line with Energy Saving Policies that the Project Developer has and as follows: • Implement water saving devices	Terminal Manager to conduct audits and record non-compliance and incidents.	Monthly	Terminal Manager	Water conservation is practiced throughout operations.	None identified.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		(dual flush toilets, automatic shut-off taps, etc). • Avoid using potable water for irrigation purposes. Landscapes should be designed to absorb rainwater runoff (stormwater) and gardens should be structured so as to minimise surface run-off. Proper irrigation scheduling must be implemented in order to limit evaporation losses. • Cleaning methods utilised for cleaning vehicles, floors, etc. should aim to minimise water use (e.g. sweep before wash-down). • Ensure that the fire water systems have proper pressure management in order to limit water use. • Ensure that regular audits of water systems are conducted to identify possible water leakages. • Proper metering and measurement of water use and wastewater discharges will enable proper performance review and management. • Ensure that operational personnel are informed of water conservation practices and the importance thereof.					

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
29. Domestic effluent discharge into sewer enters environment.							
Reduce 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 during operations such as conducting regular inspections of facilities and sewer systems, undertaking appropriate maintenance and employee training etc.	Terminal Manager to conduct audits and record non-compliance and incidents.	Monthly	Terminal Manager	Minimal spills of domestic effluent.	None identified.
30. Process wastewater discharge into the environment.							
Reduce process wastewater discharge and the impact thereof on the environment.	Process wastewater will only be generated from external and internal tank washing (and contaminated stormwater).	a) Ensure that all process wastewater is contained and tested for contaminants.	Terminal Manager to conduct audits and record non-compliance and incidents.	Monthly	Terminal Manager	Testing of all process wastewater discharge.	None identified.
		b) Ensure that wastewater is only released if quality requirements are maintained. If the process wastewater generated is not of an acceptable quality to allow appropriate discharge, then disposal at an appropriate facility must be undertaken. If this is not possible, additional pre-treatment of process wastewater should be considered if the quality requirements cannot be readily achieved.	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		c) On-site treatment systems should have a sufficient back-up and spare capacity to ensure that process wastewater is treated effectively.	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager		
		d) Ensure that regular inspection and maintenance of the treatment systems is undertaken to ensure optimal operation.					
		e) Water quality monitoring should include monitoring of all required parameters as contained through specified agreement (e.g. with CDC).	Terminal Manager to conduct audits and record non-compliance and incidents.	At regular intervals during operation	Terminal Manager and CDC		
31. Contaminated stormwater discharge into the environment.							
Reduce the impact of contaminated stormwater discharge into the environment.	Stormwater contamination could result from: accidental or other spillages of materials, oils, chemicals, litter, etc., accidental discharge of process wastewater into the stormwater system and,	a) A site Stormwater Management Plan should be developed. The plan should take into consideration existing plans that may exist (such as by TNPA).	Project Developer to compile Stormwater Management Plan.	Prior to operations.	Project Developer (OTGC)	Minimal discharge of contaminated stormwater.	None identified.
		b) Ensure that the stormwater management system keeps “dirty” stormwater completely separated from “clean” stormwater.	Terminal Manager to conduct audits and record non-compliance and incidents.	At regular intervals during operation	Terminal Manager		
		c) Ensure that clean stormwater is discharged offsite.	Terminal Manager to conduct audits and record non-compliance and incidents.	At regular intervals during operation	Terminal Manager		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
	deposition ("fallout") onto the site from emissions in the Coega IDZ.	d) Ensure that dirty stormwater is contained and tested for contaminants and treated (if necessary) prior to release. If the stormwater is still not acceptable, it must be disposed of at an appropriate facility.	Terminal Manager to conduct audits and record non-compliance and incidents.	At regular intervals during operation	Terminal Manager		
		e) Ensure robust treatment systems are in place.	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager		
		f) A suitable stormwater quality monitoring and management programme must be established to ensure that "clean" stormwater is in fact clean. The quality of the stormwater runoff should be monitored after a rainfall event to ensure that an acceptable quality is maintained.	Monitoring should be conducted at all major site stormwater outlets.	At regular intervals during operation and after rainfall events	Terminal Manager		
		g) A baseline stormwater quality monitoring point should be established on the eastern bank of the Coega River if stormwater infrastructure already exists.	Terminal Manager to conduct audits.	At regular intervals during operation	Terminal Manager		
		h) On-going monitoring of water quality of surface water for possible impacts arising from petroleum products is recommended.	Terminal Manager to conduct audits and record non-compliance and incidents.	At regular intervals during operation	Terminal Manager and CDC		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		i) Undertake ongoing stormwater management during operations by implementing the following where required and if applicable: • Oil, chemical and waste storage containers or tanks should be stored in or equipped with roofed, adequate, secondary containment to contain spills and leaks. • Any diesel driven pumps and diesel storage tanks should be covered. • Protection from erosion should be provided by properly grading any susceptible slopes and by paving or reinforcing exposed surfaces (as needed). • Discharges of oil, chemical or wastewaters to any "clean" stormwater discharge outlets must be prohibited. • Periodic inspections should be conducted to check for leaks from equipment, storage containers and to observe the integrity of secondary containment structures. • Preventative maintenance of equipment should be performed on a routine basis to reduce the potential for leaks. • A spill control and response	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		protocol/plan should be designed and implemented by all on-site personnel (including contractors). • Carry out spill prevention and response training for all relevant personnel (including contractors) at the outset of the operational phase (prior to commencing work). • Ensure that spills are contained and spill response materials are maintained and available at all fuel dispensing stations. Fuel trucks should also be equipped with oil spill response materials.					
		j) A groundwater survey of the site and surrounding area is recommended and an appropriate groundwater monitoring programme should be established. On-going monitoring of water quality for possible impacts arising from petroleum products is strongly recommended.	This could include drilling a limited number of shallow test boreholes to determine if any potentially vulnerable receiving environments (e.g. aquatic ecosystems) exist.	At regular intervals during operation	Terminal Manager		
32. Chemical and oil waste disposal into environment.							
Prevent the disposal of chemical and oil waste into the	Chemical and fuel spillages during operations.	a) Implement normal good practice at the site (e.g. containment and immediate clean-up of any spillages, collection of chemical/oil wastes, disposal at an appropriate hazardous waste	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager	Minimal spillage of fuel, oil or chemicals on site	Rapid removal, cleaning and replacement of any soil contaminated

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
environment.		facility, etc).					by fuel, oil or grease.
F. RISK ASSESSMENT							
33. Impacts associated with the loss of containment of hydrocarbons from the pipelines between the berth and the tank farm (Hydrocarbon spillages onto the ground or into rivers).							
Prevent spillages onto the ground or into rivers.	Fires and explosions.	a) Ensure that the pipelines have been designed and rated for normal and emergency situations.	Terminal Manager to conduct audits and record non-compliance and incidents.	At the beginning of operations	Terminal Manager	Minimal spillage of hydrocarbons from the pipelines.	None identified.
		b) The integrity of the pipelines must be insured with preventative maintenance of checks or procedures.	Terminal Manager to conduct audits and record non-compliance in accordance with the stipulated maintenance programme in line with the signed agreement with Transnet.	Throughout operations	Terminal Manager		
34. Impacts associated with the loss of containment of hydrocarbons from the pipelines between the berth and the tank farm (Formation of on-site fires and explosions).							
Prevent formation of fires and explosions on site.	Fires and explosions.	a) Ensure that the pipelines have been designed and rated for normal and emergency situations.	Terminal Manager to conduct audits and record non-compliance and incidents.	At the beginning of operations	Terminal Manager	Minimal spillage of hydrocarbons from the pipelines.	None identified.
		b) The integrity of the pipelines must be insured with preventative maintenance of checks or procedures.	Terminal Manager to conduct audits and record non-compliance in accordance with the stipulated maintenance programme in line with the signed agreement with Transnet.	Throughout operations	Terminal Manager		
35. Impacts associated with the loss of containment of hydrocarbons from the pipelines between the berth and the tank farm (Formation of off-site fires and explosions).							
Prevent formation of fires and	Fires and explosions.	a) Ensure that the pipelines have been designed and rated for normal and emergency situations.	Terminal Manager to conduct audits and record non-compliance and incidents.	At the beginning of operations	Terminal Manager	Minimal spillage of hydrocarbons	None identified.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
explosions.		b) The integrity of the pipelines must be insured with preventative maintenance of checks or procedures.	Terminal Manager to conduct audits and record non-compliance in accordance with the stipulated maintenance programme in line with the signed agreement with Transnet.	Throughout operations	Terminal Manager	from the pipelines.	
36. Impacts associated LPG Storage and Road Tanker Filling involving loss of containment with a subsequent ignition or detonation (Formation of on-site fires and explosions).							
Prevent formation of fires and explosions on site.	Fires and explosions.	a) Ensure suitable engineering designs, maintaining the integrity of equipment, and control of the system (such as overfill protection and removal of ignition sources in vulnerable areas).	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager	Zero formation of on-site fires and explosions.	None identified.
		b) Carry out preventative maintenance in line with API510/API570 and API 653 where the system is checked and faults can be corrected (i.e. corrosion detected) in order to maintain the integrity of the system.	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager		
37. Impacts associated LPG Storage and Road Tanker Filling involving loss of containment with a subsequent ignition or detonation (Formation of off-site fires and explosions).							
Prevent formation of fires and explosions on site.	Fires and explosions.	a) Ensure suitable engineering designs, maintaining the integrity of equipment, and control of the system (such as overfill protection and removal of ignition sources in vulnerable areas).	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager	Zero formation of on-site fires and explosions.	None identified.
		b) Carry out preventative maintenance in line with	Terminal Manager to conduct audits and record non-compliance	Throughout operations	Terminal Manager		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		API510/API570 and API 653 where the system is checked and faults can be corrected (i.e. corrosion detected) in order to maintain the integrity of the system.	and incidents.				
38. Impacts associated with the loss of containment of hydrocarbon spillages from the bulk atmospheric storage at the tank farm and road gantry (Hydrocarbon spillages onto the ground or into rivers).							
Prevent spillages onto the ground or into rivers.	Fires and explosions.	a) Ensure that the bulk atmospheric storage at the tank farm and road gantry have been designed and rated for normal and emergency situations.	Terminal Manager to conduct audits and record non-compliance and incidents.	At the beginning of operations	Terminal Manager	Zero spillage of hydrocarbons and fires and explosions.	None identified.
		b) The integrity of the bulk atmospheric storage at the tank farm and road gantry must be insured with preventative maintenance of checks or procedures.	Terminal Manager to conduct audits and record non-compliance in accordance with the stipulated maintenance programme in line with the signed agreement with Transnet.	Throughout operations	Terminal Manager		
		c) Ensure effective spill containment is implemented.	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager		
39. Impacts associated with the loss of containment of hydrocarbon spillages from the bulk atmospheric storage at the tank farm and road gantry (Formation of on-site fires and explosions).							
Prevent formation of fires and explosions on site.	Fires and explosions.	a) Ensure that the bulk atmospheric storage at the tank farm and road gantry have been designed and rated for normal and emergency situations.	Terminal Manager to conduct audits and record non-compliance and incidents.	At the beginning of operations	Terminal Manager	Zero spillage of hydrocarbons and fires and explosions.	None identified.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		b) The integrity of the bulk atmospheric storage at the tank farm and road gantry must be insured with preventative maintenance of checks or procedures.	Terminal Manager to conduct audits and record non-compliance in accordance with the stipulated maintenance programme in line with the signed agreement with Transnet.	Throughout operations	Terminal Manager		
		c) Ensure spill containment is implemented.	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager		
40. Impacts associated with the loss of containment of hydrocarbons from the bulk atmospheric storage at the tank farm and road gantry (Formation of off-site fires and explosions).							
Prevent formation of fires and explosions.	Fires and explosions.	a) Ensure that the bulk atmospheric storage at the tank farm and road gantry have been designed and rated for normal and emergency situations.	Terminal Manager to conduct audits and record non-compliance and incidents.	At the beginning of operations	Terminal Manager	Zero spillage of hydrocarbons and fires and explosions.	None identified.
		b) The integrity of the bulk atmospheric storage at the tank farm and road gantry must be insured with preventative maintenance of checks or procedures.	Terminal Manager to conduct audits and record non-compliance in accordance with the stipulated maintenance programme in line with the signed agreement with Transnet.	Throughout operations	Terminal Manager		
		c) Ensure spill containment is implemented.	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager		
41. Impacts associated with the LPG storage involving loss of containment and in some cases a subsequent ignition or detonation (Hydrocarbon spillages onto the ground entering the soil).							
Prevent formation of loss of containment.	Fires and explosions.	a) Ensure spill containment is implemented.	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager	Zero fires and explosions.	None identified.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
42. Impacts associated with the LPG storage involving loss of containment and in some cases a subsequent ignition or detonation (Formation of off-site fires and explosions).							
Prevent formation of loss of containment.	Fires and explosions.	a) Ensure spill containment is implemented.	Terminal Manager to conduct audits and record non-compliance and incidents.	Throughout operations	Terminal Manager	Zero fires and explosions.	None identified.
G. TRAFFIC MANAGEMENT							
43. Reduction in road-based level of service due to increase in traffic volumes during operations (staff).							
Reduce the impact on road-based level of service by reducing the number of private cars on the road.	Increased traffic volumes (private cars) on the road network.	a) Ensure the provision of a reliable and possibly subsidized public transport service during operations to encourage high use by workers.	Appointed inspectors must record arrival and departure times at designated pick-up points and the number of passengers, and must also check that the contracted public transport service is provided as per agreement by monitoring adherence to trip schedule.	Once a week on a randomly selected day.	CDC, TNPA, and Project Developer (OTGC)	Limited use of private cars.	None identified.
44. Reduction in level of service due to number of heavy vehicles transporting liquid hydrocarbon products during operation (road tankers).							
Reduction in level of service due to number of heavy vehicles transporting liquid hydrocarbon products during operation (road tankers).	Road tanker trips during operations.	a) Avoid operations phase tanker trips during the two busiest traffic periods (weekday AM peak 07h00 – 08h00 and PM peak 16h30 – 17h30).	OTGC Project Manager to request that tanker operators (customers) avoid arrival and departure during peak traffic periods. Appointed inspector to record arrival and departure times.	Once a week on a randomly selected day.	Terminal Manager	Limit tanker trips during peak periods.	None identified.
45. Accelerated degradation of road structure due to operational traffic and increased number of road accidents due to increased traffic during operations.							
Reduce	Poorly maintained	a) Traffic enforcement officials to	Nelson Mandela Bay Traffic	Selected	Nelson Mandela Bay	Limit	None

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
degradation of road structure due to operations traffic and increased number of road accidents.	operational vehicles and inadequately trained drivers.	conduct random vehicle inspections to monitor overloading.	Department to use of the Kinkelbos weighbridge to check suspected overloaded vehicles.	vehicles to undergo safety inspections weekly.	Traffic Department	overloading and road accidents.	identified.
		b) Ensure that well maintained vehicles and sufficiently trained drivers are used during the operations phase. Traffic enforcement officials to conduct random safety inspections of vehicles (for roadworthiness) and drivers (for correct licenses/permits).	Traffic enforcement officials to conduct vehicle/driver safety checks to randomly selected vehicles entering and leaving site.				
H. WASTE MANAGEMENT							
46. Spills from the filling of storage tanks and road tankers and leaks from bulk liquid storage tanks and can cause soil and groundwater pollution.							
Proper maintenance of tank farm equipment to reduce spillages.	Unlikely risk of overfilling of storage tanks (i.e. storage tanks will be equipped with High Level Alarm).	a) The tank area to be bunded with impermeable material.	Inspection of tank area	Daily	Terminal Manager	Minimal overfilling.	None identified.
		b) A leak detection system to be in place to expeditiously detect any leaks that may occur in the floor of the storage tanks.	Inspection of tank area	Daily	Terminal Manager		
		c) Spill interceptors to be in place with capacity to capture spills that can arise from a tanker during filling.	Inspection of tank area	Daily	Terminal Manager		
		d) Groundwater monitoring to be in place to determine any impact on groundwater from the tank farm.	Groundwater monitoring	Annual	Consultant/Specialist		
		e) The facility must be checked for	Inspection of tank area	Daily	Terminal Manager		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		leakage losses by regular patrols.					
		f) A spill containment and prevention plan to be established. The reaction time to detect and cleanup a spill shall be measured as an environmental indicator. Frequent testing of the spill containment and prevention plan to be done.	Reaction time to cleanup spill	6-monthly	EHS Manager		
47. Incorrect disposal of hazardous waste, waste oils and chemicals can result in water, soil and groundwater pollution.							
Reduce soil and groundwater contamination as a result of incorrect disposal of hazardous waste.	Incorrect disposal of hazardous waste.	a) A waste management plan must be established and shall contain a full characterization of the hazardous wastes (quantity and quality). Such a plan shall be prepared for the facility to ensure that all hazardous wastes are classified, identified, quantified and managed correctly.	Inspection of the waste area	Daily	EHS Manager/ Terminal Manager	Correct disposal of waste throughout operations.	None identified.
		b) All hazardous wastes that cannot be reused or recycled shall be labeled correctly and stored in a secure area until collected for correct disposal.					
		c) If hazardous waste has to be disposed, it shall be done at a registered hazardous waste disposal facility. Safe disposal certificates shall be obtained indicating the waste trail of collection, transportation and					

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		disposal of the hazardous waste. d) Only registered contractors, approved by TNPA, shall be used for the collection transporting and disposal of hazardous waste.					
		e) Waste amounts shall be recorded on a monthly basis.	Waste amount	Monthly	EHS Manager/ Terminal Manager		
		f) Annual audits shall be done on the waste contractors and the landfill operations.	Waste site audits	Annual	EHS Manager/ Terminal Manager		
48. Incorrect disposal of contaminated waste water can cause surface water pollution.							
Reduce soil and groundwater contamination as a result of incorrect disposal of hazardous waste,	Incorrect disposal of hazardous waste.	a) Authorization from TNPA shall be obtained prior to discharging of effluent and wastewater into TNPA effluent system.	Effluent quantity and quality	Monthly	EHS Manager/ Terminal Manager	Correct disposal of contaminated waste water.	None identified.
		b) A stormwater interceptor shall be in place to collect contaminated stormwater. Contaminated stormwater must be treated to remove the contaminants.	Stormwater quality monitoring	As required			
		c) Contaminated stormwater and wastewater will be monitored for quality parameters prior to discharging into the effluent system.	Stormwater quality monitoring	As required			
		d) Process wastewater must be kept separated from stormwater.	Effluent quantity and quality Stormwater quality monitoring	Monthly As required			
		e) A detailed layout indicating the flow and piping of industrial	Stormwater quality monitoring	As required			

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		wastewater, sewerage water and stormwater shall be mapped. Colour-coding of the pipes and manholes is suggested for the instant recognition of the water type.					
		f) A contingency plan shall be designed to address any breakdowns in the operations of the oil/water separator.	Stormwater quality monitoring	As required			
		g) Monitoring of wastewater prior to discharging to effluent drainage system shall be in place.	Effluent quantity and quality	Monthly			
49. Generation of recyclable waste and disposal to the landfill site consume resources.							
Encourage recycling of waste generated at the tank farm during the operational phase.	Lack of management of waste and recycling.	a) All waste streams that will be generated by the proposed tank farm shall be managed according to the waste management hierarchy. This specifies that wherever possible, production of wastes should be prevented or minimised at source.	Recyclable Waste amounts	Monthly	EHS Manager/Terminal Manager	Recycling of waste, where possible.	None identified.
		b) Waste separation at source shall be in place.					
		c) Where prevention or further minimization is not possible, wastes should be re-used, recycled and then disposed of responsibly so as to minimise impacts to the environment.					

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		d) In order to ensure best practice with respect to waste management, a formalized waste management system should be implemented and include regular qualitative and quantitative monitoring of all waste streams.	Waste management audits	Monthly	EHS Manager/Terminal Manager/Specialist		

7 MANAGEMENT PLAN FOR DECOMMISSIONING

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
A. MARINE ECOLOGY							
1. Disruption of benthic communities through the unauthorized disposal of concrete/ cement debris off the quay during decommissioning of the facilities at the berth.							
Reduce disruption of benthic communities through the unauthorized disposal of concrete/cement debris off the quay.	Contamination of the Port of Ngqura through spillage of concrete, cement or debris.	a) The decommissioning phase Environmental Management Program must detail how waste cement and concrete must be handled and prohibit unauthorized disposal off the quay. This must be rigorously implemented by the contractors working for OTGC during decommissioning.	The Contractor and the Project Developer must ensure that the decommissioning Phase EMP is rigorously implemented.	Weekly	Project Developer (OTGC), Contractor and ECO	No waste storage or disposal on site; all waste disposed of as specified in the Environmental Authorisation and relevant regulations.	The ECO to be notified within 24 hours of any waste spillage incidents on site. ECO and Contractor to ensure necessary clean-up actions taken.
2. Disruption of marine communities in the Port of Ngqura as a result of hydrocarbon sludge release during the dismantling of the loading arms on the quay during decommissioning of the facilities at the berth.							
Reduce disruption of marine communities in the Port of Ngqura as a result of hydrocarbon sludge release during the dismantling of the loading arms	Contamination of the Port of Ngqura through spillage of hydrocarbon sludge during dismantling of the loading arms on the quay.	a) The decommissioning phase Environmental Management Program must detail how waste sludge must be handled and prohibit unauthorized disposal off the quay. This must be rigorously implemented by the contractors working for OTGC during decommissioning.	The Contractor and the Project Developer must ensure that the Decommissioning Phase EMP is rigorously implemented.	Weekly	Project Developer (OTGC), Contractor and ECO	No waste storage or disposal on site; all waste disposed of as specified in the Environmental Authorisation and relevant regulations.	The ECO to be notified within 24 hours of any waste spillage incidents on site. ECO and Contractor to ensure necessary clean-up actions taken.

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
on the quay.							
B. AIR QUALITY							
3. Deterioration of air quality as a result of dust emissions during the decommissioning phase							
Reduce dust emissions during decommissioning activities.	Dust emissions as a result of decommissioning activities such as vehicle movements and vegetation clearing.	a) Ensure that removal of vegetation (if any) is limited to accommodate decommissioning activities only.	ECO to monitor vegetation removal and clearing during decommissioning.	Daily/Weekly	ECO and Contractor	Limited dust emissions.	None identified.
		b) Ensure unpaved site roads and access roads remain sufficiently moist throughout the decommissioning phase to suppress dust. Water can be used as a wetting or binding agent on the unpaved roads.	ECO to monitor dust suppression mechanisms and record non-compliances. ECO to maintain an incidents/complaints register, in which any complaints from the community must be logged. The date, time, nature of complaint, name of complainant and corrective actions must be logged for all complaints. Complaints must be investigated and, if appropriate, acted upon.	Weekly	ECO and Contractor		
		c) Implement traffic control measures on the site to limit vehicle-entrained dust from unpaved roads. Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.	ECO to monitor traffic control measures and report non-compliances.	Weekly	ECO and Contractor		
		d) Ensure that verges, cuttings, lay down areas and	ECO to monitor re-vegetation of disturbed areas subsequent	After decommissioning	ECO and		

Management Objectives	Risk Sources	Management Actions	Monitoring Methodology	Monitoring Frequency	Monitoring Responsibility	Targets	Remedial Actions
		decommissioning camps are re-vegetated immediately after the completion of the decommissioning.	to decommissioning.	is complete.	Contractor		
C. WASTE MANAGEMENT							
4. Extended storage of tanks and equipment can cause visual impact, soil pollution and waste resources.							
Reduce soil pollution and visual impacts during the decommissioning phase.	Decommissioning activities.	a) Redundant equipment shall not be stored outside, but shall be protected from the weather. Redundant tanks shall be maintained or removed, but not left to corrode. b) The equipment and machinery shall be sold or removed within a reasonable time period. Recycling or re-use of redundant equipment shall be investigated. c) Tanks which are supposed to be decommissioned must be rendered in safe conditions and completely drained and cleaned (gas free) so that unintended or unauthorized recommissioning is excluded. d) Contractors for decommissioning shall be approved by TNPA.	Inspection of state of equipment and tanks	Monthly	ECO/Contractor	Correct decommissioning and disposal of waste.	None identified.