7. ENVIRONMENTAL MANAGEMENT PROGRAMME

7.1 INTRODUCTION

This chapter provides the Environmental Management Programme (EMP) for the proposed project. The EMP details the specific mitigation and management measures proposed to minimise impacts identified during the EIA. This chapter provides an outline of the applicable standards and guidelines to the proposed project; organisational roles and responsibilities, and how the mitigation measures identified would be incorporated into project design and subsequently implemented throughout the duration of proposed project.

The findings of the EIA regarding the significance of residual impacts are contingent upon the commitment by Shell that mitigation commitments would be fully implemented. The EMP provides the means for ensuring that all mitigation measures and commitments are translated into actions. It also serves as the vehicle for dealing with unforeseen circumstances during the project operations, such as changes to exploration drilling methodology, unforeseen environmental conditions or ineffective mitigation measures.

The objectives the EMP are as follows:

- Guide compliance with South African legislation, international law and standards, and Shell's standards and guidelines;
- Provide a mechanism for ensuring that all mitigation measures and Shell commitments identified in the EIA are taken forward into planning and implementation of the proposed exploration drilling;
- Provide a means for verifying that mitigations are properly implemented and that they are effective through monitoring, inspection, and auditing; and
- Provide a mechanism for identifying and mitigating impacts that may be determined in the future.

The EMP was developed in consideration of legal and policy requirements relevant to the proposed project. These include:

- Legislation governing oil and gas exploration activities in South Africa;
- Environmental regulations for oil and gas exploration activities in South Africa;
- International conventions and standards to which South Africa is a signatory and with which the proposed project must therefore comply (e.g. MARPOL 73/78 and the United Nations Law of the Sea Convention); and
- Shell's corporate standards.

7.2 ORGANISATION ROLES AND RESPONSIBILITIES

This section defines the roles and responsibilities of the entities involved in the project environmental management. These include following:

- Shell (Licence Area Operator);
- Exploration Lead;
- HSSE Lead; and
- Rig Manager.

7.2.1 SHELL (LICENCE AREA OPERATOR)

Shell is ultimately responsible for the management of the environmental and social commitments and Shell policy. Shell would ensure that:

- Commitments are implemented in all material respects;

- The project's environmental and social performance complies in all material respects with applicable legal, regulatory and policy standards; and
- Shell may delegate responsibility for implementation of some commitments to third parties and all work will be carried out in a manner satisfactory to Shell.

7.2.2 EXPLORATION LEAD

Shell would designate an Exploration Lead who would have overall responsibility for the execution of the proposed project. The Exploration Lead would also be responsible for:

- environmental matters and for seeing that exploration activities are carried out safely and in accordance with the requirements of the EMP;
- verifying that environmental requirements are implemented in full, both by Shell and its contractors;
- the management of Shell staff and its contractors;
- ensuring that contractors are informed and understand environmental requirements before the commencement of the activities;
- the management of worker medical and health issues and the provision of appropriate care;
- verifying that there are adequate plans and sufficient resources in place for worker health care and contingency plans to respond to workplace accidents;
- ensuring that all operations permissions (including relevant clearances, permits, licences and necessary approvals from the relevant authorities) are valid prior to commencing the exploration activities; and
- ensuring that final details of the exploration drilling (including co-ordinates of final drilling location, schedule and drilling unit specifications) are communicated to the relevant authority prior to commencing the exploration activities.

7.2.3 HSSE LEAD

The HSSE Lead would be in charge of the execution of environmental, safety and health matters related to the proposed project. A Shell HSSE Representative would be on the drilling unit during drilling and present in the port during crew change. The Shell HSSE Representative would report to the HSSE Lead.

The HSSE Representative would work with the Rig Manager to resolve issues that may arise related to the implementation of environmental mitigation or monitoring requirements.

7.2.4 RIG MANAGER

Drilling activities would be carried out under the management of the Rig Manager who would have overall authority and responsibility for operation, navigation and safety of the drilling unit and the crew in accordance with applicable laws and regulations. The Rig Manager would ensure trainning occurs or verify that the crew receives the necessary training with regard to on-board safety and environmental control requirements.

7.3 MONITORING

Shell would be responsible for monitoring, surveillance and decision-making on all matters related to environmental protection during operations. Shell would undertake regular checks and audits in accordance with the requirements of this EMP. In addition to assessing operational aspects and monitoring, checks would assess compliance with objectives and targets, and the effectiveness of the EMP and its

implementation. The EMP would, therefore, be subject to on-going review and development to verify that is remains appropriate to the activities.

Monitoring and auditing findings would be reviewed by Shell and where corrective actions are deemed necessary, specific measures would be developed, with designated responsibility and timing, and implemented. In this way, continuous improvement in performance would be achieved.

Shell would conduct audits during the course of the drilling activities on a monthly basis. The audits would be undertaken by the HSSE Representative and would check compliance of activities against the requirements of the EMP. Findings would be documented in an audit report, which would be submitted to the Exploration Lead and Rig Manager for action and follow-up.

7.4 REPORTING

7.4.1 PRE-DRILLING NOTIFICATIONS

Shell would submit formal notification to PASA prior to initiating the proposed exploration drilling activities. Notification would include details of the activity location, schedules, drilling unit specifications and contractor details.

Individuals and organisations (including fishing operators and neighbouring license holders) identified as stakeholders through the EIA process, as well as those that have registered through the stakeholder engagement process, would be notified of planned exploration activities 30 days prior to commencement.

7.4.2 REPORTING DURING DRILLING

Shell would prepare a report on a weekly basis that summarises environmental issues associated with the drilling activities. The report would be submitted to PASA.

7.4.3 INCIDENT REPORTING

Following any HSSE incidents, Shell would conduct an incident investigation and prepare a report detailing the events and corrective and preventative measures implemented as a result. Significant incidents would be report to PASA.

7.5 SPECIFIC ENVIRONMENTAL PROTECTION ACTIVITIES AND PROCEDURES

The specific environmental protection activities and procedures are addressed under each of the project life cycle phases listed below.

7.5.1	PLANNING PHASE	7.5.1.1	Preparation of subsidiary plans
		7.5.1.2	Stakeholder consultation and notification
		7.5.1.3	Permits / Exemptions
		7.5.1.4	Financial Provision
7.5.2	ESTABLISHMENT PHASE	7.5.2.1	Compliance with the EMP
		7.5.2.2	Environmental Awareness Training
		7.5.2.3	Notifying other users of the sea
		7.5.2.4	Final well location
		7.5.2.5	Drilling equipment
7.5.3	OPERATIONAL PHASE	7.5.3.1	Adherence to the EMP and Environmental Awareness
		7.5.3.2	Prevention of emergencies
		7.5.3.3	Communication with other users of the sea and resource managers
		7.5.3.4	Dealing with emergencies including major oil spills
		7.5.3.5	Blow-out prevention
		7.5.3.6	Use and disposal of drilling muds, cuttings and cement
		7.5.3.7	Disposal of ballast water
		7.5.3.8	Pollution control and waste management
		7.5.3.9	Well testing
		7.5.3.10	Transport, storage and handling of radioactive devices
		7.5.3.11	Equipment loss
		7.5.3.12	Use of aircrafts / helicopters
		7.5.3.13	Oil bunkering / refuelling at sea
		7.5.3.14	Drilling unit lighting
7.5.4	DECOMMISSIONING AND CLOSURE PHASE	7.5.4.1	Suspension or abandonment of wells
		7.5.4.2	Drilling unit / vessels to leave area
		7.5.4.3	Inform key stakeholders of survey completion
		7.5.4.4	Final waste disposal
		7.5.4.5	Compile well drilling “close-out” report
		7.5.4.6	Information sharing

7.5.1 PLANNING PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	✓	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
7.5.1.1 PREPARATION OF SUBSIDIARY PLANS	Preparation for any emergency that could result in an environmental impact	Ensure the following plans are prepared and in place: • Oil Spill Response Plan approved by the relevant authority, namely South African Maritime Safety Authority (SAMSA); • Shipboard Oil Pollution Emergency Plan (SOPEP) for the drilling unit and all other vessels, as required by MARPOL; • Emergency Response Plan (including MEDIVAC plan); • Search and Rescue Plan (in accordance with the requirements of the South African Search and Rescue (SASAR) organisation; • Waste Management Plan (see contents in Section 7.5.3.8); and • Ballast Water Management Plan (see Section 7.5.3.7) In addition to the above, ensure that: • Drilling unit has Pollution Safety Certificate(s) issued by the South African Maritime Safety Authority (SAMSA); • There is adequate systems in place for oil pollution incidents; and • There is a record of the drilling units and supply vessel's seaworthiness certificate and/or classification stamp.		Shell HSSE Lead	Prior to commencement of operation	Confirm compliance and justify any omissions
7.5.1.2 STAKEHOLDER CONSULTATION AND NOTIFICATION	PASA and DEA notification	Compile the specific details of each drilling operation into a Drilling Notification and submit to the Petroleum Agency of South Africa (PASA) and DEA. The notification should provide, *inter alia*, the details on the following: • Drilling programme (timing, co-ordinates and duration); • Contractor details; • Drilling unit and supply vessel specifications (including relevant certification and insurance); • Oil Spill Response Plan and SOPEPs; and • Emergency Response Plan.		Shell HSSE Lead	30 days prior to commencement of operations or as required by PASA and / or DEA	Confirm that notification was sent to PASA and DEA
	Stakeholder notification	• Notify relevant government departments and other key stakeholders of the proposed drilling programme (including navigational co-ordinates of well location, timing and duration of proposed activities) and the likely implications thereof (specifically the 500 m exclusion zone and the movement of support vessels). Stakeholders include: > Fishing industry / associations: - South African Tuna Long-line Association; - South African Deep-sea Trawling Industry Association; - South African Tuna Association; and - Fresh Tuna Exporters Association.		Shell HSSE Lead	30 days prior to commencement of operations	Provide copies of all correspondence

7.5.1 PLANNING PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	✓	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
		> SAMSA, > South African Navy (SAN) Hydrographic office; > Department of Agriculture, Forestry and Fisheries (DAFF), including the fisheries research managers; > Transnet National Ports Authority (ports of Cape Town and / or Saldanha Bay); and > Adjacent prospecting / exploration right holders. • Any dispute arising with adjacent prospecting / exploration right holders should be referred to the Department of Mineral Resources or PASA for resolution.				
7.5.1.3 PERMITS / EXEMPTIONS	Compliance with legislative requirements	If necessary, apply to DEA for an exemption to approach to or remain within 300 m of whales (see note below). The request for an exemption must be submitted to DEA. <u>Note:</u> In terms of the Marine Living Resources Act, 1998 (No. 18 of 1998): • No person may approach within 300 metres of a whale by vessel, aircraft or other means without a permit; • A vessel approached by a whale is required to distance itself at 300 m from the whale, unless in possession of a permit; • A vessel may not proceed directly through a school of dolphins or porpoises; and • No person shall attempt to feed, harass, disturb or kill great white sharks, dolphins, seals or turtles.		Shell HSSE Lead	Prior to commencement of operations	Provide copy of permit / exemption
7.5.1.4 FINANCIAL PROVISION	Compliance with legislative requirements	Verify that financial provision is in place to execute the requirements of the EMP. Note: Shell does not intend to drill an exploration well in the first exploration right renewal period. In the first renewal period no field activities would be undertaken. An exploration well may be planned for the second renewal period between 2017 and 2018. When making an application for the second renewal period, the necessary financial provision would be made to PASA.		Shell	Prior to commencement of operations in the second renewal period	Confirm that financial provision for EMP has been put in place

7.5.2 ESTABLISHMENT PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	**✓**	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
7.5.2.1 COMPLIANCE WITH EMP	Operator and contractor to commit to adherence to EMP	• Verify that a copy of the approved EMP is supplied to the drilling contractor and is on board the drilling unit and supply vessels during the operation. • Operator to commit organisation and Contractor to meet the requirements of the EMP. • Verify procedures and systems for compliance are in place. • Verify correct equipment and personnel are available to meet the requirements of the EMP.		Shell HSSE Lead	Prior to commencement of operation	Verify that a copy of the EMP report is provided to the Drilling contractor
7.5.2.2 ENVIRONMENTAL AWARENESS TRAINING	Ensure personnel are appropriated trained	• Undertake Environmental Awareness Training to ensure the vessel's personnel are appropriately informed of the purpose and requirements of the EMP. • Verify responsibilities are allocated to personnel.		Rig Manager	Prior to commencement of operation	Copy of attendance register and training records
7.5.2.3 NOTIFYING OTHER USERS OF THE SEA	Ensure that other users are aware of the drilling programme	Request, in writing, the SAN Hydrographic office to release Radio Navigation Warnings and Notices to Mariners throughout the drilling period. The Notice to Mariners should give notice of (1) the co-ordinates of the well location, (2) an indication of the proposed drilling timeframes, (3) an indication of the 500 m safety zone around the drilling unit, and (4) provide details on the movements of support vessels servicing the drilling operation. These Notices to Mariners should be distributed timeously to fishing companies and directly onto vessels where possible.		Shell HSSE Lead	7 days prior to start	Confirm that request was sent to the SAN Hydrographic office
7.5.2.4 FINAL WELL LOCATION	Ensure that well positions will not affect obstacles / installations and sensitive habitats on the seabed	• Conduct a pre-drilling geohazard analysis of the seabed and near-surface substratum in order to map and avoid potentially vulnerable habitats and / or shipwrecks. • Use a Remotely Operated Vehicle (ROV) to survey the seafloor prior to drilling in order to confirm the presence or absence of any significant topographic features (e.g. rocky outcrops), vulnerable habitats (e.g. hard grounds) and / or species (e.g. cold-water corals, sponges) and cultural heritage material (e.g. shipwrecks) in the area. • Ensure final well locations avoid these vulnerable habitats / communities and any identified shipwrecks. • In the event that a shipwreck is detected, notify the South African Heritage Resource Agency (SAHRA) regarding requirements to disturb any such wrecks or any cultural heritage / archaeological material.		Shell Exploration Lead	Prior to drilling or as required	Provide pre-drill video to PASA Copy of permit from SAHRA (if required)

7.5.2 ESTABLISHMENT PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	✓	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
7.5.2.5 DRILLING EQUIPMENT	Minimise risk of the introduction of non-indigenous invasive marine species	Ensure all infrastructure (e.g. wellheads, Blow-out Preventers (BOPs) and guide bases) that has been used in other regions is thoroughly cleaned before use in South Africa.		Rig Manager	Prior to drilling	

7.5.3 OPERATIONAL PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	**✓**	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
7.5.3.1 ADHERENCE TO THE EMP AND ENVIRONMENTAL AWARENESS	Operate in an environmentally responsible manner	• Comply fully with the EMP (compliance would mean that all activities were undertaken successfully and details recorded). • Undertake appropriate monitoring (as per specific topics) and track performance against objectives and targets. Document all activities and results for internal and external auditing. • Subscribe to the principles of an internationally acceptable Environmental Management System onboard the drilling unit and supply vessels. This includes environmental awareness training, waste management and environmental monitoring, record keeping and continuous improvement.		Shell HSSE Lead	Throughout programme	Provide copies of records
7.5.3.2 PREVENTION OF EMERGENCIES	Minimise the chance of emergency and subsequent damage to the environment occurring	• Prevent collisions by ensuring that the drilling unit and supply vessels display correct signals by day and lights by night (including twilight), by visual radar watch and standby vessel(s). • Maintain 500 m safety zone around drilling unit through Notices to Mariners and Navigation Warnings • Ensure that a supply vessel, equipped with appropriate radar and communications, is kept on 24-hour standby in order to enforce the 500 m safety zone around the drilling unit. • Maintain standard vessel watch procedures (also see Section 7.5.3.3). • Ensure all hazardous materials are correctly labelled, stored, packed and sealed with proper markings for shipping. • Practice weekly emergency response drills.		Rig Manager	Throughout operation	Provide record of any incidents and interaction with other vessels
		• Ensure that all well locations are surveyed and accurately charted with the South Africa Navy Hydrographer. • Establish lines of communication with the following emergency response agencies / facilities: SAMSA, SAN Hydrographic Office (Silvermine), DEA (Directorate of Marine Pollution) and PASA.		Shell Exploration Lead		

7.5.3 OPERATIONAL PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	**✓**	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
7.5.3.3 CONTINUE TO COMMUNICATE WITH OTHER USERS OF THE SEA AND RESOURCE MANAGERS	Promote co-operation and successful multiple use of the sea, including promotion of safe navigation	• Through normal communication channels, Radio Navigation Warnings and Notices to Mariners, keep relevant government departments and other key stakeholders (see Section 7.5.1.2) updated on the drilling programme.		Shell Exploration Lead	During operations as required	Provide copies of written notices and list of those to whom it was sent
		• Co-operate with other legitimate users of the sea to minimise disruption to other marine activities. • Keep constant watch for approaching vessels during the drilling programme and warn by radio and support vessel, if required. • Call, via radio, any vessel targets at a radar range of 24 nm from the drilling unit to inform them of the safety requirements around the drilling unit. • Keep a record of any interaction with other vessels.		Rig Manager	During operations as required	Provide record of interaction with other vessels
7.5.3.4 DEALING WITH EMERGENCIES INCLUDING MAJOR OIL SPILLS (owing to collision, vessel break-up, refuelling etc.)	Minimise damage to the environment by implementing response procedures efficiently	• Adhere to obligations regarding other vessels in distress. • Notify SAMSA about wrecked vessels (safety and pollution) and the Department of Finance with regard to salvage, customs and royalties). Provide location details to SAN Hydrographer. • In the event of an oil spill immediately implement emergency plans (see Section 7.5.1.1). In the case of an oil spill to sea with serious potential consequences to marine and human life notify (a) the Principal Officer of the nearest SAMSA office, (b) the DEA's Chief Directorate of Marine & Coastal Pollution Management in Cape Town, and (c) PASA. Information that should be supplied when reporting a spill includes: > Name and contact details of person reporting the incident; > The type and circumstances of incident, ship type, port of registry, nearest agent representing the ships company; > Date and time of spill; > Location (co-ordinates), source and cause of pollution; > Type and estimated quantity of oil spilled and the potential and probability of further pollution; > Weather and sea conditions; > Action taken or intended to respond to the incident; and > Supply vessels must have the necessary spill response capability to deal with accidental spills in a safe, rapid, effective and efficient manner. • Where diesel, which evaporates relatively quickly, has been spilled, the water should be agitated or mixed using a propeller boat/dinghy to aid		Rig Manager	In event of spill	Record of all spills (Spill Record Book), including spill reports; emergency exercise reports; audit reports. Incident log

7.5.3 OPERATIONAL PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	**✓**	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
		dispersal and evaporation. • Dispersants should not be used without authorisation of DEA. Dispersants should not be used: > On diesel or light fuel oil. > On heavy fuel oil. > On slicks > 0.5 cm thick. > On any oil spills within 5 nautical miles off-shore or in depths less than 30 metres. > In areas far offshore where there is little likelihood of oil reaching the shore. • Dispersants are most effective: > On fresh crude oils; under turbulent sea conditions (as effective use of dispersants requires mixing). > When applied within 12 hours or at a maximum of 24 hours. • The volume of dispersant application should not exceed 20-30% of the oil volume.				
7.5.3.5 BLOW-OUT PREVENTION	Ensure that the necessary safeguards are in place and avoid any uncontrolled release of drilling fluids, oil and/or gas	• Fully inspect the BOPs on the drilling unit in accordance with the American Petroleum Industries recommended practices (or equivalent) prior to well drilling. • Ensure that all responsible personnel are qualified in accordance with International Well Control Forum requirements or equal and are adequately trained in both accident prevention and immediate response. • Follow written and internationally established procedures for well control. • Identify hazards and put risk control systems in place. • Implement monitoring and management measures in accordance with normal well control practise to assist in the detection and control of uncontrolled releases.		Rig Manager	Prior to and during drilling	

7.5.3 OPERATIONAL PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	**✓**	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
7.5.3.6 USE AND DISPOSAL OF DRILLING MUDS, CUTTINGS AND CEMENT	Minimise discharges into the sea	• Maximise the use of water-based mud s(WBM) at all times, using risered Synthetic-based muds (SBM) only when necessary • Ensure only low-toxicity and partially biodegradable drilling fluid and cement additives are used. • If the extent of cuttings dispersion overlaps with any vulnerable seabed communities identified in the vicinity of the proposed well location using the existing 3D seismic data and / or ROV (see Section 7.5.2.4), innovative technologies and operational procedures for drilling solids discharges should be considered (e.g. the use of weighted mud when drilling tophole sections to limit the extent of dispersion). • Centrifuge returning mud & cuttings stream to remove finer particles. • Ensure regular maintenance of the onboard solids control package. • The dispersion of the discharged cuttings should be aided by placing the cuttings chute at least 5 m below the sea surface. • Avoid excess cement usage by using a ROV to monitor discharges to the seafloor around the drill casing.		Rig Manager	During drilling operation	Provide estimates of actual volumes of muds, cuttings and cement disposed.
7.5.3.7 DISPOSAL OF BALLAST WATER	Minimise the discharge of ballast water into the sea and reduce the possibility of an impact	• De-ballasting of vessels must be undertaken only under strict adherence to IMO Guidelines governing discharge of ballast waters at sea. Re-ballasting at sea currently provides the best available measure to reduce the risk of transfer of harmful aquatic organisms, but is subject to ship-safety limits. The IMO notes that vessels using ballast water exchange should, whenever possible, conduct such exchange at least 200 nm from the nearest land and in water of at least 200 m depth. Where this is not feasible, the exchange should be as far from the nearest land as possible, and in all cases a minimum of 50 nm from the nearest land and preferably in water at least 200 m in depth; • Other precautionary guidelines suggested by the IMO include: > During the loading of ballast, every effort should be made to avoid the uptake of potentially harmful aquatic organisms, pathogens and sediment that may contain such organisms, through adequate filtration procedures; > Where practicable, routine cleaning of the ballast tank to remove sediments should be carried out in mid-ocean or under controlled arrangements in port or dry dock, in accordance with the provisions of the ship's ballast water management plan; and > Avoidance of unnecessary discharge of ballast water. • Implement a Ballast Water Management Plan (see Section 7.5.1.1).		Rig Manager	Throughout drilling operation	Provide estimates of actual volumes of ballast water disposed, distance and water depth ballast water was disposed.

7.5.3 OPERATIONAL PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	**✓**	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
7.5.3.8 POLLUTION CONTROL AND WASTE MANAGEMENT of products disposed of: into the air (exhausts, CFCs and incinerators), to sea (sewage, food, oils), to land (used oils etc, metals, plastics, glass, etc.)	Minimise pollution, and maximise recycling by implementing and maintain pollution control and waste management procedures at all times	• Implement a Waste Management Plan (see Section 7.5.1.1). The plan must comply with legal requirements (including MARPOL) for waste management and pollution control (for air and water quality levels at sea) and ensure "good housekeeping" and monitoring practices: > General waste: - Initiate a waste minimisation system. - No disposal overboard. - Ensure on-board solid waste storage is secure. - No waste is to be incinerated unless an Atmospheric Emission Licence is obtained from DEA: Air Quality Management Services. > Galley (food) waste: - No disposal within3 nm of the coast. - Disposal between 3 nm and 12 nm needs to be comminuted to particle sizes smaller than 25 mm. - Minimise the discharge of waste material should obvious attraction of fauna be observed. > Deck drainage: - Deck drainage should be routed to a separate drainage system (oily water catchment system). - Ensure all process areas are bunded to ensure drainage water flows into the closed drainage system. - Use drip trays to collect run-off from equipment that is not contained within a bunded area and route contents to the closed drainage system. - Ensure that weather decks are kept free of spillage. - Mop up any spills immediately with biodegradable low toxicity detergents. - Low-toxicity biodegradable detergents should be used in cleaning of all deck spillage. - Ensure compliance with MARPOL standards. > Machinery space drainage: Vessels must comply with international agreed standards regulated under MARPOL. All machinery space drainage would pass through an oil/water filter to reduce the oil in water concentration to less than 15 ppm. > Sewage: - Use approved treatment plants to the MARPOL standards.		Rig Manager	Throughout drilling operations	Provide summary of waste record book / schedule and receipts Report occurrence of minor oil spills and destination of wastes

7.5.3 OPERATIONAL PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	**✓**	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
		- No disposal within4 nm of the coast. - Disposal between 4 nm and 12 nm needs to be comminuted and disinfected prior to disposal into the sea. - Disposal beyond 12 nm requires no treatment. > Medical waste: Seal in aseptic containers for appropriate disposal onshore. > Metal: Send to shore for recycling or disposal. > Other waste: Dispose of remaining solid waste at a licensed landfill facility or an alternative approved facility. Ensure waste disposal is carried out in accordance with appropriate laws and ordinances. Note: no waste is to be incinerated unless an Atmospheric Emission Licence is obtained from DEA: Air Quality Management Services > Waste oil: Return used oil to a port with a registered facility for processing or disposal. > Wastewater: Comply with MARPOL. > Minor oil spill: Use oil absorbent. > Emissions to the atmosphere: - Properly tune and maintain all engines, motors, generators and all auxiliary power to contain the minimum of soot and unburned diesel. - Implement leak detection and repair programmes for valves, flanges, fittings, seals, etc. > Other hazardous waste: - Record types and volumes of chemical and hazardous wastes (e.g. radioactive devices/materials, neon lights, fluorescent tubes, toner cartridges, batteries, etc.) and destination thereof. - Send to designated onshore hazardous disposal site. Retain waste receipts. • Ensure all crew is trained in spill management.				

7.5.3 OPERATIONAL PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	**✓**	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
7.5.3.9 WELL TESTING	Ensure that there are minimal discharges into the sea and minimise product burned	• Use a high-efficiency flare to maximise combustion of hydrocarbons. • Only the minimum volume of hydrocarbons required for the test should be flowed, without compromising safety. • Reduce well test durations to the extent practical. • Maximise flare combustion efficiency by controlling and optimising flare fuel/air/stream flow rates. • Minimise the risk of pilot blow-out by ensuring sufficient exit velocity and providing wind guards. • Where appropriate, use a high integrity instrument pressure protection system to reduce over pressure events. • Minimise liquid carry over and entrainment in the flare stream using a suitable liquid separation system. • Minimise flame lift off and / or flame lick. • Monitor and control odour and visible smoke emissions (no visible black smoke). • Use well control procedures to ensure that there are no discharges to the sea. • For each drillstem flow test, provide an estimate of the volume of any oily discharge into the sea and the size of the resulting slick / sheen.		Rig Manager	During well testing	Quantity of oil / gas burned
7.5.3.10 TRANSPORT, STORAGE AND HANDLING OF RADIOACTIVE DEVICES	Avoid human and environmental exposure to radio-active material	• Comply with necessary regulations for the transport, storage and handling of radioactive devices. Transport and store radioactive devices in specially designed secured (locked) storage containers. • Designate competent person/s in charge and to handle the radioactive devices. Follow strict approved procedures when handling the devices. Wear personal monitoring devices to measure any unusual exposure. • Follow radioactive sources procedure. When radioactive sources are to be used, secure the area between and around the storage containers and the floor and only allowed key personnel in the area. • Set up incident and emergency reporting procedures for actual or suspected individual over-exposure, theft or loss, logging tools stuck downhole in wells, and release or spillage into the environment. • Routinely test the sources according to industry requirements to document leak levels.		Rig Manager	Throughout drilling operations	Provide results from routine tests on radioactive sources to determine leak levels

7.5.3 OPERATIONAL PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	**✓**	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
7.5.3.11 EQUIPMENT LOSS	Minimise hazards left on the seabed or floating in the water column, and inform relevant parties	• Keep a record of lost equipment and all items lost overboard and not recovered. • When any items that constitute a seafloor or navigational hazard are lost on the seabed, or in the sea, complete a standard form / record sheet, which records the location, date and cause of loss, details of equipment type, weather, sea state, etc. • Notify SAMSA and SAN Hydrographer. • Request that SAN Hydrographer send out a Notice to Mariners with this information.		Rig Manager	Throughout drilling operation	Provide a list of lost equipment and a copy of record sheet
7.5.3.12 USE OF AIRCRAFTS / HELICOPTERS for crew changes, servicing, etc.	Minimise disturbance / damage to marine and coastal fauna.	• Establish, with pilots, flight paths that do not pass over coastal reserves (MacDougall's Bay), seal colonies (Buchu Twins, Kleinzee and Strandfontein Point), bird colonies (Bird Island at Lambert's Bay) or Important Bird Areas (Orange River Mouth wetlands, Olifants River Estuary, Velorenvlei, Lower Berg River wetlands and the West Coast National Park and Saldanha Bay Islands). • Report deviations from set flight plans. • Low altitude coastal flights (<2 500 ft and within 1 nm of the shore) should also be avoided, particularly during the winter/spring (June to November inclusive) whale migration period and during the November to January seal breeding season. The flight path between the onshore logistics base in Kleinzee and drilling unit should be perpendicular to the coast. • Brief all pilots on ecological risks associated with flying at a low level along the coast or above marine mammals. • Comply with aviation and authority guidelines and rules.		Shell Logistics Manager	As required	Submit copy of set flight path. Report deviations from set flight paths.
7.5.3.13 OIL BUNKERING / REFUELLING AT SEA	Minimise disturbance / damage to marine life.	• No discharge of any oil whatsoever is permitted within 50 nm of the coast. • Offshore bunkering is not permitted within the economic zone (i.e. 200 nm from the coast) without permission from SAMSA. • Submit an application in terms of Regulation 14 to the Principal Officer at the port nearest to where the transfer is to take place. • Inform SAMSA of location, supplier and timing, 5 days prior to refuelling at sea.		Rig Manager / Vessel Captain	As required, 5 days prior to refuelling	Confirm that a notice was sent to SAMSA
7.5.3.14 DRILLING UNIT LIGHTING	Minimise attraction of marine fauna to drilling unit.	• Minimise non-essential lighting to reduce nocturnal attraction. However, such measures should not undermine work safety aspects or concerns. • Implement a monitoring programme of faunal attraction where all seabird injuries and mortalities are logged.		Rig Manager		Results of faunal monitoring

7.5.4 DECOMMISSIONING AND CLOSURE PHASE						
PROJECT PHASE AND ACTIVITIES:	**ENVIRONMENTAL OBJECTIVES:**	**AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME OBJECTIVES:**	✓	**RESPONSI-BILITY:**	**TIMING:**	**REQUIREMENT FOR "CLOSE-OUT" REPORT:**
7.5.4.1 SUSPENSION OR ABANDONMENT OF WELLS	Ensure that there are no leakages	• Seal well by inserting cement plugs in the well bore at various levels according to good oilfield practice. Test well integrity. • Plug wells in accordance with oil industry standards for possible use as a production well at a later date. • Record volume of cement discharged on seafloor. • Notify the SAN Hydrographer regarding the positions of any suspended or abandoned wells on the seafloor in order to inform the fishing industry of such obstructions through Navigation Warnings.		Rig Manager	On completion of well drilling	Quantity of cement discharged on seafloor Provide copies of correspondence with SAN Hydrographer
7.5.4.2 DRILLING UNIT / VESSELS TO LEAVE AREA	Leave area as it was prior to operation	Ensure that no construction debris or dropped equipment that may be detrimental to environment or other users of the sea is left on the seafloor.		Rig Manager	On completion of well drilling	Confirm through seabed scan and/or video
7.5.4.3 INFORM RELEVANT PARTIES OF SURVEY COMPLETION	Ensure that relevant parties are aware that the drilling operation is complete	Inform all key stakeholders (see Section 7.5.1.2) that the drilling unit and supply vessels are off location.		Shell Exploration Lead	Within four weeks after completion of drilling	Copies of notification documentation required
7.5.4.4 FINAL WASTE DISPOSAL	Minimise pollution and ensure correct disposal of waste	• Dispose all waste retained onboard at a licensed waste site using a licensed waste disposal contractor. • All recovered SBM should be stored on-board and taken to shore for treatment and reuse.		Drilling Contractor	When drilling unit / support vessels are in port	Receipt required from contractor
7.5.4.5 COMPILE WELL DRILLING "CLOSE-OUT" REPORT	Ensure corrective action and compliance and contribute towards improvement of EMP implementation	• Compile an exploration drilling "Close-out" Report for each well based on the monitoring undertaken during drilling (see Section 7.5.3.1). • Provide information / records as indicated in the "Close-out" Report column of the EMP within 90 days of the drilling operation or as required by PASA and / or DEA. • Provide copy of report to PASA. • Provide a copy of any video footage that was shot during the course of the drilling operation to PASA, if requested.		Shell HSSE Lead	On completion of each well	
7.5.4.6 INFORMATION SHARING	Expand knowledge base	Take steps to share data collected during the drilling programme (e.g. ROV video footage of the benthic environment), if requested, to resource managers (including DEA, South African National Biodiversity Institute and appropriate research institutes).		Shell Exploration Lead		As requested