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Draft Environmental Management Program

Proposed expansion of Port Elizabeth Rifle and Pistol Club (PERPC), Within Greenbushes, Port Elizabeth in the Eastern Cape.

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1. Scope of the EMPr

1.1 Purpose and Objectives of an EMPr

An Environmental Management Programme (EMPr) ensures that any potential environmental impacts are minimized, monitored and mitigated throughout the different project development stages. As a basic requirement, the EMPR complies with Regulation 33 of the 2010 Environmental Impact Assessment (EIA) Regulations as contained in GN R. 543, promulgated under the National Environmental Management Act (Act 107 of 1998 - NEMA) Thus, the EMPr aims to:

1. Reduce as far as possible any negative impacts, disturbance to environments and ecosystems;
2. Avoiding waste and where it is unavoidable, finding responsible methods of disposal including mitigation in the form of recycling;
3. Avoiding pollution, destruction or degradation of environment;
4. Keep in mind the environmental rights of people;
5. Promote sustainability;
6. Delegate responsibility of all mitigation and monitoring actions;
7. Ensure compliance with regulations and legislations;
8. Respond to future changes and provide continual feedback for improvement especially in the context of environmental impacts;
9. Verify environmental performance throughout the duration of a development;
10. Optimize environmental performance and ensure sufficient resource use that aligns with environmental goals and project financial constraints; and
11. Adhere to safety and time constraints throughout the development.

The EMPr is dynamic in that it should be updated as necessary with changes in technology, management methods or unforeseen impacts coming to light. An EMPr is legally binding, as it is submitted to a Competent Authority (CA) for decision-making purposes and will be considered in processes for Environmental Authorisation (EA). With the dynamic nature of the EMPr, any significant changes or alterations to the EMPr needs to be submitted and approved by the CA before being executed.

1.2 Environmental Legislation

The following legislation is directly relevant when assessing the terrestrial environment relating to the proposed new expansion in the Eastern Cape Province:

National Legislation:

Title of legislation or guideline	Administering authority	Applicability to the project
National Water Act, 1998 *(Act No. 36 of 1998)*	Department of Water & Sanitation (DWS)	Infrastructure may impact on existing surface water systems. This impact is only mentioned in this report (if relevant) and NOT discussed in detail.
National Environment Management: Biodiversity Act (NEMBA) (No. 10 of 2004)	Department of Forestry, Fisheries and the Environment (DFFE) and the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism	The proposed expansion must: – Conserve endangered ecosystems and protect and promote biodiversity. – Assess the impacts of the proposed development on endangered ecosystems. – No protected species may be removed or damaged without a permit; and

Title of legislation or guideline	Administering authority	Applicability to the project
		– The proposed site must be cleared of alien vegetation using appropriate means.
National Environmental Management Act (Act No. 107 of 1998), Environmental Impact Assessment Regulations		The activity triggers activities listed in NEMA EIA Regulations GN R. 327 and GN R. 324.
National Environmental Management: Waste Act (Act No. 59 of 2008)		The proposed expansion must: – Prevent pollution and ecological degaradation – Have delegated waste management measures – Provide for the remedation of contaminated land – Ensure compliance and enforcement of waste management legislation
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) Alien and Invasive Species Regulations		The proposed expansion site contains alien invasive species which need to be removed and controlled.
National Environmental Management Act (Act No. 107 of 1998), Environmental Impact Assessment Regulations		Site expansion must be co-operative and ensure environmental governance by establishing principles for decision-making on matters affecting the environment.
Firearms Control Act (Act No. 60 of 2000)	Department of Safety and Security	Activities on the expanded site after development must establish a comprehensive and an effective system of firearms control.
Occupational Health and Safety Act (Act No. 85 of 1993)	Department of Labour (DoL)	During and after site expansion, there must be provision for The health and safety arising out of or in connection with the activities of persons at work
National Forest Act (84 of 1998)	Provincial Department of Forestry	Requires that a permit be obtained should any forests or protected trees be removed during the construction phase of the project.
National Heritage Resources Act (Act No. 25 of 1999	South African Heritage Resources Agency (SAHRA) and the Eastern Cape Provincial Heritage Resource Authority (ECPHRA)	Proposed expansion must ensure good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations

Regional/Provincial legislation:

Title of legislation or guideline	Administering authority	Applicability to the project
Nelson Mandela Bay Municipality Bioregional Plan (NMBMBP; 2019)	DEDEAT	Map of biodiversity priorities and accompanying guidelines to inform land-use planning, environmental assessments and authorisations and natural resource management.
Nature Conservation Ordinance (19 of 1974)	Eastern Cape Department of Economic Development,	Proposed expansion must ensure the correct handling and conservation of any protected species.

Title of legislation or guideline	Administering authority	Applicability to the project
	Environmental Affairs and Tourism).	

2. EAP Declaration of Independence and Details

I, Roy de Kock as duly authorised representative of Blue Leaf Environmental (Pty) Ltd, hereby confirm my independence (as well as that of BlueLeaf) as a specialist and declare that neither I nor BlueLeaf have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which BlueLeaf was appointed as environmental assessment practitioner in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for worked performed, specifically in connection with the Environmental Impact Assessment for the proposed Expansion of the PERPC. I further declare that I am confident in the results of the studies undertaken and conclusions drawn because of it – as is described in this report.

_____

Full Name: Roy de Kock

Title / Position: Ecologist
Qualification(s): BSc (Hons) Geology; MSc Botany; Candidate PhD Botany
Experience (years/ months): 17 years.
Registration(s): SACNASP (400216/16)

EXPERTISE

Roy has over 17 years' experience in environmental consulting and specialist services in South Africa. Various projects throughout Africa have also been undertaken. Projects include baseline studies, impact assessments and compliance auditing for various large-scale projects including numerous wind farms, roads (National and Provincial), and infrastructure development projects. Blue Leaf also offers a wide range of in-house specialities including but not limited to Ecological and Botanical assessments, Biodiversity studies, Plant and Animal Search and Rescue, Fauna and Flora permits, Aquatic Assessments, Agricultural and Soil Assessments and Environmental and Venomous animals training workshops.

Roy holds a BSc Honours in Geology and an MSc in Botany from the Nelson Mandela University in Port Elizabeth. He is currently busy with his PhD (Doctorate degree) in Botany and Soil Science. He has over 17 years' experience in the environmental consulting focussing on Ecological and Agricultural Assessments, Geological and Geotechnical analysis, Environmental Management Plans, mining applications and various environmental impact studies.

3. Overview of Project

3.1 Project Description:

The expansion of the Port Elizabeth Rifle and Pistol Club (PERPC) is proposed for development on a 6.8-hectare portion on Erf 8 Portions 0 and 5 in Greenbushes, Port Elizabeth (Figure 1). The land is currently separated into two areas 500 m apart and connected by a 1 km gravel road. The separate areas are 3.5 ha and 1.5 ha and used respectively for rifles and pistols. The expansion will be to the existing rifle range and consist of (Figure 2):

- 4 x (25m x 50m) ranges.
- 2 x (25m x 115m) ranges.
- 12 x (25m x 25m) ranges.
- 1 x (50m x 70m) space for offices and storage containers
- Approx. 900m of new road, 3m wide
- A firebreak surrounding the entire expansion.

Figure 1: Location of the proposed new expansion of the rifle and pistol range in Greenbushes, Port Elizabeth (Google Earth image).

Figure 2: The Layout of the PERPC expansion in Greenbushes, Port Elizabeth.

3.2 Project Environment

Geology and Soil: Expansion site is located on a natural, flattened hilltop. Sediment is acidic lithosol soils derived from Ordovician sandstones and consist of calcareous sandstones, clastic limestones, conglomerates and coquinite from the relatively young Algoa Group of rocks

Climate: Subtropical oceanic climate with mild winters, warm summers and occasional wind. Temperatures average at 15˚C

Land Use: The project area is surrounded by degraded vegetation impacted by nearby mining stockpiles with some natural vegetation south of the proposed expansion. The project site is not cleared.

Surface hydrology: The site is located 321 m east of the non-perennial Chatty River. No wetlands occur within 500 m of the site boundary.

Vegetation: According to the SA Vegmap (2022) the proposed expansion site contains Algoa Sandstone Fynbos and Bethelsdorp Bontveld (Figure 3). However, the Nelson Mandela Bioregional Plan vegetation map defines the vegetation within the site as Rowallan Park Grassy Fynbos (Figure 4)

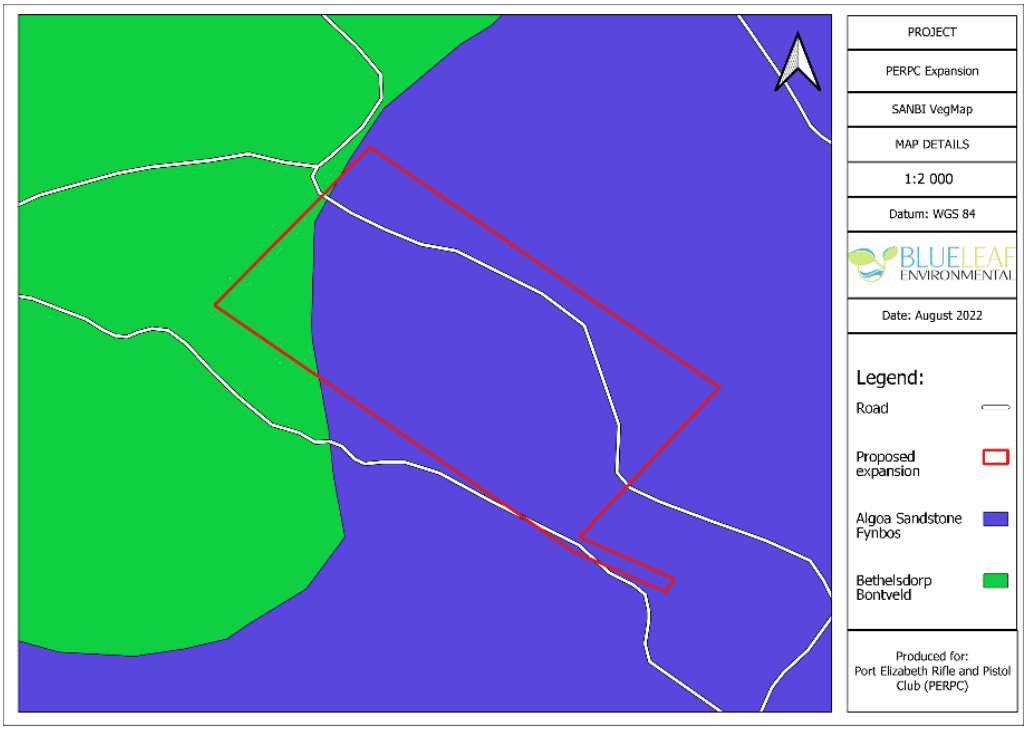

Figure 3: SANBI VegMap for the proposed expansion site.

Figure 4: NMBM vegetation units map for the proposed expansion.

Biodiversity: The project area contains an ESA2 and within the development and immediate surroundings are a CBA according to the Nelson Mandela Bay Metropolitan (NMBM) Critical Biodiversity Areas (CBA) map (Figure 5).

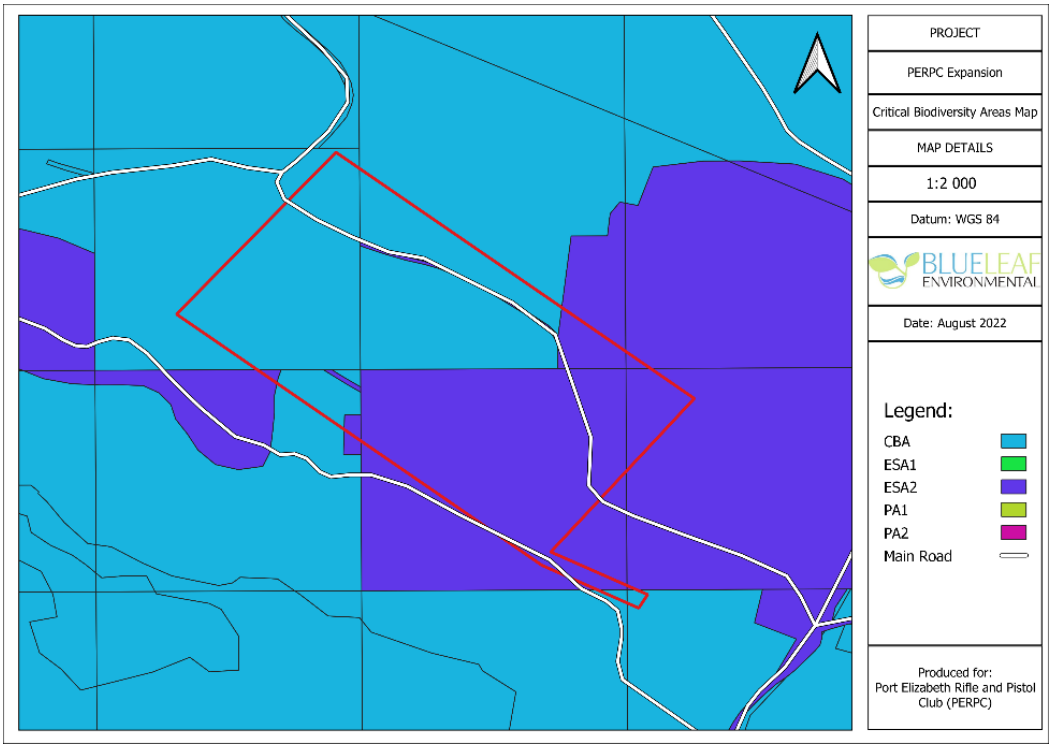

Figure 5: The critical biodiversity areas of the PERPC expansion in Greenbushes, Port Elizabeth.

4. ROLES AND RESPONSIBILITIES

Roles, responsibilities, and authority shall be defined, documented, and communicated to facilitate effective environmental management through implementation of the EMPr. The following responsibilities shall be assigned for the expansion.

Function	Respons ibility
Environmental Manager (EM)	– Overall management of project and EMPr implementation. – Oversees site works, liaison with Contractor/Suppliers, ESO and ECO.
Environmental Control Officer (ECO)	– Implementation of EMPr and liaison between PERPC and the local authorities. – Auditing of the site on a regular basis.
Environmental Site Officer(ESO)/ SHE Officer	– Interaction with ECO, landowners, and labourers. ESO must understand the content of the EMPr.
Contractors/Suppliers	– Compliance with recommendations and conditions of the EMPr.

4.1 Environmental Manager

The Environmental Manager (EM; proponent's representative) will act as the employer's on-site implementing agent and has the responsibility to ensure that the Client's responsibilities are executed in compliance with the relevant legislations. Any on-site decisions regarding environmental management are ultimately the responsibility of the EM. The EM shall assist the ECO where necessary and will have the following responsibilities in terms of the implementation of this EMPr:

- Be fully knowledgeable with the contents of this EMP.
- Review and authorise updates to the EMP.
- Ensure resource allocation for implementation of the EMP requirements.
- Ensure that environmental requirements are integrated into project plans, work method statements, tender and contract documents.
- Ensure necessary support to the ESO for implementation of the EMP.
- Undertake environmental system reviews, site inspections, audits, and other verification activities to assure that the EMP implementation is at an optimal level.
- Participate in environmental performance verification activities to verify the level of compliance with the EMP in delivering the legal and environmental obligations.
- Assess the efficacy of the EMP and identify possible areas of improvement or amendment required within the EMP.
- Participate in incident investigations (as required).
- Initiate external audits (as required)

4.2 Environmental Control Officer

The Environmental Control Officer (ECO) for the site is an independent environmental consultant appointed by PERPC to monitor and review the on-site environmental management and implementation of this EMPr during any construction activities.

The duties of the ECO:

- Ensure that all operational activities on site are undertaken in accordance with the EMPr;

- Undertake compliance audits against the EMP (where required).
- Provide support and advice to the project team, contractors, and all suppliers in the implementation of environmental management procedures and corrective actions.
- Ensure that monitoring programs, which assess the performance of the EMP, are implemented.
- Assist in the investigation of incidents and non-conformances and confirm in conjunction with the ESO that corrective and preventive action is taken and is effective.
- Assess the efficiency of the EMPr and identify possible areas of improvement or amendment required within the EMPr.
- Facilitate the amendment of the EMP in conjunction with the EM (as required).
- Provide environmental training for key project personnel (in communication EM).
- Reviewing and approving method statements in consultation with the EM.
- Prepare audit reports (and submit reports to the relevant authority as required).

4.3 Environmental Site Officer

The Environmental Site Officer (ESO or SHE Officer) is expected to administer and control all environmental matters relating to the operational activities of the expansion. The ESO will conduct the following:

- Ensure that the latest EMPr documents are on site and readily accessible as required.
- Monitor all appointed contractors' activities (during any construction activities) for compliance with the various environmental requirements contained in this EMPr.
- Identify areas of non-compliance and recommend measures to rectify them in consultation with the ECO and the EM as required.
- Ensure communication of EMPr requirements to relevant projects, contractors and sub- contractor as required for EMP implementation.
- Perform ongoing environmental awareness training of the expansion and all appointed contractor's site personnel.
- Ensure that environmental problems are remedied timeously and to the satisfaction of the ECO and the EM as required.
- Request the removal of people and/or equipment not complying with the specifications of EMPr.
- Facilitate environmental induction of all project staff and either deliver or coordinate delivery of all such training that would be required for the effective implementation of the EMPr.
- Set up activity-based method statements prior to the start of relevant construction activities and submit these to the EM and the ECO as required.
- Maintain environmental incidents and stakeholder complaints register.
- Undertake environmental system reviews, site inspections, audits, and other verification activities to assure that the EMPr implementation is at an optimal level.
- Report significant incidents internally and externally as required by law and the conditions of authorisation.
- Investigate incidents and recommend corrective and preventative actions.

4.4 Contractors

Contractors conducting work at the expansion shall ensure that all their staff and employees are familiar with, understand and adhere to the EMPr. Failure by any contractor to show adequate consideration to the environmental aspects of this contract shall be considered sufficient cause for the ECO to instruct the EM to have the employee removed from the site. The EM will also order the removal of equipment from the site that is causing continual environmental damage (e.g. building material pollution and rubble). Such measures will not replace any legal proceedings the client may institute against the Contractor.

The EM shall order the contractor to suspend part or all of the works if the contractor and/or any sub-contractor, suppliers, etc., fail to comply with both the EMPr and procedures supplied by the ESO or EM.

The suspension will be enforced until such time as the offending procedure or equipment is corrected and/or if required remedial measures are put in place.

By virtue of the environmental obligations delegated to contractors through the Contract Document, all workers (including subcontractors, suppliers, and service providers) appointed for the project would be responsible for:

- Ensuring adherence by providing adequate staff and provisions to meet the requirements of the EMP.
- Ensuring that Method Statements are submitted to the EM for approval before any work is undertaken, and monitor compliance with the EMP and approved Environmental Method Statements.
- Ensuring that any instructions issued by the ESO and/or EM are adhered to.
- Ensuring the representation of a report at each site meeting, documenting all incidents that have occurred during the period before the site meeting.
- Undertake daily, weekly, and monthly inspections of the work area(s).
- Ensuring that a register of all the transgressions issued by the ESO is kept in the site office.
- Ensuring that a register of all public complaints is maintained.
- Ensure that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the success full implementation of the environmental requirements of the Contract.
- Report and record any environmental incidents caused by the Contractor or due to the
- Contractor's activities.
- Obtain required corrective action within specified time frames and close out of environmental incidents.
- Provide weekly checklists to the EM and ESO.

5. ENVIRONMENTAL MANAGEMENT PLAN

5.1 Training and Induction

PERPC is bound to be responsible for ensuring that environmental awareness education of all employees and contractors is done satisfactorily. PERPC should ensure that employees and contractors are made aware of the environmental requirements of the project.

The EMPr should form part of the Terms of Reference for all contractors, sub-contractors, and suppliers. All contractors, sub-contractors and suppliers will have to sign an agreement to assure that they understood the EMPr and that they will comply. All senior staff should familiarise themselves with the full contents of the EMPr and its implications. Senior staffs (Expansion Manager/Supervisor) are expected to train and assist the rest of the employees on the contents of the EMP.

5.2 Environmental Incident Reporting

All environmental incidents occurring at the facility shall be recorded. The incident report should include time, date, location, and nature of the incident, extent of the incident, actions taken, and personnel involved.

All complaints received from the neighbouring properties/communities should be directed to the manager of the Markman Expansion and channelled to the EM. PERPC Management should be able to respond to the complainant within a week (even if pending further investigation). It is important that the issues raised are considered and that the complainant feels that their concerns have been addressed to and wherever possible actions taken to address these. All complaints should be entered in the environmental register and all responses and actions taken to address these should be recorded.

5.3 Environmental Monitoring

Periodic environmental monitoring must be taken on a regular basis. Monitoring should be done to ensure compliance with all aspects of the EMP. Findings should be liaised with to all responsible officers as chain command.

5.4 EMPr Administration

Copies of this EMP shall be kept at the site office and should be distributed to all senior staff members, including those of the contractors.

5.5 EMP Amendments

The EMP amendments can only be made with the approval of the EM and ultimately the DMRE. Amendments to the EMP should be liaised to all employees and contractors.

5.6 Non-compliance of the EMP

Problems may occur in carrying out mitigation measures or monitoring procedures that could result in non-compliance of the EMP. The responsible personnel should encourage staff to comply with the EMPr, and address acts of non-compliance and penalties.

PERPC is responsible for reporting non-conformance with the EMPr, to the EM. The management of PERPC, in consultation with the EM must, thereafter, undertake the following activities:

- Investigate and identify the cause of non-conformance.
- Implement suitable corrective action as well as prevent recurrence of the incident.
- Assign responsibility for corrective and preventative action.
- Any corrective action taken to eliminate the causes of non-conformance shall be appropriate to the magnitude of the problems and commensurate with the environmental impact encountered.

5.7 Environmental Register

An environmental register should be kept on site in which incidents related to actual impacts are recorded. This will include information related to incidents as spillages, dust generation and complaints from adjacent neighbours. It should also contain information relating to actions taken. Any party on site may complete the register, however, it is envisaged that the Expansion Manager and the EM will be the main contributors, and who will also be the main parties involved in suggesting mitigation measures.

5.8 Site Manager

Areas outside this designated working zone shall be considered “no go” areas. The offloading zones must be clearly demarcated when offloading goods to enhance safety around the proposed development.

Fire and safety management
Hydrocarbons are volatile under certain conditions and their vapours in specific concentrations are flammable. If precautions are not taken to prevent their ignition, fire and subsequent safety risks may arise.

No fire, whether for cooking or any other purpose, is to be made at the facility. All expansion personnel and contractors shall take all reasonable measures and active steps to avoid increasing the risk of fire through activities on site and prevent the accidental occurrence or spread of fire; and shall ensure that there is sufficient fire-fighting equipment on site at all times. This equipment shall include fire extinguishers. All expansion personnel and contractors should be prepared for such events.

PERPC management together with all expansion personnel and contractors shall take all reasonable measures to avoid increasing the risk of fire and shall ensure that there is sufficient fire-fighting equipment on site at all times.

Staff management
PERPC and its contractors must ensure that all their employees have suitable personal protective equipment and professionally trained in firefighting and first aid.

Waste management
All waste shall be removed off-site to designated waste disposal site. Sufficient bins or containers on-site to store any solid or liquid waste produced should be provided by PERPC. The bins and containers should be weatherproof and scavenger- proof.

Hydrocarbons management
If any spillage occurs, contaminated soil shall be collected in a holding tray or drum, and which will then be disposed of at a licensed hazardous waste site. Any spillage of more than 200 litres must be reported to the DMRE as per the Petroleum Products Act.

PERPC and its contractors shall take all reasonable measures to prevent surface or groundwater pollution from the release of oils and fuels.

Sufficient space should be left in fuel storage tanks to allow for fuel expansion and to prevent leakage of fuel from the fuel storage facility.

Flood management

Storm water management of the site should be a key aspect of flood management on site. All stormwater systems, culverts and waterways should be kept clean to allow storm water to flow freely.

Accidents on site

PERPC and its contractors shall comply with the Occupational Health and Safety Act and any other national, regional, or local regulations regarding safety on site. The Contractor shall ensure that contact details of the local medical services are available to the relevant construction personnel prior to commencing works.

Emergency advisory procedures

Contractors shall ensure that there is an emergency advisory procedure on site before commencing any operations that may cause damage to the environment. The Contractor shall also ensure that site staffs are familiar with all emergency procedures to be followed.

The Contractor shall ensure that lists of all emergency telephone numbers/contact people are kept up to date, and that all numbers and names are always posted at the site

6. PROJECT PHASES

The project phases can be categorized into the Planning and Design Phase (Pre-Construction), Construction Phase and Operational Activities.

6.1 Planning and Design (Pre-Construction) Phase

The Planning and Design Phase will consist of planning for the proposed development and will include, amongst others, the following activities:

- Purchasing of necessary materials to be used for the shooting range.
- Planning of stormwater infrastructure.
- Demarcation of development area.

6.2 Construction Phase

Site preparation and construction entails the following:

- The placement of a standard shipping container/s used for material storage, office space/business operation and a clubhouse.
- Clearance of vegetation with a bulldozer for the landscaping of sand mounds to penetrate bullets, as well as the clearing of vegetation to construct gravel roads.
- Clearance of vegetation for each shooting range and to ensure that each range is level.
- Provision of adequate stormwater structures as well as chemical toilets.
- Putting up rainwater harvesting tanks to harvest rainwater as needed.

6.3 Operational Phase

During the operational phase, containers will be used for business/reception for PERPC, all roads leading to each shooting range will be cleared, and all sand mounds will be in place to ensure safety within each range. Targets may also be put up at each shooting range which are non-permanent/removeable.

7. INFRASTRUCTURE AND SERVICES

7.1 Water Supply

Water will not be required during the construction phase. During the operational phase, rainwater may be stored and harvested on site using rainwater harvesting tanks (e.g., Jojo tanks).

7.2 Solid waste

During the construction phase of the development, all vegetation will be cleared and temporarily stockpiled. After construction, stockpiles not used for sand mounds will then be removed and taken to a registered landfill site. The operational phase of the proposed activity will result in the generation of general waste. Waste bins will be located at each shooting range.

7.3 Effluent waste

During the construction and operational phase of the development, liquid effluent will be handled via the implementation of portable/temporary chemical toilets for construction staff, PERPC staff, and visitors which will be housed within the business/reception container. The facilities will be serviced by an external service provider to remove the waste and service the toilets (chemical toilets). PERPC will not be making use of any municipal water and water will be harvested as needed using their existing rainwater harvesting tanks on site.

7.4 Energy sources

Electricity will be sourced from an existing generator on site and therefore PERPC will not be making use of municipal electricity.

7.5 Stormwater Infrastructure

Adequate stormwater infrastructure should be implemented to ensure that the erosion risk is not increased within the expansion area.

8. Environmental Impacts Mitigations

Mitigation guidelines are addressed through three phases namely Pre-construction (Site Establishment) Phase; Construction Phase (and associated rehabilitation of affected environment); Operational Phase (Post-Construction) and Decommissioning Phase.

Each phase has specific issues unique to that period of the development and operation of the proposed infrastructure. Each is identified and given a brief description. The four phases of the development are then identified and addressed below:

IMPACT	MITIGATION REQUIRED
Pre-construction phase	
Site preparation	Appoint an Environmental Control Officer
	The Main Contractor must draw up method statements for relevant construction activities.
	The ECO must approve all the method statements before they become operational.
	Before construction begins, all areas to be developed must be clearly demarcated with fencing or orange construction barrier where applicable.
	The ECO must ensure compliance with conditions described in the EA.
	All no-go areas on site must be properly fenced off / demarcated and signage placed prior to the onset of construction.
	Records of compliance / non-compliance with the conditions of the EMP must be kept on-site and be available on request. A copy of these records mustbe made available to the provincial department on request throughout the project execution.
	All unskilled laborers must be drawn from the local market and where possible use must be made of local semiskilled and skilled personnel.
Site clearing	Areas which are not to be constructed on must not be cleared to reduce erosion risks.
	The area to be cleared must be clearly demarcated and this footprint strictly maintained. Footprint of clearance should not exceed the required footprint.
	Spoil (including excavated sub-soils and topsoil) that is removed from the site must be removed to an approved spoil site.
Dust	Damping down of the un-surfaced access roads must be implemented to reduce dust and nuisance.
Soil erosion	The necessary silt fences and erosion control measures must be implemented in areas where these risks are more prevalent.

IMPACT	MITIGATION REQUIRED
Construction phase	
Laydown Areas	Choice of site for the Contractor's laydown area requires the Project Manager and ECO's permission and must consider location of residents and/or ecologically sensitive areas, including flood zones. A site plan must be submitted to the project Manager for approval. The size of the Construction
	Adequate parking must be provided for site staff and visitors. The Contractor must attend to drainage of the camp site to avoid standing water and / or sheet erosion.
	Suitable control measures over the Contractor's yard, plant, and material storage to mitigate any visual impact of the construction activity must be implemented.

IMPACT	MITIGATION REQUIRED
	All laydown areas are to be fenced off in such a manner that unlawful entry is prevented, and access is controlled. Signage shall be erected at all access points in compliance with all applicable occupational health and safety requirements. All access points to the Construction laydown must be controlled by a guard or otherwise monitored, to prevent unlawful access.
	The construction laydown area layout plan must be provided to the ECO for approval prior to the construction of the laydown area.
	Site establishment shall take place in an orderly manner and all requiredamenities shall be installed at the construction laydown areas before the main workforce move onto site.
	All construction equipment must be stored within the construction laydown area.
	All associated oil changes etc. (no servicing) must take place within this camp on a sealed surface such as a concrete slab.
	An area for the storage of hazardous materials must be established that conforms to the relevant safety requirements and that provides for spillage prevention and containment
	The Construction Camps shall be provided with portable fire extinguishing equipment, in accordance with all relevant legislation and must be readily accessible.
	The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate sanitary activities be allowed.
	All imported materials (e.g. sand) must be stockpiled within the site boundary/Construction Zone. Sand and excavated material stockpiles shouldbe protected against wind using temporary screens, and from water erosion using tarpaulins where necessary.
	No fires will be allowed, and the Contractor must make alternative arrangements for heating. LP Gas may be used, provided that all required safety measures are in place. The Contractor shall take specific measures to prevent the spread of fires, caused by activities at the campsites. These measures include appropriate instruction of employees about fire risks.
Storage of hazardous material	Impervious surfaces must be provided where necessary. Storage areas must be designated, demarcated, sign posted and fenced if necessary.
	Storage areas must be secure to minimize the risk of crime. They must also be safe from access by unauthorized persons i.e. children/animals etc.
	Fire prevention facilities must be present at all storage facilities.
	Proper storage facilities for the storage of oils, grease, fuels, chemicals, and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the temporary storage area(s).
	These pollution prevention measures for storage must include a bund wall high enough to contain at least 110% of any storedvolume. The bund wall must be high enough to contain 110% of the total volume of the stored hazardous material with an additional allocation for potential stormwater events.
	All necessary approvals with respect to fuel storage and dispensing (if required on site) shall be obtained from the appropriate authorities.
	Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site.
	Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures.
	General waste management protocols must always be implemented.

IMPACT	MITIGATION REQUIRED
	All excess cement and concrete mixes are to be contained on the construction site prior to disposal off site.
	All harmful materials must be safely stored in a dry, secure environment, with concrete or sealed flooring and a means of preventing unauthorized entry. Furthermore, it must be ensured that material storage facilities are cleaned/maintained on a regular basis, and that leaking containers are disposed of in a manner that allows no spillage onto the bare soil. The management of such storage facilities and means of securing them shall be agreed.
	All major spills as specified in the contractor emergency response procedure of any materials, chemicals, fuels or other potentially hazardous or pollutant substances must be cleaned immediately, and the cause of the spill investigated. Preventative measures must be identified and submitted to the EM for information. Emergency response procedures to be followed andimplemented.
Traffic	All equipment moved onto site or off site is subject to the legal specifications for the transport of such equipment.
	The Contractor shall ensure that all the necessary precautions against damage to the environment and injury to persons are taken in the event of an accident.
Soil and Geology	Implement effective erosion control measures.
	Ensure that the mixing /decanting of all chemicals and hazardous materials must take place on a tray or impermeable surface.
	Ensure all storage tanks are designed, bunded and managed to prevent pollution of drains, groundwater and soils.
	Ensure that use and storage of fuels and chemicals that could potentially leach into the ground be controlled. Adequate spillage containment measuresshall be implemented, such as cut off drains, etc. Fuel and chemical storage containers shall be set on a concrete plinth. The containment capacity shall be equal to the full amount of material stored, plus 10%.
	Appoint appropriate contractors to remove any residue from spillages fromsite. Handling, storage and disposal of excess or containers of potentially hazardous materials shall be in accordance with the requirements of the above-mentioned Regulations and Acts.
Water use andpollution	Water must be reused, recycled or treated where possible.
	Efficient oil and grease traps or sumps must be installed and maintained at re-fueling facilities, workshops, fuel storage expansions, and containment areas and spill kits must be available with emergency response plans.
	Promote a water saving mind set with construction workers to ensure less water wastage.
	Earth, stone and rubble is to be properly disposed of, or utilized on site so asnot to obstruct natural water pathways over the site (i.e. these materials must not be placed in stormwater channels, drainage lines or rivers).
	There must be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.
Surface water management	Municipal water must be used for all activities such as washing of equipmentor disposal of any type of waste, dust suppression, concrete mixing, compacting, etc.
	Storm water management must be enforced by monitoring runoff levels. At the start of erosion, accelerated run-off must be diverted away from baresoil.
Waste management	Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site.
	Where considerable quantities of waste are generated, this must be placed in 200-liter bins or skip containers and removed once full.
	The Contractor shall supply waste collection bins where such is not available,and

IMPACT	MITIGATION REQUIRED
	all solid waste collected shall be disposed of at registered/licensed landfill.
	In general, any litter must be cleared immediately.
	Littering by the employees shall not be allowed under any circumstances.
	The ECO shall monitor the neatness of the work sites as well as the Contractor campsite.
	It is important that the contractors and workers must be informed of the facilities and procedures available for the disposal of waste.
Spills and contamination	Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.
	Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site.
	The ECO/EM must determine the precise method of treatment for pollutedsoil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil.
	If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.
	Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use. Contaminated remediation materials must be carefully removed from the area of the spill toprevent further release of petrochemicals to the environment and stored in adequate containers until appropriate disposal.
Dust Control	The EO must monitor weather forecasts relating to periods of expected high.
	winds; dust control methods such as damping down must be undertaken regularly when high winds are forecast for the study area.
	The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to sensitive receptors such as the surrounding landowners and the neighboring communities.
	Dust generation must be kept to a minimum and suppressed on access roads and construction areas during dry periods. This can be accomplished by theregular application of water.
Noise management	The construction phase must aim to adhere to the relevant noise regulations (SANS 10328:2008) and limit noise to within standard working hours and acceptable industrial limits (61 dBA for an industrial noise) to reduce disturbance of dwellings in close proximity to the development.
	Construction activities are to be contained to reasonable hours during the dayand early evening (weekdays from 06:00am to 18:00pm). Night- time activities near noise sensitive areas must not be allowed.
	Construction workers to wear necessary Personal Protection Equipment (PPE).
	Noise suppression measures must be applied to all construction equipment. Construction equipment must be kept in good working order
Occupational healthand safety	Safety measures for work procedures must be implemented.
	First aid kits must be available and accessible on site.
	A health and safety plan in terms of the Occupational Health and Safety Act(Act No. 85 of 1993) must be drawn up by the Contractor and approved by the ECO to ensure worker safety.
	Workers must be thoroughly trained in using potentially dangerous equipment.
	Contractors must ensure that all equipment is maintained in a safe operating condition.

IMPACT	MITIGATION REQUIRED
	A safety officer must be appointed.
	A record of health and safety incidents must be kept on site.
	Any health and safety incidents must be reported to the Project Manager immediately.
	First aid facilities must always be available on site and several employees trained to carry out first aid procedures.
	Workers have the right to refuse work in unsafe conditions.
	The Contractor shall take all the necessary precautions against the spreading of disease such as measles, foot and mouth, etc.
	Material stockpiles or stacks must be stable and well secured to avoid collapse and possible injury to site workers / residents.
	Working areas must be provided with adequate ventilation and dust/fume extraction systems to ensure that inhalation exposure levels for potentially corrosive, oxidizing, reactive or siliceous substances are maintained and managed at safe levels.
	Eye wash and emergency shower systems must be provided in areas where there exists the possibility of chemical containment of workers and the need for rapid treatment.
	All sources of hazardous energy or hazardous substances must have written procedures for isolation, identifying how the system, plant or equipment can be made and kept safe.
	Use of contrast coloring on equipment/machinery including the provision of reflective markings to enhance visibility.
	Use of moving equipment/machinery equipped with improved operator sight lines.
	Issuing workers with high visibility clothing.
	Personal Protective Equipment (PPE) must be made available to all construction staff and must be compulsory. Hard hats and safety shoes mustalways be worn, and other PPE worn were necessary i.e. dust masks, ear plugs etc.
	No person is to enter the site without the necessary PPE.
	Emergency numbers for local police and fire department etc. must be placed in a prominent area
	All equipment used for construction must be in good working order with up-to-date maintenance records.
	From the construction phase, an emergency evacuation plan must be drawnup to ensure the safety of the staff and surrounding land users in the case of an emergency.
	All permanent staff must undergo safety training.

IMPACT	MITIGATION REQUIRED
Operational phase	
Decommissioning of construction site	All structures comprising the construction camp are to be removed from site.
	The area that previously housed the construction camp is to be checked for spills of substances such as oil etc, and these shall be cleaned up.
	Surfaces are to be checked for waste products from activities such as concreting and cleared in a manner approved by the Engineer.
	All surfaces hardened due to construction activities are to be ripped and imported material thereon removed.
	All rubble is to be removed from the site. Burying of rubble on site is prohibited.

	The construction camp site is to be cleared of all litter.
	Fences, barriers, and demarcations associated with the construction phase are to be removed from the site unless stipulated otherwise by the Engineer.
	All residual spoil and topsoil stockpiles must be removed to spoil or spread on site as directed by the Engineer.
	All residual building materials must be removed from the site.
Soil erosion	All damaged areas shall be rehabilitated upon completion of the contract.
	Rehabilitation must take place in a phased approach as soon as possible.
	Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.
	The site needs to be monitored monthly to identify the emergence of alien species and any erosion concerns.
Waste management	The site must be kept clear of litter all the time
	All waste must be removed promptly to ensure that it does not attract vermin or produce odors.
	Solid waste must be collected on a regular basis.
Health and Safety Visual	Upon completion of the construction phase, an emergency evacuation plan must be drawn up to ensure the safety of the staff and surrounding land users in the case of an emergency.
	The site is to be regularly maintained. A maintenance schedule must be drawn up and records of all maintenance kept.
	Firefighting equipment in the form of fire hydrants or fire extinguishers must be available on the site. These must be regularly maintained by an appropriate company.
	A spill kit needs to be kept on site to address any unforeseen spillages.
	Transport of all hazardous substances must be in accordance with the relevant legislation.
Visual	Lighting must be kept to a minimum and restricted to low level, downward facing lights to reduce light spill.
	Lighting must be inward and downward pointing to reduce glare in surrounding areas.
	The site and surrounds must be kept clean, tidy, and well maintained to reduce negative visual impacts;
	Roads must be well maintained.
	Regular maintenance of the associated infrastructure must be undertaken.

9. Conclusions

If the above-mentioned management recommendations are properly implemented, it is anticipated that most of the adverse impacts on the environment can be mitigated. An appointed ECO will need to monitor or audit the site throughout construction and possible decommissioning phase to ensure that the EMPr is fully implemented and complied with. The EMPr caters for operational and maintenance phases (including possible decommissioning) but will need to be reviewed during all phases of the project, especially when revisions are made to the development and/or operations of the facility.

The EMPr should be used as an on-site tool during all phases of the development. Parties responsible for contravention of the EMPr should be held responsible for any rehabilitation that may need to be undertaken.

9.1 Preconstruction Phase

The first site activities, before mobilization of equipment, will be a survey for final development designs. There will be negative impacts on land associated with the construction of laydown areas (temporary loss) and storage of construction materials. Expectations of improvement in livelihood among locals must be addressed through public participation. Construction contracts will include environmental monitoring and management procedures and requirements. These must be in place prior to the commencement of any construction activities.

9.2 Construction Phase

This phase of the project could result in both positive and negative impacts. The positive impacts are employment opportunities offered to the construction workers and any other labourer who will be hired to provide his/her services during the construction phase. The negative impacts would include wastes generated, accidents, health and safety, air, dust and noise pollution, soil erosion, contamination of geohydrology and soils. Most of the negative impacts are minor and temporary. However, on mitigating negative impacts, the contractor shall ensure that all staff have adequate protective clothing and are adequately trained. The whole range of mitigation measures are however, outlined in the EMP in this regard.

9.3 Operational Phase

The proposed project will have minimal negative effects which mainly relates to health and safety and contamination of geohydrology and soils. These negative impacts are highly unlikely to occur. Mitigation measures stipulated in this EMP outline procedures should contamination occur.

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