


**PROPOSED BELMONT VALLEY GOLF COURSE, GRAHAMSTOWN,
EASTERN CAPE PROVINCE OF SOUTH AFRICA**

DEA REFERENCE NUMBER: EC04/LN2/M/11-98

FINAL

**VOLUME 4
ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)**

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REPORTS PRODUCED AS PART OF THIS EIA:

- Volume 1: Scoping and Terms of Reference Report
- Volume 2: Specialist Report
- Volume 3: Environmental Impact Assessment Report
- Volume 4: Environmental Management Programme**

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1 INTRODUCTION

An Environmental Management Plan (EMP) must consist of a set of mitigation, monitoring and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The plan also includes the actions needed to implement these measures.

1.1 Environmental Management Plan

According to the Western Cape Department of Water and Environmental Affairs and Development Planning (2005), an Environmental Management Plan (EMP) can be defined as, “*an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the project are enhanced*”.

EMPs are very important tools in the sound environmental management of projects, provided the specifications are implemented and the user understands the contents of the report and the reasons for the implementation of certain specifications.

The EMP has the following objectives:

- To state standards and guidelines which are required to be achieved in terms of environmental legislation.
- To set out the mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts and where possible to improve the condition of the environment.
- To provide guidance regarding method statements which are required to be implemented to achieve the environmental specifications.
- To define corrective actions, which must be taken in the event of non-compliance with the specifications of the EMP.
- To prevent long-term or permanent environmental degradation.

The following principles have been used in the preparation of the EMP:

- Compliance with relevant legislation, standards, codes, and practices in the application of safe technologies;
- Minimisation of impacts on the environment and human beings;
- Performance of all activities in a safe and effective manner and maintenance of all equipment in good operating condition for the protection of the health and safety of all persons and to conserve the environment and property;
- Focus on environment risk prevention;
- Focus on occupational and public health, safety; and
- The undertaking of all necessary precautions to control, remove, or otherwise correct any leaks and/or spills of hazardous materials, or other health and safety hazards.

There are essentially four broad categories of EMPs: Design EMP, Construction EMP, Operational EMP and Decommissioning EMP. The objectives of these EMPs are all the same and include; identifying the possible environmental impacts of the proposed activity, and developing measures to minimise, mitigate and manage the negative impacts while enhancing the positive ones. The difference between these EMPs is related to the different mitigation measures required for the different stages of the project life cycle.

The proposed Belmont Valley Golf Course project will not include the decommissioning phase as this is not envisaged within 20 years at least. Each category of EMP is discussed in more detail below.

1.1.1 Design EMP

The Design EMP is an integral component of the project life cycle and requires interaction between the design engineers and environmental consultants to ensure that the engineers are aware of the environmental constraints that must be considered and incorporated into the final design of the project.

The format of this design EMP is checklist in nature to ensure that all specifications are included in the design phase. The design EMP phase requires ongoing and in-depth discussions between the final design team and the environmental officer. The engineer will have to cost for, and be available for, ongoing discussions with the environmental officer at all stages of final design.

1.1.2 Construction EMP

The Construction EMP details the environmental management system/framework within which construction activities will be governed for the Construction Phase. The Construction EMP consists of various actions, initiatives and systems that the contractor will have to ensure are in place and are undertaken. The Construction EMP (See Section 5 of this document) consists of both a management system and environmental specifications which contain detailed specifications that will need to be undertaken or adhered to by the contractor.

The Construction EMP will need to be developed in parallel with the Final Design Stages, and constructive input should be invited from the selected contractor. Sound environmental management is orientated around a pragmatic, unambiguous but enforceable set of guidelines and specifications, and for this reason it is imperative that the contractor, while being bound by the EMP, fully understands it and has had input into its final development. For this reason the final construction EMP will need to be signed off after input from the selected contractor prior to the initiation of construction activities. It should, however, be noted that the contractor must tender on the existing document and that in areas of uncertainty, a precautionary approach to the environmental guidelines and specifications must be adopted

1.1.3 Operational EMP

The operational phase EMP provides specific guidance related to operational activities associated with a particular development. Operational EMPs are sometimes referred to as Environmental Management Systems (EMS).

Impacts during the operational phase of a development of this nature will be few in number and low in intensity. By taking pro-active measures during the construction phase, potential environmental impacts emanating during the operational phase will be minimised. Monitoring of certain issues such as the success of vegetation re-establishment and erosion control will be required to continue during operation.

1.2 Contents of the Environmental Management Programme (EMPr)

The contents of the *Environmental Management Programme (EMPr)*, as it is defined Regulation 33 of the EIA Regulations published as Government Notice (GN) No R. 543 in Government Gazette No 33306 of 18 June 2010 in terms of Chapter 5 of the National Environmental Management Act No 107 of 1998 (NEMA), by must be consistent with the below requirements and include -

- a) Details of –
 - (i) the person who prepared the EMPr; and
 - (ii) the expertise of that person to prepare an EMPr;
- b) Information on any management of 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 and undertaking of the activity;
 - (iv) Rehabilitation of the environment; and
 - (v) Closure, where relevant.
- c) A detailed description of the aspects of the activity that are covered by the environmental management plan;
 - d) An identification of the persons who will be responsible for the implementation of the measures contemplated in paragraph (b);
 - e) Proposed mechanisms for monitoring compliance with the EMPr and reporting thereon;
 - 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;
 - 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 applicable provisions of the Act regarding closure, where applicable;
 - iv. Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;
 - h) Time periods within which the measures contemplated in the environmental management programme must be implemented;
 - 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;
 - j) An Environmental Awareness Plan describing the manner in which -
 - i. The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
 - ii. Risks must be dealt with in order to avoid pollution or the degradation of the environment; and
 - k) Where appropriate, closure plans, including closure objectives.

Provided in the chapters that follow is the EMPr for the proposed development, based on the requirements of Regulation 33 of the EIA Regulations (GNR 543) as detailed above.

1.3 Environmental Impact Assessment Issues and Mitigation Measures

The identification and significance of identified project related impacts (before and after mitigation) is presented in the Environmental Impact Assessment Report – EIR (Volume 3). The EIR identified potential impacts and risks associated with the proposed development and these are contained in. this EMPr presents the preliminary actions, specifications and management commitments that need to be adhered to in order to mitigate or enhance the impacts of significance. These are detailed in the following sections.

2 DEFINITIONS

For the purposes of this EMP, the following definitions and abbreviations shall apply:

Alien Vegetation: Alien vegetation is defined as undesirable plant growth which shall include, but not be limited to all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.

Cement laden water: Means water containing cement or concrete arising from the Contractor's activities.

Contaminated water: Means water contaminated by the Contractor's activities such as with hazardous substances, hydrocarbons, paints, solvents and runoff from plant, workshop or personnel wash areas but excludes water containing cement/ concrete or silt.

Construction Camp: Construction camp (site camps) refers to all storage and stockpile sites, site offices, container sites, workshops and testing facilities and other areas required undertaking construction activities.

Environment: Environment means the surroundings within which humans exist and that could be made up of:-

- The land, water and atmosphere of the earth;
- Micro-organisms, plant and animal life;
- Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Aspect: An environmental aspect is any component of a contractor's construction activity that is likely to interact with the environment.

Environmental Authorisation (EA) (formerly known as, Record of Decision): A written statement from the relevant environmental authority, with or without conditions, that records its approval of a planned undertaking to build or upgrade a section of road and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.

Environmental Control Officer (ECO): A suitably qualified and experienced person or entity appointed for the construction works, to perform the obligations specified in the EA.

Environmental Site Officer (ESO): An ESO is the site-based designated person responsible for implementing the environmental provisions of the construction contract and is appointed by the service provider that carries-out construction activities.

Environmental Impact: An impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct or indirect consequence of a construction activity.

Environmental Impact Assessment: The process of examining the environmental effects of a development. The assessment requires detailed/specialist studies of significant issues that have been identified during the environmental scoping.

Environmental Management Plan/Programme: An environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are

enhanced.

Environmental Management System: The internationally accepted and recognized environmental management system (EMS) which enables companies, organizations and operations to systematically manage, prevent and reduce environmental problems and associated costs. In terms of ISO 14001 and EMS is defined as, “*that part of the overall management system includes organizational structure, planning activities, responsibilities, procedures, processes and resources for developing, implementing, reviewing and maintaining the environmental policy.*”

Environmental Policy: A statement by the organisation of its intentions and principles in relation to its overall environmental performance which provides a framework for action and for the setting of its environmental objectives and targets.

External Auditor: A suitably qualified and experienced independent expert as per the required auditor qualifications (ISO 14012).

His: Means his or her, as applicable.

Independent Environmental Consultant: A suitably qualified and experienced independent environmental consultant (IEC) appointed by the Engineer to perform the obligations specified in the Contract. The IEC shall provide reports to the regulatory authority, the Engineer and any other parties as specified by the regulatory authority.

Interested and Affected Party (I&AP): Refers to an I&AP party contemplated in section 24(4)(d) of the NEMA (1998, Act No. 107) and which, in terms of that section, includes –

- a) *Any person, groups of persons, organisation interested in or affected by an activity, and;*
- b) *Any organ of state that may have jurisdiction over any aspect of the activity.*

ISO 14001 Environmental Management System (ISO 14001): The internationally accepted and recognised Environmental Management System as reflected in the document SABS ISO 14001: 1996.

Method Statement: Is a written submission by the Contractor to the ECO in response to the EMP or to a request by the ECO, setting out the plant (construction equipment), materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the ECO when requesting the Method Statement. The Method Statement shall be in such detail that the ECO is able to assess whether the Contractor's proposal is in accordance with the EMP and/or will produce results in accordance with the EMP.

Mitigate: The implementation of practical measures to reduce the adverse impacts, or to enhance beneficial impacts of a particular action.

No-Go Area: Areas where construction activities are prohibited.

Pollution: According to the NEMA (Act No. 107 of 1998), pollution can be defined as, “*Any change in the environment caused by (i) substances; (ii) radioactive or other waves; or (iii) noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future*”.

Potentially hazardous substance: Is a substance, which, in the reasonable opinion of the ECO, can have a deleterious effect on the environment. Hazardous Chemical Substances are defined in the Regulations for Hazardous Chemical Substances published in terms of the Occupational Health and Safety Act.

Reasonable: Means, unless the context indicates otherwise, reasonable in the opinion of the ECO, after he has consulted with ECO.

Rehabilitation: To re-establish or restore to a healthy, sustainable capacity or state.

Silt laden water:

Means water containing sand and silt arising from the Contractor's activities and/or as a result of natural run-off.

Site: The area in which construction is taking place.

Solid waste: Means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

Species of Special Concern: Those species listed in the rare, indeterminate, or monitoring categories of the South African Red Data Books, and/or species listed in globally near threatened, nationally threatened or nationally near threatened categories (Barnes, 1998).

Threatened species: Threatened species are defined as: a) species listed in the endangered or vulnerable categories in the revised South African Red Data Books or listed in the globally threatened category; b) species of special conservation concern (i.e. taxa described since the relevant South African Red Data Books, or whose conservation status has been highlighted subsequent to 1984); c) species which are included in other international lists; or d) species included in Appendix 1 or 2 of the Convention of International Trade in Endangered Species (CITES).

Topsoil: The top 100mm of soil and may include top material e.g. vegetation and leaf litter.

3 BACKGROUND INFORMATION

Provided below is a brief description of the proposed Belmont Valley Golf Course Project. A more detailed project description is provided in Chapter 2 of Volume 3 “Coastal & Environmental Services, 2011: *Environmental Impact Report: Proposed Belmont Valley Golf Course*, CES, Grahamstown.

3.1 Belmont Valley Golf Course Project

The site for the construction of the new golf course is approximately 222 ha in extent, while the property currently consists of natural areas, fallow lands previously used for agricultural purposes and road infrastructure (refer to Figure a). More specifically, the proposed development constitutes Portion 6 of Farm Belmont No. 332 and Portions 1 and 2 of the Farm Willow Glen No. 445. A railway reserve (Farm 444) traverses the proposed development site.

Currently approximately 29.2% (65 ha) of the proposed development site is being considered for the proposed development of an 18-hole golf course, a club house, a driving range and a parking area. The development will include the construction or appropriate upgrading of existing infrastructure such as electricity, water, sewage and roads.

In accordance with the requirements of the National Environmental Management Act (NEMA) No. 107 of 1998, and relevant EIA regulations made in terms of this Act (Government Notice No R.543) and promulgated in 2010, the proposed project requires a full Scoping and Environmental Impact Assessment (EIA).

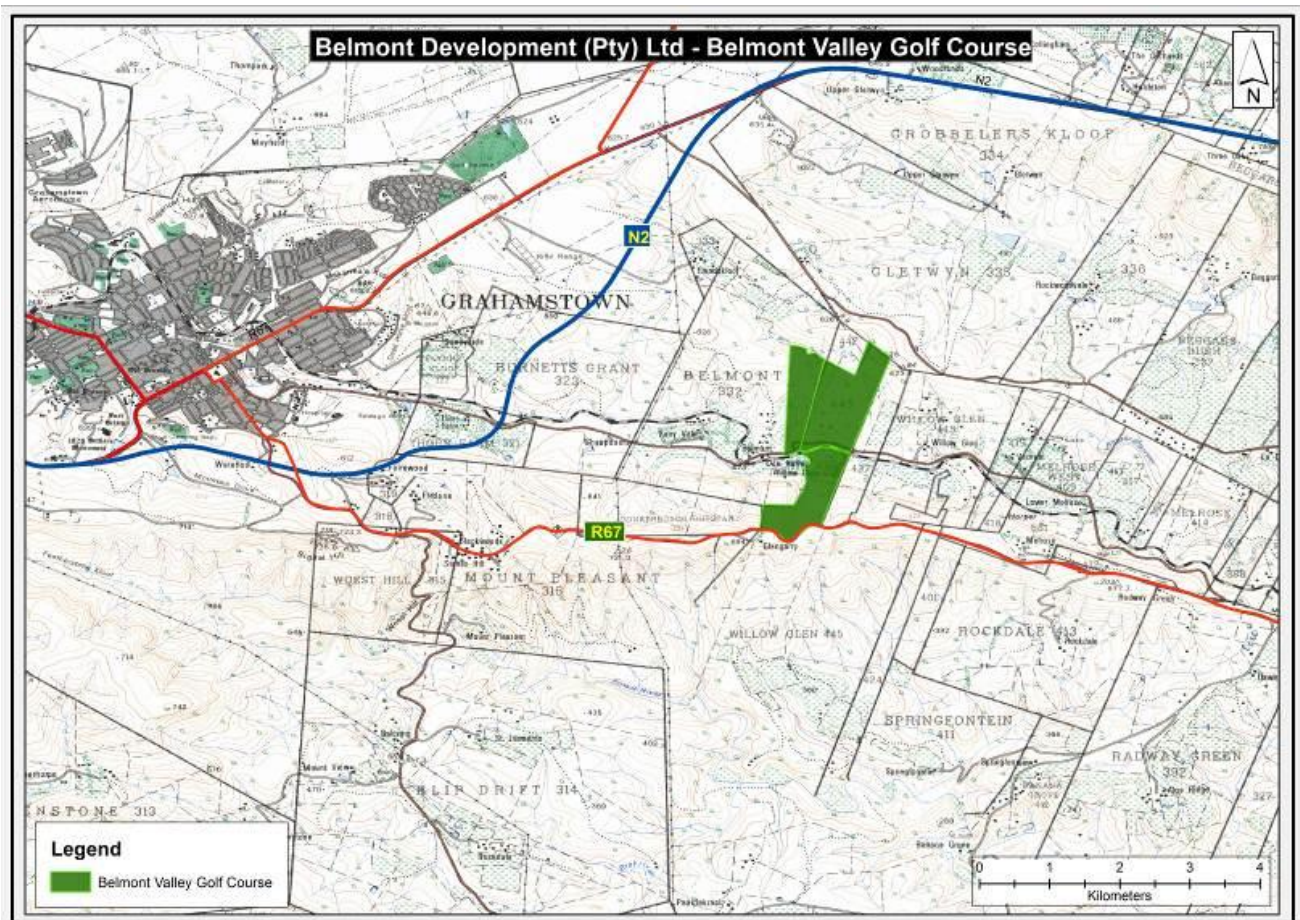


Figure 3-1: Location of the proposed Belmont Valley Golf Course

3.2 The Environmental Policy

The contractor is required to compile an Environmental Management Policy, which must consider the following:

- The contractor's mission, vision and core values;
- Guiding principles;
- Requirements of, and communication with I&APs;
- The environmental specifications and intentions of the specifications must be upheld.
- The need to work towards continual improvement;
- The obligation to prevent pollution and ecological degradation;
- The importance of coordination with other organisational policies (e.g. quality, occupational health and safety, etc.);
- Site activities will be conducted in a manner that does not create a nuisance, risk or hazard to the natural environment.
- Reference to specific local and/or regional conditions; and
- Employee and public health and safety must be considered a priority.
- A commitment to compliance with relevant environmental laws, regulations, by-laws and other criteria to which the contractor subscribes.

The contractor (contractor is defined as principal contractor, sub-contractors and any employees retained on this project) is required to be familiar with the environmental policy (to be developed by the applicant) and all that it implies, and to adopt and implement the policy throughout the course of construction. The policy must be communicated to all employees and contractors (and sub-contractors) of the contractor, and made available to the public, if requested.

3.3 Environmental Objectives and Targets

In order to meet the commitments detailed within the Environmental Management Policy, as well as those included within the environmental specifications of this EMP, the contractor shall develop environmental objectives and targets. The objectives and targets must conform to, and comply with, the following criteria:

- The objectives and targets shall constitute the overall goals for environmental performance identified in the environmental policy and strategy;
- When establishing objectives and targets, the contractor shall take into account the identified environmental aspects and associated environmental impacts, as well as the relevant findings from environmental reviews and/audits;
- The targets must be set to achieve objectives within a specified timeframe;
- Targets should be specific and measurable;
- When the objectives and targets are set, the contractor must establish measurable Key Performance Indicators (KPIs). The latter will be used by the contractor as the basis for an Environmental Performance Evaluation System, and can provide information on both the environmental management and the operational systems. Objectives and targets need to apply broadly across the contractor's operations, as well as to site-specific and individual activities; and
- Objectives and targets must be reviewed from time to time in view of changed operational circumstances and/or changes in environmental legal requirements, and need to take into consideration the views of the I&APs.

All objectives and targets must be supplied to the IEC or ECO for review and use during audits, as prescribed in the conditions of the EA.

3.4 Environmental Legislation and Guidelines

The Contractor must ensure that all South African legislation concerning the natural environment,

pollution and the built environment is strictly enforced. Such legislation must include, but is not limited to the:

- The Constitution of the Republic of South Africa Act No. 108 of 1996.
- National Environmental Management Act No. 107 of 1998.
- National Heritage Resources Act, No 25 of 1999.
- National Environmental Management: Biodiversity Act 10 of 2004
- National Environmental Management: Waste Management Act 59 of 2008
- Health Act 63 of 1977
- Occupational Health and Safety Act 85 of 1993
- Hazardous Substances Act No. 15 of 1973.

3.5 Details of EAP

Coastal and Environmental Services (CES)

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3.5.1 Expertise of the EAP

CES is a specialist environmental consulting firm. Established in 1990, and with offices in Grahamstown and East London, we primarily specialise in assessing the impacts of development on the natural, social and economic environments. CES's core expertise lies in the fields of strategic environmental assessment, environmental management plans, environmental management systems, ecological/environmental water requirements, environmental risk assessment, environmental auditing and monitoring, integrated coastal zone management, social impact assessment and state of environment reporting. In addition to adhering to all relevant national legislative requirements, which we are often required to review and summarise for specific projects, acquisition of equity funding from the majority of financial institutions demands that developments must meet certain minimum standards that are generally benchmarked against the Policy and Performance Standards of the International Finance Corporation and the World Bank Operational Directives and Policies. The quality of our work has been acknowledged by international lenders such as the World Bank and the International Finance Corporation.

4 ADMINISTRATION AND REGULATION OF ENVIRONMENTAL OBLIGATIONS

4.1 Management Structure

In line with this EMPr, the contractor must prepare a document clearly outlining and demonstrating the environmental responsibilities, accountability and liability of the contractor's employees. The contractor must assign responsibilities for the following:

- Reporting structures;
- Actions to be taken to ensure compliance;
- Overall design, development and implementation of the EMPr;
- Documenting the environmental policy and strategy;
- Implementing the EMPr in all stages/phases of the project; and
- All the aspects which require action under the other core elements and sub-elements of the EMPr.

All official communication and reporting lines including instructions, directives and information need to be channelled according to the organisation structure.

4.2 Roles and Responsibilities

4.2.1 Applicant/Developer

The applicant is the responsible entity for monitoring the implementation of the EMPr and compliance with the authorisation. However, if the company appoints a contractor to implement the project and hence implement the proposed mitigation measures documented in this EMPr on their behalf, then the successful contractor's responsibilities are outlined as per the section that follows.

4.2.2 Contractor

The successful contractor shall:

- Be responsible for the finalisation of the EMPr in terms of methodologies which are required to be implemented to achieve the environmental specifications contained herein and the relevant requirements contained in the EA;
- Be responsible for the overall implementation of the EMPr in accordance with the requirements of the developer and the EA;
- Ensure that all third parties who carry out all or part of the contractor's obligations under the contract comply with the requirements of this EMPr;
- Ensure that the appointments of the ECO are subject to the approval of the developer.

4.2.3 Environmental Control Officer

For the purposes of implementing the conditions contained herein, the contractor shall appoint an ECO for the contract. The ECO shall be the responsible person for ensuring that the provisions of the EMPr as well as the environmental authorisation are complied with during the construction period. The ECO will be responsible for issuing instructions to the contractor and where environmental considerations call for action to be taken. The ECO shall submit regular written reports to the applicant and the environmental authority (DEDEA) as required.

The ECO will be responsible for the monitoring, reviewing and verifying of compliance with the EMPr and conditions of the environmental authorisation by the contractor. The ECO's duties in this regard will include, *inter alia*, the following:

- Confirming that all the environmental authorisations and permits required in terms of the

- applicable legislation have been obtained prior to construction commencing;
- Monitoring and verifying that the EMPr, EA and contract are adhered to at all times and taking action if specifications are not followed;
 - Monitoring and verifying that environmental impacts are kept to a minimum;
 - Reviewing and approving construction method statements with input from the ESO and engineer, where necessary, in order to ensure that the environmental specifications contained within this EMPr and EA are adhered to;
 - Inspecting the site and surrounding areas on a regular basis regarding compliance with the EMPr, EA and contract;
 - Monitoring the undertaking by the contractor of environmental awareness training for all new personnel on site;
 - Ensuring that activities on site comply with all relevant environmental legislation;
 - Ordering the removal of, or issuing spot fines for person/s and/or equipment not complying with the specifications of the EMPr and/or environmental authorisation;
 - Undertaking a continual internal review of the EMPr and submitting any changes for applicant and authority review and approval as applicable;
 - Checking the register of complaints kept on site and maintained by the ESO and ensuring that the correct actions are/were taken in response to these complaints;
 - Checking that the required actions are/were undertaken to mitigate the impacts resulting from non-compliance;
 - Reporting all incidences of non-compliance;
 - Conducting annual environmental performance audits in respect of the activities undertaken relating to the project. The ECO shall also submit compliance audit reports to DEDEA, in accordance with the requirements of the environmental authorisation. Such reports shall be reviewed by the applicant, prior to submission;
 - Keeping a photographic record of progress on site from an environmental perspective. This can be conducted in conjunction with the ESO as the ESO will be the person that will be onsite at all times and can therefore take photographic records weekly. The ECO would need to check and ensure that the ESO understands the task at hand;
 - Recommending additional environmental protection measures, should this be necessary; and
 - Providing report back on any environmental issues at site meetings.

The ECO must have:

- A good working knowledge of all relevant environmental policies, legislation, guidelines and standards;
- The ability to conduct inspections and audits and to produce thorough, readable and informative reports;
- The ability to manage public communication and complaints;
- The ability to think holistically about the structure, functioning and performance of environmental systems; and
- Proven competence in the application of the following integrated environmental management tools:
 - Environmental Impact Assessment;
 - Environmental management plans/programmes;
 - Environmental auditing;
 - Mitigation and optimisation of impacts;
 - Monitoring and evaluation of impacts; and
 - Environmental Management Systems.

The ECO must be fully conversant with the EIA process and EIR, this EMPr, EA and all relevant environmental legislation for the project. The applicant shall have the authority to replace the ECO if, in their opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the EMPr or this specification. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required and within what timeframe.

4.2.4 Environmental Site Officer

The contractor shall appoint a nominated representative of the contractor as the ESO for the contract. The ESO will be site-based and shall be the responsible person for implementing the environmental provisions of the construction contract. There shall be an approved ESO on the site at all times. It may be necessary to have more than one ESO. The ESO's duties will include, *inter alia*, the following:

- Ensuring that all the EAs and permits required in terms of the applicable legislation have been obtained prior to construction commencing;
- Reviewing and approving construction method statements with input from the ECO and engineer, where necessary, in order to ensure that the environmental specifications contained within the construction contract are adhered to;
- Assisting the contractor in finding environmentally responsible solutions to problems;
- Keeping accurate and detailed records of all activities on site;
- Keeping a register of complaints on site and recording community comments and issues, and the actions taken in response to these complaints;
- Ensuring that the required actions are undertaken to mitigate the impacts resulting from non-compliance; and
- Reporting all incidences of non-compliance to the ECO and contractor.

The ESO shall submit regular written reports to the ECO, but not less frequently than once a month. The ESO must have:

- The ability to manage public communication and complaints;
- The ability to think holistically about the structure, functioning and performance of environmental systems; and
- The ESO must be fully conversant with the EIR and EMP Plan for the Mossel Bay Wind Farm and all relevant environmental legislation; and lastly
- The ESO must have received professional training, including training in the skills necessary to be able to amicably and diplomatically deal with the public as outlined in bullet point one above.

The ECO shall be in the position to determine whether or not the ESO has adequately demonstrated his/her capabilities to carry-out the tasks at hand and in a professional manner. The ECO shall therefore have the authority to instruct the contractor to replace the ESO if, in the ECO's opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the construction contract. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required and within what timeframe.

The ECO shall visit the development site and in addition to the responsibilities listed in this section, review the performance of the ESO and submit regular performance reviews to the applicant/developer.

4.3 Compliance Monitoring and Corrective Action

Non-compliance with the conditions of the EMPr must be viewed as a breach of appointment contract for which the construction contractors will be held liable. The latter is deemed NOT to have complied with the EMPr if:

- There is evidence of contravention of the EMPr, its environmental specifications or the Method Statements developed by the contractor within the boundaries of the construction site or areas of contractor responsibility;
- Construction related activities take place outside the defined boundaries of the site;
- Environmental damage ensues due to negligence;

- The contractor fails to comply with corrective or other instructions issued by the ECO within a specific time; or
- The contractor fails to respond adequately to complaints from the public or authorities.

The EPCM and the construction contractors are liable for any construction rehabilitation costs associated with their non-compliance with the EMPr. This rehabilitation will be undertaken to the satisfaction of the ECO.

The construction contractors shall have the right to appeal any punitive action undertaken by the ECO or applicant/developer.

4.4 Reporting and Review

The EMPr reporting and documentation requirements must be based on best practice principles, e.g. IS) 14001 that must take the following requirements into account:

- Documents associated with the EMPr must be regularly reviewed and updated by all environmental management parties.
- Audits of the environmental performance of the construction phase of the project will be undertaken on a quarterly basis by accredited auditors in fulfilment of likely conditions of environmental authorisation in this regard.
- The findings of external, internal and informal environmental reviews will be recorded and items requiring action will be identified from the recommendations made.
- The construction contractors will be contractually obliged to fulfil any reasonable recommendations, and implementation of these actions will be assessed in the above audit.

Weekly and monthly reporting meetings will take place on site. Internal auditing and reporting will be subject to external review by the ECO during the quarterly compliance audits.

4.5 Monitoring

Construction activities have the potential to impact on a range of biophysical habitats as well as neighbouring communities. The monitoring programme that requires development by the applicant, ECO and contractor should *inter alia* allow for analysis of:

1. Water quality e.g. BOD, COD, pH, salinity, TDS, E coli.
2. Air Quality e.g. Particulate matter, NOx, SO2
3. Hydrocarbon pollution.
4. Success of local labour employment.
5. Success of local procurement policies.
6. Ambient and workplace noise
7. Health and safety incidents.
8. Success of traffic management measures

4.6 Emergency Preparedness

The contractor shall develop environmental emergency response procedures to ensure that there will be an appropriate response to unexpected or accidental actions or incidents that will cause environmental impacts during the construction period. Such activities may include, *inter alia*:

- Accidental discharges to water and land.
- Accidental exposure of employees to hazardous substances.
- Accidental fires.
- Accidental spillage of hazardous substances.
- Specific environmental and ecosystem effects from accidental releases or incidents.

The contractor and sub-contractors shall comply with the emergency preparedness incident reporting requirements that must be developed prior to construction.

4.7 Environmental Incident Management

The construction contractors will adhere to the hazard and incident reporting protocols to be developed by the contractor. A report must be completed for all incidents, and appropriate action taken where necessary to minimise any potential impacts. DEDEA must be informed of any environmental incident, in accordance with legislative requirements, should this be necessitated by a major environmental incident.

4.8 Management Review

A formal management review needs to be conducted on a regular basis in which the internal audit reports written by the ESO based on frequent inspections and interactions with the ECO and review of the periodic reports, including audit reports by the independent external auditor - will be reviewed. The purpose of the review is to critically examine the effectiveness of the EMPr and its implementation and to decide on potential modifications to the EMPr as and when necessary. The process of management review is in keeping with the principle of continual improvement.

Management review will take place when the liaison committee consisting of representatives from the contractor, construction sub-contractors as appropriate, ECO and other parties or I&APs as deemed necessary on a monthly basis. The purpose of these monthly meetings will be to review the progress of the contractor in implementing and complying with its obligations in terms of this EMPr for the duration of the project. Where necessary, management review will take place more frequently than the required monthly meetings.

5 RECOMMENDATIONS FOR ENVIRONMENTAL MANAGEMENT

5.1 Method Statements

Annexure A provides a *pro forma* method statement sheet that must be completed by the Contractor for each activity requiring a method statement as specified in the EMP or as requested by the ECO. A method statement is “a sequence of steps taken to complete a series of construction or project related activities in a safe manner that reduces the overall risk to people and the environment”.

This can be for a once off task, or a series of tasks that are often repeated. The method statement should be written by a person that is competent in the tasks to be undertaken and how these can be effectively communicated. An understanding of how relevant environmental specifications dictate the manner in which these tasks can be implemented is also required.

When a method statement is prepared, the risks are identified during the various work stages. Steps taken to reduce the potential risk associated with these stages are then determined. The sequential steps and actions to be followed by the persons carrying out the works are written down. This sequence of steps should include all environmental and safety aspects relevant to the task being executed. The contractor shall not commence an activity until all required method statements have been approved the ECO and applicant. Such approval should not unreasonably be withheld.

All control measures detailed in the method statement must be the subject of "tool box" talks prior to the initiation of works. By introducing or reaffirming these measures during the "tool box" talk, everyone involved will have a clear understanding of the work to be carried out, as well as the safe work method sequences and equipment required. The method statement shall cover:

- Construction procedures.
- Materials and equipment to be used.
- Getting the equipment to and from site.
- How the equipment/material will be moved while on site.
- How and where material will be stored.
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur.
- Timing and location of activities.
- Compliance/non-compliance with the specifications or control measures.
- Any other information deemed necessary by the ECO.

Approved method statements shall be readily available on the site and the location thereof communicated to all relevant personnel. The contractor shall carry out the works in accordance with the approved method statements as they apply to the work in progress. Approval of the method statement shall not absolve the contractor from any of his obligations or responsibilities in terms of general legal contracts entered into by any party.

5.1.1 Contractor Method Statements for Construction Activities

The contractor should produce the following method statements as a minimum:

1. Site Dust Management
2. Solid Waste Management
3. Hazardous Material and Hydrocarbon Management
4. Surface Water Management
5. Site Clearing and Topsoil Management
6. Fire Management

7. Pollution Control
8. Site Access and Traffic Management
9. Incident and Emergency Response Management
10. Concrete Batching

Additional method statements will be developed (or revised) if the need therefore is identified during the construction phase of the project.

5.2 Site access and demarcation

The location, layout and method of establishment of the construction camp including the following must be clearly indicated and demarcated prior to construction activity commencing:

- All Contractor's buildings, and/or offices
- Lay down areas
- Vehicle wash areas
- Workshops and drip trays
- Fuel storage areas (including filling and dispensing from storage tanks)
- Cement/concrete batching areas (including the methods employed for the mixing of concrete and particularly the containment of runoff water from such areas and the method of transportation of concrete)
- Other infrastructure required for the running of the project

Details, including a site layout plan, showing where and how the access points and routes will be located and managed must be submitted to the ECO and developer that is supported by the following management requirements:

- On the site and within such distance of the site as may be stated, the contractor shall control the movement of all vehicles and plant including that of his suppliers so that they remain on designated routes, are distributed so as not to cause an undue concentration of traffic and that all relevant laws are complied with. In addition, such vehicles and plant shall be so routed and operated as to minimise disruption to regular users of the routes not on the Site.
- On gravel or earth roads on site and within 500m of the site, the vehicles of the contractor and his suppliers shall not exceed a speed of 45 km/h or as directed by the ECO.
- The Contractor shall supply the ECO with a Method Statement detailing the location and management of all access points and roads.

The Contractor shall erect and maintain permanent and / or temporary fences of the type and in the locations directed by the ECO. Such fences shall, if so specified, be erected before undertaking designated activities.

Certain areas within or next to the Site shall be "no go" areas. The Contractor shall ensure that, insofar as he has the authority, no person, machinery, equipment or materials enter the "no go" areas at any time.

5.3 Materials handling, use and storage

- The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the EMP.
- The Contractor shall ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the EMP.
- Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit.
- The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

- All manufactured and/ or imported material shall be stored within the Contractor's camp, and, if so required by the EMP, out of the rain.
- All lay down areas outside of the construction camp shall be subject to the ECO's approval.
- Imported gravel, fill, soil and sand materials shall be free of weeds, alien invasive seed matter, plant material, litter and contaminants and shall be obtained from sources approved by the ECO.

5.4 Stockpiling

- Any stockpiling of gravel, cut, fill or any other material including spoil shall be in areas approved by the ECO within the defined working area.
- The Contractor shall ensure that the material does not blow or wash away. If the stockpiled material is in danger of being washed or blown away, the Contractor shall spray it with Dustex or cover it with a suitable material, such as hessian or plastic. Stockpiles of topsoil shall not be covered with plastic.
- No stockpiling of any material shall be allowed within 20m of any "no go" area.

5.5 Solid waste management

- No on-site burning, burying or dumping of any waste materials, litter or refuse shall occur.
- The Contractor shall provide vermin and weatherproof bins with lids of sufficient number and capacity to store the solid waste produced on a daily basis. The lids shall be kept firmly on the bins at all times.
- Bins shall not be allowed to become overfull and shall be emptied at least once a day.
- The waste from bins may be temporarily stored on Site in a central waste area that is weatherproof and scavenger-proof, and which the ECO has approved.
- Recyclable waste shall be disposed of into separate skips/bins and removed off-site for recycling.
- All solid waste shall be disposed of off-site at an approved landfill Site. The Contractor shall supply the ECO with the appropriate disposal certificates.
- The Contractor must facilitate the re-use of cleared trees and bush (e.g. by allowing controlled wood cutting and removal of wood). Cleared vegetation may only be burnt when no other form of re-use (e.g. chipping or composting) is practical or economical. Burning of cleared vegetation may only take place in a safe area (e.g. borrow pit) after permission has been obtained from all the relevant authorities and the Fire Department has been informed. The Contractor must ensure that cleared trees and wood are removed from the Site within 45 days of Site clearance.
- The Contractor shall submit a solid waste management plan as part of the pollution control Method Statement to the ECO.

5.6 Water use

- All sources of water for construction purposes must be approved by the ECO in writing before any such sources can be used to obtain water.
- Where possible all wash water will be recycled for use, as wash water again or for dust suppression where applicable.

5.7 Contaminated water

- Potential pollutants of any kind and in any form shall be kept, stored, and used in such a manner that any escape can be contained and that the water table is not endangered. Water containing such pollutants as chemicals, washing detergents, sewerage, fuels, paints and solvents and hydrocarbons shall be contained and discharged into an impermeable storage facility for removal from the site or for recycling. This particularly applies to runoff from fuel depots/workshops/truck washing areas.
- Wash down areas shall be placed and constructed in such a manner so as to ensure that the

surrounding areas are not polluted. The Contractor shall notify the ECO immediately of any pollution incidents on Site.

- As part of the Pollution Control Method Statement, the Contractor shall submit a plan to the ECO detailing how the contaminated water will be managed on Site.

5.8 Hazardous substances

- The transportation and handling of hazardous substances must comply with the provisions of the Hazardous Substances Act (Act No.187 of 1993) and associated regulations as well as SABS 0228 and SABS 0229. The Contractor shall also comply with all other applicable regional and local legislation and regulations with regard to the transport, use and disposal of hazardous substances. Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction shall be stored in secondary containers. The relevant Material Safety Data Sheets (MSDS) shall be available on Site. Procedures detailed in the MSDSs shall be followed in the event of an emergency situation.
- The Contractor shall be responsible for the training and education of all personnel on Site who will be handling hazardous materials about their proper use, handling and disposal.
- If potentially hazardous substances are to be stored or used on Site, the Contractor shall submit a Method Statement to the ECO detailing the substances / materials to be used, together with the transport, storage, handling and disposal procedures for the substances.

5.9 Cement and concrete batching

- The proposed location of batching areas (including the location of cement stores and sand and aggregate stockpiles) shall be indicated on the Site layout plan and approved by the ECO. Batching areas shall not be located within 150m of any water body or any “no go” areas, unless written approval has been granted by the ECO.
- All wastewater generated from the operation and cleaning of concrete batching equipment and other sources of concrete shall be passed through a concrete wastewater settlement system as depicted in the appropriate drawing. The water from this system shall not be allowed to flow into any “no go” area or water course but must permeate through the ground before it reaches any such water course. The accumulated sludge in the settlement system must be regularly cleaned out and appropriately disposed of as solid waste.
- The Contractor shall ensure that minimal water is used for washing of concrete batching equipment.
- Used cement bags shall be disposed of in weatherproof bins on site to prevent the generation of wind-blown cement dust and the bags from blowing away.
- During construction, the contractor must ensure that concrete is mixed on mortar boards, all visible remains of concrete are removed and disposed of as waste and that all surplus aggregate is removed.
- As part of the Pollution Control and Concrete Batching Method Statement, a plan detailing all actions to be taken to comply with the cement and batching requirements shall be submitted to the ECO.

5.10 Fuel (petrol and diesel) and oil

5.10.1 Fuel Storage

- All construction materials including fuels and oil should be stored in demarcated areas that are contained within berms / bunds to avoid spread of any contamination into wetland or rivers. Washing and cleaning of equipment should also be done in berms or bunds, in order to trap any cement and prevent excessive soil erosion. These sites must be re-vegetated after construction has been completed. Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any river channel. It is therefore suggested that all construction camps, lay down areas, batching plants or areas and any stores should be more than 50m from any demarcated wetland or riverine area

- The location of the fuel storage area will be approved by the ECO and will be situated at least 100m away from any major drainage systems, residential areas or “no go” areas. All necessary approvals with respect to fuel storage and dispensing shall be obtained from the appropriate authorities. Symbolic safety signs depicting “No Smoking”, “No Naked Lights” and “Danger” conforming to the requirement of SABS 1186 shall be prominently displayed in and around the fuel storage area. There shall be adequate fire-fighting equipment at the fuel storage area.
- The Contractor shall ensure that all liquid fuels and oils are stored in tanks with lids, which are kept firmly shut and under lock and key at all times. The capacity of the tank shall be clearly displayed and the product contained within the tank clearly identified using the emergency information system detailed in SABS 0232 part 1. Fuel storage tanks shall have a capacity not exceeding 9 000 litres and shall be kept on site only for as long as fuel is needed for construction activities, on completion of which they shall be removed.
- Tanks on site shall not be linked or joined via any pipe work, but shall remain as separate entities. The tanks shall be situated on a smooth impermeable base with a bund. The volume inside the bund shall be 110% of the total capacity of the largest storage tank. The base may be constructed of concrete, or of plastic sheeting with impermeable joints with a layer of sand over to prevent perishing. The impermeable lining shall extend to the crest of the bund. The floor of the bund shall be sloped to enable any spilled fuel and/or fuel-contaminated water to be removed. Appropriate material, approved by the ECO that absorbs / breaks-down or encapsulates minor hydrocarbon spillage and which is effective in water shall be installed in the sump.
- The tanks and bunded areas shall be covered by a roofed structure, as detailed in the appropriate drawing, to prevent the bunded area from filling up with rain water. This structure shall be constructed in such a way, and to the approval of the ECO, to ensure that it is not dislodged by wind. If any water does collect in the bunded area it shall be removed within a day of this occurring and taken off Site to a disposal site approved by the ECO, and the material that absorbs / breaks-down or encapsulates minor hydrocarbon spillage shall be replenished.
- Only empty and externally clean tanks may be stored on the bare ground. Empty and externally dirty tanks shall be sealed and stored on an area where the ground has been protected.
- Adequate precautions shall be provided to prevent spillage during the filling of any tank and during the dispensing of the contents. The dispensing mechanism for the fuel storage tanks shall be stored in a waterproof container when not in use.
- As part of the site demarcation process, a plan shall be submitted to the ECO detailing the design, location and construction of the fuel storage area as well as for the filling and dispensing from storage tanks and for the type of absorbing / breaking-down or encapsulating material to be used.

5.10.2 Refuelling

- Where reasonably practical, the plant shall be refuelled at a designated re-fuelling area/depot or at a workshop as applicable. If this is not reasonably practical then the surface under the refuelling area shall be protected and appropriately bunded against pollution to the reasonable satisfaction of the ECO prior to any refuelling activities.
- If fuel is dispensed from 200 litre drums, the proper dispensing equipment shall be used, and the drum shall not be tipped in order to dispense fuel. The Contractor shall ensure that the appropriate fire-fighting equipment is present during refuelling operations.
- The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/breakdown or where possible, be designed to encapsulate minor hydrocarbon spillages. The quantities of such materials shall be able to handle a minimum of 200 l of hydrocarbon liquid spill. Prior to any refuelling or maintenance activities, the ECO must approve this material.

5.10.3 Used oil and hydrocarbon contaminated materials

- Used oil shall be stored at a central location on Site prior to removal off Site for disposal at an approved disposal or recycling site.

- Old oil filters and oil, petrol and diesel-soaked material shall be treated as hazardous waste. The Contractor shall remove all oil, petrol, and diesel-soaked sand immediately and shall dispose of it as hazardous waste or treat it on site with material that breaks-down or encapsulates such spillages as approved by the ECO.

5.11 Workshop, equipment maintenance and storage

- Where practical, all maintenance of equipment and vehicles on Site shall be performed in a workshop. If it is necessary to do maintenance outside of the workshop area, the Contractor shall obtain the approval of the ECO prior to commencing such activities. No maintenance, including emergency maintenance, of plant can take place within 50m of any "no go" area or drainage system.
- The Contractor shall ensure that in his workshop and other plant maintenance facilities, including those areas where, after obtaining the ECO's approval, the Contractor carries out emergency plant maintenance, there is no contamination of the soil or vegetation. The workshop shall have a smooth impermeable (concrete or thick plastic covered with sand) floor.
- The floor shall be bunded and sloped towards an oil trap or sump to contain any spillages. When servicing equipment, drip trays shall be used to collect the waste oil and other lubricants. Drip trays shall also be provided in construction areas for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders, vehicles).
- All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or removed from the Site.
- The washing of equipment shall be restricted to urgent or preventative maintenance requirements only. All washing shall be undertaken in the workshop or maintenance areas, and these areas must be equipped with a suitable impermeable floor and sump/oil trap. The use of detergents for washing shall be restricted to low phosphate and nitrate containing and low sudsing-type detergents.
- As part of the site layouts, a plan must be submitted to the ECO detailing the design of the bunding of the workshop and how run-off from the workshop will be managed as well as how drip trays used under plant will be managed.

5.12 Ablution facilities

- Washing, whether of the person or of personal effects, and acts of excretion and urination are strictly prohibited other than at the facilities provided. The Contractor shall provide the necessary ablution facilities for all his personnel prior to the commencement of work and shall ensure that his personnel make use of the facilities.
- Toilet facilities shall be supplied by the Contractor for the workers at a ratio of at least 1 toilet per 15 workers in areas approved by the ECO. Every 1-man urinal will be taken as supplying the equivalent of 5 men in addition to the 15 men per toilet on site. No toilets will be erected within 100m of any residential areas, within 20m of the edge of the Site, within 50m of any "no go" areas or any major drainage systems. Toilets shall be situated within 200m of any area where work is taking place in numbers sufficient to meet the ratio depicted above for the workers in the area. Mobile toilets (e.g. trailer mounted) should be considered for Sites, where workers may be expected to cover large distances every day.
- The facilities shall be maintained in a hygienic state and serviced regularly. Toilet paper shall be provided. Temporary/ portable toilets shall be secured to the ground to prevent them toppling due to wind or any other cause, to the satisfaction of the ECO.
- Discharge into the environment and burial of waste is strictly prohibited. The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from the Site. Toilets shall be emptied before the Contractors' holidays or any other temporary site closure.

5.13 Eating areas

- The Contractor shall designate eating area(s), subject to the approval of the ECO. No cooking

is allowed outside of the Contractor's camp area on Site.

- At meal times all workers must eat in designated eating areas. These areas shall have shade for the workers. The eating areas may be in existing structures or in temporary / transportable structures that shall be well constructed using wood or metal for the frame and screened on the top and sides with shade cloth/canvas or other material to the satisfaction of the ECO. These areas shall be well demarcated and in locations approved by the ECO and shall not be within 100m of any "no go" areas or any major drainage systems, on or adjacent to the Site.
- Sufficient bins shall be present in these areas. All disposable food packaging must be disposed of in the bins after every meal. The area must be cleaned after every meal.
- The feeding or leaving of food for animals is strictly prohibited.

5.14 Site structures

- All site establishment components (as well as equipment) shall be positioned to limit visual intrusion on neighbours and the size of the land area disturbed. The type and colour of roofing and cladding materials to the Contractor's temporary structures shall be selected to reduce reflection.
- The Contractor shall supply and maintain adequate and suitable sheds for the storage of materials. Sheds for the storage of materials that may deteriorate or corrode if exposed to the weather shall be weatherproof, adequately ventilated and provided with raised floors.

5.15 Lights

- The Contractor shall ensure that any lighting installed on the Site for his activities does not cause a reasonably avoidable disturbance to the naturally-occurring fauna.

5.16 Noise

- The Contractor shall take precautions to minimise noise generated on Site (e.g. Install and maintain silencers on machinery).
- The Contractor shall comply with the Noise Induced Hearing Loss Regulations published under the Occupational Health and Safety Act.
- Appropriate directional and intensity settings are to be maintained on all hooters and sirens.
- No amplified music shall be allowed on Site. The Contractor shall not use sound amplification equipment on Site unless in emergency situations.

5.17 Dust Control

- The Contractor shall be responsible for the continued control of dust arising from his operations. The Contractor shall take all reasonable measures to minimize the generation of dust as a result of construction activities to the satisfaction of the ECO. Appropriate dust suppression measures include: spraying or dampening with water, using a commercial dust binder (such as Hydropam or Dustex), rotovating straw bales, planting of open cleared space and the scheduling of dust-generating activities. If the conditions are such that the Contractor cannot satisfactorily dampen the dust, then the ECO may halt operations until such time as the conditions are more suitable for lower dust generating construction.
- Dampening of all gravel haul and access roads with water must be ongoing and special attention must be given to roads close to residential areas. Should dust still be a problem on any specific road, the allowable speed will be reduced to 20km/h. If dust is still a problem the road should be treated with a commercial dust binder, as required, to form a cohesive layer that will control the dust on the road.
- Areas that are to have the topsoil stripped for construction purposes must be limited and only stripped when work is about to take place.
- Other activities and situations that may result in a dust nuisance include: site clearance and other earth moving operations, open cleared space, stockpiles of topsoil or sand and activities associated with concrete batching plants.

5.18 Environmental awareness training

- Environmental awareness training courses shall be run for all personnel on site (See Annexure B for a proposed Basic Environmental Education Course). Two types of course shall be run, one for the Contractor's and Subcontractor's management and one for all site staff and labourers. Courses shall be run in the morning during normal working hours at a suitable venue provided by the Contractor. All attendees shall remain for the duration of the course and sign an attendance register on completion that clearly indicates participant's names, a copy of which shall be handed to the ECO.
- The size of each session shall be limited to 30 people. The Contractor shall allow for sufficient sessions to train all personnel. Subsequent sessions shall be run for any new personnel coming onto site. A Method Statement with respect to the organisation of these courses shall be submitted.
- Notwithstanding the specific provisions of this clause it is incumbent upon the Contractor to convey the sentiments of the EMP to all personnel and Subcontractors involved with the Works.

5.18.1 Training course for management and foremen

- The environmental awareness training course for management shall include all management staff and foremen. The course, which will be presented by the ECO, will be of approximately one-hour duration. The initial course shall be undertaken not less than 7 days prior to commencement of work on site. Subsequent courses shall be held as and when required.

5.18.2 Training course for site staff and labour

- The environmental awareness training course for site staff and labour shall be presented by the Contractor's SHE Officer from material provided by the ECO unless otherwise required by the Project Specification. The course will be approximately one-hour long. The course shall be run not more than 7 days after commencement of work on site with sufficient sessions to accommodate all available personnel. Subsequent courses shall be held as and when required.

5.18.3 Site division

- The Contractor shall restrict all his activities, materials, equipment and personnel to within the area specified.
- A Method Statement detailing the location, layout and method of establishment of the construction camp (including all buildings, offices, lay down yards, vehicle wash areas, fuel storage areas, batching areas and other infrastructure required for the running of the project) shall be submitted to the ECO. No accommodation for any staff is permitted on the Site.

5.19 Construction personnel information posters

- The Contractor shall erect and maintain information posters for the information of his employees depicting actions to be taken to ensure compliance with the Environmental EMP. Construction personnel information posters shall be laminated and erected in all eating areas, workshops and site offices. The Contractor shall ensure that the construction personnel information posters are not damaged in any way, and shall replace them if any part becomes illegible. Examples of these posters will be supplied to the Contractor by the ECO in electronic format.

5.20 Fire control

- The Contractor shall take all the necessary precautions to ensure that fires are not started as a result of his activities on Site.

- No open fires shall be permitted on the Site, with the exception of burning of cleared vegetation after approval by the ECO and relevant authorities. Any fires that occur shall be reported to the ECO immediately.
- Smoking shall not be permitted in those areas where there is a fire hazard. Such areas shall include the workshop and fuel storage areas and any areas where the vegetation or other material is such as to support the rapid spreading of an initial flame.
- The Contractor shall appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedures to be followed. The Contractor shall forward the name of the Fire Officer to the ECO for his approval within 7 days of being on site.
- The Contractor shall ensure that there is basic fire-fighting equipment available on Site at all times. This shall include at least rubber beaters when working in urban open spaces and natural areas, and at least one fire extinguisher of the appropriate type when welding or other “hot” activities are undertaken.
- The Contractor shall be liable for any expenses incurred by any organisations called to assist with fighting fires that were started as a result of his activities or personnel, and for any cost relating to the rehabilitation of burnt areas, or consequential damages.

5.21 Emergency procedures

- Emergency procedures, including the names and contact details of responsible personnel and emergency services shall be made available to all staff and shall be clearly displayed at relevant locations at the Site. The Contractor shall advise the ECO of any emergencies on Site, together with a record of action taken, within 24 hours of the emergency occurring.
- Telephone numbers of emergency services shall also be posted conspicuously in the Contractor’s office near the telephone.
- The Contractor shall submit a Method Statement covering the procedures for the following emergencies:

5.21.1 Fire

- The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until he can no longer control it.
- The Contractor shall ensure that his employees are aware of the procedures to be followed in the event of a fire.

5.21.2 Accidental leaks and spillages

- The Contractor shall ensure that his employees are aware of the procedures to be followed for dealing with spills and leaks, which shall include notifying the ECO and the relevant authorities. The Contractor shall ensure that all the necessary materials and equipment for dealing with spills and leaks are available on Site at all times. Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the ECO.
- In the event of a hydrocarbon spill, the source of the spillage shall be isolated and the spillage contained. The area shall be cordoned off and secured. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/ breakdown or where possible, be designed to encapsulate minor hydrocarbon spillages. The quantities of such materials shall be able to handle a minimum of 200 l of hydrocarbon liquid spill.
- Any spills must be cleared and the contaminated soil/sludge disposed of in an appropriate manner, approved by the ECO, or at a licensed hazardous waste disposal site.

5.22 Community relations

- If so required by the Project Specification, the Contractor shall erect and maintain information boards in the positions, quantities, designs and dimensions specified. Such boards shall include contact details for complaints by members of the public in accordance with details

provided by the ECO.

- The Contractor shall keep a "Complaints Register" on Site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself and note the date and time that the complaint was resolved.
- The ECO shall be responsible for responding to queries and/or complaints and may request assistance from the Contractor's Management Staff.

5.23 Protection of natural features

- The construction phase should allow for education of staff as to the significance of species of concern.
- The Contractor shall not deface, paint, damage or mark any natural features (e.g. rock formations) situated in or around the Site for survey or other purposes unless agreed beforehand with the ECO. Any features affected by the Contractor in contravention of this clause shall be restored / rehabilitated to the satisfaction of the ECO.
- The Contractor shall not permit his employees to make use of any natural water sources (e.g. springs, streams, and open water bodies) for the purposes of swimming, personal washing and the washing of machinery or clothes.
- Water crossings and bridges should not impede the natural flow of the river and be legally approved by all relevant departments.
- Operational management programs to keep the river clean and clear of rubbish should be implemented.

5.24 Protection of flora and fauna

- It is recommended that a qualified zoologist/botanist be appointed to check for sensitive species and habitats within the site.
- Except to the extent necessary for the carrying out of the Works, flora shall not be removed, damaged or disturbed nor shall any vegetation be planted.
- The search and rescue of rare, endemic or endangered species prior to Site clearance must be carried out. The removal and stockpiling of topsoil must also be carried out in accordance with the EMP.
- Trapping, poisoning and/or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on Site.
- The use of chemicals of all forms should be carefully controlled and monitored to avoid contamination of areas, particularly wetland areas.
- Construction phases should allow for education of staff as to the significance of species of concern.
- Greens, tee boxes, fairways and landscaping to the clubhouse (an existing structure to be converted) should be planted only with indigenous species and particularly those characteristics of the existing veld types. Grasses should also be indigenous for use on greens, tee boxes and fairways with avoidance of invasive species.
- Access to areas outside the course and facilities should be limited.
- Access to areas outside the footprints should be limited and controlled.
- All vegetation stripped from construction areas should be stockpiled with the intention of converting it into mulch to return the areas it was stripped from.
- Fairways and driving ranges should be kept as comfortably narrow as possible so as to reduce the scale of knitted thatch.
- Vegetation type corridors should be retained.
- Cognizance of animal pathways must be made and retained where possible.
- The use of chemicals in nutrient enrichment should be controlled and organic products should be used instead.

5.25 Vegetation Clearance

- Vegetation clearing should occur in parallel with the construction progress to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment.
- The Contractor must work according to a plan, which demarcates the area to be cleared. The plan should be part of the Project Layout Plan developed in the Site Design Phase.
- The minimum amount of vegetation clearance must take place.
- All plants not interfering with construction should be left undisturbed.
- Collection or wilful damage to any plants outside of the areas demarcated for clearing is not allowed.
- The removal of any indigenous flora from the site should not be allowed.
- No breaking of branches, outside of the demarcated areas will be allowed without prior approval from the ECO.
- The use of fire for vegetation clearing should not be allowed.

Alien Vegetation Clearance

- The construction phase should employ eradication programmes to remove existing invasive plants as well as the removal of any new invasives, especially those categorized as 1, 2 and 3 on the NEMBA list.
- Long-term operational eradication programs to eradicate invasive's should be implemented.
- The Contractor shall destroy all tagged alien vegetation within the designated area.
- The Contractor will take care of seeds collected during the removal of alien vegetation in order to counter the spread of this vegetation type. Failure to do so may result in prosecution in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983, which states that any person removing any weed (which includes alien vegetation) shall ensure that it is not able to reproduce itself. A fine not exceeding R5 000 and/or 2 years imprisonment can be imposed.

5.26 Revegetation

- All areas disturbed during construction shall be reinstated to a state that approximates or better the state that they were in before construction.
- Cut and fill areas must be restored and reshaped.
- Areas compacted by vehicles during construction must be scarified to allow penetration of plant roots and the regrowth of natural vegetation.
- The revegetation programme must take cognisance of the climatic and seasonal conditions with the most favourable period being in spring and early summer.
- The rehabilitated areas will be weeded by the nominated rehabilitation contractor for a period of 1 year.
- Plant lists with species indigenous and or endemic to the region should be proposed in place of exotics and encouraged.
- Exotic species that are xerophytic and not classified as invasive should also be recommended.
- The transplanting of indigenous species within the study area should be done.
- It is also advised that an Environmental Control Officer, with a good understanding of the local flora be appointed during the construction phase. The ECO should be able to make clear recommendations with regards to the re-vegetation of the newly completed / disturbed areas, using selected species detailed in this and the terrestrial vegetation report. All alien plant re-growth must be monitored and should it occur these plants should be eradicated. Where any works (e.g. storm water control measures) near a wetland or river is required specific attention should be paid to the immediate re-vegetation of cleared areas to prevent future erosion of sedimentation issues.

5.27 Topsoil

- All topsoil should be stockpiled and replaced as a final graded layer over the subsoil contouring

at a minimum depth of 300mm.

- Topsoil can only be stripped from the areas as indicated below:
 - Any area which is to be used for temporary storage of materials
 - Areas which could be polluted by any aspect of the construction activity and;
 - Areas designated for the dumping of soil.
- Stripping of topsoil will be undertaken in such a manner as to minimise erosion by wind or runoff.
- Areas from which the topsoil is to be removed will be cleared of any foreign material which may come to form part of the topsoil during removal including bricks, rubble, any waste material, litter, excess vegetation and any other material which could reduce the quality of the topsoil.
- The Contractor shall ensure that subsoil and topsoil are not mixed during stripping, excavation, reinstatement and rehabilitation. If mixed with clay sub-soil the usefulness of the topsoil for rehabilitation of the site will be lost.
- Soils should be exposed for the minimum time possible once cleared.
- Topsoil will be temporarily stockpiled, separately from (clay) subsoil and rocky materials.
- Topsoil will be stockpiled in areas designated by the ECO.
- Soil must not be stockpiled on drainage lines or near watercourses without prior consent from the ECO.
- Stockpiles will either be vegetated with indigenous grasses or covered by a suitable fabric to prevent erosion and invasion of weeds.
- Stockpiled topsoil will not be compacted.

5.28 Stormwater Management

- Stormwater should be managed using suitable structures such as swales, gabions and rock rip-wrap so that any run-off from the development site is attenuated prior to discharge. Silt and sedimentation should be kept to a minimum, through the use of the above mentioned structures by also ensuring that all structures don't create any form of erosion.
- Natural run-off must be diverted to stormwater drains where these are available. The Contractor shall take appropriate measures to prevent sand, silt and silt-laden waters from entering stormwater drains, or any surface water course.
- The Contractor shall take reasonable measures to control the erosive effects of stormwater runoff particularly where excavation and construction activities form temporary channels. Suitable energy breaking devices, cut-off drains, diversions and retention ponds shall be employed to ensure that storm water runoff from the Site is dissipated and does not exceed the capacity of the surrounding stormwater system and excessive suspended solids are settled before they enter the stormwater system or any surface water course.
- The new course contouring should assist in dispersing water runoff instead of concentrating it and increasing the risk of erosion.
- The new course vertical profile should be gentler towards peripheral rough areas so as to reduce water runoff speed.
- Rough areas should be wider especially on the downward side of the slope so as to assist in reducing surface runoff speeds.
- Rough areas should attempt to retain and attenuate surface runoff where possible.
- Irrigation application rates should be carefully controlled and managed.

5.29 Erosion and sedimentation control

- The Contractor shall take all reasonable measures to limit erosion and sedimentation due to construction activities and shall, in addition, comply with such detailed measures as may be required by the EMP.
- Revegetate areas that have been disturbed as soon as possible.
- Cut and fill slopes must be made stable and be revegetated as soon as possible during the construction phase.
- Newly formed terraces within the facility must be vegetated in order to stabilise the soil.

- Where erosion and/or sedimentation, whether on or off the Site, occurs despite the Contractor complying with the foregoing, rectification shall be carried out in accordance with details specified by the ECO. Where erosion and/or sedimentation occurs due to the fault of the Contractor, rectification shall be carried out to the reasonable requirements of the ECO and at the expense of the Contractor.
- Parking areas should make use of attenuation areas and erosion control methods at discharge points.

5.30 Protection of heritage features

- An historian or built environment specialist should be appointed to assess the significance of the original farmhouse and associated infrastructure.
- Construction managers/foremen must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
- It is recommended that within the area west of the Blaaukrantz River, all large scale earthworks including road construction, pond excavation, levelling etc. should be monitored by a palaeontologist.
- If concentrations of paleontological/archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken.
- Any person who causes intentional damage to archaeological or historical sites and/or artefacts could be penalised or legally prosecuted in terms of the national Heritage Resources Act 25 of 1999.

5.31 Aesthetics

- The Contractor shall take reasonable measures to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area.

5.32 Community relations

- If so required by the Project Specification, the Contractor shall erect and maintain information boards in the positions, quantities, designs and dimensions specified. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the ECO.
- The Contractor shall keep a "Complaints Register" on Site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself and note the date and time that the complaint was resolved.
- The ECO shall be responsible for responding to queries and/or complaints and may request assistance from the Contractor's Management Staff.

5.33 Temporary site closure

- If the Site is closed for a period exceeding 5 days, the Contractor's SHE Officer in consultation with the ECO shall carry out the following checklist procedure and ensure that the following conditions pertain and report on compliance with this clause:

5.33.1 Fuels / flammables / hazardous materials stores

- Fuel stores are as low in volume as practicable.
- There are no leaks.
- The outlet is secure and locked.
- The bund is empty.
- Fire extinguishers are serviced and accessible.

- The area is secure from accidental damage through vehicle collision and the like.
- Emergency and contact numbers are available and displayed.
- There is adequate ventilation in enclosed spaces.
- There are no stores or containers within the 1:50 year flood line.

5.33.2 Safety

- Site safety checks have been carried out in accordance with the Occupational Health and Safety Act (No. 85 of 1993) prior to site closure.
- An inspection schedule and log for use by security or contracts staff is developed.
- All trenches and manholes are secured.
- Applicable notice boards are in place and secured.
- Emergency and Management contact details are prominently displayed.
- Security personnel have been briefed and have the facilities to contact or be contacted by relevant management and emergency personnel.
- Night hazards such as reflectors, lighting, traffic signage etc have been checked.
- Fire hazards identified and the local authority notified of any potential threats e.g. large brush stockpiles, fuels etc.
- Pipe stockpiles are wedged / secured.
- Scaffolds are secure.
- Structures vulnerable to high winds secure.

5.33.3 Erosion

- Wind and dust mitigation measures such as straw, brush packs, irrigation etc are in place.
- Excavated and filled slopes and stockpiles are at a stable angle and capable of accommodating normal expected water flows.
- Re-vegetated areas have a watering schedule and the supply to such areas is secured.
- There are sufficient detention ponds or channels in place.

5.33.4 Water contamination and pollution

- Hazardous fuel stores are secure.
- Cement and materials stores are secure.
- Toilets are empty and secured.
- Refuse bins are empty and secured.
- Bunding is clean and treated with appropriate material that will absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage.
- Drip trays are empty & secure.

5.34 Site closure and decommissioning

- All building materials will be removed from site.
- All waste must be removed from site.
- All access roads that are not part of the development must be closed.
- All ablution facilities must be removed from site.
- All fences surrounding the construction site must be removed.
- All signs relating to the construction site must be removed.

6 CONCLUSION

Although all foreseeable actions and potential mitigations or management actions are contained in this document, the EMP should be seen as a day-to-day management document. The EMP thus sets out the environmental standards that are required to minimise the negative impacts and maximise the positive benefits of the proposed Belmont Valley Golf Course Project as detailed in the EIR (Vol. 3) and specialist reports (Vol. 2). The EMP could thus change daily, and if managed correctly lead to a successful construction and operation of the proposed project.

All attempts should be made to have this EMP available, as part of any tender documentation, so that the contractors are made aware of the potential cost and timing implications needed to fulfill the implementation of the EMP, thus adequately costing for these.

Further guidance should also taken for any conditions contained in the Environmental Authorisation, if the project is granted approval, and that these DEA conditions must be incorporated into the final EMP.

ANNEXURE A: METHOD STATEMENTS

Method statements need to be compiled by the Contractor for approval by the ECO. For the purposes of the environmental specification, a method statement is defined as a written submission by the Contractor to the ECO setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, in such detail that the ECO is enabled to assess whether the Contractor's proposal is in accordance with the EMP and/ or will produce results in accordance with EMP.

The method statement shall cover applicable details with regard to:

- construction procedures,
- materials and equipment to be used,
- getting the equipment to and from site,
- how the equipment/ material will be moved while on site,
- how and where material will be stored,
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur,
- timing and location of activities,
- compliance/ non-compliance with the Specifications, and
- any other information deemed necessary by the Engineer.

The Contractor shall abide by these approved method statements, and any activity covered by a method statement shall not commence until the ECO has approved the method statement. The method statement shall be submitted to the ECO not less than 20 days prior to the intended date of commencement of the activity, or as directed by the ECO.

METHOD STATEMENT

CONTRACT:..... **DATE:**.....

PROPOSED ACTIVITY (give title of method statement and reference number from the EMP):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

Start Date:

End Date:

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated sketches and plans where possible):

* Note: please attach extra pages if more space is required

DECLARATIONS

1) ENVIRONMENTAL CONTROL OFFICER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(Signed)

(Print name)

Dated: _____

2) PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____

ANNEXURE B: BASIC ENVIRONMENTAL EDUCATION COURSE

WHAT IS THE ENVIRONMENT?

- Soil
- Water
- Plants
- People
- Animals
- Air we breathe
- Buildings, cars and houses



WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- It affects us all as well as future generations
- We have a right to a healthy environment
- A contract has been signed
- Disciplinary action (e.g. construction could stop or fines issued)

HOW DO WE LOOK AFTER THE ENVIRONMENT?

- Report problems to your supervisor/ foreman
- Team work
- Follow the rules in the EMP



WORKING AREAS

Workers & equipment must stay inside the site boundaries at all times



ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site



TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers



SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Do not light any fires without permission
- Know the positions of fire fighting equipment
- Report all fires
- Do not burn rubbish or vegetation without permission



PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray under vehicles & machinery
- Empty drip trays after rain & throw away where instructed



DUST

Try to avoid producing dust -
Use water to make ground &
soil wet



NOISE

- Do not make loud noises around the site, especially near schools and homes
- Report or repair noisy vehicles



TOILETS

- Use the toilets provided
- Report full or leaking toilets



EATING

- Only eat in demarcated eating areas
- Never eat near a river or stream
- Put packaging & leftover food into rubbish bins



RUBBISH

- Do not litter - put all rubbish (especially cement bags) into the bins provided
 - Report full bins to your supervisor
 - The responsible person should empty bins regularly
-



TRUCKS AND DRIVING

- Always keep to the speed limit
 - Drivers - check & report leaks and vehicles that belch smoke
 - Ensure loads are secure & do not spill
-



FINES AND PENALTIES

- Spot fines may be issued
- Your company may be fined
- Removal from site
- Construction may be stopped



PROBLEMS - WHAT TO DO!

- Report any breaks, floods, fires, leaks and injuries to your supervisor
- Ask questions!

