


**PROPOSED PINEDALE ECO-ESTATE, BATHURST, EASTERN CAPE
PROVINCE OF SOUTH AFRICA**

DEDEA REF NO.: ECO5/LN2/M/10-73

FINAL

**VOLUME 4
ENVIRONMENTAL MANAGEMENT PLAN**

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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 Plan**

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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 this 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 Pinedale Eco-Estate project will not include the decommissioning phase as this is not envisaged. 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 draft Construction EMP (See Part 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 Environmental Impact Assessment Issues and Mitigation Measures

The EIA identified potential impacts and risks associated with the proposed development.

The significance before and after are also indicated in the table as are the recommendations that were made in the EIA in response to the identified impacts. Essentially, this table serves as an audit trail of the EIA, to ensure that all impacts are mitigated.

All impacts that must be considered during the design phase are given in Section 2. All impacts related to the construction phase and therefore the responsibility of the contractor, are given in Section 3. All impacts related to the operational phase and therefore the responsibilities of the owner are given in Section 4.

2 DEFINITIONS

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

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.

Environment:

Means the surroundings within which human beings exist and these comprise 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 Control Officer:

Independent consultant appointed by the proponent to monitor compliance with the EMP and provisions of the Environmental Impact Report.

His:

Means his or her, as applicable.

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.

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/ materials will be moved while on Site;
- How and where materials 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 EMP; and
- Any other information deemed necessary by the ECO.

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.

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:

This is the area in the possession of the Contractor for the construction of the Works. Where the area is not demarcated, it will include all adjacent areas, which are reasonably required for the activities for the Contractor, and approved for such use by the ECO.

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).

3 BACKGROUND INFORMATION

Provided below is a brief description of the proposed Pinedale Eco-Estate Project. A more detailed project description is provided in Chapter 2 of Volume 3 "Coastal & Environmental Services, 2011: *Environmental Impact Report: Proposed Pinedale Eco-estate*, CES, Grahamstown.

3.1 Pinedale Eco-Estate Project

The proposed Pinedale residential development constitutes the Farm 40 and 45, and portions of Farms 41 to 44, 46 and 47 of the Bathurst Administrative District. The farms are immediately to the east of the Blaaukrantz River (Figure 3-1). The proposed project will entail the construction of 50 residential units and rezoning of remaining land as Private Nature Reserve. The proposed development (including land to be re-zoned) will cover an area of approximately 940 hectares.

The development will be marketed with two accommodation options. The first option is up-market units which will be built around the Pinedale dam and will have full services i.e. water and electricity. The second accommodation option is ridge units which will be marketed as self sufficient erven. These units will be marketed as 'eco-friendly' and will provide their own water, from rain water harvesting, and electricity in the form of solar panels. A communal braai area will also be constructed at the dam. All accommodation units will be constructed from pre-treated wood and will be designed around existing vegetation.

The remainder of the land (884ha) will be managed as a game farm as there are already game species in the thicket areas. Indigenous game species will be reintroduced where viable.

The development will include the construction or appropriate upgrading of existing infrastructure such as electricity, water, sewage and roads. The existing road network is sufficient for the development needs but will need to be resurfaced with gravel.

3.2 The Environmental Policy

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 and all that it implies, and to adopt and implement the policy throughout the course of construction.

- The environmental specifications and intentions of the specifications must be upheld.
- Natural resources will not be degraded, and no unnecessary environmental degradation must take place.
- Site activities will be conducted in a manner that does not create a nuisance, risk or hazard to the natural environment.
- Employee and public health and safety must be considered a priority.

3.3 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.

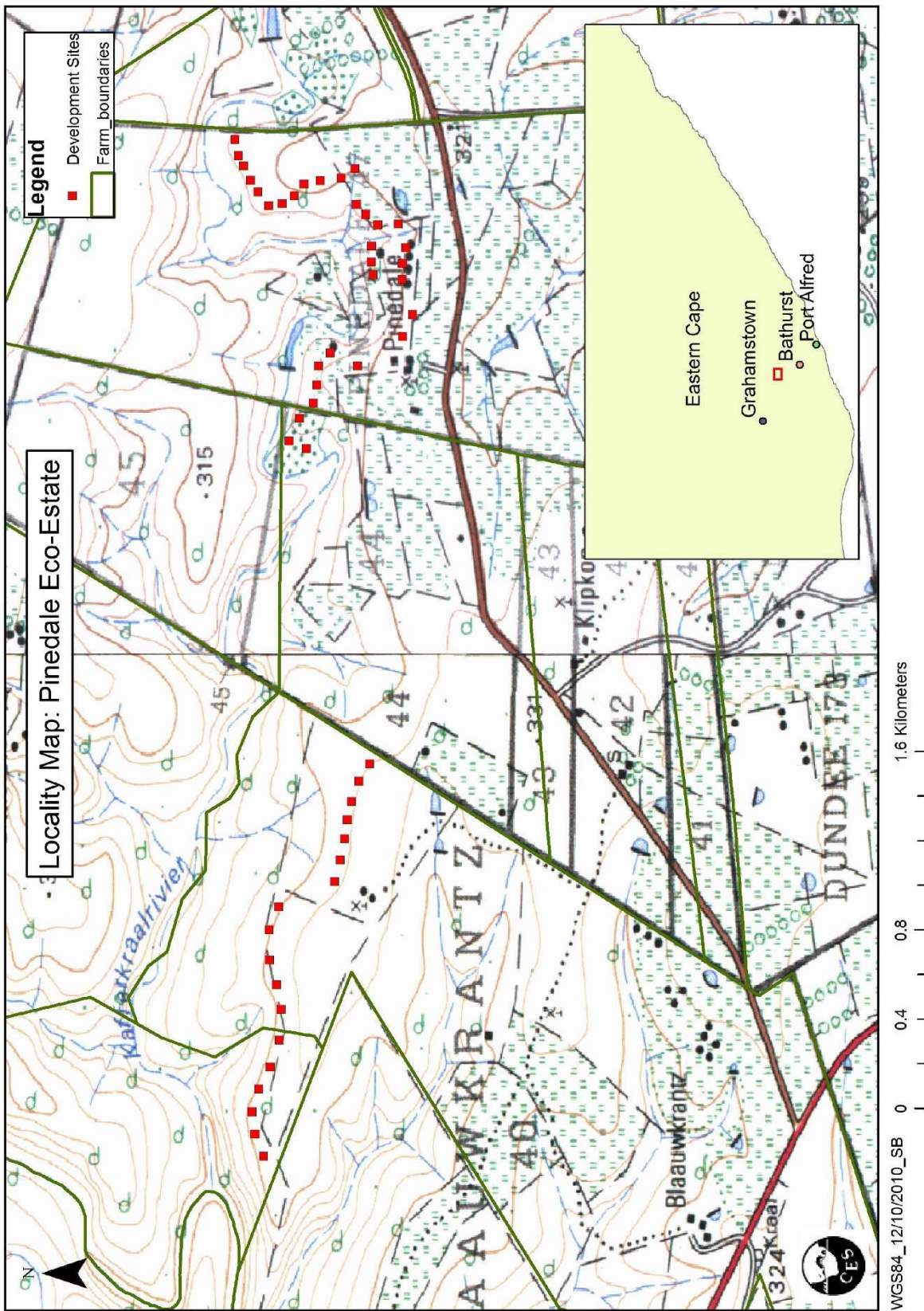


Figure 3-1: Location of the proposed Pinedale Eco-estate (residential units are represented by red squares, the farm boundaries are shown in green)

3.4 Details of EAP

Coastal & Environmental Services (CES) were commissioned by the applicant, (Mr. Mark Harris and Mr. Ross Purdon) to prepare an Environmental Management Plan (EMP) that seeks to comply with the EIA regulations. In fulfilment of this requirement, provided below are the details of CES:

Coastal and Environmental Services
Physical Address: 67 African Street, Grahamstown, 6139
Postal Address: P.O. Box 934, Grahamstown, 6140
Telephone: +27 466222364
Email: info@cesnet.co.za

In addition to the above, CES wishes to point out the expertise of the project team that prepared this EMP, which includes CES as a consulting firm and this team's members.

3.4.1 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.

Provided below are short *curriculum vitae* (CVs) of each of the project team members involved in the preparation of the Environmental Management Plan (EMP) for the proposed Terra Wind Energy Golden Valley Project. Table 3-1 that follows provides the details of the specialists that provided input into this EMP as per the specialist studies undertaken as part of the EIR Phase.

Marc Hardy (*Project Leader and Report Reviewer*)

Marc holds a M. Phil (Environmental Management) from the University of Stellenbosch's School of Public Management and Planning. His professional interests include environmental impact reporting for linear, energy and bulk infrastructure projects, strategic environmental policy development and reporting – mostly relating to Environmental Management Frameworks (EMFs) - compliance monitoring and environmental auditing. Marc has been in the private consulting industry for 2 years prior to joining CES (previously with Bohlweki-SSI Environmental, Johannesburg) and has, amongst others, been project manager for the Dinokeng EMF (Gauteng), the Milnerton Refinery to Ankerlig Power Station Liquid Fuels Transportation Infrastructure Project (on behalf of Eskom Generation – Cape Town), numerous Eskom Transmission and Distribution power line and substation EIAs countrywide, mining EMPR compliance audits, the Return-To-Service compliance audits for Camden, Grootvlei and Komati Power Stations (Mpumalanga Province) and the new high hazard waste management facility for the Coega Development Corporation (Coega IDZ). Before entering the consulting field he gained extensive experience in the EIA regulatory field whilst in the employ of the Gauteng Department of Agriculture, Conservation and Environment being responsible for the review of infrastructure projects like the Gautrain Rapid Rail Link and representing the Department on various EMF, SDF and IDP project steering committees. He is currently managing the EIA processes for numerous wind energy developments.

Dr Eric E Igbini (*Project Manager and Report Production*)

Senior Environmental Consultant; Eric holds a Ph.D and M.Sc in Environmental Biotechnology and B.Sc.Hons in Biochemistry. Eric's professional interest is in sustainable integrated environmental management with a keen interest in climate change/carbon management strategy, hydrocarbon bioremediation, waste management and valorization and alternative energy production. Before joining CES he served as a Senior Research Scientist at the Institute for Environmental Biotechnology, Rhodes University where he lectured at postgraduate level and lead a research group tasked with beneficiating coal spoils and acid mine drainage treatment. Eric has several peer reviewed publications and a patent. He is a registered professional natural scientist and a member of several international environmental organizations.

4 DESIGN PHASE EMP

4.1 Road Design

- Width of the road should be minimised.
- Runoff and stormwater systems draining the road surface area must be properly designed.

4.2 Walkway Design

- Walkways should blend in with the environment.
- Bollards with down lights should be used where lighting is needed.
- Walkways should be well-marked with informative signage.

4.3 Unit site selection

- Units should be located on the less steep areas of the development site.
- Units should be placed more than 50m from water courses
- Where possible, indigenous vegetation should be avoided, particularly large trees.

4.4 Unit design

- Units should be north-facing as far as possible.
- Roofs must be designed to capture rainwater efficiently.
- Solar panels
- Waste disposal system
- Dual-flush toilets and other water-saving devices should be incorporated into the design.
- Septic tanks should be well banded etc.

4.5 Sewage treatment works

- French drains should only be considered on a small scale application or for domestic use. Consider the cumulative impact of existing French drains in use in the area before opting for this system.
- Locate French drains outside of watercourses at a sufficient distance from any buildings to minimise bad odours.
- The septic tank must be a watertight receptacle with access for maintenance from the top.
- Grease traps should be considered when the effluent contains high levels of oils.
- Avoid soils which have a low percolation rate (clay) and soils which have a high percolation rate (sand). Soils should be loamy and deep.
- Avoid areas with high water tables and steep gradients.
- The percolation area of the soakaway should be maximised.
- Allow for the establishment of plants (preferable indigenous) at the soakaway.
- The system should be demarcated to keep out vehicular traffic.

5 CONSTRUCTION PHASE EMP

5.1 Method Statements

Annexure A gives an explanation of method statements and 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.

The following Method Statements shall be provided by the Contractor and submitted to the ECO for approval.

5.1.1 Contractors SHE Officer & Fire Officer

The name and letter of appointment of the Contractors SHE Officer and Fire Officer must be given to the ECO and the terms of reference for the work to be undertaken must be detailed including time on site, CV, roles and responsibility, interaction with the Contractor and environmental offices, etc.

5.1.2 Site division

The location, layout and method of establishment of the construction camp including the following:

- 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

5.1.3 Access Routes

Details, including a drawing, showing where and how the access points and routes will be located and managed.

Any additional Method Statements as required by the ECO or the EMP must be provided by the Contractor. The Contractor shall not commence the activity until the Method Statement has been approved in writing and shall, except in the case of emergency activities, allow a period of 20 working days for approval of the Method Statement.

The ECO may require changes to a Method Statement if the proposal does not comply with the specification or if, in the reasonable opinion of the ECO, the proposal may result in, or carries a greater than reasonable risk of, damage to the environment in excess of that permitted by the EMP or any legislation.

Approved Method Statements shall be readily available on the Site and shall be communicated to all relevant personnel and subcontractors. The Contractor shall carry out the Works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract. No claim for delay or additional cost incurred by the Contractor shall be entertained due to inadequacy of a Method Statement.

5.1.4 Pollution control

- Expected solid waste types, quantities, methods and frequency of collection and disposal as well as location of disposal sites.
- Methods of minimising, controlling, collecting and disposing of contaminated water.
- Details of any hazardous substances / materials to be used, together with the transport, storage, handling and disposal procedures for the substances.

5.1.5 Emergency procedures

Emergency procedures for fire and accidental leaks and spillages of hazardous substances (including fuel and oil). Include details of risk reduction measures to be implemented including fire fighting equipment, fire prevention procedures and spill kits (materials and compounds used to reduce the extent of spills and to breakdown or encapsulate hydrocarbons).

Other Method Statements that will be required during the course of construction are to be provided by the Contractor a minimum of 20 days prior to commencement of the works or activities to which they apply (no work can commence on site before these Method Statements have been approved):

5.1.6 Environmental awareness training

Number, dates, trainer and logistics for the initial awareness courses for the Contractor's employees and for the management Staff.

5.2 Contractor's SHE Officer

- The Contractor shall appoint a Contractor's SHE Officer who shall be responsible for undertaking a daily site inspection to monitor compliance with this EMP. The Contractor shall submit the name of the Contractor's SHE Officer as well as a Method Statement detailing his CV, roles and responsibilities to the ECO for his approval before work can commence on site.
- These appointments will be made within the first 7 days of work commencing on site and will be given to the ECO in writing.

5.3 Site demarcation

- 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.

5.4 "No go" areas

- 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.

5.5 Access routes / haul roads

- 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/hr 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.

5.6 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.

5.7 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 the 100m of any residential areas or 20m of any "no go" area.

5.8 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.

For more details see Annexure 2 of the Draft EIR (Pinedale Eco-Estate Waste Management Plan).

5.9 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.

5.10 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.

5.11 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.

5.12 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 Method Statement, a plan detailing all actions to be taken to comply with the cement and batching requirements shall be submitted to the ECO.

5.13 Fuel (petrol and diesel) and oil

5.13.1 Fuel Storage

- Fuel can be stored on site. 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 Division Method Statement, 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.

5.13.2 Refuelling

- Where reasonably practical, 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.

5.13.3 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.

5.14 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 Division Method Statement, 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.

5.15 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.

5.16 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 as specified in Section 5.8 of this EMP 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.

5.17 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.

5.18 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.

5.19 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.

5.20 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.

5.21 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.

5.21.1 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.

5.21.2 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.

5.21.3 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.

5.22 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.

5.23 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.

5.24 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:

5.24.1 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.

5.24.2 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.

5.25 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.

5.26 Protection of natural features

- 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.

5.27 Protection of flora and fauna

- 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.

5.28 Vegetation Clearance

- The Contractor must work according to a plan, which demarcates 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 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.
- No breaking of branches, outside of the demarcated areas will be allowed without prior approval from the ECO.

5.29 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.

5.30 Topsoil

- 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.
- Outside of the housing footprint, topsoil will be stripped to a depth not exceeding 150mm from the original ground level.
- 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.

5.31 Stormwater management

- 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.

5.32 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.

5.33 Protection of archaeological and palaeontological sites

- If any possible palaeontological/archaeological material is found during excavations, including human remains, shell middens, Stone Age tools, fossil bones and other artefacts, graves and wrecked vessels, the Contractor shall stop work immediately and inform the ECO. The ECO will inform the South African Heritage Resources Agency (SAHRA) and arrange for a palaeontologist/archaeologist to inspect, and if necessary excavate, the material, subject to acquiring the requisite permits from SAHRA.
- 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.

5.34 Aesthetics

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

5.35 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:

5.35.1 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.

5.35.2 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.

5.35.3 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.

5.35.4 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.

5.36 Site Closure

- 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 OPERATION PHASE EMP

All holiday unit owners should receive a copy of the operational EMP and sign acknowledgement that they have read and understood the contents of the document.

Holiday units which are rented out by the owners should provide easily accessible and clearly marked instructions and information regarding the septic tanks, waste disposal system, property rules and regulations etc.

These will include the following:

1. No vehicles may be driven off road for any reason unless prior authorisation from the Homeowner's Association.
2. No person may leave the designated roads and footpaths for any reason without prior authorisation from the Homeowner's Association.
3. Waste must be separated at source into the bins provided.
4. No firewood may be collected from the bush.
5. No fires may be started outside of the designated areas.
6. No fourwheelers, motorbikes etc will be allowed on the property.
7. No motorised boats will be allowed on the dams.
8. Vehicles using internal roads may not exceed 40km/h.

7 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 Pinedale Eco-Estate 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 operational 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:
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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: _____

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
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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
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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!

