

# Proposed Incinerator Replacement at the Grahamstown State Veterinary Laboratory, Eastern Cape

## Draft Environmental Management Programme

Report Prepared for

**Department of Rural Development and  
Agrarian Reform**

Report Number 497875/Grahamstown/3



Report Prepared by

 **srk** consulting

October 2017

# **Proposed Incinerator Replacement at the Grahamstown State Veterinary Laboratory, Eastern Cape**

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### **Report Prepared for**

#### **Department of Rural Development and Agrarian Reform**

Diagnostics and Advisory Services  
Döhne Agricultural Development Institute  
Stutterheim

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**October 2017**

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## Acronyms

**DEA:** Department of Environmental Affairs (National)

**DRDAR:** Department of Rural Development and Agrarian Reform

**EAP:** Environmental Assessment Practitioner

**ECPHRA:** Eastern Cape Provincial Heritage Resources Authority

**ECO:** Environmental Control Officer

**EIA:** Environmental Impact Assessment

**EMPr:** Environmental Management Programme

**NEMA:** National Environmental Management Act

**NMBM:** Nelson Mandela Bay Municipality

**RP:** Representative Person (developer) who is responsible for the implementation of the EMPr.

# 1 Introduction

SRK Consulting (SRK) has been appointed by the Department of Rural Development and Agrarian Reform (DRDAR) to undertake an environmental assessment process for the proposed incinerator replacement at the Grahamstown State Veterinary Clinic, which includes the compilation of this Draft Environmental Management Programme (EMPr) which will be included in the Basic Assessment Report. The DRDAR State Veterinary Clinic is located on Erf 4904 directly south of Grahamstown in the Eastern Cape Province.

## 2 Scope of Report

The environmental management measures recorded in this EMPr are based on information supplied to SRK during the compilation of the Basic Assessment Report, including information from the applicant and the recommendations from the specialist. This EMPr has been compiled to comply with the specific requirements of the National Environmental Management Act (No. 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations (2014).

It should be noted that the EMPr is written as if the project has been authorised. This approach in no way presupposes that the project will be authorised, rather, the style of writing is aimed at making the EMPr easier to read and more easily converted into a practical management tool should the application be approved.

SRK has exercised all due care in reviewing the supplied information provided during the course of the environmental assessment process and has included the requirements of commenting authorities. The appropriateness and practicality of the management measures presented in this EMPr has been considered in terms of comments received and discussed with the applicant as necessary. DRDAR is fully responsible for the implementation of the EMPr.

SRK cannot be held responsible for failure of DRDAR to comply with the EMPr. The EMPr is by nature a dynamic document and NEMA provides for continual updating of the EMPr, with approval from the Competent Authority.

The aim of this EMPr is to ensure that construction, operation, and maintenance activities are conducted such that potential negative environmental impacts are minimised and positive impacts are enhanced. This EMPr is not a health and safety plan and this EMPr makes no attempt to satisfy the requirements of the Occupational Health and Safety Act

### 2.1 Environmental Assessment Practitioner (EAP)

#### 2.1.1 Expertise of EAP

This EMPr was prepared by Karien Killian and Karissa Nel and reviewed by Rob Gardiner.

**Karien Killian (MSc Botany)** is an Environmental Scientist and has been involved in environmental management for the past 3 years. Her experience includes Environmental Impact Assessments (EIAs), Environmental Management Programmes (EMPr), Water Use Licence Applications, Air Emission Licence Applications and Environmental Auditing.

**Karissa Nel (MEM, CEAPSA)** is a Senior Environmental Scientist and EAPASA registered EAP, and has been involved in environmental management for the past 10 years working on a variety of South African projects. Her experience includes Environmental Impact Assessments (EIAs), Environmental Management Programmes (EMPr), Specialist Aquatic Assessments, Environmental Licensing, Environmental Auditing and Stakeholder Engagement.





Figure 1: Site locality map



**Rob Gardiner (MSc, MBA, Pr Sci Nat)** Gardiner is the Principal Environmental Scientist and head of SRK's Environmental Department in Port Elizabeth. He has more than 22 years environmental consulting experience covering a broad range of projects, including Environmental Impact Assessments (EIAs), Environmental Management Systems (EMS), Environmental Management Programmes (EMPr), and environmental auditing. His experience in the development, manufacturing, mining and public sectors has been gained in projects within South Africa, Lesotho, Botswana, Angola, Zimbabwe, Suriname and Argentina.

### 2.1.2 Environmental Assessment Practitioner Details

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## 3 Project Description

The Department of Rural Development and Agrarian Reform (DRDAR) State Veterinary Clinic in Grahamstown has an existing incinerator mainly for the incineration of animal carcasses at the clinic. The DRDAR proposes to replace the existing incinerator with a similar new incinerator as the existing incinerator has become unserviceable, i.e. the intention is to "replace like with like". The new incinerator can only be purchased once the waste management license, and any other authorisations, have been issued. Since the applicant is dependent on readily available units by known suppliers, the size of the proposed incinerator could not be fixed for use in this study and is given as three potential different burn rates (45 kg/hour, 60 kg/hour and 75 kg/hour). All options have been assessed in the specialist Atmospheric Impact Report included in Appendix D of the BAR.

The incineration process will be carried out by placing the material in the incinerator and igniting the diesel using an electrical burner. Incineration will be done as and when required, on average once a week. Carcasses are kept in a cold room until enough material has been gathered. The resulting ash will be placed in containers and collected and disposed of via an approved contractor (e.g. Compass Medical Waste Services). All other medical wastes, such as petri dishes and sharps, will also be collected and disposed of by the approved service provider.

The process description is based on controlled-air incineration, which is the most widely used medical waste incinerator technology, and now dominates the market for new systems at hospitals and similar medical facilities. This technology is also known as starved-air incineration, two-stage incineration, or modular combustion.

Combustion of waste in controlled air incinerators occurs in two stages. In the first stage, waste is fed into the primary, or lower, combustion chamber, which is operated with less than the stoichiometric amount of air required for combustion. Combustion air enters the primary chamber from beneath the incinerator hearth (below the burning bed of waste). This air is called primary or underfire air. In the primary (starved-air) chamber, the low air-to-fuel ratio dries and facilitates volatilization of the waste, and most of the residual carbon in the ash burns. At these conditions, combustion gas temperatures are relatively low (760 to 980 °C).

In the second stage, excess air is added to the volatile gases formed in the primary chamber to complete combustion. Secondary chamber temperatures are higher than primary chamber temperatures, typically 980 to 1,095 °C. Depending on the heating value and moisture content of the waste, additional heat may be needed. This can be provided by auxiliary burners located at the entrance to the secondary (upper) chamber to maintain desired temperatures.

Waste feed and ash removal can be manual or automatic, depending on the unit size and options purchased. Because of the low air addition rates in the primary chamber, and corresponding low flue gas velocities (and turbulence), the amount of solids entrained in the gases leaving the primary chamber is low. Therefore, the majority of controlled air incinerators do not have add-on gas cleaning devices.

Several air pollutants are emitted from the incineration process due to the combustion of fuel and waste material within the furnace. The key pollutants emitted from veterinary waste incinerators are particulate matter, metals, acid gases, NOX, CO, organics and various other materials present in medical wastes, such as pathogens, cytotoxins, and radioactive diagnostic materials. Emission rates depend on the design of the incinerator, combustion temperature, gas retention time, duct design, duct temperature and any control devices.

## 4 Environmental Objectives

This section specifies the impact management objectives and outcomes used to determine the extent of management action(s) required to mitigate the impacts identified during the impact assessment process.

### 4.1 Planning and Design

There were no impacts identified for this phase, since the project entails the replacement of an existing incinerator at the same location.

### 4.2 Construction phase

The duration of the construction phase is expected to be short as the replacement of the incinerator should be complete within a few days. The following impacts and associated management objectives are described for the construction phase:

#### 4.2.1 Impacts on Air Quality:

Prior to construction of the proposed new incinerator, the old incinerator structures will be disassembled and moved off site. The proposed new incinerator and associated structures will be brought to site by truck and assembled at the same location where the current incinerator is located. Motor vehicles, in particular diesel vehicles emit SO<sub>2</sub>, due to the higher sulphur content of diesel fuel. A minimal increase in vehicular traffic is to be expected on site during the construction phase, and should there be diesel vehicles present (delivery vehicles) their effect would be once-off and short-lived. Dust emissions are not expected to be high during this process as the site is not located in a dusty environment (mainly on paved surfaces). No additional construction or clearing of vegetation is foreseen and the site would remain in its current condition.

The impact management objective for this impact is:

- Minimise air pollution.

#### 4.2.2 Waste Management:

Construction waste as well as small amounts of domestic waste will be generated. Prior to construction or decommissioning, the existing incinerator and associated structures needs to be disassembled and removed off site. Both construction waste and waste generated during the decommissioning phase will be removed off site by trucks and either taken to a registered waste disposal facility or be recycled.



Volumes of inert construction waste are estimated to be approximately one skip. Illegal disposal on site may lead to negative ecological as well as visual impacts. It is unlikely that illegal dumping will occur in this regard due to the valuable material to be disposed of. Recycling of the scrap metal is likely to occur and is recommended.

The impact management objective for this impact is:

- Prevent waste pollution of surrounding habitats; and
- Legally compliant management of solid waste.

### 4.2.3 Noise Impacts

Noise will result mostly from the movement of vehicles and use of machinery (plant) for construction/ decommissioning related activities such as removal of the old incinerator and installation of the new incinerator.

Impacts will however be temporary in nature and of a short duration (a few days) and are predicted to be very low.

The management objectives for this impact are:

- Minimise noise impacts; and
- Legal compliance with regard to noise generation.

## 4.3 Operational phase

The following impacts and associated management objectives are described for the operational phase:

### 4.3.1 Air Quality Impacts

In order to assess the atmospheric impact of the facility on human health, a dispersion modelling study was undertaken in accordance with the regulations regarding air dispersion modelling specified for regulatory purposes – developed in terms of section 53 of AQA. The impact assessment only takes the emissions of the facility under consideration as well as prevailing ambient air concentrations into account during this assessment.

Dispersion modelling results for the predicted 1-hour, 24-hour and annual average ambient concentrations of particulates (PM<sub>10</sub> and PM<sub>2.5</sub>), NO<sub>2</sub>, SO<sub>2</sub> and CO resulting from emissions from the proposed new incinerator were all very low on site and reach a maximum approximately 200 m downwind of the site. No exceedance of the NAAQS is predicted within the site or in residential and sensitive receptor areas around the site. The predicted PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, SO<sub>2</sub> and CO concentrations therefore comply with the NAAQS in the ambient environment. The predicted ambient concentrations are based on uncontrolled emissions and are assessed against the respective National Ambient Air Quality Standards (NAAQS).

The management objective for this impact is:

- Minimise air quality impacts resulting from the operation of the new incinerator.

### 4.3.2 Waste Management Impacts

Operational activities will involve the incineration of veterinary waste. Animal carcasses destined for incineration will be kept in cold rooms until enough material have been gathered for incineration. On average, incineration will take place once a week. The resulting ash will be placed in containers and collected and disposed of via an approved contractor.

Alternatively, the ash from incineration will be collected, stored in closed marked containers and disposed of at a licensed facility authorised to accept this waste when required. Disposal of ash on the site may lead to it becoming wind-blown, which can lead to further air quality and visual impacts.

The management objectives for this impact are:

- Containment of waste to prevent nuisance, health, and/ or groundwater impacts;
- Disposal of ash in accordance with the Norms and Standards for Disposal of Waste to Landfill (GNR 636 in NEM:WA).

#### **4.4 Closure/ Decommissioning Phase**

The need or timeframe for decommissioning has not been established, however it is anticipated that the potential impacts, and therefore also the environmental objectives, will be similar to those mentioned for the construction phase.

### **5 Impact Management**

This section specifies the impact management actions required for the aspects and potential impacts related to the proposed incinerator replacement. These actions represent the manner in which the impact management objectives and outcomes, identified above, will be achieved. Where applicable, actions will include activities to:

- (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
- (ii) comply with any prescribed environmental management standards or practices;
- (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and
- (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable

The above are detailed in Table 1 and Table 2 for the construction and operational phases respectively.

**Table 1: Potential environmental aspects and impacts for the construction phase as well as the associated mitigation and management measures**

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	Time-frame	Responsibility
Construction and domestic waste generated during construction	<p><u>Waste Management Impacts</u></p> <p>Construction waste as well as waste generated as a result of the decommissioning of the old incinerator will be generated. Pollution, illegal disposal on site and accumulation of construction waste such as rubble, creates a negative visual impact and could potentially have an impact on surrounding natural ecosystems.</p>	<p><u>CONSTRUCTION MEASURES:</u></p> <ul style="list-style-type: none"> <li>Where possible, material should be recycled or taken to recycling facilities such as scrap metal yards;</li> <li>The Contractor must identify and separate materials that can be reused or recycled to minimise waste, e.g. metals, packaging and plastics, and provide separate marked bins/ skips for these items. These wastes must then be sent for recycling and records kept of recycling;</li> <li>No disposal of wastes, other than at the relevant registered landfill sites authorised to accept this waste;</li> <li>No waste may be burned or buried on site; and</li> <li>Ensure that construction materials (e.g. bags of cement) are suitably stored and protected to avoid wastage.</li> </ul>	Duration of construction	Contractor and DRDAR
Noise during construction	<p><u>Noise Impacts</u></p> <p>Noise will result mostly from the movement of vehicles and use of machinery (plant) for construction/ decommissioning related activities such as removal of the old incinerator and installation of the new incinerator.</p>	<p><u>CONSTRUCTION MEASURES:</u></p> <p>Construction activities that are likely to result in noise levels in excess of 7 dB above ambient noise, at a distance of 100 m from the sources should be restricted to normal working hours (i.e. 6:00 to 18:00, Monday to Saturday) according to the Noise Control Regulations in terms of the Environmental Conservation Act (Act 73 of 1989) to reduce the noise impact to an acceptable level. Deliveries to the site should also be limited to these times.</p>	Duration of construction	Contractor

**Table 2: Potential environmental aspects and impacts for the operational phase as well as the associated mitigation and management measures**

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	Time-frame	Responsibility
Waste associated with incineration during operation	<p><u>Waste Management Impacts:</u></p>	<p><u>OPERATIONAL MEASURES:</u></p> <ul style="list-style-type: none"> <li>No dumping within the surrounding area shall be permitted, and no waste</li> </ul>	Duration of operation	DRDAR

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	Time-frame	Responsibility
	<p>Operational activities will involve the incineration of veterinary waste. Animal carcasses destined for incineration will be kept in cold rooms until enough material have been gathered for incineration. On average, incineration will take place once a week. Alternatively, the ash from incineration will be collected, stored in closed marked containers and disposed of at a licensed facility authorised to accept this waste when required.</p> <p>Disposal of ash on the site may lead to it becoming wind-blown, which can lead to further air quality and visual impacts.</p>	<p>may be buried or burned on site;</p> <ul style="list-style-type: none"> <li>All veterinary waste destined for incineration must be kept in a cold room, on an impermeable surface, until it can be incinerated in order to prevent impacts related to groundwater contamination (odours, tampering etc.);</li> <li>Organic waste brought in from off-site should be stored in a suitable, marked, closed containers/ bags and also stored in cold rooms until incineration;</li> <li>Ash from incineration must be collected and stored in closed marked containers and disposed of via a contractor (e.g. Compass Medical Waste Services) or disposed of at a licensed facility authorised to accept this waste;</li> <li>A detailed record should be held of all wastes that are incinerated (including waste type, weight, date of incineration, etc.) as well as the use of diesel; and</li> <li>A detailed record should be held of all organic waste from outside sources (including waste type, weight, date of arrival, date of incineration, etc.). Records should be able to prove that all wastes received from outside sources have been incinerated</li> </ul>		

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	Time-frame	Responsibility
Emissions of particulates (PM <sub>10</sub> and PM <sub>2.5</sub> ) NO <sub>x</sub> , SO <sub>2</sub> and CO during operation	<p><u>Air Quality Impacts</u></p> <p>In order to assess the atmospheric impact of the facility on human health, a dispersion modelling study was undertaken in accordance with the regulations regarding air dispersion modelling specified for regulatory purposes – developed in terms of section 53 of AQA. The impact assessment only takes the emissions of the facility under consideration as well as prevailing ambient air concentrations into account during this assessment.</p> <p>Dispersion modelling results for the predicted 1-hour, 24-hour and annual average ambient concentrations of particulates (PM<sub>10</sub> and PM<sub>2.5</sub>), NO<sub>2</sub>, SO<sub>2</sub> and CO resulting from emissions from the proposed new incinerator were all very low on site and reach a maximum approximately 200 m downwind of the site. No exceedance of the NAAQS is predicted within the site or in residential and sensitive receptor areas around the site. The predicted PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, SO<sub>2</sub> and CO concentrations therefore comply with the NAAQS in the ambient environment. The predicted ambient concentrations are based on uncontrolled emissions and are assessed against the respective National Ambient Air Quality Standards (NAAQS).</p>	<p><u>OPERATIONAL MEASURES:</u></p> <ul style="list-style-type: none"> <li>• No air pollution control and abatement technology is currently proposed for the facility;</li> <li>• The incinerator should be operated according to the supplier's operating manual;</li> <li>• Training should be provided to personnel responsible for operating the incinerator;</li> <li>• Only trained personnel should be allowed to operate the incinerator; and</li> <li>• No unauthorised waste should be placed in the incinerator; and</li> <li>• Air quality monitoring will be implemented at a frequency determined by DEA's Air Quality Management Department and specified in the Atmospheric Emission Licence.</li> </ul>	Duration of operation	DRDAR



## 6 Monitoring, Reporting and Auditing

Replacement of the old, existing incinerator with a new incinerator should be complete within a few days and will be commissioned by the supplier and their trained personnel. No site inspections by an Environmental Control Officer (ECO) during construction are therefore proposed.

Monitoring measures during the operational phase is as follows:

Monitoring will be implemented at a frequency determined by DEA's Air Quality Management Department and specified in the Atmospheric Emission Licence.

## 7 Environmental Awareness Plan

The contractor supplying the new incinerator will have their own trained personnel, but should still be made aware of the requirements of the approved EMPr and the Environmental Authorisation conditions.

On-site training must be provided for all personnel during the construction and operational phase. All personnel on site must receive instructions on the requirements of the approved EMPr and the Environmental Authorisation conditions.

The training must deal specifically with triggers that would require the implementation of mitigation measures contained in the EMPr. These include, but are not limited to:

- Air quality management practices; and
- Waste management practices.

It is incumbent upon the contractor and the Developer to convey the sentiments and the specific provisions of the EMPr to all personnel involved in the construction and operations. This should be done via a formal training session.

## 8 Organisational Structure

The general roles and responsibilities of various parties are outlined below.

### 8.1 The Developer: Department of Rural Development and Agrarian Reform (DRDAR)

DRDAR shall ultimately be responsible for the implementation of the EMPr and shall appoint a representative, the Responsible Person (RP), who shall:

- Ensure that the Contractor is duly informed of the EMPr and associated responsibilities and implications of this EMPr;
- On-site training must be provided for all personnel during the operational phase;
- Monitor the Contractor's activities with regard to the requirements outlined in the EMPr;
- Act as a point of contact for local residents and community members;
- Ensure that the Contractor remedies problems in a timely manner and to the satisfaction of the authorities;
- Notify the authorities should problems arise that are not remedied effectively, or of any change in the development or changes in project specification that could significantly impact negatively on the environment; and
- The Developer has a duty to demonstrate respect and care for the environment in which they are operating. They will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the EMPr and any relevant legislation.

## 8.2 The Contractor

The contractor will be responsible for:

- Ensuring all activities on the site are undertaken in accordance with the EMPr;
- Informing all employees and sub-contractors of their roles and responsibilities in terms of the EMPr;
- Ensuring that all employees and sub-contractors comply with this EMPr; and
- The Contractor has a duty to demonstrate respect and care for the environment in which they are operating. They will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the EMPr, environmental regulations and relevant legislation.

## 9 EMPr Procedure

The EMPr implementation procedure is outlined below:

- The Contractor shall train his employees regarding the importance of the EMPr during construction (installation); and
- The Developer shall train all relevant personnel regarding the contents and importance of the EMPr during operation.

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All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

# Appendices

# **Appendix A: CV of Environmental Assessment Practitioner**

# SRK Report Distribution Record

Report No.

497875/Grahamstown/3

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Lyndon Mardon	Department of Economic Development, Environmental Affairs and Tourism (DEDEAT)	3	20 October 2017	R Gardiner
Dr George Akol	Department of Rural Development and Agrarian Reform	4	20 October 2017	R Gardiner
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